



Received: 4 September 2015
Received in revised form: 4 May 2016
Accepted: 10 May 2016

Income, Saving, and Wealth of Thai Rural Households: A Case Study of Saving Adequacies

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Abstract

This paper investigates the savings and wealth of Thai rural households with an emphasis on the issue of saving inadequacies. We use the household survey conducted by the National Statistical Office in 2009 as a database. First, we hypothesize an interrelationship between household income, saving, and assets. Further, we estimate the scope of the relationship using an econometric technique and examine savings predicted over the household's lifecycle. Our findings indicate that: (i) approximately 29% of Thai rural households overspent their income; indeed, this group failed to save and incurred negative savings, (ii) 47% of Thai rural households inadequately saved due to a "weak definition" which signifies the amount saved is inadequate or too little to cope with future risks and uncertainties. Calculations related to the probabilities of saving inadequacies compared age-cohorts, occupations, and levels of education. The last section discusses long-term implications of saving inadequacies, and limitations of the model for improving saving practices within Thai rural households.

Keywords: Income, saving, wealth, saving inadequacy, socio-economic factors, rural household, Thailand

JEL classification: D14, D64, D140, E21, R2

Introduction

Concerns regarding the rise of consumerism and indebtedness are frequently raised in Thai newspapers with worrying notes that a significant portion of Thai people overspend or save inadequately (Pootrakul, 2005). The impact on elderly Thai persons, who have inadequate savings, is particularly pronounced and has particular significance to the Thai society given that Thailand is facing a proportionate increase in its aged population. Some commentators have suggested that it may be time for the central bank to tighten controls on consumer credit. We are of an opinion that the issue of saving inadequacies should be examined closely – first focusing on those families who overspend their income or save too little. We chose to limit the scope of this study to Thai rural households for the reasons that, based on the preliminary data observed, the incidence of indebtedness is higher in rural areas. The greatest proportion of rural workers is self-employed or informally employed without social security, and appears to be more vulnerable to income fluctuations than the formal employed and urban workers.

This paper hypothesizes an interrelationship between income, saving, and assets of rural households and empirically tests the relation using an econometric model that calculates the probabilities of saving inadequacies. The term ‘saving inadequacies’ needs clarification and we propose two proxy indicators: First, a “strong definition” which refers to an inability to save, or more precisely, overspending. A second concept, referred to as a “weak definition,” meaning that the amount saved is inadequate or too little to cope with future risks and uncertainties. According to the “Self-Sufficient Philosophy”, all families should develop an immunity (which in our context connotes to saving as a risk-coping mechanism). We suggest an operational definition of inadequacy by creating a dummy variable = 1 if the actual savings amount is less than 50% of the predicted savings amount from our model.

Our paper is organized into five sections. Section I is an introduction, section II is a brief review of the lifecycle model of saving and an extended model that accepts the parental altruistic attitude toward offspring and the role of an intergenerational bequest. Section III explains the database and terminologies (measurements of saving and saving inadequacies), and leading up to an econometric estimate, presents comparative statistics according to age cohorts, occupations, and educational attainments. Section IV discusses weakness in our measurements and the complexity of the dominant issue pertinent to this study. Section V is a conclusion.

The Model

This study adopts the lifecycle model of saving as a framework (Modigliani 1988) with an extension by assuming that parents are, in general, altruistic toward their children and have good intentions to bequeath assets to their beloved children. The basic lifecycle model of saving assumes that a representative individual is rational, and that his/her life span is divided into three periods (young and not working; adult and actively working; and living in retirement). While a person is actively working, he or she must plan to save part of the income (Y) in the form of savings (S) (where S_i depends on socio-economic factors such as income, occupation, education attained, number of children, regional dummies, urban/rural, etc.) and accumulated stock of assets (A). Assets have multiple functions and provide option value for a family – assets can be withdrawn for consumption or can be used for future investment. This is in contrast to a simple model based on a maximized self-interest motive, whereby a person can plan to spend all of his/her assets by the end of life. The model implicitly assumes that a representative person plans savings seeking to maximize a lifetime utility function. In practice, it is questionable whether he or she actually will behave as such, and whether he or she has perfect foresight as to longevity. And, it is questionable whether a person can make other accurate bold assumptions, such as lifetime income stream and the future spending needed during the remainder of their lifetime.

Our approach adopts an extended version of the lifecycle model by assuming parental altruism toward their offspring (and vice versa, children are altruistic toward their parents). Becker and Tomes (1979) introduced the concept of “dynastic utility” in which the well-being of children (born or unborn) is part of parents’ utility. Parents wish to pass on their assets to offspring via bequest (B) and human capital bequest (H). Unlike self-interested parents, altruistic parents do not deplete accumulated assets by the end of life. A bequest or human capital bequest yields parents’ utility.

We follow an extended lifecycle model by assuming altruistic parents and the dynastic utility as a framework. As such the key variables in our model encompass income (Y), savings (S), assets (A), bequest (B) and human capital bequest (H). Saying that parents are, in general, altruistic to their offspring, does not mean that every parent transfers assets to younger generations – it is possible that some parents fail to save adequately; hence, few assets or assets with negligible value are actually transferred.

Akerlof (1991) suggests that people can be time-inconsistent, in the sense that he or she realizes the importance of saving and intend to save each month or every day, yet, many people procrastinate and postpone an action for tomorrow instead of saving today. A failure to save a promised amount (say $x\%$) is considered a ‘minor mistake’, yet, if one procrastinates for a long time, it can become a major mistake.

Empirical Evidence

This section reports our empirical findings and sets forth descriptions of the data and clarification of terms (in particular, the meaning of saving and saving adequacies). Household savings is conventionally defined as income subtracted by consumption expenditures. In practice, it is not always clear which expenditure item is consumption and which is not. For instance, are insurance premium payments a consumption or an investment for the future? In this paper, we adopt two definitions of savings. First, “save1” is defined as household income subtracted by household expense inclusive of insurance premium payments. Second, “save2” is defined as “save1” plus 2 x insurance payments. The latter definition means that an insurance premium payment is treated as savings rather than consumption.

It is commonly known that saving is highly influenced by income (Browning and Lusardi 1996) - yet both income and savings are influenced by cultural factors and varying social settings. We adopt the notion of social dimension of saving and assume that occupations, age cohorts, gender, and educational attainments may influence the rate of household saving. According to the socio-economic data conducted by NSO in 2009, the pattern of income, net assets, and savings of households in rural Thailand areas are shown in Figure 1, Figure 2, and Figure 3. Figure 1 shows the relationship between income and age of the household head; income increases in early age and diminishes in older age in accordance with the lifecycle model. Figure 2 indicates that persons who do not use an asset to smooth consumption later in their life may bequeath some assets to their offspring. Figure 3 shows saving rates, which vary according to the age of the household head.



Figure 1: Income and Age of Household Head in Rural Area

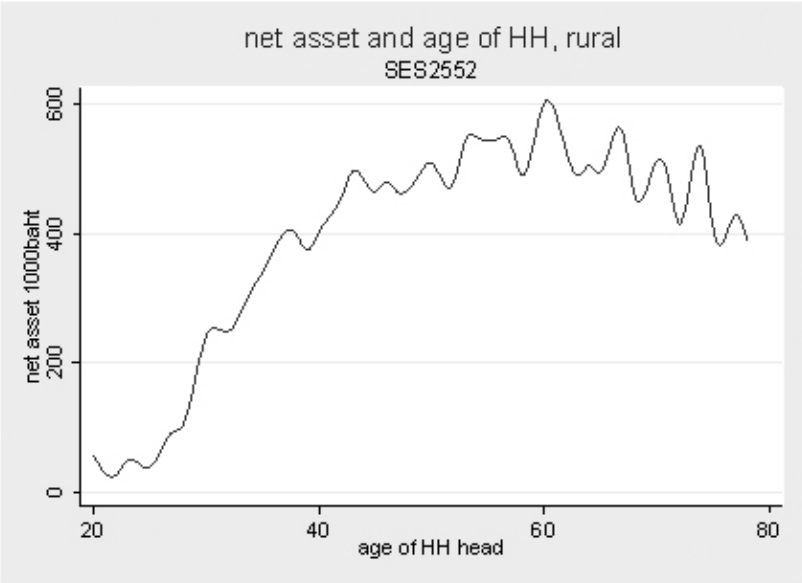


Figure 2: Net Assets and Age of Household Head in Rural Area

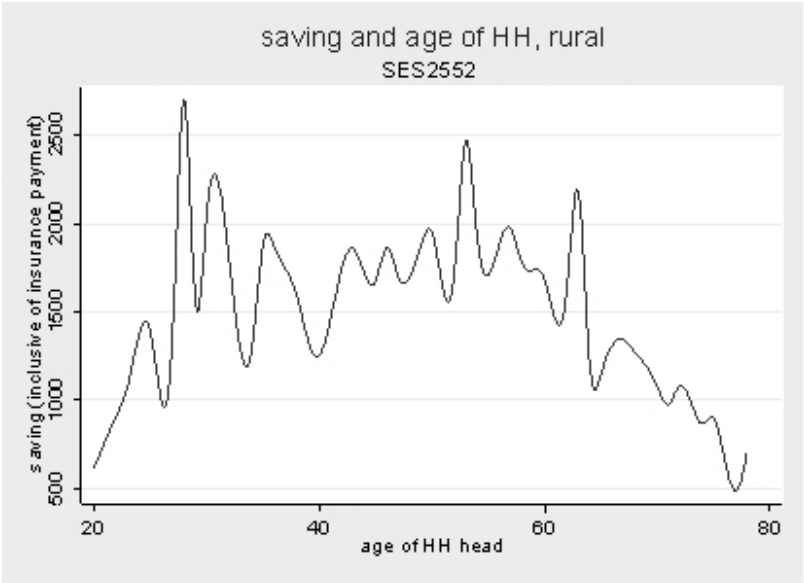


Figure 3: Saving Rate by Age of Household Head

Table 1 displays statistics describing the income, saving, and wealth for Thai rural household (all variables are per capita). The per capita income averaged 8,188 Baht per month and the per capita savings (the second definition) averaged 2,239 Baht per month. These statistics give an impression that rural households could save at a fairly high saving rate (27%). This does not mean that every rural household could save. On the other hand, the poor people (p25) still have negative savings - indeed, it is important to examine how savings is distributed. This table reports savings amounts by percentile. More than 25 percent of the rural households not only failed to save, they actually overspent and incurred negative savings.

Table 1: Descriptive Statistics of Rural Household: Income, Savings, and Wealth

Statistics		per capita	per capita	per capita	per capita
		Income	wealth	save 1	save 2
		Baht/month	1000 Baht	Baht/month	Baht/month
Mean	8,188	401	1,875	2,239	
percentiles					
	p10	1,901	9	-1,105	-882
	p25	2,959	46	-189	-33
	p50	5,117	153	548	777
	p75	9,343	377	2,026	2,476
	p90	16,737	861	5,518	6,196
	p99	47,184	4,053	23,906	25,617
Gini coefficient		0.49	0.69	0.69	0.67

Source: NSO's household survey, 2009

Figure 4: displays two kernel density curves for savings (in a natural log) and income (also in a natural log). The magnitude of variations in savings is clearly greater than that of income.

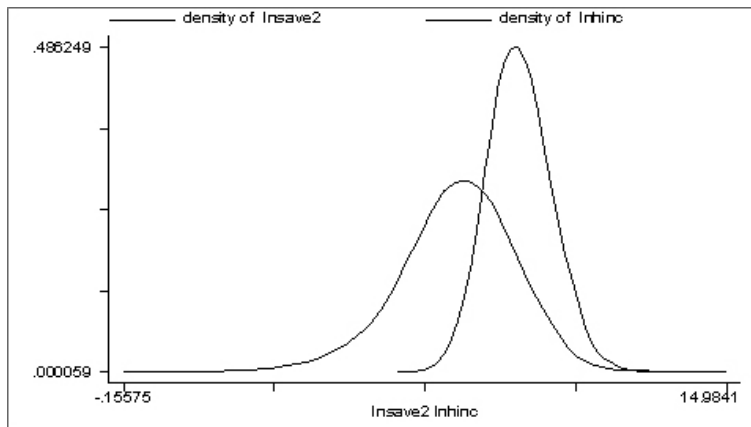


Figure 4: Kernel Densities for Savings and Income (rural households, 2009)

As mentioned earlier, we presume that income, saving, and wealth can be influenced by socio-economic variables such as occupation, educational attainment, or age of the household head. In Table 2 we tabulate distributional statistics of income by occupational groups. According to the NSO's report, occupations are broadly grouped into nine categories; we chose to regroup them into seven groups. Comparing the data according to occupation revealed that professionals and technicians (groups 2+3) ranked at the top of the income scale with an average income of 38,388 Baht per month; at the middle level are executives (group 1), clerks (group 4), and service workers (group 5) whose average incomes ranged from 20,000 to 27,000 Baht per month; and at the bottom of the income scale are agricultural workers (group 6), craftsman and factory workers (groups 7+8), and primary occupations (group 9).

Table 2: Distribution of Rural Household Income by Occupational Groups

Unit: Baht per month

Occupational Group	Mean	SD	p10	p25	p50	P75	p90
1	27,455	30,764	6,867	11,020	18,403	32,929	56,901
2+3	38,388	25,541	11,685	19,586	33,800	49,163	71,388
4	24,776	17,074	9,671	13,530	19,425	31,517	47,516
5	20,560	19,391	6,536	9,730	15,581	25,325	40,327
6	14,365	14,612	4,190	6,376	10,341	17,201	28,772
7+8	16,518	14,513	6,151	8,944	13,350	20,187	28,904
9	13,185	21,621	3,644	5,541	8,981	15,238	25,192
Average	16,814	20,390	4,444	6,879	11,551	20,018	33,845

Source: NSO's household survey, 2009

Next, we explored an association between occupational choices and educational attainment. We made a presumption that the latter variable might have a significant influence on the former, so we cross-tabulated the two variables as shown in Table 3. We noted that the majority of highly educated household heads (who hold college degrees) chose executive, professional, and technician as their occupations. By contrast, a majority of household heads with only a primary level educated indicated agricultural worker and primary occupation.

Table 3: Tabulation of Occupational Choices and Education Attainment

Unit: number of households

Occupational choice	Lower		Upper		Univ.	Univ.	Total
	Primary	Secondary	Secondary	Vocation	Higher	Bachelor	
Executive	955	213	186	41	92	33	1,520
Professional	6	3	19	13	246	35	322
Technician	57	29	47	41	73	6	253
Clerk	33	24	55	30	48	1	191
Service worker	682	162	162	43	50	0	1,099
Agricultural worker	5,111	810	274	50	35	1	6,281
Craftsman	962	199	85	48	9	0	1,303
Factory worker	460	182	129	30	5	0	806
Basic occupation	3,744	980	170	50	71	1	5,016
Total	12,010	2,602	1,127	346	629	77	16,791
Pearson chi2(40)	=	8,300.0	Pr	=	0.00		
likelihood-ratio	=	3,800.0	Pr	=	0.00		
Cramer's V	=	0.31					
Gamma	=	-0.21	ASE	=	0.01		
Kendall's tau-b	=	-0.13	ASE	=	0.01		

Source: NSO's household survey, 2009

Table 4 reports the estimates for the structural equations in which income (Y), savings (S) and net assets (assets – debt) are treated as dependent variables and assumed to be influenced by the set of explanatory variables. We chose a seemingly unrelated regression (SUR) as the method on the grounds that their error terms might be contemporaneously correlated to explain the relations among dependent and independent variables.

Table 4: The Estimates for Structural Equations (Seemingly Unrelated Regression)

Equation: Variable	Co.ef. (t-stat)	Meaning of Variable
Eq1:income		
Hinc		
Earnr	5096.9339 (33.29)	number of earner
Age	666.0314 (9.28)	age
Agesq	-5.3249 (-7.99)	age squared
Yred	2128.6195 (31.15)	year of education
_locc1_2	2746.23 (2.8)	professional
_locc1_3	-5017.6303 (-3.49)	technician
_locc1_4	-4428.8046 (-5.97)	clerk
_locc1_5	-9405.1385 (-17.09)	service worker
_locc1_6	-6736.0616 (-10.57)	agricultural or general worker
_locc1_7	-5184.7761 (-8.69)	craft
_lreg_2	4471.8038 (11.25)	central
_lreg_3	(omitted)	north
_lreg_4	-1490.2705 (-3.55)	northeast
_lreg_5	5448.3492 (11.23)	south
_cons	-23122.397 (-10.85)	constant term

Table 4: The Estimates for Structural Equations (Seemingly Unrelated Regression)

Eq2: Household Savings		
Save2		
Hinc	0.6105 (148.25)	household income
ch014	-901.0042 (-9.61)	number of children age 0-14
Age	-12.7965 (-0.32)	age of household head
Agesq	0.6538 (1.79)	age squared
Ownh	620.5849 (2.00)	own home: dummy
Female	88.3961 (0.48)	female household head
_cons	-7574.0142 (-7.49)	constant term
Eq3: Net asset		
Assetnett		
Size	50.7798 (5.47)	number of family members
save2	0.0213 (24.84)	save2
_ledu1_2	143.6558 (2.72)	lower-secondary
_ledu1_3	231.6755 (4.06)	upper-secondary
_ledu1_4	41.9103 (0.42)	vocational
_ledu1_5	418.3478 (5.53)	univ. bachelor
_ledu1_6	-136.6735 (-0.65)	univ. higher
_cons	565.7822 (15.63)	constant term
Statistics		N = 15520
Chi-squares		R2
Eq1	4093.24	Eq1 0.1964
Eq2	22120.72	Eq2 0.6146
Eq3	754.63	Eq3 0.0385
		Log likelihood = -479125.853

Source: NSO's household survey, 2009

Most of the estimated parameters (in positive or negative directions) conformed to prior expectations. The following are a few of the dominant extrapolations particularly relevant to our study: (a) household income is significantly influenced by years of education, number of family income earners, occupation dummies, and regional dummies; (b) household saving varies positively with income, and negatively with the number of children (age 0-14); (c) the net household assets is positively related to saving, family size, and educational dummies. With regard to the goodness-of-fit statistics, the R-squared of the second equation (savings) equals 0.61 which is fairly high. We noted that the R-squared for the first and the third equations are low (0.2 and 0.04) - the authors are of the opinion that this indicates the need for further improvement in model estimation and specification.

As a reference point, we retrieved the predicted values of savings within individual households. By a 'weak' definition of saving inadequacies, we mean that a person or a household could save (saving amount > 0) but that amount may be inadequate for long-term future benefits (i.e., consumption smoothing throughout retirement). Having ascertained that saving varies individually according to age cohorts, occupations, and educational attainments, we used an operational definition of saving inadequacy, dummy = 1, where the actual savings amount is less than 50% of the predicted savings amount. To illustrate this point: if a particular household is supposed to save 5,000 Baht per month (according to our estimated model) but actually saves 2,000 Baht per month, this household could save but fails the test of saving adequacy; otherwise, the dummy is 0.

Another definition of a 'strong' measure for saving inadequacy refers to those households that not only fail to save but in fact, overspend their income. The authors noted that the dummy 0/1 can be temporal; the fact that a dummy is recorded as 1 does not imply that this household would overspend all of the time. Our measurement is only true for a specific period of time, i.e., if dummy=1 for a particular household based on survey data collected in January 2009, it could be the case that one family member happened to then be sick – had we repeated the sample in the next month (February, 2009) the dummy might have been 0. In other words, our dummies (0 or 1) could be permanent or temporary. In fact, it would be interesting to further expand the study by delineating the dummies into two components, permanent and temporary. The NSO samples can be traced to the month of sampling, but it is unfortunate that the sampled households are not repeated over time.

Tables 5-8 display the cross-tabulation of saving inadequacies according to income groups, age cohorts, occupations, and educational attainments, and trace similarities or differences according to these categories. Table 5 evidences the negative correlation between income levels and the probability of saving inadequacies. Note that saving inadequacies exists for every income category; the probabilities for incidents of saving inadequacy are most frequent among the low-income families (2,501 to 5,000 Baht per month) whereas the incident probabilities of saving inadequacy are less frequent in higher income families.

Table 5: Probability of Saving Inadequacy by Income Groups

Income Baht/month	Saving Inadequacy in Rural Area		
	Frequency	Strong Definition	Weak Definition
2,500	377	0.75	0.86
5,000	1,845	0.53	0.70
7,500	2,644	0.45	0.63
10,000	2,290	0.36	0.53
20,000	5,435	0.22	0.41
50,000	3,479	0.11	0.29
100,000	605	0.04	0.17
over 100,000	116	0.03	0.16
Average	16,791	0.29	0.47

Source: NSO's household survey 2009 and the authors' estimates.

We examined the association between age cohorts and saving inadequacy, as displayed in Table 6. It appears that the probability of overspending (strong definition) in young families (age of household heads is below 40 years old) is greater than for households headed by older persons. We also noted dissimilarity between the strong inadequacy and the weak inadequacy are in this table. According to our estimates, the percentage of elderly cohorts that could save but saved too little (i.e., weak definition) increased in relation to the age of the cohorts. We do not know the reasons why this occurs, but speculate that as household members advance in age, health expenses may increase due to poor health and the greater demand for health care. We realize that our model has a weakness in that health status is assumed to be 'exogenous' whereas in reality they are endogenous. Thus, it may be a sensible to expand the model to include explicit consumption behaviors (where aging plays a role in explaining health care expenses).

Table 6: Probability of Saving Inadequacy by Age Cohorts

Age Cohort	Saving inadequacy in rural area		
	Frequency	Strong Definition	Weak Definition
<29	668	0.31	0.47
30-39	2,334	0.32	0.43
40-49	4,290	0.31	0.43
50-59	4,204	0.28	0.42
60-69	2,812	0.28	0.51
70-79	1,869	0.29	0.60
80 & over	614	0.25	0.63
Total	16,791	0.29	0.47

Source: NSO's household survey 2009 and the authors' estimates.

Table 7 tabulates the probabilities of saving inadequacy by occupations. The probabilities of saving inadequacy are observed in all occupations; yet, the frequency of incidents varies from one occupation to another. In particular, incidents of saving inadequacy by agricultural workers and persons with primary occupations are most frequent, whereas the frequency of incidents by persons with professional occupations is much less.

Table 7: Probability of Saving Inadequacy by Occupations

Occupational Group	Saving Inadequacy in Rural Area		
	Frequency	Strong Definition	Weak Definition
Executive	1,520	0.25	0.35
Professional	322	0.08	0.17
Technician	253	0.15	0.24
Clerk	191	0.15	0.30
Service worker	1,099	0.25	0.40
Agr/Gen workers	6,281	0.36	0.48
Craftsman	1,303	0.24	0.39
Factory worker	806	0.22	0.36
Primary occupations	5,016	0.29	0.59
Total	16,791	0.29	0.47

Source: NSO's household survey 2009 and the authors' estimates.

Table 8 reports the incidents of saving inadequacy by educational attainment. Predictably, household heads with lower levels of education failed to pass the test of saving adequacy most frequently. These findings raise and highlight the concept of relative risk. That is, the relative risk is largest for lower income earners, such that an unexpected reduction in income or an unexpected increase in expenditure is reflected by x Baht. If such incidents happen to high-income earners, the relative risk is moderate or small. Yet, although better able to manage relative risk, the percentage of household heads with college degrees who failed to pass the test (of saving adequacy) is much less.

Table 8: Probability of Saving Inadequacy by Educational Levels

Educational Attainment	Saving Inadequacy in Rural Area		
	Frequency	Strong Definition	Weak Definition
Primary	12,010	0.31	0.49
Lower-secondary	2,602	0.28	0.47
Upper-secondary	1,127	0.25	0.42
Vocational	346	0.19	0.40
Univ. bachelor	629	0.14	0.30
Univ. higher	77	0.08	0.16
Total	16,791	0.29	0.47

Source: NSO's household survey 2009 and the authors' estimates.

Discussion and Policy Implications

We realize the complexities of the issue and the difficulties in measuring saving inadequacy. The 'weak' definition of saving inadequacy is a debatable topic and some may comment that we are making some bold assumptions. We cannot claim to have crafted a precise definition. It may be the case that our predicted value (of saving) is overestimated, and the actual saving amount of the sample is 'normal'. However, the dummy is 1 which reads 'saving inadequately'. We merely assert that it is necessary to generate an operational definition of saving inadequacy and that we now are at experimental state; we encourage other researchers to experiment with other notions and to try different measurements.

As in many advanced countries, Thai society is moving toward an increasingly “aging” population. Already the proportion of elderly is greater than 10 percent and is likely to reach 20 percent within the next decade. Realizing the realities related to the lifecycle model and using rational assumptions, Thai people should increase their saving practices, particularly given longer life-expectancies. Yet, in practice, many people do not save adequately or unduly postpone taking saving action. Research conducted by Lusardi (2008) in the United States points out the decline in saving among the American people and recommends propagation of financial literacy as a mean to overcome the saving slump.

Our study is a modest attempt to trace “what it is”, i.e., the saving behaviors among Thai rural households. And we have undertaken to get a sense of the interrelationship between income, saving, and assets. We suggest that our measurement of saving inadequacy (albeit imprecise) is an important message and a warning signal to Thai people in general. The self-sufficiency philosophy suggests that everyone should be ‘moderate’ and ‘reasonable’ with regard to how they live, but each should develop ‘immunities’ to cope with future risk and uncertainty. We are of the opinion that saving is a core element in generating this immunity. It is timely and worth undertaking this study as one effort to raise peoples’ awareness regarding the importance of saving adequately.

Conclusion

The authors investigate the relationship between income, saving, and wealth with special reference to problems of ‘saving inadequacy’. We relied upon data contained in the household survey conducted in 2009 by the National Statistical Office. Our simple structural model assumes income, saving, and net asset as dependent variables. They are explained by a set of variables that includes socio-economic characteristics. The predicted values of saving are used as the reference for estimating the incidence of saving inadequacy, otherwise known as the strong definition and the weak definition. Our findings indicate that: i) 29% of Thai rural households (based on a total 16,791 samples) overspent their income and incurred negative savings; ii) 47% could save but, in fact, saved too little or inadequately. The “Self-Sufficiency” Philosophy recommends that all households should develop an immunity (against risk and uncertainty) which in our context means explicitly “to save adequately”. We assert two operational definitions of saving inadequacy as “preliminary” measures. We realize the complexity of this issue, yet the measurements (albeit imprecise) may serve as a warning signal to the Thai public at large and to the public agencies or financial entities in charge of financial and consumer credit policies.

References

- Akerlof, George A. (1991). **Procrastination and Obedience**. *American Economic Review*. 81: 1-19.
- Becker, G. and N. Tomes.(1979). **An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility**. *Journal of Political Economy*. 87: 1153-89.
- Browning, M., & Lusardi, A. (1996). **Household Saving: Micro Theories and Micro Facts**. *Journal of Economic Literature*. 34(4): 1797–1855.
- Lusardi, Annamariad. (2008). **Overcoming the Saving Slump**. Chicago: University of Chicago Press.
- Modigliani, Franco 1988. **The Role of Intergenerational Transfers and Lifecycle Saving in the Accumulation of Wealth**. *Journal of Economic Perspectives*. 2: 15-40.
- Pootrakul, Kobsak et.al. 2005. **Long Term Saving in Thailand: Are We Saving Enough and What Are the Risks?** A paper presented at the Bank of Thailand Annual Conference 2005. Bangkok.