ECO 450G Notes
Fall 2006 Semester
University of Kentucky

Chapter 2 – Inequality

I. Why Inequality Matters
II. Inequality of What?
III. Alternative Yardsticks
A. Income Shares
B. Lorenz Curve
C. Gini Coefficients
IV. Global Comparisons
V. Income Mobility/Mobility Patterns

Some exercises this chapter

1. As you read chapter 2, there are at least 3 clear errors. Can you find them on your own?
2. Using the March Current Population Survey to examine the income distribution – http://dataferrett.census.gov/ .
3. Can you compute Gini coefficients on your own?

I. Why Inequality Matters

Schiller presents arguments on the cost and benefits of inequality:

- A cost might be that "too much inequality may foster resentment and breed crime." (p. 19)
- Inequality of income could translate into unequal access to the justice system, neighborhoods, schools, and politics.

Discussion question: What evidence does Schiller cite that relates inequality to crime? How would you investigate this question empirically?

- A benefit of inequality is that it could be a power motivate for working, studying or investing. An individual will undertake risk when he or she can enjoy the rewards; some of these rewards might be captured by society as a whole,

making the collective “pie” larger.

II. Inequality of What?

Income and wealth concepts become complicated in practice. Income is a *flow* – money accumulated this period, while wealth is a *stock* – money accumulated as a result of past decisions.

Income concepts

- Income – wage vs. fringe benefits (like health insurance), capital gains (realized vs. unrealized)
- Consumption – can vary considerably from income. Recall the two-period model we discussed in Lesson 1. In general, consumption will be smoother across periods than income.
- Taxes and transfers affect income
- Barter (important in developing counties)

Unit of observation

- Person, family, household
- Conclusions can vary based on the concept, no one “right” concept. Figure 2.1 illustrates the obvious point that our notion of income inequality can change as family structure changes.

III. Alternative Yardsticks

Schiller presents they ways of thinking about inequality: income shares, Lorenz curves, and Gini coefficients. He even gets two of the three correct!

Figure 2.2: Presents median incomes by race & family structure.

- Median incomes for whites are approximately 50% higher than for African-Americans or Hispanics. Married couples are far better off than father-only or mother-only families.
- A few questions arise ... can you guess how Schiller deals with them?
  - Schiller characterizes families as “White,” “Black” or “Hispanic”. How does he classify inter-racial families?
  - What measure of income is he using?
  - How does he treat *subfamilies* – e.g., a 3-generation household, where one family is living within another unit. For example, an 18-year-old unmarried mother living with her parents?
  - He compares married couples to father-only and mother-only families. Married couples are certainly families, but do they all have children living at home? Would an elderly married couple, without kids, be compared with a single mother with a teenager living at home?

The March 2005 Current Population Survey (covering the 2004 year) has 522 variables

examining the income situation of households in the United States. Source: http://dataferrett.census.gov/

- Let's take the variables FKIND and FTOT-R
- FTOT_R - Total income recode
- FKIND - Kind of family (Husband-wife, other male head, other female head)

Overall, there were 129.7 million families in 2004; 46% were married couples.

	$0 - $25K	$25 - $50K	$50 - $75K	$75 - $100K	$100K +
All families	**35%**	**27%**	**16%**	**9%**	**13%**
Husband-Wife Family	**14%**	**24%**	**22%**	**16%**	**25%**
Other Male Head	**46%**	**32%**	**12%**	**5%**	**5%**
Other Female Head	**57%**	**27%**	**9%**	**3%**	**3%**

Clearly husband-wife families are much more advantaged. The statistics above include all ages, and include both families with kids and without kids.

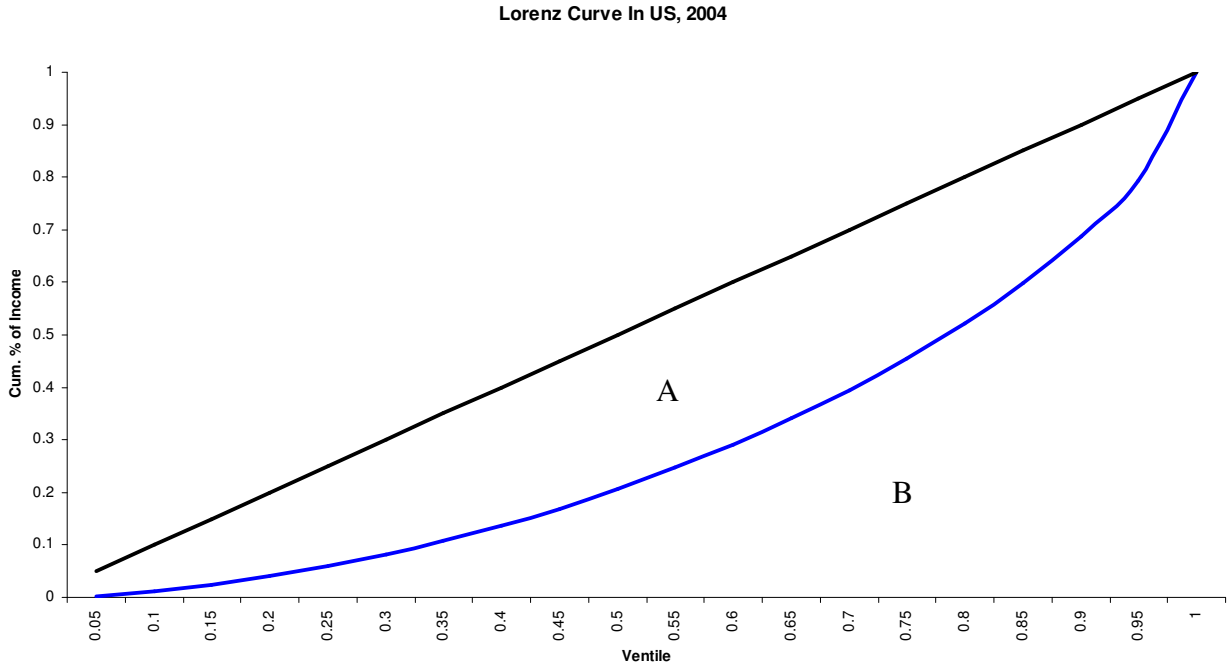
Table 2.1 presents income shares, by quintile (5 equal sized groups). This could also be done by decile (10 equal sized groups), or ventile (20 equal sized groups).

- One issue that emerges with these sorts of income breakdowns is *topcoding* – although the CPS asks families precisely about their income, this is not what is presented to researchers. Rather, those with incomes that are very high – where the individuals might be identified – have their income value topcoded at a maximum value.

Lorenz Curve

- Graphically illustrates the relationship between population shares and income shares. Order individuals or families by income, starting with the poorest. For each percentage of the population, what is their cumulative percentage of income. In Table 2.1, the bottom 20% of population has 3.5% of income. The bottom 40% of population has 12.2% of income. The bottom 100% of population has 100% of income.
    - Topcoding becomes more of an issue here, because we are not accurately measuring income at the top of the distribution.
- If each percentage of the population had that percentage of total income (e.g., the bottom 38% of the population had 38% percent of total income, etc.), then we would have perfect equality.
- Lorenz curves will lie below the 45 degree line when there is any inequality. Visually, if one Lorenz curve is everywhere "above" another Lorenz curve, then the one above is a more equal income distribution.

Lorenz curve based on March 2005 CPS (using FPCTCUT – for the 20 ventiles, and FTOTVAL (Total income amount).



Gini Coefficients

- Take area A (the area between perfect equality and the Lorenz curve), and divide it by A+B (the area under the perfect equality line). This gives the Gini coefficient.
- The closer the Lorenz curve is to perfect equality, the smaller area A, and the lower the Gini coefficient. The Gini coefficient can vary between 0 and 1, where larger values indicate more inequality.
- You can compute the Gini coefficient with the following formula:

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

- The variable *n* indicates the number of people and the variable y indicates incomes. The formula on page 27 is wrong because it does not include absolute values. If you literally use that formula, you will get a Gini coefficient of zero in all cases.

- How do you use this formula (especially the double summation)? Suppose you had 5 people, each with income equal to their person number:

	j=1	j=2	j=3	j=4	j=5
i=1	$0	$1	$2	$3	$4
i=2	$1	$0	$1	$2	$3
i=3	$2	$1	$0	$1	$2
i=4	$3	$2	$1	$0	$1
i=5	$4	$3	$2	$1	$0

- The indices I and J indicate person number, and the dollar amount income difference between the two people. For example, the dollar amount difference is zero for the same person. The dollar amount difference is $4 between person 1 and 5.
- The double summation would then mean to add all of these up, which gives us $40. Applying this, along with n=5 and average income of $3 to the formula, gives:

$$Gini = \frac{1}{2(5^2)3}(40) = \frac{40}{150} = 0.266$$

IV. Global Comparisons

The US has greater inequality, as represented by the Gini coefficient, than most other developed nations, but most developing nations have far greater inequality. It is not clear that the data sets (like other counties' versions of the CPS) ask entirely the same questions, however, which makes the comparisons more difficult.

V. Income Mobility/Mobility Patterns

Equality of opportunity, rather than equality of outcomes, may be viewed as a better metric. Is it possible for people to "move up"? How mobile are people across income classes?

- Mobility related to age due to *age-earnings profile.*
- Mobility due to family structure – marriage and divorce, and the number of earners in household
- Mobility due to new immigrants, who tend to earn lower incomes
- Mobility due to changes in labor & financial markets

Due to factors like the ones above, relative income positions vary from year-to-year. A *mobility matrix* aligns individuals or households into quintiles, deciles, or ventiles, and

compares rank from one period to the next. For example, in Figure 2.5, we could compare relative income rankings in Year 1 to Year 2 – a very short horizon. If individuals were mainly lined up on the diagonal, then your position in the first year tells us a lot about your position in the second year – hence, little income mobility. On the other hand, if many people were not on the diagonal, that would indicate more mobility.

Schiller concludes that "earnings mobility is pervasive, but is not as common at the ends of the income distribution." (p. 33) *A key question is how we assess whether mobility is a big number or a small number.* There is agreement that if all individuals in 1957 were still in the same ventile in 1971, there isn't earnings mobility (see Table 2.3). But how much lower than 100% do we need to get before earnings mobility is "pervasive?"

- *How would measurement error affect the interpretation?*

Income mobility – which includes other sources of income, in addition to earnings – shows that there is substantial mobility over relative short periods of time. One study showed that 80 of all Americans will experience at least one year of poverty, one year of affluence, or both. (p. 34)

- *How does this treat college students? How about the typical college graduate who earns only 6 months of income in the year in which they graduate?*