

# *Assessing Pro-pooriness of Regional Economic Growth: Evidence from Indonesia, 2004-2014*

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# **Assessing Pro-poorness of Regional Economic Growth: Evidence from Indonesia, 2004-2014\***

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## **Abstract**

Numerous studies have been conducted to examine the extent to which economic growth is conducive to poverty reduction. However, most of these studies assessed the pro-poorness of economic growth at the national level. This study attempts to assess the pro-poorness of regional economic growth in Indonesia over the period 2004-2014. While Indonesia achieved a moderately pro-poor growth, there is a large variation among provinces in the pro-poorness of economic growth. To achieve a balanced pro-poor growth across provinces, one needs to consider regional differences in factors that would affect growth and the change in inequality when formulating policies.

Key words: pro-poor growth, incidence of poverty, expenditure inequality, province, Indonesia

Short running title: Pro-poorness of regional economic growth in Indonesia

JEL code: I32, O15, O18

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## 1. Introduction

Numerous studies have been conducted to analyze the nexus between economic growth, income redistribution and poverty reduction. Considering the fact that poverty reduction is affected not only by economic growth but also by changes in income inequality, they have examined whether economic growth is conducive to the reduction of poverty after controlling for changes in income inequality, namely, whether economic growth is pro-poor or not. If the distribution of income remains constant, economic growth should lower poverty. But if inequality in the distribution of income increases, the poverty-reducing growth effect will be partially or fully offset by rising inequality. On the other hand, if economic growth benefits the poor proportionally more than the rich, it could bring about a substantial reduction in poverty. However, most of these studies assessed the pro-poorness of economic growth for a country or countries, not regions within countries.

As the world's largest archipelagic and Muslim country encompassing more than 13 thousand islands and 260 million people, Indonesia is spatially diverse in terms of its ecology, natural resource endowments, economy, ethnicity, and culture. Reflecting its spatial diversity, there is a large regional variation in socioeconomic well-being. If Indonesia is divided into five island regions (Sumatra, Java-Bali, Kalimantan, Sulawesi and East Indonesia), 59% of the poor are living in Java-Bali, which is followed by Sumatra, East Indonesia, Sulawesi and Kalimantan at 21%, 10%, 7% and 3%, respectively (see Figure 1 for the map of Indonesia).<sup>1</sup> However, East Indonesia had the highest incidence of poverty at 17%, and this is followed by Sumatra, Sulawesi, Java-Bali and Kalimantan.<sup>2</sup> At the provincial level, the capital province of Jakarta registers the smallest poverty incidence at 4%, while more than 25% of people in Papua are still living below the official poverty line. It is thus imperative to investigate the nexus between economic growth, income redistribution and poverty reduction at the subnational level in Indonesia. Against this background, this study attempts to assess the pro-poorness of regional economic growth in Indonesia.

Indonesia has made substantial progress in reducing poverty over the last three

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<sup>1</sup> In most studies on regional development in Indonesia, analyses are usually conducted by dividing the country into five island regions: Sumatra, Java-Bali, Kalimantan, Sulawesi and Eastern Indonesia (see, for example, Hill, Resosudarmo and Vidyattama, 2008 and Akita, Kurniawan and Miyata, 2011).

<sup>2</sup> The incidence of poverty or the headcount ratio is defined as the proportion of people living below the poverty line. In this paper, the incidence of poverty and the headcount ratio are used interchangeably.

decades. According to the Statistical Yearbook of Indonesia (Central Bureau of Statistics, various issues), the incidence of poverty has declined conspicuously from around 40% in the 1980s to 10% in 2017. In the 1980s and 1990s before the 1997 Asian financial crisis, Indonesia has grown at an average GDP growth rate of 6%. Thanks to relatively stable expenditure inequality, this has led to a substantial reduction in the incidence of poverty; the economic growth in this period is considered pro-poor. The economy, however, has been hit very hard by the 1997 financial crisis. In 1998, the country recorded a large negative growth and the incidence of poverty rose prominently. Though the country has recovered from the crisis by the early 2000s, the average growth rate in the post-crisis period has been smaller than in the pre-crisis period. Meanwhile, expenditure inequality has risen notably; as measured by the Gini index, it has increased from 0.28 in 2000 to around 0.4 in the 2010s.<sup>3</sup> While the incidence of poverty has declined, the speed of poverty reduction has been smaller than in the pre-crisis period.

De Silva and Sumarto (2014) examined the pro-poorness of economic growth in Indonesia from 2002-2012 and found that the economic growth contributed a lot to the reduction of poverty, but the poverty-reducing growth effect was mitigated by rising inequality. According to the criteria employed by Kakwani and Pernia (2000), the economic growth in the post-crisis period was moderately pro-poor. While De Silva and Sumarto (2014) contributed a lot to our understanding of the pro-poorness of economic growth in the post-crisis period, they assessed the pro-poorness at the national level. By contrast, our study assesses the pro-poorness of economic growth at the subnational level over the period 2004-2014 using pro-poor growth indices with data from the National Socio-economic Survey (*Susenas*).

The 2004-2014 period corresponds to the Yudhoyono presidency. Under the general guidelines set out in the Medium-term National Development Plans formulated by the Yudhoyono administration, a number of poverty alleviation programs have been

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<sup>3</sup> Please see Yusuf, Sumner, and Rum (2014), Akita (2017) and Akita and Miyata (2018) for possible factors of the rise in expenditure inequality in the 2000s.

implemented.<sup>4</sup> They include conditional cash transfers,<sup>5</sup> unconditional cash transfers,<sup>6</sup> scholarships for poor students,<sup>7</sup> rice subsidies for poor households,<sup>8</sup> social health insurance for the poor,<sup>9</sup> and community and micro-enterprise empowerment programs (Sumarto and Suryahadi, 2010; Suryahadi, Yumna, Raya and Marbun, 2010; World Bank, 2012; Nazara and Rahayu, 2013; Howes and Davies, 2014; Vujanovic, 2015; Dwiputri, 2017). Though the government was not able to reduce the incidence of poverty to the target value of 8-10% set out in the 2009-2014 Medium-term National Development Plan, without these programs, poverty incidence would have been higher (Howes and Davies, 2014). It is not the task of our study to evaluate the effectiveness of these poverty alleviation programs in achieving their stated objective; but, we hope to contribute to our understanding of the determinants of poverty changes and help policy makers to formulate effective poverty reducing policies and programs from the spatial perspective.

## 2. Review of Literatures

This study employs some of the methods and approaches that have been developed and used by studies on the nexus between economic growth, inequality and poverty reduction, which include Datt and Ravallion (1992), Kakwani (1993), Kakwani (1997), Kakwani and Pernia (2000), Ravallion and Chen (2003), Son (2003, 2004), Essama-Nssah (2005), Kakwani and Son (2008), Nissanov and Silber (2009), Deutsch and Silber

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<sup>4</sup> The Medium-term National Development Plan has been formulated every five years in line with the Long-term National Development Plan for 2005-2025 formulated under Law 25 in 2004 (Government of Indonesia, 2007).

<sup>5</sup> Conditional cash transfer programs, known as PKH (Program Keluarga Harapan), were launched in 2007 as pilot programs (Nazara and Rahayu, 2013; Howes and Davies, 2014). PKH, which is the first conditional cash transfer program in Indonesia, is a quarterly program targeting very poor households, conditional on their participation in health and education services. In 2007, it covered only 7 provinces; but it has expanded gradually and by 2014, has covered all provinces. It is expected that PKH would cover about half of households below the poverty line.

<sup>6</sup> Unconditional cash transfer programs, known as BLT (Bantuan Langsung Tunai), were implemented in 2005, 2008 and 2013 to compensate poor and near poor households for the rise in domestic fuel prices associated with the reduction of fuel subsidies (Howes and Davies, 2014; Dwiputri, 2017).

<sup>7</sup> Scholarship programs for poor students, known as BSM (Bantuan Siswa Miskin), were introduced in 2008 as conditional cash transfer programs designed to help poor students to stay in schools (Howes and Davies, 2014). BSM provides cash transfers directly to students or their schools, contingent upon enrolment, attendance and other criteria. BSM targets poor students at all levels of education including vocational education.

<sup>8</sup> Subsidized rice program, known as Raskin, was introduced in 1998 as a response to the 1997 Asian financial crisis (World Bank, 2012). Raskin is designed to help poor and near poor households to purchase rice at subsidized prices. It has become the largest permanent social assistance transfer program targeted to poor and near poor households in Indonesia.

<sup>9</sup> Social health insurance program for poor households, known as Askeskin (Asuransi Kesehatan untuk Masyarakat Miskin) was introduced in 2005 to help poor households to receive outpatient healthcare services at community health centers (Suryahadi, Yumna, Raya and Marbun, 2010). In 2008, Askeskin was replaced by Jamkesmas (Jaminan Kesehatan Masyarakat). Unlike Askeskin, participation in Jamkesmas is on individual basis (Suryahadi, Yumna, Raya and Marbun, 2010).

(2011), Kang and Imai (2012), Zaman, Khan, Ahmad and Shabir (2012), Gimenez, Jolliffe and Sharif (2014), Fuwa, Balisacan and Bresciani (2015), Tebaldi and Kim (2015), De Silva (2016), Ali, Barrientos, Saboor, Khan and Nelson (2017), and Fambon (2017). We will review some of the articles that are relevant to our study.

Datt and Ravallion (1992) proposed a method which can analyze the extent to which economic growth and income redistribution contribute to the reduction of poverty. The method decomposes changes in poverty measures into growth, redistribution and residual components. They applied this method to India and Brazil and examined the contributions of economic growth and income redistribution to the change in poverty. They found that in India both economic growth and income redistribution contributed to the reduction of poverty, though economic growth was much more important than income redistribution. They found, on the other hand, that in Brazil, while economic growth contributed a lot to the reduction of poverty, an increase in income inequality lowered the poverty-reducing effect of economic growth. They acknowledged, however, that the residual term emerges in their decomposition method and can be very large because the decomposition is sensitive to the selection of reference period (either initial or terminal year).

In order to overcome the limitation of the Datt and Ravallion method, Kakwani (1997) proposed an alternative poverty decomposition method, which decomposes changes in poverty measures into the growth and income redistribution components without the residual component.<sup>10</sup> By applying the method to the Household Expenditure Surveys in 1988, 1990, 1992 and 1994 in Thailand, he observed that when poverty is measured by the headcount ratio and the poverty gap index, the poverty-reducing growth effect has dominated over the poverty-increasing redistribution effect, resulting in a substantial reduction in poverty over the study period. Kakwani and Pernia (2000) introduced an index called the pro-poor growth index (PPGI) to examine the pro-poorness of economic growth in Lao PDR, Thailand and Korea. They found that while economic growth in Korea has been highly pro-poor, economic growth in Lao PDR and Thailand has not been strictly pro-poor though it has resulted in the considerable reduction of poverty. By using a new type of growth rate, called the poverty equivalent growth rate (PEGR), Kakwani and Son (2008) examined the pro-poorness of the growth of Brazil for the period 1995-2005.<sup>11</sup> They found that the growth pattern has been mostly pro-poor for

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<sup>10</sup> Our study employs the decomposition method developed by Kakwani (1997) (see Section 3.2).

<sup>11</sup> Our study employs PEGR together with PPGI to assess the pro-poorness of regional economic growth

the period as PEGR has been greater than the actual growth rate except for the 1995-96 period and argued that the growth has benefitted the poor more than the non-poor though the growth was slow and sluggish.

Ravallion and Chen (2003) introduced the growth incidence curve (GIC) to analyze the whole distribution of income growth across the initial distribution of per capita incomes by quantiles.<sup>12</sup> By estimating GIC for China over the period 1990-99, they found that GIC is upward sloping over all quantiles, but despite rising inequality, poverty has fallen no matter where the poverty line was drawn. They found also that for the subperiod 1993-96, the pattern was reversed and thus the distributional shifts were more pro-poor than the entire period. Deutsch and Silber (2011) provided a summary of the different approaches that have appeared in the literature to measure pro-poor growth including the ones discussed above. Using several alternative approaches for pro-poor growth, they examined whether growth in Israel was pro-poor or not during the period 1990-2006.

Among the empirical studies that employed the methods and approaches developed by the studies discussed above, Kang and Imai (2012) examined, using the Living Standard Surveys in 2002, 2004 and 2006, the nexus between economic growth, redistribution and change in poverty in Rural Vietnam. They also investigated the roles played by ethnicity during the post transition period. Using GIC and some inequality measures, they found that the impact of economic growth on poverty varied across ethnic groups as the growth had differential effects on the distribution of consumption expenditure. Based on the Household Income and Expenditure Surveys in 2000, 2005 and 2010, Gimenez, Jolliffe and Sharif (2014) investigated changes in poverty in Bangladesh during the period 2000-2010. Employing the poverty decomposition method proposed by Kakwani (1997), they found that both growth and redistribution contributed to the reduction of poverty incidence during the period 2000-2010, though growth had a much larger effect on poverty reduction than redistribution. Based on the Household Income and Expenditure Surveys in 1990 and 2010, De Silva (2016) analyzed the pro-poorness of economic growth during the period 1990-2010 in Sri Lanka. Employing the poverty decomposition method proposed by Kakwani (1997), the author found that the growth effect contributed to the reduction of poverty incidence by 22 percentage points, but rising

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(see Section 3.2).

<sup>12</sup> Our study employs GIC to assess the pro-poorness of regional economic growth (see Section 3.2).

inequality offset the poverty-reducing growth effect notably and thus the incidence of poverty has actually declined from 26% to 9%.

In Indonesia, studies that have analyzed the nexus between economic growth, inequality and poverty include Balisacan, Pernia and Asra (2003), Timmer (2004), Suryahadi, Suryadarma and Sumarto (2009), Miranti (2010), Suryahadi, Hadiwidjaja and Sumarto (2012), De Silva and Sumarto (2014), Miranti, Duncan and Cassells (2014), van Leeuwen and Foldvari (2016), Miranti (2017), and Timmer (2018). We will review some of the studies that are relevant to our study. Using a district-level panel data set constructed from the core National Socio-economic Survey (core *Susenas*) and the Village Potential Statistics (*Podes*) for 1993, 1996 and 1999, Baisacan, Pernia and Asra (2003) conducted a two-stage least squares fixed effects regression analysis to examine the key determinants of poverty reduction in the 1990s. They found that the growth elasticity of poverty reduction was around 0.7, indicating that a 10% growth in mean per capita expenditure would increase mean per capita expenditure for the poorest quintile by 7%. They argued that besides growth, terms of trade (as proxied by the ratio of agricultural to non-agricultural product prices), mean years of schooling among the poor, availability of paved roads, and access to technology appear to have affected, directly or indirectly, the reduction of poverty.

Using a provincial panel data set constructed from the consumption module National Socio-economic Survey (module *Susenas*), regional GDP data and the National Labor Force Survey (*Sakernas*) for the period 1984 to 2002, Suryahadi, Suryadarma and Sumarto (2009) investigated the relationship between economic growth and poverty reduction by differentiating growth and poverty into their sectoral components and urban and rural locations. They found that growth in the urban services sector had the largest effect on reducing poverty in both rural and urban areas, while growth in the rural agricultural sector strongly reduced poverty in rural areas. They argued that while growth in the rural agricultural sector still plays a major role in reducing poverty, policies that promote growth in the services sector in both urban and rural areas would expedite poverty reduction. By extending the study period of Suryahadi, Suryadarma and Sumarto (2009) until 2008, Suryahadi, Hadiwidjaja and Sumarto (2012) analyzed the relationship between economic growth and poverty reduction before and after the Asian financial crisis. They found that after the financial crisis, the rate of poverty reduction slowed significantly, but there was no evidence that the growth elasticity of poverty declined and



that in both rural and urban areas, growth in the urban services sector remained the largest contributor to the reduction of poverty in the post-crisis period. They also found that while agricultural growth remained important in reducing poverty in rural areas, industrial growth became almost irrelevant for poverty reduction.

Miranti (2010), using a provincial panel data set constructed from the consumption module *Susenas* between 1984 and 2002, analyzed the growth and inequality elasticities of poverty for the three development periods: first liberalization period 1984-90; second liberalization period 1990-96; and crisis recovery period 1999-2002. She observed unexpectedly that the growth elasticity of poverty was very stable across the three periods at around -2.4. Meanwhile, the inequality elasticity of poverty varied across the three periods with the change between the first and second periods particularly noticeable, and in the second and third periods, rising expenditure inequality tended to offset the decline in poverty due to growth. Miranti, Duncan and Cassells (2014) extended the study period of Miranti (2010) until 2010 to compare the growth and inequality elasticities of poverty reduction in the decentralization period (2002-10) with those in the pre-decentralization period (1983-2002) by conducting a panel data regression analysis. They found that though the effect of growth on poverty reduction was the largest in the decentralization period, rising inequality offset, to a greater extent, the reduction of poverty induced by growth.

Using expenditure data from *Susenas* and the national poverty lines for 2002 and 2012, De Silva and Sumarto (2014) examined whether economic growth was pro-poor during the period 2002-2012 by employing several pro-poor growth concepts and indices. They found that while economic growth contributed to the reduction of poverty, the poverty-reducing growth effect was lowered substantially by rising inequality. If inequality was not increased, the incidence of poverty would have decreased by 17.6 percentage points from 18.2%; but rising inequality offset the reduction of poverty by 11.4 percentage points and thus the incidence of poverty declined to 12.0% in 2012. They thus argued that policies designed to spur growth need to consider the possible impacts of growth on inequality. Our study is similar to De Silva and Sumarto (2014) in that it employs pro-poor growth indices developed by Kakwani and Pernia (2000) and Kakwani and Son (2008) and the decomposition method developed by Kakwani (1997) to examine the nexus between economic growth, income redistribution and poverty reduction. Unlike their study, however, our study assesses the pro-poorness of regional economic growth.

To the best of our knowledge, no previous studies have investigated the pro-poorness of economic growth at the subnational level in Indonesia.

### 3. Data and Method

#### 3.1. Data

This study uses data from the National Socio-Economic Surveys (*Susenas*) in 2004 and 2014, conducted by the Central Bureau of Statistics. These surveys include information on household expenditure, location of households, household size and the gender, age and education of household head. Table 1 presents the sample sizes of these two surveys. The sample size of *Susenas* has increased as the population has risen. The total sample size is 264.1 thousand households in 2004, while it is 285.4 thousand households in 2014. As shown in the table, the sample size is large enough to estimate the incidence of poverty and inequality for each province, since more than one thousand households are sampled from each province.

This study uses household consumption expenditure data to estimate the amount of poverty. To identify the poor, per capita expenditure for a household, which is obtained by dividing household consumption expenditure by the number of household members, is compared with the poverty lines from the Statistical Yearbook of Indonesia (Central Bureau of Statistic, various issues).<sup>13</sup> The poverty line is the sum of the food and non-food poverty lines, which are constructed based on the basic needs approach and available for urban and rural areas in each province.<sup>14</sup> People below the poverty lines are considered poor; thus, the incidence of poverty (or head count ratio) is obtained by dividing the number of people below the poverty lines by the total number of people. Like Miranti (2010), to calculate real growth of mean per capita expenditure, expenditures in 2014 are converted to expenditures at constant 2004 prices using the nominal poverty lines in 2004 and 2014, which are deemed price indices for the poor segment of the economy.

It should be noted that there are 33 provinces in Indonesia,<sup>15</sup> seven of which have been created since 1999 under decentralization (see Figure 1). These provinces are Riau

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<sup>13</sup> Some studies use consumption expenditure per adult equivalent to account for differences in basic needs among household members, where children are given much smaller weights than adult members. According to Haughton and Khandker (2009), however, adult equivalent scales are controversial and may not be estimated satisfactorily; thus, this study uses consumption expenditure per capita as a measure of welfare.

<sup>14</sup> Miranti (2010) provided a detailed account of the construction of the poverty lines, which have been used by the Central Bureau of Statistics since 1996.

<sup>15</sup> Here, the youngest province, North Kalimantan (formerly, East Kalimantan) established in 2012 is excluded.

Islands (formerly, Riau), Bangka Belitung Islands (formerly, South Sumatra), Banten (formerly, West Java), Gorontalo (formerly, North Sulawesi), West Sulawesi (formerly, South Sulawesi), North Maluku (formerly, Maluku) and West Papua (formerly, Papua). But, in our study, Riau Islands, West Sulawesi and West Papua are merged, respectively, with Riau, South Sulawesi and Papua. Therefore, the analysis is conducted using 30 provinces, which are classified into five regions: Sumatra, Java-Bali, Kalimantan, Sulawesi and East Indonesia (see Figure 1).

### 3.2. Methods

#### Decomposition of Change in Poverty into Growth and Redistribution Components

To analyze the extent to which growth and redistribution have reduced or raised poverty over the period 2004-2014, this study employs the method developed by Kakwani (1997). The method decomposes total change in poverty into the growth and redistribution components. If we let  $z$ ,  $\mu$  and  $L$  be, respectively, the poverty line, the mean per capita expenditure and the Lorenz curve of a region, where the Lorenz curve represents a relative inequality, then the amount of poverty can be described as a function of  $z$ ,  $\mu$  and  $L$  as follows.

$$P = P(z, \mu, L) \quad (1)$$

Using this poverty function, the change in poverty between 2004 (year 1) and 2014 (year 2) can be decomposed into the growth effect ( $GE$ ) and redistribution effect ( $IE$ ) as follows.

$$\Delta P = P(z, \mu_2, L_2) - P(z, \mu_1, L_1) = GE + IE, \quad (2)$$

where

$$GE = \frac{1}{2} [(P(z, \mu_2, L_1) - P(z, \mu_1, L_1)) + (P(z, \mu_2, L_2) - P(z, \mu_1, L_2))]$$

$$IE = \frac{1}{2} [(P(z, \mu_1, L_2) - P(z, \mu_1, L_1)) + (P(z, \mu_2, L_2) - P(z, \mu_2, L_1))]$$

In equation (2), expenditures in 2014 are all converted into 2004 constant prices and  $z$  is the poverty line at 2004 constant prices. The growth effect shows the change in poverty due to the change in mean per capita expenditure provided that relative inequality represented by the Lorenz curve remains constant. Meanwhile, the redistribution effect presents the change in poverty due to the change in inequality provided that mean per capita expenditure remains constant. In this study, the amount of poverty is measured by the incidence of poverty or the poverty head count ratio.<sup>16</sup>

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<sup>16</sup> It should be noted that the amount of poverty is often measured by the following Foster-Greer-Thorbecke

### Pro-poor Growth Indices

To assess the pro-poor growth over the period 2004-2014, this study employs two pro-poor growth indices: the pro-poor growth index (PPGI) of Kakwani and Pernia (2000) and the poverty equivalent growth rate (PEGR) of Kakwani and Son (2008). It also uses the growth incidence curve (GIC) proposed by Ravallion and Chen (2003) to visualize the whole distribution of economic growth across the initial distribution of per capita expenditures by quantiles.

#### *Pro-poor Growth Index (PPGI) of Kakwani and Pernia*

One of the most well-known pro-poor growth indices is PPGI proposed by Kakwani and Pernia (2000). Suppose that  $P_{12}$ ,  $GE_{12}$ ,  $IE_{12}$  and  $G_{12}$  are, respectively, the proportional change in total poverty, the proportional change in poverty due to the change in mean per capita expenditure provided that relative inequality remains constant, the proportional change in poverty due to the change in inequality provided that mean per capita expenditure remains constant, and the proportional change in mean per capita expenditure. Then, they can be given by

$$\begin{aligned} P_{12} &= \ln \left( \frac{P(z, \mu_2, L_2)}{P(z, \mu_1, L_1)} \right), \\ GE_{12} &= \frac{1}{2} \left[ \ln \left( \frac{P(z, \mu_2, L_1)}{P(z, \mu_1, L_1)} \right) + \ln \left( \frac{P(z, \mu_2, L_2)}{P(z, \mu_1, L_2)} \right) \right], \\ IE_{12} &= \frac{1}{2} \left[ \ln \left( \frac{P(z, \mu_1, L_2)}{P(z, \mu_1, L_1)} \right) + \ln \left( \frac{P(z, \mu_2, L_2)}{P(z, \mu_2, L_1)} \right) \right], \text{ and} \\ G_{12} &= \ln \left( \frac{\mu_2}{\mu_1} \right) \end{aligned}$$

Using  $P_{12}$ ,  $GE_{12}$  and  $G_{12}$ , PPGI is defined by

$$\text{PPGI} = \frac{\varepsilon}{\varepsilon_G} \quad (3)$$

where  $\varepsilon = \frac{P_{12}}{G_{12}}$  and  $\varepsilon_G = \frac{GE_{12}}{G_{12}}$  are, respectively, the growth elasticity of total poverty and the growth elasticity of poverty provided that relative inequality remains constant. Hereafter, the proportional change in mean per capita expenditure is assumed to be positive,  $G_{12} > 0$ , which is referred to as the growth of mean per capita expenditure. Then,  $\varepsilon_G < 0$  since  $GE_{12}$  is always negative

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(FGT) poverty index (Foster, Greer and Thorbecke, 1984):  $P_\alpha(z) = \frac{1}{n} \sum_{i=1}^q \left( \frac{z-y_i}{z} \right)^\alpha$ , where  $n$ ,  $q$  and  $y_i$  are, respectively, the total number of people, the number of poor people, and per capita expenditure of  $i$ th person. When  $\alpha = 0, 1$  and  $2$ , the index is, respectively, the head count ratio, the poverty gap index and the poverty severity index. In this study, we focus on the poverty headcount ratio, though it cannot account for the depth and severity of poverty.

If we let  $\varepsilon_I = \frac{IE_{12}}{G_{12}}$  be the elasticity of poverty with respect to redistribution, then we have  $PPGI = 1 + \frac{\varepsilon_I}{\varepsilon_G}$  since  $\varepsilon = \varepsilon_G + \varepsilon_I$ . If  $\varepsilon_I < 0$ , then we have  $PPGI > 1$ , indicating that the growth of mean per capita expenditure has been associated with a change in inequality in favor of the poor. Such a growth is pro-poor in the strict sense. If  $\varepsilon_I > 0$ , then we have the following two cases:  $\varepsilon_G < \varepsilon < 0$  and  $0 < \varepsilon$ . If  $\varepsilon_G < \varepsilon < 0$ , then we have  $0 < PPGI < 1$ , indicating that even though the change in inequality is against the poor, total poverty declines. According to Kakwani and Pernia (2000), this situation is characterized as trickle-down. When  $0 < \varepsilon$ , we have  $PPGI < 0$ , showing that the growth has led to an increase in total poverty since the change in inequality has badly hurt the poor.

#### ***Poverty Equivalent Growth Rate (PEGR) of Kakwani and Son***

To rectify the problem that PPGI does not consider the magnitude of observed growth, Kakwani and Son (2008) proposed another pro-poor growth index, called the poverty equivalent growth rate (PEGR). PEGR takes into account both the magnitude of growth and the degree to which the poor benefited from the growth. PEGR is defined by the multiplication of PPGI and the growth of mean per capita expenditure as follows.

$$PEGR = G_{12}PPGI \quad (4)$$

If  $PEGR > G_{12}$ , then the growth is pro-poor. If  $0 < PEGR < G_{12}$ , then even though the change in inequality is against the poor, total poverty declines. Finally,  $PEGR < 0$  indicates that the growth raises total poverty. This occurs when the poverty-reducing effect of the growth is surpassed by the negative impact of increasing inequality.

#### ***Growth Incidence Curve (GIC) of Ravallion and Chen***

Suppose that  $p = F_t(y)$  is the cumulative distribution function of per capita expenditure  $y$ , which presents the proportion of the population with per capita expenditure smaller than  $y$  at time  $t$ , where  $0 \leq p \leq 1$ . Then the frequency density function at time  $t$  is given by  $f_t(y) = F_t'(y)$ . Using this frequency density function, the Lorenz curve can be defined by  $L_t(p) = \frac{1}{\mu_t} \int_0^{y_t(p)} x f_t(x) dx$  where  $y_t(p) = F_t^{-1}(p)$ . With some derivations, we can obtain  $y_t(p) = \mu_t L_t'(p)$  where  $L_t'(p) \geq 0$  is the slope of the Lorenz curve. The growth rate of per capita expenditure at the  $p$ th quantile between years 1 and 2 is thus given by

$$g_{12}(p) = \frac{y_2(p)}{y_1(p)} - 1 = \frac{L_2'(p)}{L_1'(p)} (G_{12} + 1) - 1 \quad (5)$$

where  $G_{12} = \frac{\mu_2}{\mu_1} - 1$  is the growth rate of mean per capita expenditure. Letting  $p$  vary from 0 to 1, equation (5) presents the GIC. If the relative inequality represented by the Lorenz curve does not change, then  $g_{12}(p) = G_{12}$  for all  $p$ . Also, we have  $g_{12}(p) > (<) G_{12}$  if and only if  $\frac{L_2'(p)}{L_1'(p)} = \frac{y_2(p)/\mu_2}{y_1(p)/\mu_1} > (<) 1$  at the  $p$ th quantile.

### **Regression Analysis: Factors of Distribution-neutral Growth Elasticity of Poverty**

Heltberg (2005) argued that the distribution-neutral growth elasticity of poverty,  $\varepsilon_G$ , should depend on the levels of inequality and development; thus, care should be taken when the change in poverty is decomposed into growth and redistribution effects since the growth effect itself is a function of the levels of inequality and development. Ravallion (1997) also acknowledged that the literature on the poverty decomposition method, such as Datt and Ravallion (1992) and Kakwani (1993, 1997), did not examine the dependence of poverty changes on the degree of inequality; he thus proposed the inequality-corrected growth rate when analyzing the relationship between economic growth and the change of poverty.

To examine the relationship between the distribution-neutral growth elasticity of poverty,  $\varepsilon_G$ , and the initial levels of inequality and development across provinces, we conduct the following regression analysis using, as independent variables, expenditure inequality in 2004 as measured by the Gini index (in 100) and mean per capita expenditure (in million Rupiah) in 2004 as a proxy for the level of development (*INEQ04* and *PCEXP04*, respectively).

$$\text{Model 1: } EG = \alpha + \beta_1 INEQ04 + \beta_2 PCEXP04 + e, \quad (6)$$

where  $EG$  is the distribution-neutral growth elasticity of poverty (absolute value of  $\varepsilon_G$ ). Since North Maluku had an exceptionally low inequality in 2004 and is regarded as an outlier, it is excluded from the sample. Thus, the total number of observations is 29. Our hypotheses are as follows. (1) The higher the initial level of inequality is, the smaller the distribution-neutral growth elasticity of poverty tends to be. An argument for a negative relationship between initial inequality and the reduction of poverty is that even though a growth process is neutral among people in terms of their growth rates, the poor gain less in absolute terms from the growth when initial inequality is higher. (2) The higher the

level of development is, the larger the distribution-neutral growth elasticity of poverty tends to be. An argument for a positive relationship between the level of development and the reduction of poverty is that even though a growth process is neutral among people in terms of their growth rates, the poor gain more in absolute terms from the growth when the level of development is higher. Therefore, we expect that  $\beta_1$  is negative, while  $\beta_2$  is positive.

Since there are structural differences between East Indonesia and the other regions, a dummy variable is introduced in the second regression model as follows, where the other regions include Sumatra, Java-Bali, Kalimantan and Sulawesi.

$$\text{Model 2: } EG = \alpha + \beta_1 INEQ04 + \beta_2 PCEXP04 + \beta_3 DE + \beta_4 (DE * INEQ04) + \beta_5 (DE * PCEXP04), \quad (7)$$

where  $DE$  is a dummy variable ( $DE = 1$  when provinces are in East Indonesia).

#### 4. Empirical Results

This study analyzes the effect of economic growth and redistribution on poverty reduction in Indonesia at the subnational level by using the methods described in the previous section. Before presenting the result, we first examine the change in the incidence of poverty, economic growth, and redistribution, where economic growth is measured by the change in mean per capita expenditure.

##### 4.1. Change in Poverty

Table 2 shows changes in the incidence of poverty (or poverty headcount ratio) over the period 2004-2014 by region and by province. Indonesia saw a significant decrease in poverty incidence from 27.3% to 10.0%. It should be noted here that to estimate poverty incidence, this study uses the poverty lines for urban and rural areas in each province obtained from the Statistical Yearbook of Indonesia (Central Bureau of Statistic, various issues). Though the reason is unknown, our estimate in 2004 at 27% is much larger than the one reported by the Central Bureau of Statistics. We should note, however, that many people were living around the poverty lines; thus, a small change in the poverty lines will change poverty incidence substantially. For example, a 10% reduction of the poverty lines would lower poverty incidence to 18%, which is close to the official poverty estimate. Since the main objective of our study is to make a comparison among regions and provinces in terms of the pro-poorness of regional economic growth, the conclusion would not be changed very much qualitatively even though lower poverty lines were used to obtain poverty incidence in 2004.

In 2004, Papua had the highest poverty incidence, where almost half of the people were living below the official poverty lines. The second highest poverty incidence was registered by East Java at 39%, which is followed by Lampung and West and East Nusa Tenggara at above 30%. On the other hand, North Maluku, which is considered to be one of the poorest provinces in terms of mean per capita expenditure, had the lowest poverty incidence at 4.2% in 2004 (see Table 3 for its mean per capita expenditure).<sup>17</sup> In North Maluku, 93% of people were living below the mean per capita expenditure in 2004, which is compared to 68% in Indonesia. This indicates that almost 90% of people in North Maluku were living between the poverty line and the mean per capita expenditure. This is very large compared to other provinces, suggesting that many people were vulnerable to falling into poverty. Meanwhile, the capital province of Jakarta registered the second smallest poverty incidence at 9.1%, which is followed by Banten, Bali, South Kalimantan, West Kalimantan and North Sulawesi.<sup>18</sup>

Except North Maluku, all province experienced a decrease in the incidence of poverty in the period, but the declining speed varies across provinces. East Java recorded the largest decrease at 27.6 percentage points, which is followed by Papua, Central Java, West Sumatra, Riau and Lampung. On the other hand, Bengkulu registered the smallest decrease at 4.1 percentage points, which is followed by Jakarta, West Kalimantan, Gorontalo, Aceh and Banten.<sup>19</sup> Even though Papua recorded a very large decrease, it still had the largest poverty incidence at 22.9% in 2014. Bengkulu had the second highest poverty incidence at 16.5%, which is followed by East Nusa Tenggara, Aceh, Gorontalo and West Nusa Tenggara at around 16%. On the other hand, in 2014, Jakarta had the smallest incidence of poverty at 3.0%, which is followed by Bali, South Kalimantan, Banten and Central Kalimantan. We should note that North Maluku is the only province that raised the incidence of poverty, and its poverty incidence was not the smallest in 2014.

#### **4.2. Economic Growth**

As discussed above, economic growth is the main driver of poverty reduction. Table 3 shows annual average growth rate of mean per capita expenditure by region and by province. Over the period 2004-2014, mean per capita expenditure has increased at an annual average rate of 5.5% in Indonesia. As the capital province, Jakarta was the richest

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<sup>17</sup> North Maluku was separated from conflict-ridden Maluku as a new province in 1999 and is one of the least populous provinces in Indonesia.

<sup>18</sup> Banten was established in 2000 by splitting off from West Java.

<sup>19</sup> Gorontalo was established in 2000 by splitting off from North Sulawesi.



province in 2004 in terms of mean per capita expenditure; it kept the richest position in 2014. Among the 10 richest provinces in 2004, Riau, Jakarta, Yogyakarta, Banten, Bali, East Kalimantan and North Sulawesi were still among the 10 richest provinces in 2014. Bangka Belitung, South Kalimantan and Papua left the 10 richest group in 2014 with their growth rates being smaller than the national average.<sup>20</sup> Meanwhile, South Sulawesi grew rapidly as the center of the eastern part of Indonesia; thus, it joined the 10 richest group in 2014. West Java, including fast-growing districts of Bogor, Depok and Bekasi that are located adjacent to Jakarta, also grew rapidly and joined the 10 richest group.

Among the 10 poorest provinces in 2004, South Sumatera, Lampung, Central Java, East Nusa Tenggara and West Nusa Tenggara were still among the 10 poorest provinces in 2014 with their growth rates being smaller than the national average. Among the provinces which left the 10 poorest group, North Maluku is a peculiar province as discussed above. Though the province had the smallest poverty incidence, it had the smallest mean per capita expenditure in 2004. However, during the period 2004-2014, it grew very rapidly and thus left the 10 poorest group in 2014, though its poverty incidence has risen (see Table 2). Three Sulawesi provinces, namely, South Sulawesi, Southeast Sulawesi and Gorontalo also left the 10 poorest group as they grew rapidly. On the other hand, Aceh, North Sumatera, Jambi, Bengkulu and Central Sulawesi joined the 10 poorest group in 2014. Of these five provinces, four provinces are in the Sumatra region. Due mainly to the earthquake and subsequent Tsunami in 2004, Aceh grew at a much slower rate than the national average; this growth rate at 2.5% was in fact the smallest in the period. In 2014, six out of 10 poorest provinces are those in the Sumatra region. Except the resource-rich province of Riau, no other Sumatra provinces are among the 10 richest provinces. It should be noted that Riau includes Batam and Bintan islands, which are located close to Singapore.<sup>21</sup>

#### **4.3. Redistribution: Change in Expenditure Inequality**

If there is no change in expenditure inequality, economic growth should reduce poverty incidence. However, if it is accompanied by rising inequality, then the poverty-reducing growth effect will be partially or fully offset by rising inequality. To analyze the extent to which economic growth is conducive to the reduction of poverty, it is necessary

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<sup>20</sup> Bangka Belitung was established in 2000 by splitting off from South Sumatra.

<sup>21</sup> The province of Riau Islands, which includes Batam and Bingtan islands, was established in 2002 by splitting off from Riau.

to know whether economic growth is accompanied by rising expenditure inequality or not. Table 4 presents expenditure inequality in 2004 and 2014, as measured by the Theil  $L$  index and the Gini coefficient.<sup>22</sup>

As measured by the Gini coefficient, expenditure inequality was 0.34 in 2004 in Indonesia, but has increased notably to 0.43 in 2014.<sup>23</sup> Yogyakarta had the highest inequality in 2004, followed by Jakarta, East Kalimantan, Papua and Riau. Among the 10 most unequal provinces, 4 provinces were in the Java region. On the other hand, North Maluku had the smallest inequality in 2004, followed by Bangka Belitung, North Sumatra, Jambi, North Sulawesi and South Sumatra. North Maluku, in fact, had a very small inequality in 2004. Since its poverty incidence was also small, this indicates again that many people were vulnerable to falling into poverty. Among the 10 least unequal provinces, four provinces, namely, Bangka Belitung, Jambi, South Sumatra and North Sumatra, were in the Sumatra region.

All provinces except East Kalimantan raised their inequality in the period 2004-2014. Besides North Maluku, North Sulawesi and Gorontalo recorded a very large increase in expenditure inequality. In 2014, Gorontalo became the most unequal province, which is followed by South Sulawesi, Papua, North Sulawesi and West Kalimantan. On the other hand, most Sumatra provinces had a small increase in inequality; thus, 6 out of 10 least unequal provinces were in the Sumatra region in 2014. These provinces are Aceh, North Sumatra, West Sumatra, Jambi, Bangka Belitung and Lampung. South Sumatra is exceptional, as it raised its inequality substantially from 0.28 to 0.41 by the Gini coefficient.

#### **4.4. Economic Growth, Redistribution and Poverty Reduction: Pro-poorness of Regional Economic Growth**

Economic growth should reduce poverty incidence if there is no change in inequality. However, economic growth is usually accompanied by change in the distribution of income. If growth is accompanied by declining inequality, then it could

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<sup>22</sup> The Gini coefficient can be obtained by the following formula:  $G = \frac{2}{n\mu} \text{cov}(i, y_i)$ , where  $n$  is total number of people,  $\mu$  is mean per capita expenditure, and  $y_i$  is per capita expenditure of person  $i$ . The Gini coefficient ranges between 0 (perfect equality) and 1 (perfect inequality). On the other hand, the Theil  $L$  index can be obtained by the following formula:  $L = \frac{1}{n} \sum_{i=1}^n \ln \left( \frac{\mu}{y_i} \right)$ .

<sup>23</sup> Since the ranking of provinces in terms of expenditure inequality as measured by the Theil  $L$  index is very similar to the one by the Gini coefficient, we will discuss expenditure inequality using the Gini coefficient.

decrease poverty incidence substantially and is considered pro-poor. On the other hand, if growth is accompanied by rising inequality that does not wholly offset the poverty-reducing effect of the growth, poverty incidence will decrease even though it is not pro-poor in the strict sense. This subsection examines, for each region and province, the extent to which economic growth is conducive to the reduction of poverty in the period 2004-2014 by using the methods described in the previous section.

To examine the pro-poorness of regional economic growth, we first decompose the change in poverty into the growth and redistribution components using equation (2). Table 5 presents the result. It then estimates two pro-poor growth indices, PPGI and PEGR, using equations (3) and (4), whose results are presented in Table 6. According to the classification employed by Kakwani and Pernia (2000), regions and provinces can be classified into the following five groups:

- (1)  $PPGI < 0$ , growth is antipoor;
- (2)  $0 < PPGI \leq 0.33$ , growth is weakly pro-poor;
- (3)  $0.33 < PPGI \leq 0.66$ , growth is moderately pro-poor;
- (4)  $0.66 < PPGI < 1.0$ , growth is pro-poor; and
- (5)  $PPGI \geq 1.0$ , growth is highly pro-poor.

In the period 2004-2014, Indonesia grew at 5.5% in terms of mean per capita expenditure. If expenditure inequality remained constant, poverty incidence would have declined substantially. However, it was accompanied by a rise in inequality. According to Table 5, the increase in inequality raised poverty incidence by 11.9 percentage points. The incidence of poverty has, thereby, declined from 27.3% to 10.0%. Since PPGI is 0.51, the growth was moderately pro-poor. Figure 2 exhibits GIC for Indonesia.<sup>24</sup> An upward sloping curve indicates that poorer people have increased their per capita expenditures at smaller rates than richer people. The average growth rate of per capita expenditure among the poorest quartile was 2.7%, much smaller than the mean growth rate of 5.5%.

All five regions exhibit an upward sloping GIC, though its shape differs among regions reflecting differences in the pattern of economic growth and redistribution. All regions are in group (3), since their PPGIs are between 0.33 and 0.66. Among these regions, the economic growth of Kalimantan is the most pro-poor as it has a PPGI of 0.64. According to Table 5, the increase in poverty incidence due to redistribution is the

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<sup>24</sup> Based on *Susenas* 2004 and 2014, GIC is constructed by using the STATA command, *gicurve*, developed by the World Bank. In the figures presenting GIC, 95% ci is the 95% confidence interval..

smallest at 7.3, and this is due to the fact that Kalimantan registered the smallest increase in inequality. Meanwhile, Sulawesi is the least pro-poor as its PPGI is 0.40, which is followed by East Indonesia with 0.42. According to Table 5, the increase in poverty incidence due to redistribution is very large in these two regions. In Sulawesi, the average growth rate of per capita expenditure among the poorest quartile was 2.5%, while in East Indonesia, it was 1.6%. These values are much smaller than their mean growth rates.

Though Indonesia achieved a moderately pro-poor growth at the national level, there is a large variation among provinces in terms of the pro-poorness of economic growth. Employing the classification described above, provinces can be classified into the following five groups.

(1)  $PPGI < 0$ , growth is antipoor

North Maluku

(2)  $0 < PPGI \leq 0.33$ , growth is weakly pro-poor

Bengkulu, Gorontalo

(3)  $0.33 < PPGI \leq 0.66$ , growth is moderately pro-poor

Aceh, North Sumatera, Jambi, South Sumatera, West Java, Central Java, East Java, Banten, Bali, West Nusa Tenggara, East Nusa Tenggara, West Kalimantan, Central Kalimantan, North Sulawesi, Central Sulawesi, South Sulawesi, South East Sulawesi, Maluku

(4)  $0.66 < PPGI < 1.0$ , growth is pro-poor

West Sumatera, Riau, Bangka Belitung, Jakarta, South Kalimantan

(5)  $PPGI \geq 1.0$ , growth is highly pro-poor.

Yogyakarta, East Kalimantan, Papua

Out of 30 provinces, 19 provinces are in group (3), namely, their growths are moderately pro-poor. Among the other 11 provinces, only North Maluku is in group (1), as its PPGI is negative. As discussed above, North Maluku recorded an increase in the incidence of poverty, and this is due to a large increase in expenditure inequality. The province achieved a very high growth at 8.3%; but, the increase in inequality has wholly offset the poverty-reducing effect of economic growth. As shown in Figure 3, its GIC is very upward sloping and the average growth rate of the poorest quartile was in fact negative. Gorontalo and Bengkulu are in group (2), namely, their growth is weakly pro-poor. Like North Maluku, Gorontalo realized a very high growth at 6.8%, but the reduction of poverty was very small due to a large increase in inequality. Its GIC is similar to the one

for North Maluku; the average growth rate of the poorest quartile was 2.2%, much smaller than the average growth rate of 6.8%. Meanwhile, Bengkulu had a relatively small increase in inequality, but its growth was very small at 2.9% and thus, the incidence of poverty has declined by merely 4.1 percentage points from 20.6%. As shown in Figure 4, its GIC is upward sloping, but very flat.

West Sumatera, Riau, Bangka Belitung, Jakarta and South Kalimantan are in group (4), while Yogyakarta, East Kalimantan and Papua are in group (5). In other words, their economic growths are either pro-poor or highly pro-poor. It should be noted that no Sulawesi provinces are in these two groups. As mentioned above, the Sulawesi region had the smallest PPGI at 0.4. Among provinces in group (4), West Sumatera, Riau and Bangka Belitung are Sumatra provinces. As shown in Table 5, West Sumatera recorded a very large decrease in poverty incidence, though its growth rate was not large. This is due to a relatively small increase in expenditure inequality. According to Figure 5, the average growth rate of poorest quartile was 3.5%, which is compared to the mean growth rate of 4.8%. Riau also registered a large decrease in the incidence of poverty; but it grew faster than West Sumatra.

Bangka Belitung grew less rapidly. But it is one of the least unequal provinces and experienced a relatively small increase in inequality. According to Figure 6, the average growth rate of the poorest quartile was 2.5%, which is only one percentage point smaller than the mean growth rate. Jakarta also grew less rapidly, and its inequality rose only slightly; thus, the incidence of poverty has declined by 6.1 percentage points from 9.1% to 3.0%. Jakarta has a unique GIC. According to Figure 7, the average growth rate of the poorest decile was 2.8%, which is larger than the growth rate of the second poorest decile and only one percentage point smaller than the mean growth rate. On the other hand, South Kalimantan grew at 5.1% and reduced its poverty incidence by 12.2 percentage points. In 2014, it had the third smallest poverty incidence, next to Jakarta and Bali. It should be noted that all five provinces in group (4) are among those whose poverty incidence was much smaller than the national average in 2014.

Yogyakarta, East Kalimantan and Papua registered a highly pro-poor growth, as their PPGIs exceed one; in other words, their PEGRs exceed their mean growth rates. While Yogyakarta grew very slowly, its expenditure inequality remained almost constant; thus, its PPGI exceeds one. As shown in Figure 8, Yogyakarta's GIC is quite unique. Though the poorest decile had a much smaller growth rate than the mean growth rate, the

growth rates of people between 20 and 60 percentile were around the mean growth rate. Meanwhile, the growth rates of people in the richest decile were much smaller than the mean growth rate. The growth appears to have benefitted the middle-income group. As discussed in the previous subsection, Yogyakarta had the highest inequality in 2004. Though the inequality remained almost constant, it still had a relatively high inequality in 2014.

East Kalimantan is the only province that experienced a decrease in expenditure inequality. Though its growth rate was much smaller than the national average at 2.8%, it reduced its poverty incidence by 14.4 percentage points from 20.1% to 5.7%. As shown in Figure 9, the average growth rate of the poorest quartile was 3.6%, larger than the mean growth rate of 2.8%, and except the richest 5%, the growth rates were above the mean growth rate. Papua realized a large reduction in the incidence of poverty from 49% to 23%, though it grew less rapidly than the national average. According to Table 5, the change in the incidence of poverty due to redistribution was negative; the redistribution appears to have been conducive to the reduction of poverty. However, as shown in Table 4, the province raised its inequality substantially, from 0.35 to 0.44 by the Gini coefficient. According to Figure 10, people in the poorest decile had higher growth rates than those in the second and third poorest deciles. Using the poorest half of the population, the Gini index, in fact, declined from 0.162 to 0.148. Since Papua started with a very high incidence of poverty, the reduction in expenditure inequality among poorer groups has reduced the incidence of poverty though overall inequality has risen.

#### **4.5. Factors of the Distribution-neutral Growth Elasticity of Poverty**

To examine the relationship between the distribution-neutral growth elasticity of poverty,  $\varepsilon_G$ , and the initial levels of inequality and development across provinces, we conduct a regression analysis using the models presented in (6) and (7). The result of the ordinary least squares estimation is presented in Table 7. We conduct the Breusch-Pagan test for heteroscedasticity; according to the test, we cannot reject the null hypothesis that the variance is homogeneous since the Chi-square value is 1.93 in Model 1 (p-value = 0.165) and 0.21 in Model 2 (p-value = 0.647). Nonetheless, the robust standard errors are given in Table 7. We also conduct the Ramsey RESET test for Model 2; according to the test, we cannot reject the null hypothesis that the model has no omitted variables since the F-value is 1.38 (p-value = 0.278), meaning that the model does not suffer from omitted variable bias.

In Model 1, all the coefficients are significant at the 1% significance level and have expected signs. Meanwhile, Model 2 indicates that structural differences exist between East Indonesia and the other regions since coefficients associated with the terms involving the dummy variable are significant at the 1% or 5% level. In the other regions, the estimated coefficients for *INEQ04* and *PCEXP04* are -0.103 and 5.174, respectively and thus have expected signs. This implies that ceteris paribus, 10 points reduction of inequality (Gini coefficient in 100) would increase the elasticity by 1.03, while a 0.1 million Rupiah increase in mean per capita expenditure would increase the elasticity by 0.517. On the other hand, in East Indonesia, the estimated coefficients for *INEQ04* and *PCEXP04* are, respectively, -0.283 and -6.027. This implies that ceteris paribus, 10 points reduction of inequality (Gini coefficient in 100) would increase the elasticity by 2.83, while a 0.1 million Rupiah increase in mean per capita expenditure would decrease the elasticity by 0.603. Though the coefficient for *INEQ04* has an expected sign, the coefficient for *PCEXP04* does not in East Indonesia.

In both regions, the distribution-neutral growth elasticity of poverty increases with decreasing inequality, implying that a lower level of inequality is conducive to an acceleration of poverty reduction for a given rate of growth. The poverty reducing growth effect is, however, more pronounced in East Indonesia. On the other hand, the distribution-neutral growth elasticity of poverty decreases with increasing mean per capita expenditure in East Indonesia, while it increases with increasing mean per capita expenditure in the other regions. In the other regions, a higher level of mean per capita expenditure is conducive to an acceleration of poverty reduction for a given rate of growth. Against our expectations, however, in East Indonesia, a higher level of mean per capita expenditure does not necessarily lead to an acceleration of poverty reduction. Even in East Indonesia, growth is necessary for poverty reduction unless inequality decreases. As shown in Table 3, however, mean per capita expenditure is still low in East Indonesia; thus, the region might not have reached the critical development level above which a higher level of mean per capita expenditure leads to an acceleration of poverty reduction.

## 5. Conclusions

Based on the National Socio-Economic Surveys (*Susenas*), this study attempted to examine the pro-pooriness of regional economic growth over the period 2004-2014 in Indonesia. The following provides a summary of findings. First, Indonesia grew at 5.5% in mean per capita expenditure. However, its growth was accompanied by rising

inequality. This mitigated the poverty-reducing growth effect. Since its pro-poor growth index (PPGI) is 0.51, the growth is moderately pro-poor according to the criteria employed by Kakwani and Pernia (2000). Second, five island regions have their PPGI ranging from 0.42 to 0.64; thus, their growths are all moderately pro-poor. However, the shape of the growth incidence curve (GIC) differs among regions, reflecting differences in the pattern of economic growth and redistribution.

Third, there is a large variation among provinces in the pro-poorness of economic growth. Out of 30 provinces, 19 provinces have achieved a moderately pro-poor growth. Among the other 11 provinces, only North Maluku registered an anti-poor growth, as it experienced an increase in poverty incidence due to a large increase in inequality. Gorontalo and Bengkulu exhibited a weakly pro-poor growth. Like North Maluku, Gorontalo achieved a very high growth, but the reduction of poverty incidence was very small due to a large increase in inequality. On the other hand, Bengkulu had a relatively small increase in inequality; but its growth was very small and thus, its poverty incidence has declined only slightly. Fourth, West Sumatra, Riau, Bangka Belitung, Jakarta and South Kalimantan achieved a pro-poor growth. West Sumatra recorded a very large decrease in the incidence of poverty, though its growth rate was not large. This is due to a relatively small increase in inequality. Riau also registered a large decrease in poverty incidence; but it grew faster. Bangka Belitung grew less rapidly. However, it is one of the least unequal provinces and experienced a relatively small increase in inequality. Jakarta also grew less rapidly, but its inequality rose only slightly; thus, its incidence has declined to 3%, the smallest in 2014. All these five provinces are among those whose poverty incidence was much smaller than the national average in 2014.

Fifth, Yogyakarta, East Kalimantan and Papua realized a highly pro-poor growth. Yogyakarta grew very slowly, but its inequality remained almost constant though at a high level. The growth appears to have benefitted the middle-income group. East Kalimantan experienced a decrease in inequality and reduced its poverty incidence notably, though it grew very slowly. Except the richest 5%, the growth rates were above the mean growth rate. Papua realized a large reduction in poverty incidence, though it grew slowly. However, the growth was in fact accompanied by rising inequality. People in the poorest decile had higher growth rates than those in the second and third poorest deciles. Since Papua started with a very high poverty incidence, the reduction in inequality among poorer groups would have reduced its poverty incidence. Sixth, there is a large variation



in the distribution-neutral growth elasticity of poverty across provinces. A regression analysis indicates that a lower level of inequality is conducive to an acceleration of poverty reduction for a given rate of growth. The poverty reducing growth effect is, however, more pronounced in East Indonesia than the other regions. On the other hand, except East Indonesia, a higher level of mean per capita expenditure is conducive to an acceleration of poverty reduction for a given rate of growth.

From these findings, some policy implications can be drawn. While Indonesia achieved a moderately pro-poor growth over the period 2004-2014, there is a large variation among provinces in the pro-poorness of economic growth, with PPGI ranging from -0.15 (anti-poor) to 1.32 (highly pro-poor). Growth is necessary for poverty reduction; but it is often accompanied by rising inequality as we witnessed in the study period. To achieve a balanced pro-poor growth across provinces, one needs to consider regional differences in factors that could affect growth and the change in inequality. The effectiveness of distribution-neutral economic growth with respect to poverty reduction appears to have depended on the levels of inequality and development. For provinces having a low level of inequality, such as North Sumatra, Jambi and Bangka Belitung, growth-enhancing policies that could maintain its current level of inequality would be effective in reducing poverty. For provinces having a high level of inequality, such as North Sulawesi, South Sulawesi and Gorontalo, policies that are conducive to the reduction of inequality would be effective in reducing poverty, though they might have negative impacts on growth.

To effectively reduce overall poverty, it is necessary to focus on provinces that have a relatively high poverty incidence. Here, we present some policy options for these provinces. Aceh and East Nusa Tenggara realized a moderately pro-poor growth since their inequality were kept relatively low. Since their growth rates are much smaller than the national average, it is essential to accelerate their economic growth. Since Aceh is rich in natural resources, its economy depends highly on mining activities. However, no significant manufacturing activities exist; thus, to accelerate its growth, it is necessary to promote manufacturing activities, particularly non-oil and gas manufacturing. On the other hand, East Nusa Tenggara is not only poor in natural resources but also lacks manufacturing activities. Its economy depends highly on agriculture; thus, to accelerate its economic growth, it is recommended to promote agriculture-based small and medium scale manufacturing activities in line with comparative advantages and disadvantages.

West Nusa Tenggara also achieved a moderately pro-poor growth owing to a relatively high growth. But it raised its inequality conspicuously. Its recent economic development relies highly on non-oil and gas mining activities such as copper and gold, but it is enclave. Therefore, to reduce inequality, it is essential to facilitate the linkage between non-oil and gas mining and the local economy. The province, located next to Bali, has recently been developed as one of tourism destinations, where a special economic zone for tourism is located. Though further promotion of tourism would accelerate its economic growth, this might be accompanied by rising inequality as we observed in the development of Bali. To reduce poverty, therefore, it is necessary to facilitate balanced regional development.

Papua achieved a highly pro-poor growth and reduced its incidence of poverty substantially. But it still had the highest poverty incidence. The province in fact raised its inequality and remains one of the most unequal provinces. As described above, redistribution among poorer groups seems to have reduced the incidence of poverty. Papua is rich in natural resources and its economy depends highly on mining activities. But, its economic development is enclave and it lacks non-oil and gas manufacturing. To further reduce poverty, it is necessary to promote economic growth through the development of small and medium scale non-oil and gas manufacturing activities in line with comparative advantages and disadvantages. At the same time, it is important to develop industrial infrastructure since its economic activities have been sparsely developed.

Gorontalo was established in 2000 under decentralization by being split off from North Sulawesi. Though the province achieved a rapid growth, it was one of the poorest provinces and had the highest inequality. Since its economy relies on agricultural activities, promoting agriculture-based small and medium scale manufacturing is recommended to reduce poverty. Bengkulu also experienced a weakly pro-poor growth due to its poor growth performance. The province is poor in natural resources. Its economy relies highly on food and estate crops and there are no significant manufacturing activities. Located in the western side of Sumatra island, it lacks industrial infrastructure. Thus, it is essential to promote small and medium scale manufacturing to reduce poverty. At the same time, the province needs to develop industrial infrastructure to facilitate its economic connection with other parts of Indonesia.

In October 2014, Joko Widodo (Jokowi) replaced Susilo Bambang Yudhoyono as

the president of Indonesia. During his first term from 2014-2019, Indonesia has grown at an annual average rate of 4.9% (at 2010 constant prices), while its expenditure inequality has declined slightly from 0.41 to 0.38 by the Gini index (Central Bureau of Statistics, various issues). The economic growth in this period seems to have been pro-poor at the national level, and the incidence of poverty has declined from 11.0% to 9.2% (Central Bureau of Statistics, various issues). However, the speed of poverty reduction has been smaller than in the Yudhoyono period, and the government failed to achieve the target level of 7%-8% set out in the 2015-2019 Medium-term National Development Plan. Under increasingly uncertain economic conditions, it is less likely to raise the current level of economic growth. To further reduce poverty, therefore, the government needs to consider regional differences in factors that would affect growth and the change in inequality when formulating poverty alleviation policies and programs.

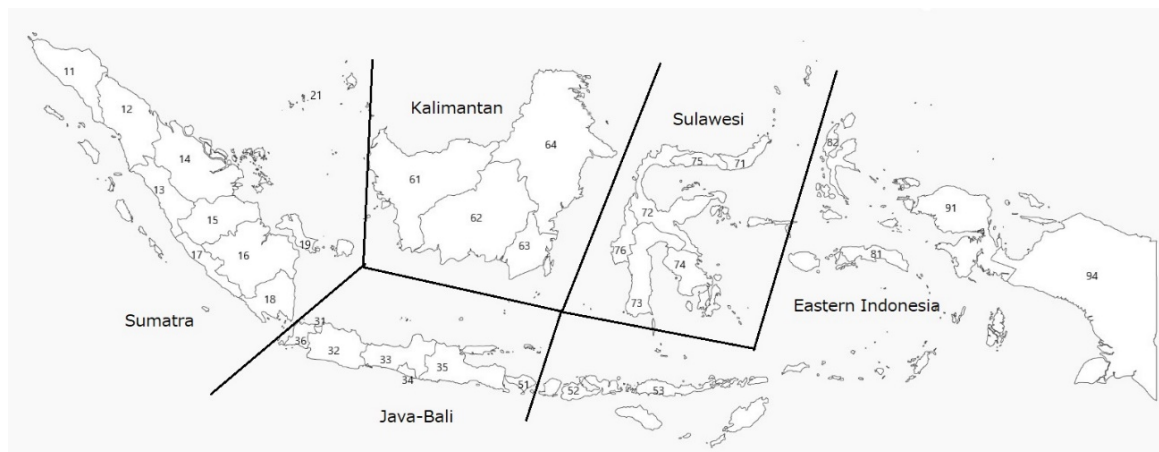
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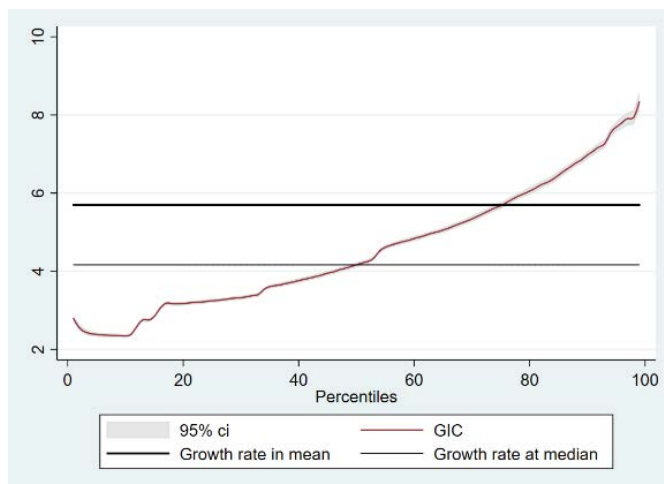
**Figure 1. Map of Indonesia**



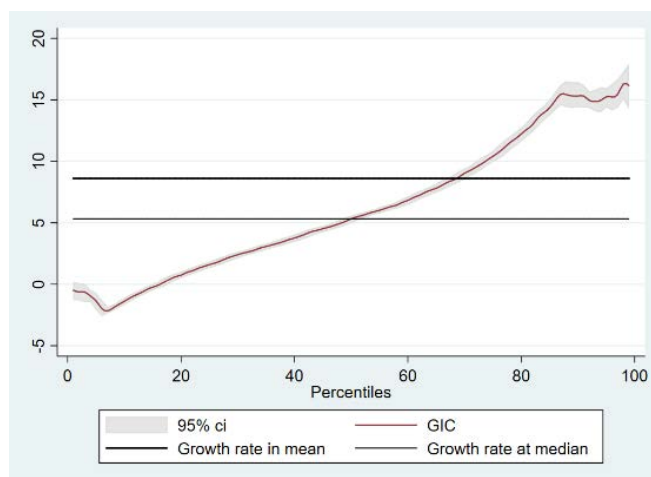
Region	Province code	Province	Region	Province code	Province
Sumatra	11	Aceh	Kalimantan	61	West Kalimantan
	12	North Sumatera		62	C. Kalimantan
	13	West Sumatera		63	S. Kalimantan
	14	Riau		64	East Kalimantan
	15	Jambi	Sulawesi	71	North Sulawesi
	16	South Sumatera		72	Central Sulawesi
	17	Bengkulu		73	South Sulawesi
	18	Lampung		74	S.E. Sulawesi
	19	Bangka Belitung		75	Gorontalo
21	Riau Islands	76	West Sulawesi		
Java-Bali	31	Jakarta	East Indonesia	52	West Nusa Teng.
	32	West Java		53	East Nusa Teng.
	33	Central Java		81	Maluku
	34	Yogyakarta		82	North Maluku
	35	East Java		91	West Papua
	51	Bali		94	Papua

(Note) In our study, Riau Islands (21), West Sulawesi (76) and West Papua (91), are merged, respectively, with Riau (14), South Sulawesi (73) and Papua (94).

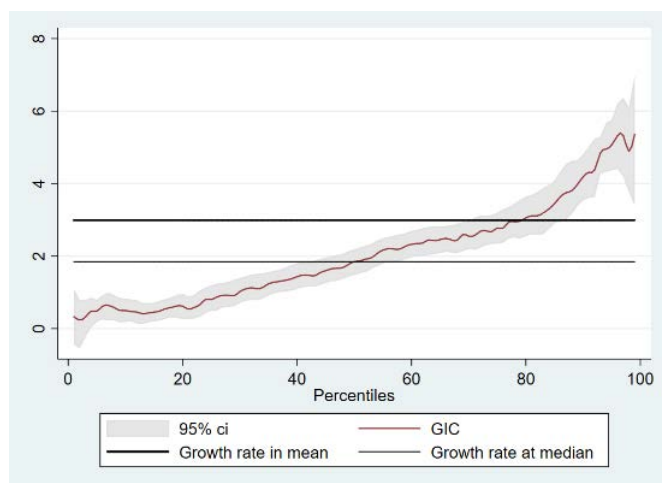
**Figure 2. GIC for Indonesia**



**Figure 3. GIC for North Maluku**

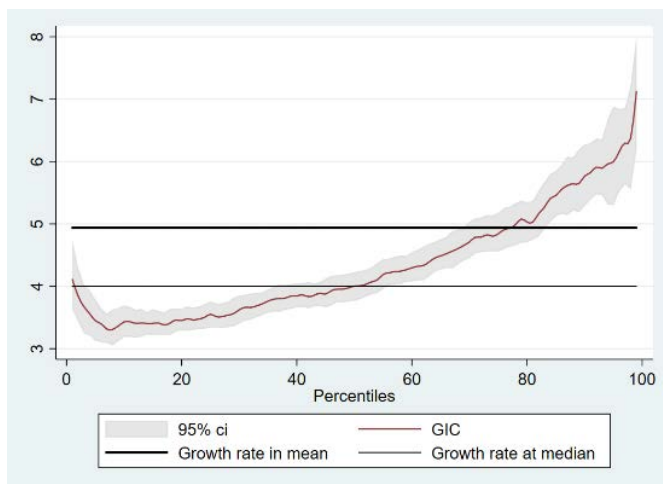


**Figure 4. GIC for Bengkulu**

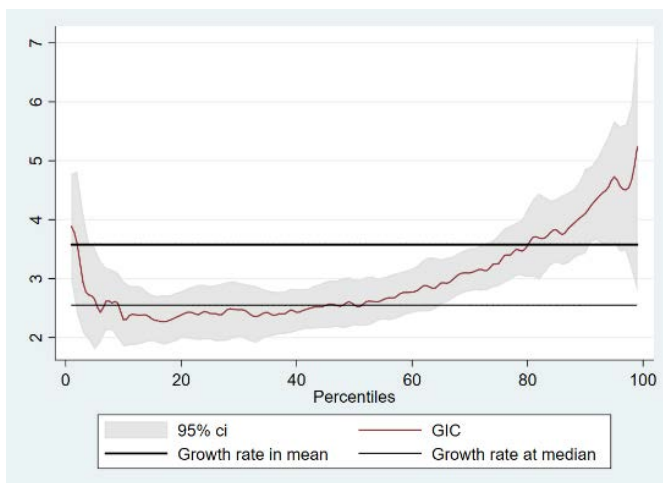




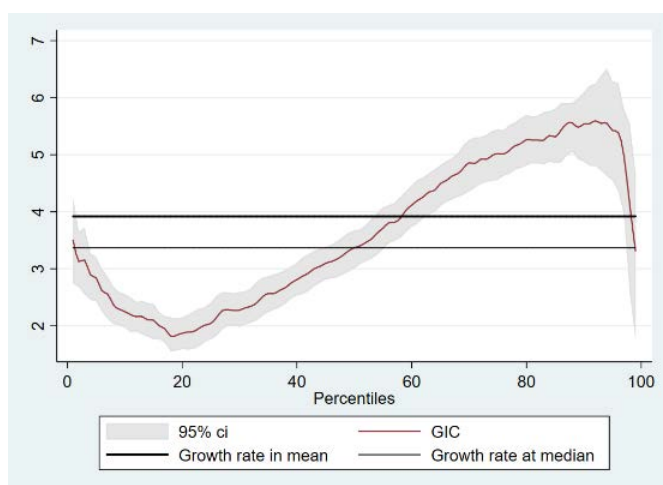
**Figure 5. GIC for West Sumatra**



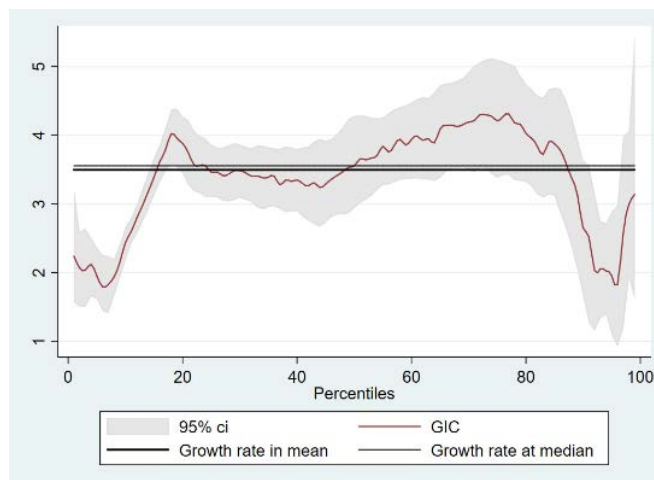
**Figure 6. GIC for Bangka Belitung**



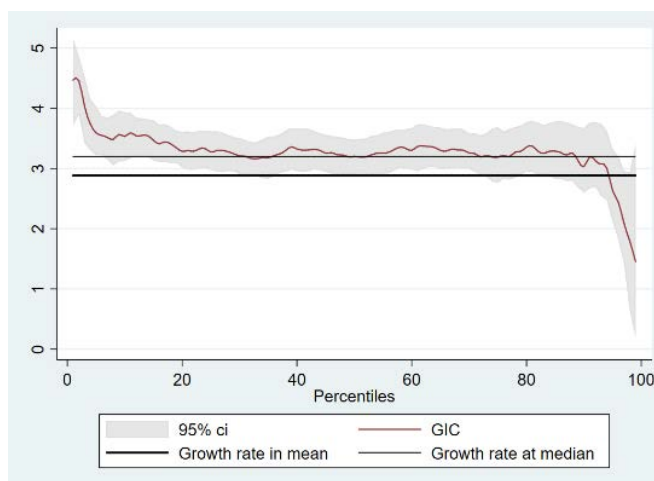
**Figure 7. GIC for Jakarta**



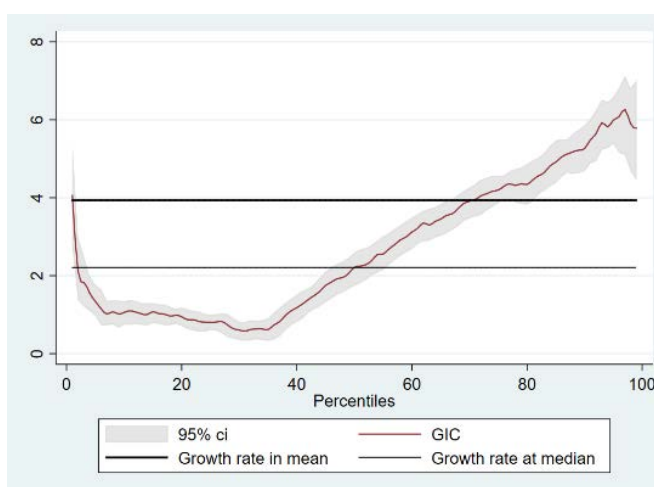
**Figure 8. GIC for Yogyakarta**



**Figure 9. GIC for East Kalimantan**



**Figure 10. GIC for Papua**



**Table 1. Sample Sizes of *Susenas* 2004 and 2014 (in 1,000 households)**

Province code	Province	2004	2014
11	Aceh	10.19	11.00
12	North Sumatera	13.85	17.98
13	West Sumatera	9.10	9.66
14	Riau	10.22	10.47
15	Jambi	6.08	5.92
16	South Sumatera	7.07	9.17
17	Bengkulu	2.47	4.91
18	Lampung	7.00	9.04
19	Bangka Belitung	1.86	3.49
31	Jakarta	7.10	4.79
32	West Java	22.03	22.41
33	Central Java	27.01	26.61
34	Yogyakarta	3.83	3.63
35	East Java	31.74	29.30
36	Banten	4.80	6.46
51	Bali	6.43	5.63
61	West Kalimantan	6.08	7.32
62	Central Kalimantan	8.54	6.75
63	South Kalimantan	6.95	7.20
64	East Kalimantan	7.57	6.79
71	North Sulawesi	4.14	6.88
72	Central Sulawesi	5.60	5.83
73	South Sulawesi	16.54	15.93
74	Southeast Sulawesi	4.48	5.69
75	Gorontalo	2.02	2.92
52	West Nusa Tenggara	9.49	6.11
53	East Nusa Tenggara	9.12	10.51
81	Maluku	1.98	4.69
82	North Maluku	4.91	3.66
94	Papua	5.95	14.67
Province code	Region		
11 - 19	Sumatra	67.85	81.63
31 - 36, 51	Java-Bali	102.92	98.82
61 - 64	Kalimantan	29.13	28.05
71 - 75	Sulawesi	32.77	37.25
52, 53, 81, 82, 94	East Indonesia	31.46	39.64
	Indonesia	264.13	285.40

(Source) Calculated from *Susenas* in 2004 and 2014.

**Table 2. Poverty Incidence in 2004 and 2014 and Change in Poverty Incidence between 2004 and 2014 (in %)**

Province	Poverty incidence <sup>(a)</sup>				Change <sup>(b)</sup> = (B) – (A)		Proportional change $= \frac{1}{10} \ln \left( \frac{(B)}{(A)} \right)$
	2004		2014		Value	Ranking	
	Value (A)	Ranking	Value (B)	Ranking			
Aceh	26.0	10	16.3	4	-9.6	25	-4.6
North Sumatera	18.0	23	7.7	19	-10.3	23	-8.5
West Sumatera	26.5	9	6.6	22	-19.9	4	-13.9
Riau	26.0	11	6.6	23	-19.3	5	-13.6
Jambi	19.9	21	8.0	17	-11.9	18	-9.1
South Sumatera	24.4	13	12.7	10	-11.7	19	-6.5
Bengkulu	20.6	18	16.5	2	-4.1	29	-2.2
Lampung	32.2	4	13.9	7	-18.4	6	-8.4
Bangka Belitung	18.5	22	5.7	25	-12.8	16	-11.7
Jakarta	9.1	29	3.0	30	-6.1	28	-11.2
West Java	22.1	17	8.4	16	-13.6	14	-9.6
Central Java	35.4	3	13.4	8	-22.0	3	-9.7
Yogyakarta	29.4	7	11.9	12	-17.5	7	-9.1
East Java	39.1	2	11.5	13	-27.6	1	-12.2
Banten	14.7	27	4.8	27	-9.9	24	-11.2
Bali	14.4	28	3.7	29	-10.6	20	-13.4
West Kalimantan	17.5	25	7.9	18	-9.6	26	-8.0
Central Kalimantan	20.6	19	5.4	26	-15.2	12	-13.3
South Kalimantan	16.0	26	3.8	28	-12.2	17	-14.4
East Kalimantan	20.1	20	5.7	24	-14.4	13	-12.7
North Sulawesi	17.9	24	7.3	20	-10.5	21	-8.9
Central Sulawesi	28.2	8	12.0	11	-16.1	10	-8.5
South Sulawesi	25.2	12	9.0	15	-16.2	9	-10.3
Southeast Sulawesi	24.0	14	11.0	14	-13.0	15	-7.8
Gorontalo	23.4	16	16.0	5	-7.3	27	-3.8
West Nusa Tenggara	32.0	5	15.8	6	-16.2	8	-7.0
East Nusa Tenggara	31.6	6	16.3	3	-15.3	11	-6.6
Maluku	23.7	15	13.2	9	-10.5	22	-5.9
North Maluku	4.2	30	7.2	21	3.0	30	5.4
Papua	49.4	1	22.9	1	-26.5	2	-7.7
<b>Region</b>							
Sumatra	24.0		10.2		-13.8		-8.6
Java-Bali	29.2		9.7		-19.4		-11.0
Kalimantan	18.2		5.7		-12.4		-11.5
Sulawesi	24.1		9.9		-14.2		-8.9
East Indonesia	28.2		16.9		-11.3		-5.1
Indonesia	27.3		10.0		-17.3		-10.0

(Notes) (a) Provinces are ranked in descending order of poverty incidence. (b) Provinces are ranked in ascending order of the change in poverty incidence.

(Source) Calculated based on data from *Susenas* 2004 and 2014.

**Table 3. Annual Average Growth Rate of Mean Per Capita Expenditure between 2004 and 2014 (at 2004 Constant Prices)**

Province	Mean per capita expenditure (in 1,000) <sup>(a)</sup>				Growth rate (%) <sup>(b)</sup>		Population share (%)	
	2004		2014		Value	Ranking	2004	2014
	Value	Ranking	Value	Ranking				
Aceh	202	18	260	27	2.5	30	1.7	1.8
North Sumatera	215	14	301	25	3.4	27	4.6	5.0
West Sumatera	225	11	365	13	4.8	17	1.8	1.9
Riau	302	4	535	3	5.7	10	2.3	3.1
Jambi	207	16	311	23	4.1	21	1.1	1.3
South Sumatera	185	22	314	21	5.3	15	2.8	3.0
Bengkulu	192	20	257	28	2.9	28	0.6	0.7
Lampung	167	27	248	29	4.0	22	2.8	3.2
Bangka Belitung	257	6	365	12	3.5	24	0.4	0.5
Jakarta	519	1	763	1	3.8	23	3.6	4.0
West Java	221	13	424	7	6.5	6	18.9	19.0
Central Java	180	25	311	22	5.5	12	15.7	13.9
Yogyakarta	271	5	382	10	3.4	25	1.8	1.7
East Java	182	24	322	19	5.7	11	19.0	16.3
Banten	257	7	465	6	5.9	8	3.7	4.3
Bali	304	3	608	2	6.9	4	1.8	1.7
West Kalimantan	206	17	350	15	5.3	13	1.5	1.7
Central Kalimantan	222	12	415	8	6.3	7	0.8	1.0
South Kalimantan	228	10	380	11	5.1	16	1.5	1.7
East Kalimantan	350	2	465	5	2.8	29	1.2	1.5
North Sulawesi	232	8	491	4	7.5	2	1.1	0.9
Central Sulawesi	196	19	309	24	4.5	18	0.9	1.1
South Sulawesi	189	21	383	9	7.0	3	3.2	3.5
Southeast Sulawesi	184	23	328	18	5.8	9	0.7	0.9
Gorontalo	167	26	328	17	6.8	5	0.4	0.4
West Nusa Tenggara	167	28	283	26	5.3	14	1.8	2.0
East Nusa Tenggara	151	29	213	30	3.4	26	1.5	1.7
Maluku	211	15	317	20	4.1	20	0.4	0.5
North Maluku	149	30	340	16	8.3	1	1.3	0.4
Papua	231	9	353	14	4.2	19	1.0	1.5
Region								
Sumatra	213		333		4.5		18.1	20.4
Java-Bali	222		400		5.9		64.6	60.8
Kalimantan	248		399		4.7		5.0	5.9
Sulawesi	196		376		6.5		6.3	6.8
East Indonesia	173		288		5.1		6.1	6.1
Indonesia	217		378		5.5		100	100

(Notes) (a) Provinces are ranked in descending order of mean per capita expenditure. (b) Provinces are ranked in descending order of the growth rate of mean per capita expenditure.

(Source) Calculated based on data from *Susenas* 2004 and 2014.

**Table 4. Inequality in Per Capita Expenditure in 2004 and 2014 at Constant 2004 Prices**

	Theil L index <sup>(a)</sup>				Gini coefficient <sup>(a)</sup>			
	2004		2014		2004		2014	
	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking
Aceh	0.141	20	0.189	28	0.294	20	0.343	27
North Sumatera	0.132	24	0.175	29	0.283	24	0.329	29
West Sumatera	0.150	12	0.208	25	0.304	12	0.359	25
Riau	0.175	5	0.255	16	0.328	5	0.398	16
Jambi	0.121	27	0.191	27	0.271	28	0.343	28
South Sumatera	0.123	26	0.267	14	0.275	26	0.406	14
Bengkulu	0.143	17	0.237	20	0.298	14	0.383	20
Lampung	0.142	19	0.212	23	0.295	18	0.361	23
Bangka Belitung	0.119	29	0.174	30	0.270	29	0.326	30
Jakarta	0.251	2	0.282	12	0.385	2	0.415	12
West Java	0.144	16	0.296	7	0.295	17	0.426	6
Central Java	0.133	23	0.253	17	0.287	22	0.395	17
Yogyakarta	0.282	1	0.291	8	0.420	1	0.423	7
East Java	0.156	9	0.251	18	0.309	10	0.393	18
Banten	0.163	7	0.284	9	0.314	8	0.417	10
Bali	0.146	14	0.298	6	0.294	19	0.422	8
West Kalimantan	0.156	11	0.300	5	0.308	11	0.429	5
Central Kalimantan	0.129	25	0.235	21	0.282	25	0.381	21
South Kalimantan	0.148	13	0.218	22	0.302	13	0.365	22
East Kalimantan	0.237	3	0.199	26	0.377	3	0.350	26
North Sulawesi	0.121	28	0.312	4	0.274	27	0.435	4
Central Sulawesi	0.166	6	0.264	15	0.318	6	0.402	15
South Sulawesi	0.161	8	0.328	2	0.314	7	0.445	2
Southeast Sulawesi	0.134	22	0.283	11	0.286	23	0.416	11
Gorontalo	0.143	18	0.371	1	0.296	15	0.470	1
West Nusa Tenggara	0.138	21	0.284	10	0.292	21	0.419	9
East Nusa Tenggara	0.156	10	0.240	19	0.311	9	0.385	19
Maluku	0.145	15	0.210	24	0.296	16	0.360	24
North Maluku	0.034	30	0.274	13	0.099	30	0.412	13
Papua	0.200	4	0.318	3	0.348	4	0.439	3
<b>Region</b>								
Sumatra	0.155		0.246		0.308		0.389	
Java-Bali	0.196		0.306		0.347		0.433	
Kalimantan	0.191		0.246		0.340		0.387	
Sulawesi	0.154		0.322		0.308		0.442	
East Indonesia	0.145		0.292		0.295		0.425	
Indonesia	0.185		0.295		0.337		0.425	

(Notes) (a) Provinces are ranked in descending order of expenditure inequality.

(Source) Calculated based on data from *Susenas* 2004 and 2014.

**Table 5. Decomposition of Change in Poverty Incidence into Growth and Redistribution Components (in %)**

Province	Poverty in 2004 (1)	Poverty in 2014 (2)	Change in poverty (3) = (2) – (1) = (GE) + (IE)	Change in poverty due to growth (GE)	Change in poverty due to redistribution (IE)	Annual average rate of change in poverty
Aceh	26.0	16.3	-9.6	-16.9	7.3	-4.6
North Sumatera	18.0	7.7	-10.3	-16.2	5.9	-8.5
West Sumatera	26.5	6.6	-19.9	-27.3	7.3	-13.9
Riau	26.0	6.6	-19.3	-28.1	8.8	-13.6
Jambi	19.9	8.0	-11.9	-21.2	9.3	-9.1
South Sumatera	24.4	12.7	-11.7	-27.1	15.4	-6.5
Bengkulu	20.6	16.5	-4.1	-17.5	13.4	-2.2
Lampung	32.2	13.9	-18.4	-27.8	9.4	-8.4
Bangka Belitung	18.5	5.7	-12.8	-18.0	5.2	-11.7
Jakarta	9.1	3.0	-6.2	-10.7	4.5	-11.2
West Java	22.1	8.4	-13.6	-29.2	15.6	-9.6
Central Java	35.4	13.4	-22.0	-34.7	12.7	-9.7
Yogyakarta	29.4	11.9	-17.5	-17.3	-0.2	-9.1
East Java	39.1	11.5	-27.6	-36.8	9.3	-12.2
Banten	14.7	4.8	-9.9	-21.8	11.9	-11.2
Bali	14.4	3.7	-10.6	-21.7	11.1	-13.4
West Kalimantan	17.5	7.9	-9.6	-23.2	13.6	-8.0
Central Kalimantan	20.6	5.4	-15.2	-25.7	10.6	-13.3
South Kalimantan	16.0	3.8	-12.2	-19.2	7.0	-14.4
East Kalimantan	20.1	5.7	-14.4	-11.9	-2.6	-12.7
North Sulawesi	17.9	7.3	-10.6	-26.9	16.4	-8.9
Central Sulawesi	28.2	12.0	-16.1	-27.1	10.9	-8.5
South Sulawesi	25.2	9.0	-16.2	-30.6	14.4	-10.3
Southeast Sulawesi	24.0	11.0	-13.0	-27.9	14.9	-7.8
Gorontalo	23.4	16.0	-7.3	-27.9	20.6	-3.8
West Nusa Tenggara	32.0	15.8	-16.2	-31.7	15.6	-7.0
East Nusa Tenggara	31.6	16.3	-15.3	-25.0	9.7	-6.6
Maluku	23.7	13.2	-10.5	-21.2	10.7	-5.9
North Maluku	4.2	7.2	3.0	-28.8	31.8	5.4
Papua	49.4	22.9	-26.5	-21.4	-5.1	-7.7
<b>Region</b>						
Sumatra	24.0	10.2	-13.8	-24.4	10.6	-8.6
Java-Bali	29.2	9.7	-19.4	-31.2	11.7	-11.0
Kalimantan	18.2	5.7	-12.4	-19.7	7.3	-11.5
Sulawesi	24.1	9.9	-14.2	-29.4	15.2	-8.9
East Indonesia	28.2	16.9	-11.3	-27.3	16.0	-5.1
Indonesia	27.3	10.0	-17.3	-29.2	11.9	-10.0

(Source) Calculated based on data from *Susenas* 2004 and 2014.

**Table 6. Pro-poor Growth Indices**

Province	$G_{12}$ (in %) (1)	$\varepsilon$ (2)	$\varepsilon_G$ (3)	PPGI <sup>(a)</sup> (4) = (2)/(3)		PEGR <sup>(a)</sup> (in %) (5) = (4)×(1)	
				Value	Ranking	Value	Ranking
Aceh	2.5	-1.86	-3.20	0.58	13	1.4	27
North Sumatera	3.4	-2.50	-3.97	0.63	10	2.1	22
West Sumatera	4.8	-2.89	-3.88	0.75	5	3.6	4
Riau	5.7	-2.38	-3.51	0.68	8	3.9	2
Jambi	4.1	-2.24	-3.81	0.59	12	2.4	18
South Sumatera	5.3	-1.23	-3.25	0.38	26	2.0	25
Bengkulu	2.9	-0.75	-3.63	0.21	28	0.6	29
Lampung	4.0	-2.13	-3.27	0.65	9	2.6	15
Bangka Belitung	3.5	-3.34	-4.42	0.76	4	2.7	12
Jakarta	3.8	-2.92	-4.22	0.69	6	2.7	13
West Java	6.5	-1.47	-3.52	0.42	23	2.7	14
Central Java	5.5	-1.77	-3.88	0.46	19	2.5	17
Yogyakarta	3.4	-2.63	-2.37	1.11	3	3.8	3
East Java	5.7	-2.15	-3.69	0.58	14	3.3	9
Banten	5.9	-1.89	-3.84	0.49	17	2.9	11
Bali	6.9	-1.94	-3.99	0.49	18	3.4	8
West Kalimantan	5.3	-1.50	-3.75	0.40	25	2.1	24
Central Kalimantan	6.3	-2.12	-3.87	0.55	15	3.4	7
South Kalimantan	5.1	-2.81	-4.09	0.69	7	3.5	6
East Kalimantan	2.8	-4.46	-3.63	1.23	2	3.5	5
North Sulawesi	7.5	-1.19	-3.45	0.35	27	2.6	16
Central Sulawesi	4.5	-1.87	-3.55	0.53	16	2.4	19
South Sulawesi	7.0	-1.47	-3.39	0.43	22	3.0	10
Southeast Sulawesi	5.8	-1.35	-3.29	0.41	24	2.4	20
Gorontalo	6.8	-0.56	-2.79	0.20	29	1.3	28
West Nusa Tenggara	5.3	-1.32	-3.09	0.43	21	2.3	21
East Nusa Tenggara	3.4	-1.95	-3.24	0.60	11	2.1	23
Maluku	4.1	-1.45	-3.29	0.44	20	1.8	26
North Maluku	8.3	0.65	-4.28	-0.15	30	-1.3	30
Papua	4.2	-1.82	-1.38	1.32	1	5.6	1
Region							
Sumatra	4.5	-1.93	-3.49	0.55		2.5	
Java-Bali	5.9	-1.86	-3.70	0.50		3.0	
Kalimantan	4.7	-2.43	-3.77	0.64		3.1	
Sulawesi	6.5	-1.36	-3.41	0.40		2.6	
East Indonesia	5.1	-1.00	-2.39	0.42		2.1	
Indonesia	5.5	-1.81	-3.52	0.51		2.8	

(Notes) (a) Provinces are ranked in descending order of the pro-pooriness of economic growth.

(Source) Calculated based on data from *Susenas* 2004 and 2014.



**Table 7. Regression Result**

Dependent variable: growth elasticity of poverty without change in inequality	Model 1 Without dummy variable		Model 2 With dummy variable	
	Coefficient	Robust St. Error	Coefficient	Robust St. Error
INEQ04	-0.134	0.034 ***	-0.103	0.022 ***
PCEXP04	6.157	1.104 ***	5.174	0.867 ***
DE			7.152	1.781 ***
DE*INEQ04			-0.180	0.069 **
DE*PCEXP04			-11.201	4.949 **
Constant	6.210	0.800 ***	5.571	0.543 ***
No. of observations	29		29	
R-squared	0.475		0.760	
F-value	17.73		66.39	

(Note) \*\*\* significant at 1% level; \*\* significant at 5% level.

(Source) Calculated based on data from *Susenas* 2004 and 2014.