Factors Determining Having Secondary Health Insurance among Thai Population: Evidence from KDSS

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Introduction

The concepts of human security have been officially proposed first time by Human Development Report of United Nation Development Program in 1994. Human security concept refers to an emerging paradigm for understanding global vulnerabilities, which is challenging the traditional notion of national security. It is arguing that the security should concentrate on the individual level rather than the state level. Human security based on a people-centered concept of security is necessary for national, regional and global stability (United Nations Development Programme (UNDP), 1994). Following the definition of human security, UNDP (1994) has mentioned that the scope of global security should be expanded to include threats in seven area i.e. economic security, food security, health security, environment security, personal security, community security and political security.

Health Security aims to guarantee a minimum protection from diseases and unhealthy lifestyles. According to the UNDP's 1994 definition of health security, in both developing and industrial countries, threats to health security are usually greater for poor people in rural area, particularly children. This is mainly due to malnutrition and insufficient supply of medicine, clean water or other necessity for healthcare.

In Thailand, the public provision health insurance was firstly adopted in 1963 for civil servants and their family under condition to compensate their minimum wage paid by the government. The health insurance for civil servants and their family was called "Civil Servant Medical Benefits" (The Comptroller General's Department, 2008).

In 1972, the government decided that employees who have sustained injuries or illness or who died as a result of working for the employer should be protected that they would receive compensation money. As a result, a compensation fund was established in the Department of Labor, Ministry of Interior, with the intention to protection security to employees who were ill or injured from their works. Under Social Security Act in 1990, the employees would receive protection in the capacity as the insured under a total of 7 circumstances, namely: illness or accident; physical disability; death not related to performance of work; child delivery; old age, child assistance and unemployment.

For the people who work in the informal sector, the health insurance was provided for those who are the poor in the first group in 1975. Then, the coverage of this project had extended to other group of people such as elderly, child who aged 0-12 years old, disabled person, etc. In 2001, the government had proposed the health care policy in order to let all Thai citizens who did not have any kinds of health insurance provided by the government yet can receive the public provision health insurance, known as "30 baht program" or "Universal Coverage".

At present, there are three major health insurance schemes provided by the government, namely, Universal Coverage (UC), Social Security (SS) and Civil Service Medical Benefits (CSMB). These health insurance schemes in this study are called primary health insurance.

In fact, to construct the health security should not be the responsibility of the government only but the health security should derive from individual by having the additional health insurance in term of financial guarantee; such as savings, cooperative shares, life and health insurance from private company etc. These kinds of health insurance are called "secondary health insurance" in this study. Some people decided to use the secondary health insurance because they have no confidence and do not receive convenience in health care services which getting from primary health insurance.

Many research focused on study the accessibility, equity, and quality of service utilization in primary health insurance (e.g. Santiyanont, 2007; Sridhamrongsawat, 2006; ABAC, 2006) but there were a few of research that talking about secondary health insurance in term of savings, cooperative shares, life and health insurance from private company to encourage people have more secondary health insurance in any types in order to reduce the burden of government budget.

Therefore, this study aims to find what factors determining people to have secondary health insurance i.e. savings, cooperative shares, life and health insurance. How are the health securities in Thailand and which groups of people should be encouraged to have secondary health insurance are the main questions that need to find the answers and suggest something based on findings to improve health security system in Thailand.

Literature Review

Two main concepts related with having secondary health insurance should be mentioned before analysis; Life cycle hypothesis and Risk aversion concepts. The details are shown below.

Life Cycle Hypothesis

The life cycle hypothesis makes use of the interaction between income, consumption, saving, wealth and age. This concept was initially proposed by Modigliani and Brumberg (1954), while others developed this concept such as Modigliani and Ando (1957), and Ando and Modigliani (1963). A review of the life cycle hypothesis is given by Modigliani (1986) in his Nobel Prize lecture (Heertje, 1993).

Generally, people will have low income when they were young and then their income will continuously increase until they get old, their income will decline again. Income distribution through their life span has the characteristic following income line.

Whereas the consumption will increase when they was young and then their consumption will rapidly increase because they have no need to work and they can get the money from their parent when they was young. But when they are working, they can earn money by themselves so their consumption in this early period may have lower than their income.

Debt may be incurred to finance education or to generate a flow of services from house, automobile, and other durables. The middle period of life is characterized by positive saving as previously incurred debts are paid back and the family accumulates resources for retirement and possibly to make bequests. The later stage of life, after retirement, may have some dissaving as some of the accumulated wealth is spent, but the average elderly family still saves (Gapinski, 1993). This idea can be applied to find what factors determining people to have secondary health insurance through their lifetime.

Examples of studying saving and investment as response variable with independent variables, it was found that the results of the econometric model suggest that the country's population dynamics play important role in the aggregate household's saving rate. A higher proportion of young dependents (ages 0 to 14 years) creates hindrance to the aggregate household saving, supporting the life-cycle hypothesis on saving in Philippines (Bersales and Mapa, 2008).

Life cycle saving is proposed as one explanation for much of the increase in savings and economic growth in Asia. The association between the age composition of a nation's population and its savings rate, observed within 16 Asian countries from 1952 to 1992, is estimated again here to be less than a quarter the size reported in a seminal study, which assumed lagged savings are exogenous (Schultz, 2004).

Different factors have influenced cooperative farmers' saving and investment patterns. Income, loan repayment and amount of money borrowed were significant variables that influenced saving patterns while the fund borrowed significantly influenced investment patterns in Nigeria (Adeyemo and Bamire, 2005).

In Sri Lanka, an affluent family has only one or two children; the tendency in the middle class is generally to have a smaller family. In the long run large families create problems especially about inheritance of land and property (De Silva, 2007). Logistic regression analysis indicated that life cycle variables, such as household head's age, marital status, employment status, and child's presence, influenced ownership of 11 financial assets (Xiao, 1996).

In India, it is found that the saving rate rises with both the level and the rate of growth of disposable income and the magnitude of the impact of the former is smaller than that of the latter (Athukorala and Sen, 2004). Moreover, it was found that educational attainment, banking sector development, and inflation is the most robust predictors of life insurance consumption, while income is only a weak predictor across country (Beck and Webb, 2002).

These results indicate that there are significantly associations between saving and investment with the different factors from difference concepts, especially age, income, saving and investment.

Risk Aversion Concept

Risk aversion is a concept in economics, finance, and psychology related to the behavior of consumers and investors under uncertainty. Risk aversion is the reluctance of a person to accept a bargain with an uncertain payoff rather than another bargain with more certain, but possibly lower, expected payoff. The inverse of a person's risk aversion is sometimes called their risk tolerance (Bellemare and Brown, 2009).

Person who is risk averse can be explained by investment behavior. Certainly, risk aversion person do not want to use his or her money in any investment or he or she will choose the type of investment that have minimum risk if he or she has to invest such savings. For person who likes risk, he or she will expect the maximum returns from his or her investment such as investment in stock market. A way to reduce risk of investor is to invest in many assets, called "risk diversification".

The risk aversion concept will be employed to explain what factors determining people to have secondary health insurance as the investment under risk. With regard to the financial risk tolerance literature, there is considerable interest in the demographic determinants and attention is particularly focused on age, gender, education, income and wealth, and marital status. First, financial risk tolerance decreases with age (Morin and Suarez, 1983). Second, females have a lower preference for risk than males (Grable, 2000). Third, financial risk tolerance increases with education (Haliassos and Bertaut, 1995). Fourth, financial risk tolerance increases with income and wealth (Cohn et al., 1975; Bernheim, Skinnner and Weinberg, 2001). Fifth, single investors are more risk tolerant (Roszkowski, Snelbecker and Leimberg, 1993). These concepts are applied as conceptual framework to study what factors determining people to have secondary health insurance. To decide which kind of secondary health insurance reflects the investment behavior under risk aversion based on the at least these factors i.e. age, gender, education, income and wealth, and marital status.

Conceptual Framework

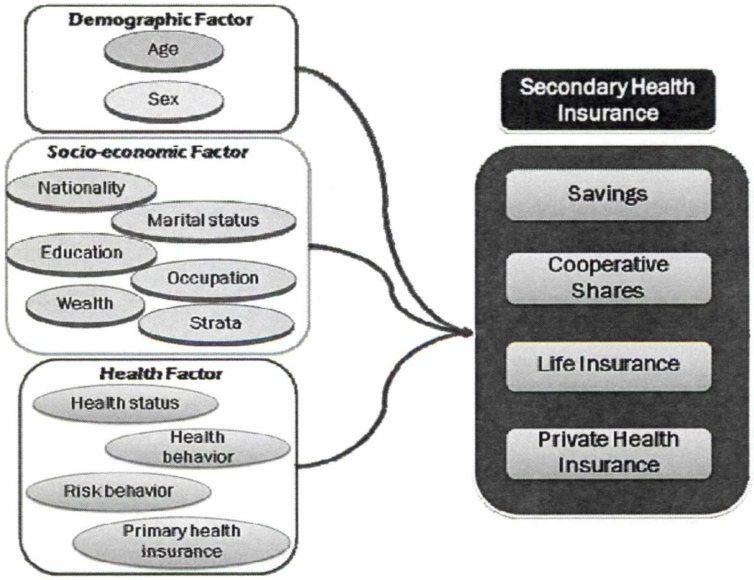

Figure 1

Conceptual Framework

Figure 1 graphically summarizes the structure of this study to clarify its content and data analysis to examine the association between the possession of secondary health insurance i.e. savings, cooperative shares, life and health insurance with selective three main factors, which are demographic factor (age and sex), socio-economic factor (ethnicity, marital status, education, occupation, wealth, strata) and health factor (health status, health behavior, risk behavior and primary health insurance). There are two types of dependent variables; (1) four variables of secondary health insurance and (2) index of secondary health insurance. First type of dependent variable is measured into four binary dependent variables, which will be analyzed by using binary logistic regression. Second type of dependent variable is measured to be ordinal dependent variable, which will be analyzed by using ordered logistic regression.

Methodology

The data employed for this study are obtained from the Kanchanaburi Demographic Surveillance System (KDSS) in 2002 and 2003, conducted in selected area of Kanchanaburi province, Thailand, by the Institute for Population and Social Research (IPSR), Mahidol University and supported by the Wellcome Trust, United Kingdom. The Kanchanaburi project is a longitudinal study that has monitored population change in a designated study area since 2000.

The study villages and census blocks for KDSS are selected using a stratified systematic sample design. As Kanchanaburi province is a mixture of both rural and urban area, the primary selection units for rural area are villages and for urban area are census blocks. First, Kanchanaburi area is divided into five strata according to the main occupation of the population and land use patterns. They are: urban/semi urban (industrialized) area; rice producing area; plantation area; upland area and mixed economy area. From all village/census blocks of these strata, 100 village/census blocks are selected systematically as study village/census blocks.

The method used for data collection was structured interviews and entailed the use of three sets of questionnaires: village, household and individual. The enumeration

consists of two main components. In the first component, data on fertility, mortality, and migration is collected. These data are collected annually. The second component includes questions related to social, economic, health and environmental issues. The issues included in the enumeration in this component may change each year in order to maintain the survey instrument at an acceptable size and to respond to the changing social and policy context.

This study needs to examine the causes and consequences by different period of time in order to examine what factors affected on having secondary health insurance. Taking advantage of nature of longitudinal data in KDSS, this study will use two rounds of KDSS. This study utilizes the KDSS data in round 3 (2002) as independent variables and use dependent variable from round 4 (2003) in the sixth part asking about "guarantees future". The individual questionnaire both of two rounds is analyzed, so that is why the unit of analysis in this study is the individual level.

The target population in this study is the population in the working age 15 years old and above. There were 42,816 persons in the study area in round 4 (2003) census, 20,350 males and 22,466 females. They are from 12,356 households. The population size had decreased compared to previous censuses, especially in urban/ semi-urban and upland strata. The population distribution among strata was as follows: 27 percent in the upland stratum; 21 percent in the mixed economy stratum; 20 percent in the urban/ semi-urban stratum; 16 percent in the rice stratum and 16 percent in the plantation stratum (IPSR, 2005).

There were 21,829 cases followed and interviewed both round 3 (2002) and round 4 (2003) without missing data in primary health insurance which occurred from those who had more than one primary health insurance, especially UC and SS were found the most one.

The index of secondary health insurance is constructed by using Principal Component Analysis (PCA) to assign the indicator weights in each item from the questions that asked "Do you have savings/ cooperative shares/ life insurance/ health

insurance or not?" in KDSS round 4 (2003). The index of having secondary health insurance uses the SPSS factor analysis procedure. This procedure first standardizes the indicator variables (calculating z-scores); then the factor coefficient scores (factor loadings) are calculated; and finally, for each household, the indicator values are multiplied by the loadings and summed to produce the household's index value. In this process, only the first of the factors produced is used to represent the index of having secondary health insurance. The resulting sum is itself a standardized score with a mean of zero and a standard deviation of one (Filmer and Pritchett, 2001).

Age, sex, ethnicity, marital status, education, occupation, strata, health status and primary health insurance are measured as categorical variable. Wealth, health behavior and risk behavior are measured as quintile index. Wealth index is measured by having water supply, own toilet, electricity, stereo, television, mobile phone, base phone, refrigerator, bicycle, motorcycle, car and pick-up car (Rutstein and Johnson, 2004). Health behavior is measured by using ten behaviors reflecting whether good or bad health behavior. It was asked about consumption behavior and lifestyle behavior including usual exercise such as eating spicy food, raw or half cooked food, fast food, supplementary food, taking some vitamins, reading the book at night time, etc. Risk behavior is measured by using seven behaviors reflecting whether high or low risk to have unhealthy. It was asked regarding health risk consumption such as cigarette, beer, liquor, vine, etc. All of these independent variables come from round 3 (2002).

The multivariate analysis is used to investigate what factors determine people to have secondary health insurance. In case of the index of having secondary health insurance is used as dependent variable, the ordered logistic regression is employed to analyze. The reason why using the ordered logistic regression is that each person can have several secondary health insurances, which need to construct the index to measure how many secondary health insurances they have. In case of each item of having secondary health insurance (i.e. savings, cooperative shares, life and health insurance), the binary logistic regression is employed to analyze because they are measured as a binary response (Tabachnick and Fidell, 1996; Agresti, 1996).

Findings

Demographic, Socio-economic and Health Characteristics of Population

Table 1 shows the percentage distribution of independent variables and secondary health insurance of population aged 15 and over. Secondary health insurances include savings, cooperative shares, life insurance and health insurance. In this study, the samples can have several secondary health insurances so that the percentage in table 1 shows the percentage of each category.

Higher age was associated with higher proportions with savings, cooperative shares and life insurance but somewhat lower for the elderly. Males had higher percentage of having cooperative shares, life and health insurance than females while females had higher savings than males. Thai ethnicity had the highest percentage of every secondary health insurance when compared with other ethnicities. Divorced person had the highest proportion of savings, cooperative shares and life insurance while health insurance had the highest proportion among single person. Higher levels of education and wealth were associated with higher proportion with savings, cooperative shares, life and health insurance. Professional persons had the highest proportion of every secondary health insurance when compared with other occupations. Those who were unhealthy had the higher proportion with savings, cooperative shares and life insurance when compared with those who were healthy. Those who had good health behavior and those with CSMB had the highest proportion with every secondary health insurance.

Table 1: Percentage distribution of population aged 15 and over in KDSS having secondary health insurance by demographic, socio-economic and health characteristics

Characteristics	(n)	Savings	Cooperative shares	Life insurance	Health insurance	None
Total	(21,829)	30.45	15.84	16.64	6.90	30.16
Age						
Early working age (15-29)	(5,044)	30.66	9.00	12.77	8.56	39.02
Middle working age (30-44)	(7,797)	31.52	17.41	16.40	6.73	27.94
Late working age (45-59)	(5,525)	29.93	20.00	19.72	6.57	23.79
Elderly (60+)	(3,463)	28.56	13.95	17.22	5.65	34.62
Sex						
Male	(9,532)	28.16	17.18	17.44	7.34	29.88
Female	(12,297)	32.31	14.72	16.02	6.56	30.40
Ethnicity						
Thai	(19,589)	31.24	16.80	17.84	7.31	26.81
Burmese/Twai	(335)	19.01	1.18	0.60	0.60	78.61
Mon	(617)	17.64	0.80	0.64	2.56	78.35
Karen	(927)	20.43	6.70	1.65	0.73	70.49
Others	(361)	28.91	5.30	8.44	5.78	51.57
Marital status						
Single	(3,306)	30.93	9.58	17.49	10.71	31.29
Married	(16,140)	30.51	17.42	16.50	6.34	29.22
Divorced	(124)	35.70	20.54	19.56	7.34	16.86
Separated	(684)	28.70	12.91	12.79	4.30	41.30
Widowed	(1,575)	28.96	12.97	17.70	5.62	34.75
Education						
Under grade 6	(13,142)	28.26	15.79	15.42	5.17	35.36
Grade 6	(5,526)	31.10	13.11	15.77	8.50	31.52
Secondary school	(1,422)	38.15	15.48	20.70	10.40	15.28
College and over	(730)	35.68	24.17	26.28	11.09	2.77
Occupation						
Not working	(4,970)	30.59	9.90	16.01	7.60	35.90
Professional	(620)	33.28	29.06	25.39	10.07	2.19
Business and administrative	(349)	35.22	18.85	23.64	10.75	11.54
Sales	(1,815)	38.46	10.63	20.51	10.00	20.40
Services	(536)	33.50	23.13	18.12	6.08	19.17
Agriculture	(11,200)	28.08	17.50	15.13	5.64	33.65
Transportation and communication	(346)	27.47	20.16	19.76	7.71	24.89
Crafts and labor	(1,813)	31.75	13.66	14.38	6.49	33.72
Others	(177)	34.33	20.11	21.15	8.32	16.08

Table 1: (Continued)

Characteristics	(n)	Savings	Cooperative shares	Life insurance	Health insurance	None
Wealth						
Poorest	(1,725)	21.56	9.48	5.22	2.90	60.83
Poor	(1,953)	27.43	17.22	13.03	4.51	37.81
Medium	(2,280)	29.01	20.15	16.95	6.59	27.30
Rich	(1,964)	31.49	21.39	20.60	7.14	19.38
Richest	(2,131)	34.66	20.24	25.66	9.33	10.11
Strata						
Urban/semi-urban	(4,250)	35.46	12.23	21.58	8.62	22.12
Rice field	(3,945)	35.78	18.61	19.89	6.58	19.14
Plantation	(3,520)	23.74	17.29	18.01	8.04	32.92
Upland	(5,230)	28.14	16.39	7.35	4.05	44.07
Mixed economy	(4,884)	27.89	15.05	17.01	7.50	32.56
Health status						
Unhealthy	(4,280)	30.74	18.07	18.40	6.43	26.37
Healthy	(17,549)	30.38	15.25	16.21	7.02	31.14
Health behavior						
Bad	(7,620)	29.67	15.75	16.49	6.11	31.98
Mild	(6,116)	28.78	16.38	15.21	5.67	33.96
Middle	(4,329)	31.13	14.88	15.76	7.42	30.81
Good	(3,749)	33.38	16.07	19.82	9.55	21.18
Risk behavior						
Lowest	(10,476)	32.91	14.73	17.27	7.44	27.66
Mild	(3,272)	28.37	14.70	14.42	6.25	36.27
Middle	(3,772)	28.45	16.82	17.35	6.77	30.61
Highest	(4,300)	27.73	18.42	16.11	6.19	31.55
Primary health insurance						
None	(3,709)	30.06	13.98	16.59	6.06	33.31
UC	(16,812)	30.08	15.39	15.84	6.77	31.92
SS	(801)	37.33	13.22	21.39	10.41	17.66
CSMB	(507)	31.00	32.57	26.06	9.26	1.11

Determinants of Having Secondary Health Insurance

The ordered logistic regression in having the secondary health insurance can be shown in Table 2. According to the derived index information on part of socio-economic factors, group of education and wealth had indicated obviously the increment of opportunity in having the secondary health insurance when the level of education and wealthy increases. The information has also further shown that ethnicity of Thai, occupation of working and strata of all areas (except urban and mixed economy) were more likely to have secondary health insurance. Moreover, this likelihood can be found as well in SS and CSMB of primary health insurance group, in high level of health behavior group, in low level of risk behavior and unhealthy of health status. These can be implied that there were a lot of factors motivating people to take the secondary health insurance such as the factor of age, ethnicity, marital status, education, occupation, wealth, strata, health status, health and risk behavior and availability of primary health insurance provided by the government.

As mentioned above, every independent variable was associated to the index of having the secondary health insurance that derived by analysis technique of ordered logistic regression. It would be interesting to find out the affected category of having the secondary health insurance influenced by those independent variables as an addition. Principally, the statistic value that used to measure and test the significance was the probability of possession for each category called 'odds ratio'. The ratio that is greater than one will indicates the higher probability of having the secondary health insurance. So, to determine the influences of factors having the secondary health insurance, the binary logistic regression analysis technique will be applied and presented subsequently.

Table 2: Ordered logistic regression on having secondary health insurance with independent variables, KDSS (N = 9,585)

	Estimate		Estimate
Demographic factors		**Socio-economic factors**	
Age (Ref: Early working age)		Ethnicity (Ref: Thai)	
Middle working age	0.390***	Burmese/Twai	-0.678***
Late working age	0.601***	Mon	-0.840***
Elderly	0.435***	Karen	-0.528***
Sex (Ref: Male)		Others	-0.287**
Female	-0.074	Marital Status (Ref: Single)	
Health factors		Married	-0.121
Health status (Ref: Unhealthy)		Divorced	0.147
Healthy	-0.080*	Separated	-0.284**
Health behavior (Ref: Low)		Widowed	-0.074
Mild	-0.022	Education (Ref: Under grade 6)	
Middle	0.014	Grade 6	0.162***
High	0.154***	Secondary school	0.505***
Risk behavior (Ref: Low)		College and over	0.692***
Mild	-0.091*	Occupation (Ref: Not working)	
Middle	-0.182***	Professional	0.600***
High	-0.120**	Business and administrative	0.422***
Primary health insurance (Ref: Having none)		Sales	0.465***
Universal Coverage	0.047	Service	0.375***
Social Security	0.319***	Agricultural	0.407***
Civil Servant Medical Benefits	0.648***	Transportation and communication	0.215*
		Crafts and labor	0.201**
		Others	0.499**
		Wealth (Ref: Poorest)	
		Poor	0.363***
		Middle	0.615***
		Rich	0.798***
		Richest	1.127***
		Strata (Ref: Urban/semi-urban)	
		Rice	0.450***
		Plantation	0.139**
		Upland	0.121*
		Mixed economy	-0.087*

Note: *** = $p < 0.001$; ** = $p < 0.01$; * = $p < 0.05$;

Table 3: Binary logistic regression on having secondary health insurance in each category with independent variables, KDSS

	Saving	Cooperative Share	Life Insurance	Heath Insurance
Demographic factors				
Age (Ref: Early working age)				
Middle working age	1.269*	1.795***	2.617***	1.648**
Late working age	1.336**	2.723***	3.672***	1.980***
Elderly	1.160	2.095***	3.157***	1.736**
Sex (Ref: Male)				
Female	0.964	0.881	0.869	0.772*
Socio-economic factors				
Ethnicity (Ref: Thai)				
Burmese/twai	0.630*	0.054***	0.094*	0.171
Mon	0.504***	0.041***	0.000	0.804
Karen	0.636**	0.300***	0.251***	0.160**
Others	0.858	0.256***	0.612	0.613
Marital Status (Ref: Single)				
Married	0.757*	1.687***	0.771*	0.626**
Divorced	1.096	2.265**	0.946	0.750
Separated	0.651**	1.234	0.653*	0.488**
Widowed	0.737*	1.532*	1.021	0.708
Education (Ref: Under grade 6)				
Grade 6	1.234**	1.071	1.157	1.342**
Secondary school	1.850***	1.537**	1.860***	1.934***
Bachelors degree and higher	2.397***	2.192***	2.709***	2.485***
Occupation (Ref: Not working)				
Professional	1.873**	5.184***	2.696***	2.286**
Business and administrative	1.204	2.418***	1.726**	1.890*
Sales	1.775***	1.229	1.826***	1.679**
Service	1.368*	3.603***	1.782**	1.011
Agricultural	1.329***	2.179***	1.958***	1.29
Transportation and communication	1.006	2.393***	1.567*	1.229
Crafts and labor	1.223*	1.568***	1.242	1.084
Others	1.003	2.895***	2.561**	1.662

Table 3: (Continued)

	Saving	Cooperative Share	Life Insurance	Heath Insurance
Socio-economic factors (Continued)				
Wealth (Ref: Poorest)				
Poor	1.400***	1.961***	1.795***	1.252
Middle	1.822***	2.711***	2.468***	1.920***
Rich	2.198***	3.095***	3.196***	2.021***
Richest	3.541***	3.471***	5.447***	3.034***
Strata (Ref: Urban/semi-urban)				
Rice	1.763***	2.707***	1.662***	1.544***
Plantation	0.829*	2.308***	1.344**	1.798***
Upland	1.264**	3.210***	0.502***	1.080
Mixed economy	0.747***	1.672***	0.950	1.090
Health factors				
Health status (Ref: Unhealthy)				
Healthy	0.947	0.792***	0.918	1.082
Health behavior (Ref: Low)				
Mild	0.936	1.029	0.955	0.891
Middle	1.036	1.096	0.907	1.065
High	1.274**	1.429***	1.129	1.107
Risk behavior (Ref: Low)				
Mild	0.768***	1.017	0.997	1.016
Middle	0.698***	1.023	0.911	0.891
High	0.729***	1.092	1.040	0.917
Primary health insurance (Ref: Having none)				
Universal Coverage	0.971	0.868	1.113	1.339*
Social Security	1.311	0.898	1.756***	1.626*
Civil Servant Medical Benefits	1.128	4.004***	1.938***	1.080
Constant	0.364***	0.013***	0.029***	0.022***
N	9,585	9,589	9,589	9,589
R square (Nakelkerke)	0.153	0.222	0.238	0.099

Note: *** = $p < 0.001$; ** = $p < 0.01$; * = $p < 0.05$

According to Table 3, the probabilities of having the secondary health insurance for all categories except saving increases. For gender, female is less likely to have health insurance while there were no differences for the remaining categories. For ethnicity, all ethnic groups are less likely to have secondary health insurance than Thai categories. For marital status, only cooperatives share had been observed that a married person was more likely to have an unmarried one, about 68.7% while other categories like saving, life insurance and health insurance had shown the opposite results.

The probabilities of having the secondary health insurance for all categories are getting higher when the level of education and wealth rise. For occupation, people who worked in professional, sales, services, agricultural, crafts and labor were more likely to have secondary health insurance than those who are in administrative, transportation and communication and others. For the study area, people who lived in rural areas preferred to have cooperative share more than the one who lived in urban/semi-urban area, approximately 1-3 times higher.

However, when considering the saving category, people who lived in rice field and upland were more likely to have secondary health insurance than urban/semi-urban, plantation and mixed economy. In addition, life insurance and health insurance that obtained from private company were preferred by people who lived in both rice field and plantation while upland people were likely to have their life insurance, about 50% lower than the urban/semi-urban people.

For health factors, unhealthy people and high level of health behavior people preferred to have their cooperative share more than other categories of insurance. For health behavior, people at the lowest level preferred to have saving lower than the one in the highest level. For the risk behavior, the lowest level people preferred to have a saving as secondary health insurance.

With respect to people without any primary health insurance, people who possessed UC were more likely to have private health insurance as an addition by 33.9%. People who obtained SS were also prefer to have additional life and private

health insurance while people with CSMB were more likely to have additional cooperative share and life insurance by about 4 and 2 times respectively.

Discussion and Recommendation

To examine what factors determine people to have secondary health insurance (i.e. savings, cooperative shares, life and health insurance), most of the previous study provided in terms of saving and investment explained by economic theories both macro and micro level but none of the existing theories provides a suitable explanation for saving and asset accumulation in low-income households (Berverly, et al., 2008). This study, therefore, attempted to explain the relationship between savings and investment called in this study as secondary health insurance both in terms of composite index and in each category, analyzed with the independent variables categorized into three factors i.e. demographic factors (age and sex), socio-economic factors (ethnicity, marital status, education, occupation, wealth, strata) and health factors (health status, health behavior, risk behavior and having primary health insurance).

The results indicated that the proportion possessing of all categories except private health insurance had increased with age since early working age until late working age. But the proportion of all categories decreased when they get old. It support the life cycle hypothesis, mentioned that people had lower possession of savings and investment when they were young and then their savings and investment would continuously increase until they get old, their saving and investment would turn to decline again, followed by their income (Modigliani and Brumberg, 1954; Modigliani and Ando, 1957; Ando and Modigliani, 1963).

However, the results support risk aversion concept that females had higher proportion of savings than males due to risk averse, while having cooperative shares, life and health insurance were no clear distinction between sexes because these investments were explained by risk neutral of investors under risk (Grable, 2000). Those who were married found clearly difference to have cooperative shares and private

health insurance than single because single investors were more risk tolerant than married investor (Roszkowski, Snelbecker, and Leimberg, 1993).

In addition, higher education and wealth were associated with higher proportions with savings, life and health insurance, which also could be explained by risk aversion concept (Haliassos and Bertaut, 1995; Cohn et al., 1975; Bernheim, Skinnner, and Weinberg, 2001).

It was found that age, ethnicity, marital status, education, occupation, wealth, living place, health status, health behavior, risk behavior and having primary health insurance are statistically significantly associated with having secondary health insurance. While controlling the socio-economic factors and health factors, the chance of having secondary health insurance in each category increases with age and males are more likely to have only private health insurance than females.

From the results, it can be suggested that having secondary health insurance for the present and the future, beginning at an early working age, and particularly females, should be promoted. The government should encourage people to have secondary health insurance instead of depending upon only the primary health insurance provided by the government. This is a way to reduce burden on the government budget to manage health security of the people.

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