

RESEARCH ARTICLE

Socio-Economic Determinants of Consumption Patterns in Thailand

Suchita Manajit*, Bhubate Samutachak, and Marc Voelker
Institute for Population and Social Research, Mahidol University, Thailand
*s.manajit@gmail.com

Abstract: The purposes of this study were (1) to investigate household consumption patterns, and (2) to investigate how household socioeconomic characteristics contribute to different consumption patterns. The data were obtained from the Household Socio-Economic Survey in the year 2015 by the National Statistical Office of Thailand. The sample consisted of 43,224 households. Cluster analysis was employed to reveal the consumption patterns of households. The relationship between the consumption patterns and household socioeconomic factors was analyzed using logistic regression. The results found five distinctively different consumption. Households with older persons were incorporated in the investigation along with other characteristics of the household, that is, the region of residence, area of residence (municipal or non-municipal area), household arrangement (one person, nuclear, extended, and others), children in the household, older person in the household, sex, marital status, education, work status of household head, and average monthly income of the household. Logistic regression analysis was employed to test the association between household characteristics and consumption patterns, suggesting that household characteristics contributed to consumption patterns. Households with older persons tended to have food-dominated and housing-dominated patterns.

Keywords: consumption patterns, socioeconomic determinants, older person household, Thailand

Thailand has experienced the demographic transition from high to low levels of fertility and mortality, resulting in an increase in the older population (age 60 years or older) during the past century (Prasartkul & Vapattanawong, 2011). The growing size of the older population has attracted considerable research and policy interest, raising questions about the economic well-being of older Thais. One of the important issues is the consumption patterns of older-person households (Buathong, 2013), which are the results of various factors and concern their income, lifestyle, and well-being. Analysis of

consumption patterns and income within a subgroup of the population, such as the older adults, can provide valuable insights for policymakers (Organisation for Economic Cooperation and Development [OECD], 2013).

Consumption patterns of older-person households have been studied in many countries. However, most of these were in developed countries such as the United States (Banerjee, 2014, 2015; Ketkar & Cho, 1982), Canada (Chawla, 2005, 2006; Denton et al., 2006; LaFrance & LaRochelle-Côté, 2011), Japan (Ohtake & Saito, 1998; Wakabayashi, 2008), and Germany

(Burzig & Herrmann, 2012; Lührmann, 2010; Schwerdt, 2005), with a few in developing countries (Luncido et al., n.d.). These studies provide insights into the financial management of the household and its effect on older people's physical, mental, and social environment changes. This type of study has never been studied within the Thai context before and is particularly important as Thailand has been in a speedy transition into a complete aged society soon (United Nations Population Fund [UNFPA], 2011).

The consumption pattern of households with older persons in Thailand is somewhat of a mystery matters due to the steadily improving economic and social status. Although the status of an upper-middle-income country that was recently announced by the World Bank (World Bank Group, 2011) may articulate better-off economic conditions, the standard of living has correspondingly shifted up. Not only does the average price increase, but also a great deal of necessary items for living have emerged. The speed of the transition has made it difficult for many older persons to prepare properly.

Besides the economic changes, Thai households are also facing many social challenges. Historically, members of multiple generations lived under the same roof, thus making the household size relatively large (UNFPA, 2016). Recently, an increasing number of grandparents are living separately from their children and grandchildren; nuclear families in Thailand are rising while extended families are declining. The number of older persons who live alone or with only their spouse is increasing. The 2014 Survey of Older Persons in Thailand found that the proportion of older persons living alone was 6% in 2002 and increased to 9% in 2014 (Foundation of Thai Gerontology Research and Development institute [TGRI], 2016). In addition, older people living with only their spouses increased from 16% to 19% during the same period. Thai society is witnessing an increasing number of households with older persons and the number of older persons living alone, apart and away from younger household members who could provide them sufficient care. These changes in the living arrangement have, to a great extent, profound implications for the consumption pattern, economic, and social well-being of older persons in Thailand.

Consumption patterns, income, and financial security have closely interplayed to affect the older persons' way of life. Changes in consumption

patterns and reduction in income might put certain groups of older persons into financial insecurity and undermine their well-being. According to the 2014 Survey of Older Persons in Thailand (TGRI, 2016), around one-third of older persons had income below the poverty line (2,647 Baht per person per month). In Thailand, the older person's main source of income was traditionally from their children. However, this source of income declined from 52% to 37% between 2007 and 2014 due to the decrease in fertility rates combined with the domestic migration and the increase in an older person's living apart from their children.

This study aims to gain a deeper understanding of the consumption pattern of Thai households, particularly those with older persons. Using the data from the Household Socio-Economic Survey (HSES) collected by the National Statistical Office of Thailand, the study will analyze household consumption patterns using cluster analysis. The HSES is structured to include comprehensive items of household expenditure, as well as household characteristics. Further analysis of the association between consumption patterns and characteristics of the household, which include older persons, are conducted by logistic regression analysis. The results of this study contribute to the more efficient planning and preparation for an aging and "complete aged society" in Thailand.

Literature Review

Demographic Transition in Thailand

Before 1970, Thailand's population was 34.4 million and increased to 64.2 million in 2000 (Wongboonsin et al., 2005). Recently, the population reached around 66 million (Institute for Population and Social Research, 2018). Along with the population growth was also the dramatic change in demographic structure.

In Thailand, the Older Persons Act (Article 3) defined "older persons" as those over 60 years (TGRI, 2016). The country started to experience an aging society when the one-tenth of the population was over 60 years of age in 2005, ranked second after Singapore. It is expected to become a "complete aged society" by 2021 when the proportion of the 60 years old or older persons is greater than 20%, as projected by the National Economic and Social Development Board (TGRI, 2016).

The older persons are considered a vulnerable segment of the population because they have little or no earned income. The case is especially worse for minorities, women, and those with the least education (Lusardi & Mitchell, 2007). However, the becoming of an upper-middle-income status implies that the Thais have a better economic condition, education, and health than the previous generations. Some of them may remain economically active even after 60 years of age (Knode et al., 2015); hence, their patterns of consumption are likely to be different.

Another major change that has become prominent in Thailand is the transformation of the Thai household structure, that is, the living arrangements. Due to the increasing trend of fewer children and childlessness, children leaving parent's household (e.g., for continuing education and job opportunities) and increasing nuclear family, household size is shrinking. This trend also implies that a greater number of older persons will live alone or only with their older person spouse in the years ahead (UNFPA, 2016).

The financial situation of households with older persons is an important issue, particularly in an aging society. Financial security is the condition of having stable sources of income, such as paid employment, government allowance, or remittances from children or other relatives (Smuseneto & Soonthornhada, 2011). Financial security is also related to the safety, well-being, and self-sufficiency of older persons.

Presently, the most important source of financial security for the Thai older people is from the family, especially children (TGRI, 2016). However, with the shrinking size of the family, there is a decrease in the potential support ratio, which results in a decrease in informal financial support from the family. For the uninsured and underprivileged older persons, government welfare provides only minimal support, which does not cover the cost of living for most cases (Suwanrada, 2008). Older persons face a higher risk of poverty than average because of the inability to work or lower income. In 2010, 10.9% of older individuals in Thailand were poor, compared with 7.7% of the general population (Jitsuchon et al., 2012). An additional 7.1% of older individuals were close to poor, that is, at risk of becoming poor in the event of even a small economic shock, such as an unforeseen medical bill. This financial issue raises the question of how households with older persons adjust their consumption patterns.

Household Expenditure and Consumption Patterns Concept and Measurement

Consumption is the use of goods and services by households and can be a determinant of well-being (Magrabi et al., 1991; Paim, 1995). Goods and services are acquired by households through the use of resources. Thus, the amount and kind of available goods and services consumed by households are determined by the amount and kind of resources at their disposal, the usage of those resources, the number of resources needed to obtain goods and services, and the tastes and preferences of the household (Goodwin et al., 2008; Magrabi et al., 1991).

Household expenditure is the amount of consumption expenditure made by household members to meet their everyday needs, such as food, clothing, housing, energy, transport, durable goods, health costs, leisure, and miscellaneous services (OECD, 2018). The consumption pattern refers to the elements or components of consumption and how they are organized among each other, the amounts consumed, and the time relationship among consumption periods (Magrabi et al., 1991). In other words, the consumption pattern is a reflection of household preference structure, defined in the budget share space and way of life (Fan, 1993).

The level of household consumption is influenced by household member's life-cycle stages (Foster, 2015). A young members' household usually has a small family size and relatively low income. Therefore, those households need to be frugal and usually spend less than average on products and services. By middle age, with the increase in family size and increase in income, spending usually reaches the maximum level for a household. The household size, income, and spending decline after the household members retire and become aged (Magrabi et al., 1991, p. 29).

To explain how income and consumption vary along with the life cycle, the life cycle hypothesis was introduced by Modigliani and Brumberg (1954) and further developed by Ando and Modigliani (1963). This hypothesis suggests that consumers try to maintain a relatively stable level of consumption over their lifetime. In practice, this implies that younger individuals borrow to meet consumption desires, whereas middle-aged individuals save as much income as possible, and the oldest individuals spend down their assets once their financial income declines in retirement.

The life cycle hypothesis has been widely used to analyze household consumption-saving decisions. Generally, the life cycle model suggests that individuals save during their working years or before retirement, and deplete it after they retire, using their savings to spend for consumption, especially on health care, over the remainder of their lives (Modigliani, 1988). Based on the literature review, this study frames its investigation using the life cycle theory of consumption and savings. It does not consider the unexpected situations or uncertainties that occur during the remainder of an individual's lifetime.

Factors Influencing Household Expenditure

The literature on household economics introduces various factors that influence household expenditure. These include demographic and other characteristics of the household, such as rural-urban, household income, household size, the number of members who are employed, and household head's employment status, education, and marital status.

Socioeconomic variables, and consumer tastes and preferences, also interestingly interplay to affect the household consumption pattern. Given the similar level of income and the same market price of goods and services, households with different tastes and preferences have different consumption patterns. Eastwood (1985) found that differences in household characteristics, such as household arrangement, age composition in the household, race, gender, education levels, and residential area, predict different tastes or preferences of households and their consumption pattern.

In a similar vein, a number of characteristics of older persons can affect their consumption expenditures. Lee (2001) investigated factors influencing the consumption expenditures of households with retired older-person using the 1990 Consumer Expenditure Survey and found that age, residential area, household arrangement, and education had a significant effect on the household's patterns of consumption.

Previous research suggested that age has a negative effect on all consumption categories except for food at home and health care, which has a positive effect (Neal et al., 1990; Schwenk, 1993; Walker & Schwenk, 1991). There are also age-related changes in the value of time and tastes and preferences of older-person households. Persons of different age group may assign the value in different goods and services differently.

The older persons may cook and eat more at home than at the restaurant. An older persons may have less spending on categories that are related to work, for example, clothes and transportation. Changes in the opportunity cost of household time use and change in environmental factors such as marital status, social contact, and physical mobility might explain this phenomenon.

Rural-urban settings can also be expected to relate to lifestyle and, thus, household expenditure. According to Schwenk (1993), rural households were less likely to spend on food away from home, housing, apparel and services, and health care compared to urban households. The differences between rural and urban may be due to social, economic, and environmental factors (Schwenk, 1993).

Living arrangement was also studied for association with consumption expenditures of households. For example, single-person households may allocate less money to food at home and more money to housing than households with other living arrangements (Schwenk, 1993; Walker & Schwenk, 1991).

Other socioeconomic variables that have been included in the research are education and income. Education influences lifestyle in social, occupational, and environmental settings. Prior research found that education positively affects consumption for food away from home, apparel and services, transportation, and entertainment, and negatively affects consumption on food at home and utilities (Neal et al., 1990; Schwenk, 1993; Walker & Schwenk, 1991).

Income is one of the important constraints on consumption. Household consumption choice is influenced by the amount of income, the expectations regarding future income, source of income, and the number of earners (Magrabi et al., 1991). Some studies that have examined differences across age groups on a cross-sectional basis have shown that older households consumed significantly less than younger households (Chawla, 2005).

Factors influencing consumption patterns included in this study are household characters and socioeconomic variables of the household head. The household characters include region, area of residence (urban-rural), living arrangement, number of children in the household, and total household income. The socioeconomic variables of household head are sex, age, education, and work status.

Methods

Source of Data

This study employs data from the Household Socio-Economic Survey (HSES) in Thailand collected by the National Statistical Office (NSO). The HSES is nationally representative and contains data relevant to household characteristics and expenditures. The survey collects information on household income and consumption, changes in assets and liabilities, ownership of durable goods, and comprehensive housing characteristics, which include living conditions of the household. The NSO has conducted the survey since 1968, every 5 years before 1987 and every 2 years thereafter. Based on the 2015 dataset, this study investigates the consumption patterns of the household with older persons.

Household expenditures refer to money (or equivalent) spent on goods or services needed for daily life; the spending may be in the form of cash or received without pay as own-produced, received from other household members, received as part of work or social welfare, or received from the employer. Expenditure consists of the monetary equivalent of the dwelling, furniture, household appliance, clothes, shoes, personal service, medical cost, travel cost, education, entertainment, religious activities, food, and tobacco, and so forth. All the expenditure values were converted to a one-month base. For 7-day food consumption, the value was multiplied by 4.3, which is the average number of weeks per month (52 weeks/12 months = 4.3 weeks/month).

The expenditure data are in a ratio scale, grouped into the following 11 categories: (1) food and non-alcoholic beverages; (2) alcoholic beverages, tobacco, and narcotics; (3) clothing and footwear; (4) housing, water, electricity, gas, and other fuels; (5) furnishings, household equipment, and routine household maintenance; (6) health; (7) transport; (8) communication; (9) recreation and culture; (10) education; and (11) Miscellaneous goods and services (e.g., taxes, insurances premiums, lottery ticket, interest payment, personal care, beauty services, and special ceremony such as wedding, birthday, etc.)

Operational Definition of Variables

Independent variables of this study include (1) region; (2) place of residence; (3) household arrangement; (4) presence of older person(s); (5)

presence of child(ren); (6) average monthly household income; (7) age of household head; (8) sex of household head; (9) marital status of household head; (10) education of household head; and (11) working status of the household head.

The survey includes characteristics of household members and relationship to the household head. This information is a proxy for household size and household arrangement, namely a one-person household, nuclear family, and extended family. According to UNFPA (2016), a one-person household is a household with only one occupant. A nuclear-family household may be one of three types: (1) Husband and wife; (2) Husband, wife, and child(ren); or (3) Single parent. Extended family may be either a skipped-generation or three-generation household. The literature suggests that these types of households are different in terms of intergenerational support and the effect that it has on consumption patterns. Household arrangements that do not fit into these three types are recorded as “other living arrangements.”

Cluster Analysis and Logistic Regression

Analysis of consumption patterns was performed using cluster analysis. The technique groups households based on their similarity with respect to an array of consumption variables. Once the households were grouped, cluster membership can reflect the pattern of consumption, described as mean values of the variables used as the basis for clustering (Magrabi et al., 1991). Cluster analysis is commonly used to address heterogeneity in each set of data, thus identifying the structures within the data set. It is also called segmentation analysis or taxonomy analysis. Specifically, cluster analysis was used in this study to segment the observations into groups of similar patterns of consumption. The determination of a number of the cluster in this study was conducted using a heuristic approach. Further, the rescaled distances (the fusion coefficients) between clusters of respectively smaller sizes are exhibited using a dendrogram. The steepness of the line indicates a degree of difference between clusters. At the point above, horizontality, the clusters are almost indistinguishable and should be merged. The number of clusters before the merger is the most probable solution (Aldenderfer & Blashfield, 1984).

Each cluster is described by the mean value of variables for households in the cluster, using the squared Euclidean distance, which equally weights

all clustering variables. The distance between the two cases is the sum of the squared differences between the values of the clustering variables. The squared Euclidean distance is defined as:

$$d_{ij} = \sum_{k=1}^p (X_{ik} - X_{jk})^2$$

where d_{ij} = distance between case i and j
 X_{jk} = value of k^{th} variable for the i^{th} case

Initially, the number of clusters is equal to the number of observations. To group observations into clusters, the agglomerative hierarchical clustering method, which forms clusters by the corresponding proximity values, was used.

The relationships between the consumption pattern and the socioeconomic and demographic factors were explored using logistic regression, with the former as a dependent variable and the latter as independent variables. The consumption patterns were transformed into the logarithm of the odds ratio, that is, $\log P/(1-P)$ by the logit model because the logarithm of odds is not bounded between zero and one as in the probabilistic range. The odds ratio is the likelihood of membership in a given cluster.

The logistic regression model contained household socioeconomic variables. The empirical models were tested in the following functional form:

$$E_0 = c_0 + c_1v_1 + c_2v_2 + c_3v_3 + \dots + c_nv_n + e_n$$

$i = 1, 2, 3, \dots, n$

where E_0 = a dummy variable indicating whether the household was a member of the cluster for which the probability was being computed

v_i = household socioeconomic and demographic variables

The author obtained permission from the NSO to access the secondary data of the HSES for the study years. The protocol for this study was approved by the IPSR-Institutional Review Board (IPSR-IRB), Mahidol University, Thailand, COE. No. 2017/11-244, on November 30, 2017.

Results

Clusters of consumption patterns exhibit the intensity of budget share for particular items of expenditure. For example, the food-dominated cluster

Table 1
Percentage of Household Consumption Expenditure of the Five Clusters in 2015

	Cluster				
	1	2	3	4	5
Food and non-alcoholic beverages	55.79	37.12	36.80	25.10	24.58
Alcoholic beverages, tobacco, and narcotics	1.07	0.72	1.77	1.23	0.72
Clothing and footwear	1.62	1.30	3.27	2.34	2.10
Housing, water, electricity, gas, and other fuels	18.53	37.15	17.28	13.06	12.05
Furnishings, household equipment, and routine household maintenance	2.00	2.09	2.66	1.66	1.67
Health	0.87	1.24	1.63	0.86	0.91
Transportation	6.21	5.48	12.88	9.05	37.79
Communication	2.58	2.73	3.96	2.89	3.09
Recreation and culture	1.94	2.78	3.62	3.15	2.46
Education	0.71	0.96	1.69	0.45	1.03
Miscellaneous goods and services	8.66	8.45	14.45	40.21	13.61

indicates that the household spends heavily on food items relative to other items. The use of budget share in identifying consumption patterns is justified because it has been confirmed that the relative importance that the household gives to a certain consumption item is stable in time and among households over a certain period (Chung, 1998).

A hierarchical approach was used to determine the number of clusters suggested by Aldenderfer and Blashfield (1984). The dendrogram was constructed to show the amalgamation steps of clusters, and the rescaled distances were used to measure the points of hierarchical clustering. After multiple experiments, five patterns of consumption (clusters) were revealed, that is, (1) food-dominated household, (2) housing-dominated household, (3) food and housing-dominated household, (4) miscellaneous good and services household, and (5) transportation-dominated household. This decision was based on the sizes of cluster membership and dendrogram. Each pattern reflects the relatively high percentage of expenditure on the respective item. For example, the food-dominated household is the household that spends on food items relatively higher than on other items. Table 1 shows that out of 43,224 households, 55.8% were food-dominated households, 54.08% food and housing-dominated households, 37.15% housing-dominated households, 40.21% miscellaneous goods and services households, and 37.8% transportation-dominated households.

Next, relationships between consumption patterns or cluster membership and socioeconomic factors were identified. A logit analysis was then applied. Each logit function of the dependent variable was the membership of a given cluster. If a household belongs to the particular cluster, the dependent variable takes the value of 1, and if a household belongs to any of the other clusters, the dependent variable takes the value of 0. The logit coefficient shows the marginal effect of each independent variable on the likelihood of membership in the given cluster. The independent variables are household characteristics that are essential to the study of consumption.

Food-Dominated Households

Among the independent variables, region of residence, area of residence, household arrangement, having child(ren) in the household, having older person(s) in the household, marital status of household

head, education of household head, and average household income are significant factors influencing the probability of belonging to this cluster of households. The odds ratio of a region of residence indicates that households in Central, North, Northeast, and South are more likely to be in this Food-Dominated Cluster than the households in Bangkok. The odds ratio of the area of residence indicates that households in the municipal area are less likely to spend on food than the households in the non-municipal area by around 0.9 times at a significance level of 0.05. Nuclear family, extended family, and other living arrangements are more likely to be in this type of household than one-person households at a significance level of 0.001. Households that have child(ren) in the household are more likely to spend on food than households without child(ren) by around 2.1 times at a significance level of 0.001. Households that have older person in the household are more likely to spend on food than households without an older person by around 1.2 times at a significance level of 0.001. Married household head households are more likely to spend on food than households whose head is single 0.8 times at a significance level of 0.01. Households whose household head has the education of primary school or higher are less likely to spend on food than households whose head is illiterate. Households that have average income in quintile 2-5 are less likely to spend on food than households that have average income in quintile 1.

Housing-Dominated Households

Among the independent variables, the region of residence, area of residence, household arrangement, having child(ren) in the household, having older person(s) in the household, sex of household head, marital status of household head, work status of household head, education of household head, and average household income are significant factors influencing the probability of belonging to this household arrangement. The odds ratio of a region of residence indicates that households in the Central, North, Northeast, and South are less likely to spend on housing items than in Bangkok. The odds ratio of the area of residence indicates that households in municipal areas are more likely to spend on housing items than the households in the non-municipal areas by around 1.3 times at a significance level of 0.001. Nuclear family, extended family, and other living arrangements are less likely to spend on housing items than one-person

Table 2*Socioeconomic and Demographic Factors that Determine Consumption Patterns of the Household*

Independent variables	Food-Dominated Cluster		Housing-Dominated Cluster		Food-House-Miscellaneous-Dominated Cluster		Miscellaneous-Dominated Cluster		Transportation-Dominated Cluster						
	Odds ratio	std.err.	Odds ratio	std.err.	Odds ratio	std.err.	Odds ratio	std.err.	Odds ratio	std.err.					
Region of Residence															
Bangkok (ref)															
Central	1.179	*	0.077	0.368	***	0.062	1.071	0.049	1.444	***	0.069	1.672	***	0.070	
North	1.306	**	0.078	0.317	***	0.064	0.974	0.051	1.831	***	0.072	1.712	***	0.073	
Northeast	2.262	***	0.077	0.273	***	0.065	0.648	***	0.051	1.238	**	0.072	1.991	***	0.071
South	1.976	***	0.079	0.256	***	0.071	0.867	**	0.053	1.185	*	0.076	1.826	***	0.074
Area of Residence															
Non-municipal area (ref)															
Municipal area	0.946	*	0.025	1.326	***	0.033	1.038	0.024	1.054		0.037	0.778	***	0.033	
Household Arrangement															
1-person household (ref)															
Nuclear family	2.127	***	0.042	0.515	***	0.046	1.599	***	0.041	0.379	***	0.053	1.003		0.062
Extended family	2.348	***	0.053	0.370	***	0.069	1.778	***	0.052	0.341	***	0.087	0.827	*	0.079
Other living arrangements	2.409	***	0.048	0.341	***	0.057	1.766	***	0.045	0.406	***	0.061	1.053		0.067
Child(ren) in the household (<15 years old)															
No (ref)															
Yes	2.124	***	0.031	0.565	***	0.048	0.993	0.027	0.295	***	0.046	1.191	***	0.036	
Older person (s) in the household (>59 years old)															
No (ref)															
Yes	1.171	***	0.030	2.105	***	0.039	0.896	***	0.028	0.566	***	0.045	0.729	***	0.040
Sex of Household Head															
Female (ref)															
Male	1.029		0.028	0.772	***	0.034	1.045	0.026	1.102	*	0.038	1.089	*	0.036	
Household Head Marital Status															
Single (ref)															
Married	0.852	**	0.054	0.850	**	0.058	0.834	***	0.047	1.322	***	0.062	1.163	*	0.070
Divorced, separated, and widowed	0.921		0.052	0.844	**	0.054	0.858	**	0.047	1.318	***	0.064	0.995		0.075
Education of Household Head															
Illiterate (ref)															
Pre-primary or primary	0.683	***	0.048	1.238	**	0.062	1.674	***	0.060	0.579	***	0.084	1.370	**	0.109
Secondary	0.429	***	0.055	1.367	***	0.072	2.071	***	0.063	0.656	***	0.089	1.569	***	0.112
Higher than secondary	0.231	***	0.073	1.285	**	0.080	2.085	***	0.067	0.768	**	0.092	1.435	**	0.115
Work Status of Household Head															
Economically inactive (ref)															
Economically active	1.041		0.031	0.553	***	0.036	1.076	*	0.030	1.797	***	0.054	1.249	***	0.047
Average Household Monthly Total Income															
1st Quintiles - poorest (ref)															
2nd Quintiles	0.552	***	0.035	0.875	**	0.041	1.943	***	0.041	2.929	***	0.084	1.977	***	0.102
3rd Quintiles	0.312	***	0.037	0.550	***	0.048	2.661	***	0.041	6.798	***	0.081	4.599	***	0.094
4th Quintiles	0.144	***	0.042	0.356	***	0.056	2.903	***	0.042	9.973	***	0.082	12.265	***	0.091
5th Quintiles - richest	0.044	***	0.058	0.273	***	0.065	2.243	***	0.046	16.138	***	0.085	24.590	***	0.092
Constant	0.663	***	0.101	1.529	***	0.100	0.089	***	0.091	0.034	***	0.134	0.007	***	0.162
L-2 log likelihood	42925.846			29532.627			49778.609			25733.98			28257.437		
R ²	0.322			0.216			0.080			0.213			0.222		
N	3,224			3,224			3,224			43,224			3,224		

* significant at 0.05 level, ** significant at 0.01 level, *** significant at 0.001 level

households. Households that have child(ren) in the household are less likely to spend on housing items than households without child(ren) by around 0.6 times at a significance level of 0.001. Households that have older person in the household are more likely to spend on housing items than households without the older person by around 2.1 times at a significance level of 0.001. Households whose head is male are less likely to be in Housing-Dominated Cluster than the households with a female head by around 0.8 times at a significance level of 0.001. Households whose household head has the education of primary school or higher are more likely to spend on housing items than households whose head is illiterate. Households whose household head is economically active are less likely to spend on housing items than the households whose head is economically inactive by around 0.6 times at a significance level of 0.001. Households that have average income in quintile 2-5 are less likely to spend on housing items than households that have average income in quintile 1.

Food-House-Miscellaneous-Dominated Household

This type of household has a combination of heavy spending on food, housing items, and miscellaneous goods and services such as taxes, insurance premiums, lottery ticket, interest payment, personal care, beauty services. Among the independent variables, region of residence, household arrangement, having child(ren) in the household, having older person(s) in the household, work status of household head, education of household head, and average household income are significant factors influencing the probability of belonging to this type of households. The odds ratio of a region of residence indicates that households in the Northeast and South are less likely to be spending more on food, housing items, and miscellaneous goods and services than the households in Bangkok. Nuclear family, extended family, and other living arrangements are more likely to spend on food, housing items, and miscellaneous goods and services than one-person households. Households that have older person in the household are less likely to spend on food, housing items, and miscellaneous goods and services than households without an older person by around 0.9 times at a significance level of 0.001. Households whose head is married or divorced, separated, or widowed are less likely to spend on food, housing items, and miscellaneous goods and services than the households

whose head is single by around 0.8 times. Households whose household head has the education of primary school or higher are more likely to spend on food, housing items, and miscellaneous goods and services than households whose head is illiterate. Households that have average income in quintile 2-5 are more likely to be spending food, housing items, and miscellaneous goods and services than households that have average income in quintile 1.

Miscellaneous-Dominated Households

Among the independent variables, the region of residence, household arrangement, having the older person(s) in the household, having child(ren) in the household, sex of household head, household head marital status, education of household head, household head work status, and average household income are significant factors influencing the probability of belonging to this cluster. The odds ratio for the region of residence indicates that households in the Central, North, and Northeast are more likely to spend on miscellaneous goods and services than the households in Bangkok. Nuclear family, extended family, and other living arrangements are less likely to spend on miscellaneous goods and services than one-person households. Households that have child(ren) in the household are less likely to spend on miscellaneous goods and services than households without child(ren) by around 0.3 times at a significance level of 0.001. Households that have older person(s) in the household are less likely to spend on miscellaneous goods and services than households without older person(s) by around 0.3 times at a significance level of 0.001. Households whose head is male are more likely to spend on miscellaneous goods and services than the household with female head by around 1.1 times at a significance level of 0.5. Households whose household head is married or divorced, separated, or widowed are more likely to spend on miscellaneous goods and services than the households whose head is single. Households whose household head has primary school education or higher are less likely to spend on miscellaneous goods and services than households whose head is illiterate. Households whose household head is economically active are more likely to spend on miscellaneous goods and services than the households whose head is economically inactive by around 1.8 times at a significance level of 0.001. Households that have average income in quintile 2-5 are more likely

to spend on miscellaneous goods and services than households that have average income in quintile 1.

Transportation-Dominated Households

Among the independent variables, region of residence, area of residence, household arrangement, having older person(s) in the household, having child(ren) in the household, sex of household head, work status, and average household income are significant factors influencing the probability of belonging to this cluster. The odds ratio of a region of residence indicates that households in Central, North, Northeast, and South are more likely to have transportation costs than the households in Bangkok. The odds ratio of the area of residence indicates that households in municipal areas are less likely to have transportation costs than the households in the non-municipal areas by around 0.8 times at a significance level of 0.001. Extended families are less likely to have transportation costs than one-person households by 0.8 times at a significance level of 0.5. Households that have child(ren) in the household are more likely to have transportation costs than the households without child(ren) person by 1.2 times at a significance level of 0.001. Households that have the older person(s) in the household are less likely to have transportation costs than the households without older person(s) by 0.7 times at a significance level of 0.001. Households whose head is male are more likely to have transportation costs than the households whose head is female by around 1.1 times at a significance level of 0.05. Households that have a married household head are more likely to have transportation costs than the households whose household head is single by 1.1 times at a significance level of 0.05. Households whose household head has the primary school education or higher are more likely to have transportation costs than households whose head is illiterate. Households whose household head is economically active are more likely to have transportation costs than the households whose head is economically inactive by around 1.3 times at a significance level of 0.001. Households that have average income in quintile 2-5 are more likely to have transportation costs than households that have average income in quintile 1.

Most of the independent variables in this study, such as region of residence, area of residence, household living arrangement, having older person(s) in the household, having child(ren) in the household, sex

of household head, marital status of the household head, work status of the household head, and average household income are significant factors influencing the probability of belonging to each cluster of consumption pattern and the odds ratio are varied.

Discussion

The demographic changes in Thailand showed that the older people (persons aged 60 or older) are increasing in both numbers and percentage of the population. Applying cluster analysis to the data, this study was able to identify five distinct consumption patterns. These consumption patterns, in turn, reflect Thai household's lifestyles. In 2015, the five clusters were Food-dominated, Housing-dominated, Miscellaneous-dominated, Transportation-dominated, and Food-House-Miscellaneous-dominated.

Logistic analysis was also employed, and the results show that consumption patterns of the households are likely to vary depending on socioeconomic factors. The present study found that, in 2015, the education level of household head significantly influenced all clusters, namely, Food-Dominated Cluster, Housing-Dominated Cluster, Food-House-Miscellaneous-Dominated Cluster, Miscellaneous-Dominated Cluster, and Transportation-Dominated Cluster. Varlamova and Larionova (2015) found that the education level of the population is also a significant factor that influences consumer and household spending.

Region of the residence and living arrangements are the significant factors affecting all consumption patterns. Lee (2001) studied factors influencing the consumption expenditures of retired older person households using the 1990 Consumer Expenditure Survey and found that age, residential area, household arrangement, and education were significant factors affecting total consumption and consumption categories of the retired older people.

A rural-urban setting can be expected to relate to lifestyle. For this study, the area of residence (classified into the municipal and non-municipal area) was a significant factor affecting the consumption patterns of Thai households. According to Schwenk (1993), rural households were less likely to spend on food away from home, housing, apparel and services, and healthcare compared to urban households. The differences between rural and urban may be due to

social, economic, and environmental factors (Schwenk, 1993).

It is expected that Thailand will become a “complete aged society” by 2021, logistic regression was applied to examine the presence of older person(s) in the household and the effect that has on the consumption patterns. The presence of older person(s) in the household had a positive relationship with housing-dominated consumption patterns at a statistically significant level of 0.001. In contrast, the presence of older person(s) in the household had a negative relationship with transportation-dominated and miscellaneous-dominated consumption patterns for the investigated year. However, it should be noted that for the food-dominated consumption pattern and housing-dominated consumption pattern, the presence of older person(s) in the household has a positive relationship. This finding is similar to Chung (1990), who found that being over age 65 was positively related to membership in the homebound cluster.

It is empirically shown in this study that households are not necessarily homogeneous in terms of consumption patterns; the different household compositions lead to different consumption patterns. The government should, therefore, take into consideration this multidimensional household characteristic when designing and implementing assistance programs and when targeting older people in particular. A “one-size-fits-all” type of aid program will not be efficient in accomplishing the objective of the program.

Given the association of Food-Dominated cluster and Housing-Dominated cluster, households with heavy proportionate consumption of older person(s) must be aware of and make proper preparation to accommodate these two categories of expenditure. Households need to have the ability to manage their own financial investment, savings, and income to maintain their financial well-being in the long term without falling into financial insecurity. In Thai society, intergenerational intra-household income has been a common old-age income security mechanism. Unfortunately, the evolution of Thai society and the economy have reduced the importance of the family. Thais should start saving or make secure, long-term investments starting from a young age. In addition, the public sector should provide financial literacy training. The pension and allowance systems currently

implemented by the government are not enough for most older people. As a makeshift intervention, the government should provide occupational training or create jobs for older person(s) to help generate household income. The results of this study may also be used by consumer educators and financial planners to help those households who are at a relative economic disadvantage or the lowest income quintile households. To better help households who are in financial trouble, consumer educators and financial planners need to first understand the households they are helping. The information provided in this study should be especially useful for understanding different consumption patterns behavior.

The results of this study may also be useful for marketing practices. By understanding and recognizing differences in preference structure and consumption patterns of the household, the production sector can better identify market segments for their line of products, so that more information can be provided to the specific market segment to increase market efficiency. Although this study only includes broad expenditure categories and may not be directly useful for specific product development or marketing, information on detailed product preference may be logically inferred using the given information. The information provided in this study may also be used as a guide for further detailed marketing research.

This study only considered the income and expenditure sides but did not explore the savings and other financial assets of the household. Further research on this issue would give more insight into the financial situation of the household. To capture the change in consumption patterns of the older-person household before and after becoming an older person, a longitudinal study of a population panel would provide a more complete picture. Details of food and housing expenditure should be further investigated in greater depth with respect to pricing, quality, and necessity.

Declaration of Ownership

This report is our original work.

Conflict of Interest

None.

Ethical Clearance

The study was approved by the institution.

References

- Aldenderfer, M. S., & Blashfield, R. (1984). *Cluster analysis*. SAGE Publications.
- Ando, A., & Modigliani, F. (1963). The "life cycle" hypothesis of saving: Aggregate implications and tests. *The American Economic Review*, 53(1), 55–84.
- Banerjee, S. (2014). How does household expenditure change with age for older Americans? *EBRI Notes*, 35(9), 2–11.
- Banerjee, S. (2015). Change in household spending after retirement: Results from a longitudinal sample. *EBRI Issue Brief*, (420), 4–19.
- Buathong, T. (2013). Age composition of households and consumption patterns in Thailand. *Journal of Humanities and Social Sciences of Ubon Ratchathani University*, 4(2), 26–44.
- Burzig, J., & Herrmann, R. (2012). Food expenditure patterns of the generation 50+: An Engel-curve analysis for Germany. *British Food Journal*, 114(10), 1380–1393.
- Chawla, R. K. (2005). *Shifts in spending patterns of older Canadians*. Statistics Canada.
- Chawla, R. K. (2006). *Change in expenditure patterns of older households in Canada, 1982-2003*. Paper presented at The 29th General Conference of The International Association for Research in Income and Wealth, held in Joensuu, Finland on August 20–26.
- Chung, Y. S. (1990). *Expenditure patterns of older and younger consumers* [Unpublished doctoral dissertation]. University of Illinois at Urbana-Champaign.
- Chung, Y. S. (1998). Culture and consumption expenditure patterns: Comparison between Korean and United States households. *Journal of Consumer Studies & Home Economics*, 22(1), 39–50.
- Denton, F. T., Mountain, D. C., & Spencer, B. G. (2006). Age, retirement, and expenditure patterns: An econometric study of older households. *Atlantic Economic Journal*, 34(4), 421–434. <https://doi.org/10.1007/s11293-006-9028-8>
- Eastwood, D. B. (1985). *The Economics of Consumer Behavior*. Newton, MA: Allyn and Bacon
- Fan, J. X. (1993). *Ethnic differences in preference structure and budget allocation patterns*. [Unpublished doctoral dissertation]. The Ohio State University.
- Foster, A. C. (2015). Consumer expenditures vary by age. *Beyond the Numbers: Prices and Spending*, 4(14). www.bls.gov/opub/btn/volume-4/consumer-expenditures-vary-by-age.htm
- Foundation of Thai Gerontology Research and Development Institute. (2016). *Situation of the Thai elderly 2015*. Foundation of Thai Gerontology Research and Development Institute.
- Goodwin, N., Nelson, J. A., Ackerman, F., & Weisskopf, T. (2008). *Consumption and the consumer society*. Global Development and Environment Institute.
- Institute for Population and Social Research. (2018). *Mahidol population gazette*. <http://www.ipsr.mahidol.ac.th/ipsrbeta/en/Gazette.aspx>
- Jitsuchon, S., Skoufias, E., & Wiener, M. (2012). *Reducing elderly poverty in Thailand: The role of Thailand's pension and social assistance programs*. The World Bank.
- Ketkar, S. L., & Cho, W. (1982). Demographic factors and the pattern of household expenditures in the United States. *Atlantic Economic Journal*, 10(3), 16–27.
- Knodel, J., Teerawichitchainan, B. P., Prachuabmoh, V., & Pothisiri, W. (2015). The situation of Thailand's older population: An update based on the 2014 Survey of Older Persons in Thailand. Chiang Mai, Thailand: HelpAge International.
- Lafrance, A., & LaRochelle-Côté, S. (2011). *Consumption patterns among aging Canadians: A synthetic cohort approach*. Statistics Canada, Economic Analysis Division.
- Lee, H.-S. (2001). Factors influencing the consumption expenditures of retired elderly households: Focused on the factor of wealth components. *Journal of Korean Home Economics Association English Edition*, 2(1), 17–38.
- Lührmann, M. (2010). Consumer expenditures and home production at retirement – New evidence from Germany. *German Economic Review*, 11(2), 225–245.
- Luncido, A. J. P., Cruz, E. D., & Ayala, M. L. (n.d.). Consumption expenditure of the elderly headed households in Mindanao. http://www.academia.edu/12702357/Consumption_Expenditure_of_the_Elderly-Headed_Households_in_Mindanao
- Lusardi, A., & Mitchell, O. S. (2007). Financial literacy and retirement preparedness: Evidence and implications for financial education. *Business Economics*, 42(1), 35–44.
- Magrabi, F. M., Chung, Y. S., Cha, S. S., & Yang, S. J. (1991). *The economics of household consumption*. Greenwood Publishing Group.
- Modigliani, F. (1988). The role of intergenerational transfers and life cycle saving in the accumulation of wealth. *The Journal of Economic Perspectives*, 2(2), 15–40. <http://www.jstor.org/stable/1942847>
- Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In K.K. Kurihara (Ed.), *Post Keynesian Economics* (pp. 388–436). New Brunswick: Rutgers University Press.

- Neal, E. G., Schwenk, F. N., & Courtless, J. C. (1990). Apparel expenditures of older consumers. *Family Economics Review*, 3(4), 12–17.
- Organisation for Economic Cooperation and Development. (2013). *OECD framework for statistics on the distribution of household income, consumption and wealth*. OECD Publishing.
- Organisation for Economic Cooperation and Development. (2018). *Household spending*. <https://data.oecd.org/hha/household-spending.htm>
- Ohtake, F., & Saito, M. (1998). Population aging and consumption inequality in Japan. *Review of Income and Wealth*, 44(3), 361–381.
- Paim, L. (1995). A consumption model for measuring poverty: An exploratory exercise. *Social Indicators Research*, 35(2), 129–153. <http://www.jstor.org/stable/27522838>
- Prasartkul, P., & Vapattanawong, P. (2011). Transitional point of the Thai population. In S. Punpuing & M. Sunpuwan (Eds.), *Thailand's population in transition: A turning point of Thai society* (pp. 13–22). Institute for Population and Social Research.
- Schwenk, F. (1993). Housing expenditures of the elderly: Owners and renters. *Family Economics Review*, 6(3), 2–7.
- Schwerdt, G. (2005). Why does consumption fall at retirement? Evidence from Germany. *Economics Letters*, 89(3), 300–305.
- Smuseneeto, A., & Soonthornhdada, K. (2011). The impact of health factors on financial security among the Thai elderly: In 2002 and 2007. *Journal of Health Research*, 25(1), 11–14.
- Suwanrada, W. (2008). Poverty and financial security of the elderly in Thailand. *Ageing International*, 33(1–4), 50–61.
- United Nations Population Fund. (2011). *Impact of demographic change in Thailand*. Bangkok, Thailand: United Nations Population Fund Country Office in Thailand.
- United Nations Population Fund. (2016). *The state of Thailand's population report 2015*. The United Nations Population Fund Thailand and the Office of the National Economic and Social Development Board.
- Varlamova, J., & Larionova, N. (2015). Macroeconomic and demographic determinants of household expenditures in OECD countries. *Procedia Economics and Finance*, 24, 727–733.
- Wakabayashi, M. (2008). The retirement consumption puzzle in Japan. *Journal of Population Economics*, 21(4), 983–1005.
- Walker, R. S., & Schwenk, F. N. (1991). Income and expenditure patterns of consumer units with reference person age 70 to 79 and 80 or older. *Family Economics Review*, 4(1), 8–13.
- Wongboonsin, K., Guest, P., & Prachuabmoh, V. (2005). Demographic change and the demographic dividend in Thailand. *Asian Population Studies*, 1(2), 245–256.
- World Bank Group. (2011). Thailand now an upper middle income economy. Retrieved August 1, 2016 from <http://www.worldbank.org/en/news/press-release/2011/08/02/thailand-now-upper-middle-income-economy>