

Age-Adjusted Poverty Line: Thailand Case Study

Thoedsak Chomtohsuwan, Rangsit University, Thailand
Narissara Charoenphandhu, Rangsit University, Thailand
Jirabodi Tanaattasena, Rangsit University, Thailand

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Abstract

This study proposes an Age-Adjusted Poverty Line (AAPL) to address the limitations of the official poverty line, which is age-neutral and may not adequately reflect differences in the minimum cost of living across age groups. Although Thailand's official poverty line is constructed on the basis of the Cost of Basic Needs (CBN) approach at the household level, when reported on a per capita basis, it does not explicitly account for age-specific differences in basic consumption expenditure. Methodologically, this study treats Thailand's official poverty line as an age-neutral benchmark and adjusts it using age-specific weights to reflect differences in basic consumption costs across life-cycle stages. Age-specific basic consumption expenditure is estimated from observed consumption patterns derived from the Thai Household Socio-Economic Survey. The findings indicate that the use of a single poverty line for all age groups may obscure structural vulnerabilities arising from differences in consumption patterns over the life course, particularly at critical stages of human capital formation and in the context of population ageing. Therefore, adjusting the poverty line to account for age enhances the sensitivity of poverty analysis and provides a more useful basis for designing social protection policies that are better aligned with the needs of people at different stages of life.

Keywords: age-adjusted poverty line, poverty measurement, age-specific basic consumption, Thailand

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Introduction

Poverty is a critical issue in economic and social development because it is directly related to people's ability to access the basic necessities required for living, including food, housing, health care, education, and opportunities for long-term quality-of-life improvement. The poverty line therefore plays an important role as a tool for monitoring poverty conditions, assessing the economic vulnerability of the population, and informing the design of government social protection policies (Gordon et al., 2024; Yang et al., 2020).

In Thailand, the official poverty line is calculated under the Cost of Basic Needs (CBN) approach, which is the standard framework for measuring absolute poverty and is based on the minimum cost of consumption necessary for living (Gordon et al., 2024). However, although this poverty line is calculated from household-level data, once it is reported on a per capita basis, it effectively becomes an age-neutral poverty line. In other words, the same threshold is applied to all age groups without explicitly reflecting age-specific differences in minimum living costs (Gordon et al., 2024).

From the perspectives of household economics and population economics, individual consumption patterns do not remain constant over the life course; rather, they tend to vary with age in both the level and composition of expenditure. People at different stages of life may face different basic needs. When a single poverty line is applied to all age groups, these structural differences may not be adequately captured, thereby reducing the sensitivity of poverty analysis to life-cycle differences within the population (Gordon et al., 2024).

This issue becomes even more important in the context of Thailand's demographic transformation, which is characterized by a continuous increase in the proportion of older persons. Reports on the situation of older persons in Thailand reflect the country's transition toward an ageing society and highlight demographic changes with important implications for long-term social and economic policy planning (Department of Older Persons, 2024; Foundation of Thai Gerontology Research and Development Institute, 2018). Under these conditions, an age-neutral poverty line may be insufficient to fully capture the economic vulnerability of population groups with different age-specific expenditure structures (Gordon et al., 2024).

In response to these limitations, this study proposes an Age-Adjusted Poverty Line (AAPL) for Thailand. It uses the official poverty line as an age-neutral benchmark and adjusts that benchmark with age-specific weights in order to better reflect differences in basic consumption expenditure across life stages. The principal aim of this study is not to replace the official poverty line, but rather to develop an additional analytical tool that extends the capacity of poverty measurement to become more sensitive to demographic structure and life-cycle consumption patterns.

Methodologically, this study estimates age-specific basic consumption expenditure from observed consumption patterns derived from the Thai Household Socio-Economic Survey and then uses these estimates to construct age-specific weights for adjusting the official poverty line. This approach is based on the assumption that, although the official poverty line serves as a common national benchmark, the minimum living needs of people at different life stages may differ in relative terms. Age adjustment therefore allows poverty assessment to better correspond to actual living patterns across the population while remaining connected to Thailand's existing poverty measurement framework (Gordon et al., 2024).

The key contribution of this study lies in linking poverty measurement to demographic structure and the life course. It argues that an age-neutral poverty line may be insufficient for understanding the vulnerability of a population undergoing continuous demographic change. The findings are therefore important both academically and in policy terms. Academically, this study extends the framework of poverty measurement by incorporating the age dimension more explicitly. From a policy perspective, it provides useful evidence for the design of social protection measures that are better aligned with the needs of people at different stages of life (Department of Older Persons, 2024; Gordon et al., 2024; Yang et al., 2020).

Literature Review

Poverty measurement in Thailand has generally been grounded in a monetary poverty framework that uses the official poverty line as its principal benchmark. This benchmark has been developed under the Cost of Basic Needs (CBN) approach. Gordon et al. (2024) noted that Thailand has a relatively advanced and sophisticated system of monetary poverty measurement compared with many other countries, particularly in terms of the development of an official poverty line and the continuous monitoring of poverty. However, the same report also pointed out that the use of the official poverty line on a per capita basis has limitations, as it does not explicitly reflect differences in minimum needs across population groups, especially when age differences within households and across the broader population are taken into account.

From the perspective of poverty and inequality assessment, Yang et al. (2020) showed that poverty measurement is not merely a matter of setting an income or expenditure threshold. Rather, it also depends on the extent to which the indicator can appropriately capture the vulnerability of different population groups. Their report argued that poverty monitoring should be considered alongside inequality, economic structure, and the limitations of the existing measures, because a technically simple threshold may be insufficient to reflect differences within a society characterized by substantial demographic and socioeconomic diversity.

In the Thai demographic context, the literature on population ageing has consistently shown that Thailand is undergoing significant changes in its age structure. Reports on the situation of older persons in Thailand in 2017 and 2023 indicate a rising proportion of older persons and changes in population composition that affect dependency burdens, intra-household resource allocation, and the need for social policies that are more responsive to the life course. Under such conditions, the use of a single poverty line for all age groups may become increasingly problematic, since expenditure structures and minimum living needs differ across life stages.

Conceptually, the issue most directly related to age-adjusted poverty measurement is that of equivalence scales, or weights used to compare household members with different sizes and demographic compositions. Lewbel and Pendakur (2008) explained that equivalence scales are tools for comparing the cost of living across households with different household structures. They are based on the idea that living needs do not increase proportionally with the number of household members and also depend on demographic composition, such as the ages of household members, as well as shared resource use within the household. This concept is highly relevant to poverty analysis because it implies that a straightforward per capita measure may fail to adequately reflect the actual cost burden faced by people of different ages.

The classic work of Deaton and Paxson (1998) demonstrated clearly that the measurement of poverty among children and older persons is highly sensitive to assumptions regarding the costs of household members of different ages, the allocation of resources within the household, and the extent of economies of scale. In other words, even when the same income or expenditure data are used, poverty estimates for different age groups may change substantially simply because the assumptions regarding age weights and household sharing arrangements are modified. This point is particularly relevant to the present study, as it suggests that an age-neutral poverty line may not be truly “neutral” if it implicitly embeds assumptions about the needs of different age groups.

With respect to child poverty, the global empirical study by Newhouse et al. (2017) found that child poverty rates remain higher than adult poverty rates under a range of reasonable equivalence scales, and that this result is robust to changes in parameters related to age weights and economies of scale. Their findings suggest that age-sensitive poverty measurement is not merely a minor statistical refinement, but can materially alter how vulnerability among different population groups is perceived, particularly when comparing children with adults.

Similarly, UNICEF (2020) observed that measuring child poverty using household-level data and simple per capita averages may lead to biased estimates, because such an approach assumes that household resources are equally shared among members, whereas in reality members of different ages have different needs and household resource allocation is not always proportional. This observation provides strong support for the argument advanced in the present study that poverty measurement should become more sensitive to age, even while remaining anchored in the country’s existing official poverty measurement framework.

Returning to the Thai context, the work of Gordon et al. (2024) is especially important because it systematically evaluated both monetary poverty measures and multidimensional poverty measures in Thailand. The report argued that, although Thailand has a highly developed poverty measurement system, reliance on the official monetary poverty line alone may still be insufficient to fully capture deprivation across all population groups, particularly where minimum needs vary according to demographic structure. The report therefore opens an important academic space for the development of complementary tools that make poverty analysis more sensitive to differences in age, life stage, and household composition.

The study by Chomtohsuwan (2016), although not directly aimed at calculating an age-adjusted poverty line, makes an important conceptual and methodological contribution. It shows that expenditure on basic consumption, health care, and education forms part of the accumulation of explicit human capital, and that differences in costs and returns can be evaluated across life stages and educational pathways. This work therefore supports the argument of the present study that “basic expenditure” is not constant across all population groups and should be incorporated more systematically into the development of a poverty line that is more sensitive to population age structure.

Taken together, the literature provides clear theoretical and empirical foundations for the argument that poverty measurement for children, adults, and older persons is highly sensitive to age weights and to assumptions regarding shared household resources. It also suggests that age-neutral thresholds may distort the visibility of vulnerability among certain population groups. However, in the Thai context, relatively few studies have developed a systematic quantitative approach for adjusting the official poverty line to reflect age-specific differences in minimum living costs while still remaining linked to the country’s official poverty

measurement system. This constitutes an important research gap that the present study seeks to address.

The present study differs from previous literature in two important respects. First, rather than applying a standard international equivalence scale directly, it constructs age weights from observed basic consumption patterns derived from Thai household data. Second, it retains Thailand's official poverty line as the reference benchmark and adjusts that benchmark with age-specific weights, instead of proposing an entirely new poverty line detached from the existing system. In this way, the study builds a bridge between the literature on equivalence scales and policy-oriented application in the Thai context.

Objective

This study aims to develop an Age-Adjusted Poverty Line (AAPL) within the framework of Thailand's official poverty line by using age-specific weights that reflect differences in basic consumption expenditure across life stages. It also seeks to examine the limitations of an age-neutral poverty line and to compare poverty measurement outcomes under the official benchmark with those under the age-adjusted benchmark. In doing so, the study aims to provide policy-relevant insights for designing social protection measures that are more closely aligned with the needs of people at different stages of life.

Methodology

This study employs a quantitative research design using secondary data to develop an Age-Adjusted Poverty Line (AAPL) within the framework of Thailand's official poverty line. The core idea of the study is to estimate basic consumption expenditure and age-specific consumption weights from historical household consumption behavior in Thailand and then use these estimates to adjust the official poverty line so that it becomes more sensitive to age-related differences in the minimum cost of living.

Data Sources

The study draws on two main sources of data. First, it uses data from Thailand's Socio-Economic Survey (SES) over a 20-year period, from 1986 to 2006, as the basis for analyzing consumption patterns and estimating age-specific basic consumption expenditure. Second, it uses Thailand's population data for the year 2025 as population weights for calculating the weighted average of basic consumption expenditure and constructing age-specific weights for poverty line adjustment. These population data are drawn from the *Statistical Yearbook Thailand 2025* published by the National Statistical Office (National Statistical Office, 2025). The SES data are used to capture the long-term consumption patterns of the Thai population, particularly differences in both the composition and level of expenditure across age groups. The 2025 population data are used to ensure that the resulting age weights are consistent with Thailand's current demographic structure, which is situated in the context of an ageing society.

Estimation of Age-Specific Basic Consumption Expenditure

The analysis begins by estimating the average monthly total expenditure of individuals at each age from the SES data. A share of this total expenditure that can be classified as "basic consumption" is then separated from total expenditure on the basis of age-specific consumption structures in both food and non-food categories that are necessary for living. The resulting

measure is age-specific basic consumption expenditure (EBC_λ), which represents the value of basic consumption for an individual aged λ . To generate these estimates, the study uses SES data from multiple years in order to identify life-cycle consumption patterns more robustly and reduce the influence of fluctuations in any single year. All expenditure values are converted into constant prices so that the estimates reflect differences in consumption behavior rather than changes in the overall price level.

Construction of Age-Specific Consumption Weights

After obtaining age-specific basic consumption expenditure, the study computes an age-specific weight (w_λ) by comparing the basic consumption expenditure of individuals aged λ with the population-weighted average of basic consumption expenditure for the entire population. The weight is defined as follows:

$$w_\lambda = \frac{EBC_\lambda}{EBC_{ref}} \quad (1)$$

Where

$$EBC_{ref} = \frac{\sum_{\lambda=0}^n N_\lambda EBC_\lambda}{\sum_{\lambda=0}^n N_\lambda} \quad (2)$$

Here, N_λ denotes the number of people aged λ in the year 2025, and EBC_{ref} denotes the population-weighted average of basic consumption expenditure. Defining the reference value in this way is intended to make the age weight reflect the “average population” of the country, rather than relying on a single reference age group, which might bias the benchmark toward the consumption pattern of that particular life stage.

Calculation of the Age-Adjusted Poverty Line

Once the age weights have been obtained, they are applied to Thailand’s official poverty line ($PL_{official}$) in order to generate the age-adjusted poverty line (PL_λ), as follows:

$$PL_\lambda = PL_{official} \times w_\lambda \quad (3)$$

This equation reflects the idea that the official poverty line serves as an age-neutral benchmark, while the age-specific weight adjusts that benchmark so that it better captures differences in basic consumption expenditure across life stages. In this way, the study does not seek to replace the official poverty line entirely; rather, it offers an additional analytical framework that makes poverty measurement more sensitive to the age structure of the population.

Analysis and Interpretation

The resulting estimates are used to compare the characteristics of the age-neutral poverty line with those of the age-adjusted poverty line. The analysis further examines how the picture of economic vulnerability changes once differences in age-specific basic consumption expenditure are taken into account. The aim is to support the argument that an age-sensitive poverty line can improve the sensitivity of poverty measurement and provide more useful

evidence for the design of social protection policies that are better suited to the needs of people at different stages of life.

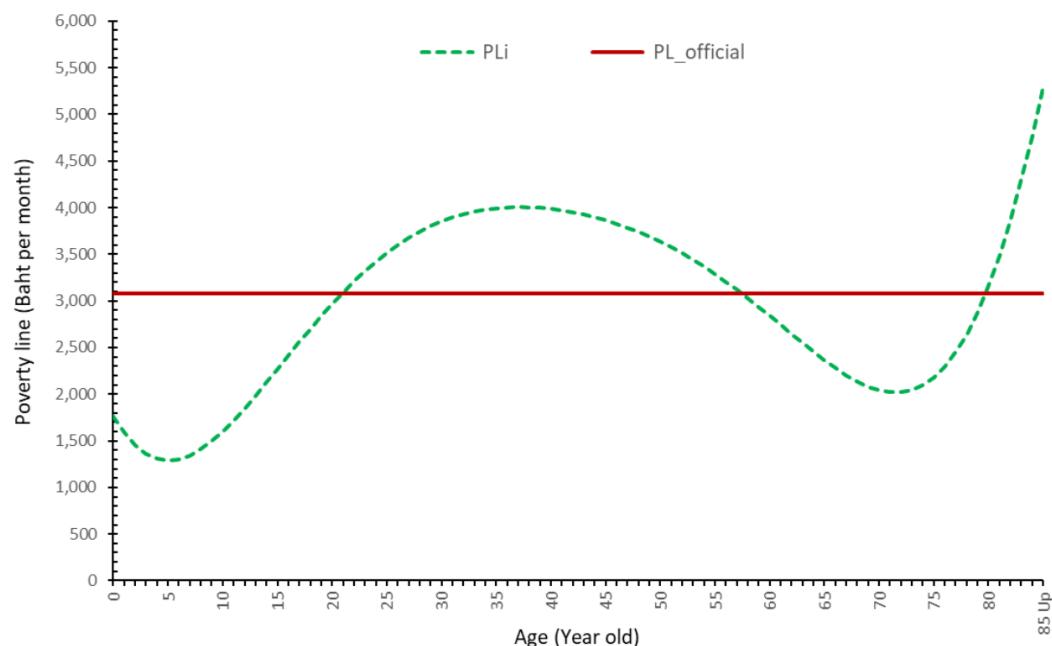
Results and Discussion

The estimated age-adjusted poverty line shows that the poverty line does not remain constant over the life course in the same way as Thailand's official poverty line. Instead, it varies substantially by age, following a life-cycle consumption pattern. When the official poverty line ($PL_{official}$), which is fixed across age groups, is compared with the age-adjusted poverty line (PL_{λ}), the latter exhibits a pronounced age-varying curve.

In early childhood, the age-adjusted poverty line lies well below the official poverty line. It then gradually rises during adolescence and continues to increase into the working ages. The line exceeds the official poverty line during early to middle working age and reaches its peak at approximately ages 35–40, indicating that age-specific basic consumption expenditure at this stage is higher than the population-weighted average. After middle working age, the age-adjusted poverty line declines continuously and falls below the official poverty line again during early old age, particularly between approximately ages 60 and 75. However, at very old ages, the age-adjusted poverty line rises sharply once more. This pattern may reflect both an increase in the burden of basic living costs at advanced ages and estimation effects at the upper end of the age distribution.

Figure 1

Age-Varying Poverty Line and the Official Poverty Line Held Constant Across All Age Groups.



Overall, the estimates suggest that the use of a single poverty line for all age groups may not adequately capture age-specific differences in the minimum cost of living. As a result, it may generate a picture of economic vulnerability across age groups that differs from that obtained under an age-sensitive framework.

Discussion

These findings are consistent with the literature on equivalence scales, which argues that household members do not face identical living needs at all ages and that a straightforward per capita approach may fail to capture the true expenditure burden of individuals at different stages of life (Lewbel & Pendakur, 2008). In the present study, the age-adjusted poverty line varies systematically over the life course, indicating that the official age-neutral poverty line functions only as a common benchmark and may not be sufficiently sensitive to age-specific differences in minimum living costs.

The pattern in which the age-adjusted poverty line rises during early to middle working age is consistent with a hump-shaped profile of basic consumption expenditure. This suggests that individuals in these age ranges face a higher burden of basic expenditure than the population average, whether due to food, housing, transportation, or other forms of consumption necessary for daily living, social participation, and economic participation. This result implies that reliance solely on a fixed official poverty line may underestimate the minimum living costs faced by some segments of the working-age population.

On the other hand, the finding that the age-adjusted poverty line lies below the official poverty line in early childhood and early old age should be interpreted with caution. In this study, age-specific basic consumption expenditure is estimated from observed household consumption patterns, which may reflect both “minimum needs” and “constraints on ability to pay.” It may also reflect expenditures subsidized by the state through social welfare arrangements, such as free education and health-care entitlements. Thus, lower observed expenditure in some age groups does not necessarily imply that their true minimum needs are below the official poverty threshold. Rather, it may reflect under-consumption or limited access to necessary resources and services, particularly among children and older persons. This interpretation is consistent with debates in the literature on the measurement of poverty among children and older persons (Deaton & Paxson, 1998; UNICEF, 2020).

The findings are also consistent with Newhouse et al. (2017), who showed that poverty measurement across age groups is sensitive to the specification of age weights and the use of equivalence scales. The clear age variation observed in this study therefore supports the argument that the poverty line should not be treated as a fixed threshold equally appropriate for all age groups and all contexts. Instead, it should be considered a benchmark that may need to be adjusted in order to reflect demographic structure and the life course more accurately.

A further issue that deserves discussion is the sharp increase in the age-adjusted poverty line at very advanced ages. Although this result may reflect substantially higher living costs at old-old ages, particularly with respect to health care and long-term care, it may also be influenced by trend estimation at the upper end of the age range. The interpretation of this part of the results should therefore be made cautiously.

Conclusion and Policy Suggestions

This study aimed to develop an approach for calculating an Age-Adjusted Poverty Line (AAPL) within the framework of Thailand’s official poverty line. It drew on data from Thailand’s Household Socio-Economic Survey for the period 1986–2006, together with Thailand’s 2025 population data, to estimate age-specific basic consumption expenditure and construct age-specific weights for adjusting the official poverty line.

The findings show that once differences in basic consumption expenditure across life stages are taken into account, the resulting poverty line varies clearly over the life course and differs from the official poverty line, which applies a single threshold to all age groups. These results suggest that the official age-neutral poverty line may not adequately reflect age-specific differences in the minimum cost of living and may therefore limit the ability of poverty analysis to detect structural vulnerability within the population.

From an academic perspective, this study contributes to extending the framework of monetary poverty measurement by incorporating the age dimension more explicitly and by linking the concepts of equivalence scales and life-cycle consumption patterns to the context of poverty measurement in Thailand. From a policy perspective, the study suggests that the use of age-sensitive data and benchmarks can improve the design of social protection measures by aligning them more closely with the needs of people at different stages of life.

Overall, the findings indicate that an age-neutral official poverty line may be insufficient for understanding the vulnerability of populations experiencing continuous demographic change, particularly in the case of Thailand as it moves further into an ageing society. Adjusting the poverty line to account for age is therefore not merely a technical refinement in calculation, but also an expansion of the analytical framework of poverty measurement so that it better corresponds to the life structure and demographic structure of society.

Nevertheless, the findings should be interpreted with caution because the age-specific basic consumption expenditure used in the analysis is based on observed consumption data, which may reflect both minimum needs and constraints on ability to pay. This concern is particularly relevant at the upper end of the age distribution. Further research is therefore needed to test the robustness of the results and to improve the estimation approach in future work.

Policy Suggestions

First, the government should consider using the age-adjusted poverty line as a complementary analytical tool alongside the existing official poverty line, rather than viewing it as a complete replacement. Such an approach would enable relevant agencies to better identify age-specific differences in minimum living costs while preserving continuity in the country's official poverty measurement system.

Second, the design of social protection measures should place greater emphasis on differences in needs across life stages, particularly for children, youth, and older persons. Although this study does not seek to recommend lowering the minimum standard of any group below the official poverty line, the findings indicate that basic consumption expenditure differs significantly across age groups. Therefore, a uniform policy approach applied to all ages may not be fully consistent with the actual needs of each population group.

Third, social policy agencies should develop data systems and poverty analysis frameworks that more closely integrate expenditure data, household structure, and age composition in order to improve the accuracy of policy targeting. This is especially important in the context of Thailand's transition into an ageing society, where differences in expenditure burdens and minimum living needs across age groups will become increasingly significant.

Fourth, from a policy research perspective, the robustness of the age-adjusted poverty line should be tested using more contemporary data. Consideration should also be given to

alternative approaches for estimating minimum expenditure that can more clearly distinguish “need” from “ability-to-pay constraints,” such as the use of near-poor household data or the separate treatment of essential expenditure categories such as health care and education. This would enhance the suitability of the results for policy application.

Finally, future poverty measurement should pay greater attention to demographic sensitivity, not only in terms of age, but also in relation to household composition, household size, and spatial differences. This would allow Thailand’s poverty measurement system to better accommodate ongoing changes in demographic and social structure and to remain responsive to the country’s long-term development context.

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Contact email: thoedsak.c@rsu.ac.th