*DLSU Business & Economics Review 29(1) 2019, p. 165-177*

RESEARCH ARTICLE

# Does Being Old Mean Being Poor? Evidence from Thailand

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This paper studies the links between poverty and being old by analyzing how important age is as a risk factor for poverty and whether the determinants of poverty change with the age of the household head. The multivariate regression analysis uses probit estimation techniques applied to nationally representative household survey data for Thailand. The results show that the role of age in explaining the probability of a household being poor is very small once other socioeconomic aspects are considered and that most of the determinants of poverty remain the same across different age cohorts. The policy implications of these findings disentangling age and poverty are particularly relevant for aging societies: tackling poverty requires structural initiatives addressing the socioeconomic disadvantages of individuals and their families across all age groups.

***Keywords:*** Age, Poverty, Risk factors, Aging society, Thailand

**JEL Classification**: I32, J14, Q01

In the last two decades, policy initiatives to reduce world poverty have proliferated in the international community. The Millennium Development Goals in 2000 and the 2030 Agenda for Sustainable Development agreed upon in 2015 (United Nations, 2015a) are some of the milestones of the international effort to end poverty and leave no one behind. This development agenda comes at a time of significant demographic changes towards aging population: the world population aged 60 years old or older is projected to grow by 46% during the period 2017–2030 (United Nations, 2017a). The growth of the older population will be especially rapid in Asia and, by 2050, 61% of the people aged 60 years old or older will live in Asia. This demographic change reflects the decrease in fertility rates and the increase in life expectancy resulting from social and economic development. Such a reality should not represent a problem because longer lives offer more opportunities for individuals to live a life they value and to contribute to society.

However, aging is frequently considered with apprehension. In addition to macro-level debates about fiscal sustainability and the preparedness of healthcare systems, there are concerns about how individuals can keep their standard of living at older ages. Several discussions warn that older people are vulnerable to poverty due to the lack of income sources and the incapacity to cope with the natural challenges of aging (HelpAge International, 2015).

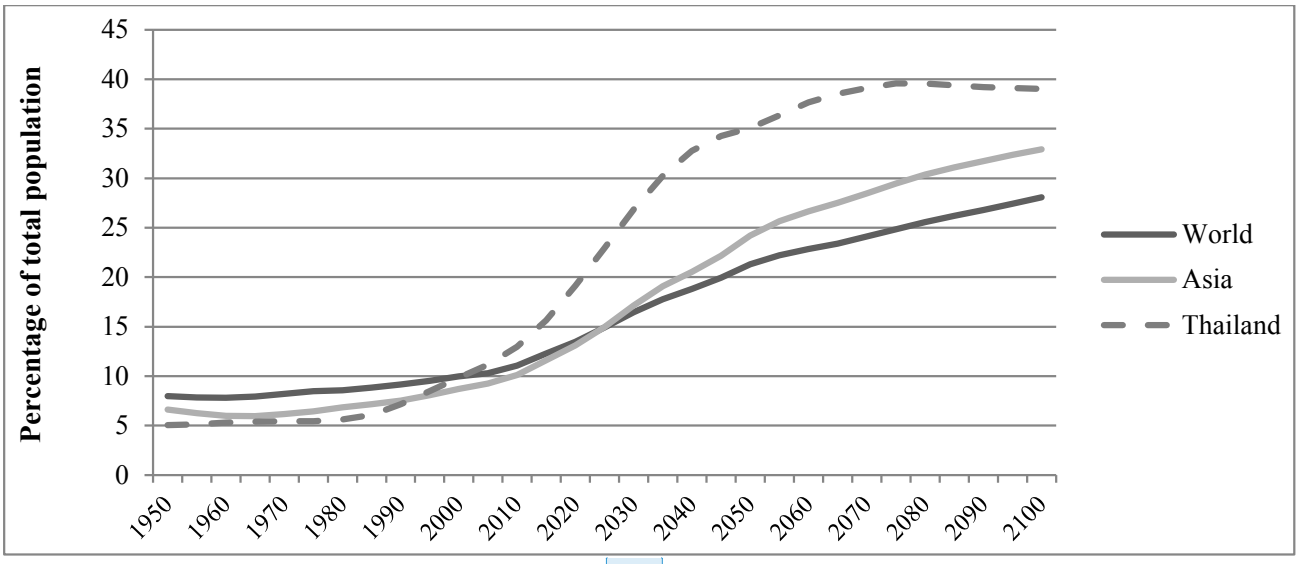
This study contributes to the policy debate by analyzing the factors behind poverty and the links between poverty and age. In particular, this study explores the impact of age on poverty and tries to understand the risk factors of poverty at older ages. The results are useful to inform the design of tailored and, hence, more effective policy initiatives to tackle elderly poverty, improve the welfare of an increasing part of the world population, and contribute to the ambitious development objective of eradicating poverty.

To our knowledge, little literature has analyzed poverty in older ages, and most of these studies use a qualitative approach. This paper contributes to filling this gap by applying quantitative methods to the debate and using nationally representative household survey data from a fast-aging Asian country, Thailand, for 2013.

## Poverty and Old Age in Thailand

Studying poverty in Thailand and its links with being old is particularly interesting due to the fast aging of the population and the higher rate of poverty among older people than among the overall population (United Nations, 2017b). The Thai demographic structure is changing at a fast rate, and by 2022, it is expected to be the first developing country with an aged society ("The next Japan is not China but Thailand," 2018). In the 1990s, the growth of the older population in Thailand accelerated, and by 2010, almost 13% of the Thai population was 60 years old or older. It is expected that approximately 23% of Thai people, approximately 18.7 million people, will be 60 years old or older by 2025 (United Nations, 2017a). Figure 1 illustrates the projected path of demographic change.

Acknowledging such demographic change, the Thai government has designed policies, such as the 2nd National Plan on the Elderly 2002–2021 and the Act on the Elderly B.E. 2546, targeting the improvement of elderly welfare. Under these policies, several initiatives have been implemented, including the universal coverage of the Old Age Allowance System in 2009 and the creation of the National Saving Fund in 2011. The introduction in 2001 of the Universal Coverage




*Source: Authors, based on data from United Nations (2017a).*

***Figure 1.*** Population aged 60 years old or older.

Scheme for healthcare has also benefited the elderly. By 2010, there were eight separate pension programs covering different proportions of the population (World Bank, 2012).

Despite these initiatives, challenges persist in sustaining the welfare and living standards of the elderly in Thailand. The Global AgeWatch Index for 2015 reported that 28% of Thai people aged 60 years old or older had an income amounting to less than half of the country's median income (Kaewkantha, 2015), and according to the official estimates of the Office of the National Economic and Social Development Board (NESDB) of Thailand, the rate of poverty incidence has been systematically higher among older Thai people than that among younger Thai people.

Within such a sociodemographic context, this study aims to understand how important age is as a factor of these disadvantages of Thai older people, by answering two research questions: (1) is age an important risk factor of poverty? and (2) are the risk factors of poverty change when comparing older and younger groups of the population?

## Theoretical Background

### *Literature Review*

Aging and elderly poverty have been important policy topics in developed countries for several decades (e.g., European Commission, 2014). However, in developing countries, only recently have policymakers turned their attention to the need of addressing aging challenges in order to achieve international commitments (e.g., Kudo, Mutisya, & Nagao , 2015). In the last few years, there have also been improvements in the collection and treatment of socioeconomic and poverty data for developing countries. Some data gaps persist (e.g., Serajuddin, Uematsu, Wieser, Yoshida, & Dabalen, 2015), but consistent research analysis on the topic of aging and, particularly, on elderly poverty for developing countries is flourishing. Barrientos, Gorman, & Heslop (2003) presented a review of studies on elderly poverty for 31 developing countries. They found that a great variety of sources and methodologies are used, with most of the analyses based on qualitative and participatory techniques. The current study contributes to this literature by analyzing poverty at older ages using a quantitative method.

Other studies mention elderly poverty in Thailand. Sondergaard et al. (2016) presented a diagnosis of the Thai poverty situation, evaluated policy decisions, and proposed solutions to address some of the existing challenges. The positive and normative analysis of that study focused on overall poverty, with occasional references to elderly deprivations. The report contributed to the understanding of the overall patterns of poverty in Thailand, and, therefore, it is an important source for establishing the research hypotheses of this paper. Likewise, the report from Knodel, Teerawichitchainan, Prachuabmoh, & Pothisiri (2015), analyzing the answers from the 2014 Survey for Older People in Thailand, contributed to the understanding of the patterns of elderly poverty in Thailand. However, neither of these reports studies the risk factors of poverty and their links with age.

Closer to this paper, Khongboon, Pongpanich, & Tangcharoensathien (2016) analyzed the predictors of perceived income insufficiency among the elderly population in Thailand, using survey data from 2007 and 2011. Their results showed regional differences, with the Northern region of Thailand having a higher prevalence of income insufficiency than the Southern region. They also found significant differences based on the main source of income, with a higher perception of income insufficiency among those receiving assistance from their work organizations or the government than among those having other sources of income. These results can be interesting to contrast with those from the current study because although both studies try to infer about determinants of poverty, the definition of poverty is substantially different: it is subjective in their case and objective in the current paper. Furthermore, this paper benefits from more detailed information collected at the national level representing the entire population, which provides additional results and allows the comparison of poverty determinants for different age cohorts of the Thai population.

Within a country, poverty may be linked to regional, community, and individual characteristics (World Bank, 2014). Reviewing the literature on poverty with a special focus on elderly poverty and Thailand, some patterns can be identified, as shown in Table 1.

Based on the existing literature, this paper considers three levels of possible risk factors of poverty: (a) demographic and economic characteristics related to the individuals who head the households, (b) characteristics of the households, and (c) community and regional aspects.

**Table 1.** *Patterns of Poverty Determinants Based on Existing Literature*

| Characteristic | Patterns and selected sources in previous literature |
|---|---|
| *Age* | In Organisation for Economic Cooperation and Development (OECD) countries, there is a U-shaped relation between age and poverty, with a visible increase in poverty amongst children and older people (Organisation for Economic Cooperation and Development, 2015). |
| *Gender* | Households headed by women tend to be poorer (e.g., Gunnarsson, 2002; Rissanen & Ylinen, 2014; Barrientos, Gorman & Heslop, 2003). However, in Thailand, World Bank (2012) reported that poverty rates are higher among men than among women. |
| *Marital status* | Widowed, separated, or single people are more prone to poverty (e.g., Emmerson & Muriel, 2006; Barrientos, Gorman & Heslop, 2003). |
| *Education level* | Households headed by more educated individuals are less likely to be poor (e.g., Rissanen & Ylinen, 2014; Akerele, Momoh, Adewuyi, Phillip, & Ashaolu, 2012). |
| *Main source of income* | Households are more likely to be poor when their main source of income is linked to agriculture activities (e.g., World Bank, 2014). |
| *Size of household* | Poverty is higher among larger households (e.g., World Bank, 2014). |
| *Remittances* | Remittances alleviate economic challenges and reduce the likelihood of the household being poor (United Nations Development Program, 2009). |
| *Geographic region in Thailand* | Bangkok is the least poor region in Thailand (e.g., Sondergaard et al., 2016). |
| *Urban or rural community* | There is higher probability of poverty in rural areas than in urban areas (e.g., World Bank, 2014; Knodel, Teerawichitchainan, Prachuabmoh & Pothisiri, 2015; Butler, 2006). |

### *Research Questions and Hypotheses*

The two main research questions (RQs) and associated hypotheses (H) of this study are as follows:

**RQ1.** Is age an important risk factor of poverty?

On the one hand, the facts in several parts of the world show that older people seem more exposed to poverty than younger people. Likewise, the Office of the National Economic and Social Development Board *(2017*) reported that the poverty rate in Thailand is higher among Thai people aged 60 years old or older than among people aged 15–59 years old. In 2014, the poverty rates for the respective age groups were 13.94% and 8.53%, and in 2015, they were 8.48% and 6.03%.

On the other hand, there are reports and studies (e.g., United Nations, 2015b; Barrientos, Gorman & Heslop, 2003) arguing that older people are poor only when they lack the institutional mechanisms to cope with the natural challenges of aging. Poverty at older ages may be linked to inadequate sources of income, lack of capacity to improve those sources, and the presence of multiple pressing needs. In this study, we account for several socioeconomic characteristics that may explain the poverty situation and, therefore, significantly reduce the impact of age on poverty.

H1A: Before controlling for socioeconomic variables, age is significantly and positively related to the probability of a household being poor.

H1B: After controlling for socioeconomic variables, age has a smaller or even non-significant role in explaining the probability of a household being poor.

**RQ2.** Do risk factors of poverty change by population age group, and in particular for older people?

Given the novelty of this question compared to the existing literature on elderly poverty, there is no a priori reason to suspect that the risk factors of poverty change in relevance when comparing different age cohorts of the population. Therefore, this study formulates:

**H2:** The individual, household, and community risk factors of poverty do not differ across age cohorts of the population.

## Data and Methodology

### *Data*

This study uses the household socioeconomic survey (SES) for Thailand, collected and treated by

the National Statistical Office (NSO) of Thailand, which is affiliated with the Ministry of Information and Communication Technology (National Statistical Office of Thailand, 2013). The SES from the Thai NSO provides a well-respected dataset that has been used in several other research articles (e.g., Mammen & Paxson, 2000; Felkner & Townsend, 2011). The data collection took place between January and December 2013 through face-to-face interviews in all provinces, in both municipal and non-municipal areas across the entire Kingdom of Thailand. In total, almost 52,000 private non-institution households were interviewed, excluding households of foreign diplomats and other temporary residents. The sample selection followed a two-stage stratified methodology, for a total of 77 strata. The primary sampling units were independently selected in each municipal or non-municipal area using a probability proportional to the total number of households in that area. The secondary sampling units were private households in each area, rearranged by the size and economic type of the household (based on the occupation that provided the main source of income for the household). All recorded questionnaires were preliminarily reviewed, edited, and encoded in each provincial office of the NSO, before sending the data to the NSO headquarters for a final computerized review. After data standardization and consistency tests, a total of 42,738 private households were considered to have valid data for analysis. In this study, we consider households headed by individuals aged 15 or older and, therefore, the sample is smaller than 42,738.

The starting point to answer the research questions of this study is to identify Thai households living in poverty. There is much literature on measuring poverty, with studies using both unidimensional and multidimensional approaches (e.g., Alkire et al., 2015). The latter approach shows different aspects of an individual's welfare, such as social inclusion or functional capabilities. The former approach benefits from great simplicity and still allows the inclusion of several dimensions by aggregating them through the use of a common unit of account, such as income allowances or consumption expenditure. This study uses a unidimensional measure of poverty.

A person or a household is considered poor when its resources are below an established threshold, evaluating in terms of income or consumption. Income represents the potential goods and services that individuals can obtain, whereas consumption refers to the actual goods and services obtained. In practical terms, most countries use a welfare measure of poverty based on per capita consumption (World Bank, 2016). Several studies argued that using consumption for poverty measurement is a better way to analyze well-being due to the higher volatility of income and its frequent misreport in socioeconomic surveys (e.g., Meyer & Sullivan, 2011).

Therefore, this study considers someone poor if his or her consumption expenditure is less than what is considered necessary for a satisfactory standard of life. The minimum required for a satisfactory life may differ across countries and sub-national areas. In Thailand, there are regional poverty lines that consider a set of food and non-food items, the demographic composition of households, and the price vector in each region. This study considers the regional poverty lines used by the NESDB, which distinguishes five regions of Thailand: Bangkok metropolitan area, Central, North, Northeast, and South. Using such regional poverty lines, an indicator of poverty is defined as:

*Pov_cons_reg*=1 if the per capita household consumption is below the regional poverty line, zero otherwise.

For each of the five regions in Thailand, the NESDB also calculates poverty lines distinguishing between municipal (urban) and non-municipal (rural) communities. Using these alternative poverty lines for each region and community, another indicator of poverty is defined as:

*Pov_cons_regcomm*=1 if the per capita household consumption is below the poverty line for the region and community, zero otherwise.

In this study, the two indicators of poverty are used as endogenous variables in alternative models as a way to infer the robustness of the results.

As explanatory variables affect the poverty status of the household, this study considers demographic and economic factors related to the individuals heading the households, the household, and the community and region, presented in Table 2.

**Table 2.** ***Control Variables Used in the Study***

| Variable | Description |
|---|---|
| *Age* | Age of the household head, measured in years. |
| *Agesq* | Age squared of the household head. |
| *Age_xx_yy* | Indicator of the age group of the household head: 1 if she or he is at least *xx* years old and at most *yy* years old, zero otherwise.<br>The age groups considered are *15-59*, *60-69*, *70-79*, and *80 or above*. |
| *Gender_fem* | Indicator of the gender of the household head: 1 if female, zero if male. |
| *Marital status* | Indicator of the marital status of the household head. The groups considered are single and never married, married, widowed, divorced or separated. |
| *Education level* | Indicator of the highest education level obtained by the household head:<br>*Educ_belowPrim*=Below primary-level or incomplete primary-level education;<br>*Educ_Primary*=Complete primary-level or incomplete secondary-level education;<br>*Educ_Sec*=Complete secondary-level or incomplete bachelor-level education;<br>*Educ_Voc*=Complete vocational-level education;<br>*Educ_Bachup*=Complete bachelor-level or higher-level education. |
| Socioeconomic class | Indicator of the socioeconomic class of the household. Class is defined by the Thai government based on the main source of income or main economic activity of the household. The classifications used are as follows:<br>*Inact_pension*=economically inactive household, mainly receiving income from pensions;<br>*Inact_assets_other*=economically inactive household, mainly receiving income from assets or other sources;<br>Farmer=economically active household that owns, rents, or occupies land for free. If the agricultural land area is up to 19 rai, a farmer is classified as a Small farmer; if the land area is 20 rai or above, a farmer is classified as a Large farmer;<br>*Farm_fish_forst*=economically active household whose activity is related to fishery, forestry, hunting, or agricultural service or being a farm worker;<br>*Prof_Manager_Tech*=economically active household whose activity is that of an own-account entrepreneur with managerial skills, manager, professional, technician, technical person, or related;<br>*OwnAcc_Techn_other_employer*=economically active household whose activity is that of an own-account entrepreneur with technical or other skills and with paid workers;<br>*OwnAcc_Techn_other_selfemploy*=economically active household whose activity is that of own-account entrepreneur with technical or other skills but without paid workers;<br>*Service_armed_worker*=economically active household whose activity is that of a worker in the service sector (logistics, transportation and basic works, clerical, sales, drivers, machine operators, cleaners, food processed assistance, or street vendors) or related to the armed forces;<br>*Product_worker*=economically active household whose activity is that of a worker in the production sector;<br>*Const_Mining_worker*=economically active household whose activity is that of a worker in the construction or mining sectors. |
| *Size of household* | Total number of members living in the household, excluding servants. |
| *Remittances (Remittances_per_Income)* | Ratio between the average monthly amount of remittances received by the household in the past 12 months and the average monthly current income of the household (income in money or in-kind but excluding other sources such as lottery income). |
| *Region* | Indicator of the geographic region within Thailand where the household lives: Bangkok and surrounding metropolitan area, Central, North, Northeast, or South of Thailand. |
| *Rural* | Indicator of the type of community in which the household lives: 1 if rural (non-municipal) area, zero if urban (municipal) area. |

**Table 3.** *Summary Statistics of the Variables Used in the Study*

| Variable | | No. of observ. | Mean | Std. deviation | Minimum value | Maximum value |
|---|---|---|---|---|---|---|
| *Pov_cons_reg* | | 41279 | 0.111 | 0.314 | 0 | 1 |
| *Pov_cons_regcomm* | | 41279 | 0.099 | 0.299 | 0 | 1 |
| *Age* | | 41279 | 52.306 | 14.730 | 15 | 99 |
| *Age_15-59* | | 41279 | 0.690 | 0.463 | 0 | 1 |
| *Age_60-69* | | 41279 | 0.178 | 0.382 | 0 | 1 |
| *Age_70-79* | | 41279 | 0.098 | 0.298 | 0 | 1 |
| *Age_80 up* | | 41279 | 0.034 | 0.182 | 0 | 1 |
| *Gender_fem* | | 41279 | 0.349 | 0.477 | 0 | 1 |
| *Marital status* | Single | 41279 | 0.096 | 0.295 | 0 | 1 |
| | Married | 41279 | 0.686 | 0.464 | 0 | 1 |
| | Widowed | 41279 | 0.159 | 0.365 | 0 | 1 |
| | Div_Separated | 41279 | 0.059 | 0.235 | 0 | 1 |
| *Education level* | Below primary | 41279 | 0.496 | 0.500 | 0 | 1 |
| | Primary | 41279 | 0.167 | 0.373 | 0 | 1 |
| | Secondary | 41279 | 0.190 | 0.392 | 0 | 1 |
| | Vocational | 41279 | 0.054 | 0.227 | 0 | 1 |
| | Bachelor & above | 41279 | 0.093 | 0.290 | 0 | 1 |
| *Socioeconomic class* | | | | | | |
| | Inact_pension | 41279 | 0.202 | 0.401 | 0 | 1 |
| | Inact_assets_other | 41279 | 0.013 | 0.113 | 0 | 1 |
| | Smallfarmer | 41279 | 0.116 | 0.320 | 0 | 1 |
| | Largefarmer | 41279 | 0.089 | 0.284 | 0 | 1 |
| | Farm_fish_forst | 41279 | 0.027 | 0.161 | 0 | 1 |
| | Prof_Manager_Tech | 41279 | 0.128 | 0.334 | 0 | 1 |
| | OwnAcc_Techn_other_employer | 41279 | 0.109 | 0.312 | 0 | 1 |
| | OwnAcc_Techn_other_selfemploy | 41279 | 0.046 | 0.210 | 0 | 1 |
| | Service_armed_worker | 41279 | 0.180 | 0.384 | 0 | 1 |
| | Product_worker | 41279 | 0.077 | 0.267 | 0 | 1 |
| | Const_Mining_worker | 41279 | 0.013 | 0.113 | 0 | 1 |
| *Size of household* | | 41279 | 3.043 | 1.587 | 1 | 23 |
| *Remittances_per_Income* | | 41279 | 0.049 | 0.141 | 0 | 2.854 |
| *Region* | Bangkok | 41279 | 0.098 | 0.298 | 0 | 1 |
| | Central | 41279 | 0.244 | 0.429 | 0 | 1 |
| | North | 41279 | 0.181 | 0.385 | 0 | 1 |
| | Northeast | 41279 | 0.343 | 0.475 | 0 | 1 |
| | South | 41279 | 0.134 | 0.341 | 0 | 1 |
| *Rural* | | 41279 | 0.637 | 0.481 | 0 | 1 |

*Note: The descriptive statistics use the sample weights calculated by NSO Thailand to make the results nationally representative.*
*Source: Authors, based on National Statistical Office of Thailand (2013).*

Table 3 reports the summary statistics for all variables included in this study.

In this sample of 41,279 Thai households and considering the regional poverty lines, the poverty rate is approximately 11%, but the rate drops to 10% when considering the regional and community poverty lines. The majority of the households are headed by individuals between 15 and 59 years old, and elderly households account for 30% of the sample. Women head 35% of households, and almost 70% of the individuals are married. The education levels of the household heads are quite low, with half of the individuals reporting less than primary education and less than 10% of the individuals reporting a bachelor's degree or higher. Economically inactive households that mainly receive income from pensions represent 20% of the sample, whereas own-account entrepreneurs or professionals with managerial, professional, or technical occupation represent almost 30% of the sample. More than half of the Thai households live in the Northeast and Central regions, as well as in rural communities.

The analysis of the summary statistics for the poverty indicators by group age, shown in Table 4, reveals that older households in Thailand register higher rates of poverty. Whether using regionally adjusted poverty lines or regionally and community-adjusted poverty lines, the percentage of households that are consumption poor doubles when comparing the youngest and the oldest households.

***Methods of Data Analysis***

To infer about the links between poverty and age, this study starts by conducting correlation analysis and continues by estimating the probability of a household being poor using multivariate regression techniques. The theoretical model can be described as:

$$\Pr(y = 1|Z,X) = G(Z.\alpha + X.\beta) \quad (1)$$

where $y$ is the observed poverty condition, with a value of 1 if the household is consumption-poor and zero otherwise; Z are the age-related variables; and X is the set of the remaining control variables, as described in Table 2. The main interest is the estimation of parameters $\alpha$, which is obtained using binary probit regression, assuming that the error term in (1) follows a standard normal distribution. Such estimation is conducted in two stages: first, using the sample of all 41,279 observations, and second, considering separate subsamples for each age cohort of the population.

## Results and Discussion

***Age as a Risk Factor for Poverty***

Table 5 shows that, overall, age and poverty are positively correlated. Considering the separate age groups, for households whose head is aged 60 or older, age and poverty are positively correlated. These initial results are partially aligned with hypothesis H1A that postulated a positive relationship between age and

**Table 4.** ***Summary Statistics for the Poverty Indicators by Age Groups***

| **Table 4a** | **Pov_cons_reg** | | | | |
|---|---|---|---|---|---|
| | **No. of Observ.** | **Mean** | **Std. Deviation** | **Minimum value** | **Maximum value** |
| Age_15-59 | 28,514 | **0.091** | 0.287 | 0 | 1 |
| Age_60-69 | 7,321 | **0.138** | 0.345 | 0 | 1 |
| Age_70-79 | 4,030 | **0.173** | 0.378 | 0 | 1 |
| Age_80 up | 1,414 | **0.199** | 0.399 | 0 | 1 |
| **Table 4b** | **Pov_cons_regcomm** | | | | |
| | **No. of Observ.** | **Mean** | **Std. Deviation** | **Minimum value** | **Maximum value** |
| Age_15-59 | 28,514 | **0.081** | 0.273 | 0 | 1 |
| Age_60-69 | 7,321 | **0.125** | 0.331 | 0 | 1 |
| Age_70-79 | 4,030 | **0.154** | 0.361 | 0 | 1 |
| Age_80 up | 1,414 | **0.165** | 0.371 | 0 | 1 |

*Note: The descriptive statistics use the sample weights calculated by NSO Thailand to make the results nationally representative.*
*Source: Authors, based on National Statistical Office of Thailand (2013).*

poverty before controlling for other socioeconomic factors. Interestingly, for the youngest households, age and poverty are negatively correlated, which may be evidence of career progress along these ages.

The results from the binary probit regressions for the entire sample are shown in Table 6. Each column represents an alternative model regarding the poverty indicator used as an endogenous variable or the age-related explanatory variables.

Models (1) and (3) in Table 6 show a U-shaped relation between age and the probability of a household being poor but with quite small marginal effects. When considering the different age groups separately, as in models (2) and (4), households headed by individuals aged 60 to 69 years old are as likely to be poor as those headed by younger individuals, whereas households headed by older individuals have a higher probability of being poor. These results partially confirm hypothesis H1B that suggested a small relation between age and poverty after controlling for socioeconomic variables.

Table 6 also shows that the results considering the two alternative poverty indicators are very similar, except regarding the marginal effect of the type of community. Interestingly, when considering the regional poverty lines, as in models (1) and (2), the households in rural communities seem more likely to be poor than those in urban areas; however, when considering poverty lines adjusted for the region and community aspects, as in models (3) and (4), the opposite result is found.

**Table 5.** *Pairwise Correlation Between Age Variables and Poverty Indicators*

| | ***Pov_cons_reg*** | ***Pov_cons_regcomm*** |
|---|---|---|
| *Age* | 0.1129 *** | 0.1017 *** |
| *Age_15-59* | -0.0961 *** | -0.089 *** |
| *Age_60-69* | 0.0403 *** | 0.0406 *** |
| *Age_70-79* | 0.0649 *** | 0.0607 *** |
| *Age_80 µp* | 0.0532 *** | 0.0415 *** |

*Notes: The numbers reported are the coefficients of pairwise correlation. *** means the correlation is significant at the 1% level. The pairwise correlation related to the remaining control variables is available upon request.*
*Source: Authors, based on National Statistical Office of Thailand (2013).*

**Table 6.** *Binary Probit Regression for the Probability of a Household Being Poor*

| **(Robust marginal effects)** | **Pr (Pov_cons_reg)** | | **Pr (Pov_cons_regcomm)** | |
|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** |
| *Age* | -0.0084 *** | -- | -0.0073 *** | -- |
| *Agesq* | 0.0001 *** | -- | 0.0001 *** | -- |
| *Age_60-69* | -- | 0.0044 | -- | 0.0041 |
| *Age_70-79* | -- | 0.0327 *** | -- | 0.0283 *** |
| *Age_80 up* | -- | 0.0600 *** | -- | 0.0446 *** |
| *Rural* | 0.0270 *** | 0.0267 *** | -0.0307 *** | -0.0309 *** |
| *Other control variables* | YES | YES | YES | YES |
| **No. of observations** | 41279 | 41279 | 41279 | 41279 |
| **Wald chi2** | 2270.6 *** | 2261.19 *** | 2256.6 *** | 2272.9 *** |

*Notes: The numbers reported are the estimated robust probit regression marginal effects.*
****, **, and * mean that the correlation is significant at the 1%, 5% and 10% levels, respectively.*
*The estimated robust marginal effects for the remaining control variables are available upon request.*
*Source: Authors, based on National Statistical Office of Thailand (2013).*

***Risk Factors of Poverty by Age Group***

The results from the analysis of the poverty risk factors by age group are presented in Table 7. Given that similar patterns were found when considering the alternative poverty indicators using the regional poverty lines and the regional and community poverty lines, only the results for latter are shown (the only exception to the similarity of patterns refers to the opposite sign of the marginal effect of the rural indicator).

**Table 7.** *Binary Probit Regression for the Probability of a Household Being Poor, by Age Group*

| (Robust marginal effects) | Pr(Pov_cons_regcomm) | | | |
|---|---|---|---|---|
| | **Age_15-59** | **Age_60-69** | **Age_70-79** | **Age_80 µp** |
| *Age* | -0.0022 | -0.0873 | 0.1772 | -0.0044 |
| *Agesq* | 0.0000 | 0.0007 | -0.0012 | 0.0000 |
| *Gender_fem* | -0.0024 | -0.0088 | -0.0220 | -0.0198 |
| *Single* | -0.0287 ** | 0.0399 | -0.0237 | -0.2576 *** |
| *Widowed* | 0.0064 | -0.0121 | -0.0548 ** | -0.0829 ** |
| *Div_separated* | 0.0061 | -0.0124 | -0.1104 ** | -0.0489 |
| *Educ_Primary* | -0.0229 *** | -0.0767 *** | -0.0475 | -0.1561 |
| *Educ_Sec* | -0.0662 *** | -0.1870 *** | -0.0922 ** | -0.1943 ** |
| *Educ_Voc* | -0.1126 *** | -0.2503 *** | -0.1927 ** | (omitted) |
| *Educ_Bachup* | -0.1727 *** | -0.3018 *** | (omitted) | (omitted) |
| *Inact_pension* | 0.0992 *** | 0.1716 *** | 0.2580 *** | 0.3867 *** |
| *Inact_assets_other* | -0.0014 | -0.0111 | 0.0804 | 0.1772 |
| *Smallfarmer* | 0.1187 *** | 0.1997 *** | 0.2535 *** | 0.4535 *** |
| *Largefarmer* | 0.0660 *** | 0.1220 *** | 0.2050 *** | 0.2729 *** |
| *Farm_fish_forst* | 0.1475 *** | 0.2344 *** | 0.3103 *** | 0.4525 *** |
| *OwnAcc_Techn_other_employer* | -0.0068 | 0.0175 | 0.0220 | 0.4222 *** |
| *OwnAcc_Techn_other_selfemploy* | 0.0533 *** | 0.0959 *** | 0.1297 *** | 0.2940 *** |
| *Service_armed_worker* | 0.0816 *** | 0.1271 *** | 0.2291 *** | 0.3477 *** |
| *Product_worker* | 0.0644 *** | 0.1024 ** | 0.1420 ** | 0.3481 *** |
| *Const_Mining_worker* | 0.0997 *** | 0.1113 ** | 0.3871 *** | 0.6509 *** |
| *Size of household* | 0.0428 *** | 0.0443 *** | 0.0462 *** | 0.0445 *** |
| *Remittances_per_Income* | 0.0204 | -0.0300 | -0.1323 ** | -0.0870 |
| *Central* | 0.0506 *** | 0.1445 *** | 0.1638 *** | 0.1706 ** |
| *North* | 0.0873 *** | 0.1696 *** | 0.2242 *** | 0.2073 ** |
| *Northeast* | 0.0910 *** | 0.1712 *** | 0.2308 *** | 0.2668 *** |
| *South* | 0.0534 *** | 0.1232 *** | 0.1324 ** | 0.1176 |
| *Rural* | -0.0258 *** | -0.0435 *** | -0.0538 *** | -0.0562 *** |
| **Nr Observations** | 28514 | 7321 | 3904 | 1381 |
| **Wald chi2** | 1579.07 *** | 381.63 *** | 225.86 *** | 150.29 *** |

*Notes: The numbers reported are the estimated robust probit regression marginal effects. In some of the models, there are omitted marginal effects estimations, and the correspondent observations were dropped automatically by the estimation procedure because those explanatory variables predicted "failure" perfectly.*
****, **, and * mean that the correlation is significant at the 1%, 5% and 10% levels, respectively.*
*Source: Authors, based on National Statistical Office of Thailand (2013).*

Overall, the results in Table 7 are consistent with the hypothesized similarity of the poverty risk factors across different age cohorts (H2). A few characteristics represent exceptions to such a similarity, in particular for older people: marital status, primary education, own-account entrepreneurs with technical or other skills and paid workers, remittances, and the Southern region in Thailand. Compared to being married, being single at ages 60 to 79 does not decrease the probability of being poor, but being widowed, divorced, or separated does seem to decrease the probability of being poor. From 70 years old onwards, individuals with primary education are as likely to be poor as those with lower levels of education. At age 80 or above, an own-account entrepreneur with technical skills and with employees is more likely to be poor than an own-account entrepreneur with managerial skills. Remittances seem to be relevant to decrease the probability of being poor at the later ages of 70 to 79 years old. The households in the other four regions in Thailand are more likely to be poor than those in the Bangkok metropolitan area, except for the oldest cohort in the South that is equally likely to be poor (this result for the Southern region is in line with the previous findings of Khongboon, Pongpanich & Tangcharoensathien, 2016).

The results in Table 7 also show that most of the findings for Thailand are consistent with those previously reported for other countries (Table 1), with three curious differences: gender does not seem relevant to explain poverty in Thailand given that households headed by women are as likely to be poor as those headed by men. Compared to being married, having a marital status of being alone does not increase the likelihood of being poor; and after adjusting poverty lines for the demographic composition of households and the price vector in different regions and communities, households living in rural areas appear less likely to be poor than those living in urban areas.

## Concluding Remarks, Policy Implications, and Future Research

This paper empirically assesses the relation between age and poverty, with special focus on older people and poverty, using nationally representative household survey data for a fast-aging country in Asia, Thailand. Basic correlation analysis reveals a significant and positive relationship between age and poverty. However, when controlling for socioeconomic variables and using probit regression estimation, age has a very small role in explaining poverty. These results support the proposed hypotheses. When comparing different age cohorts of the population, the evidence is also consistent with the initial expectations: the patterns of the risk factors of poverty are mostly similar between younger and older households.

The results of this study show that old age in itself should not be seen as a cause of poverty. It is the socioeconomic context of the individuals, the households and the community, and region where they live that are important determinants of poverty status. A clear policy message from this study is that when individuals, households, communities, and regions are equipped to answer the challenges of poverty, the role of age is substantially reduced and can even vanish. To tackle poverty, individuals, households, communities, and policymakers should focus on key aspects of education, economic and work opportunities, family relations, and community services and facilities. The solutions implemented should consider the process of population aging and the different potential needs of people at different stages of life.

This study has some limitations. First, it uses household-level data, which include the aggregates of many variables. When appropriate, it uses per capita values or the individual characteristics of the household head. However, this information may not fully reflect the reality of each individual in the household. Second, regarding poverty lines, this study uses values adjusted to the regional or community realities. Nevertheless, such poverty lines result from averaging values for the region or community and may ignore the specific needs of each household. Future research can try to develop other ways of measuring the poverty condition of each household that could be more closely adjusted to its own reality. Third, this study focuses on data for Thailand. Although there are results and conclusions that may apply to other countries, particularly to those in the Asia-Pacific region, it may be that some results are due to country-specific characteristics, such as the gender-related aspects of poverty. In the wait for internationally harmonized poverty data disaggregated by age, future research can replicate this study for other countries.

## Acknowledgments and Final Notes

The authors thank the National Statistical Office of Thailand for its permission in accessing the household survey data used in this study: http://web.nso.go.th/en/survey/house_seco/socio_13_Whole%20Kingdom.htm. The data for this particular study was generously and freely shared with the authors by the NSO of Thailand, for the sole purpose of academic research that can provide useful insights to inform future policy initiatives. The authors of this study are the only ones responsible for the statements and conclusions presented here.

Prior to conducting the research that led to this article, the authors submitted the research proposal requesting the official approval of the Institute for Population and Social Research – International Review Board (IPSR-IRB) of Mahidol University certifying its ethical compliance. In October 2017, the IPSR-IRB issued a Certificate of Exemption according to which this research does not offer any ethical concerns.

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