ชื่อเรื่อง	การแบ่งปันความเสี่ยงและการตอบสนองต่อความเสี่ยงในประเทศไทย
Title	Risk Sharing and Risk Response in Thailand

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บทคัดย่อ

การศึกษาในครั้งนี้มีวัตถุประสงค์เพื่อทดสอบการประกันเต็มรูปแบบและแบบจำลองการแบ่งปัน
ความเสี่ยงในประเทศไทย ผลการวิจัยปฏิเสธการประกันเต็มรูปแบบและปฏิเสธแบบจำลองการแบ่งปันความ
เสี่ยง สัมประสิทธิ์สหสัมพันธ์ทั้งหมดมีค่าไม่เท่ากับหนึ่งและไม่เท่ากับศูนย์ แต่มีค่าเข้าใกล้ศูนย์ ซึ่งหมายความ
ว่าการเปลี่ยนแปลง (อัตราการเจริญเติบโต) ในการบริโภคมวลรวม และการเปลี่ยนแปลง (อัตราการ
เจริญเติบโต) ในรายได้ของครัวเรือน แทบไม่มีผลต่อการเปลี่ยนแปลง (อัตราการเจริญเติบโต) ในการบริโภค
ของครัวเรือน การที่ผลวิจัยเป็นเช่นนี้เป็นเพราะการประกันตนเอง เมื่อเผชิญกับเหตุการณ์ฉุกเฉินหรือ
การช็อคที่เฉพาะเจาะจง คนไทยนำเงินออมออกมาใช้ และลดการใช้จ่ายในการบริโภคลง

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เฉพาะเจาะจง

Abstract

This study tries to test full insurance and the risk-sharing model in Thailand. The results
reject full insurance and reject the risk-sharing model. All coefficients are not equal to one and not
equal to zero. The coefficients are closed to zero which mean that changes (growth rates) in
aggregate consumption and changes (growth rates) in household income are almost no effect on
changes (growth rates) in household consumption. This result is because of self-insurance. When
Thai people have unavoidable emergency or face idiosyncratic shocks, they use savings and spend
less on household items, food, etc.

Keywords: full insurance, consumption insurance, self insurance, risk sharing, idiosyncratic shocks

Introduction

The objective of this study is to test that in Thailand there are full insurance or not, if not what
is the reason and there are the same result as Risk Sharing Model predict that the individual
consumption responds to aggregate risk but not idiosyncratic risk or not.

People face risk throughout most of the developing countries of the world. Risks are
human illness, which cause large expenditures such as medical costs and funeral, sickness or death
of plow animals, crop pests and diseases, erratic monsoon rain, earthquake, flood, and involuntary
job loss which cause fluctuations in net income of people. While household income in developing
countries varies greatly, consumption is remarkably smooth (Townsend (1994)).

From the theory of full insurance – if households are risk averse, and if actuarially fair insurance is available, then households will choose to buy insurance. Moreover, if the risks are largely idiosyncratic as the empirical evidence argues (e.g. Mace (1991), Cochrane (1991), Townsend (1994), and Townsend (1995)), then risk-averse households should group together to share all risks. Households receive help primarily through networks of friends and relatives. Risk can be shared through flexible, zero interest informal loans (e.g. Udry (1990)), gifts, remittances, saving, purchases and sales of real capital assets, including livestock, rice and consumer durables, or increased labor supply.

If risk is shared efficiently, household consumption should be unaffected by idiosyncratic risks. There are some economists that test about full insurance in different countries such as Mace (1991) tests in the United States, Cochrane (1991) tests in the United States, Townsend (1994) tests in village India, and Townsend (1995) tests in Thailand.

They study consumption insurance with specifications related to the regression. Mace (1991) ran the first explicit test of consumption insurance. She regressed change in household consumption with change in aggregate consumption and change in household income and employment status in 12 topics-: total consumption, services, non durables, durables, food, housing, utilities, household furnishings, clothing, medical care, transportation, and recreation. All variables other than the change in aggregate consumption are predicted to be insignificant in explaining the change in household consumption. The results are mixed. The results for one specification (exponential utility) are mostly consistent with full consumption insurance; the results for the other specification (power utility) are not. One possible explanation for the divergence in results between the first-difference (for exponential utility) and growth rate specifications (for power utility) is that lower income households are effectively given a larger weight than other households in the growth rate specification.

Cochrane (1991) tests consumption insurance by regressing growth in food consumption with 7 shocks in right-hand variables-: illness, involuntary job loss, weeks job search given involuntary job loss, strike days, involuntary move, income growth, and number move in minus move out. The result is the study rejects consumption insurance for a sample distributed throughout the United States.

Townsend (1994) ran pooled time-series, cross-sectional versions of individual consumption with aggregate consumption and individual income on the right-hand side in the three villages in India. The result is the income coefficients are statistically positive, thus rejecting the hypothesis of full insurance but there is relatively low influence of household income on household consumption. Changes in household consumption when there are changes in household income are no larger than .14 in any of the three villages. The income variable as a group do have significant impact on a household's present consumption, and villages display a considerable amount of risk sharing, though pooling is less than perfect.

The remarkable aspect of the analysis of Townsend (1994) and Cochrane (1991) is consumption insurance may hold more closely among groups that are closed by relationship such as relatives, friends, colleagues, or closed by geographical such as live in the same village or in rural amphoes. This is the reason we can explain that why the study of Cochrane (1991) rejects consumption insurance for a sample distributed throughout the United States and change in households income have more impact to changes in households consumption than the study of Townsend (1994) which studies in the three villages in India.

Townsend (1995) studied in Thailand. He used data during the five survey years: 1975, 1981, 1986, 1988 and 1990, but it's not household panel data. He regresses measured changes in region and community type average log consumption onto change in average log amphoe income for Bangkok, North, Northeast, Central, South, and all kingdom of Thailand. The result is an overwhelming rejection of full insurance. Consumption in an amphoe does move with income in that amphoe. The coefficients are between .414 and .847 which display that change in average log amphoe income has much impact on changes in region and community type average log consumption. There is little pooling of risk among entrepreneurs. Risk sharing is worse for entrepreneurs than for household as a whole, and with exceptions, worse within the greater Bangkok area than within the other regions.

Most of all studies reject full insurance. Self-insurance can be an alternative to consumption insurance. Households can have self-insurance through accumulation of assets and saving. Self-insured households must adjust consumption to idiosyncratic shocks.

This study includes 6 parts, part 1 is introduction, part 2 is theoretical framework, part 3 is methodology, part 4 is data, part 5 is results and part 6 is conclusions.

Theoretical Framework

Full Insurance

From the permanent income hypothesis: the individuals might be well insured and able to smooth consumption over states of nature over time. Consumption insurance studies households' ability to smooth consumption over states of nature. Under full insurance, consumption growth should be cross-sectional independent of idiosyncratic variables that are exogeneous to consumers. Some possible sources of insurance include insurance among family members, relatives and friends, contracts between employer and employee, unemployment insurance, crop insurance, borrowing and lending in credit market, and selling and buying in stock market. If people have full insurance, they can smooth their consumption eventhough income are fluctuate. It means that if we regress change in household consumption onto change in household income, the coefficient must be zero ($\beta = 0$).

Self Insurance

Self Insurance is an alternative to full insurance. People can have self insurance through accumulation of assets and saving and adjusting consumption to idiosyncratic shocks.

Theory of Risk Sharing

People can share risk among relatives, friends, and communities or networks. The principal implication of risk sharing is the individual consumption responds to aggregate risk but not idiosyncratic risk. Aggregate risk is represented by changes in aggregate consumption, and idiosyncratic risk is represented by changes in household's income. From the principal implication of risk sharing, it means that,if we regress change in household consumption onto change in aggregate consumption and change in household income, the coefficient of change in aggregate consumption must be positive ($\beta_1 > 0$) and the coefficient of change in household income must be zero ($\beta_2 = 0$). The risk-sharing model predicts that $\beta_1 = 1$, $\beta_2 = 0$. The implications of risk sharing are emphasized in recent works by Mace (1991), Cochrane (1991),Townsend (1994), and Townsend (1995).

Linkage between full insurance and risk sharing

Full insurance is a part of risk sharing. Full insurance we concentrate on respond of change in individual consumption when individual income changes. If people have full insurance, they can smooth their consumption eventhough income are fluctuate. It means that if we regress change in household consumption onto change in household income, the coefficient must be zero ($\beta_2 = 0$). Risk sharing we concentrate on both responds of change in individual consumption when aggregate consumption change and individual income change. The risk-sharing model predicts that individual consumption comove with aggregate consumption ($\beta_1 = 1$), but not respond to change in individual income ($\beta_2 = 0$).

Preference Specifications

Preferences are specialized to a class of homothetic functions. The first specification is exponential utility and the additional preference specification is power utility.

From recent works, if the specification is exponential utility, they regress change in individual consumption (ΔC_t^j) onto change in aggregate consumption (ΔC_t^a) and change in individual income (Δy_t^j) for first- differences specification in this form:

$$\Delta C_t^j = \alpha + \beta_1 \Delta C_t^a + \beta_2 \Delta y_t^j$$

If the specification is power utility, they regress growth rate in individual consumption ($\Delta \log C_t^j$) onto growth rate in aggregate consumption ($\Delta \log C_t^a$) and growth rate in individual income ($\Delta \log y_t^j$) for growth rate specification in this form:

$$\Delta \log C_t^j = \alpha + \beta_1 \Delta \log C_t^a + \beta_2 \Delta \log y_t^j$$

Mace (1991) says in her study (which is pointed out by Marjorie Flavin) that one possible explanation for the divergence in results between the first-difference and growth rate specifications is that lower income households are effectively given a larger weight than other households in the growth rate specification.

Idiosyncratic shocks are shocks that affect only one or some household, not affect the community such as unemployment of family's members, high expenses because of illness, death in family, fire destroy house or equipment, lost money from gambling, unable to repay debt, bad year for household business, income lower because of retirement, or won lottery, children finish school and go to work, children send money home, get a better main job, etc. Ideosyncratic shocks display by change in individual income.

Aggregate shocks are shocks that affect the community such as flood, not enough rainfall,earthquake, pests that destroy crops, low price for outputs, high input prices, high investment costs, or good weather for farming, high price for outputs, etc. Aggregate shocks display (when we find data) by change in aggregate consumption.

Methodology

The test involves regressing the change in household consumption onto the change in aggregate consumption and the change in household income.

For first-differences specification

$$\Delta C_t^j \;=\; \alpha + \beta_1 \Delta C_t^a + \beta_2 \Delta y_t^j \qquad\qquad (1)$$

where

$$\Delta C_t^j = C_t^j - C_{t-1}^j, \quad \Delta C_t^a = \frac{1}{J}\sum_{j=1}^{J}\Delta C_t^j, \quad \Delta y_t^j = y_t^j - y_{t-1}^j$$

C_t^j is household consumption at time t,

ΔC_t^j is change in household consumption,

C_t^a is aggregate consumption,

ΔC_t^a is change in aggregate consumption,

y_t^j is household income,

Δy_t^j is change in household income.

For growth rate specification

$$\Delta \log C_t^j \;=\; \alpha + \beta_1 \Delta \log C_t^a + \beta_2 \Delta \log y_t^j \qquad\qquad (2)$$

The risk-sharing model predicts that $\beta_1 = 1$, $\beta_2 = 0$. This study uses ordinary least squares (OLS) estimates and t-test to test significance of the coefficients. The study uses F-test to check that the model is best fits to the population from which the data are sampled. P-value of F-test is probability that all βs equal to 0. The model is best fits to the population if P-value of F-test is less than .05 (significance at the 5% level).

Data

I use data from TOWNSEND THAI PROJECT HOUSEHOLD SURVEY 2005 and 2007 (Urban Area). 1st Data Distributor Version: NORC at the University of Chicago [Producer]. Bangkok, Thailand: The University of Chicago-UTCC Research Center [distributor], 2008 which is panel data (see appendix).

This study uses Household Identification, Expenditure and Income to compute OLS for risk sharing and full insurance and use Residential Patterns in 2007, Risk Response in 2007 and Hypothetical Situation in 2007 to find risk response. First I want to use Children Living outside the House to find about remittances, but almost no data. Urban data in 2005 and 2006 are also almost no data, so I do not study about remittances.

In computing for risk sharing, I match CASEID of household in 2005 with 2007 to find the same household and deflate household income and expenditure in 2005 with Consumer Price Index: CPI in order to adjust them to be constant price. Some households which data are incomplete are cut off such as don't know the answer, refuse to answer, missing or invalid values and some households that appear in only one year (2005 or 2007). Furthermore, some data that have negative value of net income are cut off because they can not take log. The data are neither seasonally adjusted nor detrended prior to estimate. The coefficients are estimated using ordinary least squares (OLS).

Results

In Table 1 Household Consumption Regressions: First Differences Specification, I use equation (1) to compute OLS.

$$\Delta C_t^j \;=\; \alpha \;+\; \beta_1 \Delta C_t^a \;+\; \beta_2 \Delta y_t^j \qquad\qquad (1)$$

TABLE 1

Household Consumption Regressions: First Differences Specification

Consumption Measure	Intercept α	ΔC_t^a β_1	Δy_t^j β_2	P-value of F-Test	R^2
Total expenditure	-1525.085 (-0.17)	0.006 (1.07)	0.038 (3.57)*	.0009**	.013
Item 1+2+3 Rice, sticky rice, and grains	-7.958 (-0.03)	0.005 (7.12)*	-0.000 (-0.63)	.0000**	.042
Item 4 Milk and milk products	-317.914 (-0.52)	48.921 (2.27)*	-0.000 (-0.17)	.0754	.007
Item 5 Meat (chicken, beef, pork)	5.426 (0.02)	0.006 (5.23)*	-0.000 (-0.05)	.0000**	.024
Item 6 Alcoholic beverages consumed at home	-145.915 (-0.15)	0.039 (3.49)*	-0.001 (-0.22)	.0025**	.090
Item 7 Alcoholic beverages consumed away from home	1365.454 (0.79)	0.296 (1.66)	0.004 (1.17)	.2029	.111
Item 8 Tobacco	451.558 (0.45)	0.019 (1.65)	-0.003 (-1.41)	.1003	.020
Item 9 Gasoline (excluding gasoline for business or farm use)	-132.777 (-0.20)	0.006 (2.48)*	0.006 (3.30)*	.0002**	.017
Item 10 Ceremonies (wedding, monk's ceremony)	-99.633 (-0.31)	0.005 (3.87)*	0.002 (2.92)*	.0000**	.022
EX 5 House repairs	1320.393 (0.15)	0.054 (3.79)*	0.018 (1.00)	.0007**	.118

Consumption Measure	Intercept α	ΔC_t^a β_1	Δy_t^j β_2	P-value of F-Test	R^2
EX 6 Vehicle repairs	-53.117 (-0.14)	0.007 (2.34)*	0.002 (2.41)*	.0029**	.014
EX 7 Education expenses	-457.610 (-0.25)	0.010 (2.88)*	0.009 (2.52)*	.0010**	.021
EX 8 Clothing	-25.947 (-0.19)	0.006 (3.16)	0.001 (3.08)*	.0000**	.019
EX 9 Food eaten away from home	-294.404 (-0.32)	0.006 (9.94)*	0.006 (3.60)*	.0000**	.102

Note : Each row in each specification is a separate regression. t-statistics are in parentheses. Asterisks* at t-statistic denote significance at the 5% level. P-value of F-Test is probability that all βs equal 0. The model is best fits to the population if P-value of F-Test is less than .05 (significance at the 5% level). Asterisks ** at P-value of F-Test denote significance at the 5% level.

The model is best fits to the population if P-value of F-test is less than .05 (significance at the 5% level) in total expenditure, item 1+2+3 rice + sticky rice + grains, item 5 meat (chicken, beef, pork), item 6 alcoholic beverages consumed at home, item 9 gasoline (excluding gasoline for business or farm use), item 10 ceremonies (wedding, monk's ceremony), ex 5 house repairs, ex 6 vehicle repairs, ex 7 education expenses, ex 8 clothing and ex 9 food eaten away from home. Item 4 milk and milk products, item 7 alcoholic beverages consumed away from home and item 8 tobacco – the models are not best fits to the population at the significance of the 5% level and t-statistic are not significance at the 5% level for all β_1 and β_2, except β_1 of item 4 milk and milk products, so this study does not analyze about these 3 items.

The risk-sharing model predicts that β_1 = 1, β_2 = 0, but the results from this study are different from the risk-sharing model. T-statistic of β_1s are significance at the 5% level in item 1+2+3 rice + sticky rice + grains, item 5 meat (chicken, beef, pork), item 6 alcoholic beverages consumed at home, item 9 gasoline (excluding gasoline for business or farm use, item 10 ceremonies (wedding, monk's ceremony), ex 5 house repairs, ex 6 vehicle repairs, ex 7 education expenses, ex 8 clothing and ex 9 food eaten away from home, but all β_1s are not equal to 1 as the risk-sharing model predicts. The coefficients $\beta_1 \neq 0$ and $\neq 1$, but they are so small such as. 005, .006, .039, .006, .005, .054, .007, .010, .006, .006 respectively. All β_1s show that change in aggregate consumption (ΔC_t^a) have very small effect on change in individual household consumption (ΔC_t^j). However t-statistic of β_1 is insignificance at the 5% level in total expenditure.

T-statistic of β_2s are significance at the 5% level in total expenditure, item 9 gasoline (excluding gasoline for business or farm use), item 10 ceremonies (wedding, monk's ceremony), ex 6 vehicle repairs, ex 7 education expenses, ex 8 clothing and ex 9 food eaten away from home. The coefficients β_2 are so small such as .038, .006, .002, .002, .009, .001 and .006 respectively. All β_2s

show that change in individual household income (Δy_t^j) have very small effect on change in individual household consumption (ΔC_t^j). Households are well insured but not full insurance. Why? It is possible that people has alternative to full insurance. It may be self-insurance which this study will compare this table 1: first differences specification to table 2: growth rates specification and study more in the part of risk response. However T-statistic of β_2s are insignificance at the 5% level in item 1+2+3 rice + sticky rice + grains, item 5 meat (chicken, beef, pork), item 6 alcoholic beverages consumed at home and ex 5 house repairs.

In Table 2 Consumption Regressions: Growth Rates Specification, I use equation (2) to compute OLS.

$$\Delta \log C_t^j \ = \ \alpha \ + \ \beta_1 \Delta \log C_t^a \ + \ \beta_2 \Delta \log y_t^j \tag{2}$$

TABLE 2

Household Consumption Regressions: Growth Rates Specification

Consumption Measure	Intercept α	$\Delta \log C_t^a$ β_1	$\Delta \log y_t^j$ β_2	P-value of F-Test	R^2
Total expenditure	0.000	0.005	0.196	0.0000**	.060
	(0.00)	(2.01)*	(7.86)*		
Item 1+2+3 Rice, sticky rice, and grains	-0.011	0.005	0.050	0.0000**	0.042
	(-0.26)	(6.65)*	(2.25)*		
Item 4 Milk and milk products	-0.005	0.009	0.029	.0013**	0.020
	(-0.07)	(3.60)*	(0.53)		
Item 5 Meat (chicken, beef, pork)	-0.010	0.006	0.060	.0000**	.031
	(-0.32)	(5.57)*	(1.78)		
Item 6 Alcoholic beverages consumed at home	-0.038	0.038	0.068	.0774	.039
	(-0.35)	(2.27)*	(0.51)		
Item 7 Alcoholic beverages consumed away from home	0.036	0.183	0.344	.0758	.174
	(0.18)	(2.21)*	(1.57)		
Item 8 Tobacco	-0.048	0.028	0.095	.0105**	.040
	(-0.44)	(2.85)*	(0.87)		
Item 9 Gasoline (excluding gasoline for business or farm use)	-0.047	0.006	0.262	.0000**	.063
	(-0.93)	(3.70)*	(7.25)*		
Item 10 Ceremonies (wedding, monk's ceremony)	-0.021	0.006	0.127	.0000**	.039
	(-0.66)	(5.32)*	(3.78)*		
EX 5 House repairs	0.066	0.065	0.207	.0037**	.092
	(0.35)	(3.28)*	(1.04)		
EX 6 Vehicle repairs	-0.024	0.007	0.113	.0000**	.029
	(-0.40)	(4.55)*	(1.98)*		

Consumption Measure	Intercept α	$\Delta \log C_t^a$ β_1	$\Delta \log y_t^j$ β_2	P-value of F-Test	R^2
EX 7 Education expenses	0.004 (0.02)	0.009 (2.25)*	0.116 (2.07)*	.0093**	.015
EX 8 Clothing	-0.020 (-0.50)	0.006 (4.92)*	0.132 (3.49)*	.0000**	.034
EX 9 Food eaten away from home	-0.090 (-1.03)	0.006 (11.68)*	0.274 (4.85)*	.0000**	.144

Note :   Each row in each specification is a separate regression. t-statistics are in parentheses. Asterisks * at t-statistic denote significance at the 5% level. P-value of F-Test is probability that all βs equal 0. The model is best fits to the population if P-value of F-Test is less than .05 (significance at the 5% level). Asterisks ** at P-value of F-Test denote significance at the 5% level.

The model is best fits to the population if P-value of F-test is less than .05 (significance at the 5% level) in total expenditure, item 1+2+3 rice + sticky rice + grains, item 4 milk and milk products, item 5 meat (chicken, beef, pork), item 8 tobacco, item 9 gasoline (excluding gasoline for business or farm use), item 10 ceremonies (wedding, monk's ceremony), ex 5 house repairs, ex 6 vehicle repairs, ex 7 education expenses, ex 8 clothing and ex 9 food eaten away from home. Item 6 alcoholic beverages consumed at home and item 7 alcoholic beverages consumed away from home, F-test are not significance at the 5% level, but significance at the 10% level. So, this study analyzes all of them.

The risk-sharing model predicts that β_1 = 1, β_2 = 0, but the results from this study are different from the risk-sharing model. T-statistics of β_1s are significance at the 5% level in all of consumption measures, but all β_1s are not equal to one as the risk-sharing model predicts. The coefficients $\beta_1 \neq 0$ and $\neq 1$, but they are so small such as .005, .005, .009, .006, .038, .183, .028,. 006, .006, .065, .007, .009, .006 and .006 for total expenditure, item 1+2+3 rice + sticky rice + grains, item 4 milk and milk products, item 5 meat (chicken, beef, pork), item 6 alcoholic beverages consumed at home, item 7 alcoholic beverages consumed away from home, item 8 tobacco, item 9 gasoline (excluding gasoline for business or farm use), item 10 ceremonies (wedding, monk's ceremony), ex 5 house repairs, ex 6 vehicle repairs, ex 7 education expenses, ex 8 clothing and ex 9 food eaten away from home respectively. All β_1s show that growth rates in aggregate consumption ($\Delta \log C_t^a$) have very small effect on growth rates in individual household consumption ($\Delta \log C_t^j$). β_1s in table 1 and table 2 have the same conclusion that $\beta_1 \neq 0$ and $\neq 1$ (which is different from the prediction of the risk-sharing model that $\beta_1 = 1$) and they are so small.

T-statistic of β_2s are significance at the 5% level in total expenditure, item 1+2+3 rice + sticky rice + grains, item 9 gasoline (excluding gasoline for business or farm use), item 10 ceremonies (wedding, monk's ceremony), ex 6 vehicle repairs, ex 7 education expenses, ex 8 clothing and ex 9 food eaten away from home. The coefficients β_2s are so small such as .196, .050, .262, .127, .113, .116, .132 and .274 respectively. All β_2s show that growth rates in individual household income ($\Delta \log y_t^j$) has small effect on growth rates in individual household consumption ($\Delta \log C_t^j$). Households are well insured but not full insurance. Why? It may be self-

insurance which households can have through accumulation of assets and saving which we will study more in the part of risk response. However, β_2s in Table 2: Consumption Regressions: Growth Rates Specification (between .050 and .274) are bigger than β_2s in Table 1: Consumption Regressions: First Differences Specification (between .001 and .038). One possible explanation for the divergence in results between the first-difference (for exponential utility) and growth rate specifications (for power utility) is that lower income households are effectively given a larger weight than other households in the growth rate specification. So, if the government or social planners concentrate on lower income group or poor people, they should analyze by using growth rate specifications. T-statistic of β_2s are insignificance at the 5% level in item 4 milk and milk products, item 5 meat (chicken, beef, pork), item 8 tobacco and ex 5 house repairs.

All coefficients β_1s and β_2s that significance at the 5% level in table 1 and table 2 are not equal to zero and not equal to one ($\beta_1 \neq 0$, $\beta_1 \neq 1$, $\beta_2 \neq 0$, $\beta_2 \neq 1$), but they are closed to zero which mean that changes (growth rates) in aggregate consumption and changes (growth rates) in household income are almost no effect on changes (growth rates) in household consumption. This result is different from the prediction of the risk-sharing model which predicts that $\beta_1 = 1$, $\beta_2 = 0$ which means that changes (growth rates) in household consumption comove with changes (growth rates) in aggregate consumption but not respond with changes (growth rates) in household income. This result of the study of risk-sharing in Thailand may be because of self-insurance which households can have through accumulation of assets and saving and adjusting consumption to idiosyncratic shocks which we can see from the part of risk response from table 3 to table 5.2.

When households face idiosyncratic risks, what are their respond. They have networks or not. We can see from this part-risk response.

TABLE 3

Residential Patterns in 2007

Questions	Yes	No
Did head or spouse's parents share rice with anyone in household?	291 (65.7)	152 (34.3)
Did anyone in household help the head or spouse's parents with free labor?	156 (35.2)	287 (64.8)
Did head or spouse's parents help anyone in household with free labor?	138 (31.2)	305 (68.8)
Did anyone in household help the head or spouse's parents with money?	267 (60.3)	176 (39.7)
Did head or spouse's parents help anyone in household with money?	188 (42.4)	255 (57.6)
Is the head or the spouse have any relatives (including parents and kids) who live in this village or in this tambon, but not in this house?	1,240 (86.1)	200 (13.9)

Did anyone in household share rice with any relatives that are living in the village or the tambon?	1,180 (95.2)	60 (4.8)
Did any relatives that are living in the village or in the tambon share rice with any of the people who live in this house?	1,163 (93.8)	77 (6.2)
Did anyone in household do labor exchange with any relatives that are living in the village or tambon?	525 (42.3)	715 (57.7)
Did anyone in household let any relatives that are living in the village or in tambon use farm equipment owned by people in this house for free?	313 (25.2)	927 (74.8)
Did anyone in household that are living in the village or in the tambon get free use of farm equipment owned by the relatives who live in the village or tambon?	293 (23.6)	947 (76.4)
Did anyone in household help any relatives that are living in the village or in tambon?	681 (54.9)	559 (45.1)
Did any relatives that are living in the village or in the tambon help anyone in this house with money?	785 (63.3)	455 (36.7)
Did anyone in household share rice with any non-relatives that are living in the tambon?	1,128 (78.3)	312 (21.7)
Did any non-relatives that are living in the village or in the tambon share rice with you or anyone else in your household?	1,132 (78.6)	308 (21.4)
Did anyone in household help non-relatives that are living in the village or in the tambon?	532 (36.9)	908 (63.1)
Did any non-relatives that are living in the village or in the tambon help anyone in your household with free labor?	524 (36.4)	916 (63.6)
Did anyone in household let non-relatives that are living in the village or in the tambon use farm equipment for free?	263 (18.3)	1,177 (81.7)
Did any non-relatives that are living in the village or in the tambon let anyone in your household use farm equipment for free?	241 (16.7)	1,199 (83.3)
Did anyone in household help non-relatives that are living in the village or in the tambon with money?	435 (30.2)	1,005 (69.8)
Did any non-relatives that are living in the village or in the tambon help anyone in your household with money?	461 (32.0)	979 (68.0)

Note: The number in the parenthesis is percentage.

From table 3 residential patterns in 2007, we can see that households help each other with parents, relatives and non relatives in the same village or tambon in some kind like networks. 65% of households share rice with parents and 60% share in the form of money. 86% of households have relatives in the same village or tambon. 93-95% of households share rice with relatives who live in the same village or tambon. 55% of households help relatives who live in the same village or tambon and 63% of relatives help households with money. Furthermore, 78% of households share rice with non-relatives who live in the same village or tambon. This data show networks of

households who help each other in the kind of rice and money. There are small percentages that households help each other with free labor, labor exchange and use farm equipment. Households share rice with non relatives in the same village or tambon, but only help in small percentage in the form of money.

Table 4 risk response in 2007 comprise of table 4.1-4.7.

TABLE 4 Risk Response in 2007

TABLE 4.1

What was the worst year for household income in the past 5 years?

Answers	Number	Percent
this past year, June 2006-May 2007	782	54.3
the year before, June 2005-May 2006	176	12.2
income exactly the same in both years	482	33.5

From table 4.1, 54% of households answer that the worst year for households' income in the past 5 years is June 2006 – May 2007.

TABLE 4.2

First reason why household had the worst income in which year mentions (rank 1-3).

Answers	Rank	Number	Percent
high investment costs	1	279	19.4
worked fewer days in current occupation	2	182	12.6
education expenses are higher	3	171	11.9

In table 4.2, first reason why households have the worst income in which year mention – the first rank (19%) is high investment costs, the second rank (13%) is worked fewer days in current occupation and the third rank (12%) is education expenses are higher.

TABLE 4.3

Second reason why household had the worst income in which year mentions (rank 1-3).

Answers	Rank	Number	Percent
bad year for household business	1	188	14.6
worked fewer days in current occupation	2	169	13.1
high investment costs	3	115	8.9

Rank 1-3 in the second reason in table 4.3 are almost the same of the first reason. For the second reason, the first rank (15%) is bad year for household business, the second rank (13%) is worked fewer days in current occupation, the third rank (9%) is high investment costs.

TABLE 4.4

Whether the year is also bad for several other households in the village?

Answers	Number	Percent
Yes	296	20.6
No	1,144	79.4

From table 4.4, 79% of households do not think that bad year for him is also bad for several other households in the village. It means that most of them think it is idiosyncratic shock not aggregate shock.

TABLE 4.5

1st most important response for worst income year

Answers	Rank		Number		Percent	
use savings	1		566		39.3	
spend less on household items, food, etc.	2		392		27.2	
borrow from village fund	3		101		7.0	
sell/eat rice in storage	7		40		2.8	
help from relatives in village (not money)	5		45		3.1	
help from relatives in village (money)	6		43	190	3.0	13.2
help from relatives out of the village (not money)	17		6		0.4	
help from relatives out of the village (money)	4		96		6.7	
help from non-relatives in the village (not money)	13		9		0.6	
help from non-relatives in the village (money)	15		7	18	0.5	1.2
help from non-relatives out of village (money)	22		2		0.1	
borrow from moneylender in the village	12		13	19	0.9	1.3
borrow from moneylender out of the village	17		6		0.4	
borrow from BAAC	11		15		1.0	
borrow from PCG	22		2		0.1	
sell livestock or equipment	22		2		0.1	

Note: PCG is Public Consulting Group.

BAAC is Bank for Agriculture and Agricultural Cooperative.

For self-insurance we can see from table 4.5 first most important respond for worst income year.The first priority (39%) is use saving. The second priority (27%) is spend less on household items, food, etc. The first and the second priority (66%) show that households have self-insurance by accumulate money in the form of saving and use it when they have idiosyncratic shocks and try to adjust themselves by spend less. The third (7%) is borrow from village fund. Sell or eat rice in storage is only small proportion (3%) and rank 7. If we concentrate on networks, we can see that help from relatives in the form of money and not money in village and out of the village is very high proportion (13%). It is very important. Help from non relatives in the form of money and not money in the village and out of the village is very small proportion (1.2%). Borrow from moneylender in the village and out of the village is also small proportion (1.3%). Borrow from the Bank for Agriculture and Agricultural Cooperative: BAAC and Public Consulting Group: PCG are very small (1% and 0.1% respectively). In Thailand, sell livestock or equipment is not important response as the other countries, there is only 0.1%.

TABLE 4.6

Did your family get the effect from financial and economy condition that happen?

Answers	Number	Percent
Yes	402	27.9
No	1,038	72.1

Surprising that 72% of household answer that their family do not get the effect from financial and economy condition that happen in table 4.6 despite they answer in table 4.1 about worst year for household income. This display that they think they can cope with their problem by using saving and spend less on household items, food, etc. which they answer in table 4.5 which is their self insurance.

TABLE 4.7

What the effect did your family get?

Answers	Rank	N	Percent
increased consumer goods price caused household expenses increased	1	60	3.8
increased goods price caused household expenses increased	2	40	2.6
consumer goods and petrol price increased	3	36	2.3

In table 4.7 ranks 1-3 of what the effect their families get, the first rank (3.8%) is increased consumer goods price caused household expenses increased, the second rank (2.6%) is increased goods price caused households expense increased, the third rank (2.3%) is consumer goods and petrol price increased.

TABLE 5 Hypothetical Situation in 2007

TABLE 5.1

How would you get THB 2,000, suppose you have any unavoidable emergency?

Answers	Rank	Number		Percent	
use savings	1	1,212		84.2	
borrow from money lender in the village	3	33		2.3	
borrow from one relative in village	2	95		6.6	
borrow from one relative out of village	4	32		2.2	
borrow from many relatives in the village	9	4	133	0.3	9.3
borrow from many relatives outside the village	11	1		0.1	
borrow from many relatives in and out of the village	11	1		0.1	
sell rice	8	8		0.6	
borrow from PCG	11	1		0.1	
borrow from Agricultural cooperative	19	0		0.0	
borrow from housewife's group	19	0		0.0	
borrow from BAAC group members	19	0		0.0	
borrow from doctor	19	0		0.0	
borrow from bank	19	0		0.0	

Note: PCG is Public Consulting Group.

BAAC is Bank for Agriculture and Agricultural Cooperative.

Table 5 hypothetical situation in 2007 show that if households have unavoidable emergency, how would households get 2,000 baht in table 5.1 and 20,000 baht (a lot more money) in table 5.2.The rank priority of the answer in these 2 tables are almost the same, but the percentage are difference. In table 5.1 the first rank priority (84%) is use savings, the second rank (7%) is borrow from one relative in village, the third rank (2%) is borrow from moneylender in the village. Help from relatives is a very important source. Borrow from relatives either one or many relatives in the village and outside the village is in high proportion (9%). Sell rice is not important response. There is only 0.6%. Borrow from PCG is also not important (0.1%). No one borrow from Agricultural cooperative, housewife's group, BAAC, doctor and bank. This result is because of these institutions or groups in Thailand do not give loans for consumption. They give loans for investment.

TABLE 5.2

How would you get THB 20,000, suppose you have any unavoidable emergency?

Answers	Rank	Number		Percent	
use savings	1	677		47.0	
borrow from money lender in the village	3	107		7.4	
could not find	4	97		6.7	
borrow from one relative in village	2	199		13.8	
borrow from one relative out of village	5	85		5.9	
borrow from many relatives in the village	8	39	358	2.7	24.8
borrow from many relatives outside the village	12	16		1.1	
borrow from many relatives in and out of the village	11	19		1.3	
sell rice	22	1		0.1	
borrow from PCG	15	4		0.3	
borrow from Agricultural cooperative	27	0		0.0	
borrow from housewife's group	27	0		0.0	
borrow from BAAC group members	27	0		0.0	
borrow from doctor	27	0		0.0	
borrow from bank	15	5		0.3	

Note: PCG is Public Consulting Group.

BAAC is Bank for Agriculture and Agricultural Cooperative.

In table 5.2 the same question as in table 5.1, but increase amount of money that households would get suppose they have unavoidable emergency from 2,000 baht to 20,000 baht. The first rank priority (47%) of answers is use saving which confirm that people in Thailand have self-insurance by accumulate money in the form of saving and use it when they face idiosyncratic shocks. The second priority (14%) is borrow from one relative in village. The third priority (7%) is borrow from moneylender in the village. The interesting remark from this table is there are 7% of households which is the fourth rank priority that answer 'could not find'. Only 20,000 baht or around $570 is not much for people in developed countries, but there are around 7% of Thai people that could not find when they have unavoidable emergency. Help from relatives is very importance source. Borrow from relatives either one or many relatives in the village and outside the village is in high proportion (25%). Sell rice is not important (only 0.1%). Borrow from PCG and banks are also not important (the same proportion 0.3%). No one borrow from Agricultural cooperative, housewife's group, BAAC and doctor.

Conclusions

This study tries to test full insurance and the risk-sharing model by using TOWNSEND THAI PROJECT HOUSEHOLD SURVEY 2005 AND 2007 (Urban Area) in 6 provinces 96 communities. The results from household consumption regressions both first differences specification and growth rates specification reject full insurance and reject the risk-sharing model. All coefficients β_1s and β_2s are closed to zero which mean that changes in aggregate consumption and changes in household income have very small effect on changes in household consumption in almost all consumption measures for first differences specification and growth rates in aggregate consumption and growth rates in household income have small effect on growth rates in household consumption in all consumption measures for growth rates specification.

This result is because of self-insurance which households can have through accumulation of assets and saving. When people in Thailand have unavoidable emergency, they use savings in the first priority. And first most important response for worst income year is use savings in the first priority and spend less on household items, food, etc. in the second priority which is confirm that Thai people have self-insurance.

For policy suggestion from this result, if the government or social planners concentrate on lower income group or poor people, they should analyze by using growth rate specifications and Thai government should promote saving by giving motivation and rewards for poor people in Thailand in order to increase their self insurance

However the result in this study that reject perfect risk-sharing may be because of the assumption that all households have the same preferences. If households have different risk preference, some households who have lower risk averse may accept risk that have high return. This reason can make us underestimate risk-sharing. Indeed that community may have efficient risk-sharing.

This study is different from Townsend (1995) which is study in Thailand because this study use household panel data which I compare change in consumption and income from the same household by matching CASEID in 6 provinces and more recent data (2005 and 2007). Townsend used pool data (not compare for the same household, but compare for the same amphoe). He said in his paper that the major drawback of the Thai data he used was that they did not constitute a household panel-no household was known to be sampled more than once during the five survey years. He compares in the level of amphoes. So, the result is different. In this study, the impact of changes (growth rates) in household income on changes (growth rates) in household consumption is less than in the study of Townsend (1995). The coefficients (β_2) in my study (between .001 to .196) are smaller than in Townsend (1995) (between .414 to .847) which means people are more insured in this study.

In the future, if someone has data or budget to survey, I think they should study in the rural area of Thailand to compare with urban area in this study.

References

Cochrane, J. H., "A Simple Test of Consumption Insurance." Journal of Political Economics, 99(5): 1991,pp. 957-976.

Mace, B. J., "Full Insurance in the Presence of Aggregate Uncertainty." Journal of Political Economics, 99(5): 1991, pp. 928-956.

Townsend, Robert M. "Consumption Insurance: An Evaluation of Risk-Bearing Systems in LowIncome Economies." Journal of Economic Perspectives, Vol. 9, No. 3. (Summer 1995), pp. 83-102.

Townsend, Robert M. "Risk and Insurance in Village India." Econometrica, Vol. 62, No. 3. (May, 1994), pp.539-591.

Udry, C., "Credit Markets in Northern Nigeria: Credit as Insurance in a Rural Economy." The World Bank Economic Review, Vol. 4, No. 3. (Sept, 1990), pp.251-259.

APPENDIX

TOWNSEND THAI PROJECT HOUSEHOLD SURVEY 2005 and 2007 (Urban Area). 1st Data Distributor Version: NORC at the University of Chicago [Producer]. Bangkok, Thailand: The University of Chicago-UTCC Research Center [distributor], 2008.

This survey was undertaken to evaluate the role of informal institutions such as the family and local networks and formal institutions in helping to support the welfare and well-being of individuals in urban areas of Thailand. Questions concerned Household Identification, Risk Response, Household composition, Occupation, Children Living outside the Household, Residential Patterns, Household Assets, Agricultural Assets, Household Business, Housing and Landholding, Expenditures, Income, Borrowing, Lending, Savings, General Questions, Hypothetical Situation and Institutions and Organizations were collected.

Date of collection

HOUSEHOLD SURVEY 2005   2005-07 – 2005-09

HOUSEHOLD SURVEY 2007   2007-07 – 2007-09

Universe: All resident population in the selected six provinces (Chachoengsao, Lop Buri, Buriram, Sisaket, Satun, Phrae) in Thailand in July – September

Area selection

The survey picks 16 communities in municipal areas of each amphoe under the ongoing Townsend's project (Rural Survey). However, the numbers of communities in each amphoe vary between 1 to 18 communities; the Muang district has the largest number of communities, while other municipalities have no more than 4 communities. In order to cover the majority of both areas and community, the survey chooses 10 communities in Muang district and additional 2 communities in other municipal areas in 3 amphoes in each province, totaling 96 communities. The choices of amphoes for urban survey are as follow:

1. Chachoengsao includes Muang district and 3 amphoes, namely Bangpakong, Bangkla and Phanomsarakam. Amphoe Bang Nam Priao and Amphoe Sanamchai have only 1 community and 2 villages that are semi-urban. In addition, there are villages included in the Townsend Rural Survey. Amphoe Khao Takiab is excluded for the reason that there is no muinicipality.

2.   Lop Buri the survey covers Amphoe Muang, Ban Mee, Chaibadan and Koksamrong.

3.   Buriram the survey covers Amphoe Muang, Prakonchai, Satuk and Nangrong.

4.   Sisaket the survey covers Amphoe Muang, Kanthararom, Kanthonlak and Uthumpornpisai. Amphoe Prangkoo is excluded for the reason that it has only 1 community. Amphoe Posrisuwan is excluded for the reason that there is no municipality.

5.   Satun the survey covers Amphoe Muang, Langu, Tapae and Kuandon.

6.   Phrae the survey covers Amphoe Muang, Denchai, Rongkwang and Sungman.

Sample Selection 15 Households are selected from each community for interview. Due to time constraint, the survey decided to use the list of community fund's member who applied for village/community fund from Government Housing Bank and Bank for Agriculture and Agricultural Cooperatives. Each community fund must have members who are residents of that community no less than 95% of total household in the community. Each member is assigned a number and will be randomly selected. There are 1440 households (240 for each province) in total. The community heads (in the selected sample) are also interviewed; totaling 96 communities. For institutional survey, it is required prior to the community selection that such community must have village/community fund in operation. The village fund committees are interviewed by using Household Questionnaire Initial Survey. The survey includes 96 communities' funds, saving groups, other group and 26 institutions /organizations of ROSCA. Data Source: Personal interviews