Original Article

Financing the elderly in Indonesia

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ABSTRACT In developing countries, where the informal labor sector is large, the pay-as-you-go pension system is inapplicable. However, in order to maintain the distributional effect of a pension system, a kind of cash transfer for the elderly, taken from consumption taxes, is applicable. This notion of applying consumption taxes for older people's income is novel as it has never been applied anywhere, not even in Indonesia. This study analyzes how the capacity of consumption tax in Indonesian provinces is able to finance the economic lives of the elderly. The methodology and steps taken in this research are as follows: (a) Identifying consumption function for each province by using the life cycle-permanent income hypothesis (LCPIH) consumption function econometric model; (b) Predicting consumption function according to population trajectory for each province by using the Arima econometrics model; (c) Predicting the necessary amount to finance the elderly; and (d) Calculating the deficits (surplus) of the consumption tax under the older person financing. The findings are as follows. From the 30 provinces observed, four provinces show a low marginal tax rate (ranges lower than 2 per cent). While 13 provinces have a medium marginal tax rate (ranges from 2 to 4 per cent), the remaining 13 provinces show a high marginal tax rate (4 per cent and above). In addition, from the 30 provinces observed, 10 provinces show decreasing marginal tax indicators, three provinces show relatively constant marginal tax indicators, and the remaining 17 provinces show increasing marginal tax indicators. The conclusions are, first, that consumption taxes are applicable in Indonesia to finance the economic lives of the elderly; and second, that because not all Indonesian provinces are able to levy this type of tax without charging an overly high tax rate, some of the provinces that are not capable should seek assistance from the central government in terms of a block grant.

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INTRODUCTION

The purpose of this research is to elaborate the financing capacity of each province in Indonesia in supporting the economic lives of the elderly (population aged 60 and above). Previous work by Widjaja^{1,2} shows that the Indonesian macroeconomy has the capacity to finance the economic lives of the aging

population through consumption taxes, either through sales tax (PPn – Pajak Penjualan) or through value-added tax (PPN – Pajak Pertambahan Nilai). Household consumption is high in Indonesia, contributing roughly 65–70 per cent of the country's GDP. By using the 2005 Social Accounting Matrix Data, it is estimated that roughly 70 per cent of household income is spent on consumption. The problem is that, first, there is no mapping regarding the number of older people in each province. Second, there is currently no mapping regarding

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Figure 1: The proposed scheme for provinces consumption tax social security.

the consumption level of each province. Third, as a result of the second condition, there is no mapping regarding the level of consumption tax (sales tax/value-added tax) of each province in Indonesia. Fourth, as a result, there is no mapping regarding the ability of each province to support the lives of the elderly according to Law No 40 from 2004 regarding the National Social Security System (Sistem Jaminan Sosial Nasional-SJSN). Therefore, this research aims to provide information regarding provincial capacity in financing elderly people and to propose a social protection policy for elderly Indonesian people.

This social protection for the elderly in Indonesia is important for four reasons. First, it serves as a means to support the Indonesian older persons to smoothing consumption. In Indonesia, older persons tends to stop working at age 55, and in the informal sector, it means that they stop receiving income, since there is no pension program provided while they were working. Therefore, many elderly people need support either from government or from children so that they are able to maintain consumption. Second, it serves as a means to protect the economic resilience of the elderly when economic crisis occurs. Third, it decreases some of the burden of younger people, as they should also support the lives of their own children. Fourth, it serves as a means of income redistribution among the

population. Therefore, research into how the government is able to protect the economic lives of the elderly is important.

Accordingly, the research question posed in this article is: How is the capacity consumption tax in Indonesian provinces able to finance the economic lives of the elderly?

The theoretical scheme

The theoretical scheme can be described as follows. Household members in each province comprise young people and older people who spend on consumption (Figure 1). Their spending behavior will determine the level of consumption in each province. As the consumption tax is levied at the provincial level, each province will have a specific level of consumption tax revenue, depending on the tax base and the tax rate. By calculating the necessary amount for social security funds for the elderly, the current consumption tax may be adjusted by adding the social security tax. After that, the consumption tax revenue will be separated into that received by the government and that distributed as social protection for the elderly.

Research methodology

The research methodology used in this research will be a quantitative descriptive method, in addition to an econometric estimation method.

LITERATURE REVIEW

Cameron and Cobb-Clark^{3,4} stated that even though currently Indonesians live in families where the young and old co-reside, as the population grows and young people make their own nuclear families, this co-residing pattern will be broken down. As a result, income support from the young to the old will be broken as well. This condition calls for action from the government, either central or local, to set up social security financing support for the elderly.

Arifin and Ananta⁵ stated that the composition of the Indonesian population according to age structure will lead to an aging population, where the number of older people will increase and the number of young people will decrease. This condition will lead to the changing of consumption patterns in the Indonesian economy in the future, as well as the income pattern, the insurance pattern and the social security pattern.

James⁶ and Widjaja² stated that one way to provide financing for the elderly in Indonesia is by applying the pillars model. The first pillar is income support from the government. This kind of support is an income-redistributional means. The second pillar will be a mandatory fully funded pension program, and the third pillar will be a voluntary fully funded pension program. Therefore, this research is about how the provincial government provides the financing for the first pillar in order to support the economic lives of the elderly in Indonesia.

For the inter-temporal econometric model, the first paper that I review is that authored by DeJuan *et al*.⁷ This paper builds on previous studies by using time-series data from 48 contiguous US states to perform a direct test of the $\beta = X$ implication of the PIH. Parameter β is the size of the revision in consumption, while parameter X is the size of the revision in income. The US state-level data are an underutilized source of information on consumer behavior and have a number of attractive features for testing consumption theories. First, the quality of data across states is relatively uniform and has to meet the standard set by the US

Bureau of Economic Analysis. Consequently, test results based on these data are less prone to problems associated with systematic data quality variation that are inherent in many cross-country studies. Second, the US states have a national banking system, well-integrated capital and goods markets. Each state can be viewed as part of a highly integrated region, making it possible for states to adjust consumption in the face of income innovations. Test results based on state-level data therefore provide a useful benchmark for subsequent studies applying the direct test to other data sets.

The paper's test procedure can be summarized as follows. For each state, the authors jointly estimate (1) the univariate income-generating process and (2) the equation describing the relation between consumption revision and income innovation. They then use the estimated parameters of the income process to quantify the magnitude of the revision in permanent income associated with an income innovation. Overall, they find β to be insignificantly different from X across the US states, as the PIH predicts. The PIH may thus be a reasonable model for describing the response of consumption to income innovations at the state level.

The second article that I review for econometric modeling is that authored by Campbell and Mankiw.⁸ This article reexamines the consistency of the permanent-income hypothesis with aggregate postwar US data. The permanent-income hypothesis is nested within a more general model in which a fraction of income accrues to individuals who consume their current income rather than their permanent income. This fraction is estimated to be about 50 per cent, indicating a substantial departure from the permanent-income hypothesis. Their results cannot be easily explained by time aggregation or small-sample bias, by changes in the real interest rate, or by non-separabilities in the utility function of consumers.

The first goal of Campbell and Mankiw's article is to provide a simple framework for understanding these disparate results. They nest the permanent-income hypothesis in a more

general model in which some fraction of income λ accrues to individuals who consume their current income, while the remainder $(1 - \lambda)$ accrues to individuals who consume their permanent income. Their test is valid whether or not income has a unit root, and it is more powerful than the standard unrestricted test for consumption following a random walk. By lagging instrument variables two periods, they are able to avoid econometric difficulties that would otherwise be created by data time aggregation. They also show how to test the framework against an even more general time series representation for consumption and income.

The second goal of this article is to generalize the preceding approach to handling alternative versions of the permanent-income hypothesis. They allow for changes in the real interest rate and also for non-separability in the utility function between consumption and other goods. Following previous work, they examine interactions with labor supply, durable goods and government purchases. They examine whether these alternative formulations of preferences can explain the apparent excess sensitivity of consumption to income.

The third paper to be examined for econometric modeling is that authored by Carroll.⁹ This paper argues that the typical household's savings is better described by a 'buffer-stock' version than by the traditional version of the life cycle-permanent income hypothesis (LC/PIH) model. Buffer-stock behavior emerges if consumers with significant income uncertainty are sufficiently impatient. In the traditional model, consumption growth is determined solely by tastes. In contrast, buffer-stock consumers set average consumption growth equal to average labor income growth, regardless of tastes. The model can explain three empirical puzzles: the 'consumption/income parallel' documented by Carroll and Summers; the 'consumption/income divergence' first documented in the 1930s; and the stability of the household age/wealth profile over time despite the unpredictability of idiosyncratic wealth changes.

Buffer-stock savers have a target-wealth-to-permanent-income ratio such that, on one hand, if wealth is below the target, the precautionary saving motive will dominate impatient consumers'

behavior, inducing consumers to save. On the other hand, if wealth is above the target, impatience will dominate prudence, causing consumers to spend.

The fourth paper to be examined is that authored by Hubbard *et al.*¹⁰ Micro data studies of US household savings often find a significant group in the population with virtually no wealth, raising concerns about heterogeneity in motives for saving. In particular, this heterogeneity has been interpreted as evidence against the life cycle model of saving. This paper argues that a life cycle model can replicate observed patterns in household wealth accumulation after accounting explicitly for precautionary saving and asset-based, means-tested social insurance. Hubbard *et al* demonstrate theoretically that social insurance programs with means tests based on assets discourage saving by households with low expected lifetime income. In addition, they evaluate the model using a dynamic programming model with four state variables. By assuming common preference parameters across lifetime income groups, Hubbard *et al* are able to replicate the empirical pattern that low-income households are more likely than high-income households to hold virtually no wealth. Low wealth accumulation can be explained as a utility-maximizing response to asset-based, means-tested welfare programs.

DATA AND METHODOLOGY

In this section, I explain the economics and econometrics foundation of my forecasting model. I use this model to forecast consumption expenditure for 26 provinces from 2010 to 2025. First, I explain the theoretical foundation of the economic model, the life cycle-permanent income hypothesis. After this, I define the variables and data sets that I use in my research. Finally, I describe the applied forecasting models: the ARMA-ARIMA model and OLS-ECM model.

Economic model: life cycle-permanent income hypothesis

The author uses life cycle-permanent income hypothesis (LCPIH) to define consumption

behavior. The main premise of the LCPIH model is that an agent adjusts his level of consumption for each period according to his lifetime resources (see Romer¹¹). Equation (1) shows that an agent's total lifetime consumption should not exceed his total lifetime resources

$$\sum_{t=1}^T E[C_t]A_0 + \sum_{t=1}^T E[Y_t] \quad (1)$$

where A_0 is initial asset and Y_t is income in time t .

Equation (2) shows that an agent will try to smooth his consumption in each period. The consumption level in each period equals the average of an agent's lifetime resources. This equation has two behavioral implications. First, an agent will change his consumption level if there is a change in his permanent income, or the right-hand side of equation (2). Second, an agent's level of consumption will not respond to change in transitory income, that is, the difference between permanent income and current income.

$$C_t = \frac{1}{T} \left(A_0 + \sum_{t=1}^T E[Y_t] \right) \quad (2)$$

In summary, I use the LCPIH model to define consumption behavior. In this model, people change their consumption level if there is a change in their permanent income.

Variable definitions and data sets

Table 1 presents the summary of variables that I used in my forecasting model. There are three independent variables (LRGDP, LAGES and LFINA) and one dependent variable (LCONS). LCONS stands for log of private household consumption per capita, LRGDP is defined as log of provincial level GDP per capita, LAGES is the log of prime savers age ratio, and LFINA is the log of financial assets that are private deposits (in rupiah and other foreign currencies) per capita. Prime savers age ratio is the ratio of the population at the most

Table 1: Variable definition

Variable name	Variable description	Variable definition
LCONS	Dependent	Log of private consumption per capita
LRGDP	Independent	Log of provincial level GDP per capita
LAGES	Independent	Log of prime savers age ratio
LFINA	Independent	Log of private deposit (in rupiah and other foreign currency) per capita

Table 2: List of merged province

Current provinces name	Original provinces
Riau	Riau
Riau Islands	
South Sumatera	South Sumatera
Bangka Belitung	
West Java	West Java
Banten	
North Sulawesi	North Sulawesi
Gorontalo	
South Sulawesi	South Sulawesi
Sulawesi Barat	
Maluku	Maluku
North Maluku	
Papua	Papua
West Papua	

productive age (45–60) divided by the population at working age (20–49) plus older population (60+).

The author uses annual time series data of 26 provinces for the 1985–2009 period as a sample because the data for private deposit per capita are available for only 26 provinces. Up to the year 2000, there were 30 provinces in Indonesia; by 2010, there were 33 provinces.

Table 2 presents the list of merged provinces in the sample. The author gathered the data from Central Statistics Bureau (BPS) and Bank Indonesia publications. I obtained the household private consumption and provincial level GDP data from the BPS Regional GDP by Expenditure publication. For prime savers ratio calculation, I follow the definition applied in Erlandsen and Nymoen¹² to calculate the ratio in each province. Moreover, the population data are taken from the BPS 2000–2025 Population Projection publication. The financial asset per capita is calculated by using data from

Table 3: Data source and treatment

Variables	Data source	Data treatment
LCONS	BPS, Provincial GDP by Expenditure	Log of average per capita, adjusted to real value (2007=100)
LRGDP	BPS, Provincial GDP by Expenditure	Log of average per capita, adjusted to real value (2007=100)
LAGES	BPS, Population Projection 2000–2025	Log of [Total Pop (50–66)/{Total Pop (20–49) + Total Pop(67+)}] Ratio
LFINA	BI, Financial and Economics Statistics	Log of average per capita, adjusted to real value (2007=100)

the Bank Indonesia Financial and Economics Statistics publication. The data sets applied are summarized in Table 3.

Forecasting model: ARMA-ARIMA and OLS-ECM

For the purpose of this research, the author carries out a forecast on three variables: LCONS, LRGDP and LFINA. I apply the ARMA-ARIMA model to forecast LRGDP and LFINA from 2010 to 2025. It is important to forecast LRGDP and LFINA, because we need the forecast value of LRGDP and LFINA in order to forecast the value of LCONS from 2010 to 2025. Further, I apply the OLS-ECM model to forecast LCONS.

The ARMA-ARIMA model

ARMA-ARIMA consists of three elements. First, the AR or autoregressive element: the autoregressive element presents how the lag value of a variable determines the current value of the variable in question. Second, the MA or moving average element: the moving average element shows how the lag value of the error term determines the value of the variable. Third, the I or identification element: the I element is important to keep the stationary assumption in place. If we use non-stationary time series data in the ARMA-ARIMA model, our regression result could be spurious and not reliable for forecasting.

The author applies the ARMA-ARIMA model to forecast two endogenous variables, LRGDP and LFINA. The reason behind the application

of the ARMA-ARIMA model is that we assume that permanent income is generated through random walk behavior. Thus, ARMA-ARIMA is the fittest model that accommodates our assumption of randomness. The ARMA-ARIMA models for each province are shown in Table 4.

The OLS-ECM model

OLS-ECM stands for Ordinary Least Square Error Correction Model. I use this model because I assume that consumption is the result of equilibrium in permanent income. The error term in my model is treated as a deviation from long-term equilibrium, and the deviation from long-term equilibrium will be corrected automatically.

There are three steps to operate the OLS-ECM model. First, I define the long-term consumption equilibrium model. I specified my long-term equilibrium model in terms of function as

$$LCONS = f\{LRGDP, LAGES, LFINA\}.$$

Next, I use Augmented Dickey-Fuller methods to identify whether there is cointegration between

Table 4: ARMA-ARIMA model for each province

Provinces	RGDP	FINA
NAD	3.1.2	3.1.3
North Sumatra	4.1.3	4.1.2
West Sumatra	1.1.1	2.1.2
Riau	1.1.1	1.1.3
Jambi	1.1.1	2.1.0
South Sumatra	2.1.2	1.1.2
Bengkulu	1.1.2	0.1.1
Lampung	1.1.1	1.1.4
Jakarta	1.1.1	2.1.1
West Java	1.1.3	3.1.2
Mid Java	3.1.2	1.1.3
Yogyakarta	4.1.3	1.1.1
East Java	2.1.2	2.1.3
Bali	2.1.2	1.1.1
West Nusa Tenggara	1.1.1	1.1.1
East Nusa Tenggara	1.1.1	3.1.3
West Kalimantan	1.1.1	2.1.1
South East Kalimantan	4.1.3	2.1.3
South Kalimantan	3.1.0	2.1.1
East Kalimantan	1.1.2	1.1.3
North Sulawesi	4.1.3	4.1.2
Mid Sulawesi	4.1.3	2.1.2
South Sulawesi	3.1.2	2.1.3
South-east Sulawesi	2.1.2	4.1.3
Maluku	2.1.1	1.1.1
Papua	2.1.2	1.1.1

the error term and short-term equilibrium models. Finally, I construct a short-term consumption equilibrium model, which can be specified in terms of function as

$$\Delta LCONS = f\{\Delta LR GDP, \Delta LAGES, \Delta LFINA, \Delta LCONS(-1), E(-1)\}$$

where $E(-1)$ stands for lag value of deviation from equilibrium, and Δ means the first difference value. This last step is known as the Engle Granger Method. The author follows the estimation method of Singh.¹³

ANALYSIS OF THE MARGINAL TAX ESTIMATION RESULT

From the estimation of consumption function, we can now estimate the value of annual consumption of each province and the expected annual support for the elderly. Older people are members of the population aged 60 and above. The expected annual consumption level is defined as consumption per capita multiplied by the population of each province. The expected annual support for the elderly is defined as per capita multiplied by the number of older people in each province. The estimated consumption function per capita applies for 26 provinces. The number of provinces in Indonesia before the year 2000 was 26, before the Indonesian central government started to break down provinces due to fiscal decentralization. The number of 26 provinces was chosen because the estimation for consumption function uses the variable financial assets (M2 broad money) as an endogenous variable, where the time series data for M2 broad money are available only for the 26 provinces. However, calculation for support for the elderly applies to 30 provinces. These were chosen because the population projection is available for them. For new provinces, consumption per capita estimation uses the same variable estimated for the original province. As of 2011, Indonesia had 33 provinces.

The following analysis is the calculation of the financing capacity of the economic lives of the elderly in Indonesia as being as much as Rp. 10 000 per day per person (or roughly equal to

USD1 per day per person, according to the World Bank standard). The findings from my calculation show that the expected marginal tax rate for the consumption level of each province varies. The marginal tax rate is defined as the necessary annual amount to provide financial support to the elderly divided by total annual consumption. The variation ranges from less than 1 per cent additional tax to almost 10 per cent of additional tax rates. Before we proceed further, we can make a categorization among provinces according to the expected marginal tax rate. Readers are advised to refer to the Appendix for calculation results.

There are four provinces that show a low expected marginal tax rate (ranges lower than 2 per cent): Riau province, DKI Jakarta, East Kalimantan and Papua. This low expected marginal tax rate also means that the four provinces have a high consumption level as tax base. A medium expected marginal tax rate (ranges from 2 to 4 per cent) exists in the following 13 provinces: North Sumatra, West Sumatra, Jambi, South Sumatra, Bangka Belitung, Bengkulu, Lampung, West Java, East Java, Banten, Mid Kalimantan, South Kalimantan, Mid Sulawesi. The remaining 13 provinces show high expected marginal tax rates (4 per cent and above).

This condition means that while some provinces are able to provide financial support for the elderly by themselves, some provinces are not because an increase in the consumption tax rate of more than 4 per cent is relatively high, decreasing consumer purchasing power. From the 30 observed provinces, only 17 provinces are able to provide financial support for the elderly on their own. The remaining 13 provinces need help from the central government. In this case, fiscal decentralization through a block grant will have an important role in distributing funds to provinces to provide additional financial support.

In addition, there is another finding. The ability of most provinces to provide financing for the elderly is decreasing, as shown by the increasing expected marginal tax indicator. However, some provinces show a decreasing expected marginal tax indicator. Moreover, some provinces show a constant expected marginal

tax indicator over time. Provinces that show decreasing marginal tax indicators are as follows¹⁰: West Sumatra, Riau, Bengkulu, Lampung, DKI Jakarta, West Java, Mid Java, DI Yogyakarta, East Java and East Kalimantan. Provinces that show relatively constant marginal tax indicators are as follows³: Banten, Mid Kalimantan and South Kalimantan.

SUMMARY AND CONCLUSION

1. As has been predicted at the macroeconomic level of central government, the Indonesian economy at the provincial level actually has the capacity to support the financing of the older population by applying consumption taxes. In order to prove this, the author forecasts the marginal tax rate of consumption taxes for each province.
2. There are several steps in forecasting the marginal tax rate of consumption taxes. First, the author forecasts regional gross domestic product, financial assets and prime savers age ratio as independent variables. After this, by using the forecasted independent variables, the author forecasts the real value of the per capita consumption tax rate as dependent variable by applying the ARMA-ARIMA method.
3. The level of consumption expenditure for each province is obtained by multiplying the estimated consumption per capita by the population of the province. The level of financial support for the elderly is obtained by multiplying USD 1 per day by 365 days and by the number of older people in a province. The marginal tax rate is then obtained by dividing the financial support expenditure by consumption expenditure.
4. Of the 30 observed provinces in Indonesia, only 17 provinces have the capacity to increase their marginal tax rate without creating an overly high consumption tax rate. Therefore, it is concluded that although consumption taxes are available for financial support for the elderly, their application still needs some support from the central government by disbursing a block grant.
5. From the 30 observed provinces in Indonesia, only 10 provinces have an increasing capability to finance the elderly by applying consumption

tax. Three provinces have relatively constant capability, while the capability of the remainder of the provinces is decreasing.

Recommendation

1. Consumption taxes are applicable in Indonesia to finance the economic lives of the elderly. As this type of tax is non-earmarked, it is also a good tool for income redistribution.
2. Since not all Indonesian provinces are able to levy this type of tax without charging overly high tax rates, some of the provinces that are not capable should seek assistance from the central government in terms of a block grant. This action is necessary to prevent people moving to rich provinces as this policy is put into action.

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APPENDIX

Table A1: The marginal consumption tax rate (per cent)

		Indonesian provinces 2010–2025															
Year		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	Nanggroe Aceh Darussalam	4.3	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.6	4.7	4.8	4.9	5.0	5.2	5.2
2	North Sumatra	2.7	2.7	2.7	2.9	3.0	3.1	3.2	3.3	3.5	3.6	3.7	3.8	3.8	3.9	4.0	4.0
3	West Sumatra	3.7	3.5	3.4	3.3	3.1	3.1	2.9	2.8	2.8	2.7	2.7	2.7	2.6	2.5	2.5	2.5
4	Riau	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2
5	Jambi	2.6	2.6	2.7	2.7	2.8	2.8	2.9	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7
6	South Sulawesi	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3
7	Bengkulu	4.0	3.8	3.6	3.4	3.3	3.1	3.0	2.9	2.8	2.7	2.7	2.6	2.5	2.4	2.3	2.2
8	Lampung	4.3	4.2	4.1	4.0	3.9	3.9	3.8	3.7	3.7	3.6	3.6	3.6	3.6	3.6	3.6	3.6
9	Bangka Belitung	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.6	2.6	2.6
10	DKI Jakarta	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
11	West Java	3.2	3.2	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9
12	Mid Java	5.3	5.0	4.7	4.4	4.2	4.0	3.8	3.6	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7
13	DI Yogyakarta	9.6	9.2	8.8	8.5	8.2	7.9	7.7	7.6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
14	East Java	3.7	3.5	3.4	3.3	3.3	3.2	3.1	3.1	3.0	2.9	2.9	2.9	2.8	2.8	2.7	2.7
15	Banten	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
16	Bali	4.3	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.6	4.7	4.8	4.9	5.0	5.2	5.2
17	West Nusa Tenggara	6.8	6.9	7.0	7.1	7.2	7.4	7.5	7.6	7.8	8.0	8.3	8.5	8.7	8.9	9.1	9.3
18	East Nusa Tenggara	8.1	8.2	8.2	8.3	8.4	8.5	8.6	8.7	8.8	9.0	9.3	9.5	9.6	9.9	10.1	10.3
19	West Kalimantan	4.3	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.6	4.7	4.8	4.9	5.0	5.2	5.2
20	Mid Kalimantan	2.6	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.6	2.6
21	South Kalimantan	3.2	3.1	3.1	3.0	2.9	2.9	2.8	2.8	2.8	2.9	2.9	3.0	3.0	3.1	3.1	3.2
22	East Kalimantan	1.5	1.4	1.3	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
23	North Sulawesi	6.3	6.3	6.2	6.2	6.1	6.1	6.1	6.0	6.0	6.0	6.0	5.9	5.9	5.8	5.8	5.7
24	Mid Sulawesi	3.4	3.4	3.4	3.4	3.5	3.5	3.5	3.4	3.6	3.6	3.7	3.7	3.7	3.8	3.8	3.9
25	South Sulawesi	4.8	4.9	4.9	4.9	5.1	5.2	5.2	5.3	5.5	5.7	5.8	5.9	6.1	6.2	6.3	6.4
26	South-East Sulawesi	4.2	4.4	4.4	4.5	4.6	4.7	4.7	4.9	4.9	5.1	5.2	5.4	5.4	5.7	5.7	6.0
27	Gorontalo	4.8	4.8	4.8	4.7	4.7	4.7	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5
28	Maluku	7.3	7.4	7.5	7.6	7.7	7.9	8.0	8.0	8.2	8.4	8.6	8.8	8.9	9.0	9.2	9.3
29	North Maluku	5.9	6.1	6.3	6.2	6.6	6.7	6.8	6.8	7.0	7.3	7.5	7.8	8.0	8.1	8.3	8.4
30	Papua	1.1	1.2	1.2	1.4	1.5	1.7	1.7	1.9	2.0	2.2	2.4	2.5	2.8	2.9	3.2	3.3

Source: Author's own calculation.