インドネシアにおける1990年から2002年までの所得格差の┌態

ー政府統計*Susenas*の支出ミクロデ┌タに基づく┌証分析ー

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PATTERNS OF INCOME INEQUALITY IN INDONESIA 1990-2002:

An Empirical Analysis Based on the Expenditure Micro-data set of *Susenas*

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The purpose of this research is to carry out an analysis of income inequality approached by consumption-expenditure per capita, trying to identify how much inequality there is. It determines the pattern of income inequality over the period 1990-2002, and examines the sources of income inequality through disaggregating the inequality indices. By means of SAS® program version 8.2, based on three-year-span micro data set drawn from *Susenas,* the Gini coefficient - a tool selected for inequality measurement in this paper – is calculated. In order to conceptualizing and measuring inequality, two essential graphic analytical tools such as Lorenz curve and Cumulative frequency distribution are presented.

The main findings are, first, overall income inequality has been increasing both before and after economic crisis periods. Second, urban inequality was higher not only than rural inequality but also than overall inequality. Third, population changes or urbanization positively affected inequality to increase.

Income Distribution, Inequality, Government Statistics, Gini Index, Lorenz Curve.

INTRODUCTION

As one of the developing countries, Indonesia experienced high economic growth in the two decades of 1970s and 1980s. It was often said that Indonesia was one of the highest performing economies in Asia. In line with this, problems related to income distribution attracted much attention in this country. How is the gain from economic growth distributed among individuals? The economic crisis of the late 1997, however, turned Indonesia from an economy of positive growth into one of negative growth. Then, a second question arose: did the crisis increase the inequality of income distribution? This country still consists largely of rural area, and is in the process of urbanization, which changes sectoral income differentials. This process of urbanization may deteriorate the nation's income distribution; it is for this reason that we decompose the country into urban and rural areas to analyze changes in income distribution. The Inverted-U Hypothesis of Kuznet may be useful to understand Indonesian experiences. The purpose of this paper is to give a broad picture of distribution of income and level of inequality in Indonesia before and after the economic crisis of 1997, and propose some hypotheses explaining the statistical findings.

More specifically, we analyze the inequality of Indonesia using techniques of modern statistical analysis, in order to assess contributions of different population subgroups to the overall inequality, to determine the pattern of income inequality at the national level and provincial level, and to show the pattern of changes in inequality. By doing so, we propose a tentative conclusion that

trend of income distribution in Indonesia is explained by inequality in urban area and population movement from rural to urban area.

Setting period of observations from 1990 to 2002, we come across one problem that deserves particular attention. That is, East Timor no longer belongs to this country in 1999. It is for this reason that we recalculated inequality indices for the whole period excluding East Timor. This exclusion accounts partly for the differences between earlier figures and ours.

The rest of this paper is divided into four sections. Section 1 explains the nature of the data used in this analysis. After presenting formulae defining alternative measures of inequality and their decomposition in Section 2, we report, in Section 3, on the statistical findings in detail, with some hypotheses explaining these results. Finally, in the last section, we summary the results on the basis of the main findings revealed by dividing Indonesia into urban and rural areas.

1. DATA

Using household as the unit of analysis, this research is done on the basis of the micro-data set drawn from the household survey undertaken by BPS-Statistics Indonesia. The series of national socio-economic surveys, known by the Indonesian acronym *Susenas* were the most frequently used source for nationwide studies of income distribution relying on household consumption expenditure data since this survey is the only source of information on household expenditures covering the whole of Indonesia. Consumption expenditure data is used as a proxy of measuring society's income distribution, even though it is acknowledged that such a way in fact has a serious demerit. The use of consumption expenditure data can underestimate income. However, because income data collection in Indonesia is still relatively difficult, so the use of household consumption expenditure data is still regarded as an alternative with the reason that as we know that there two kinds of income; namely, (a) income in cash and (b) income in kind; this survey in collecting the consumption expenditure data also takes the original source of expenditure into consideration, such as (a) purchase or (b) self-produce especially in food-consumption items.

The BPS-Statistics Indonesia has been carrying out this survey since the first time in 1963 which covered only some parts of Indonesian territory. The 1963 *Susenas* covered only Java island composed of five provinces at that time and the number of household sample was around 16,000. Nevertheless, the number of sample size gradually increased. The purpose of increasing sample size is that the sample might be able to represent all parts of the country. With a number of households in the sample (49,000 in 1990; 65,600 in 1993; 65,664 in 1996; 49,248 in 1999; and 62,720 in 2002), the survey is capable of obtaining both national and provincial level estimates.

Susenas questionnaire -- consumption module questionnaire -- covers two parts of expenditure items; namely, food and non-food group. Food category is comprised from about 200 items whereas a total number of about 100 item is included in the non-food group. They are 205, 203, 216, 214, and 216 for food items and 97, 103, 103, 105, and 105 for non-food items in 1990, 1993, 1996, 1999, and 2002 questionnaire, respectively. In the case of food consumption, *Susenas* provides information on the original source of consumption. It records whether a consumed foodstuff is initially market purchased, own-produced or received as a gift. It was collected information on quantity and money value for items on food category whereas on non-food category items, information gathered was related only to money value.

2. METHODOLOGY

2.1 Inequality Measures

Income[1] inequality measures for individuals are examined by adjusting the total consumption-expenditure of a household with the number of its member (size). Hence, the living standards among

[1]In this paper, income is approached by consumption-expenditure. Therefore, the terms of income/expenditure will be used interchangeably throughout the rest of the discussion.

the households are the same. If the total consumption expenditure is not adjusted by the household size, then if two households have the same level of consumption-expenditure but one household has a size twice as large as the other, individuals in the household with a smaller size have access to a higher level of spending.

In order to gauge the level of income inequality and its changes over time, we need to have an appropriate yardstick. By considering desirable properties that index of inequality should have, such as *mean independence* (*income-zero-homogeneity*), *population size independence*, and the *Pigou-Dalton principle of transfers* (Bourguignon 1979; Shorrocks 1980), we use four inequality measures.

The Gini coefficient which is sensitive to changes in the middle-income range satisfies all properties above. It is the best single measure of inequality due to its easy interpretation and the most widely used one. This, which is derived from the Lorenz curve approach, is the ratio of area between the 45 degree line and the Lorenz curve to the total area under the 45 degree line. Suppose there are n individuals (or households) who are labeled in non-descending order to income as: $y_1 \le y_2 \ldots \le y_n$. Let μ be its mean, F_i be the cumulative population share and Q_i be the cumulative income share corresponding to individual i ($i = 1,2,\ldots,n$). $F_0 = Q_0 = 0$. $F_i = \frac{i}{n}$ and $Q_i = \frac{1}{n\mu}\sum_{k=1}^{i} y_k$ for $i = 0,1,\ldots,n$. Figure 1 illustrates the Lorenz curve for the discrete income distribution $y = (y_1, y_2, \ldots, y_n)$. The shaded area below the Lorenz curve shows a typical segment of the area below the Lorenz curve which is the area of all shaded area (square area) minus the shaded area of the triangle above the Lorenz curve

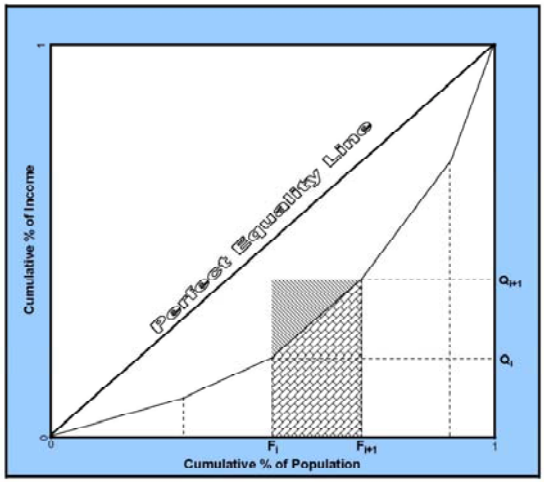


Figure 1. The Lorenz Curve for a Discrete Income Distribution

$$= Q_{i+1}(F_{i+1} - F_i) - \frac{1}{2}(Q_{i+1} - Q_i)(F_{i+1} - F_i) = \left\{Q_{i+1} - \frac{1}{2}(Q_{i+1} - Q_i)\right\}(F_{i+1} - F_i).$$

Therefore, the total area below the Lorenz curve $= \sum_{i=0}^{n-1}\left\{Q_{i+1} - \frac{1}{2}(Q_{i+1} - Q_i)\right\}(F_{i+1} - F_i)$. As a result; the Gini coefficient will be equation (1).

The Gini index ranges between 0 and 1, with inequality increasing with an increasing index: 0 stands for completely equal distribution of income, whereas 1 refers to the extreme situation of one household/individual holding the total population income, and all the rest having no income at all.

$$G = 1 - \left\{\frac{\sum_{i=0}^{n-1}\left\{Q_{i+1} - \frac{1}{2}(Q_{i+1} - Q_i)\right\}(F_{i+1} - F_i)}{\frac{1}{2} \times F_n Q_n}\right\}$$

$$= 1 - 2 \times \left\{\frac{\sum_{i=0}^{n-1}\left\{Q_{i+1} - \frac{1}{2}(Q_{i+1} - Q_i)\right\}(F_{i+1} - F_i)}{F_n Q_n}\right\} \quad \ldots (1)$$

Accompanying Gini index, Atkinson index, which is one of the normative [2] measures of inequality, takes the form as equation (2), where ε is an unknown parameter measuring inequality aversion, that is, the relative weights to be attached to persons at different levels of income.

[2]Normative measures are based on welfare economic theory and related to loss of social welfare resulting from the unequal distribution of income so that a higher degree of inequality corresponds to a lower level of social welfare for a given total income.

In addition to Gini and Atkinson, two Generalized Entropy measures, Theil-T and Theil-L, are also applied. According to Anand (1983), they are defined, respectively, as equation (3) and equation (4), where: where m is arithmetic mean income of the population.

$$I_A = 1 - \left[\frac{1}{n} \sum_{j=1}^{n} \left(\frac{y_j}{\overline{y}} \right)^{1-\varepsilon} \right]^{\frac{1}{1-\varepsilon}} \quad \ldots (2)$$

$$T = \frac{1}{n} \sum_{j=1}^{n} \frac{y_j}{m} \log\left(\frac{y_j}{m} \right) \ldots (3)$$

$$L = \frac{1}{n} \sum_{j=1}^{n} \log\left(\frac{m}{y_j} \right) \ldots (4)$$

2.2 Decomposition

Decomposition refers to determination of the contribution of each of several constituent parts to the total. Constituent parts might be subsets of components or geographic regions. There are two types of decompositions: (a). *Decomposition by Population Subgroups* which considers a partition of the population into disjoint subgroups of households or persons and (b). *Decomposition by Factor Components* which considers total income of each individual or household as the sum of amounts earned from different sources. This paper deals only with the former.

Supposing that the population is grouped into mutually exclusive and collectively exhaustive socioeconomic groups, the decomposition for Theil-T and Theil-L into *within-group* and *between-group* components are as in the equations (5) and (6), where n_i is number of households belonging to the i group, m_i is arithmetic mean income of the i group, T_i is the Theil-T index in equation (3) corresponding to the i household group, L_i is the Theil-L index in equation (4) corresponding to the i household group.

$$T = \sum_{i=1}^{G} \left(\frac{n_i}{n} \frac{m_i}{m} \right) T_i + \sum_{i=1}^{G} \left(\frac{n_i}{n} \frac{m_i}{m} \right) \log\left(\frac{m_i}{m} \right) \ldots (5)$$

$$L = \underbrace{\sum_{i=1}^{G} \left(\frac{n_i}{n} \right) L_i}_{within-group} + \underbrace{\sum_{i=1}^{G} \left(\frac{n_i}{n} \right) \log\left(\frac{m}{m_i} \right)}_{between-group} \ldots (6)$$

Let $f_i = \frac{n_i}{n}$ be the population share of the i group and $\lambda_i = \frac{m_i}{m}$ be arithmetic income share of the i group. Then equations (5) and (6) can be rewritten, respectively, as equation (7) and equation (8).

$$T = \sum_{i=1}^{G} (f_i \lambda_i) T_i + \sum_{i=1}^{G} f_i \lambda_i \log \lambda_i \ldots (7)$$

$$L = \sum_{i=1}^{G} f_i L_i - \sum_{i=1}^{G} f_i \log \lambda_i \ldots (8)$$

The first term on the right side of equations (7) and (8) refers to the *within-group* component whereas the second term can be regarded as the *between-group* component, explaining that the inequality is solely caused by differences in the subgroup mean income. Theil-L uses population share while Theil-T uses income share as a weight.

$$\Delta L = \sum_{i=1}^{G} f_i \Delta L_i + \sum_{i=1}^{G} L_i \Delta f_i - \sum_{i=1}^{G} \log \lambda_i \Delta f_i - \sum_{i=1}^{G} f_i \Delta \log \lambda_i \ldots (9)$$

In order to examine the extent to which the changes in different factors contributed to changes in aggregate inequality, only Theil-L index is applied. Following Mookherjee and Shorrocks (1982), applying the difference operator to both sides of equation (8) gives equation (9) where Δ represents the change in the variable from period t to period $t+1$. Equation (9) decomposes the change in inequality into four terms. The first term refers to "*Pure Inequality Effect*"; the sum of the second and the third term gives "*Demographic Effect*" whereas the last term represents "*Income Effect*". For the computational convenience, Mookherjee and Shorrocks (1982) and Tsakloglou (1993) have proposed an approximation given as the equation (10) where the over-bar represents a simple average.

$$\Delta L = \underbrace{\sum_{i=1}^{G} \overline{f}_i \Delta L_i}_{PureEffect\,(PE)} + \underbrace{\sum_{i=1}^{G} \overline{L}_i \Delta f_i + \sum_{i=1}^{G} \left(\overline{\lambda}_i - \overline{\log \lambda_i} \right) \Delta f_i}_{Demographi\,cEffect\,(DE)} + \underbrace{\sum_{i=1}^{G} \overline{f}_i \left(\overline{\lambda}_i - 1 \right) \Delta \log m_i}_{IncomeEffe\,ct\,(IE)} \ldots (10)$$

2.3 Use of SAS

We have used huge data sets of *Susenas* of five years. To do the same calculation for such data sets, we wrote SAS macro programs. One of such programs for calculating Gini coefficient is given in the Appendix. All the calculations necessary for this paper have been done by SAS.

3. PATTERNS OF INCOME INEQUALITY IN INDONESIA

3.1 Overall Inequality

Table 1 provides a summary of inequality indicators for the period 1990-2002. The table contains information on different inequality measures. In addition to the Gini index, two members of Generalized Entropy Class, and Atkinson Index with three parameters of aversion (0.5, 2, and 4) are also presented. What we can infer from Table 1 is that in 1999 all indices show that the degree of income inequality has the lowest value which reveals that 1999 became the year in which distribution of total household expenditure per capita was most equal, and all indices also show that the total household expenditure per capita was most unevenly distributed in 1996.

Table 1. Income Inequality Indicators

Index	*)	1990	1993	1996	1999	2002
(1)		(2)	(3)	(4)	(5)	(6)
Gini	**E**	**0.3306**	**0.3468**	**0.3630**	**0.3173**	**0.3412**
	I	0.3307	0.3470	0.3632	0.3174	0.3412
Theil T	**E**	**0.2070**	**0.2302**	**0.2624**	**0.1927**	**0.2320**
	I	0.2073	0.2304	0.2626	0.1927	0.2320
Theil L	**E**	**0.1769**	**0.1944**	**0.2143**	**0.1631**	**0.1891**
	I	0.1770	0.1946	0.2145	0.1632	0.1891
Atkinson						
- Epsilon = 0.5	**E**	**0.0909**	**0.0999**	**0.1111**	**0.0843**	**0.0983**
	I	0.0910	0.1000	0.1112	0.0843	0.0983
- Epsilon = 2	**E**	**0.2678**	**0.2876**	**0.3073**	**0.2503**	**0.2798**
	I	0.2680	0.2879	0.3077	0.2505	0.2798
- Epsilon = 4	**E**	**0.4052**	**0.4252**	**0.4452**	**0.3830**	**0.4151**
	I	0.4054	0.4256	0.4459	0.3833	0.4151

Source: Own calculation from the 1990-2002 *Susenas*.

Our estimates for the Gini coefficient in Indonesia as a whole are slightly larger than the previous estimates. For instance, the Gini coefficient calculated by BPS were 0.321, 0.335, 0.355, 0.308, and 0.329 in 1990, 1993, 1996, 1999, and 2002, respectively. For this analysis we will concern with the figures excluding East Timor (E). Table 1 confirms that the evolution of inequality over the period is marked by an increase from 1990 to 1996, a decline from 1996 to 1999, and a subsequent deterioration over the remaining period. The Gini coefficient increased from 0.3306 in 1990 to 0.3468 in 1993 and further increased to 0.3629 in 1996. Gini Coefficient and all other inequality measures show a decreasing trend in 1999. This reduction in income inequality appeared during a period when financial crisis swept into Indonesia in late 1997. The financial crisis has made the Indonesian situation get worse everyday. The effect of the monetary crisis was severe for Indonesia. "...*The monetary crisis affects Indonesia worse than it affects any other countries, because there are also racial problems in Indonesia*..." (Son,n.d.,p.3). In addition, the crisis was also accompanied by a political crisis.

The crisis has turned Indonesia from an economy of positive growth into one of negative growth. GDP growth fell from 8 per cent in 1996 to minus 13 per cent in 1998. Many workers were laid off from their jobs during this period, especially non-agriculture workers. The manufacturing sector fluctuated very violently with the negative growth resulting in a severe contraction of GDP. The bad economic situation resulting from the crisis has caused the people's dissatisfaction to the government. In May 1998, there was a students' movement, which caused the downfall of President Soeharto; Vice President Habibie was pointed as the third president of the Republic of Indonesia, which ruled only for one year, and after that there were many riots. Dissatisfaction about economic condition was not only directed to the government but also to the ethnic Chinese. In the May 1998

riots more than 500 people died and thousands of shops, homes, and offices were destroyed, where many of them belonged to ethnic Chinese. The Chinese minority has therefore suffered a severe traumatic shock since many have lost their property. Much of the violence has been directed at the Chinese minority, which is resented partly because of its relative wealth. There is at least an image among native Indonesian that Chinese are rich and control the economy. Some Indonesians often blame the Chinese for the monetary crisis; even though, the Chinese has nothing to do with the cause of the crisis. Some left the country temporarily or permanently. Since then, ethnic-Chinese businessmen were reported to be further sending their wealth abroad. "*... The flight of wealthy, educated Chinese following last May's riots came as a shattering blow in a nation that has since become the frailest of Asia's once prosperous and now shattered economies. An estimated 70,000 of them left the country, taking with them tens of billions of dollars....*"(Washington Times, November 27 1998). Sim, Susan from Singapore Straits Times reported that accompanying an exodus of ethnic Chinese entrepreneurs about US$80 billion (S$136 billion) had already left the country and 25,000 ethnic Chinese businessmen were likely to take their families out of Indonesia costing the country another US$500 million in lost expenditure. Reuters also reported that Indonesia suffered an estimated US$20 billion in capital outflows before, during and after the May riots and saw little chance of the money returning soon. It made a serious problem of the Indonesian economy. According to Hill (2000), the number of Chinese community was about 3 per cent of the population but they controlled perhaps up to 40 per cent of the economy. Moreover, Bardsley (1999) states that 3.5% of the Chinese in Indonesia is in control of 70% of the economy. Hill shows a table of the major business conglomerates in Indonesia on page 113. The table exhibits that only four out of the top 40 conglomerates in 1993 were owned by *pribumi*[3] and two of the three largest were owned by the former President Soeharto's sons. Based on another table listing the largest 40 private business groups in Indonesia, Booth (1992) estimates that total annual sales of them in 1988 were estimated to be Rp. 37 trillion in which the top 10 accounted for almost 57 per cent; all were controlled by Indonesians of Chinese extraction. From 40 conglomerates, only 12 were controlled by *pribumi* interest which all together accounted for only 17.9 per cent of total sales. It shows the degree to which the Indonesian economy was dominated by a relatively small number of business groups, most of which were owned by Indonesians of Chinese descent.

Considering the condition mentioned above, all these factors -- economic, political, and social situation -- all together might be able to be taken into considerations as factors reducing income inequality in Indonesia during 1996-1999. According to Pigou-Dalton principle of transfer, any income transfer from a richer to a poorer that does not reverse their relative ranks in income reduces the value of index. This statement implies that the income share of the rich falls. It is the case in Indonesia during the crisis, if we look at the above situation even though not transfer but it still reduces the income share of the rich in which that of the poor is unchanged or increases. Accordingly, this can explain the decreasing in inequality level during the period 1996-1999. When the economic situation was rather stable from prolonged economic crisis, income inequality began to rise again showed by the increasing Gini coefficient by 7.53 per cent from 0.3173 to 0.3412 in 2002.

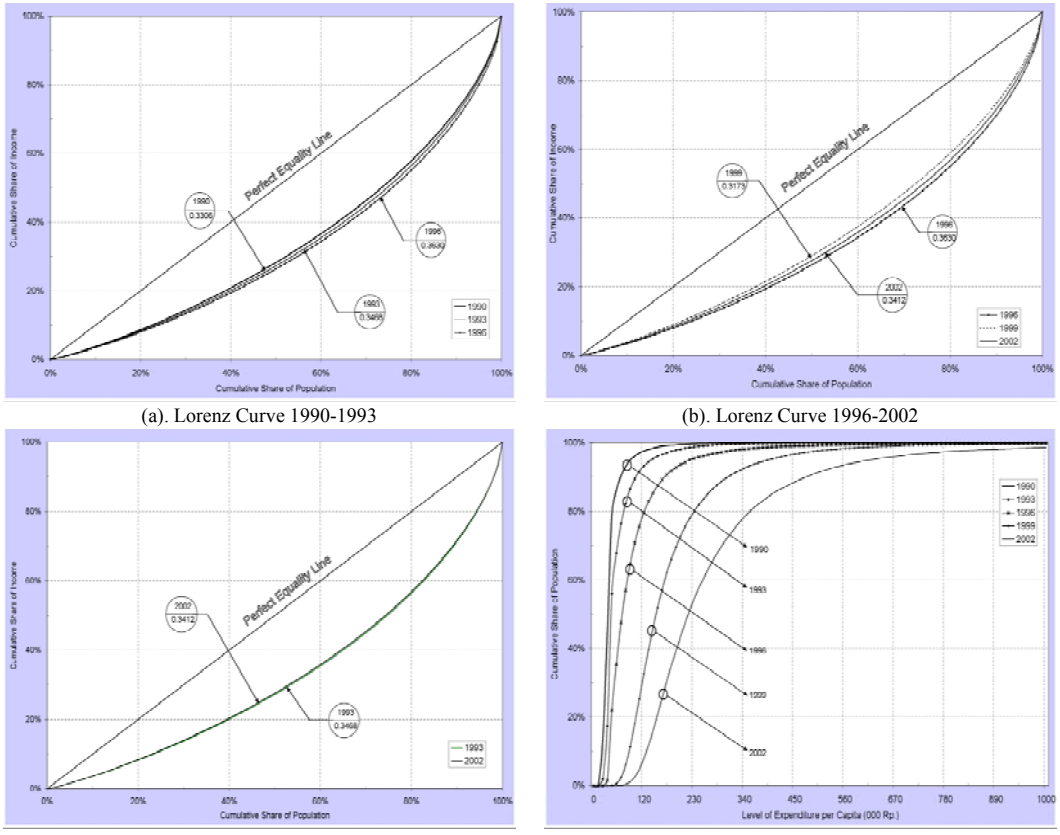
In order to conceptualizing and measuring inequality visually so as to get a complete picture of income distribution in Indonesia, two essential graphic analytical tools are employed here. These two graphical presentation devices include Lorenz Curve and Cumulative Frequency Distribution Function (CDF) which are plotted in Figure 2. Due to the relatively slightly different Gini coefficient, the Lorenz curve are depicted in the several figures so that we will be able to see them more clearly while in presenting CDF, the expenditure level is truncated at the level of 1,000,000 rupiahs.

If one Lorenz curve lies everywhere above another it is said to "*Lorenz dominance*" over the other curve and all inequality measures will show inequality to be lower for the higher curve. If distribution function A lies nowhere above and somewhere below that of B, then A displays "*first-order-stochastic dominance*" over B. First order stochastic dominance of distribution A over B implies that any social welfare function that is increasing in income, will record higher levels of

[3] *Pribumi* refers to indigenous people, as distinct from non-*pribumi*, mainly ethnic Chinese.

welfare in distribution A than in distribution B as stated by Saposnik (1981;1983.)

As far as our data on consumption expenditure can be a good proxy of income, which is capable of representing an actual figure of income, the results imply that Indonesia's economic development during 1990-2002 succeeded in raising social welfare even though raising inequality in some periods. The increase in social welfare from the beginning to the end of the period is remarkable. Incomes rose so much that, despite growing disparities, social welfare increased unambiguously between 1990 and 2002.



(a). Lorenz Curve 1990-1993 (b). Lorenz Curve 1996-2002

(c). Lorenz Curve 1993-2002 (d). Truncated Cumulative Distribution Function

Figure 2. Lorenz Curve and Cumulative Distribution Function

Inequality indices are convenient to show the degree of inequality but do not reveal what kind of changes happened to the income share of each income group. The changes are more clearly brought out by an examination of the amount of income accruing to each group of the population. Table 2 shows the income share by household group. The results suggest that there was an increase in the share of total household income accruing to the top 10 per cent during 1990-1996.

Table 2.Distribution of Income by Household Group

Decile Group	Percentage Share of Income				
	1990	1993	1996	1999	2002
(1)	(2)	(3)	(4)	(5)	(6)
1	3.72	3.58	3.44	3.90	3.65
2	4.90	4.70	4.53	5.06	4.78
3	5.71	5.49	5.32	5.88	5.58
4	6.50	6.29	6.11	6.66	6.36
5	7.38	7.15	6.97	7.51	7.23
6	8.39	8.19	8.01	8.51	8.24
7	9.69	9.54	9.35	9.78	9.57
8	11.54	11.49	11.36	11.55	11.48
9	14.66	14.92	14.84	14.59	14.80
10	27.53	28.65	30.07	26.56	28.31
Ratio of highest 20% to lowest 20%	4.89	5.26	5.63	4.59	5.11

Source: Own calculation from the 1990-2002 *Susenas*.

At the national level, fifty per cent of the population receives 28.21 per cent of the total national income in 1990. This share gradually falls in 1993 and 1996, viz. 27.21 and 26.37 per cent respectively. It rises of 10.01 percentage points in 1999 becoming 29.01 and decreases again to 27.60 per cent in 2002, however.

In the years 1990 and 1999, the

share of the top 10 per cent of the population is lower than that of the bottom 50 per cent in terms of income approximated by household expenditure per capita. The opposite situation happens in the other years. The most equally distributed income can be seen in the case of 1999 in which the lowest 50 percent has the highest income share of 29.01 per cent among other years. It shows that the poor were not probably much influenced by economic crisis, and the impact of the crisis, on the other hand, was more severe for the rich.

The movement of the share of the top 10 per cent and lowest 50 per cent has the opposite direction in which if the former increases then the latter decreases; in contrast, if the former decreases then the latter increases. That of the top 10 per cent has consistency with the change in income inequality. If there is an increase in the share of the top 10 per cent, then there will also be an increase in the Gini index. Conversely, if the share of the top 10 per cent falls, the index will also decrease. It means that the trend of the overall inequality in Indonesia during the period 1990-2002 is mainly determined by the change in the income share of the top 10 per cent.

Looking at the distribution of income by decile groups in Table 3, we can see that the income share rises relatively slowly as we move from the lowest group upwards, but there will be a big gap between the ninth decile and the top 10%. It is probably a feature of the income distribution pattern in the developing countries as the case of Indonesia.

3.2 Urban/Rural Area Income Inequality

Inequality in income distribution among society group takes place not only for the country as a whole but also spatially or between areas -- urban and rural. Income was distributed more evenly in rural than in urban area; in other words, income distribution in rural area is better than in urban area. It is shown in Table 3 that all rural Gini coefficients are always lower than that of urban. The table also tells us that average urban household expenditure per capita is much higher than that of rural. The Gini coefficient for Indonesian urban dwellers increased slightly from 0.3463 in 1990 to 0.3474 in 1993 and dramatically rose to 0.3705 in 1996, while for the rural population the increase was also experienced during this period from 0.2633 in 1990 to 0.2823 in 1996 during the pre-crisis period.

Table 3. Mean Household Expenditure Per Capita and Gini Coefficient by Area

Area	Year					Gini Coefficient				
	1990	1993	1996	1999	2002	1990	1993	1996	1999	2002
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Overall	30,310.48	43,842.54	70,055.63	137,454.50	206,365.50	0.3306	0.3468	0.3629	0.3173	0.3412
Urban	44,062.32	64,628.02	100,635.13	180,496.88	273,359.34	0.3463	0.3474	0.3705	0.3301	0.3442
Rural	24,309.45	33,470.95	52,749.99	109,526.20	152,784.41	0.2633	0.2687	0.2823	0.2531	0.2598
Ratio	1.81	1.93	1.91	1.65	1.79					

Source: Own calculation from the 1990-2002 *Susenas*.

Although income was evenly distributed in rural area, urban area appeared to be benefiting relatively more from economic growth. The ratio of average urban household expenditures to average rural household expenditures indicates the disparity showing the income gap between rural and urban areas. The ratio has been increasing from about 1.81 in 1990 to 1.93 in 1993. There was no further rise in urban-rural disparity until the year 1996. During the period covering economic crisis, the Gini coefficient for both Indonesian urban and rural population dropped drastically until below its initial level in 1990 -- 0.3301 in the case of urban and 0.2531 in the case of rural. They, however, rose again in 2002 to 0.3442 and 0.2598 in urban area and rural area, respectively. The decrease and increase in Gini coefficient from 1996 to 1999 and to 2002 are accompanied by the decline and the rise in the ratio. It declined in 1999 and rose again to 1.79 in the year 2002. It indicates that in 2002 urban population is 79 per cent better off than that of rural. We can observe also that all year Gini coefficients of urban are higher not only than that of rural but also than that of the country-wide. The smaller is the gap, the more equal is income distribution in the country as a whole.

Generally speaking, given the distribution within rural and urban economies, the inequality of overall distribution of income varies directly with the inequality between average urban and average

rural income. A rise in rural income, as a proportion of national income, shown by the smaller ratio in Table 3 has a strongly equalizing effect on the distribution of income for Indonesia as a whole reducing the level of the inequality index.

The movement of urban Gini index is similar to that of the overall Gini. The increase in income inequality in urban area played an important role in increasing overall income inequality. Changes of the top 10 per cent of urban income share affected the top 10 per cent of the whole Indonesia directly because urban population predominates the top 10 percent of the country as a whole. This relationship also happens in the regard to the income share of the lowest income between the whole Indonesia and the rural area.

Table 4.Percentage of Population Contribution

Group	1990		1993		1996		1999		2002	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
The Lowest 10%	7.78	92.22	6.52	93.48	8.13	91.87	14.54	85.46	13.98	86.02
The Lowest 50%*)	15.00	85.00	14.87	85.13	18.52	81.48	23.87	76.13	25.81	74.19
The Top 10 %	73.90	26.10	80.14	19.86	79.85	20.15	80.42	19.58	85.03	14.97
	(24.31)	(3.75)	(24.07)	(2.98)	(22.09)	(3.16)	(20.43)	(3.23)	(19.13)	(2.69)

Source: Own calculation from the 1990-2002 *Susenas*.

Table 4 provides the population share of the richest decile and the poorest decile as well as the poorest 50%. As given by Table 4, seventy-three point nine per cent of the richest 10% lived in urban area accounting for 24.31 per cent of total urban population in 1990 and became 85.03 per cent composing of 19.13 per cent of urban population in the last period. On the other hand, more than 85 per cent of the poorest 10% or 74 per cent of the poorest 50% lived in the rural area. It even reached to 93.48 per cent in the case of the lowest 10% and 85.13% in the case of the lowest 50% in 1993. The fact that many urban people lost their jobs during the economic crisis has made them become unemployed increasing the number of the poor who lived in urban area. It is shown by a very sharp increase in the percentage of the poor residing in urban area from only 8.13 per cent in 1996 to 14.54 per cent in 1999. Therefore, we might be able to say that the decreasing (increasing) income share of the rich of the country as a whole is mostly attributable to the decreasing (increasing) income share of the rich dwelling in urban area over the full period.

3.3 Decomposition of Overall Inequality by Area

After analyzing urban-rural inequality separately, now we move to the decomposition of total inequality with respect to urban-rural divide. The decomposition result in Table 5 shows that the *between-group* inequality accounts for a smaller part of the overall inequality than the *within-group* inequality. None of the years shows that more than 24% of the overall inequality is attributable to the *between-group* inequality, in the case of Theil-T. In a similar manner, Theil-L gives 27%. The highest contribution (23.02%) that the *between-group* component has to overall inequality happened in 1993, given by the Theil-T index. Likewise, Theil-L gives the result of 26.18% as the highest one

Table 5.Decomposition of Inequality between Areas

Area	1990			1993			1996			1999			2002		
	Index	Compo-nent	Contri-bution	Index	Compo-nent	Contri-bution	Index	Compo-nent	Contri-bution	Index	Compo-nent	Contri-bution	Index	Compo-nent	Contri-bution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Theil T															
Urban	0.2180	0.0963	46.52%	0.2232	0.1095	47.57%	0.2641	0.1371	52.25%	0.2029	0.1048	54.39%	0.2361	0.1390	59.91%
Rural	0.1230	0.0687	33.19%	0.1330	0.0677	29.41%	0.1532	0.0737	28.09%	0.1176	0.0568	29.48%	0.1246	0.0512	22.07%
Within		0.1650	79.71%		0.1772	76.98%		0.2108	80.34%		0.1617	83.91%		0.1902	81.98%
Between		0.0420	20.29%		0.0530	23.02%		0.0516	19.66%		0.0310	16.09%		0.0418	18.02%
Total	**0.2070**	**0.2070**		**0.2302**	**0.2302**		**0.2624**	**0.2624**		**0.1927**	**0.1927**		**0.2320**	**0.2320**	
Theil L															
Urban	0.1941	0.0590	33.35%	0.1961	0.0653	33.59%	0.2238	0.0809	37.75%	0.1762	0.0693	42.49%	0.1936	0.0860	45.48%
Rural	0.1120	0.0780	44.09%	0.1173	0.0782	40.23%	0.1301	0.0831	38.78%	0.1043	0.0632	38.75%	0.1097	0.0609	32.21%
Within		0.1369	77.39%		0.1435	73.82%		0.1640	76.53%		0.1326	81.30%		0.1470	77.74%
Between		0.0400	22.61%		0.0509	26.18%		0.0503	23.47%		0.0305	18.70%		0.0421	22.26%
Total	**0.1769**	**0.1769**		**0.1944**	**0.1944**		**0.2143**	**0.2143**		**0.1631**	**0.1631**		**0.1891**	**0.1891**	

Source: Own calculation from the 1990-2002 *Susenas*.

taking place also in 1993. Using these two indices, we estimate the smallest contribution of *between-group* inequality to be 16.09% and 18.70% for 1999.

Turning to *within-group* inequality, we find that it gives more than 76% contribution to overall inequality in Indonesia for all years in this analysis, i.e. 79.71%, 76.98%, 80.34%, 83.91%, and 81.98%, respectively, in 1990, 1993, 1996, 1999, and 2002. The big contribution of *within-group* inequality mainly came from *intra-urban* inequality which accounted for more than 46% of total inequality. The fact that the shift of population from rural area to urban area has increased urban income made the contribution of *intra-urban* inequality to Indonesia's inequality as a whole rise.

Using Theil-L in decomposing overall inequality into *between* and *within* components, we can further disaggregate '*between*' into an effect due to changes in relative mean incomes between urban and rural, and due to changes in the size of urban and rural. The dynamic decomposition in Table 6 shows that *intra-sectoral* inequality increase contributed to a 9.89% rise in the Theil-L over 1990-1993. The rise in inequality has been induced by a small rise in *intra-sectoral* inequality of 2.40%. During this period the biggest component to raise inequality is changes in relative income in urban and rural areas accounting for 5.28 % out of 9.89% increase. The remaining part is composed of the result of urbanization that rose from 30% to 33%; thus, demography effect gave an increase of 2.23%.

Table 6. Urban-Rural Dynamic Decomposition of Theil-L Index

Year	L(0)	L(1)	$L_U(0)$	$L_U(1)$	$L_R(0)$	$L_R(1)$	$Lamda_U$ (0)	$Lamda_U$ (1)	$Lamda_R$ (0)	$Lamda_R$ (1)	$f_U(0)$	$f_U(1)$	Delta L	% Delta L	% Pure Effect	% Income Effect	% Demogra-phy effect
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1990-1993	0.1769	0.1944	0.1941	0.1961	0.1120	0.1173	1.4537	1.4741	0.8020	0.7634	0.3038	0.3329	0.0175	9.89	2.40	**5.28**	2.23
1993-1996	0.1944	0.2143	0.1961	0.2238	0.1173	0.1301	1.4741	1.4365	0.7634	0.7530	0.3329	0.3614	0.0199	10.24	9.25	**-0.97**	1.93
1996-1999	0.2143	0.1631	0.2238	0.1762	0.1301	0.1043	1.4365	1.3131	0.7530	0.7968	0.3614	0.3935	**-0.0512**	**-23.89**	**-15.88**	**-9.60**	1.65
1999-2002	0.1631	0.1891	0.1762	0.1936	0.1043	0.1097	1.3131	1.3246	0.7968	0.7404	0.3935	0.4444	0.0260	15.94	6.39	6.73	2.73
1990-2002	0.1769	0.1891	0.1941	0.1936	0.1120	0.1097	1.4537	1.3246	0.8020	0.7404	0.3038	0.4444	0.0122	6.90	**-0.92**	**-1.04**	8.96

Note: '0' and '1' refer to the beginning and end of period; L is Theil-L, 'U' and 'R' are urban and rural, respectively; Lambda = relative mean income; f is population share; Delta = absolut change in overall inequality; %Delta = percentage change in overall inequality; PE = Pure Effect; IE = Income Effect; and DE = Demographic Effect.
Source: Own calculation from the 1990-2002 *Susenas*

In the period 1993-1996, a 10.24% rise in inequality is mostly due to an increase in *intra-sectoral* inequality of 9.25%. An increasing urban population share of 8.56% results in a rise in overall inequality by 1.93%. The only component that gives negative effect on a rise in overall inequality is income effect, which decreases inequality by 0.97%.

During 1996-1999, a 23.89% fall in overall inequality was mostly affected by a fall in *within-group* inequality of 15.88%, income effect being 9.6% fall in inequality. The fact that urban population share increases made the demographic component become the only component raising inequality in this sub-period composing of the remaining part of 1.65%.

There seems to have been a rise in total inequality associated with a rise in all three components of inequality during 1999-2002. Because urban-rural gap in this period widened, an income effect has increased inequality by 6.73%. The increase in *intra-urban* inequality has driven an increase in total inequality by 6.39%. Population shifts from rural area to urban area shown by an increase in urban population share from 39.35% in 1999 to 44.44% in 2002 has caused a 2.73% increase in inequality in terms of demographic component. All three components, *pure effect* (6.39%), *income effect* (6.73%), and *demographic effect* (2.73%) compose of a rise in overall inequality of 15.94% in the last sub-period of our study.

During the whole period 1990-2002, a large part of the changes in the overall income inequality was contributed by the changing population share, which contributed a sizable positive portion. This situation kept the overall inequality to grow at a higher level than the 1990 level. Looking at the other components, which show negative figures, it means that if the population structure had not changed during the period 1990-2002, the overall level of Theil-L would have been lower in 2002 instead of the actual value of 0.1891.

After investigating the inequality change between two time periods, we can infer that the population or workers movement from rural area to urban area has changed the income distribution pattern in terms of unequal income distribution. Urban life may still be attractive to many rural

dwellers, relative to the opportunities available at home. The urbanization, on the other hand, can give a positive impact on rural economy: productivity level and average income of rural society may increase. Rural people migrate in search work to supplement the income of their family. Once they succeed in getting an urban job, they try to make remittances to their families. These remittances can increase productivity of rural economy.

CONCLUSION

Gini and other indices of inequality, Atkinson, Theil-T, etc., show that inequality of income distribution of Indonesia, reflected in distribution of expenditure per capita, has an increasing trend, over the period observed. The inequality increased sharply from 1990 to 1996, and decreased in three years to 1999, perhaps as a result of the 1997 economic crisis. The main factor behind this change is that Chinese ethnic minority dominating Indonesian economy moved their wealth abroad during the crisis. This fall in the degree of inequality, however, was temporary. As the economic conditions improved, inequality again increased in three years to 2002.

Decomposing Indonesia into urban and rural areas, we find typical differences in income distribution between the two. First, the mean income of urban area is higher than that of rural area. Secondly, the degree of inequality is higher for urban area than for rural area. Decomposition of Theil-T and Theil-L shows that contribution to the overall inequality of *within-inequality* is much larger than *between-inequality*. This follows from the fact that both *intra-urban* and *intra-rural* inequalities are larger compared with the *between-urban and rural areas* inequality.

Comparing income distribution of urban and rural areas, we know that the trend of overall inequality is explained mainly by changes in inequality of urban area. First of all, in decomposition of Theil-T and Theil-L, contribution to the overall inequality of *intra-urban* inequality is the largest. Moreover, urban inequality is growing at a substantial rate from 1990 to 1996. Rural inequality, too, is growing in the same period, but appears to be stagnant in comparison with urban inequality. The fall in 1999 of the overall degree of inequality, in particular, is largely a reflection of the change in urban inequality. Consider the fact that many wealthy people of Chinese origin live in urban area, who moved their wealth abroad at the crisis. The crisis affected other groups, as well, in higher income brackets to a greater extent than did those in lower income brackets, in urban area.

Population movement made further contribution to increases in the overall inequality. It moved from rural area to urban area throughout the period observed. This certainly increased the degree of overall inequality, because urban inequality is larger than rural inequality. Dynamic decomposition of Theil-L confirms this by revealing that demographic effect was positive, that is, population movement increased the overall inequality, throughout the period observed.

It will be in order now to give a brief account on the causes of growth of urban inequality. We observe increases in the degree of inequality in the top group of urban society. Opportunities increase to earn higher income as the economy develops especially for the richest population with very good position in their job, making dispersion of income larger. On the other hand, at the bottom of urban society, the degree of inequality is very low, but its trend is mixed. Either way, as the number of migrants increases, it becomes harder to provide all of them with jobs paying regular wages, jobs in the formal sector. As a consequence, there will be urban unemployment, or in order to survive, many are engaged in the informal sector, in which productivity is low and wages paid are low and irregular. As a result, the lowest income in urban society may fall. This will increase the degree of inequality of an urban society as a whole although it may not increase inequality of the bottom group of urban society.

This study also found that income distribution of Indonesia has a typical pattern observed in the developing economies. Income share rises relatively slowly as we move from the lowest income group upward, but there is a big gap between the ninth decile and the top 10%.

Finally; some suggestions for policies, one of the main results of this research is that *between-group* component of inequality accounts only for a small part of the overall inequality. Therefore, keeping the *within-group* inequality unchanged, any attempt to eliminate the *between-group* inequality would not have any significant impact on the overall inequality. Any policy to reduce

overall inequality should be targeted at mitigating inequality *within-group*.

Any policy to reduce inequality should also be aimed at promoting urban sector by promoting or creating small and medium scale industries, or encouraging self-employment. As Adelman and Robinson (1978) point out, those policies, encouraging rural-urban migration, will improve the living standard of the rural poor. They argue that if the urban area can absorb new migrants without significant fall in wages, the relative increase in the supply or urban goods will increase rural incomes by raising the agricultural terms of trade. Migrants, if successful, will even purchase land in their village, significantly increasing their relative's income.

However, although migration is increasing rapidly, a large number of people are still engaged in the agricultural sector, at low-income level. The low rural income is an indication that majority of people of low income live in rural area. If the government intends to reduce inequality of income distribution, the rural area should be the first to receive its attention.

Our findings suggest also that increasing income will be likely to increase its income inequality, as well. It is for this reason that we have to design measures carefully, so that increase in the level of income and decrease in the degree of inequality be achieved simultaneously. One way is to try to increase rural income by raising the agricultural terms of trade, for it plays a key role in determining rural household incomes. Another is by rural industrialization. The demand for agricultural wage labor is relatively fixed in the rural area. Therefore, increase in employment opportunities in the village must come from its non-farm sectors. A possible candidate is weaving. A study by Mizuno (1996) finds that the textile industry plays an important role in equalizing distribution of income among social strata of villages. We have to endeavor to find industries that are likely to grow and increase employment opportunities in the rural area.

APPENDIX: MACRO PROGRAM TO CALCULATE GINI COEFFICIENT

```
/*****************************
* Program name : Gini_decile.sas *
*****************************/
OPTIONS nocenter nodate pageno=1 linesize=80
pagesize=60 nosource;

%LET dir                                  = e:₩sasdata;
%LET y0                                   = expend;
%LET gout                                 = gini;
%LET dout                                 = decile;
%LET w                                    = weight;

%MACRO gini(suffix=,print=1,file=1);

LIBNAME          ssn
FILENAME         giniout                  "&dir₩&gout.txt";
FILENAME         decilout                 "&dir₩&dout.txt";

DATA susenas;
   SET ssn.susenas&suffix;
   IF pro = "54" THEN DELETE;
   y= &y0/jart;
RUN;

PROC SORT DATA=susenas OUT=sorttmp;
   BY y;
RUN;

PROC MEANS NOPRINT;
  VAR &w;
   OUTPUT OUT=gtotals SUM=gtwgts;
  RUN;

  DATA frank;
    SET sorttmp;
    IF _n_= 1 THEN SET gtotals;
    IF &w =. THEN ERROR "missing values
                found";
    RETAIN       cs                                    0;
    LENGTH       decile                                3;
    RETAIN       cy                                    0;
    cs     = cs+ &w;
    frank  = cs/gtwgts;
    SELECT;
      WHEN (frank<=0.10) decile = 1;
      WHEN (frank<=0.20) decile = 2;
      WHEN (frank<=0.30) decile = 3;
      WHEN (frank<=0.40) decile = 4;
      WHEN (frank<=0.50) decile = 5;
      WHEN (frank<=0.60) decile = 6;
      WHEN (frank<=0.70) decile = 7;
      WHEN (frank<=0.80) decile = 8;
      WHEN (frank<=0.90) decile = 9;
      OTHERWISE          decile = 10;
    END;
    wy       = y*&w;
    cy       = cy+ wy;
    area     = (cy-wy/2)*&w;
    original = 1;
    LENGTH  original 3;
```

```
   KEEP    y &w decile area wy original;
RUN;

PROC SUMMARY DATA=frank;
  WEIGHT
  CLASS   decile;
  VAR     y;
  OUTPUT              SUMWGT(y)
          MEAN(y)     = mean&suffix
          SUM(y)      = totaly
          MIN(y)      = lb&suffix
          MAX(y)      = ub&suffix;
RUN;

DATA ;
  SET _LAST_;
  IF _type_                                    = 0 THEN DO;
    gtw     = wcases&suffix;
    gty     = totaly;
    gtm     = mean&suffix;
    decile  = 99;
  END;
  RETAIN gtw gty gtm;
  share&suffix                                 = 100*&w/gty;
  RETAIN cshare&suffix 0;
  cshare&suffix                          = share&suffix+cshare&suffix;
  IF _type_                                    = 0 THEN
  cm&suffix                             = (cshare&suffix*gtm/100)/(decile&w);
  KEEP _type_ decile share&suffix mean&suffix
       wcases&suffix  cshare&suffix  cm&suffix
lb&suffix
       ub&suffix;
RUN;

PROC SORT;
  BY decile;
RUN;

DATA &dout;
  SET _LAST_;
  IF decile=99 THEN DO;
    cshare&suffix
    cm&suffix
  END;
RUN;

%IF &print %THEN %DO;
  %IF &file=1 %THEN %DO;
    %IF &suffix=90 %THEN %DO;
      PROC PRINTTO PRINT=decilout NEW;
      RUN;
      %END;
    %ELSE %DO;
      PROC PRINTTO PRINT=decilout;
      RUN;
      %END;
    %END;
  PROC PRINT SPLIT='|';
    TITLE "Decile Shares for &suffix";
    FORMAT                          decile
           3.0
           lb&suffix ub&suffix                  comma9.0
&w;        mean&suffix                          comma8.0
           share&suffix cshare&suffix   6.2
           cm&suffix                comma8.0
  =        wcases&suffix                wcases&suffix 10.0;
    ID     decile;
    VAR    lb&suffix   ub&suffix   mean&suffix
share&suffix
       cshare&suffix                cm&suffix
wcases&suffix ;
    LABEL  lb&suffix     =                  'Lower|Bound';
    LABEL  ub&suffix     =                  'Upper|Bound';
    LABEL  mean&suffix                              =
    LABEL  share&suffix                             =
    LABEL  cshare&suffix                            =
    LABEL  cm&suffix     =                 'Cumulative|Mean';
    LABEL  wcases&suffix                            =
  RUN;
%END;

PROC SUMMARY DATA=frank;
  VAR    area wy &w original;
  OUTPUT                          SUM(area)                 = tarea
         SUM(wy)                                            = ty
         SUM(&w)                                            = sumwgt
         SUM(original)                                      = n&suffix;
RUN;

DATA &gout;
  SET _LAST_;
  wcases&suffix                                             = sumwgt;
  mean&suffix                                               = ty/sumwgt;
  gini&suffix   = 1-2*(tarea/(ty*sumwgt));
  KEEP  gini&suffix  mean&suffix  wcases&suffix
n&suffix ;
RUN;

%IF &print %THEN %DO;
 =%IF &file=1 %THEN %DO;
 =.%IF &suffix=90 %THEN %DO;
      PROC PRINTTO PRINT=giniout NEW;
      RUN;
      %END;
   %ELSE %DO;
      PROC PRINTTO PRINT=giniout;
      RUN;
      %END;
   %END;
  PROC PRINT;
    TITLE "Gini Coefficient";
    FORMAT gini&suffix
    FORMAT mean&suffix
    FORMAT wcases&suffix
    FORMAT n&suffix
  RUN;
```

```
  PROC PRINTTO;
  RUN;
%END;

TITLE;
%MEND gini;

%gini(suffix=90,print=1,file=0);
%gini(suffix=93,print=1,file=0);
%gini(suffix=96,print=1,file=0);
%gini(suffix=99,print=1,file=0);
%gini(suffix=02,print=1,file=0);

/******************
* End of the Program *
******************/
```

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