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Thailand's Ageing Policy in Active Ageing Perspectives

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Abstract

Approaching a completely aged society, the Thai government attempts to promote active ageing in the elderly population. This article assesses Thailand's ageing schemes in the perspectives of Active Ageing Index (AAI). AAI is a composite index which reflects the overall living wellness of the elderly, covering their characteristics multi-dimensionally. The focus is to explore whether such schemes are in coherence with the behavioral attributes of the elderly in Thailand. The ordered logistic regression of data from the Survey of the Older Persons in 2017 recognizes influential behavioral attributes, emphasizing the need to revise policy perceptions. The findings show that variables related not only to health care and direct income provisions but also to decent choices of work, lifelong learning opportunities and community participation and involvement contribute to higher AAI level. Quantity-wise, Thailand has accomplished a wide coverage of health care and income security. Nevertheless, these policies remain passive and incoherent with the overall active ageing behavioral attributes. There is still a policy space to "actively" engage the elderly in the move. By increasing old-age-friendly infrastructures and market incentives in the forms of subsidies and tax schemes for the key players, namely, the elderly, themselves, and the business sectors will promote policy coherence.

Keywords : Ageing Policy, Active Ageing Index, Ordered Logistic Regression, Market Incentives

JEL Classification Code : I18, I38, J14, J18, J19

1. Introduction

This article assesses Thailand's ageing policies and schemes in the perspectives of active ageing. The focus is to explore whether existing policies are in coherence enough with the behavioral attributes of the elderly in Thailand. Specifically in this research, elderly refers to older persons who are at the age of 60 or above. The degree of active ageing is represented by the Active Ageing Index (AAI), a composite index which reflects the overall living wellness of the elderly, encompassing their characteristics in various dimensions. The index is a widely accepted tool used as a guideline for effective ageing policy designs in many countries, particularly the member countries of the European Union, the People's Republic of China and the Republic of Korea. The methodology comprises of two parts. First, this study employs secondary data, that is, the 2017 Survey of the Older Persons conducted by the National Statistical Office, in the calculation of AAI. It modifies the calculation method of AAI in National Statistical Office (2017) which is in accordance with the concept of the World Health Organization. The AAI of an individual older person depends on his or her attributes denoted by the answers to the survey questions. In the second part, ordered logistic regression analysis is employed to identify the attributes that are statistically significant in promoting higher AAI among the elderly population in Thailand. These attributes are different from the ones used in the AAI calculation in the first part. It is expected that significant behavioral attributes of the elderly can be explored to render more feasible active ageing policy options.

As a background, Thailand had its first National Long-term Plan of Action for the Elderly (1986-1991) since 1986. The major objectives of the plan were to provide older persons with appropriate health care, communities and

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needs as deemed necessary. Along with the United Nations having adopted the United Nation Principles for Older Persons in 1991, the "Essence of the Long-term Policies and Measures for the Elderly (1992-2011)" was developed by the Thai government (Jitapunkul & Chayovan, 2001). These measures accelerated a progression of actions, particularly the structured welfare provided by the state in addition to the traditional informal welfare provided by the family, affiliations and local community in the past. It was also included in the Eighth National Economic and Social Development Plan (1997-2001). This has since become a formal welfare provision covering a living allowance, universal health care services and other necessary provisions such as discounted fares for transportation. The Second National Long-Term Plan for Older Persons (2002-2021) materialized the coverage in the first plan and added more features related to security, life-course planning and preparation for old-age security.

Thailand has accomplished, in terms of quantity, a wide coverage of health care, living allowance and income security. Evidently, most of these policies have been considerably passive provision, without having the elderly "actively" involved. To truly stimulate active ageing, there remains possibilities of increasing engagement of the elderly in the policy schemes. In the last decades, worldwide policy trend, in line with active ageing, promoted activities such as elderly employment and participation in the economy. Major supporting reasons were related to post-retirement income, good health due to positive externalities from suitable work and shortages of working-age workers in some sectors of production. Many countries implemented policies to extend the working life and encourage the elderly to continue working. For example, Germany has been successful in employing elderly workers over the past decades. The retirement incentives were removed along with increased vocational training and reduced part-time subsidies. Early retirement yielded high cost to the German social security system (Borsch-Supan & Schnabel, 1998). In Japan, 34% of the population of 127.6 million were elderly population (65 years and above) in 2004. Japan implemented fiscal reforms related to the retirement benefits against the decline in the number of workers and the growing elderly population. As a result, the replacement rate decreased from 60% to the minimum bound of 50%. Moreover, in 2013, the law was amended to require employers to gradually implement measures to extend the retirement age until the age of 65 and to have an employment system after retirement (International Longevity Center, 2013). This is in congruent with a proposal in Gruber and Wise (2005) using data from Japan and 11 OECD countries. Their findings show that a three-year extension of employment could reduce government expenditures on benefits by up to 27% of the expenses, or approximately 0.72 % of the GDP, subject to actuarial scaling of benefits.

In Thailand, extension of formal retirement age has been subject to long debates and controversies. Partly culturally, in the past it was viewed that children of the elderly parents who continue to work after retirement were being"ungrateful", not taking good enough care of their parents. Customarily, therefore, the well-to-do elderly ought to stop working. Moreover, most of the elderly workers, themselves, feel that they are ageing as the National Statistical Office's Survey of the Older Persons reflects that more than half of the older persons stop working because they feel "old". Therefore, the reason for the majority of the elderly who continue to work was mostly because of necessity. Even those who preferred to work just to be active would not be able to easily find an appropriate workplace that provide flexibility to the elderly lifestyle. At the turn of the decade, however, some degrees of change in the perception on "healthy" elderly have been observed. It has become more widely accepted that part of being active ageing is to continue to work in a decent atmosphere. Grown-up children have changed perceptions that working elderly parents (with appropriate jobs) are healthier.

There exist a number of domestic studies suggesting to promote elderly-friendly environment and flexible working hours. (National Labor Development Advisory Council, 2013). However, the country lagged formal as well as legal infrastructure to accommodate and materialize these suggestions. A study by Phijaisanit (2015) proposed a policy package and guideline along with a scenario analysis of the economic and fiscal impacts of elderly employment support policy through tax incentives in Thailand. In the following year, the Ministry of Finance issued such tax policy as one of the measures to support elderly employment. (The Revenue Code on Revenue Exemption (Issue 639) BE 2560 (AD 2017) stipulates corporate income tax exemption for companies or juristic partnership in the case of employing sixty years of age or older to work.) Many large private enterprises in Thailand were encouraged by this tax incentives to retain and hire older workers. As a result, increased old age employment in organizations has been observed in the following years. Following the implementation of the tax incentive for elderly employment, it becomes evident that there is a policy space to promote a more active involvement of the elderly in the economy and society. Exploring significant behavioral attributes of the elderly can, therefore, portray more policy options.

2. Literature Review

The concept of active ageing can be traced back to the definition of "Active Ageing" of the World Health

Organization that states "Active ageing is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age" (2002, p. 12).

The term "health" in the definition includes physical, mental, as well as social well-being. Therefore, promoting good mental health and social connectedness is as important as physical health. The coverage of this definition paves an important foundation for the development of the AAI in industrialized countries and in Thailand. The report by the United Nations Economic Commission for Europe (UNECE) & European Commission (2019), based on the first report in 2015, constructs AAI for comparison of the quality of life of the elderly population in the European Union (EU). The index comprises of 22 indicators grouped into four dimensions with unequal weights. These four dimensions include employment, participation in the society, independent, healthy and secure living; and enabling environment for active ageing. The first three dimensions reflect the actual experiences of active ageing and the fourth dimension relates to the capacity to actively age. The weights for each country or region were determined by groups of experts in various fields of studies. Zaidi et al. (2019) applies the earlier framework for European countries in Zaidi et al. (2017) into the calculation of AAI in China for comparative analysis with other countries.

The earlier studies of active ageing in Thailand attempt to construct AAI by categorizing the sub-indices differently from the aforementioned models in UNECE & European Commission (2015) and Zaidi et al. (2017) due to three major reasons. First, there are limitations of the available secondary time series dataset in the survey of the older persons in Thailand. Second, the majority of the Thai labor force are in the informal sector, not having to pay direct income taxes despite receiving universal health care and other state provisions. Third, and as a consequence of the second reason, the way of life, culture and social safety net structure greatly differ from that of the western context. In Thanakwang and Soonthorndhada (2006), there are three sub-indices in the calculation of AAI, namely: health, community participation and security. Their study aims to assess active ageing attributes of Thai older persons in relation to socio-demographic characteristics and active ageing-related factors using the WHO framework. Employing the Survey of the Older Persons in 2002, the study concludes that active aging groups were found mostly among males, with high level of education, and having no chronic illnesses. Chansarn (2012) further investigates the determinants of active ageing on the data obtained from the Survey of the Older Persons in 2007. The finding reveals that health dimension promotes active ageing while existing security dimension promotes moderate active ageing and the low-score participation dimension contributes to low active ageing. Similar to the prior research, Saengprachaksakula (2014) constructs AAI using three sub-indices from the Survey of the Older Persons in 2011. Setting restrictions in the multinomial ordered probit model, the findings reveal that age, region, education level, marital status, income, work, healthcare and regular exercise are significant factors determining the AAI. The finding is in line with that of Thanakwang and Soonthorndhada (2006) and Chansarn (2012).

Following the earlier work, the National Statistical Office (2017) calculates the AAI using Survey of the Older Persons, Survey of Working Conditions of the Population, and Survey of Household Use of Information and Communication Technology in 2014. This composite index has an additional feature to the previous research. There are sub-indices covering four aspects, namely health, participation, stability and conditions conducive to active ageing. The conducive factors consist of the use of ICT and basic literacy (able to read and write). The study finds that the average AAI level of the Thai elderly is at moderate level. When comparing the outcome of each sub-index, the health index and stability index are at higher level while the conducive factors index and participation index are at the lower level. Without controlling other factors, the basic descriptive statistics indicate that males are found to have higher level of AAI than females. This is a different case from the findings in countries in the European Union where females have higher AAI level. The conducive factors are shown to have the highest gender gap, while the health factors imply lowest gender gap. Regionally, the AAI level is highest in the north and lowest in the south.

It can, thus, be observed that the existing literature show comprehensive studies of the relationship between AAI and demographic factors. However, there has not been sufficient discussion on the policy coherence to promote these active ageing attributes. Therefore, exploring significant behavioral attributes of the elderly that could link to policy tools can, therefore, contribute to increasing ageing policy options for the country.

3. Data and Methodology

This study employs secondary data from the Survey of the Older Persons in 2017. The survey was conducted by the National Statistical Office through the interview of older persons in selected households covering 77 provinces in five regions. The stratified two-stage sampling consists of the province being a stratum, having the establishment (in the municipality) and the village (out of municipality) as the first-stage sample units and the private households and members of special households as the second-stage sample units. The scope of this study restricts the old age population

to 60 and above, to be consistent with the current official retirement age in Thailand. After setting the restrictions, the sample size becomes 39,153. The analysis applies sample weights so that the sample can be nationally representative.

As an overview of the old age population, approximately 36% of the older persons live in the northeast while 23% live in the north, 22% live in the central region, 13% lives in the south and 6% live in Bangkok. Approximately 4.06 million older persons are still working, constituting 36% of the total old-age population of 11.35 million in 2017. Most of the older persons (62%) are working in agriculture, forestry and fishery sectors. Regarding their work status, 72% of the older persons operate their own business without having employees, 4% work for household without pay, 13% are private sector employees, 2% are government employees and the remaining join voluntary or community working group.

In the first part, this study modifies the calculation method in National Statistical Office (2017) which is in accordance with the concept of the World Health Organization. The added features to the calculation in this paper is elaborated in the explanation of the sub-indices below. The four sub-indices include: Health Index (HI), Participation Index (PI), Security Index (SI) and Enabling Factors Index (EI) with equal weight as represented in Equation (1). The reasons for using equal weights have been pointed out earlier in the Literature Review section.

$$\text{AAI} = \frac{1}{4}(\text{HI}) + \frac{1}{4}(\text{PI}) + \frac{1}{4}(\text{SI}) + \frac{1}{4}(\text{EI}) \quad (1)$$

The Health Index includes general physical and mental health, physical movements and activities of daily living (ADLs). In this paper, a wider range of ADLs have been added to the calculation as shown in Equation (2)

$$HI = \frac{H_1}{(M_1 \times n)} + \frac{H_2}{(M_2 \times n)} + \frac{H_3}{(M_3 \times n)} + \frac{H_4}{(M_4 \times n)} + \frac{H_5}{(M_5 \times n)} + \frac{H_6}{(M_6 \times n)} \quad (2)$$

where,

H_i is the score given to the answer to the interview question *i*

H_1 is self-evaluation of health condition; 0 = bad, 1 = not good, 2 = moderate, 3 = good, 4 = very good

H_2 is degree of happiness, scaled 1-10; 0 = unhappy, 10 = happiest

H_3 is ability to perform ADLs; 0=completely dependent, 1 = independent

H_4 is ability to see; 0= unable to see or see unclearly, 1= able to see clearly

H_5 is ability to hear; 0 = unable to hear or hear unclearly, 1 = able to hear clearly

H_6 is physical limitation such as going to restrooms; 0 = unable, 1 = able

M_i is the highest score for each question

n is the number of questions

Therefore,

$$HI = \frac{H_1}{(4 \times 6)} + \frac{H_2}{(10 \times 6)} + \frac{H_3}{(1 \times 6)} + \frac{H_4}{(1 \times 6)} + \frac{H_5}{(1 \times 6)} + \frac{H_6}{(1 \times 6)} \quad (3)$$

From Equation (3), the highest possible score is:

$$\frac{4}{24} + \frac{10}{60} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = 1$$

The lowest possible score is:

$$\frac{0}{24} + \frac{0}{60} + \frac{0}{6} + \frac{0}{6} + \frac{0}{6} + \frac{0}{6} = 0$$

The Participation Index includes participation in family and communal activities, financial and non-financial supports for the family, and networking with family and friends through social media. The last attribute is the added feature to the calculation to reflect the influential role of today's social media. The calculation is shown in Equation (4)

$$PI = \frac{P_1}{(M_1 \times n)} + \frac{P_2}{(M_2 \times n)} + \frac{P_3}{(M_3 \times n)} + \frac{P_4}{(M_4 \times n)} \quad (4)$$

where,

P_i is the score given to the answer to the interview question *i*

P_1 is work status; 0 = not working, 1 = working

P_2 is participation in communal activities 0 = not participate 1 = participate

P_3 is involvement in helping family members; 0= not involved, 1= involved

P_4 is networking and contacts via social media; 0 = no, 1 = yes

M_i is the highest score for each question

n is the number of questions

Therefore,

$$PI = \frac{P_1}{(1 \times 4)} + \frac{P_2}{(1 \times 4)} + \frac{P_3}{(1 \times 4)} + \frac{P_4}{(1 \times 4)} \quad (5)$$

From Equation (5), the highest possible score is:

$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 1$$

The lowest possible score is:

$$\frac{0}{4} + \frac{0}{4} + \frac{0}{4} + \frac{0}{4} = 0$$

The Security Index includes financial security, home ownership and safety of living environment as expressed in Equation (6)

$$SI = \frac{S_1}{(M_1 \times n)} + \frac{S_2}{(M_2 \times n)} + \frac{S_3}{(M_3 \times n)} + \frac{S_4}{(M_4 \times n)} \quad (6)$$

where,

S_i is the score given to the answer to the interview question *i*

S_1 is sufficiency of income; 0 = not sufficient/sometimes sufficient, 1 = sufficient/more than sufficient

S_2 is home ownership; 0 = not owned , 1 = owned

S_3 is living companion; 0= living alone, 1= living with family members

S_4 is safety of living environment; 0 = unsafe, 1 = safe

M_i is the highest score for each question

n is the number of questions

Therefore,

$$SI = \frac{S_1}{(1 \times 4)} + \frac{S_2}{(1 \times 4)} + \frac{S_3}{(1 \times 4)} + \frac{S_4}{(1 \times 4)} \quad (7)$$

From Equation (7), the highest possible score is:

$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 1$$

The lowest possible score is:

$$\frac{0}{4} + \frac{0}{4} + \frac{0}{4} + \frac{0}{4} = 0$$

The Enabling Factors Index includes basic literacy (can read and write) and possession of information and communication technology (ICT) tools. In the calculation of this paper, there are added components of the ICT tools such as mobile phones and tablets. The calculation is shown in Equation (8).

$$EI = \frac{E_1}{(M_1 \times n)} + \frac{E_2}{(M_2 \times n)} \quad (8)$$

where,

E_i is the score given to the answer to the interview question *i*

E_1 is possession of ICT tools; 0 = no, 1 = yes

E_2 is ability to read and write; 0 = no , 1 = yes

M_i is the highest score for each question

n is the number of questions

Therefore,

$$EI = \frac{E_1}{(1 \times 2)} + \frac{E_2}{(1 \times 2)} \quad (9)$$

From Equation (9), the highest possible score is:

$$\frac{1}{2} + \frac{1}{2} = 1$$

The lowest possible score is:

$$\frac{0}{2} + \frac{0}{2} = 0$$

In the second part, to identify the behavioral factors that are statistically significant in promoting higher AAI, ordered logistic regression model is employed for multinomial choice variables. The dependent variables, y = AAI, are ranked into three levels, where y = 1 (*low level AAI*, score 0-0.499), y = 2 (*moderate level AAI*, score 0.5-0.799), and y = 3 (*high level AAI*, score 0.8-1.00). The separate set of independent variables are taken from the same survey. The endogeneity problem is avoided because these variables are not used in the calculation of AAI in the first part.

The independent variables are grouped into three dimensions, namely (1) general attributes: age, sex, area (in municipality, outside municipality), region and marital status; (2) socio-economic status variables: highest level of education attained, work status, reason for still working, the most important sources of income for living, income level, sufficiency of income for living and savings; and (3)

supportive environmental and external factors variables: frequency of contact with grown-up children through visits, telephone calls or e-mails; and access to public or private health care services. A model in its general form can be represented by Equation (10).

$$y_i^* = \beta' x_i + \varepsilon_i \quad (10)$$

where y_i^*= dependent variable (AAI), x_i = independent variables, β'= coefficient, ε_i = error terms

In the situation that dataset allows, a continuous model may be possible, which should yield a more detailed presentation of the results. However, in this situation, the nature of the available qualitative data is not suitable for a continuous model.

The Odds Ratio (OR) when the independent variable is changed by one unit is shown in Equation (11)

$$OR = e^{\beta' x_i + \varepsilon_i} \quad (11)$$

The odds ratio indicates the likelihood that the elderly will have higher AAI level in comparison with the reference group. If OR = 1, it implies that the independent variable of interest is likely to have the same AAI level as the reference group. If OR > 1 or OR < 1, the independent variable of interest is likely to have a level of AAI that is equal to the odds ratio times of the reference group.

The model has been selected through detailed steps of testing the relationship between variables. With the Pearson chi-squared test, it is found that all the independent variables are related to the AAI. Independent variables have no relationship with each other. Some precautions must be noted regarding the endogeneity problem between health indices that impact the work status of the elderly. Kalwij and Vermeulen (2008) conduct a study related to health and old-age workforce in Europe. Their finding reveals that there is some endogeneity issue when interviewees, particularly those who are still working, are concerned that their answers related to health will affect their employment status. Cai (2010) overcomes the endogeneity problem by using panel data in simultaneous equation model. Moreover, another precautionary note is the possible effect of other factors which influence the health index in older persons, for example, age group, education and sex (Amengual et al., 2017). In this research, the Goodness of Fit Test considers the Pseudo R-square, the Log Likelihood and the Likelihood Ratio (LR) Chi-square test. Regression analysis with multivariate ordered logistic model by Maximum Likelihood Estimator (MLE) is processed by Stata where the value of variable = 0 is reference group. In the analysis of the results, the coefficient (Coefficient: β) is shown to describe the relationship between dependent and independent variables against reference groups. The dependent variable y is classified into 3 AAI rankings, consisting of *low level* (1), *intermediate level* (2), and *high level* (3). Variable names and their descriptions are shown in Table 1. Table 2 presents the Pearson's chi-squared, showing the relationship between dependent and independent variables. All of the independent variables are statistically significant to the AAI at 99% confidence level. Table 3 reports the ordered logistic regression coefficients and the Odds Ratio.

[Insert Table 1 here]

[Insert Table 2 here]

[Insert Table 3 here]

4. Results and Discussion

Considering the general attributes, the AAI level of elderly who are aged 70-79 and above 80 are 0.68 and 0.42 times of those who are aged 60-69, respectively. Ceteris paribas, females are likely to be 1.30 times more active than males. Elderly living outside of the municipality are 1.126 times more active than those living within municipality. Married elderly tend to be 8.16 times more active than singles. The ordered logistic regression analysis also shows statistical significance of the regional variables. The AAI levels of elderly living in other regions are about 1.84 to 3.85 times those living in Bangkok. This implies regional disparity, which may be influenced by region-specific factors such as dialects, culture, history, demography and geography. The policy space here is for the local schemes binding to the region-specific behavioral attributes of the elderly to supplement the national ageing policies. For example, the elderly living in Bangkok may not be active in terms of physical community activity in comparison with those living in the other regions. The nature of the pre-retirement jobs also differ from the other regions. Hence, supportive schemes which accommodate such behavioral attributes could be to promote an ecosystem or an infrastructure that prepares workers for a second job or participative social activities after retirement.

In terms of socio-economic attributes, elderly who attained graduate diploma or an equivalent tend to be 1.460 more active than those who completed at most primary school level. Therefore, lifelong learning for the elderly should be promoted through various market incentives such as tax refunds for employers who encourage post-retirement training skills for their employees. Elderly whose most important source of income for a living comes from pensions, social security fund, government subsistence have AAI level of 0.76 times that of the elderly with major

source of income from work. The elderly whose main income from the family or existing wealth tend to have AAI level 1.30 times that of the elderly with the main income source from work. The AAI level of the elderly who work because of financial needs tends to be only 0.849 times that of the elderly working without financial necessity. This is in accordance with savings. It is found that elderly with a savings of 100,000 baht or more tend to have AAI level between 1.77- 1.91 times of those without savings. Two major implications can be drawn from the above. First, decent workplace is important for the elderly, whether be it for active ageing or as a source of necessary income for living. Despite the wide population coverage, the living allowance and existing pensions are insufficient for making a living. Second, the elderly, who are supported by their children or family wealth tend to have higher level of AAI. However, it is not to be taken for granted that this group is also at risk to having lower levels of AAI due to the changing demographic structure that will reduce the number of children taking care of them.

In terms of environment and external factors, the AAI level of the elderly receiving government or private services in health care is about 2.3-2.4 times of those not receiving any health services. Indisputably, this implies the importance of public health care. In addition to medical personnel, other factors related to health, such as fitness areas and the infrastructure that facilitates activities for maintaining good health need to be considered. This also applies to the working age population. One of the variables associated with family and community participation is the frequency of contact of the elderly with their grown-up children. The AAI levels of the elderly who regularly contact their children are 2.2-2.8 times those who have never contacted their children. This reflects the importance of the schemes that stimulate care and attention of elderly parents along with the infrastructure that facilitates greater interaction between the elderly and their children. Measures that had, in vain, been proposed in 2018, such as tax deductions for supporting or traveling with elderly parents can be considered supportive in boosting AAI level, while creating positive socio-economic externalities on local tourism in the secondary cities (which was the major objective of the policy proposal at the time). (Theparat & Chantanusornsiri, 2018).

4. Conclusion

Overall, the findings show that behavioral attributes related not only to health care and direct income provisions but also to decent choices of work, supporting legal infrastructure, lifelong learning opportunities and community participation and involvement contribute to higher AAI level. Thailand has accomplished, in terms of quantity, a wide coverage of healthcare and income security. Evidently, these policies have only been passive, without having the elderly "actively" involved enough in the process. There remains policy space for the existing ageing policy schemes to become more coherent with the behavioral attributes of the Thai elderly. Increasing old-age-friendly infrastructure along with conducive market incentives to enhance behavioral active ageing attributes among the elderly will generate overall positive externalities to the economy. A well-designed market-driven ageing support model can be self-funded, efficient and government budget saving. From the above discussion, it is evident that appropriate measures, such as subsidies and supportive tax schemes can be designed according to the highlighted behavioral attributes to promote policy coherence.

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Table 1. Independent Variables of the Ordered Logistic Regression

Variable	Variable Name	Description, reference group = 0
x1	Age	0=60-69, 1=70-79, 2= 80 and above
x2	Sex	0=male, 1=female
x3	Area	0=within municipality, 1=outside municipality
x4	Region	0=Bangkok, 1=Central, 2=East, 3=Northeast, 4=West, 5= North, 6=South
x5	Marital status	0=single, 1=married, 2=others
x6	Highest level of education attained	0= primary school, 1= secondary school, 2= graduate diploma
x7	Reason for still working	0=non-financial reasons, such as working for leisure, 1= financial necessity
x8	Work status	0=employers, 1= employees, 2= volunteers (receiving no pay)
x9	Most important source of income for living	0=income from work, 1=state or social security pensions, 2=savings, 3=family
x10	Sufficiency of income for living	0=insufficient or sometimes insufficient, 1=sufficient
x11	Savings	0=none, 1= below 25,000 Baht, 2=25,000-99,999 Baht, 3=100,000-999,999 Baht, 4 = above 1,000,000 Baht
x12	Frequency of contact with grown-up children living outside (visits, telephone calls, internet)	0=never or once a year, 1=every month, 2= every day or every week
x13	Having access to health care and/or health services such as caregiver provisions	0=none, 1=state provision, 2=private provision

Table 2. Pearson's chi-squared

Variable	Pearson's chi-squared	Prob.
x1	4700***	0.0000
x2	869.0312***	0.0000
x3	58.8642***	0.0000
x4	1100***	0.0000
x5	3200***	0.0000
x6	523.9586***	0.0000
x7	154.6257***	0.0000
x8	286.2178***	0.0000
x9	5500***	0.0000
x10	2800***	0.0000
x11	2500***	0.0000
x12	810.6155***	0.0000
x13	484.0653***	0.0000

*Note. *** Significant at the 0.001 level*

Table 3. Ordered Logistic Regression Coefficient and Odds Ratio

Variable	Coefficient	Odds Ratio
Reference x1	0.0000	
x1=1	-0.3890***	0.6777
x1=2	-1.0731***	0.3419
Reference x2	0.0000	
x2=1	0.2602***	1.2972
Reference x3	0.0000	
x3=1	0.1184**	1.1257
Reference x4	0.0000	
x4=1	0.7538***	2.1250
x4=2	0.6489***	1.9133
x4=3	1.3481***	3.8499
x4=4	0.6107**	1.8416
x4=5	1.3313***	3.7861
x4=6	0.1235	1.1314
Reference x5	0.0000	
x5=1	2.0962*	8.1353
x5=2	1.4940	4.4547
Reference x6	0.0000	
x6=1	0.1088	1.1149
x6=2	0.3786**	1.4603
Reference x7	0.0000	
x7=1	-0.1641***	0.8486
Reference x8	0.0000	
x8=1	-0.4488***	0.6384
x8=2	0.1367*	1.1465
Reference x9	0.0000	
x9=1	-0.2761*	0.7588
x9=2	-0.3594	0.6981
x9=3	0.2358**	1.2660
Reference x10	0.0000	
x10=1	1.2892***	3.6299
Reference x11	0.0000	
x11=1	0.1198	1.1273
x11=2	0.0468	1.0479
x11=3	0.5733***	1.7740
x11=4	0.6484***	1.9125
Reference x12	0.0000	
x12=1	0.8028***	2.2318
x12=2	1.0352***	2.8156

Reference x13	0.0000	
x13=1	0.8636***	2.3716
x13=2	0.8358***	2.3066
cut1	-0.1424	
cut2	4.9914***	
N	10,929.0000	
Log Likelihood	-6,339.1596	
Pseudo R-squared	0.1552	

*Note. * Significant at the 0.05 level, ** Significant at the 0.01 level, *** Significant at the 0.001 level*