

## PROBLEM SET – POVERTY \*8

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### Exercise I

- 1) In a sample survey in which the proportion of poor ( $P^0$ ) is 30% and the sample size is 25,000 medium-sized families of 4 people. Calculate the 95% confidence interval of  $P^0$ .
- 2) Let us say that this society is divided into only two groups X and Z, with respectively 10,000 and 15,000 families each, but with identical mean size. If the  $P^0$  of X equals 30%, what would be the largest size of the  $P^0$  of Z so that the hypothesis of  $P^0$  of X is equal to  $P^0$  of Z could not be rejected?
- 3) Now if the Mean Quadratic Poverty Gap ( $P^2$ ) for the total population and for group X coincides in 10%, what is the  $P^2$  of Group Z and its relative contribution for the total  $P^2$ ?
- 4) Explain in three steps how to impute rental income to the calculation of social indicators.
- 5) How to incorporate the possibility of different degrees of economies of scale by the size of households into social welfare measures?
- 6) Write the formula and discuss the possible contraindications of the following indicators:
  - Sen's Poverty Index
  - Decomposition of the effect of inequality on poverty according to Datt-Ravallion (mean and inequality)
  - Contribution of category i for the poverty profile of group j using  $P^2$
- 7) How to evaluate the impact of a balanced growth process on a given variation observed in two measures of poverty?
- 8) Graphically relate the concept of Second Order Stochastic Dominance and the poverty indicators of the FGT Family ( $P^1$ ,  $P^0$ ,  $P^2$ ).
- 9) R\$14 per month refers to the minimum monthly amount per Brazilian able to take the income of each miserable up to R\$79 (the line corresponding to 33.3% miserable).
  - i) What would be the permanent cost of eradicating poverty per Brazilian if the rate of return on social investment was 0.5% p.m.?
  - ii) If the wage of each non-miserable was R\$7 per hour, how many hours per week would correspond to his contribution?

### Question II

- 1) Discuss the role of the theta parameter in the formula below:

$$y_{ij} = \frac{Y_{ij}}{I_j n_i^\theta} \quad \theta \in (0,1)$$

where family  $i$  lives in area  $j$ ,  $n(i)$  is the number of people in household  $i$ ,  $y(ij)$  is the total consumption of family  $i$  in region  $j$  and  $I(j)$  is the deflator for area  $j$ .

2) Calculate from the data below the minimum monthly cost for the complete alleviation of misery per non-miserable (line 80 R\$/month).

Population	Monthly	Proportion of Poor	P1 (%)
	per capita Household Income		
180	270	30	20

Assuming a monthly interest rate of 1% p.m., what would be the stock of wealth corresponding to the flow above?

3) Calculate all Poverty Indices ( $P^0$ ,  $P^1$ ,  $P^2$ , PSen, etc.) in the sample below assuming a poverty line equal to 3. {1, 1, 2, 6, 30}

4) Repeat 3 assuming a balanced growth process of 100%

5) Make a Datt-Ravallion decomposition of the distribution changes by defining the inequality growth components above for {0, 1, 2, 6, 30}.

6) Explain the formulas and compare the advantages and disadvantages of the indicators of poverty known as the Mean Poverty Gap ( $P^1$ ) and the Sen's Index of Poverty (1976). When the two are equal?

### Question III

Comment, agreeing totally, partially or not agreeing and justifying in three or four lines the following propositions (if possible present formulas, graphics or models in capsular forms to illustrate your answer):

- i) If the poverty severity curve (the integral of the CDF integral) of society A is always higher than that of society B, we can ensure that the indicator known as the proportion of the poor ( $P^0$ ) and the average poverty gap ( $P^1$ ) are always larger in A than in B.
- ii) The Poverty Indicator known as the Mean Poverty Gap ( $P^1$ ) is higher than the indicator relative to the proportion of poor ( $P^0$ ) in the design of a system of social goals because it prioritizes the poorest of the poor.
- iii) If we adopt the social goal based on the poverty index known as the Mean Poverty Gap ( $P^1$ ) we will implicitly assume that the first priority is given to the poorest of the poor