# A Reassessment of Inequality and

# Its Role in Poverty Reduction in Indonesia[#]

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**Abstract**

This study provides an overview of inequality trends in Indonesia for the period from 1984 to 2002. Different from previous studies on inequality in Indonesia, we use data on household consumption expenditure that takes into account price differentials across regions. We found that, although all measures indicate a decrease in inequality during the economic crisis, it actually increased for those below the poverty line. We also found that because inequality during the peak of the crisis in 1999 was at its lowest level in 15 years, the poverty rate decreased very rapidly during the recovery between 1999 and 2002.

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Keywords:  Inequality, poverty, economic growth, Indonesia

## I.    INTRODUCTION

While many people and governments, especially in developing countries, put enormous faith in economic growth as the most essential indicator of progress in the well being of their populace, more critical minds would undoubtedly think that there is more to human well being than just economic growth. In the past few years, development economists have talked in more urgent terms about the importance of the quality of growth in addition to mere economic growth rates. This can be seen from the increased number of studies that measure the contribution of economic growth to widely-used factors that measure quality of life such as democracy, job opportunity, health, poverty reduction and income distribution (for example Barro, 2002; Hines Jr. *et al.*, 2001; see section III for more).

The new emphasis that economists put on the quality of growth means that there are more important things than just the basic numbers. These include who benefits from growth; what kind of environmental damage accompanies growth and whether the costs associated with the damage are included in the analysis of growth; whether growth is equally distributed among all income groups; whether growth only benefits the rich while leaving the poor out; whether growth helps the poor escape poverty; whether growth only benefits certain sectors of the economy or reaches all sectors; whether children and women also enjoy the benefits from growth and whether growth plays a positive or negative role in achieving income, and eventually welfare, equality among people of a country.

From all the different questions that one asks in order to assess the quality of growth, in this study we focus on the question of inequality. Before the onset of the economic crisis in mid 1997, there is no doubt that Indonesia had an extended period of high economic growth. There is still controversy however,

about whether the benefits of this period of high growth have been equally distributed among the whole population or largely accrued only to the politically and economically well-connected minority. While popular perceptions strongly support the latter (Utomo, 2004), the relatively abundant studies on inequality in Indonesia in general have failed to find quantitative evidence to support this popular belief and have found, in fact, that Indonesia's income inequality has been relatively low and stable. During the 1990s, Indonesia's Gini coefficient – a widely used measure of inequality – was lower than neighbouring countries such as Malaysia, Singapore, and the Philippines, and even lower than the average Gini coefficient of high income countries (Sudjana & Mishra, 2004).

In this study, we reassess the calculation of inequality measures by taking into account price disparities across regions in Indonesia. There is evidence of a significant price differential across regions in Indonesia, making the real value of the *rupiah* highly variable between regions. Although this differential should be considered in any study of inequality (Arndt & Sundrum, 1975; Asra, 1999), almost all previous inequality studies in Indonesia have ignored this aspect of Indonesian household expenditure data. By deflating the nominal expenditure with a regional price index, we ensure that every *rupiah* in our household expenditure data carries equal purchasing power across regions. For simplicity, we refer to the deflated expenditure as the real expenditure.

Since there is no published data available in Indonesia on regional price differentials, we use regional poverty lines that were calculated in Pradhan *et al.* (2001) as the regional price index. These regional poverty lines are based on a single national basket of goods multiplied by regional price levels, so that

differences in the poverty lines across regions simply reflect the differences in the price levels across regions.

This study consists of two main parts. In the first part we reassess the evolution of inequality in Indonesia during the period between 1984 and 2002 using several widely used inequality measures with the household per capita expenditure data taken from the Consumption Module Susenas (National Socioeconomic Survey). Since this period covers both the pre-crisis high growth period and the crisis low growth period, we are able to conjecture how inequality evolves with economic growth. Furthermore, in the second part of the study we examine whether a relationship exists between inequality and poverty in Indonesia during the same period. To see the role of inequality in the poverty-growth relationship, we utilize a model to estimate the "distribution-corrected" growth elasticity of the poverty rate using provincial level data.

The rest of the paper is organised as follows. Section II briefly reviews the Indonesian economy during its high growth period from 1984 – 1996 and the aftershock of the economic crisis that hit Indonesia in 1997. Section III discusses different inequality measurements and reviews the literature on inequality studies both generally and specifically in the Indonesian context. Section IV describes the data used in this study. Section V provides the analysis on inequality evolution. Section VI examines the role of inequality in poverty reduction in Indonesia. Finally, Section VII provides the conclusions.


## II.    A QUICK OVERVIEW OF INDONESIA 1984-2002

Indonesia experienced an extended period of high economic growth between 1984 and 1996, before the Asian economic crisis brought this to an end

in 1997. Table 1 shows some indicators of basic economic performance of Indonesia between 1984 and 2002. For consistency with analysis in this paper, we only show the years where a Consumption Module Susenas was carried out.

| Table 1 | | | | |
|---|---|---|---|---|
| Indonesian Basic Economic Indicators | | | | |
| Year | Annual Real GDP Growth (%) | Inflation Rate (yoy, %) | Average Exchange Rate (Rp./US$) | Poverty Rate (%) |
| 1984 | 7.0 | 3.63 | 1,070 | 56.68 |
| 1987 | 5.3 | 3.94 | 1,644 | 45.95 |
| 1990 | 7.5 | 3.91 | 1,843 | 32.68 |
| 1993 | 6.8 | 6.53 | 2,087 | 25.32 |
| 1996 | 7.3 | 8.71 | 2,342 | 17.44 |
| 1999 | 0.3 | 34.47 | 7,100 | 27.13 |
| 2002 | 4.1 | 10.03 | 9,269 | 12.22 |
| Source: Authors' calculations based on BPS data | | | | |

During the high growth period, the economy grew at an average rate of around 7% annually, while inflation was relatively low between 1984 and 1990 before climbing to 6.5% in 1993 and then 8.7% in 1996. The average exchange rate difference between 1984 and 1987 was quite significant because of devaluation in 1986, and after 1987 up to 1996 the exchange rate was continuously depreciated at relatively stable rates. Furthermore, the government was very successful in reducing poverty before the crisis, which is shown by the decrease in the poverty rate from 56.7% in 1984 to 17.4% in 1996, just before the onset of the crisis.

In 1997, the economic crisis hit Indonesia. Numerous papers have documented the crisis in Indonesia from different points of view (Kenward, 2002; Levinsohn *et. al.*, 1999; Strauss *et al.*, 2004; Suryahadi *et al.*, 2003 to mention a

few). In short, the crisis caused Indonesia's worst economic recession since the 1960s. The *rupiah* began a free fall from 3,000 *rupiah* in August 1997 to around 15,000 *rupiah* against the dollar in June 1998. From January 1998 to March 1999, nominal food prices increased threefold. In September 1998, the food CPI reached 261 relative to around 100 in January 1997, while the CPIs for housing, clothing, and health reached 156, 225, and 204 respectively.

Although the crisis started as a crisis in the financial and banking sector, it quickly spilled over to the real sector. Real Gross Domestic Product (GDP) contracted by almost 14% in 1998 and remained stagnant in 1999. The investment sector was heavily affected by the downturn as real gross domestic fixed investment fell by 36% in 1998. Since nominal wages rose more slowly than food prices during this period, real income declined. The impact of the crisis on welfare is reflected by the increase in the poverty rate from around 15% in the second half of 1997 to 33% by the end of 1998. (Darja *et al.*, 2004).

Economic performance in 1999 was still affected by the crisis with real GDP only growing at 0.3%, a year-on-year inflation rate of 34.4%, very weak *rupiah* compared to 1996, and a huge spike in the poverty rate that even surpassed the 1993 poverty rate. Coupled with population growth, this meant that there was a large increase in absolute numbers of people below the poverty line. In 2002, 5 years after the crisis, the poverty rate had decreased to its lowest level since 1984 and stood at 12.22%,[1] a record low in Indonesia, and inflation had decreased to 10.5%.

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[1] The poverty rate calculation in 2002 did not include Aceh, Maluku, and Papua. We have therefore estimated that if each of those three provinces had a poverty rate of 50%, the national poverty rate would be 14%. The exclusion of the three provinces does not therefore, affect our argument that the poverty rate had decreased by half between 1999 and 2002.

## III.  INEQUALITY MEASUREMENTS AND LITERATURE REVIEW

### a.  Overview of different inequality measurements

There are several widely used indicators to measure inequality: Gini ratio, Generalized Entropy index, and Atkinson's inequality index.[2] The Gini ratio, or sometimes referred to as Gini coefficient, is the measure of inequality that is most widely used. This measure is calculated based on the comparison between the cumulative distribution of a Lorenz curve with the cumulative distribution of a uniform distribution. Figure 1 illustrates the calculation of Gini ratio. In the horizontal axis of this figure, the population is ordered from the poorest to the richest, with the Lorenz curve showing the cumulative distribution of their income. Meanwhile, the line of equality is drawn based on the assumption that everybody in the population has the same income.

In this figure, Gini ratio is simply calculated as:

$$Gini\ Ratio = \frac{A}{A+B} \tag{1}$$

where A is the area between the line of equality and Lorenz curve, while B is the area below the Lorenz curve. If there is no inequality (i.e. perfect equality) then the Lorenz curve will be right on top of the line of equality, which means area A is 0, implying a Gini ratio = 0. On the other hand, if there is perfect inequality, that is there is only one person who owns everything, then area B is 0, implying a Gini ratio = 1.

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[2] More recently, there are new techniques of inequality decomposition proposed by several researchers. For example, Mussard *et. al.*, 2003; de la Vega & Urrutia, 2003; Wan, 2002.
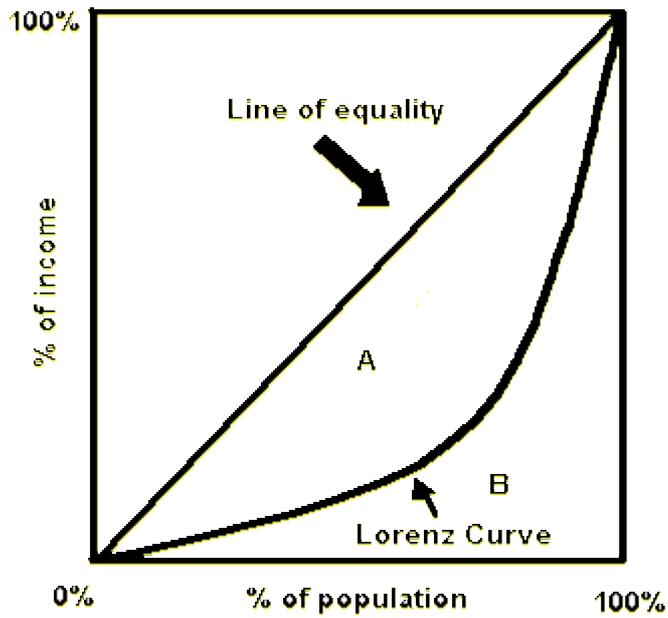
Figure 1. Lorenz Curve and the Calculation of Gini Ratio

The Generalized Entropy (GE) index is an inequality measure defined by the following formula:

$$GE(\alpha) = \frac{1}{\alpha(\alpha-1)}\left[\frac{1}{N}\sum_{i=1}^{N}\left(\frac{y_i}{\bar{y}}\right)^{a} - 1\right] \qquad (2)$$

where $y$ is income, $i$ indexes the population, and $N$ is the total number of population. Meanwhile, the parameter α represents the weight given to levels of well-being at different parts of the distribution. The most commonly used values of α are 0 (sensitive to the lower end of the distribution), 1 (sensitive to the middle), and 2 (sensitive to the upper end). GE with α value of 0 is called Theil's L while GE with α = 1 is called Theil's T. The value of the GE index ranges from zero to infinity, with GE = 0 implying no inequality in the distribution.

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The last widely used inequality measurement is the Atkinson index. This index is a measurement of inequality that explicitly incorporates normative judgments about social welfare (Atkinson, 1970). The general formula for the Atkinson index is:

$$A_\varepsilon = 1 - \left[ \frac{1}{N} \sum_{i=1}^{N} \left( \frac{y_i}{\bar{y}} \right)^{1-\varepsilon} \right]^{\frac{1}{(1-\varepsilon)}} \tag{3}$$

where ε is the degree of inequality aversion or a society's preference for equality. Higher values of ε indicate that a society is more averse to inequality. Hence, the calculation is more sensitive to changes in the lower end of the distribution. The Atkinson index ranges from 0 to 1, with 1 indicating perfect inequality.

### b. Literature review on inequality

Ever since Kuznets put forward his hypothesis of the inverted-U shaped relationship between income level and inequality (Kuznets, 1955), many studies have tried to relate inequality to income level, poverty and economic growth.[3] On the relationship between inequality and growth, there is a basic agreement that the causality could go both ways. There are, however, two conflicting sides: those who claim that inequality has a positive impact on growth and those who believe and have proven that inequality may retard growth. Excellent reviews of the literature can be found in Aghion *et al.* (1999) and Barro (1999).

A study in the United States rejected the importance of inequality and claimed that it is poverty rather than inequality that should be tackled with vigour

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[3] The validity of Kuznets' inverted-U shaped curve can be proven in some studies but not in others. Although this is the case, Kuznets is still regarded as one of the pioneers of inequality studies.

(Feldstein, 1998). On the other hand, a cross-country study (Deininger & Squire, 1998) found that there is a strong negative relationship between initial inequality in the asset distribution and long-term growth.[4] This study also found that inequality reduces income growth for the poor but not the rich.

Barro (1999) classified the relationship between inequality and economic growth into four categories: credit market imperfections, political economy, social unrest, and savings rates. In a world where access to credit is limited, investment opportunities depend on one's assets and income. This means poor people have no access to investments that offer high rates of return. Consequently, a redistribution of assets from the rich to the poor will enable the poor to gain access to these investment opportunities and, in turn, increase the rate of economic growth. Barro also claims that a greater degree of inequality would motivate more redistribution through political process and that this will create economic distortion. In turn, the distortion would reduce growth. This means lowering inequality would increase growth. Thirdly, inequality of wealth and income motivates the poor to turn to crime and violence and this is detrimental to economic growth. So from this perspective high inequality is bad for growth. In addition to providing an excellent compilation of other literatures, this paper also investigated the link using cross-country data and concluded that inequality retards growth in poor countries but encourages growth in richer ones.

Aghion *et al.* (1999) stated that the effect of growth on inequality can be through acquisition of new technologies. In short, there are two channels through which technological advances can increase inequality: (1) between the group that acquires the new technology faster, hence consequently can demand higher

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[4] This is not the only paper that found the negative relationship between initial inequality and growth. See Aghion *et al.* (1999) for a thorough overview.

wages, and the group that acquires the technology slower; and (2) through intra-group increases in inequality: between workers who are highly adaptable and those who are not as adaptable, although they have the same education level to acquire the new technology. The extent to which the growth process actually induces rising inequality however, depends on the institutional characteristics of each country. They also said that education narrows the differential between skilled and unskilled workers and therefore has the direct effect of reducing wage inequality.

The level of inequality raises the question of whether redistribution is necessary or not. There is also conflicting evidence regarding the effect of redistribution on growth. Easterly & Rebello (1993) found that redistribution is harmful for growth, while two studies (Aghion *et al.*, 1999; Benabou, 1996) stated that redistributing wealth from the rich, whose marginal productivity of investments is relatively low due to decreasing returns to individual capital investments, to the poor, whose marginal productivity of investment is relatively high for exactly the same reason, would enhance aggregate productivity and hence growth.

On establishing the connection between poverty, growth and inequality, one of the most recent studies on this issue (Bourguignon, 2004) stated that distribution changes (i.e. changes in inequality) have a very powerful effect on poverty. The study also said that it is important to consider growth and distribution simultaneously and that the connection between poverty, growth and inequality is very country specific. In addition to Bourguignon (2004), another study mentioned another aspect of the relationship between poverty, inequality, and growth (McCulloch *et al.*, 2000). They stated that change in poverty can be represented by the sum of three components: a growth component with inequality constant, an

inequality component with growth constant and a residual. This means inequality is an important aspect in poverty reduction and thus should be given more attention in poverty reduction efforts.

In formalizing the relationship between poverty, inequality and growth, Ravallion (1997) stated that there are two channels where inequality can affect poverty. The first channel is through the well-studied relationship between inequality and growth, then growth and poverty. High initial inequality retards growth, which in turn reduces the rate of poverty reduction. The second channel is the "growth-elasticity argument". The argument states that in a growth process where all levels of income grow at roughly the same rate, higher inequality means that the poor gain less. This means the poor will continue to have a lower share of the total income and its increment through growth, which means the rate of poverty reduction must be lower. However, this also means that the poor will suffer proportionately less of the impact in the event of an economic contraction. Thus, both high and low inequality have their own benefits and disadvantages for the poor. The paper also found that higher inequality tends to entail a lower rate of poverty reduction at any given positive rate of growth.

A study using cross-sectional and longitudinal US and German data that followed a set of individuals over time (Jenkins & Van Kerm, 2003) concluded that cross-sectional data cannot be used to track the experiences of particular individuals but only income groups, whose composition may change. The study also claimed that this explains why it is possible for the poor to fare badly relative to the rich and for income growth to be pro-poor at the same time.

Ravallion (2000) iterated that there is a need for deeper micro empirical work on growth and distributional change because even small changes in overall

distribution can matter greatly to how much the poor share in growth, and the absence of a correlation between growth and inequality does not mean inequality matters little. In addition, the paper also stated that high or rising inequality is putting a brake on the prospects for poverty reduction through growth. The paper also warned however, that reducing inequality by adding further distortions to the economy will have unpredictable effects on growth and poverty reduction.

### c. Studies on inequality in Indonesia

There have been a large number of investigations on the subject of inequality conducted within the Indonesian context (for example, Skoufias *et al.*, 2000; Tjiptoherijanto & Remi, 2001; Alisjahbana, 2001; Akita & Alisjahbana, 2002; Said & Widyanti, 2002; Akita *et al.*, 1999 to mention a few). Most of these studies use nominal expenditure data, hence disregarding the effect of regional price differentials on the differences in purchasing power across regions at the same level of nominal expenditure. An exception is Skoufias *et al.* (2000) who deflated household nominal expenditure with a household specific deflator. Such a deflator, however, can only be constructed using panel data.

A study using the Theil decomposition technique applied to household expenditure data from the 1987, 1990, and 1993 Susenas (Akita *et al.*, 1999) suspected that several factors such as location, province, age, education, gender and household size affect income inequality in Indonesia. Their results, however, suggested that gender appeared to be an insignificant factor in affecting inequality in Indonesia. Other findings from this study indicated that intra-province inequality was greater than inter-province inequality and rural-urban expenditure inequality accounted for 22% to 24% of total inequality. Furthermore, the urban inequality

trend continuously increased during the period under study. Finally, this study found that education was a significant determinant of expenditure inequality, as the inter-education component accounted for 30-33% of total inequality.

Another study focused on regional income inequality between 1993 and 1998 using district-level GDP and population data using the two-stage nested decomposition method (Akita & Alisjahbana, 2002). This study concluded that overall income inequality measured by Theil index increased significantly over the 1993-1997 period, from 0.262 to 0.287, during which time Indonesia achieved an annual average growth rate of more than 7%. On the other hand, it declined to 0.266 during the crisis, which corresponded to the level prevailing in 1993-1994.This finding was supported by the finding of a study using the Theil index and L-index methods (Tjiptoherijanto & Remi, 2001) that, during the period prior to the crisis (between 1993 and 1996), income inequality tended to increase in Indonesia as a whole. The inequality seemed to be more apparent in urban areas than in rural areas and declined during the period from 1996 to 1998.

The finding of a decline in inequality during the crisis period is also consistent with the finding from a study by Said & Widyanti (2002). When they investigated inequality changes among the population below the poverty line, however, the result contradicted the trend of inequality in the entire population. The Gini and Theil indices for the population living below the poverty line actually increased during the crisis period. This is consistent with the finding of a study by Skoufias *et al.* (2000) who used the 100 Village Survey data, that has a sample of relatively poor households. They calculated that the Gini Ratio of household-specific deflated expenditure increased from 0.283 to 0.304 during the crisis. This

increase was especially driven by the significant rise in inequality in the rural areas, whereas in the urban areas, inequality slightly decreased.[5]

### d. Caveats in inequality analysis

Before proceeding further, it is useful to reiterate that inequality should not be used as the sole indicator for judging economic performance of a country. Inequality only measures the distribution of income or expenditure. At one extreme this means that in a country where everybody is poor, inequality does not exist. This extreme example shows that having low inequality does not necessarily mean a country is doing well or a country has provided excellent social welfare to its people. Therefore, countries with higher inequality do not necessarily need to follow countries with lower inequality (Kaplow, 2002).

By the same token, increasing inequality does not necessarily have a negative implication. For example, increasing the income of high-income individuals without decreasing the income of others will increase inequality, but it is better than nobody experiencing any increase in income at all (Feldstein, 1998).[6] This means that discretion should be exercised when looking at the results of inequality calculations. Although the calculations provide some insights into the condition of a country, they do not tell the whole story because, by itself, inequality does not even provide a partial analysis of welfare, let alone a comprehensive one.

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[5] Curiously, Breman & Wiradi (2002) naively concluded that when different data sources show different trends of inequality during the crisis, it simply reflected changes in the researchers' state of mind.

[6] This of course assumes there is no negative externality to the welfare of the poor from the increasing welfare of the rich.

## IV.  DATA

As already mentioned in the introduction, in calculating inequality we use household per capita expenditure data deflated by a regional price index, and we call the deflated expenditure as real expenditure. The data on nominal household expenditure is obtained from the Consumption Module Susenas, while the regional price index used is based on the regional poverty lines as calculated in Pradhan *et al.* (2001) extended to other years. The nature of data collection and the calculation of the regional poverty lines are discussed in this section.

### a.  The National Socioeconomic Survey (Susenas)

Susenas is a nationally representative repeated cross-section household survey that is conducted regularly by Statistics Indonesia (*Badan Pusat Statistik* or BPS), covering all areas of the country. Susenas usually consists of two parts. The first part is conducted in February each year and collects demographic and socioeconomic characteristics of households and their members. This part of the Susenas is known as the Core Susenas. The second part of the Susenas is called the Module Susenas. Every year the module rotates between Health Module, Social & Cultural Module, and Consumption Module. This means that each of these modules is conducted every three years.

The one used in this study is the Consumption Module, which collects very detailed data on household consumption expenditure. There are two kinds of consumption items in the questionnaire: food and non-food items. There are more than 200 items in the food category and more than 100 items in the non-food category. In this study, we use the Consumption Module Susenas from 1984 to 2002, which means data from 1984, 1987, 1990, 1993, 1996, 1999 and 2002

survey years, where the sample size ranges from 45,415 to 64,406 households in 26 provinces of Indonesia.

Using expenditure as a proxy for income has been a source of grievance for some researchers (Robilliard *et al.*, 2001; Mishra, 1997 for example). A study that examines the movement between income and consumption in the US has found uneven growth among the two (Krueger & Perri, 2002). Basically the grievance centres on the notion that the rich save more of their income than the poor, and this means inequality calculations using expenditure data tend to underestimate the actual income inequality. This has obscured the reliability of using expenditure as a proxy for income to an extent that some found unacceptable. There are studies, however, that claim that consumption is a better measure of welfare than income (Attanasio *et al.*, 2004; Blundell & Preston, 1998). At least in the case of developing countries, household expenditure data is thought to be much more reliable than household income data.

### b. Regional poverty line calculation[7]

As is widely known, poverty line calculation is a straightforward but, at the same time, complex undertaking. In Indonesia, the poverty line that is usually used is the one published by BPS. In short, BPS calculates the food poverty line by differentiating the amount of food needed between rural and urban areas. So, for example, it could be the case that in urban areas food A is put at x kilograms but y kilogram in rural areas. There are consequences for the difference in the amount: one cannot really compare poverty lines between urban and rural areas and the respective poverty lines cannot be summarized to form a national poverty line.

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[7] Discussion in this section is mostly taken from a paper published by SMERU (Pradhan *et al.*, 2000), and a more detailed description can be found there.

Moreover, BPS uses *a priori* assumption when choosing the reference population in each region. This method of choosing a reference population arbitrarily could lead to self-fulfilling prophecies. In the extreme, two researchers using the same data using exactly the same method but different *a priori* beliefs on headcount poverty would produce different poverty estimates (Pradhan *et al.*, 2001). We cannot, therefore, use BPS poverty lines for our purpose.

On the other hand Pradhan *et al.* (2001) use the same food basket in all regions. This means the poverty lines can be compared between regions as the differences in regional poverty lines only arise from the differences in regional prices. Secondly, they use an iterative method to determine the true reference group, and hence the stable poverty line for each region, that has been freed of personal *a priori* assumptions. Table 2 shows the data summary of the Susenas nominal expenditure and Pradhan *et al.* (2001) poverty line for each survey year.

| Table 2 | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|
| Data Summary of Susenas Expenditure and Pradhan's Poverty Line | | | | | | | | | |
| Year | N | Nominal Expenditure | | | | Poverty Line | | | |
|  |  | Mean | Std. Dev. | Min | Max | Mean | Std. Dev. | Min | Max |
| 1984 | 49965 | 19225.77 | 16180.34 | 1476 | 602376 | 14368.72 | 4391.53 | 10189.00 | 26904.84 |
| 1987 | 50954 | 24803.24 | 20492.01 | 2744 | 900694 | 17000.91 | 4894.67 | 12052.46 | 33174.64 |
| 1990 | 45415 | 31492.10 | 23747.21 | 5080 | 831653 | 19427.93 | 2195.75 | 15143.76 | 26461.90 |
| 1993 | 58906 | 48941.69 | 41363.19 | 5506 | 1906999 | 24964.25 | 2976.43 | 19466.20 | 30951.88 |
| 1996 | 59900 | 75744.11 | 72077.76 | 8338 | 3160063 | 34252.74 | 3640.04 | 27670.90 | 43402.59 |
| 1999 | 61483 | 152886.90 | 121651.40 | 19972 | 3769032 | 84948.11 | 7296.98 | 70199.00 | 102814.00 |
| 2002 | 64406 | 237008.90 | 268159.60 | 28390 | 21300000 | 98392.14 | 9553.97 | 81656.06 | 117940.70 |

## V.     ANALYSIS OF RESULTS

### a.  Trends in real expenditure

As a first step, we look at the changes in mean real per capita expenditure by deciles of per capita expenditure over time in order to examine the differences in the trends of expenditure growth across different socioeconomic levels. By looking at these changes, we can show quantitative evidence on whether economic growth in Indonesia has benefited the rich more than the poor or *vice versa*. Table 3 provides the index of mean real per capita expenditure for all deciles from 1984 to 2002 with the per capita expenditure in 1984 normalized to 100.

| Table 3 | | | | | |
|---|---|---|---|---|---|
| Index of Mean Real Per Capita Expenditure by Decile (1984=100) | | | | | |
| Year | I (poorest) | II | III | IV | V |
| 1984 | 100 | 100 | 100 | 100 | 100 |
| 1987 | 118.25 | 117.96 | 119.34 | 118.92 | 117.82 |
| 1990 | 169.69 | 156.23 | 149.39 | 143.71 | 139.65 |
| 1993 | 187.40 | 171.35 | 164.15 | 158.46 | 153.67 |
| 1996 | 209.52 | 192.91 | 185.32 | 179.48 | 174.33 |
| 1999 | 187.05 | 169.92 | 160.87 | 153.59 | 147.68 |
| 2002 | 232.21 | 211.21 | 200.94 | 192.72 | 185.88 |
| | | | | | |
| Year | VI | VII | VIII | IX | X (richest) |
| 1984 | 100 | 100 | 100 | 100 | 100 |
| 1987 | 116.70 | 115.78 | 114.87 | 114.34 | 117.38 |
| 1990 | 136.00 | 132.24 | 129.44 | 127.22 | 128.98 |
| 1993 | 149.89 | 146.97 | 145.10 | 143.84 | 149.91 |
| 1996 | 170.48 | 167.46 | 165.65 | 164.51 | 177.99 |
| 1999 | 143.05 | 138.51 | 133.96 | 129.75 | 126.90 |
| 2002 | 180.55 | 175.63 | 172.38 | 169.87 | 176.02 |

Table 3 shows that during the high growth period from 1984-1996, mean per capita expenditure of the poorest decile increased by 110% (from 100 to 209.5), implying that economic growth improves the welfare of the poor.[8] Furthermore, this increase was the highest compared to the increases in other deciles. In fact, from the lowest to the ninth decile, the increase in real per capita expenditure was lower the higher the decile. The increase experienced by the ninth decile during the same period is only 65%. The increase experienced by the richest decile (78%) was, however, relatively high and comparable to the increase experienced by the fourth decile. This implies that the high economic growth during this period has, in general, been relatively pro-poor, with the exception that the richest decile grew faster than the middle deciles.

In 1999, due to the crisis, the mean per capita expenditure of all deciles fell substantially, reflecting the negative impact of the crisis on the population at all socio-economic levels. Table 3 clearly shows, however, that the decline in real expenditure is larger the higher the decile, implying that the richest decile was hit hardest by the crisis. As a result, relative to the distribution in 1984, there was an improvement in expenditure distribution in 1999.

After recovery in 2002, the real expenditure of all deciles bounced back and even surpassed the 1996 level, except for the richest decile that was still slightly below the 1996 level. This is most likely due to the fact that the top decile suffered the largest decline in expenditure during the crisis. In terms of expenditure distribution relative to the base year of 1984, however, the growth of expenditure of the top decile was still higher than the eighth and ninth deciles.

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[8] The highest jump occurred between 1987 and 1990, where the lowest decile's mean expenditure increased to 70% above 1984, while the highest decile's mean expenditure only increased to 30%. Timmer (2004) also found that 1987-1990 was one of only two periods between 1984 and 2002 where income growth of the bottom quintile was higher than average income growth.

In terms of how the poor fare relative to the whole population and the rich, Table 4 shows the ratio of total expenditure of the poorest 20% to total expenditure of the whole population and the ratio of total expenditure of the poorest 10% to total expenditure of the richest 10%. The table shows that the two ratios moved in parallel. Between 1984 and 1990, both ratios increased substantially, indicating that the poor gained more of the benefit of economic growth during this period. As the economy grew further in the period between 1990 and 1996, however, the poor gained less than the whole population and, in particular, compared to the richest group. This implies that the impact of economic growth on the relative position of the poor cannot be taken for granted.

| Table 4 | | |
|---|---|---|
| Ratio of Total Real Expenditure (%) | | |
| Year | Poorest 20% to whole population | Poorest 10% to richest 10% |
| 1984 | 7.34 | 10.87 |
| 1987 | 7.42 | 10.95 |
| 1990 | 8.80 | 14.32 |
| 1993 | 8.64 | 13.64 |
| 1996 | 8.41 | 12.82 |
| 1999 | 9.33 | 16.06 |
| 2002 | 8.91 | 14.30 |

As the previous Table 3 has shown that the impact of the crisis was larger for the higher deciles, consequently the two ratios in Table 4 jumped significantly in 1999. This means that although the crisis made the poor worse off in absolute terms, their share in the economy relative to the whole population, and particularly to the rich, actually increased. As the economy recovered in the following period, both ratios fell back. The share of the poor in the economy in 2002 was, however, still similar to their share during the pre-crisis peak in 1990.

### b. Gini ratio

Table 5 provides the Gini ratios of real expenditure from 1984 to 2002 for the whole country as well as disaggregated by urban and rural areas. The table shows that total inequality decreased from 1984 to 1990, then increased from 1990 to 1996, but decreased again by a large extent between 1996 and 1999, and finally increased again during the recovery period between 1999 and 2002.

| Table 5 | | | | | | |
|---------|---|---|---|---|---|---|
| Gini Ratio of Real Per Capita Expenditure | | | | | | |
| Year | Urban | % change from previous year | Rural | % change from previous year | Total | % change from previous year |
| 1984 | 0.35 | - | 0.32 | - | 0.35 | - |
| 1987 | 0.36 | 2.86 | 0.30 | -6.25 | 0.35 | 0.00 |
| 1990 | 0.34 | -5.56 | 0.26 | -13.33 | 0.32 | -8.57 |
| 1993 | 0.34 | 0.00 | 0.27 | 3.85 | 0.33 | 3.13 |
| 1996 | 0.36 | 5.88 | 0.28 | 3.70 | 0.34 | 3.03 |
| 1999 | 0.32 | -11.11 | 0.25 | -10.71 | 0.30 | -11.76 |
| 2002 | 0.33 | 3.13 | 0.26 | 4.00 | 0.32 | 6.67 |

In urban areas, the result is roughly the same except inequality actually increased between 1984 and 1987. In contrast, rural areas experienced the

opposite, where inequality decreased between 1984 and 1987. In terms of the relative magnitude of inequality between urban and rural areas, inequality in rural areas at any given year is always lower than that in urban areas.

These trends are consistent with the figures obtained from the trends and ratios of deciles of expenditures discussed in the previous section. Furthermore, this trend is also consistent with the result from a recent study of inequality in Indonesia (Sudjana & Mishra, 2004), although the actual ratios themselves are quite different since the study used nominal expenditure data.

If we look at those below the poverty line, inequality actually increased slightly between 1996 and 1999, from 0.0914 to 0.0986. This shows that although inequality decreased in total, there was an increase in inequality among the poor, which was mainly caused by more people falling into poverty, hence the group became more heterogeneous. The increase in inequality among the poor during the crisis is also the finding in Said & Widyanti (2002).

### c. Generalized Entropy (GE) index

As already mentioned in section III, the GE index is a class of inequality measure that allows for an additive decomposition of inequality to the intra and inter-group level. This feature makes the GE index one of the popular indices used in analysing inequality. Table 6 shows GE indices for two different values of α. In choosing which α is more relevant for Indonesia, our choice is based on studies that showed that Indonesians are vulnerable to poverty (Suryahadi & Sumarto, 2003; Chowdury & Setiadi, 2002).[9] On the other hand, the "10 to 10 ratio" in Table

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[9] Suryahadi and Sumarto (2003) wrote that vulnerability to poverty is defined as the probability of falling below the poverty line. The total vulnerable group (TVG) includes all those who are currently poor plus those who are currently non-poor but have a relatively strong chance of falling into poverty in the near future. Between 1996 and 1999, TVG increased from 18.1% to 33.7%. Moreover, Chowdury and Setiadi (2002) provided the widely documented fact that when measured

4 shows that the ratio actually increased during the crisis, which means that the richest 10% suffered from a larger decline in welfare than the poorest 10%. We shall, therefore, discuss the GE results mainly using GE(0) and GE(2), because GE(0) is more sensitive to changes in the lower tail of the distribution while GE(2) is sensitive to changes in the higher tail.

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using a poverty line of US$1/day only 7.8% of Indonesians were poor in 2001 but increasing the line to US$2/day caused the poverty rate to jump to 60%.

Table 6

## Generalized Entropy Indices

| Year | Urban | Percentage change | Rural | Percentage change | Total | Percentage change | Intra group | Percentage change | Inter group | Percentage change |
|------|-------|-------------------|-------|-------------------|-------|-------------------|-------------|-------------------|-------------|-------------------|
| | | | | | GE(0) | | | | | |
| 1984 | 0.2103 | - | 0.1640 | - | 0.2071 | - | 0.1749 | - | 0.0323 | - |
| 1987 | 0.2214 | 5.28 | 0.1524 | -7.07 | 0.2044 | -1.30 | 0.1712 | -2.12 | 0.0332 | 2.79 |
| 1990 | 0.1906 | -13.91 | 0.1133 | -25.66 | 0.1648 | -19.37 | 0.1369 | -20.04 | 0.0279 | -15.96 |
| 1993 | 0.1905 | -0.05 | 0.1168 | 3.09 | 0.1764 | 7.04 | 0.1413 | 3.21 | 0.0350 | 25.45 |
| 1996 | 0.2062 | 8.24 | 0.1286 | 10.10 | 0.1882 | 6.69 | 0.1566 | 10.83 | 0.0315 | -10.00 |
| 1999 | 0.1648 | -20.08 | 0.1049 | -18.43 | 0.1461 | -22.37 | 0.1285 | -17.94 | 0.0176 | -44.13 |
| 2002 | 0.1809 | 9.77 | 0.1084 | 3.34 | 0.1674 | 14.58 | 0.1406 | 9.42 | 0.0267 | 51.70 |
| | | | | | GE(2) | | | | | |
| 1984 | 0.2915 | - | 0.2325 | - | 0.3199 | - | 0.2815 | - | 0.0384 | - |
| 1987 | 0.3269 | 12.14 | 0.3076 | 32.30 | 0.3802 | 18.85 | 0.3421 | 21.53 | 0.0381 | -0.78 |
| 1990 | 0.3065 | -6.24 | 0.1608 | -47.72 | 0.2858 | -24.83 | 0.2548 | -25.52 | 0.0309 | -18.90 |
| 1993 | 0.3334 | 8.78 | 0.1836 | 14.18 | 0.3325 | 16.34 | 0.2942 | 15.46 | 0.0383 | 23.95 |
| 1996 | 0.3948 | 18.42 | 0.2385 | 29.90 | 0.3902 | 17.35 | 0.3566 | 21.21 | 0.0336 | -12.27 |
| 1999 | 0.2831 | -28.29 | 0.1770 | -25.79 | 0.2656 | -31.93 | 0.2474 | -30.62 | 0.0183 | -45.54 |
| 2002 | 0.4373 | 54.47 | 0.1740 | -1.69 | 0.3959 | 49.06 | 0.3689 | 49.11 | 0.0269 | 46.99 |

The pattern of GE(0) is almost identical to the pattern of Gini coefficients, although the percentage changes are more extreme. Overall inequality decreased from 1984 to 1990 then increased until 1996 and dropped to its lowest level in 15 years in 1999 before increasing again in 2002. In urban areas, inequality increased between 1984 and 1987, then decreased in 1990 and 1993 before rising again in 1996 in the pre-crisis period. Inequality then declined to its lowest level in 15 years in 1999, before increasing again in 2002. On the other hand, in rural areas the pattern is identical to the combined group. In terms of percentage increase or decrease, the largest decreases were in rural areas where inequality decreased by almost 26% in 1990 compared to 1987 and inter-group where inequality first increased by 25% between 1990 and 1993, dropped by 44% between 1996 and 1999, and increased again by 51.7% between 1999 and 2002.

By using the advantage of GE we can see that intra-group inequality accounts for most of the inequality. There are several observations that can be gathered here. First, between 1984 and 1987, intra-group inequality decreased while at the same time inter-group inequality increased. In order to explain this, we see that during the same period urban inequality increased while rural inequality decreased. This means that almost all intra-group decreases in inequality happened in rural areas. The opposite trend took place between 1993 and 1996, where intra-group inequality increased while inter-group inequality decreased. If we look at the separate rural and urban inequalities, Table 6 shows that, in percentage terms, the increase in inequality in rural areas was greater than the increase in inequality in urban areas. So between 1993 and 1996, urban areas managed to keep the increase in inequality below that of rural areas and narrowed the gap between them.

Secondly, the calculations show that, although total inequality decreased in 1999, the percentage decrease in intra-group inequality was much smaller compared to the decrease in inter-group inequality and the intra-group's share of all-group inequality was the highest in 1999. This implies that there was a narrowing of the gap in inequality between urban and rural areas. On the other hand, between 1999 and 2002, the increase in inequality happened more between rural and urban areas rather than within areas, as shown by the large percentage point increase in inter-group inequality compared to intra-group. This means the effect of the crisis that had lessened inter-group inequality considerably had been totally reversed by 2002.

Finally, the results show that the decrease in inequality between 1996 and 1999 could be attributed to the fact that the crisis had hit high-income households disproportionately harder and this contributed to a reduction in the income gap (Said and Widyanti, 2002). This impact had been channelled through large shifts in relative prices that may have benefited those in the rural economy relative to those in the modern-formal economy (Remy & Tjiptoherijanto, 1999). This is supported by the greater decline in inequality in urban areas than in rural areas, although urban areas still had higher inequality than rural areas in 1999. Looking at inequality in 2002, however, it is clear that high-income households have recovered to their pre-crisis level of income much faster, proven by the fact that the percentage point increase in inequality in urban areas was three times larger than in rural areas. In other words, they had been hit disproportionately hard by the crisis but also bounced back much faster, thus increasing inequality once again.

This conclusion is reinforced by the GE(2) results that also show a similar pattern, although the inequality is much higher in all specifications except inter-group. For example, in 2002 inequality in urban areas reached 0.4373, more than twice as high as GE(0) that recorded 0.1809. In addition, the percentage change is also much higher in most specifications and years in GE(2) than GE(0). If we look specifically at the 1996-2002 period, the crisis reduced inequality in all specifications by 26% to 46%, with the greatest reduction in inequality between urban and rural areas. As the crisis dissipated, only rural areas experienced a decrease in inequality, by just 1.7%. Inequality in urban areas increased by 55%, intra–group inequality increased by 49%, and inter-group by 47%. This proves that there is indeed more movement in the top level of the distribution, meaning they had been hit harder than the poor by the crisis, but they have recovered stronger than before.

### d. Atkinson index

The Atkinson index is more "bottom-sensitive", which means it is more strongly correlated with the extent of poverty (Kawachi, 2000). In contrast to GE measures, intra and inter-group inequalities in the Atkinson index cannot be added to obtain combined group inequality and thus are left out of the discussion. Table 7 provides the results of inequality calculations in Indonesia using the Atkinson Index.

| Table 7 | | | | | | |
|---|---|---|---|---|---|---|
| Atkinson Inequality Results Using Different Values of Epsilon | | | | | | |
| Year | Urban | % change from previous year | Rural | % change from previous year | All Groups | % change from previous year |
| | | | A(0.5) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1984 | 0.1010 | - | 0.0811 | - | 0.1021 | - |
| 1987 | 0.1066 | 5.54 | 0.0766 | -5.55 | 0.1022 | 0.10 |
| 1990 | 0.0956 | -10.32 | 0.0573 | -25.20 | 0.0844 | -17.42 |
| 1993 | 0.0962 | 0.63 | 0.0598 | 4.36 | 0.0908 | 7.58 |
| 1996 | 0.1052 | 9.36 | 0.0665 | 11.20 | 0.0975 | 7.38 |
| 1999 | 0.0839 | -20.25 | 0.0537 | -19.25 | 0.0753 | -22.77 |
| 2002 | 0.0936 | 11.56 | 0.0559 | 4.10 | 0.0872 | 15.80 |
| | | | A(1) | | | |
| 1984 | 0.1896 | - | 0.1513 | - | 0.1871 | - |
| 1987 | 0.1986 | 4.75 | 0.1413 | -6.57 | 0.1849 | -1.18 |
| 1990 | 0.1736 | -12.59 | 0.1071 | -24.21 | 0.1519 | -17.85 |
| 1993 | 0.1734 | -0.12 | 0.1102 | 2.89 | 0.1617 | 6.45 |
| 1996 | 0.1863 | 7.44 | 0.1207 | 9.53 | 0.1715 | 6.06 |
| 1999 | 0.1519 | -18.46 | 0.0996 | -17.48 | 0.1359 | -20.76 |
| 2002 | 0.1655 | 8.95 | 0.1027 | 3.11 | 0.1541 | 13.39 |
| | | | A(2) | | | |
| 1984 | 0.3402 | - | 0.2683 | - | 0.3210 | - |
| 1987 | 0.3517 | 3.38 | 0.2498 | -6.90 | 0.3135 | -2.34 |
| 1990 | 0.2932 | -16.63 | 0.1908 | -23.62 | 0.2549 | -18.69 |
| 1993 | 0.2908 | -0.82 | 0.1927 | 1.00 | 0.2671 | 4.79 |
| 1996 | 0.3053 | 4.99 | 0.2073 | 7.58 | 0.2793 | 4.57 |
| 1999 | 0.2570 | -15.82 | 0.1766 | -14.81 | 0.2300 | -17.65 |
| 2002 | 0.2736 | 6.46 | 0.1794 | 1.59 | 0.2538 | 10.35 |

According to this index, inequality in urban areas had increased between 1984 and 1987 before dropping in 1990 and 1993. Then, inequality again increased in 1996 before decreasing in 1999. This is identical to patterns found in Gini and GE calculations. On the other side of the coin, rural and all-group inequalities exhibit the same pattern, where both experienced decreases between 1984 and 1990 before increasing in 1993 and 1996. In 1999, inequality decreased. Between 1999 and 2002, we see that inequality in urban areas increased by a much higher percentage than in rural areas after also decreasing by a greater percentage between 1996 and 1999.

## VI.    ASSESSING THE ROLE OF INEQUALITY IN POVERTY REDUCTION

We now turn to the second part of our study, where we try to establish the relationship between inequality, poverty and growth in the context of Indonesia. Specifically, we aim to establish the role of inequality in poverty reduction observed in the country. First, Table 8 provides the trends of poverty rate, GE(2) inequality measure and expenditure growth index in rural and urban areas so that we can see their movements during the 1984-2002 period. We use GE(2) as our inequality measure for reasons stated in section IV.

| | Table 8 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Poverty Rate (%), GE(2) Inequality Measure, and Mean Real Expenditure Index (1984=100) in Urban and Rural Areas, 1984-2002 | | | | | | | | |
| | Urban | | | Rural | | | Total | | |
| Year | Poverty Rate | GE(2) | Mean Real Expenditure | Poverty Rate | GE(2) | Mean Real Expenditure | Poverty Rate | GE(2) | Mean Real Expenditure |
| 1984 | 29.25 | 0.2915 | 100 | 65.1 | 0.2325 | 100 | 56.68 | 0.3199 | 100 |
| 1987 | 24.30 | 0.3269 | 112.81 | 54.08 | 0.3076 | 114.53 | 45.95 | 0.3802 | 116.67 |
| 1990 | 16.65 | 0.3065 | 123.67 | 39.72 | 0.1608 | 133.09 | 32.68 | 0.2858 | 134.87 |
| 1993 | 10.22 | 0.3334 | 140.76 | 32.86 | 0.1836 | 144.22 | 25.32 | 0.3325 | 151.71 |
| 1996 | 7.11 | 0.3948 | 156.45 | 23.28 | 0.2385 | 165.99 | 17.44 | 0.3902 | 174.53 |
| 1999 | 16.33 | 0.2831 | 114.97 | 33.93 | 0.177 | 139.33 | 27.00 | 0.2656 | 139.38 |
| 2002 | 5.47 | 0.4373 | 152.23 | 17.61 | 0.174 | 169.71 | 12.22 | 0.3959 | 181.27 |

Looking at the mean expenditure index, the crisis nearly eliminated a decade's progress in mean expenditure in urban areas, taking the 1999 mean expenditure level almost back to the 1987 level, a huge drop from the height of the boom in 1996 where mean expenditure was 56% higher than its 1984 level. In 1999, the figure stood at merely 15% higher than 1984. Although, it bounced back by 2002, it is still lower than the pre-crisis level. Mean expenditure in urban areas also experienced the least positive change compared to the rural and national figures. In 1996, a year before the crisis hit, rural mean expenditure was 66%

higher than 1984 while national mean expenditure was 75% higher than 1984. The crisis also did not have as detrimental an effect in rural areas and nationally compared to urban areas since in both areas mean expenditure was still 39% higher than 1984.[10] In addition, in 2002, the mean expenditures in both rural and national levels have not only bounced back but have increased higher than pre-crisis levels. Although urban areas changed the least, it has to be acknowledged that urban areas still have higher mean expenditure than rural areas, a fact that is not shown in the table.

Comparing poverty rates and mean expenditure, it is clear that as expenditure increased, the poverty rate declined. This result is in accordance with expectations. It is quite interesting to see that in urban areas, even though the mean expenditure index in 1999 was almost the same as the 1987 level, the poverty rate was much smaller in 1999 than in 1987.

On the other hand, the inequality and mean expenditure index mostly moved in parallel, with inequality increasing (decreasing) each time expenditure increased (decreased). The exception is during the period between 1987 and 1990. In addition, it is interesting to see that in 1999, the only time when mean expenditure index dropped compared to previous period, inequality also dropped to its lowest level. Finally, the relationship between inequality and poverty is negative, except, once again, for the period between 1987 and 1990.

To see how inequality affects the poverty-growth relationship, we utilize a model used by Ravallion (1997) to see the "distribution-corrected" growth elasticity

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[10] This is consistent with the findings in Wetterberg *et al.* (1999).

of poverty rate. We use provincial level data from 1984 to 2002 in order to get sufficient observations.[11] The estimation result is:

$$r = -3.699(1-I)\,g + residual............(4)$$

with a heteroskedasticity corrected standard error of 0.809 and an $R^2$ of 0.2943, where $r$ is the rate of growth of poverty rate between two periods, $I$ is the initial Gini ratio, and $g$ is the growth rate between the two periods. However, joint F-tests reject two tests with null hypothesis that only growth matters and that only "distribution-corrected" growth matters.[12] This result means that the poverty-reducing effect of growth depends on the state of inequality. As inequality increases, the elasticity decreases.

In conclusion, we have shown that high inequality reduces growth elasticity of poverty. This means that the higher inequality the less impact growth has on reducing poverty. Most importantly, this also explains why the poverty rate between 1999 and 2002 decreased very rapidly: because inequality in 1999 was at its lowest, thus the impact of growth on poverty reduction was high.

## VII.    CONCLUSION

The purpose of this investigation has been to assess what happened to inequality during Indonesia's high growth and crisis eras and to examine whether inequality is related to poverty reduction in Indonesia. We use various widely used and familiar tools and manage to unearth several interesting results.

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[11] From the 26 provinces in Indonesia, we gathered 153 observations between 1984 and 2002 ((6 x 26)-3=153). The three provinces of Aceh, Papua and Maluku were not surveyed in 2002 because of civil unrest.

[12] This is different to the result obtained by Ravallion (1997). Putting in fixed-effects or random-effects did not remedy the situation. We believe, however, that our result still shows the importance of inequality in the relationship between poverty and growth.

First, looking at several inequality measures we found that inequality was actually at its lowest in 1999. During the period under investigation, there was quite a mixed pattern of inequality trends. It decreased between 1984 and 1990, increased between 1990 and 1996, then dropped in 1999 before finally increasing again in 2002.

Second, disaggregating by rural and urban areas revealed that intra-group inequality accounted for most of the inequality in Indonesia. What we have now established is that inequality between urban and rural areas in Indonesia is relatively lower than the inequality between the rich and the poor in each area.

Third, the changes in mean expenditure across deciles from 1984 to 2002 show that the bottom decile experienced the greatest positive change and the change decreased as one moves up to higher deciles. On the other hand, although people in lower deciles experienced higher percentage expenditure increases than people in higher deciles, we argue that they are still very much behind in terms of actual expenditure — total expenditure of the poorest 20% only accounted for 9% of total expenditure in 2002. In 1999, after the crisis, the ratio was at its highest level since 1984. This finding proves that people in lower deciles were hit less hard during the period than those in higher deciles. The rich bounced back by 2002 however, as shown by a decrease in the "10 to 10" ratio.

Fourth, the fact that in 1999 inequality was at its lowest level while the poverty rate was higher than the 1993 level suggested that two things happened during the crisis: people in higher deciles lost more than people in lower deciles in terms of mean expenditure. This caused inequality to decrease and there was enough decrease in the expenditure of people in lower deciles that some who

were not poor before the crisis became poor because of the crisis, thus increasing the poverty rate.

Finally, we have proven the importance of reducing inequality (improving income distribution) as a means to increase the impact of economic growth on poverty reduction, because inequality influences the growth elasticity of poverty. As inequality increases, the elasticity decreases. At high levels of inequality, growth would have less effect on Indonesia's quest to reduce poverty. This is partly proven by the fact that poverty reduction between 1999 and 2002 was very successful, that inequality in 1999 was at its lowest level in 15 years and resulted in the increased impact of growth on poverty reduction.

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