

## **Midterm Prep + Gini Coefficient**

### **GINI**

Axioms of an inequality measures

1. Anonymity: it does not matter who has which income level
  - a. Does identity matter – individual incomes – within a HH – increase in income share of the women has a greater effect on the child welfare outcomes
2. Transfer Principle: transferring income from the poor to the rich must increase inequality
  - a. Fairly non-controversial
3. Income Scale Independence
  - a. Relative versus absolute – do you think it is the relative differences that matter or the absolute differences that matter – at all income levels?
4. Population replication independence
5. Decomposability
  - a. Sum(Inequality within all groups) + inequality between groups = total inequality
  - b. Why is this decomposition relevant for policy issues?

### **Why does dividing by mean makes Gini scale invariant?**

$$Gini = \frac{1}{2n^2 \bar{y}} \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j|$$

### **What does scale invariance mean?**

- ➔ Is mean scale invariance – what happens to the mean income when I multiply all incomes by 100
- ➔ And therefore what happens to Gini coefficient?
- ➔ When this sort of scaling might be relevant – currency conversion
- ➔ What happens to Gini if I give everyone an extra \$10?

An example of calculating Gini:

$ y_i - y_j $	Income = 1	Income = 3	Income = 5
Income = 1	0	2	4
Income = 3	2	0	2
Income = 5	4	2	0

$$\text{Mean} = (1+3+5)/3 = 3$$

$$\text{Gini} = (1/2 * 3^2 * 3) * ((0+2+4) + (2+0+2) + (4+2+0))$$

➔ Calculate Gini if all incomes are multiplied by 2

➔ Calculate Gini if 2 is added to all the incomes

Verify that the Gini index for an income distribution across two people of  $(0, x)$  is 0.5 no matter what the value of  $x$

$ y_i - y_j $	Income1 = 0	Income2 = x
Income1 = 0	0	x
Income2 = x	x	0

$$\text{Mean} = (0+x)/2$$

➔ What is Gini?

Does it depend on the values of  $x$ ?

## **MIDTERM PREP**

### **Question 1:**

Typically, this poverty line is set separately for rural and urban areas. However, food energy intakes tend to be higher at any given level of income in rural areas. Why?

Head-count index (% poor)		
	Urban	Rural
<u>Indonesia</u>		
Food energy method	16.8	14.3
Cost-of-basic needs method	10.7	23.6
<u>Tunisia</u>		
Food share method	7.3	5.7
Cost-of-basic needs method	3.5	13.1

**Explain FEI and CBN give inconsistent results.**

### **Question 2:**

What are the four desirable properties in a poverty measure? Define them.

Consider the following two economies. Assume that the poverty line is fixed at 130. Calculate the head count rate, poverty gap index and squared poverty gap index. Which measure would you prefer? Why?

Distribution	Inc1	Inc2	Inc3	Inc4	HCR	PGI	SPG
A	99	101	150	150			
B	79	121	150	150			

### **Question 3:**

Consider a distribution of incomes (2, 4, 6). Draw the Lorenz curve and compute the Gini coefficient. Now consider another distribution (1, 4, 7). Is it more or less unequal than the previous distribution? Use BOTH the Lorenz curve and the Gini coefficient to substantiate your argument.

### **Question 4:**

How does the idea of consumption floor relate to Rawlsian idea of maximin? What do we know about the consumption floor over the past few decades?

*Lecture 3- slides 84-89*

**Question 5**

The First Poverty Enlightenment came near the end of the Age of Enlightenment. What were the historical events that were responsible for driving the First Poverty Enlightenment? After the First Poverty Enlightenment, was the poverty still seen as inevitable? What was the policy approach towards poverty now?

**Question 6**

After the Second Poverty Enlightenment, poverty was seen as a result of market failure. Give an example of a market failure that begets poverty.

**Question 7**

Recall that the concentration curve,  $C(p)$ , gives the cumulative share of that variable going to the poorest  $p\%$  of the population, ranked by income. What can you conclude when  $C(p) > p$  for all  $p$ ? What about when  $C_A(p) > C_B(p)$  for all  $p$ ?

**Question 8**

Cost of participating in a survey rises with income. Why do you think that is the case? What does this imply for measuring inequality?