

## Introduction

From 1964 to 1999 Indonesia experienced significant economic growth. The average real GDP growth rate for this 30-year period indicated a seven-fold increase in GDP (Cameron,1). The population growth during this time also grew at a fourfold increase (Cameron,1). While rapid structural changes can increase standards of living for those who are able to take advantage of it, growth like this can also cause displacement and result in a widening income distribution. As a result, the Indonesian government recognized the possibility of increasing inequality and started the National-Socioeconomic Survey (Susenas) in the mid 1960's (Cameron, 2). The Susenas collects data on Indonesian households pertaining to indicators of welfare most notably household expenditure and income (Cameron, 2). Included in household expenditure is data on the value of consumption because "... current consumption is a better indicator of household welfare than is current income. In a bad year, the household may appear very poor according to current income whereas measurement of current consumption would indicate that the household is in a strong position over the longer term." (Cameron, 11). In the paper *Growth with or without Equity? The distributional impact of Indonesian development*, Lisa Cameron explores the distribution of household expenditure of this 30-year period. In this paper we will be looking deeper at household expenditure, and determine the differences in consumption between urban and rural areas.

## Methods

In this paper we will be using three indices to measure inequality concerning Indonesian consumption in 2003. The three indices that we will be computing for this paper are the Gini index, the Palma ratio, and the Atkinson ratio. The two types of consumption we will be focusing on are the deliberation between urban and rural consumption. Our data was found via the World Bank Poverty Calculator, and organizes the data into 10 groups, each group containing the percentage share of each 10% in the group.

The Gini index is used to measure the distribution of inequality pertaining to consumption across a population. A value of 0 represents perfect equality in the population while a 1 represents perfect inequality. The Gini Index is calculated by the following formula, where  $N$  is the number of bins, in this case 10, and  $f_i$  is the value of the  $i^{th}$  bin.

$$G \approx 2 \sum_{i=1}^N \left( \frac{i - \frac{1}{2}}{N} \right) f_i - 1$$

The Palma ratio is used to measure inequality pertaining to consumption by looking at the ratio between the top 10% and the bottom 40% of consumers. A higher ratio result means a higher level of inequality, while a lower result indicated lower levels of inequality. The Palma ratio is calculated by the following formula, where  $f_i$  is the value of the  $i^{th}$  bin.

$$r = \frac{f_{10}}{\sum_{i=1}^4 f_i}$$

The Atkinson ratio is used to measure how each end of the distribution contributes to inequality. A value of 1 indicated a large amount of inequality in the distribution, while a value of 0 indicates lower amounts of inequality. The Atkinson ratio is calculated by the following formula, where  $N = 10$  and  $Geo[f]$  is the geometric average of the share held by each bin.

$$A = 1 - N \cdot Geo[f]$$

Utilizing these indices, we will calculate an approximation of the inequality of consumption in Indonesia during the year 2003. However, these indices are not perfect, and may not fully give an estimation of the inequality in the country at the time.

## Results

For this paper, we computed each of the three indices utilizing Excel and then checked the values again using other calculators. The Gini index, the Palma ratio, and the Atkinson ratio were used as measures of inequality within the analyzed population. In general, we would like for a society to be more equal or at minimum, reasonably equal. In the case of the data found in 2003 Indonesia, we have summarized the data we found below:

Type	Gini Index	Palma Ratio	Atkinson Ratio
Urban	0.332351	1.36376868	0.162931256
Rural	0.248327	0.8825304	0.093040504

Figure 1 shows the Lorenz Curves for the data given in Indonesia, and it can be seen that the rural consumption is closer to the line of equality than the urban curve. Lower values indicated that the population was more equal in terms of consumption. These values indicate that urban consumption tends to be more weighted towards the top of the population while the rural value indicates that it's slightly less weighted towards the top of the population. They are still fairly close to an even distribution compared to other places in the world, but it is still somewhat different.

When it comes to the Palma ratio, as mentioned before, a lower result indicates lower levels of inequality. And the rural ratio is approximately 65% of the urban ratio, this shows that, like before, rural consumption tends to be more equally distributed than urban consumption. Finally, the Atkinson ratio also comes in as lower in the rural metric than in the urban metric. Ultimately, all of our data shows that urban consumption tends to be more unequal than rural consumption.

## Discussion

In this section of the paper, we will compare and contrast our results to that of Lisa Cameron's paper *Growth with or without Equity? The distributional impact of Indonesian development*. Our findings show that the Gini index for consumption in urban Indonesia was 0.332351. From 1964-

1999 Cameron showed that the average Gini index for per capita consumption expenditures was .340833. Our results from urban consumption in 2003 show that urban consumption has made progress towards stronger levels of equality. Our results along with Cameron's results indicate that there is a strong amount of equality in urban consumption. In the case of rural consumption, our results show a Gini index of 0.248327 and Cameron's 30-year average of rural consumption is .2925. Once again, our findings show that rural consumption has made progress towards a better level of equality. The Gini index for rural consumption is lower than urban and Cameron points out that this could be due to faster adaptation of farming technology by smaller land holders, off-farm earnings, and the geographic location of these off-farm activities (Cameron, 4). However, we are unsure how to comprehend the gap between a higher level of equality in rural consumption to that of urban. Cameron attempts to explain this by citing the manufacturing boom in Indonesia, resulting in a higher level of inequality for urban consumption (Cameron, 7).

The Palma ratio we calculated for Urban communities was 1.36376868 which represents a substantial degree of inequality. This finding tells us that the top 10% of urban communities have higher expenditures than those in the bottom 40%. Cameron once again points out that the financial crisis hit urban communities harder because sector jobs were lost (Cameron, 9). While urban communities had a high level of inequality, rural communities had a Palma ratio 0.8825304 which tells us that the top 10% of rural communities do consume a significant amount more than the bottom 40%. Cameron alludes that this level of equality could be a result of better agricultural prices between crops grown on small plots and large plots (Cameron, 4).

The Atkinson ratio for urban consumption was 0.162931256 and this finding tells us that the lower percentiles of urban consumption were the main contributors to the level of inequality. Cameron points out that large increases in equality in urban cities are the main contributor to urban inequality (Cameron, 7). For rural communities, an Atkinson ratio of 0.093040504 was observed and shows that the bottom 10% of rural households contribute the most to inequality.

Overall, the decreased level of inequality in rural communities was a feat of achievement for Indonesia. However, there was a substantial increase in urban inequality which can be attributed to the manufacturing boom and the financial crisis. Overall consumption equality in Indonesia is decent but a rise in urban communities is a problem that the Indonesian government should act on.

### References

- Cameron, Lisa. 2002. "Growth with or without Equity? The Distributional Impact of Indonesian Development." *Asian-Pacific Economic Literature* 16 (2): 1. doi:10.1111/1467-8411.00119.
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Figure 1:

