国際大学
INTERNATIONAL UNIVERSITY OF JAPAN

Economics & Management Series *EMS-2012-21*

Spatial Dimensions of Expenditure Inequality and the Role of Education in Indonesia: An Analysis of the 2008-2010 Susenas Panel

Mitsuhiro Hayashi
Alumnus 1990, International University of Japan

Mitsuhiko Kataoka
Alumnus 1997, International University of Japan

Takahiro Akita
International University of Japan

November 2012

IUJ Research Institute
International University of Japan

Spatial Dimensions of Expenditure Inequality and the Role of Education in Indonesia: An Analysis of the 2008-2010 *Susenas* Panel Data*

Mitsuhiro Hayashi
Crawford School, ANU/Chuo University
mitsuhiro.hayashi@anu.edu.au

Mitsuhiko Kataoka
Chiba Keizai University
m-kataoka@cku.ac.jp

Takahiro Akita
International University of Japan
akita@iuj.ac.jp

Abstract

Based on 2008–2010 *Susenas* panel data, this study analyzes expenditure inequality in Indonesia from spatial perspectives by using several inequality decomposition methods: decomposition of the Theil indices by population subgroups; decomposition of the Gini coefficient by expenditure components; and the Blinder-Oaxaca decomposition. In the Theil decomposition, this study employs not only the conventional approach but also an alternative approach proposed by Elbers and others (2008). Our results show that a substantial portion of expenditure inequality is attributed to inequalities within urban and rural sectors. According to the alternative approach, however, the contribution of between-sector inequality increases conspicuously, suggesting that there are notable differences in the distribution of per capita household expenditures between the urban and rural sectors. Educational differences appear to have played an important role in urban inequality as well as urban-rural disparity. For both urban and rural households, expenditures on non-food items, including expenditure on education, serve to have increased total inequality.

Keywords: Indonesia, spatial inequality, decomposition of Theil indices and Gini coefficient, Blinder-Oaxaca decomposition, education, contribution of between-group inequality
JEL classification: O5, O8, R12

* Earlier versions of the paper were presented at the Indonesian Regional Science Association in Banjarmasin, Indonesia in July 2012 and the 13th International Convention of the East Asian Economic Association in Singapore in September 2012. The authors thank Iwan Jaya Azis, Chris Manning, Shigeru Otsubo, Budy Resosudarmo, Arief Yusuf, and participants of these conferences for their useful comments and suggestions. Mitsuhiro Hayashi is grateful to the Chuo University for its financial support (Joint Research Grant 0981), while Takahiro Akita and Mitsuhiko Kataoka are grateful to the Japan Society for the Promotion of Science for its financial support (Grant-in-Aid for Scientific Research No. 24530274 and No. 23530285, respectively).

I. Introduction

According to Hill, Resosudarmo and Vidyattama (2008), the concentration of economic activity across the major island groupings in Indonesia has not substantially changed over the past 30 years, even though growth and social progress have been remarkably even. They observed that Java's share of economic activity has risen, if the mining sector is excluded from the analysis. Mahi and Nazara (2012) characterized regional inequality in Indonesia as a long-term and deep-seated phenomenon since there has been no significant redistribution of regional GDP during the past four decades between 1971 and 2010. In 2010, Java-Bali generated nearly 60% of Indonesia's total GDP. Jakarta's share alone in 2010 accounts for around 16% of the total GDP, which is roughly twice that of four decades earlier. Over these four decades, Jakarta's per capita GDP relative to Indonesia has increased remarkably, while those for the rest of the regions (i.e., Sumatra, Java-Bali (excluding Jakarta), Nusa Tenggara, Kalimantan, Sulawesi, and Maluku-Papua) show an unchanging or declining trend.

In addition to such between-region disparities, within-region inequalities, especially inequalities between rural and urban sectors and within the urban sector, have been recognized as significant phenomena of spatial differences in Indonesia. Akita and Pirmansah (2012) found, based on *Susenas* (National Socio-Economic Survey) consumption expenditure data in 1999, 2002 and 2005, that a rising urban inequality, together with a widening urban-rural disparity, contributed to an increase in overall inequality in per capita household expenditure for the period of Indonesia's positive economic growth between 1999 and 2005. They observed also that households whose heads acquired a tertiary education, particularly those in Jakarta's tertiary group, seem to have played a crucial role in the rising urban inequality.

A large number of studies have attempted to analyze spatial differences in living standards in Indonesia,[1] one of the largest archipelagic countries in the world, where average incomes vary substantially across provinces and between urban and rural areas, and where decentralization policies have been pursued actively to reduce socioeconomic disparities since the collapse of the Suharto regime following the 1997–1998 economic crises. Nevertheless, there is a need for continual research into the extent and patterns of spatial inequalities and development, as spatial equity is one of the major policy

objectives in Indonesia.

The main objectives of this study are to examine the current trend and pattern of expenditure inequality from spatial perspectives, and to explore the factors of urban-rural disparity and urban and rural inequalities with particular attention to educational differences. Specifically, this study analyzes spatial inequalities in Indonesia based on the 2008–2010 *Susenas* panel data by using several inequality decomposition methods: decomposition of the Theil indices by population subgroups; decomposition of the Gini index by expenditure components; and the Blinder-Oaxaca decomposition. In the Theil decomposition, this study employs not only the conventional approach, where observed between-group inequality is assessed against overall inequality, but also an alternative approach proposed by Elbers and others (2008), where observed between-group inequality is assessed against the maximum between-group inequality attainable given the number and relative sizes of the groups, in order to rectify the problem associated with the conventional method.

The rest of this paper is organized as follows. Section II presents the data and methods used in this study. Section III presents the results of decomposition analyses. In this section, the role of education in urban-rural disparity and urban and rural inequalities is particularly analyzed by using several decomposition methods. Finally, Section IV summarizes main findings and discusses some policy implications.

II. The Data and Method

Data

This study uses *Susenas* panel data on expenditure from 2008 to 2010, compiled by BPS (the Central Bureau of Statistics), to analyze the spatial distribution of economic well-being in Indonesia. Table 1 presents the geographical distribution of households in the *Susenas* sample. The *Susenas* panel dataset includes 60,947 households, of which 23,690 are in urban areas and 37,257 households are in rural areas. To analyze inequality changes in real terms, this study converts current price expenditures into expenditures at 2008 constant prices by using current price provincial urban and rural poverty lines in 2008, 2009, and 2010. Table 1 also shows the distribution of households by sector and province, which is estimated using household weights. The estimated

share of urban households was 47.1% in 2008, which remains constant in the study period.

The *Susenas* panel dataset provides consumption expenditure data on 21 items, which are classified into food and non-food items. Food items include: (1) rice & rice products; (2) fresh fish, (3) preserved fish, (4) meat & meat products, (5) egg, milk & their products, (6) vegetables, (7) beans, (8) fruit, (9) cooking oil & fat, (10) non-alcoholic beverages, (11) spices, (12) other foodstuff, (13) prepared food, and (14) tobacco & alcoholic beverages. Non-food items include: (15) housing, water, electricity, gas & fuel, (16) transportation, communication & financial services, (17) education, recreation & sport, (18) health, (19) clothing, (20) tax & insurance, and (21) religion & party.

Method

Theil indices and their decomposition by population groups

Suppose that there are *n* households in a population, which are classified into *m* mutually exclusive and collectively exhaustive groups in accordance with a certain categorical variable, such as location (for example, urban and rural sectors, provinces, and regions), gender, age, education, occupation, sector, household size, etc. Let $\mu, n_i, \mu_i,$ and y_{ij} be the mean per capita expenditure of all households, the number of households in group *i*, the mean per capita expenditure of households in group *i*, and the per capita expenditure of household *j* in group *i*, respectively. Overall inequality in per capita household expenditure is then measured by the Theil indices T and L as follows (Anand, 1983; Fields, 2001):

$$T = \frac{1}{n}\sum_{i=1}^{m}\sum_{j=1}^{n_i}\left(\frac{y_{ij}}{\mu}\right)\log\left(\frac{y_{ij}}{\mu}\right) \quad (1)$$

$$L = \frac{1}{n}\sum_{i=1}^{m}\sum_{j=1}^{n_i}\log\left(\frac{\mu}{y_{ij}}\right) \quad (2)$$

These Theil indices belong to the generalized entropy class of inequality measures and satisfy several desirable properties as a measure of inequality: anonymity; income homogeneity; population homogeneity; and the Pigue-Dalton principle of transfers. Furthermore, they can be additively decomposed into the within-group inequality

component (T_W and L_W) and the between-group inequality component (T_B and L_B) as follows (Shorrocks, 1980):

$$T = \sum_{i=1}^{m}\left(\frac{n_i}{n}\frac{\mu_i}{\mu}\right)T_i + \sum_{i=1}^{m}\left(\frac{n_i}{n}\frac{\mu_i}{\mu}\right)\log\left(\frac{\mu_i}{\mu}\right) = T_W + T_B \quad (3)$$

$$L = \sum_{i=1}^{m}\left(\frac{n_i}{n}\right)L_i + \sum_{i=1}^{m}\left(\frac{n_i}{n}\right)\log\left(\frac{\mu}{\mu_i}\right) = L_W + L_B \quad (4)$$

where T_i and L_i are, respectively, the Theil indices T and L for the within-group inequality of group *i*.

Theil decomposition and the maximum between-group inequality

Elber and others (2008) proposed a new measurement approach for the contribution of the between-group inequality component. As shown in equations (3) and (4), the between-group component depends on the number of groups, the relative sizes of the groups, and differences in mean per capita expenditures among the groups. Therefore, care should be taken to compare decomposition results based on different spatial groupings, for example, urban and rural sectors, south and north regions, provinces, etc., although any finer nested partitions, for example, partitions of regions into sub-regions such as provinces and districts, will not decrease between-group inequality (Akita and Alisjahbana, 2002; Shorrocks and Wan, 2005). Even when the same spatial grouping is used, decomposition results would not be comparable if the relative sizes of the groups are different.

In order to rectify the problem, Elber and others (2008) suggested that between-group inequality should be assessed against the maximum between-group inequality attainable given the number and relative sizes of the groups, rather than overall inequality that is used in the conventional approach for the contribution of the between-group inequality component. In our study, between-group inequality is evaluated not only against overall inequality but also the maximum between-group inequality that is obtained based on the observed ranking of the groups in mean per capita household expenditures. Specifically, given the number and relative sizes of the groups under consideration, all households are reclassified in an ascending order of per capita household expenditure into groups that are non-overlapping and preserve the ranking of the original groups. The maximum between-group inequality attainable given

the number and relative sizes of the groups can be obtained based on these non-overlapping and rank-preserving groups.

The contribution of observed between-group inequality to the maximum attainable between-group inequality, as measured by the Theil indices T and L, is denoted, respectively, by

$$\overline{CT_B} = T_B \big/ T_B^{max} \text{ and } \overline{CL_B} = L_B \big/ L_B^{max} \qquad (5)$$

as opposed to $CT_B = T_B \big/ T$ and $CL_B = L_B \big/ L$, which denote the contribution of observed between-group inequality to overall inequality used in the conventional decomposition method.

Gini coefficient and its decomposition by expenditure components

This study also uses the Gini coefficient to analyze the contribution of expenditure components to overall inequality. Suppose that all households are arranged in non-descending order of per capita household expenditure, i.e., $y_1 \le y_2 \le \ldots \le y_n$, where y_i is the per capita expenditure of *i*th household. Then the Gini coefficient for the distribution of per capita household expenditures, $\boldsymbol{y} = (y_1, y_2, \cdots, y_n)$, can be given by:

$$G = \frac{2}{n\mu} \operatorname{cov}(i(\boldsymbol{y}), \boldsymbol{y}) \qquad (5)$$

where $i(\boldsymbol{y})$ is the rank of households in the distribution of per capita household expenditures. It should be noted that the Gini coefficient satisfies the above-mentioned four desirable properties.

Suppose now that the per capita expenditure of *i*th household is composed of *K* expenditure components as follows:

$y_i = y_{1i} + y_{2i} + \cdots + y_{Ki}$ and $\mu = \mu_1 + \mu_2 + \cdots + \mu_K$ $\quad i = 1, 2, \ldots, n$.

Then the Gini coefficient can be additively decomposed by expenditure components as follows (Pyatt, Chen and Fei, 1980; Lerman and Yitzhaki, 1985):

$$G = \sum_{k=1}^{K} w_k C_k = \sum_{k=1}^{K} w_k R_k G_k \qquad (6)$$

In this formula, w_k is the share of expenditure component *k* and

$C_k = \frac{2}{n\mu_k}\text{cov}(i(\boldsymbol{y}), \boldsymbol{y_k})$, $G_k = \frac{2}{n\mu_k}\text{cov}(i(\boldsymbol{y_k}), \boldsymbol{y_k})$, and $R_k = \frac{\text{cov}(i(\boldsymbol{y}), \boldsymbol{y_k})}{\text{cov}(i(\boldsymbol{y_k}), \boldsymbol{y_k})}$ are, respectively, the concentration ratio, the Gini coefficient, and the rank correlation ratio for expenditure component *k*, where $\mathbf{y_k} = (y_{k1}, y_{k2}, \cdots, y_{kn})$ is the distribution of per capita household expenditure for component *k* and $i(\boldsymbol{y_k})$ is the rank of households in the distribution of per capita household expenditures for component *k*.

In equation (6), if we let $g_k = \frac{C_k}{G} = \frac{R_k G_k}{G}$, then we have

$$1 = \sum_{k=1}^{K} w_k g_k \qquad (7)$$

g_k is called the relative concentration ratio of expenditure component *k*. If $g_k > 1$, then expenditure component *k* is an inequality-increasing component, while if $g_k < 1$, then expenditure component *k* is an inequality-decreasing component.

III. Empirical Results

Spatial decomposition of overall expenditure inequality:

Rural-urban decomposition

Table 2 presents the result of rural-urban decomposition of expenditure inequality in 2008 and 2010. As measured by the Theil T, overall inequality is 0.253 in 2008. This is much smaller than the values in 2002 and 2005, which were, respectively, 0.34 and 0.37, according to Akita and Pirmansah (2012), indicating that there has been a substantial decrease in expenditure inequality between 2005 and 2008. There is, however, a slight increase between 2008 and 2010 by the Theil T. This coincides with a rising trend in the BPS estimate of the Gini coefficient: from 0.35 in 2008 to 0.38 in 2010 (BPS, 2012).[2] According to BPS, the Gini coefficient further increased to 0.41 in 2011, which is an alarming level of inequality in per capita household expenditure.

The urban sector's mean per capita expenditure is 1.7 times as large as the rural sector's in 2008 and 2010, which is much smaller than the ratio in 2005 at 2.2; thus between-sector inequality at 0.035-0.036 by the Theil T accounts for 14% of overall inequality. In other words, about 86% of overall inequality is attributed to inequalities within urban and rural sectors. However, using an alternative measure $\overline{CT_B}$ (B-sector

(B) in Table 2), we find that observed inequality between the two sectors accounts for more than 26% of the maximum attainable between-sector inequality given the current distribution of per capita household expenditures, the relative sizes of urban and rural sectors, and their ranking in terms of mean per capita expenditure.

The urban sector has a significantly larger within-group inequality than the rural sector: 0.242 vs. 0.180 by the Theil T in 2008, while 0.264 vs. 0.177 in 2010.[3] According to the Theil T, the urban sector accounts for 58% of overall inequality. In 2005, the Theil T was 0.370 in urban areas, while in rural areas, it was 0.182 (Akita and Pirmansah, 2012), signifying that substantial decrease in overall inequality between 2005 and 2008 is due not only to a decrease in between-sector inequality but also to a fall in urban inequality.

Decomposition by region (five regions and 33 provinces)

Table 3 presents the result of inequality decomposition by regions (Sumatra, Kalimantan, Java-Bali, Sulawesi and Others). The differences in mean per capita expenditure among the five regions are not large. In both 2008 and 2010, Kalimantan has the largest mean per capita expenditure, which is followed, in turn, by Sumatra, Java-Bali, Sulawesi and Others. The ratio between the largest to the smallest mean per capita expenditure is very small at around 1.4. Between-region inequality, at 0.003 by the Theil T, thus accounts for only 1% of overall inequality in 2008. Even if we use an alternative measure $\overline{CT_B}$ (B-region (B) in Table 3), its contribution amounts to only 2%, signifying that there are large overlaps in the distribution of per capita expenditures among the five regions. In other words, unless we decrease within-region inequalities, we are not able to decrease overall inequality. Since the Java-Bali region has a large within-region inequality, accounting for around 65% of the overall inequality, it is imperative to reduce Java-Bali's within-region inequality. It should be noted that all regions have experienced an increase in within-region inequality between 2008 and 2010. In particular, Sulawesi and Others have raised their within-region inequalities conspicuously. The slight increase in overall inequality between 2008 and 2010 is due mostly to an increase in the within-region inequality component.

Table 4 shows inequality decomposition by province. Between-province inequality, at around 0.03 by the Theil T, accounts for 12.6% of overall inequality in 2008. Even if

we employ an alternative measure $\overline{CT_B}$ (B-region (B) in Table 4), its contribution amounts to 13.7%, indicating that there are large overlaps in the distribution of per capita expenditures among provinces, with Jakarta being an exception as its mean per capita expenditure is far larger than other provinces' (see Table 5).

Rural-urban decomposition of within-region inequality

Tables 6-1 and 6-2 present rural-urban decomposition of expenditure inequality for each of the five regions in 2008 and 2010, respectively. Due mainly to the existence of a large metropolitan area including Jakarta, Bogor, Depok, Tangerang, and Bekasi (i.e., Jabodetabek), the Java-Bali region is the most urbanized, with the urbanization rate of 54%. This is followed, in turn, by Kalimantan, Sumatra, Sulawesi and Others. As measured by the Theil T, between-sector inequality ranges from 0.02 in Sumatra to 0.04 in Java-Bali. Using the conventional measure CT_B (B-sector (A) in Tables 6-1 and 6-2), its contribution is less than 17% to total within-region inequality in each region, meaning that more than 83% of total within-region inequality is attributed to within-sector inequalities.

However, using an alternative measure $\overline{CT_B}$ (B-sector (B) in Tables 6-1 and 6-2), the contribution increases conspicuously. In Java-Bali, particularly, the contribution rises to around 35%, which is 20 percentage points larger than the one using the conventional measure, indicating that there is no large overlap in the distribution of per capita expenditures between urban and rural sectors in Java-Bali. To a lesser extent, Kalimantan registers a relatively large between-sector contribution at 30% in 2008 using the alternative measure, which is compared to 16% using the conventional measure, while Sulawesi has a between-sector contribution of 26% using the alternative measure, which is 10 percentage points larger than the one using the conventional measure. It should be noted that in Sumatra, the urban-to-rural ratio of mean per capita expenditure is 1.5 in 2008 and 2010, which is significantly smaller than the ratios in the other regions (around 1.7–1.8); thus the between-sector inequality accounts for 10–11% of Sumatra's total within-region inequality, even though using the alternative measure, its contribution increases to 18–20%. These values are much smaller than those in the other regions.

In all regions, urban inequality is larger than rural inequality. As measured by the Theil T, urban inequality's contribution to total within-region inequality ranges from 37% to 64% in 2008. With the exception of Kalimantan, urban inequality has risen in the study period. In 2010, its contribution ranges from 40% to 67%. Java-Bali has the highest urban inequality, while Sulawesi has the lowest in 2008. However, in the study period, Others has raised its urban inequality markedly to 0.296 from 0.222 by the Theil T; thus it registers the highest urban inequality in 2010. It is interesting to note that Kalimantan has lowered its urban inequality in the study period and has the lowest urban inequality in 2010 by the Theil T, even though its total within-region inequality has increased slightly (from 0.231 to 0.242).

Accounting for urban and rural inequalities and urban-rural disparity

Decomposition of urban and rural inequalities by educational attainment level

As shown in Table 2, a large inequality exists among urban households. According to previous decomposition studies in Asian countries, educational differences played an important role by accounting for 20-40% of overall inter-household inequality. We thus focus on educational differences as the major determinant and conduct a decomposition analysis with respect to the educational attainment levels of household heads.

In the *Susenas* panel dataset, households are classified into 13 groups according to educational attainment levels. These groups are: no schooling; incomplete primary school; general primary school; Islamic primary school; general junior high school; Islamic junior high school; general senior high school; Islamic senior high school; vocational senior high school; diploma I and II; diploma III; diploma IV (Bachelor's degree); and master's or doctor's degree. In our study, these 13 groups are aggregated into five groups to conduct a decomposition analysis: no education (no schooling and incomplete primary school), primary education (general primary school and Islamic primary school), junior secondary education (general junior high school and Islamic junior high school), senior secondary education (general senior high school, Islamic senior high school, and vocational senior high school), and tertiary education (diploma I and II, diploma III, diploma IV (Bachelor's degree), and master's or doctor's degree).

Tables 7-1 and 7-2 exhibit the results for the urban and rural sectors, respectively. More than 55% of urban households have heads who have completed at least junior

secondary education, which is compared to 25% in the rural sector. Mean per capita household expenditure increases gradually as we move from the no education group to the tertiary education group in the urban sector, where the ratio of the highest to lowest mean per capita expenditure (tertiary group against no education group) is very high at 2.9. According to the Theil T, the between-group inequality, i.e., inequality due to educational differences, at 0.06, accounts for 24.7% of urban inequality in 2008 using the conventional measure. Furthermore, using an alternative measure $\overline{CT_B}$ (B-sector (B) in Tables 7-1 and 7-2), its contribution increases to around 30%. Thus, educational differences play an important role in urban inequality.

The tertiary education group accounts for 11% of urban households and has the largest within-group inequality in the urban sector. By the Theil T, its contribution to total urban inequality amounts to 20% in 2008. But the senior secondary education group, despite its smaller within-group inequality, registers the largest contribution at 25% as its expenditure share is the largest among the five educational groups.

Rural inequality is much smaller than urban inequality. 41% of rural households have heads without any education or with incomplete primary education. The population share of the primary education group is also high at 34%. On the other hand, less than 3% of rural households have heads who have completed tertiary education. Like in the urban sector, mean per capita household expenditure increases gradually as we move from the no education group to the tertiary education group in the rural sector. However, the ratio of the highest to lowest mean per capita expenditure (tertiary group against no education group) is not so high. Thus, inequality due to educational differences accounts for 11% of rural inequality. Even using the alternative measure $\overline{CT_B}$, its contribution to rural inequality amounts to 13%.

Accounting for urban-rural disparity (between-sector inequality): Blinder-Oaxaca decomposition

As shown in Table 2, the urban-to-rural ratio in mean per capita expenditure is 1.7 and urban-rural disparity (between-sector inequality) accounts for 14% of overall expenditure inequality by the Theil T. In order to explore the determinants of the

urban-rural disparity in mean per capita expenditure, we perform a Blinder-Oaxaca decomposition, which was popularized by Blinder (1973) and Oaxaca (1973).[4]

Let Y_U and Y_R be the natural log of per capita expenditure of urban and rural households, respectively. Given the linear regression model,

$$Y_k = \boldsymbol{X}_k'\boldsymbol{\beta}_k + e_k \qquad E(e_k) = 0 \qquad k = U, R$$

where $\boldsymbol{X}_k$ is a vector of explanatory variables, $\boldsymbol{\beta}_k$ includes the parameters associated with $\boldsymbol{X}_k$, and e_k is the error term, which contains unobserved factors, we let $\hat{\boldsymbol{\beta}}_k$ be a vector of the least-squares estimates for $\boldsymbol{\beta}_k$ ($k = U, R$), obtained separately from the urban and rural samples and $\overline{\boldsymbol{X}}_k$ be the estimate for $E(\boldsymbol{X}_k)$. Then, the estimated urban-rural difference in mean per capita expenditure is expressed as (twofold decomposition):

$$\hat{D} = \overline{Y}_U - \overline{Y}_R = (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'\hat{\boldsymbol{\beta}}^* + \left(\overline{\boldsymbol{X}}_U'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}^*) + \overline{\boldsymbol{X}}_R'(\hat{\boldsymbol{\beta}}^* - \hat{\boldsymbol{\beta}}_R)\right) \qquad (8)$$

where $\hat{\boldsymbol{\beta}}^*$ is a vector of the least-squares estimates for the slope parameters and the intercept which are obtained from the pooled sample of urban and rural households (Newmark, 1988). The first term in equation (8) is the part of the urban-rural difference in mean per capita expenditure that is explained by urban-rural differences in the explanatory variables (endowments or quantity effect) and the second term is the unexplained part.

As the explanatory variables, this study considers *hhsize* (household size), *male* (gender of household head: female = 0; male = 1), *age* (age of household head), *age2* (square of age of household head), *edyear* (years of education of household head) and *wkcat* (job of household head: agriculture/mining = 0; non-agriculture/mining =1).[5] Table 8 presents the result of the Blinder-Oaxaca decomposition in 2008 and 2010. In our sample, the mean of natural log of per capita expenditure is 12.97 for urban households and 12.48 for rural households, yielding an urban-rural expenditure gap of 0.49. In Table 8, the expenditure gap is divided into two parts. The first part, i.e., the explained part (endowments or quantity effect), reflects the increase in mean per capita expenditure if rural households had the same endowments as urban households, assuming that rural and urban households have the same coefficients, obtained from the

pooled sample of urban and rural households. The increase of 0.226 in Table 8 indicates that differences in endowments (household size, age, gender, education, and job type) as a whole account for more than 45% of the urban-rural expenditure gap.[6] In particular, differences in educational attainments account for 36% of the urban-rural expenditure gap. Furthermore, differences in job type contribute 13% to the gap.

Inequality decomposition by expenditure components in rural and urban areas

Table 9 presents the result of inequality decomposition by expenditure components in urban and rural areas in 2008. There is a notable difference between urban and rural households in terms of the pattern of consumption expenditures on food and non-food items.[7] Urban households spend more on non-food items than on food items, while the opposite pattern is observed for rural households: Urban households spend 55% of their disposable income on non-food items, whereas rural households spend 58% on food items. Among food items, for urban households, (13) prepared food has the largest share at 9.5%, which is followed by (1) rice & rice products and (10) non-alcoholic beverages (see Table A1). On the other hand, for rural households, (1) rice & rice products has the largest share at 15.9%, which is followed by (13) prepared food and (14) tobacco & alcoholic beverages. Among non-food items, for urban households, (15) housing, water, electricity, gas & fuel has the largest share at 23.9%, which is followed by (16) transportation, communication & financial services and (18) health services. Though the share is much smaller, for rural households, (15) housing, water, electricity, gas & fuel has the largest share at 17.7%, which is followed by (16) transportation, communication & financial services and health services.

For both urban and rural households, inequality in per capita expenditure on non-food items serves to have increased total expenditure inequality, as its relative concentration ratio is 1.3 and 1.4, respectively. It contributes 72% to urban inequality, while 59% to rural inequality. In order to see which non-food item is the inequality increasing or decreasing component, we conducted inequality decomposition for non-food items only.[8] The result is also presented in Table 9. For urban households, expenditures on (16) transportation, communication & financial services, (20) tax & insurance and (21) religion & party are inequality increasing components, while expenditure on (15) housing, water, electricity, gas & fuel and (19) clothing are

inequality decreasing components. For rural households, expenditures on (21) religion & party and (16) transportation, communication & financial services are inequality increasing components, while expenditures on (15) housing, water, electricity, gas & fuel and (19) clothing are inequality decreasing components.

It should be noted that due to their large expenditure shares, the combined contribution of expenditures on (15) housing, water, electricity, gas & fuel and (16) transportation, communication & financial services amounts to 70% of urban inequality and 69% of rural inequality in per capita expenditure on non-food items. In particular, expenditure on (16) transportation, communication & financial services plays a decisive role in expenditure inequality in both urban and rural sectors, as its contribution is much larger than its expenditure share due to its high relative concentration ratio. Compared to these two items, expenditure on (17) education, recreation & sport appears to be less prominent. However, among non-food items other than (15) and (16), this expenditure on education, recreation & sport is an important component in expenditure inequality for urban households, since it has a relatively large expenditure share (8.5%) and the second highest Gini coefficient (0.73) next to (21) religion & party, and thus contributes 8.8% to total non-food expenditure inequality in the urban sector.

IV. Concluding Remarks

Based on the 2008–2010 *Susenas* panel data, this study has analyzed expenditure inequality in Indonesia from spatial perspectives for the period from 2008–2010 by using several inequality decomposition methods: decomposition of the Theil indices by population subgroups; decomposition of the Gini index by expenditure components; and the Blinder-Oaxaca decomposition. In the Theil decomposition, this study employed not only the conventional approach, where observed between-group inequality is assessed against overall inequality, but also an alternative approach proposed by Elbers and others (2008), where observed between-group inequality is assessed against the maximum between-group inequality, in order to rectify the problem associated with the conventional method. The main findings and some policy implications are given as follows.

Based on the results of this and previous studies, there seems to have been a substantial decrease in expenditure inequality between 2005 and 2008, due not only to a

decrease in urban-rural disparity but also due to a fall in urban inequality. After such a sharp decrease, there is a slight increase in overall inequality between 2008 and 2010, mainly because of a rise in urban inequality. This coincides with a rising trend in the BPS estimate of the Gini coefficient in the same period. The Gini coefficient exceeding 0.4 in 2011 estimated by BPS is, in fact, an alarming level of inequality in per capita household expenditure. This prompts us to carefully and thoroughly examine such a trend, identify the factors of growing inequality, and explore ways to solve the problem.

According to the decomposition analysis for urban and rural sectors, between-sector inequality accounts for 14% of overall expenditure inequality, meaning that a substantial portion of inequality in per capita household expenditure is attributed to within-sector inequalities. Meanwhile, decomposition by five regions (Sumatra, Java-Bali, Kalimantan, Sulawesi, and Others) shows that between-region inequality explains merely 1% of overall inequality. In other words, 99% is ascribed to within-region inequalities; but further decomposition of within-region inequality by urban and rural sectors for each of the five regions exhibits a prominence of inequalities within urban and rural sectors.

It should be noted, however, that according to an alternative approach proposed by Elbers and others (2008), where between-sector inequality is assessed against the maximum attainable between-sector inequality, the contribution of between-sector inequality jumps to 26%. A similar pattern is observed in each of the five regions. Particularly in Java-Bali, most urbanized among the five regions, the contribution of between-sector inequality by the Theil T is around 35% using the alternative measure, which is 20 percentage points larger than the one using the conventional measure. These observations suggest that there are notable differences in the distribution of per capita household expenditures between the urban and rural sectors. As pointed out by Kanbur (2000), a relatively small contribution of between-group inequality to overall inequality does not necessarily mean that between-group inequality is less important than within-group inequalities. It is thus necessary to employ an alternative approach such as the one proposed by Elbers and other (2008) to supplement the conventional approach.

As in the previous *Susenas* years, urban inequality is significantly higher than rural inequality in each of the five regions as well as in the nation as a whole (Akita and Lukman, 1999; Akita and Miyata, 2008; and Akita and Pirmansah, 2012). Urban

inequality is very high in Java-Bali especially, at 0.25 in 2008 and 0.27 in 2010 by the Theil T, accounting for two-thirds of Java-Bali's within-region inequality. Since the contribution of Java-Bali's within-region inequality to Indonesia's overall inequality is more than 60%, Java-Bali's urban inequality accounts for 40% of overall inequality; thus in order to mitigate Indonesia's overall inequality, it is imperative to reduce inequality within Java-Bali's urban sector.

Within the urban sector, educational differences appear to have played an important role in expenditure inequality. According to decomposition by education, disparity due to educational differences explains around 25% of urban inequality, as measured by the Theil T. When the alternative measure is employed, the contribution increases to 30%, signifying the prominence of educational differences in urban inequality. Among five educational groups (no education, primary education, junior secondary education, senior secondary education and tertiary education), the tertiary group registers not only the highest mean per capita expenditure (almost three times as large as the smallest, registered by the no education group) but also the highest within-group inequality. Even though the senior secondary group is the largest contributor to urban inequality due to its much larger population share, the tertiary group seems to have played a key role in urban inequality, as argued by Akita and Miyata (2008) and Akita and Pirmansah (2012). On the other hand, in the rural sector, disparity due to educational differences is not so prominent, as it accounts for 11% of rural inequality.

According to the Blinder-Oaxaca decomposition, differences in educational endowments appear to have been a key determinant of urban-rural expenditure disparity, by accounting for 36% of the urban-rural expenditure gap. To a much lesser extent, differences in job type also contribute to the expenditure gap. The result of the Blinder-Oaxaca decomposition for urban-rural disparity together with the decomposition result for urban inequality indicates the important role of education in expenditure inequality in Indonesia. Raising the general educational level might thus be essential to the reduction of urban-rural disparity as well as urban inequality. In this context, conditional cash transfer programs for low-income households to send their children to higher education would be useful. At the same time, it would be necessary to reduce inequality among households in higher educational groups, especially in the urban sector. If their relatively high within-group inequalities are caused by a mismatch

between the qualifications of graduates from higher education institutions and the needs of employers, it would be necessary to strengthen linkages between industry and academe, promote more efficient labour markets, increase educational opportunities, and improve the quality and efficiency of higher education; but in the short run, comprehensive retraining programs may be essential to remedy the mismatch, as suggested by Akita and Miyata (2008).

There is a notable difference between urban and rural households in the pattern of consumption expenditures: urban households spend more on non-food items, while rural households spend more on food items. Decomposition of the Gini coefficient by expenditure components reveals, however, that for both urban and rural households, expenditures on non-food items serve to have increased total expenditure inequality. Among non-food items, expenditures on religious and related activities and transportation/communication function as inequality increasing components, whereas expenditures on housing/utilities and clothes serve as inequality decreasing components for both urban and rural households. It should be noted that among non-food items other than housing/utilities and transportation/communication, which are closely related to people's lives, expenditure on education/recreation/sport is an important component in urban inequality, since it has a relatively large expenditure share and the second highest Gini coefficient.

Poverty is a narrower concept than inequality in that it only focusses on people under the predetermined poverty line in the distribution of economic wellbeing (Haughton and Khandker, 2009). However, an analysis of poverty dynamics based on the *Susenas* panel data would provide other characteristics of the distribution of economic wellbeing, which could not be revealed by inequality analyses. According to Dariwardani (2012), the rural sector has a much higher incidence of chronic poverty than the urban sector, though the former has a significantly smaller expenditure inequality than the latter. There are also large differences in the incidence of chronic poverty among the five regions and 33 provinces.

References

Akita, T., 1988, Regional development and income disparities in Indonesia. *Asian Economic Journal*, 2, pp. 165–91.

Akita, T. and A. Alisjahbana, 2002, Regional income inequality in Indonesia and the initial impact of the economic crisis. *Bulletin of Indonesian Economic Studies*, 38, pp. 201–22.

Akita, T., P.A. Kurniawan and S. Miyata, 2011, Structural changes and regional income inequality in Indonesia: A bidimensional decomposition analysis. *Asian Economic Journal*, 25, pp. 55–77.

Akita, T. and R.A. Lukman, 1995, Interregional inequalities in Indonesia: A sectoral decomposition analysis for 1975–92. *Bulletin of Indonesian Economic Studies*, 31, pp. 61–81.

Akita, T. and R.A. Lukman, 1999, Spatial patterns of expenditure inequalities in Indonesia: 1987, 1990, and 1993. *Bulletin of Indonesian Economic Studies*, 35, pp. 67–90.

Akita, T. and S. Miyata, 2008, Urbanization, educational expansion, and expenditure inequality in Indonesia in 1996, 1999, and 2002. *Journal of the Asia Pacific Economy*, 13, pp. 147–67.

Akita, T. and Alit Pirmansah, 2012, Urban inequality in Indonesia. In: *Regional Development and Finances: Challenges for Expanding and Financing Public Services* (eds. Handra, H., Resosudarmo, B.P., Yusuf, A.A., Elfindri and Yonnedi, E.), pp. 103–17. IRSA Book Series on Regional Development No.10, Padang: Andalas University Press.

Anand, Sudhir, 1983, *Inequality and Poverty in Malaysia: Measurement and Decomposition*. World Bank Research Publication, New York: Oxford University Press.

Azis, I.J., 1990, Inpres role in the reduction of interregional disparity. *Asian Economic Journal*, 4, pp. 1–27.

Blinder, A.S., 1973, Wage discrimination: Reduced form and structural estimates. *Journal of Human Resources*, 8, pp. 436–55.

BPS (Central Bureau of Statistics), 2012, *Statistical Yearbook of Indonesia 2011*. BPS, Jakarta.

Dariwardani, N.M.I., 2012, *Poverty in Indonesia: Analysis of Poverty Dynamics and Poverty Determinants*. (Unpublished Master's Thesis), International Development Program/International University of Japan, Niigata, Japan.

Eastwood, Robert, and Michael Lipton, 2000, Rural-urban dimensions of inequality change. Working Papers no. 2003. Helsinki: UNU World Institute for Development Economics Research.

Elbers, Chris, Peter Lanjouw, Johan A. Mistiaen and Berk Ozler, 2008, Reinterpreting between-group inequality. *Journal of Economic Inequality*, 6(3), pp. 231–45.

Esmara, H., 1975, Regional income disparities. *Bulletin of Indonesian Economic Studies*, 11, pp. 41–57.

Fields, Gary S., 2001, *Distribution and Development*. MIT Press, Cambridge, MA.

Garcia, J.G. and L. Soelistianingsih, 1998, Why do differences in provincial incomes persists in Indonesia? *Bulletin of Indonesian Economic Studies*, 34, pp. 95–120.

Haughton, J. and S.R. Khandker, 2009, *Handbook of Poverty and Inequality*. World Bank, Washington D.C.

Hill, H., 2008, Globalization, inequality, and local-level dynamics: Indonesia and the Philippines. *Asian Economic Policy Review*, 3, pp. 2–61.

Hill, H., B.P. Resosudarmo and Y. Vidyattama, 2008, Indonesia's changing economic geography. *Bulletin of Indonesian Economic Studies*, 44, pp. 407–35.

Jann, Ben, 2008, The Blinder–Oaxaca decomposition for linear regression models. *The STATA Journal*, 8(4), pp. 453–79.

Kanbur, R., 2000, Income distribution and development. In: *Handbook of Income Distribution* (eds. Atkinson A.B. and Bourguignon F.), pp. 791–841. North-Holland, Oxford.

Lerman, Robert I., and Shlomo Yitzhaki, 1985, Income inequality effects by income sources: a new approach and applications to the United States. *The Review of Economics and Statistics*, 67(1), pp. 151–56.

Mahi, B.R. and S. Nazara, 2012, Survey of recent developments, *Bulletin of Indonesian Economic Studies*, 48, pp. 7–31.

McCulloch, N. and B.S. Sjahrir, 2008, Endowments, location or luck?: Evaluating the determinants of sub-national growth in decentralized Indonesia. Policy Research Working Paper 4769, World Bank.

Milanovic, B., 2005, Half a world: regional inequality in five great federations. *Journal of the Asia and Pacific Economy*, 10, pp. 408–45.

Neumark, D., 1988, Employers' discriminatory behavior and the estimation of wage discrimination. *Journal of Human Resources*, 23(3), pp. 279–95.

Oaxaca, R., 1973, Male‐female wage differentials in urban labor markets. *International Economic Review*, 14, pp. 693–709.

Pyatt, Graham, Chau-man Chen and John Fei, 1980, The distribution of income by factor components. *The Quarterly Journal of Economics*, 95(3), pp. 451–73.

Resosudarmo, B.P. and Y. Vidyattama, 2006, Regional income disparity in Indonesia: A panel data analysis. *ASEAN Economic Bulletin*, 23, pp. 31–44.

Shorrocks, Anthony, 1980, The class of additively decomposable inequality measures. *Econometrica*, 48(3), pp. 613–25.

Shorrocks, Anthony and Guanghua Wan, 2005, Spatial decomposition of inequality.

Journal of Economic Geography, 5(1), pp. 59–81.

Skoufias, E., 2001, Changes in regional inequality and social welfare in Indonesia from 1996 to 1999. *Journal of International Development*, 13, pp. 73–91.

Tadjoeddin, M.Z., W.I. Suharyo and S. Mishra, 2001, Regional disparity and vertical conflict in Indonesia. *Journal of the Asia Pacific Economy*, 6, pp. 283–304.

Uppal, J.S. and Sri Handoko Budiono, 1986, Regional income disparities in Indonesia. *Ekonomi dan Keuangan Indonesia*, 34, pp. 286–304.

Table 1. Sample Size and Estimated Number of Households

		Sample Size		Estimated Number of Households			
				2008		2010	
			% Share	in 1,000	% Share	in 1,000	% Share
Location (Urban vs. Rural)							
	Urban	23,690	38.9	25,019	47.1	25,820	47.1
	Rural	37,257	61.1	28,085	52.9	29,032	52.9
Province and Region							
	Sumatra						
11	Aceh	1,713	2.8	851	1.6	879	1.6
12	N. Sumatra	2,553	4.2	2,634	5.0	2,845	5.2
13	W. Sumatra	1,568	2.6	949	1.8	1,006	1.8
14	Riau	1,386	2.3	1,117	2.1	1,173	2.1
15	Jambi	1,047	1.7	644	1.2	692	1.3
16	S. Sumatra	1,632	2.7	1,601	3.0	1,642	3.0
17	Bengkulu	908	1.5	372	0.7	392	0.7
18	Lampung	1,977	3.2	1,768	3.3	1,819	3.3
19	Bangka Belitung	763	1.3	239	0.5	248	0.5
21	Kepulauan Riau	650	1.1	315	0.6	354	0.7
	Sub-total	14,197	23.3	10,490	19.7	11,050	20.1
	Java-Bali						
31	Jakarta	2,512	4.1	1,816	3.4	1,894	3.5
32	W. Java	6,688	11.0	10,192	19.2	10,452	19.1
33	C. Java	6,899	11.3	8,088	15.2	8,238	15.0
34	Yogyakarta	1,818	3.0	842	1.6	850	1.6
35	E. Java	8,011	13.1	9,101	17.1	9,291	16.9
36	Banten	1,774	2.9	2,227	4.2	2,325	4.2
51	Bali	1,714	2.8	827	1.6	861	1.6
	Sub-total	29,416	48.3	33,093	62.3	33,910	61.8
	Kalimantan						
61	W. Kalimantan	1,766	2.9	983	1.9	1,046	1.9
62	C. Kalimantan	1,030	1.7	549	1.0	591	1.1
63	S. Kalimantan	1,584	2.6	815	1.5	857	1.6
64	E. Kalimantan	1,002	1.6	647	1.2	696	1.3
	Sub-total	5,382	8.8	2,994	5.6	3,190	5.8
	Sulawesi						
71	N. Sulawesi	1,052	1.7	541	1.0	572	1.0
72	C. Sulawesi	1,054	1.7	570	1.1	594	1.1
73	S. Sulawesi	1,906	3.1	1,696	3.2	1,732	3.2
74	S. E. Sulawesi	990	1.6	445	0.8	464	0.9
75	Gorontalo	711	1.2	188	0.4	199	0.4
76	W. Sulawesi	528	0.9	214	0.4	214	0.4
	Sub-total	6,241	10.3	3,654	6.9	3,774	6.9
	Others						
52	W. Nusa Tenggara	1,975	3.2	1,136	2.1	1,163	2.1
53	E. Nusa Tenggara	1,518	2.5	828	1.6	809	1.5
81	Maluku	604	1.0	216	0.4	251	0.5
82	Maluku Utara	450	0.7	171	0.3	191	0.4
91	W. Papua	358	0.6	144	0.3	142	0.3
94	Papua	806	1.3	376	0.7	372	0.7
	Sub-total	5,711	9.4	2,872	5.4	2,928	5.4
	Total	60,947	100.0	53,104	100.0	54,853	100.0

Table 2. Inequality Decomposition by Urban and Rural Sectors

	Theil L		Theil T		Mean	Expend. Share %
	Value	% Contri.	Value	% Contri.		
2008						
Urban	0.213	46.9	0.242	57.8	510,191	60.3
Rural	0.148	36.5	0.180	28.3	298,795	39.7
W-sector	0.178	83.3	0.218	86.1		
B-sector (A)	0.036	16.7	0.035	13.9		
Total	0.214	100.0	0.253	100.0	398,390	
B-sector (B)	0.036	26.8	0.035	28.5		
Max B-sector	0.133	100.0	0.123	100.0		
2010						
Urban	0.233	47.6	0.264	60.1	571,949	60.5
Rural	0.159	36.4	0.177	26.3	331,722	39.5
W-sector	0.194	84.0	0.230	86.3		
B-sector (A)	0.037	16.0	0.036	13.7		
Total	0.231	100.0	0.266	100.0	444,802	
B-sector (B)	0.037	25.2	0.036	26.8		
Max B-sector	0.147	100.0	0.136	100.0		

Table 3. Inequality Decomposition by Region

	Theil L		Theil T		Mean	Expend. Share%
	Value	% Contri.	Value	% Contri.		
2008						
Sumatra	0.178	16.4	0.206	16.9	418,305	20.7
Java-Bali	0.224	65.3	0.270	66.8	399,572	62.5
Kalimantan	0.196	5.2	0.231	6.0	464,031	6.6
Sulawesi	0.196	6.3	0.216	5.0	336,474	5.8
Others	0.214	5.4	0.241	4.2	322,384	4.4
W-region	0.211	98.6	0.250	98.8		
B-region (A)	0.003	1.4	0.003	1.1		
Total	0.214	100.0	0.253	100.0	398,390	
B-region (B)	0.003	2.0	0.003	2.1		
Max B-region	0.147	100.0	0.136	100.0		
2010						
Sumatra	0.195	17.0	0.228	17.9	460,819	20.9
Java-Bali	0.236	63.4	0.278	63.9	441,558	61.4
Kalimantan	0.217	5.5	0.242	6.2	519,553	6.8
Sulawesi	0.252	7.5	0.267	6.5	417,124	6.5
Others	0.256	5.9	0.291	4.9	376,151	4.5
W-region	0.229	99.2	0.265	99.4		
B-region (A)	0.002	0.8	0.002	0.6		
Total	0.231	100.0	0.266	100.0	444,802	
B-region (B)	0.002	0.9	0.002	0.8		
Max B-region	0.192	100.0	0.216	100.0		

Table 4. Inequality Decomposition by Province

	Theil L		Theil T	
	Value	% Contri.	Value	% Contri.
2008				
W-province	0.186	87.0	0.221	87.4
B-province (A)	0.028	13.0	0.032	12.6
Total	0.214	100.0	0.253	100.0
B-province (B)	0.028	13.3	0.032	13.7
Max B-province	0.208	100.0	0.232	100.0
2010				
W-province	0.204	88.4	0.236	88.7
B-province (A)	0.027	11.6	0.030	11.3
Total	0.231	100.0	0.266	100.0
B-province (B)	0.027	11.9	0.030	12.2
Max B-province	0.225	100.0	0.247	100.0

Table 5. Mean Per Capita Household Expenditure by Province

2008			2010		
Code	Province	Mean Expenditure	Code	Province	Mean Expenditure
53	E. Nusa Tenggara	252,740	53	E. Nusa Tenggara	287,608
75	Gorontalo	289,508	33	C. Java	359,946
74	S. E. Sulawesi	301,764	76	W. Sulawesi	361,711
52	W. Nusa Tenggara	308,513	35	E. Java	363,816
33	C. Java	318,481	18	Lampung	365,423
76	W. Sulawesi	319,820	52	W. Nusa Tenggara	370,343
18	Lampung	337,579	81	Maluku	372,490
81	Maluku	339,884	75	Gorontalo	376,039
73	S. Sulawesi	340,434	74	S. E. Sulawesi	403,894
35	E. Java	344,888	72	C. Sulawesi	405,564
72	C. Sulawesi	350,358	17	Bengkulu	418,127
71	N. Sulawesi	360,913	61	W. Kalimantan	418,339
61	W. Kalimantan	369,944	73	S. Sulawesi	420,309
91	W. Papua	378,218	15	Jambi	431,004
17	Bengkulu	386,565	16	S. Sumatra	436,406
16	S. Sumatra	387,047	11	Aceh	443,279
15	Jambi	400,499	32	W. Java	445,398
34	Yogyakarta	403,091	91	W. Papua	457,388
32	W. Java	407,516	34	Yogyakarta	458,143
11	Aceh	409,170	71	N. Sulawesi	465,271
12	N. Sumatra	414,703	12	N. Sumatra	465,918
13	W. Sumatra	424,191	62	C. Kalimantan	478,296
94	Papua	426,002	13	W. Sumatra	484,353
51	Bali	439,615	94	Papua	488,691
62	C. Kalimantan	441,802	82	Maluku Utara	512,028
82	Maluku Utara	454,741	51	Bali	529,037
63	S. Kalimantan	462,947	63	S. Kalimantan	532,738
36	Banten	471,762	14	Riau	574,037
14	Riau	547,841	36	Banten	582,890
19	Bangka Belitung	559,465	19	Bangka Belitung	596,402
21	Kepulauan Riau	574,517	21	Kepulauan Riau	635,039
64	E. Kalimantan	627,227	64	E. Kalimantan	690,425
31	Jakarta	881,770	31	Jakarta	935,986
	Total	398,390		Total	444,802
	Ratio (Max/Min)	3.5			3.3

Table 6-1. Inequality Decomposition by Urban and Rural Sectors for Each Region in 2008

	Theil L		Theil T		Mean	Pop. Share %	Exp. Share %
	Value	% Contri.	Value	% Contri.			
Sumatra							
Urban	0.183	38.8	0.204	46.9	528,283	37.6	47.5
Rural	0.143	50.0	0.170	43.2	351,909	62.4	52.5
W-sector	0.158	88.8	0.186	90.2			
B-sector (A)	0.020	11.2	0.020	9.8			
Total	0.178	100.0	0.206	100.0	418,305		
B-sector (B)	0.020	17.5	0.020	17.8			
Max B-sector	0.114	100.0	0.114	100.0			
Java-Bali							
Urban	0.219	53.1	0.253	64.0	503,264	54.2	68.3
Rural	0.136	27.7	0.177	20.8	276,719	45.8	31.7
W-sector	0.181	80.8	0.229	84.8			
B-sector (A)	0.043	19.2	0.041	15.2			
Total	0.224	100.0	0.270	100.0	399,572		
B-sector (B)	0.043	33.2	0.041	35.8			
Max B-sector	0.130	100.0	0.115	100.0			
Kalimantan							
Urban	0.210	42.0	0.246	55.7	620,482	39.2	52.5
Rural	0.129	40.0	0.140	28.8	362,984	60.8	47.5
W-sector	0.161	82.1	0.196	84.5			
B-sector (A)	0.035	17.9	0.036	15.5			
Total	0.196	100.0	0.231	100.0	464,031		
B-sector (B)	0.035	28.5	0.036	29.7			
Max B-sector	0.123	100.0	0.120	100.0			
Sulawesi							
Urban	0.182	28.4	0.188	37.4	475,916	30.4	43.0
Rural	0.153	54.5	0.176	46.3	275,541	69.6	57.0
W-sector	0.162	82.8	0.181	83.7			
B-sector (A)	0.034	17.2	0.035	16.3			
Total	0.196	100.0	0.216	100.0	336,474		
B-sector (B)	0.034	26.0	0.035	26.3			
Max B-sector	0.129	100.0	0.134	100.0			
Others							
Urban	0.213	29.1	0.222	38.7	464,046	29.2	42.0
Rural	0.165	54.5	0.190	45.8	264,053	70.8	58.0
W-sector	0.179	83.6	0.204	84.6			
B-sector (A)	0.035	16.4	0.037	15.4			
Total	0.214	100.0	0.241	100.0	322,384		
B-sector (B)	0.035	24.2	0.037	24.0			
Max B-sector	0.145	100.0	0.155	100.0			

Table 6-2. Inequality Decomposition by Urban and Rural Sectors for Each Region in 2010

	Theil L		Theil T		Mean	Pop. Share %	Exp. Share %
	Value	% Contri.	Value	% Contri.			
Sumatra							
Urban	0.203	40.0	0.241	52.2	597,042	38.3	49.6
Rural	0.147	46.7	0.164	36.3	376,435	61.7	50.4
W-sector	0.169	86.7	0.202	88.5			
B-sector (A)	0.026	13.3	0.026	11.5			
Total	0.195	100.0	0.228	100.0	460,819		
B-sector (B)	0.026	20.8	0.026	21.3			
Max B-sector	0.124	100.0	0.124	100.0			
Java-Bali							
Urban	0.237	54.3	0.271	66.6	556,562	54.2	68.3
Rural	0.141	27.4	0.162	18.5	305,574	45.8	31.7
W-sector	0.193	81.7	0.236	85.1			
B-sector (A)	0.043	18.3	0.041	14.9			
Total	0.236	100.0	0.278	100.0	441,558		
B-sector (B)	0.043	30.8	0.041	33.4			
Max B-sector	0.140	100.0	0.124	100.0			
Kalimantan							
Urban	0.214	38.1	0.233	50.7	708,668	38.6	52.6
Rural	0.154	43.6	0.166	32.6	400,685	61.4	47.4
W-sector	0.177	81.7	0.201	83.3			
B-sector (A)	0.040	18.3	0.040	16.7			
Total	0.217	100.0	0.242	100.0	519,553		
B-sector (B)	0.040	28.2	0.040	29.4			
Max B-sector	0.141	100.0	0.137	100.0			
Sulawesi							
Urban	0.238	28.7	0.240	39.5	602,367	30.4	43.9
Rural	0.203	56.1	0.216	45.4	336,328	69.6	56.1
W-sector	0.213	84.8	0.226	84.9			
B-sector (A)	0.038	15.2	0.040	15.1			
Total	0.252	100.0	0.267	100.0	417,124		
B-sector (B)	0.038	23.2	0.040	23.6			
Max B-sector	0.165	100.0	0.171	100.0			
Others							
Urban	0.271	30.5	0.296	42.0	540,452	28.8	41.4
Rural	0.202	56.2	0.227	45.6	309,648	71.2	58.6
W-sector	0.222	86.7	0.255	87.6			
B-sector (A)	0.034	13.3	0.036	12.4			
Total	0.256	100.0	0.291	100.0	376,151		
B-sector (B)	0.034	19.6	0.036	19.4			
Max B-sector	0.174	100.0	0.185	100.0			

Table 7-1. Inequality Decomposition by Educational Attainment Level in Urban Sector

	Theil L		Theil T				
	Value	% Contri.	Value	% Contri.	Mean	Pop. Share %	Expend. Share %
2008							
No education	0.136	13.1	0.151	8.3	330,823	20.5	13.3
Primary	0.140	15.0	0.157	11.1	384,322	22.8	17.2
Junior secondary	0.160	11.4	0.189	10.7	462,898	15.2	13.8
Senior secondary	0.161	23.0	0.174	25.0	585,135	30.3	34.8
Tertiary	0.209	11.0	0.232	20.1	956,729	11.2	21.0
W-group	0.156	73.5	0.182	75.3			
B-group (A)	0.056	26.5	0.060	24.7			
Total	0.213	100.0	0.242	100.0	510,191	100.0	100.0
B-group (B)	0.056	29.3	0.060	29.8			
Max B-group	0.192	100.0	0.201	100.0			
2010							
No education	0.167	14.8	0.214	10.8	372,462	20.5	13.4
Primary	0.161	16.2	0.176	11.7	428,090	23.5	17.6
Junior secondary	0.161	10.4	0.171	8.5	501,139	15.1	13.2
Senior secondary	0.183	23.4	0.201	26.4	663,559	29.9	34.6
Tertiary	0.204	9.7	0.229	18.4	1,097,547	11.0	21.2
W-group	0.173	74.4	0.201	75.8			
B-group (A)	0.060	25.6	0.064	24.2			
Total	0.233	100.0	0.264	100.0	571,949	100.0	100.0
B-group (B)	0.060	28.2	0.064	29.2			
Max B-group	0.212	100.0	0.2187	100.0			

Table 7-2. Inequality Decomposition by Educational Attainment Level in Rural Sector

	Theil L		Theil T				
	Value	% Contri.	Value	% Contri.	Mean	Pop. Share %	Expend. Share %
2008							
No education	0.118	33.2	0.131	26.2	258,143	41.6	36.0
Primary	0.134	30.3	0.186	32.7	284,482	33.3	31.7
Junior secondary	0.134	10.4	0.150	10.5	328,159	11.5	12.6
Senior secondary	0.151	11.1	0.167	13.6	402,351	10.8	14.6
Tertiary	0.183	3.4	0.232	6.6	557,075	2.7	5.1
W-group	0.130	88.4	0.161	89.5			
B-group	0.017	11.6	0.019	10.5			
Total	0.148	100.0	0.180	100.0	298,795	100.0	100.0
B-group	0.017	13.1	0.019	12.8			
Max B-group	0.130	100.0	0.149	100.0			
2010							
No education	0.133	33.8	0.147	28.9	286,206	40.4	34.8
Primary	0.135	29.4	0.150	27.4	312,083	34.5	32.4
Junior secondary	0.151	11.0	0.166	11.9	365,641	11.5	12.7
Senior secondary	0.164	11.1	0.175	14.3	448,411	10.8	14.5
Tertiary	0.173	3.1	0.191	5.9	637,377	2.8	5.5
W-group	0.140	88.4	0.157	88.4			
B-group	0.018	11.6	0.021	11.6			
Total	0.159	100.0	0.177	100.0	331,722	100.0	100.0
B-group	0.018	13.1	0.021	13.2			
Max B-group	0.141	100.0	0.157	100.0			

Table 8. Blinder-Oaxaca Decomposition of Urban-Rural Difference in Mean Per Capital Expenditure in 2008 and 2010: Twofold Decomposition

	Coefficient	Std. Err.	z	Contribution
2008				
Prediction (Urban)	12.973	0.004	3,214.9	
Prediction (Rural)	12.482	0.003	4,660.7	
Difference (Urban - Rural)	0.492	0.005	101.5	100.0%
Explained				
hhsize	-0.008	0.001	-6.8	-1.7%
male	0.000	0.000	1.5	0.0%
age	-0.017	0.003	-6.8	-3.5%
age2	0.015	0.002	6.9	3.0%
edyear	0.175	0.003	65.1	35.5%
wkcat	0.062	0.002	27.4	12.7%
Explained total	0.226	0.003	68.0	46.0%
Unexplained				
Unexplained total	0.265	0.005	55.8	54.0%
2010				
Differential				
Prediction (Urban)	13.071	0.004	3,072.9	
Prediction (Rural)	12.574	0.003	4,413.6	
Difference (Urban - Rural)	0.496	0.005	97.0	100.0%
Explained				
hhsize	-0.012	0.001	-8.8	-2.4%
male	0.000	0.000	1.8	0.0%
age	-0.007	0.003	-2.3	-1.4%
age2	0.008	0.003	3.3	1.7%
edyear	0.181	0.003	64.8	36.5%
wkcat	0.069	0.002	28.7	13.9%
Explained total	0.239	0.004	67.4	48.2%
Unexplained				
Unexplained total	0.257	0.005	51.0	51.8%

Table 9. Inequality Decomposition by Expenditure Components in 2008

Exp. Items	Urban					Rural				
	Exp. Share (%)	C. Ratio	Gini	R.C. Ratio	% Contrib.	Exp. Share (%)	C. Ratio	Gini	R.C. Ratio	% Contrib.
	wk	Ck	Gk	gk	wk*gk	wk	Ck	Gk	gk	wk*gk
All expenditure										
Food	44.6	0.23	0.26	0.62	27.8	58.1	0.22	0.24	0.71	41.2
Non-food	55.4	0.47	0.49	1.30	72.2	41.9	0.43	0.46	1.40	58.8
Total	100.0	0.36	0.36	1.00	100.0	100.0	0.31	0.31	1.00	100.0
Non-food expenditure										
15	43.1	0.43	0.47	0.89	38.3	42.1	0.34	0.40	0.75	31.7
16	26.8	0.58	0.64	1.19	31.9	25.8	0.67	0.74	1.46	37.6
17	8.5	0.50	0.73	1.04	8.8	6.0	0.44	0.76	0.96	5.7
18	9.3	0.44	0.57	0.91	8.4	10.8	0.40	0.52	0.87	9.4
19	6.8	0.38	0.50	0.77	5.2	9.5	0.35	0.47	0.76	7.2
20	2.7	0.61	0.73	1.25	3.4	1.8	0.55	0.75	1.20	2.2
21	2.9	0.67	0.94	1.37	4.0	4.1	0.70	0.94	1.53	6.3
Total	100.0	0.49	0.49	1.00	100.0	100.0	0.46	0.46	1.00	100.0

(Notes)
(1) C. Ratio: Concentration Ratio; R.C.: Relative Concentration Ratio
(2) Non-food expenditure items
15. Housing, water, electricity, gas & fuel
16. Transportation, communication & financial services
17. Education, recreation & sport
18. Health services
19. Clothing
20. Tax & insurance
21. Religion & party

Appendix

Table A1. Inequality Decomposition by Expenditure Components in 2008

Exp. Items	Urban					Rural				
	Exp. Share (%)	C. Ratio	Gini	R.C. Ratio	% Contrib.	Exp. Share (%)	C. Ratio	Gini	R.C. Ratio	% Contrib.
	wk	Ck	Gk	gk	wk*gk	wk	Ck	Gk	gk	wk*gk
1	7.7	0.04	0.20	0.11	0.8	15.9	0.07	0.21	0.23	3.6
2	2.7	0.29	0.60	0.79	2.1	3.6	0.31	0.63	1.02	3.7
3	0.9	0.10	0.67	0.28	0.3	1.8	0.23	0.63	0.76	1.4
4	1.9	0.41	0.70	1.12	2.1	1.7	0.44	0.84	1.44	2.5
5	3.3	0.35	0.60	0.97	3.2	2.6	0.38	0.64	1.25	3.3
6	3.4	0.14	0.35	0.38	1.3	5.6	0.18	0.33	0.58	3.2
7	1.3	0.09	0.47	0.24	0.3	1.7	0.15	0.56	0.48	0.8
8	2.3	0.37	0.57	1.01	2.3	2.6	0.35	0.61	1.15	2.9
9	1.7	0.11	0.33	0.29	0.5	2.9	0.15	0.32	0.50	1.5
10	4.3	0.30	0.44	0.83	3.6	4.5	0.25	0.39	0.80	3.6
11	1.1	0.15	0.40	0.41	0.4	1.7	0.18	0.39	0.58	1.0
12	0.3	0.32	0.82	0.87	0.3	0.3	0.34	0.88	1.12	0.3
13	9.5	0.32	0.48	0.88	8.4	7.0	0.31	0.53	1.02	7.1
14	4.3	0.20	0.64	0.54	2.3	6.1	0.31	0.61	1.01	6.2
15	23.9	0.42	0.47	1.17	27.9	17.7	0.33	0.40	1.07	18.9
16	14.9	0.56	0.64	1.54	22.9	10.8	0.62	0.74	2.04	22.1
17	4.7	0.47	0.73	1.30	6.1	2.5	0.36	0.76	1.19	3.0
18	5.1	0.43	0.57	1.18	6.0	4.5	0.37	0.52	1.22	5.5
19	3.8	0.38	0.50	1.05	3.9	4.0	0.34	0.47	1.12	4.5
20	1.5	0.60	0.73	1.64	2.5	0.8	0.51	0.75	1.66	1.3
21	1.6	0.64	0.94	1.75	2.8	1.7	0.65	0.94	2.11	3.6
Total	100.0	0.36	0.36	1.00	100.0	100.0	0.31	0.31	1.00	100.0

(Note)

	Food Expenditure Items		Non-food Expenditure Items
1	Rice & rice products	15	Housing, water, electricity, gas & fuel
2	Fresh fish	16	Transportation, communication & financial services
3	Preserved fish	17	Education, recreation & sport
4	Meat & meat products	18	Health
5	Egg, milk & their products	19	Clothing
6	Vegetables	20	Tax & insurance
7	Beans	21	Religion & party
8	Fruit		
9	Cooking oil & fat		
10	Non-alcoholic beverage		
11	Spices		
12	Other foodstuff		
13	Prepared food		
14	Tobacco & alcoholic beverage		

Table A2. Blinder-Oaxaca Decomposition of Urban-Rural Difference in Mean Per Capita Expenditure in 2008 and 2010: Threefold Decomposition

	Coefficient	Std. Err.	z	Contribution
2008				
Prediction (Urban)	12.973	0.004	3,214.6	
Prediction (Rural)	12.482	0.003	4,660.4	
Difference	0.492	0.005	101.5	100.0%
Endowments				
hhsize	-0.009	0.001	-6.8	-1.8%
male	-0.001	0.000	-3.3	-0.1%
age	-0.019	0.003	-6.7	-4.0%
age2	0.019	0.003	7.0	3.8%
edyear	0.133	0.003	50.3	27.1%
wkcat	0.060	0.003	23.8	12.1%
Endowment Total	0.183	0.003	53.3	37.2%
Coefficients				
hhsize	0.033	0.010	3.1	6.7%
male	0.150	0.015	10.0	30.4%
age	-0.378	0.087	-4.4	-76.8%
age2	0.291	0.044	6.6	59.1%
edyear	0.165	0.006	25.5	33.5%
wkcat	0.027	0.004	6.1	5.5%
_cons	-0.096	0.048	-2.0	-19.5%
Coefficient Total	0.192	0.006	29.8	38.9%
Interaction				
Interaction Total	0.118	0.006	20.5	23.9%
2010				
Differential				
Prediction (Urban)	13.071	0.004	3,072.6	
Prediction (Rural)	12.574	0.003	4,413.3	
Difference	0.496	0.005	97.0	100.0%
Endowments				
hhsize	-0.013	0.001	-8.8	-2.6%
male	-0.001	0.000	-3.4	-0.1%
age	-0.008	0.003	-2.3	-1.5%
age2	0.010	0.003	3.3	2.0%
edyear	0.140	0.003	50.8	28.2%
wkcat	0.065	0.003	24.6	13.0%
Endowment Total	0.193	0.004	52.9	38.9%
Coefficients				
hhsize	0.061	0.011	5.5	12.2%
male	0.137	0.015	9.0	27.6%
age	-0.328	0.100	-3.3	-66.0%
age2	0.278	0.051	5.5	56.0%
edyear	0.168	0.007	24.9	33.9%
wkcat	0.034	0.005	7.1	6.8%
_cons	-0.173	0.055	-3.2	-34.9%
Coefficient Total	0.176	0.007	26.1	35.5%
Interaction				
Interaction Total	0.127	0.006	21.2	25.6%

[1] See, for example, Esmara (1975), Uppal and Budiono (1986), Akita (1988), Azis (1990), Akita and Lukman (1995), Garcia and Soelistianingsih (1998), Akita and Lukman (1999), Skoufias (2001), Tadjoeddin, Suharyo and Mishra (2001), Akita and Alisjahbana (2002), Milanovic (2005), Resosudarmo and Vidyattama (2006), Hill (2008), Hill, Resosudarmo and Vidyattama (2008), McCulloch and Sjahrir (2008), Akita, Kurniawan, and Miyata (2011).

[2] According to the *Susenas* panel data from 2008 to 2010, the Gini coefficient rose from 0.362 to 0.376. This increase is statistically significant based on the bootstrap standard error.

[3] Based on the bootstrap standard error, the 95% confidence interval is 0.233-0.252 for urban inequality and 0.148-0.212 for rural inequality in 2008.

[4] For a comprehensive review of the Blinder-Oaxaca decomposition method and its applications, please see Jann (2008).

[5] The number of years of education is calculated according to the following: no schooling (0 year); incomplete primary school (3 years); general and Islamic primary schools (6 years); general and Islamic junior high schools (9 years); general, Islamic and vocational senior high schools (12 years); diploma I and II (13 years); diploma III (15 years); diploma IV (Bachelor's degree) (16 years); and master's or doctor's degree (18 years).

[6] The estimated urban-rural difference in mean per capita expenditure can also be decomposed into the three terms as follows (threefold decomposition):

$$\hat{D} = \overline{Y}_U - \overline{Y}_R = (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'\hat{\boldsymbol{\beta}}_R + \overline{\boldsymbol{X}}_R'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}_R) + (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}_R) \quad \text{or}$$

$$\hat{D} = \overline{Y}_U - \overline{Y}_R = (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'\hat{\boldsymbol{\beta}}_U + \overline{\boldsymbol{X}}_U'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}_R) - (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}_R).$$

Table A2 in the Appendix presents the decomposition result based on the first equation. The first term reflects the mean increase in rural households' per capita expenditures if they had the same characteristics as urban households (endowments effect), while the second term presents the increase in rural households' per capita expenditures when applying the urban households' coefficients to the rural households' characteristics. The third component is the interaction term. According to the result in Table A2, differences in endowments as a whole account for 37% of the urban-rural expenditure gap, while differences in coefficients account for 39% in 2008. Similar to the result based on the twofold decomposition, differences in educational attainments and job type play an important role in the gap.

[7] See Table A1 in the Appendix for a list of food and non-food items in the *Susenas* dataset.

[8] See Table A1 in the Appendix for the result of the decomposition for all food and non-food items.