The Indonesian Crisis and Its Impacts on Household Welfare, Poverty Transitions, and Inequality:

Evidence from Matched Households in 100 Village Survey

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1. Introduction

In this study we provide some preliminary evidence about the impact of the economic crisis on household living standards, measured by real consumption expenditures per capita, and the distribution of living standards across households, measured by indices of inequality. Our study has two distinguishing characteristics worth highlighting right from the start. The first is that it is based on a set of households that were first surveyed in May 1997 just before the onset of the crisis, and then fourteen months later in August 1998 when the crisis had reached its peak. Examining the impact of the crisis using a 'panel' of households offers the opportunity to identify how the welfare of specific households changed as a result of the crisis.

The second is in relation to the price deflator we use to make nominal consumption expenditures comparable across years. Given the large shifts in food versus non-food relative price changes during the crisis, the price deflator used results in very different estimates of the magnitude and severity of the crisis.[1] We adopt a household-specific deflator that is a weighted average of the food and non-food price

* We wish to thank Lant Pritchett for his valuable comments and suggestions, Yusuf Suharso for his excellent research assistance, and BPS for providing access to the data.

[1] See Suryahadi and Sumarto (1999) and Thomas *et al* (1999).

indices. The weights applied to food and non-food prices vary from household to household and are calculated from an 'Engel curve' which predicts each household's food share in consumption expenditure, based on the household's (logarithm of) per capita consumption and family size. Such a deflator is more appropriate for evaluating the effects of the economic crisis since it captures more accurately the impact of higher food prices on the poorer households.

2. Description of the Data and Construction of Key Variables

The data we use are part of the 100 Village Survey conducted by the "Badan Pusat Statistik" (BPS) and funded by UNICEF.[2] The purpose of this survey is to monitor changes in health, education nutrition and socioeconomic status in 100 villages purposively selected from 10 "kabupaten" or districts in 8 provinces throughout Indonesia. In each village, 120 households were chosen (for a total sample of 12,000 households) and information was collected about all family members. While this sample is large in terms of number of households, and does represent a variety of areas across the country, because the selection of "desa" (villages) was not random, no firm conclusions about the impact of the crisis on the broader Indonesian population can be drawn from this sample. A preliminary round of the survey was conducted in 1994 and another full round in May 1997, just before the start of the crisis. The third and fourth rounds were conducted post-crisis in

[2] See Suryahadi and Sumarto (1999) for a more detailed description of the 100 Village Survey. A detailed descriptive analysis of the first two rounds of data from the 100 Village Survey has also been conducted by Molyneaux (1999).

August and December 1998 respectively, and there are plans to repeat the survey during 1999.[3]

Our analysis in this paper relies exclusively on those households that were interviewed in both rounds in May 1997 and August 1998. In August 1998 the sampling frame was changed from two enumeration areas of 60 households each to the original two plus a third enumeration area, each with 40 households. Of the 120 households from the two enumeration areas that were the same in both rounds, 80 households were targeted for re-interview. Unfortunately, in the second round the identifying codes for households was changed. The SMERU team identified the households using the name of the household head, cross checked with demographic characteristics. The effort to match households across rounds by the name of the household head resulted in matching 8,141 or 68% of the households across the two rounds. This implies that, on average, from the 120 households in each village, approximately 82 households were actually followed across rounds and 38 were replaced by new households in each village.[4]

Measure of Household Welfare

We use household per capita expenditures (*PCE*) or its natural logarithm (ln) as one measure of the living standards of a household. Of course, consumption expenditures are only one of many components of household welfare. Other

[3] See Suryahadi and Sumarto (1999).
[4] This actually exceeds the 'target' number of re-interviews. This is probably due to the fact that the rules followed by interviewers in the field did not match exactly the instructions from the central office of BPS.

important components include employment, health conditions, and the ability to access and utilize basic services such as water, sanitation, health care, and education. Later analysis will examine these alternative indicators.

Motivated by the social welfare approach developed by Atkinson (1970) and discussed in detail in Deaton (1997), we examine the impact of the crisis by evaluating its effect on mainly, though not exclusively, two aspects of the distribution of PCE: the mean (or median) and an index of inequality. Such a formulation allows us to account for the possibility that although the economic crisis may have an adverse effect on individual household welfare, by decreasing the mean level of *PCE*, it is possible that overall 'social' welfare may increase as a result of the distributional changes taking place because of the crisis. For example, the economic crisis may lead to a redistribution of income from the richer households to the poorer households and thus to decreases in the inequality of distribution of *PCE* .[5]

Specifically, *PCE(t) = C(t)/N(t)*, where *C(t)* denotes deflated food and nonfood consumption expenditures in year t (see below for details on the deflators

[5] If we were to describe social welfare with the help of a social welfare function, then social welfare in period t, *W(t)*, could be described as a function of the *PCE* of all the households in the population in period t, i.e.,

$$W(t) = W\left(PCE_1(t), PCE_2(t), ..., PCE_K(t)\right),$$

where K is the number of households in the population. Using a set of relatively innocuous assumptions about the properties of the function *W*, such as *W* being non-decreasing in each of its arguments, symmetric and quasi-concave, and homogeneous of degree one, we may then express social welfare in period t as

$$W(t) = \overline{PCE(t)}(1 - I(t)),$$

i.e. as a function of the mean level of *PCE* in period t, denoted by the bar over *PCE(t)*, multiplied by one minus the level of inequality in the distribution of *PCE* in period t, (denoted by *I(t)*). This formulation allows for the possibility that social welfare may increase from one period to another, as long as there is sufficient decrease in the inequality of the distribution of PCE that exceeds the decrease in mean PCE.

used) and *N(t)* denotes total family size in year t[6]. In various instances we also look at *PCE* for food and nonfood separately. Food expenditure is the sum of expenditures on grains, meat, fish, eggs and milk, vegetables, beans and nuts, fruits, seasonings, fats and oils, soft drinks, prepared food and other food items, as well as alcohol and tobacco.[7] The reference period for expenditures on these items was the week preceding the day of the interview. These weekly expenditures were transformed into monthly expenditures by multiplying by (30/7).

For non-food expenditures two measures were collected, each for a different reference period: last month and last 12 months. To minimize recall errors (but at the expense of exclusion errors) we utilized the expenditures reported based on the reference period of last month. Nonfood expenditure is defined as the sum of expenditures on housing, health, education clothing and shoes, durable gods, taxes and insurance, and other ceremonial expenses.

Given the prevalence of rural households in our sample, it is possible that the value of consumption collected by the first two rounds of the 100 village survey may understate true household consumption, especially for a staple commodity such as rice that is both purchased from the market and produced and consumed at home. The questionnaires of the May 1997 and August 1998 rounds did not ask respondents explicitly about consumption purchases from the market last week and

[6] For cross household comparisons it is more appropriate to use C/N^q, where "q" is a parameter that represents economies of scale at the HH level (e.g. q = 1 implies no economies of scale). For our present purposes of comparisons over time the use of the special case of q = 1 is not overly limiting.
[7] In our calculation of total food expenditures we included alcohol and tobacco to be in accordance with the practice of BPS.

the value of consumption from own production or food received as a gift. However, the questionnaire of the December 1998 round did collect this information on consumption from these three sources separately. To check for the possibility of underestimating household consumption in the first two rounds of the survey, we examined the proportion of rice consumption from total food consumption for land-owners who are likely producers and self-consumers of rice. According to the August 1998 round, the mean proportion of rice consumed was 37 percent, while on December 1998 it was 41 percent, with 25 percent coming from the market, 14 percent coming from own production and 2 percent from gifts and transfers. Based on these small differences we conclude that under-reporting of consumption in the first two rounds of the surveys does not constitute a significant problem for measuring household welfare.

It is also important to take note of two other points. First, the questionnaires were conducted at different months of the calendar year (May in 1997 vs. August in 1998), thus introducing the possibility that some of the observed changes in consumption may simply be due to seasonality and not necessarily because of the crisis. This is particularly true of some items like education expenditures or clothing which are quite seasonal because affected by the educational calendar. Second, although our sample consists primarily of households in rural areas, there are households or villages that are classified as being in 'urban' areas (17.8 percent of the sample). The reader is cautioned that villages in urban areas in our sample are not part of large metropolitan agglomerations (e.g. Jabotabek, Surabaya, Medan etc.), but

are villages ("desa") that are closer to the district capital. Such villages are classified administratively as "kelurahan" instead of "desa" and coded as urban areas in our sample.

Deflating Expenditures

The nominal consumption expenditures in the two rounds of the survey need to be adjusted in order to be able to make meaningful comparisons about household welfare across the two rounds of the survey. Because of the large increases in the price of rice during the economic crisis, an expenditure of 10,000 Rps on rice during August 1998 represents a much smaller quantity of rice compared to the same expenditure in May 1997.

To control for the large differences in price level across the rounds we have constructed a Laspeyres index using the following steps. First, we constructed a deflator for non-food items using the mean shares of the non-food items in the May 1997 survey as weights and the price indices published in the Monthly Statistical Bulletin ("Indikator Ekonomi") of BPS in May 1997 and in August 1998.[8] We have not used region-specific deflators for food or non-food items because regional deflators available in Indonesia are based explicitly on urban prices, so any cross regional comparisons should be made with caution.[9]

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[8] Beginning in April 1998, the BPS changed the base year used to calculate price indexes in its publications, from April 1988-May 1989 to 1996. As a result, month-specific values of the price indexes in May 1997 (the first round of the survey) and in August 1998 (the second round of the survey) are calculated and published using different base years. Therefore, prior to constructing the deflator for non-food items we had to fist convert the value of the May 1997 food and non-food price index to Aug 1996 prices.

[9] Alternative price indices include the general price indices for 44 cities or the category-specific prices indices for the same 44 cities (see "Indikator Ekonomi"). All measures suffer from the disadvantage that price indices based on the prices of food items or groups of food items in cities may be quite different from the prices prevailing in rural areas.

Second, we constructed a household-specific deflator that is a weighted average of the food and non-food prices indices calculated above. Specifically, if we denote by t the periods of May 1997 and August 1998, and the price deflators for food and non-food in period t, by $P_F(t)$ and $P_{NF}(t)$, respectively, the price deflator for period t for household *h*, $P^h(t)$ can be expressed as

$$P^h(t) = \hat{W}_F^h(97)P_F(t) + \left(1 - \hat{W}_F^h(97)\right)P_{NF}(t)$$

The weights applied to food and non-food vary from household to household. The weight for each household was calculated from the predicted value of the regression of household food share in May 1997, $\hat{W}_F^h(97)$, on the logarithm of per-capita consumption, $\ln(PCE(97))$, and the logarithm of household size.[10] In this manner the influence of household specific unobserved components or tastes on the share of food is eliminated.

As is the case for all Laspeyres price deflators, the share of food is assumed to be constant. To the extent that the changes in relative prices are such that the share of food also increases as a result of the crisis (as indicated by the data below) then the above deflator may be underestimating the increases in prices. In an effort to check for this possibility, we have also constructed another deflator with variable weights for food based from the coefficients from an Engel curve estimated separately for May 1997 and for August 1998. The changes in the results using the deflator with the varying food share were very small and so we have opted to present the results obtained using the deflator based on a fixed food share.

[10] In other words, we estimated a semi log-linear Engel curve for food.

3. Descriptive Statistics and Analysis of the Data

A Visual Tour of Changes in Per Capita Consumption Expenditures

We begin with a series of graphs and figures that provide a quick visual impression of the impact of the crisis on the distribution of household consumption between the May 1997 and August 1998. Figure 1 contains graphs of the cumulative distribution functions (CDF) of *lnPCE* in 1997 and 1998. As can be seen from the figure, the 1998 CDF lies to the left of the CDF in 1997 with no 'crossings'. This implies the CDF in 1998 'stochastically dominates' the CDF in 1997,[11] and hence that the poverty rate will be higher in 1998 no matter what poverty line is chosen (see Deaton, 1997). Moreover, the shift to the left in the CDF between 1997 and 1998 has not been exactly parallel, with the lower part of the CDF shifting more to the left than the upper part.

Figures 2 and 3 contain quantile-quantile (QQ plots) of *lnPCE* in 1997 vs *lnPCE* in 1998. QQ plots graph the ranked data values of *lnPCE* in 1997 in ascending order along the horizontal axis against the ranked data values of *lnPCE* in 1998 on the vertical axis. If the two *distributions* were identical then all points would lie on the diagonal line. (At this stage we are *not* comparing the same households in the two rounds of the survey so that the 'worst' household in 1997 and 'worst' household in 1998 are likely not the same). In Figure 2 we present the QQ plot for rural and urban areas. These figures reveal that in rural areas the 1998 values fall farther below the

[11] A distribution f 'stochastically dominates' another distribution g if $\int_{-\infty}^{\alpha} f(x)dx > \int_{-\infty}^{\alpha} g(x)dx \quad \forall \alpha$

diagonal line for households at the lower end of the distribution in 1998. This implies that the fall in income was worse for those at the lower end than at the upper end in rural areas and indicates a worsening of the distribution. In contrast, in urban areas there is some indication that those of greater falls were at the upper end of the distribution.

Figure 3 repeats these QQ plots for coastal and inland areas. These plots suggest that both coastal and inland villages have been affected, but the negative impact on household welfare has been smaller in the coastal areas than in the inland villages. This consistent with the findings reported in the "Participatory Assessment Study" carried out by BPS to supplement the 100 Village Survey where fishermen in coastal areas reportedly benefited greatly from the devaluation of the rupiah.

In Figures 4 and 5 we present estimates of the probability densities for total and food expenditures, respectively. Kernel density estimates provide a better view of the impact of the crisis on the mean and variance of *lnPCE*. Apparently there is a significant shift to the left (worsening) in both urban and rural areas, but variance seems to have increased in urban areas.

Using the Matched Households

Having taken a quick look at the broad impacts of the crisis on the distribution of *lnPCE* in the sample, we now make better use of the panel nature of the sample and look at the distribution of growth rates as measured by the difference between the *lnPCE* of *the same* household in 1998 versus 1997.

Figure 6 presents non-parametric estimates of the density of consumption changes in urban and rural areas. The vertical line at 0 divides the density of changes into positive and negative changes. The fact that a larger portion of the two densities lies to the left of the vertical line implies that that most households experienced falls in real consumption.

One thing visually apparent is the enormous magnitude of the changes for measured ln PCE in specific households versus the overall average. The variance of changes for specific households is enormous. Since this graph is in natural log units, the difference in natural logs of PCE is roughly the same as percentage change in the level of PCE for small changes and a one unit in the difference of *lnPCE* represents an 80 percentage point shift in the level of PCE. This suggests both that there is likely a tremendous amount of noise involved in measuring the expenditures of specific households from year to year and that aggregate measures are likely to mask the huge changes in the circumstances of specific households.

Figure 7, presents the same graphs of changes in *lnPCE* for households separately for urban and rural villages when households are classified by their quartile in the 1997 distribution of income. Those who were in the bottom quartile in 1997 did relatively well—more than half of those households (in both rural and urban areas) experienced a positive growth in consumption. But as we move up to higher quartiles in the original distribution the fraction of households experiencing consumption decreases is higher than 50% percent. Part of this is likely to be 'regression to the

mean' due to measurement error in household expenditures, but it also reflects different impacts.

Thus the first impressions created by the shift to the left of the CDF in Figure 1, miss a large part of the story. That is, while those classified as poor in 1998 were poorer than those classified as poor in 1997, it is not simply that poor households got poorer. Many of the households likely to be classified as poor in 1998 are probably new households entering into the poverty and in many instances replacing previously poor households that moved out of poverty. Both of these are consistent with the view that in rural areas the crisis is more likely to have had a negative effect on those without land relying primarily on wage income, as the data on agricultural wages suggest very large falls in real wages (Papanek and Handoko, 1999). In contrast, the real incomes of producers in rural areas is likely to remain unchanged, if not increase, as they benefit from relative price shifts favoring food and export crops (to varying degrees, depending on what was being produced and production versus consumption). In urban areas, evidence from other surveys suggests the shock has affected the relatively well-off (particularly the IFLS 2+ evidence, and particularly in provinces on Java, see Frankenberg *et al* (1999)).

Figure 8 presents the distribution of changes in household consumption by kabupaten, whereas Figure 9 permits visual investigation of the distribution of changes in *lnPCE* in coastal and landlocked villages. Irrespective of the groupings examined, the share of food expenditures increased between 1997 and 1998 while

(not surprisingly) the share of nonfood expenditures decreased, suggesting again that welfare decreased because of the crisis.

Key Summary Statistics on Expenditures

Table 1 provides the numerical estimates of some key parameters of the distribution of PCE in 1997 and 1998, such as the mean, standard deviation, median and interquartile range (IQR which stands for the difference between the .75 and .25 quantiles) by rural and urban areas, inland and coastal areas, kabupaten, household size in 1997, gender of household head, education level of household head and by expenditure quartile in 1997. The patterns reported in Table 1 are quite standard so we will not devote too much space discussing them.[12]

In Table 2, columns (A) present the changes, as percentages, in the mean and median values of the sample for each of the groups listed in Table 1. For purposes of comparison, we have also constructed another table similar to table 1 by deflating nominal consumption expenditures with a household-specific deflator that allows the share of food to vary from year to year. The changes, as percentages, in the mean and median values of the sample for each of the groups are presented in the next two columns under the heading (B). Clearly, the percentage changes in the mean and median expenditures are slightly higher using a deflator that allows the share of food

[12] The mean *per capita* expenditures of households decrease monotonically with household size which is due to the assumption of zero economies of scale ($q = 1$). Other equally valid assumptions about the degree of economies of scale ($q < 1$) would produce other results.

to adjust. As suspected, holding the share of food constant in the deflator tends to underestimate the drop in mean consumption. However, the difference in most instances is quite small, i.e. around one percentage point.

Table 3 contains the mean shares of food nonfood and of their components. The share of food expenditures increased from 71 to 77.5 percent as a result of the crisis suggesting that households have cut down consumption of non-food items as a means of maintaining their welfare. It also appears that there have been some reallocations in the consumption of specific food items with households devoting a bigger share of their budget on rice, tubers and pulses, and less on meat and fruits.

Poverty Rates

There is a variety of methodological approaches to calculating a poverty line, and each of these approaches can produce widely differing results. Moreover, at any given point in time the *level* of poverty reported is quite sensitive to the poverty line. Equally reasonable poverty lines can produce poverty rates for exactly the same data for the same year between 10 and 25 percent of the population. In this instance we are interested principally in the *changes* in poverty. Hence, the poverty line is chosen to be the 11^{th} percentile of the distribution of *lnPCE* in the full sample of 12,000 households (not just the matched sample of 8,141 households). That is, the poverty line was chosen to produce an 11 percent poverty rate so the *level* of poverty in this case is an arbitrary assumption. But from that level we can calculate changes and these changes in poverty, while not invariant, are robust to the initial assumed level of

poverty. With this poverty line, the poverty rate in our matched sample of 8,141 households the poverty rate in May 1997 turned out to be 12.4 percent, i.e. slightly higher than the 11 percent poverty rate in the full sample of 12,000 households in May 1997.

In Table 4 we report the values of the Foster, Greer, and Thorbecke (FGT) poverty index (Foster *et al*, 1984). This class of poverty measures is highly regarded because it meets all the axioms desirable in consumption-based poverty measures and contains a parameter α that can be set according to society's sensitivity to the income distribution among the poor. Specifically the FGT family of poverty measures is summarized by the formula:

$$P(\alpha) = \left(\frac{1}{N}\right)\sum_{i=1}^{q}\left(\frac{z - c_i}{z}\right)^{\alpha}$$

where N is the number of households, c_i is the per capita consumption (or income) of the i'th household, z is the poverty line, q is the number of poor households, and a is the weight attached to the severity of household poverty (or the distance from the poverty line). When a = 0, the FGT measure collapses to the Headcount Index, or P(0), the percentage of the population that is below the poverty line. This measure while useful for general poverty comparisons, is insensitive to differences in the depth of poverty, in the sense that households far below the poverty line receive the same weight as households just below the poverty line. This shortcoming is overcome by assigning higher values to the parameter α. When α = 1 the FGT measure gives the Poverty Gap, or P(1), a measure of the average depth of poverty

and indicates the average money gap by which the consumption of the poor falls short of the poverty line. When $\alpha = 2$, for example, the FGT index is called the Severity of Poverty index, or P(2). The P(2) measure differs from the P(1) measure because it assigns relatively more weight than the P(1) measure to individuals whose expenditures are further away from the poverty line and thus in more severe poverty.

Based on the poverty line in 1997, the poverty rate (head-count index) doubled in our panel of households from 12.4 percent to 24.3 percent.[13] Although this poverty rate in 1998 is remarkably close to the rural area poverty rate of 25.72 percent estimated by the BPS during the recent months (Sutanto, 1999), it should be noted that these two poverty rates are not strictly comparable because each one is derived by very different methods. What is more comparable, however, is the change in the poverty rate from the year before the crisis to the year during the crisis. In our sample, it appears that the poverty rate in the rural areas has increased by 100 percent (i.e. doubled) although, according to the methodology used by BPS the poverty rate in rural areas increased from February 1996 to December 1998 by 21 percent or from 21.27 to 25.72 percent using the 1998 poverty bundle (or from 12.3 to 17.64 percent using the 1996 poverty bundle). A significant portion of this large discrepancy in the change in the poverty rate may be attributed to differences in the timing of the surveys during the crisis. Perhaps the much lower increase in the poverty rate

[13] It is important to note that the increase in poverty rate did not differ much when we deflated nominal expenditures with the deflator that allows the share of food to vary from year to year. With this alternative deflator, the headcount poverty rate P(0) in 1998 was 25.6 percent instead of 24.5 percent.

estimated by BPS in December 1998 is a reflection of the easing off of the crisis after August 1998.[14]

The poverty indices of higher order also increased and by a factor higher than the increase in the headcount ratio. For example, in strictly rural areas the poverty rate in 1998 is 2 times as high as in 1997 (28.1% versus 14.6%). The poverty gap in rural areas increased from 0.027 to 0.070, so the average poverty deficit increased from 2.7% to 7.0% of the poverty line. The poverty severity index increased by a factor of 3, from 0.008 to 0.027. Also, poverty rates seem to have increased more in the inland areas compared to the increase in coastal areas.

Household Transitions in Poverty and Expenditures

If the two rounds of the survey were to be treated as independent cross sectional surveys conducted at different points in time, then we could only examine how key parameters characterizing the distribution of welfare have changed across rounds in our sample population. In this manner we could only draw inferences about the impact of the crisis on the 'average' or 'median' household in the sample or the 'average' or 'median' household among the set of households with certain common characteristics, such as households with a college-educated heads. This approach, however, does not allow us to make inferences about the impact of the crisis on the welfare of specific households. Thus, if a specific household was at the top or bottom of the consumption distribution in May 1997, there is no way of

[14] See Suryahadi and Sumarto (1999) for further evidence that after August 1998 there has been some easing off of the impacts of the crisis.

determining where this household ended up in the distribution of consumption among households after the onset of the crisis. Simply put, in comparisons of the means of two repeated cross-sections, the mean may stay relatively unchanged between rounds, if between rounds many of the poor households in the first round of the sample switched income or consumption levels with the rich households in the first round of the sample. In this extreme case, the absence of significant changes in the mean of the distribution of per capita consumption would lead to the conclusion that the crisis has had 'no impact' on aggregate household welfare even though many individual households experienced a severe shock, while others benefited. The 'net' change may mask a large entry into poverty accompanied by exit from poverty.

In Table 5 we present a poverty transition matrix. We classify households into one of four categories based on their per capita expenditures (PCE) and the poverty line (PL), *poor* (PCE<PL), *near poor*, i.e. above the poverty line but by less than 25% (PL=PCE<1.25*PL), *near non-poor*, i.e. more than 25% but less than 50% above poverty line (1.25*PL=PCE<1.5PL), and *non-poor,* i.e. those more than 50% above (PCE=1.5PL). This allows us to examine both how those in poverty in 1997 fared and who moved into poverty in 1998. This table is difficult to read as it contains a lot of information. The row totals (at the far right) show the allocations of households in 1997. So in 1997, 1,010 households were poor while 5,029 non-poor. The column totals (along the bottom) show the allocations of households across these categories in 1998. So in 1998, 1,997 households were poor while 3,562 were non-poor.

For each row, the columns show how households in that category in 1997 fared in 1998. So, take the second row of the 988 households that were near poor in

1997, where were they in 1998? Only 239 (24.19%) were 'on the diagonal', that is, in the same category in 1998 as 1997. Of the rest were 309 (140 + 169) households which improved their economic status, while 440 (44.53%) fell into poverty. Similarly by looking down the columns one can see where the households in any category in 1998 were in 1997. So, for instance, of the 3,562 households that were non-poor in 1998, 3,029 (85.04%) were also non-poor in 1997, while only 58 households (1.63% of the 1998 non-poor) came from being poor in 1997. Meanwhile, the bottom number in each 'cell' gives the percent of the total households. So, 8.56% of the population was poor in both periods, while 524 households (6.44% of 8,141) were non-poor in 1997 and becoming poor in 1998.

Keeping all this straight, one needs to keep in mind the arithmetic of percentages. For instance, a larger fraction of a smaller percent of the population might be smaller absolutely than a smaller fraction of a larger part of the population. So, only 10.42% of those non-poor in 1997 became poor in 1998. However, since the non-poor were 61.77% of the 1997 population, they are 26.24% of the 1998 poor. On the other hand, even though 44.53% of the 1997 near poor became poor, as only 12.41% of the 1997 population was near poor, only 22.03% of the poor in 1998 came from the near poor category in 1997.

These transitions reveal considerable fluidity. Approximately 31% of the poor in 1997 moved out of poverty in 1998, though mostly to being near poor. Fully 44% of the near poor in 1997 became poor in 1998, but 17% became non poor. Clearly, the crisis has resulted in the impoverishment of many of the households who were

marginally poor before the crisis. But more surprisingly a significant fraction (almost 17%) of the new poor households in 1998 come from the near non-poor category.

What is striking is the composition of poverty in 1998. Only 35 percent of the poor in 1998 are those who were poor in 1997, while more than a quarter (26.24%) of the poor in 1998 were *non-poor* in 1997. These are households which in 1997 had expenditures more than 50 percent above the poverty line. This implies that reaching 'the poor' in 1998 will be difficult, as many families who would not have been at all poor have suffered large reversals in fortune during the crisis and became poor.

The observation that a large fraction of this mobility may be just pure measurement error does not make the targeting any easier. This just points how difficult it is in practice to get a firm handle on 'poverty' for administrative targeting as, if even a detailed household survey leads to a large classification errors, cruder proxies based on a few characteristics like the quality of the house could well do much worse.

Table 6 contains a transition matrix of households from quintiles of expenditures in May 1997 to quintiles of expenditures in August 1998. The numbers reported in the top 5 x 5 matrix are the ratios of households in the cell divided the total number of households in the sample. The fluidity is also revealed here. For instance, only half (10.85% of 20%) of those in the bottom quintile of the distribution in 1997 remained in the bottom quintile one year later. Similarly for the rich households at the top quintile of the distribution in 1997 only half were still in the top. But, the same quintile plus or minus one is usually about three quarters of

the quintile (so, of those in the 3rd (middle) quintile in 1997, 5.44 stayed in the 3rd, 4.41 were in the 2nd (down one), and 4.63 were in the 4th (up one) for 14.5% of the 20% moving one quintile or less).

Of the 8,141 panel households only 39 percent remained in the same quintile in both years, 38% moved by one quintile (up or down) and 23% moved across two or more quintiles (up or down). Clearly, there were major differences in how hard households were hit by the crisis and in their ability to adapt to it.

Comparing transitions in urban and rural areas reveals that a smaller fraction (14.5/20 or 72.5%) of households stayed in the same quintile in the rural areas and that a larger percent of households moved down by 1 quintile in rural areas than urban areas (20% vs 16%, respectively). Comparing transitions in the coast versus inland also shows that households in inland areas moved down by one quintile more frequently than households in coastal areas. Also female-headed households did not fare much differently than male-headed households.

Household Correlates of Transitions

However, the crisis had quite a differential effect on household welfare depending on the level of education of the household head and the number of family members in the household. Households with heads that have a lower levels of education seemed to have moved out of their original position (only 38% the same both years) with an equal proportion of such households moving up (20%) or down

(20%) by one quintile. In contrast, household with more educated heads as a diploma, were more likely to not move (61%) but were more likely to move down (25%) than up (14%).

The last panel in Table 6 reveals that larger households were more likely to improve their ranking compared to smaller households. Thus household size seems to have played an important role in alleviating the impact of the crisis on household welfare. This finding is consistent with the findings by Thomas *et al.* (1999) with the IFLS2+ where "PCE has declined least in larger households" (p. 16).

To examine further the household covariates of the change in *lnPCE* between the two rounds we have also estimated a number of exploratory regressions contained in Table 7. Column (A) in Table 7 contains the estimates obtained from regressing the change in *lnPCE*, (i.e. *lnPCE*98-*lnPCE*97) on a set of household and head characteristics in 1997 such as family size, age of the head, education level of the head, sector of employment and type of work of the head, detailed age and gender composition of the household and some variables characterizing the geographic location of the household.

Individuals working in the manufacturing sector (-0.086), in transportation and communication (-0.063) and in services (-0.062) seem to have experienced larger falls in consumption compared to those in agriculture (the 'default' occupational). In contrast, households with a head that is self-employed working with help from family members or as unpaid family workers seem to have experienced higher consumption growth.

The variables characterizing the age and gender composition of a family seem to become statistically significant more frequently after controlling for village (or desa-specific) fixed effects as in columns (B) and (C). In column (C) the dependent variable is the difference in nominal PCE as opposed to columns (A) and (B) where PCE is deflated. The advantage of the specification in (C) is that inflation rates are allowed to vary across villages. In any case it seems that when we control for village specific inflation rates, households with male and female members between ages 10 and 14 and males 55 years old or older, experienced significantly lower growth rates in consumption. In contrast the presence of younger adult and older female members seems to have contributed to higher growth rates.

Similar regressions were run for the change in food share (Table 8). The estimates obtained after controlling for "desa"-specific fixed effects suggest that unpaid family workers experienced a significantly smaller increase in their food share or in other words relatively smaller decrease in their welfare. This is consistent with the result in Table 7. Also, if we were to continue using food share as an indicator of welfare, households with a head that has primary education or vocational senior high-school, experienced a relatively smaller decrease in their welfare compared to household with a head that has no education.

Changes in Inequality

In order to examine the impact of the crisis on the distribution of welfare across households we have also calculated the values of a variety of inequality indices

such as percentile ratios, the Generalized Entropy class of inequality indices, denoted by GE(α), the Gini index, and the Atkinson index, denoted by A(ε).[15] The GE(α) and A(ε) indices offer the advantage of being more sensitive to differences in different parts of the expenditure distribution depending on the value of the sensitivity parameters α and ε. For example, the larger a is, the more sensitive GE(α) is to consumption differences at the top of the distribution; and the more negative is α the more sensitive it is to differences in the bottom of the distribution. GE(0) is identical to the standard deviation of the natural logarithm of *PCE* (*lnPCE*), GE(1) is the Theil index of inequality and GE(2) is half the square of the coefficient of variation. Along similar lines, in Atkinson's index of inequality, the larger e (known as the inequality aversion parameter) is, the more sensitive A(ε) is to income differences at the bottom of the distribution. Another advantage offered by the Generalized Entropy and Atkinson's indices of inequality is that both are additively decomposable into within-group and between-group inequality. This way we can examine whether consumption inequality changed differently within and across (or between) urban and rural areas or kabupaten. Such a decomposition is not possible for the Gini index,, although this is the index more commonly used as an index of inequality.

In Table 9 for each of the two rounds, of the survey, we report the values of the percentile ratios and the values of the GE(α) index for selected values of α, such

[15] If we were to deflate nominal consumption expenditures with a common price deflator such as the national consumer price index, the corresponding inequality indices for each year would be identical to those obtained using nominal consumption expenditures in each year. That is because inequality indices are independent of the scale of the variable analyzed. It is important to clarify that since our price deflator varies from household to household our analysis on inequality is based on the deflated PCE.

as α=-1, α=0, α=1, and α=2. These are followed by the value of the Gini coefficient of inequality, and the values of the Atkinson index for ε=0.5, ε=1 and ε=2.

As can be seen, based on the full sample of matched households, inequality in *real expenditures* increased substantially according to the GE(-1) (22.44%) and A(2) (17.05%) measures. Both of these measure are more sensitive to consumption differences at the bottom of the distribution. The Gini coefficient increases only by 7%.

Next, we calculated the inequality indices separately for rural and urban villages. We find that the drop in inequality using the GE(2) measure in the full sample was driven by the drop in inequality in the urban areas. For households strictly in rural areas we find that inequality increased even for the GE(2) inequality index. These findings appear to reflect two phenomena of the crisis. First, inequality in rural areas likely *increased*, as rural wage earners, both in agriculture and non-agriculture had real wages drop precipitously as rising nominal wages did not keep pace with price inflation in their consumption basket, while many rural net producers actually benefited from the depreciation and relative price shift. Second, even though this sample does not capture the major metropolitan areas (e.g. Jabotabek, Surabaya, Medan, etc.), it does indicate very large falls in the expenditure of the rich in urban areas, so inequality measured by the Gini (or measures sensitive to the upper tail) shows actually improving though not for the poor sensitive indices (e.g. GE(-1) or A(2)). This is consistent with the findings of Sutanto (1999) showing increasing P(2) indices, potentially indicating rising inequality amongst the poor.

Lastly, we also calculated inequality separately by kabupaten. Briefly, it appears that although overall inequality increased as a result of the crisis, the effects of the economic crisis on inequality was quite heterogeneous across kabupatens in the sample with inequality increasing in some kabupatens and decreasing in others (for example see the GE(-1) index for the Pandeglang kabupaten in West West Java and Kutai kabupaten in E. Kalimanatan). The increase in inequality in the sample was accompanied by an increase in both within-group and between-group inequality. What is more interesting however, is that the growth in inequality between kabupatens was proportionately higher than the growth in inequality within kabupatens. Thus, inequalities in mean consumption across kabupatens that were present before the crisis were reinforced as a result of the crisis.

These results are providing illuminating contrast to the findings in the IFLS2+ (see Thomas *et al*, 1999) where it is reported that the impact of the economic crisis in Indonesia resulted in lower inequality. In our sample, the crisis resulted in lower inequality only if we use the GE(2) inequality index which is more sensitive to consumption differences at the top of the distribution and especially in urban areas. The IFLS2+ also finds varying changes in inequalities across provinces and between urban and rural areas. In order to investigate some of the possible reasons for finding an increase in inequality as opposed to a decrease found with the IFLS2+, we have also recalculated all of the inequality indices reported in Table 9 using nominal consumption expenditures instead of real consumption expenditures (i.e. consumption expenditures deflated by the household-specific deflators discussed earlier). We found that inequality was also higher in 1998 compared to 1997 but the

proportional increase from the 1997 level was smaller. Though suggestive, these results indicate that using nominal consumption or consumption expenditures are deflated by price indices that vary only across regions but not across households are likely to underestimate the impact of the economic crisis in Indonesia on inequality.

4. Concluding Remarks

Our preliminary results from the panel of matched households in the 100 Village Survey, suggest that the economic crisis has resulted in a considerable drop in the welfare of households in our sample. Average per capita expenditures dropped significantly and at the same time inequality increased, especially when account is taken of the relative price shifts by a household specific deflator.

The poverty rate in rural areas in our sample appears to have doubled from the immediate pre-crisis level of 12 percent to 24 percent at the worst of the crisis. However, transitions into and out of poverty as well as transitions into and out of quartiles of consumption expenditures in the two survey rounds revealed remarkable fluidity. This implies that reaching "the poor" in 1998 will be difficult, as many families who would not have been at all poor have suffered large reversals in fortune during the crisis and have entered poverty.

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Table 1
Descriptive Statistics of Per Capita Household Expenditure (PCE)
(Expenditures in 1996 Rps.)

	1997					1998			
	Mean	**Std Dev**	**Median**	**IQR**		**Mean**	**Std Dev**	**Median**	**IQR**
Full sample	49,349	34,530	42,885	26,769		40,934	27,631	34,327	23,591
Rural	45,538	25,179	40,546	24,946		37,668	24,595	32,282	20,723
Urban	66,962	58,290	55,055	33,593		56,030	34,927	48,202	33,551
Inland	47,500	31,768	41,849	25,583		37,639	24,691	32,257	20,629
Coast	52,505	38,595	44,999	29,560		46,559	31,245	39,004	29,682
District:									
Indragiri Ilir, Riau	57,423	30,320	50,895	23,827		60,761	31,486	52,185	31,421
Lampung Selatan, Lampung	40,908	22,421	36,597	20,103		34,213	25,085	27,287	17,687
Pandeglang, West Java	51,377	37,587	43,778	26,732		37,675	21,646	33,691	14,904
Sumedang, West Java	58,967	25,948	52,898	26,432		47,440	26,046	42,089	24,554
Banjarnegara, Central Java	37,981	24,109	32,480	21,871		33,811	25,996	29,125	15,339
Rembang, Central Java	51,089	37,221	44,370	20,136		42,861	24,950	36,649	19,213
Karangasem, Bali	53,926	23,940	49,451	22,170		42,522	25,997	36,512	19,334
Kupang, NTT	39,706	44,300	31,851	22,121		27,194	19,836	21,818	17,826
Kutai, East Kalimanatan	71,736	45,106	60,120	39,636		59,442	34,050	50,915	34,955
Kendari, S.E. Sulawesi	37,560	22,092	31,588	20,167		33,020	22,601	27,171	17,914
Household Size in 1997:									
1-2 persons	68,320	50,410	57,853	33,983		53,740	37,410	44,061	31,597
3 persons	54,163	35,157	48,145	26,486		43,438	24,711	37,608	23,125
4 persons	46,160	23,093	42,060	24,615		39,270	26,624	33,362	20,510
5 persons	43,257	32,761	37,792	21,737		36,400	21,627	30,804	21,281
6 persons	38,353	20,248	35,027	18,737		34,400	22,532	28,947	18,850
>=7 persons	35,491	17,680	32,007	19,686		31,879	21,221	27,208	19,771
Male Head of Household	48,866	34,720	42,466	26,227		40,512	27,546	34,095	23,395
Female Head of Household	54,993	31,729	47,928	32,151		45,863	28,188	39,063	26,088
Education Level of Head:									
Missing/No Education	43,837	21,345	39,968	25,132		36,808	22,495	32,063	20,099
Primary	46,542	30,503	41,276	24,888		38,946	25,006	33,278	22,034
JuniorHS+VocJHS	54,585	30,307	47,012	29,202		45,686	33,628	37,661	27,331
SeniorHS	66,271	44,096	55,051	37,502		56,482	40,725	47,849	38,256
Voc SHS	69,728	41,965	60,610	39,265		51,089	29,128	43,759	27,859
Diploma	94,579	116,029	71,815	38,552		69,986	47,173	57,617	45,300
Quartile of 1997 PCE:									
1-25%tile	24,158	4,733	24,849	7,437		25,327	12,412	23,251	12,428
26-50%tile	36,943	3,377	36,894	5,818		35,075	18,488	31,172	16,387
51-75%tile	49,771	4,277	49,531	7,252		42,242	19,083	38,332	18,866
76-100%tile	86,536	50,463	74,652	27,384		61,101	38,840	51,725	34,315

Table 2
Changes in Per Capita Household Expenditure (PCE)

		(A)			(B)	
		Change in			Change in	
	N	Mean	Median		Mean	Median
		%	%		%	%
Full sample	8,141	-17	-20			
Rural	6,693	-17	-20		-19	-22
Urban	1,448	-16	-12		-18	-14
Inland	5,134	-21	-23		-22	-24
Coast	3,007	-11	-13		-13	-15
District:						
Indragiri Ilir, Riau	731	6	3		4	1
Lampung Selatan, Lampung	573	-16	-25		-18	-26
Pandeglang, West Java	919	-27	-23		-28	-25
Sumedang, West Java	797	-20	-20		-21	-22
Banjarnegara, Central Java	741	-11	-10		-12	-12
Rembang, Central Java	868	-16	-17		-18	-19
Karangasem, Bali	760	-21	-26		-23	-28
Kupang, NTT	1,096	-32	-31		-33	-33
Kutai, E.Kalimanatan	671	-17	-15		-19	-18
Kendari, S.E. Sulawesi	985	-12	-14		-13	-15
Household Size in 1997:						
1-2 persons	1,387	-21	-24		-23	-26
3 persons	1,839	-20	-22		-21	-23
4 persons	1,910	-15	-21		-16	-22
5 persons	1,314	-16	-18		-17	-20
6 persons	826	-10	-17		-12	-19
>=7 persons	865	-10	-15		-11	-17
Male Head of Household	7,500	-17	-20		-19	-21
Female Head of Household	640	-17	-18		-18	-20
Education Level of Head:						
Missing/No Education	1,300	-16	-20		-17	-21
Primary	5,345	-16	-19		-18	-21
JuniorHS+VocJHS	660	-16	-20		-18	-21
SeniorHS	385	-15	-13		-17	-15
Voc SHS	330	-27	-28		-28	-29
Diploma	121	-26	-20		-28	-21
Quartile of 1997 PCE:						
1-25%tile	2,036	5	-6		4	-7
26-50%tile	2,035	-5	-16		-6	-17
51-75%tile	2,035	-15	-23		-17	-24
76-100%tile	2,035	-29	-31		-31	-33

Columns (A) and (C) are obtained by deflating nominal consumption expenditures using the deflator with a constant share of food (at the May 1997 level) used throughout the paper. Columns (B) are obtained by deflating nominal consumption expenditures using a deflator with a variable share of food (see text for more details).

Table 3 Expenditure Shares and Changes in Shares					
	1997 Mean	**1998 Mean**		**% Change in Mean**	**Mean of % Changes**
Share of:					
Food:	71.0	77.5		9	13
Rice	21.6	26.6		23	43
Tuber	1.2	2.2		90	59
Meat	1.7	1.4		-14	-50
Fish	7.3	6.8		-6	24
Egg	2.3	2.3		-3	9
Vegetables	5.2	5.3		3	44
Pulses	2.7	3.1		15	46
Fruit	2.1	1.8		-12	-9
Oils and fats	3.6	5.7		59	95
Other food	15.1	14.6		-3	22
Alcohol & tobacco	8.4	7.7		-8	7
Non-Food:	29.0	22.5		-23	-13
Housing	15.0	11.4		-24	-3
Health	1.3	1.4		2	199
Education	1.3	1.1		-16	81
Clothing and footwear	4.0	3.3		-18	32
Other nonfood	5.3	5.3		0	42
Food Shares by:					
Rural	71.5	78.1		9	12
Urban	68.8	75.1		9	15
Inland	62.7	69.7		11	13
Coast	62.4	70.1		12	13
District:					
Indragiri Ilir, Riau	68.2	73.6		8	7
Lampung Selatan, Lampung	66.8	72.1		8	8
Pandeglang, West Java	59.4	69.3		17	14
Sumedang, West Java	58.3	68.4		17	16
Banjarnegara, Central Java	56.8	68.9		21	21
Rembang, Central Java	63.5	71.2		12	15
Karangasem, Bali	62.6	68.6		10	13
Kupang, NTT	64.9	69.2		7	9
Kutai, E.Kalimantan	57.9	68.9		19	20
Kendari, S.E. Sulawesi	66.6	69.5		4	7

Table 4 Foster-Greer-Torbecke (FGT) Poverty Indices			
	P(0)	**P(1)**	**P(2)**
Full Sample 1997	0.124	0.023	0.006
Full Sample 1998	0.245	0.060	0.023
% Change from 1997	**98**	**163**	**259**
Rural sample in 1997	0.146	0.027	0.008
Rural sample in 1998	0.281	0.070	0.027
% Change from 1997	**92**	**158**	**254**
Urban sample in 1997	0.021	0.003	0.001
Urban sample in 1998	0.079	0.014	0.004
% Change from 1997	**268**	**337**	**476**
Inland sample in 1997	0.133	0.025	0.007
Inland sample in 1998	0.280	0.067	0.025
% Change from 1997	**111**	**164**	**247**
Coastal sample in 1997	0.109	0.019	0.005
Coastal sample in 1998	0.185	0.049	0.019
% Change from 1997	**69**	**160**	**288**

Table 5 Poverty Transition Matrix					
Poverty Status in 1997	**Poverty Status in 1998**				**Total 1997**
	Poor	**Near Poor**	**Near Non**	**Non Poor**	
Poor	697	177	78	58	1,010
($C < P_L$)	69.01	17.52	7.72	5.74	100.00
	34.90	12.93	6.43	1.63	12.41
	8.56	2.17	0.96	0.71	12.41
Near Poor	440	239	140	169	988
($P_L \leq C < 1.25*P_L$)	44.53	24.19	14.17	17.11	100.00
	22.03	17.46	11.54	4.74	12.14
	5.40	2.94	1.72	2.08	12.14
Near Non Poor	336	282	190	306	1,114
($1.25*P_L \leq C < 1.5*P_L$)	30.16	25.31	17.06	27.47	100.00
	16.83	20.60	15.66	8.59	13.68
	4.13	3.46	2.33	3.76	13.68
Non Poor	524	671	805	3,029	5,029
($C \geq 1.5*P_L$)	10.42	13.34	16.01	60.23	100.00
	26.24	49.01	66.36	85.04	61.77
	6.44	8.24	9.89	37.21	61.77
Total 1998	1,997	1,369	1,213	3,562	8,141
	24.53	16.82	14.90	43.75	100.00
	100.00	100.00	100.00	100.00	100.00
	24.53	16.82	14.90	43.75	100.00

Notes:
C = Consumption
P_L = Poverty line

Table 6
Quintile Position Transition Matrix

	Quintile Position in August 1998				
Quintile Position in May 1997	**1**	**2**	**3**	**4**	**5**
1	10.85	5.25	2.41	1.02	0.49
2	4.96	5.75	4.59	3.17	1.52
3	2.48	4.41	5.44	4.63	3.03
4	1.28	3.22	4.82	6.02	4.67
5	0.44	1.38	2.74	5.16	10.28

						Head is:	
Change in Quintile Position	**All Hh**	**Urban**	**Rural**	**Coast**	**Inland**	**Female**	**Male**
Stayed in the same quintile	38%	43%	37%	40%	38%	34%	39%
Moved down 1 quintile	19%	17%	20%	15%	22%	20%	19%
Moved down 2 quintiles	8%	7%	9%	7%	9%	8%	8%
Moved down ≥ 3 quintiles	3%	2%	3%	2%	3%	5%	3%
Moved up 1 quintile	19%	19%	19%	22%	17%	20%	19%
Moved up 2 quintiles	9%	10%	8%	10%	8%	10%	9%
Moved up ≥ 3 quintiles	3%	2%	3%	4%	3%	3%	3%
Number of households	8,141	1,448	6,693	3,007	5,134	640	7,500

	Education Level of Head					
Change in Quintile Position	**Illit/Miss**	**Primary**	**JHS/VJHS**	**SHS**	**VSHS**	**Diploma**
Stayed in the same quintile	38%	37%	40%	46%	42%	61%
Moved down 1 quintile	20%	19%	23%	16%	25%	14%
Moved down 2 quintiles	8%	9%	6%	8%	9%	9%
Moved down ≥ quintiles	3%	3%	4%	3%	3%	2%
Moved up 1 quintile	20%	20%	18%	17%	13%	12%
Moved up 2 quintiles	9%	9%	8%	8%	4%	2%
Moved up ≥ 3 quintiles	3%	3%	2%	3%	3%	0%
Number of households	1300	5345	660	385	330	121

	Household Size					
Change in Quintile Position	**1-2**	**3**	**4**	**5**	**6**	**>=7**
Stayed in the same quintile	40%	35%	37%	37%	41%	46%
Moved down 1 quintile	22%	22%	18%	18%	17%	14%
Moved down 2 quintiles	10%	10%	8%	8%	7%	5%
Moved down ≥ 3 quintiles	5%	3%	4%	4%	1%	2%
Moved up 1 quintile	14%	17%	21%	21%	21%	21%
Moved up 2 quintiles	6%	9%	9%	9%	9%	9%
Moved up ≥ 3 quintiles	2%	3%	3%	3%	4%	4%
Number of households	1387	1839	1910	1314	826	865

Notes:
JHS = Junior High School
VJHS = Vocational Junior High School
SHS = Senior High School
VSHS = Vocational Senior High School

Table 7
Correlates of the Change in lnPCE (Dependent Variabe: lnPCE98 – lnPCE97)

	Without Fixed-Effects		Including Desa-Specific Fixed-Effects			
	(A)		(B)		(C)	
Variable	**Coeff.**	**t-value**	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Family Size in 1997 (log)	0.113	3.24	0.134	4.24	0.138	4.39
Age of Household Head in 1997	-0.003	-1.25	0.001	0.41	0.001	0.36
Age Squared	0.004	1.49	0.000	0.03	0.000	0.07
Education Level of Head in 1997:						
Primary	0.045	0.93	0.038	0.87	0.042	0.95
Junior HS + Vocational JHS	0.015	0.31	0.021	0.50	0.024	0.57
Senior HS	-0.011	-0.23	0.019	0.44	0.021	0.50
Vocational SHS	0.064	1.34	0.068	1.56	0.069	1.60
Diploma	-0.055	-1.13	-0.038	-0.88	-0.037	-0.86
Head's Employment Sector in 1997:						
Mining	-0.058	-0.99	-0.061	-1.16	-0.060	-1.15
Manufacturing	-0.086	-3.33	-0.051	-2.15	-0.051	-2.14
Utilities	0.140	1.21	0.107	1.02	0.105	1.01
Construction	-0.051	-1.73	-0.021	-0.76	-0.021	-0.76
Trade	-0.042	-2.21	-0.023	-1.32	-0.024	-1.39
Transportation & Communication	-0.063	-2.30	-0.040	-1.61	-0.041	-1.65
Financing	-0.041	-0.42	-0.138	-1.56	-0.138	-1.58
Services	-0.062	-2.39	-0.046	-1.94	-0.046	-1.96
Self-Employed with Family Help	0.042	3.57	0.024	2.13	0.024	2.13
Employer	0.068	1.07	0.055	0.96	0.054	0.95
Government Employee	0.021	0.60	0.025	0.78	0.024	0.76
SOE Employee	0.017	0.23	0.012	0.18	0.011	0.16
Private Employee	0.012	0.61	0.019	1.09	0.019	1.10
Unpad Family Worker	0.090	1.75	0.054	1.16	0.053	1.15
Children 0-4 yr old in 1997	-0.008	-0.64	-0.010	-0.96	-0.009	-0.83
Males 5-9 yr old in 1997	-0.005	-0.40	-0.014	-1.41	-0.013	-1.29
Females 5-9 yr old in 1997	-0.016	-1.39	-0.022	-2.12	-0.020	-1.98
Males 10-14 yr old in 1997	-0.014	-0.92	-0.016	-1.10	-0.016	-1.11
Females 10-14 yr old in 1997	-0.013	-0.81	-0.020	-1.41	-0.021	-1.43
Males 15-19 yr old in 1997	-0.012	-0.75	-0.023	-1.52	-0.023	-1.52
Females 15-19 yr in 1997	-0.003	-0.15	-0.016	-1.05	-0.017	-1.07
Males 20-24 yr old in 1997	-0.018	-1.23	-0.006	-0.48	-0.006	-0.44
Females 20-24 yr old in 1997	0.040	2.49	0.027	1.86	0.026	1.80
Males 25-54 yr old in 1997	-0.017	-1.06	-0.017	-1.23	-0.017	-1.19
Females 25-54 yr old in 1997	0.027	1.61	0.018	1.20	0.016	1.07
Males ≥ 55 yr old in 1997	-0.040	-1.97	-0.036	-1.97	-0.036	-1.94
Females ≥ 55 yr old in 1997	0.026	1.49	0.037	2.37	0.035	2.22
Urban community	-0.009	-0.60				
Coastal community	0.124	10.23				
District:						
Indragiri Ilir, Riau	0.086	3.45				
Lampung Selatan, Lampung	-0.140	-5.61				
Pandeglang, West Java	-0.221	-9.61				
Sumedang, West Java	-0.100	-4.31				
Rembang, Central Java	-0.104	-4.53				
Karangasem, Bali	-0.202	-8.39				
Kupang, NTT	-0.353	-15.96				
Kutai, East Kalimanatan	-0.147	-5.69				
Kendari, South-East Sulawesi	-0.078	-3.44				
Constant term	-0.242	-3.27	-0.445	-6.90	0.310	4.85
Number of observation =	8,140		8,140		8,140	
F(46, 8093) =	18.33		4.92		5.2	
R-squared =	0.094		0.2788		0.2795	
Adj R-squared =	0.089		0.2668		0.2675	
Root MSE =	0.445		0.39884		0.39581	

Excluded dummy variables: Household heads with no education or missing codes for education, household heads engaged in agriculture, household heads self employed without any family help, Banjarnegara (Central Java) district.

Table 8
Correlates of the Change in the Food Share (Dependent variabe: FoodShare98-FoodShare97)

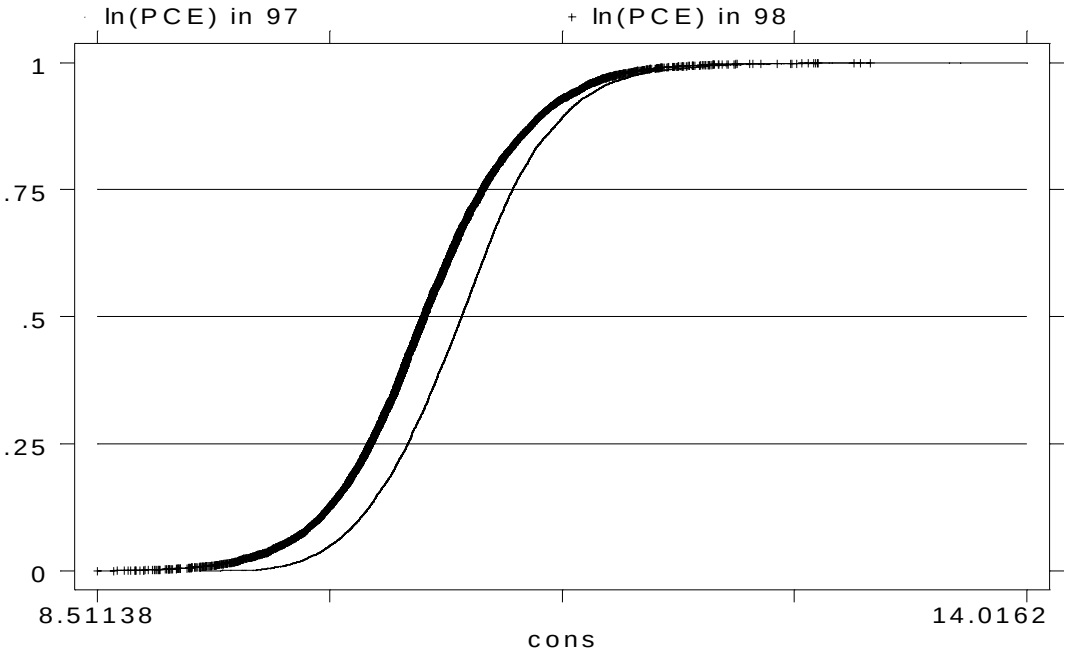
	(A) Without Fixed-Effects		(B) With Fixed-Effects	
Variable	**Coeff.**	**t-value**	**Coeff.**	**t-value**
Family Size in 1997 (log)	-0.907	-0.94	-1.015	-1.14
Age of Household Head in 1997	0.094	1.39	0.048	0.78
Age Squared	-0.101	-1.43	-0.064	-1.00
Education Level of Head in 1997:				
Primary	-3.639	-2.70	-1.750	-1.41
Junior HS +Vocational JHS	-2.450	-1.90	-0.996	-0.84
Senior HS	-1.535	-1.15	-0.728	-0.60
Vocational SHS	-2.260	-1.69	-2.179	-1.79
Diploma	0.133	0.10	0.913	0.74
Head's Employment Sector in 1997:				
Mining	0.103	0.06	0.106	0.07
Manufacturing	1.980	2.76	0.681	1.01
Utilities	0.244	0.08	-1.878	-0.64
Construction	0.351	0.43	-1.246	-1.63
Trade	1.401	2.68	0.202	0.41
Transportation & Communication	0.594	0.78	-0.494	-0.70
Financing	-9.282	-3.46	-7.557	-3.05
Services	-1.158	-1.61	-1.403	-2.11
Self-Employed with Family Help	-0.866	-2.62	-0.301	-0.95
Employer	-1.391	-0.79	-2.303	-1.43
Government Employee	4.175	4.27	3.096	3.39
SOE Employee	2.815	1.32	0.229	0.12
Private Employee	-0.782	-1.46	-0.308	-0.61
Unpaid Family Worker	-2.490	-1.75	-2.716	-2.08
Children 0-4 yr old in 1997	-0.199	-0.61	0.026	0.09
Males 5-9 yr old in 1997	-0.443	-1.41	-0.168	-0.58
Females 5-9 yr old in 1997	-0.381	-1.20	-0.267	-0.91
Males 10-14 yr old in 1997	0.173	0.40	0.423	1.05
Females 10-14 yr old in 1997	0.221	0.50	0.431	1.06
Males 15-19 yr old in 1997	-0.748	-1.63	-0.449	-1.06
Females 15-19 yr in 1997	1.007	2.11	0.927	2.12
Males 20-24 yr old in 1997	-0.020	-0.05	-0.202	-0.54
Females 20-24 yr old in 1997	0.685	1.54	0.390	0.96
Males 25-54 yr old in 1997	-1.347	-3.10	-1.087	-2.73
Females 25-54 yr old in 1997	1.220	2.66	0.490	1.16
Males ≥ 55 yr old in 1997	-1.508	-2.66	-0.950	-1.83
Females ≥ 55 yr old in 1997	-0.105	-0.22	-0.392	-0.88
Urban community	-2.066	-5.12		
Coastal community	0.416	1.24		
District:				
Indragiri Ilir, Riau	-7.422	-10.70		
Lampung Selatan, Lampung	-6.700	-9.64		
Pandeglang, West Java	-4.686	-7.32		
Sumedang, West Java	-3.886	-6.04		
Rembang, Central Java	-3.574	-5.57		
Karangasem, Bali	-5.714	-8.51		
Kupang, NTT	-6.545	-10.62		
Kutai, East Kalimanatan	-0.818	-1.14		
Kendari, South-East Sulawesi	-8.798	-13.97		
Constant term	14.231	6.92	9.134	5.03
Number of obs	8140		8140	
F_value	11.55		3.35	
Prob > F	0		0	
R-squared	0.0616		0.234	
Adj R-squared	0.0563		0.2213	
Root MSE	12.638		11.235	

Excluded dummy variables: Household heads with no education or missing codes for education, household heads engaged in agriculture, household heads self employed without any family help, Banajarnegara (Central Java) district.

Table 9
Percentile Ratios, Generalized Entropy, Gini, and Atkinson Indices of Inequality

	p90/p10	p90/p50	p10/p50	p75/p25	p75/p50	p25/p50
Full Sample 1997	3.411	1.857	0.545	1.858	1.352	0.727
Full Sample 1998	3.799	2.029	0.534	1.944	1.415	0.728
% Change from 1997	11	9	-2	5	5	0

	GE(-1)	GE(0)	GE(1)	GE(2)	Gini	A(0.5)	A(1)	A(2)
Full Sample 1997	0.140	0.133	0.152	0.245	0.283	0.068	0.125	0.219
Full Sample 1998	0.173	0.154	0.166	0.228	0.304	0.076	0.143	0.257
% Change from 1997	23	16	9	-7	7	13	15	17
Rural sample in 1997	0.124	0.115	0.122	0.153	0.265	0.057	0.109	0.198
Rural sample in 1998	0.158	0.143	0.154	0.213	0.292	0.071	0.133	0.241
% Change from 1997	28	24	26	39	10	24	22	21
Urban sample in 1997	0.147	0.150	0.193	0.379	0.299	0.080	0.139	0.227
Urban sample in 1998	0.148	0.137	0.147	0.194	0.289	0.068	0.128	0.229
% Change from 1997	1	-9	-24	-49	-3	-15	-8	1
Within-group (rural) in 1997	0.129	0.121	0.139	0.231		0.063	0.116	0.205
Within-group (rural) in 1998	0.161	0.141	0.153	0.213		0.070	0.132	0.238
% Change from 1997	24	17	10	-8		12	13	16
Between-group (rural) in 1997	0.011	0.012	0.013	0.014		0.005	0.010	0.018
Between group (rural) in 1998	0.012	0.013	0.014	0.015		0.007	0.013	0.025
% Change from 1997	6	6	6	7		24	33	40
By District:								
Within-group (district) in 1997	0.119	0.112	0.131	0.223		0.057	0.104	0.179
Within-group (district) in 1998	0.141	0.123	0.134	0.195		0.061	0.111	0.192
% Change from 1997	18	9	3	-13		6	7	7
Between-group (district) in 1997	0.021	0.021	0.021	0.022		0.011	0.023	0.049
Between group (district) in 1998	0.032	0.031	0.032	0.033		0.017	0.036	0.080
% Change from 1997	50	50	50	53		52	54	62



Cumulatives: lnPCE in 1997 and in 1998

Figure 1

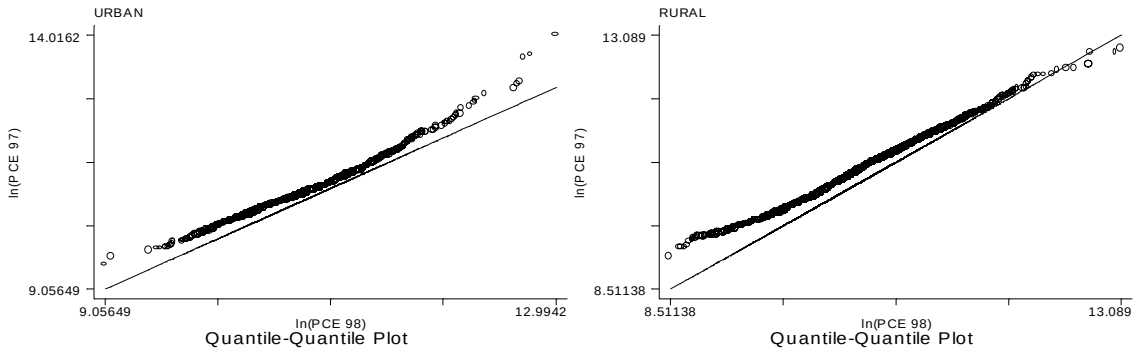

URBAN
14.0162
9.05649
ln(PCE 97)
9.05649
12.9942
ln(PCE 98)
Quantile-Quantile Plot
RURAL
13.089
8.51138
ln(PCE 97)
8.51138
13.089
ln(PCE 98)
Quantile-Quantile Plot

Figure 2

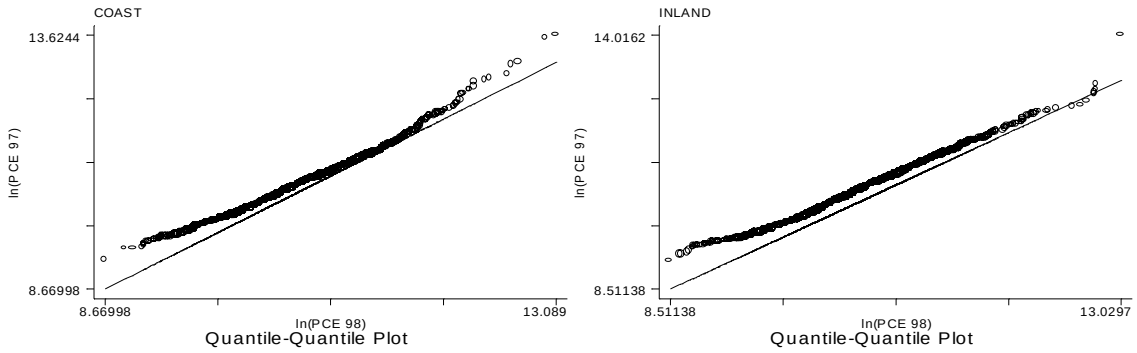

COAST
13.6244
8.66998
ln(PCE 97)
8.66998
13.089
ln(PCE 98)
Quantile-Quantile Plot
INLAND
14.0162
8.51138
ln(PCE 97)
8.51138
13.0297
ln(PCE 98)
Quantile-Quantile Plot

Figure 3

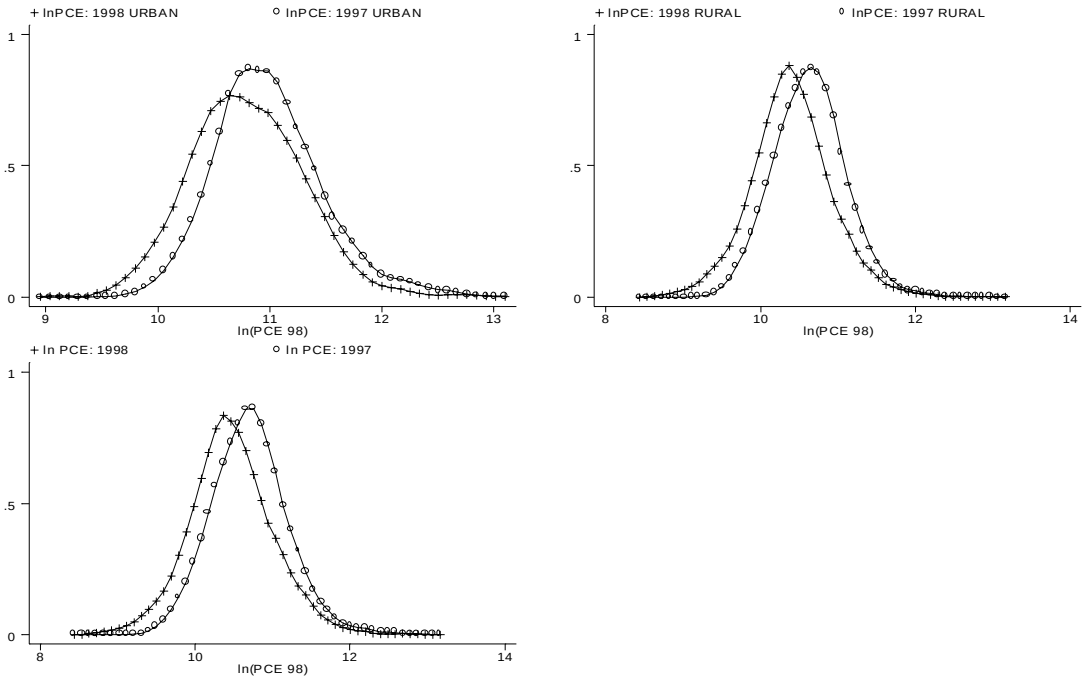

+ lnPCE: 1998 URBAN
o lnPCE: 1997 URBAN
1
.5
0
9
10
11
12
13
ln(PCE 98)
+ lnPCE: 1998 RURAL
o lnPCE: 1997 RURAL
1
.5
0
8
10
12
14
ln(PCE 98)
+ ln PCE: 1998
o ln PCE: 1997
1
.5
0
8
10
12
14
ln(PCE 98)

Figure 4

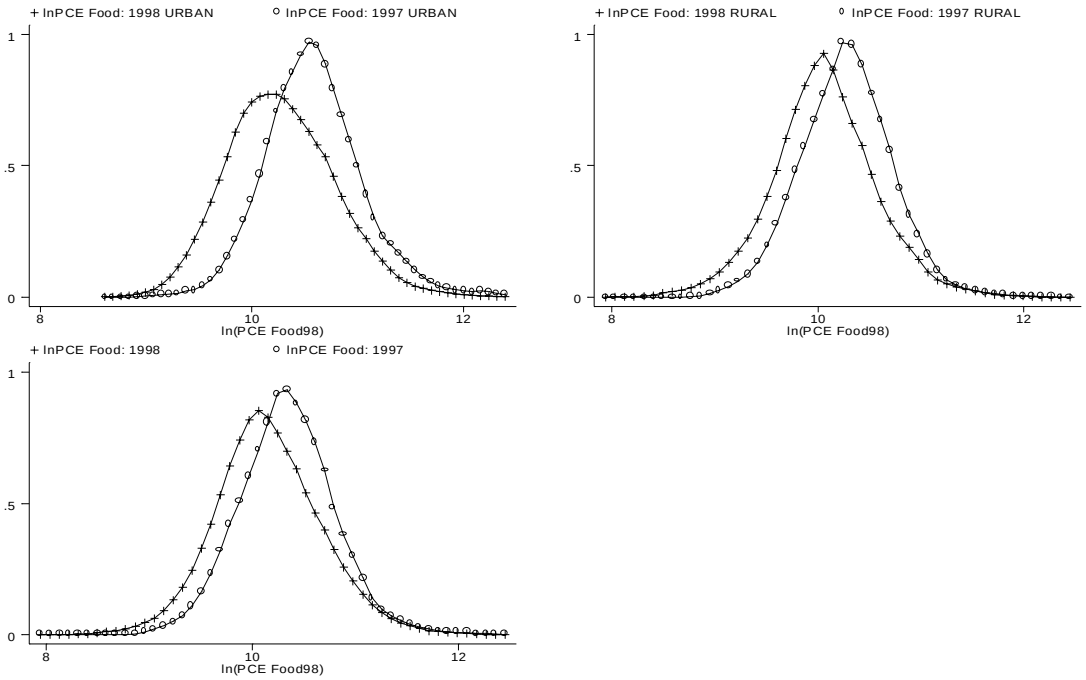

+ lnPCE Food: 1998 URBAN
o lnPCE Food: 1997 URBAN
+ lnPCE Food: 1998 RURAL
o lnPCE Food: 1997 RURAL
+ lnPCE Food: 1998
o lnPCE Food: 1997
1
.5
0
8
10
12
ln(PCE Food98)

Figure 5

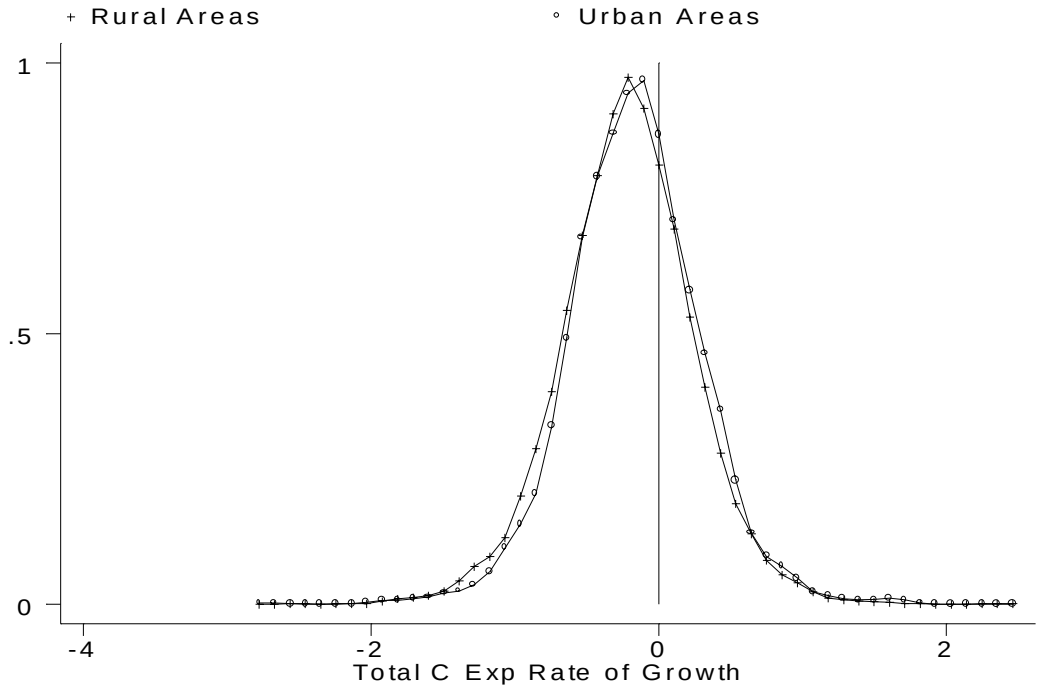
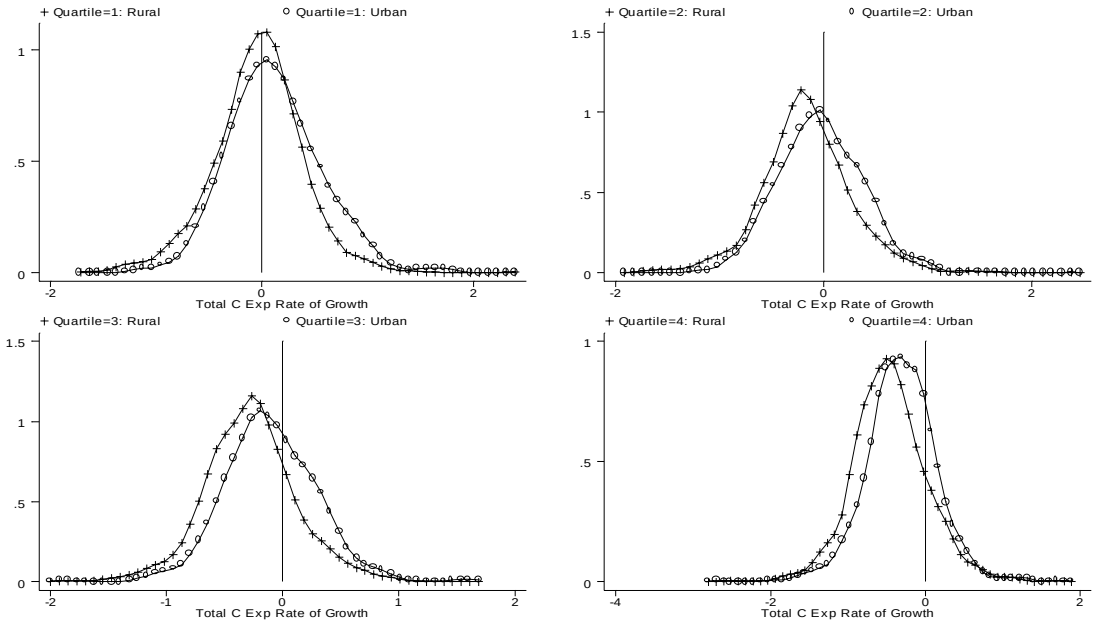


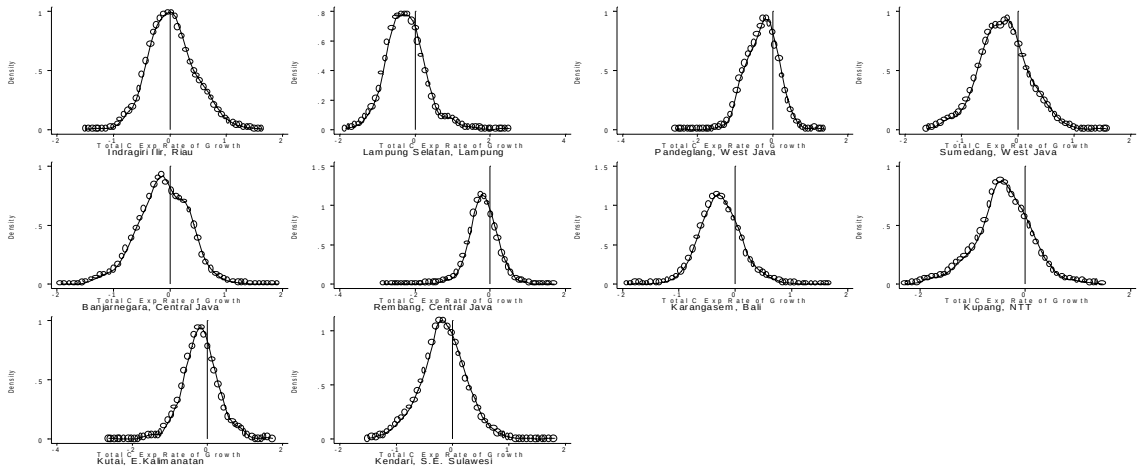
Figure 6



by Quartile lnPCE97 Urban vs Rural

Kernel Densities of lnPCE98-lnPCE97

Figure 7



by Kabupaten

Kernel Densities of lnPCE98-lnPCE97

Figure 8

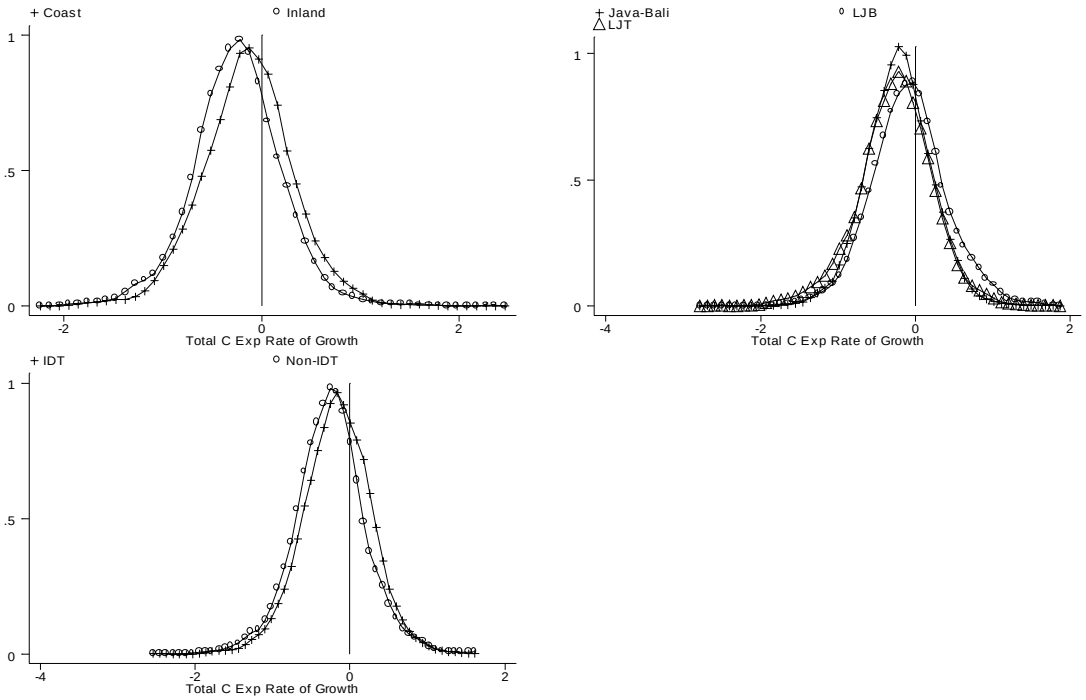

+ Coast
o Inland
1
.5
0
-2
0
2
Total C Exp Rate of Growth
+ Java-Bali
△ LJT
o LJB
1
.5
0
-4
-2
0
2
Total C Exp Rate of Growth
+ IDT
o Non-IDT
1
.5
0
-4
-2
0
2
Total C Exp Rate of Growth

Figure 9