

## Section Chapter 6: Inequality and Development

# 1 Inequality

## 1.1 Poverty vs Inequality

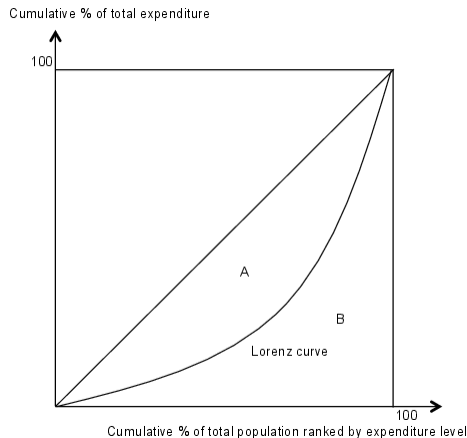
As opposed to poverty, inequality is not measured relative to a threshold (i.e. it does not require the specification of a poverty line). It is more demanding in terms of data since it requires information on the expenditure of the whole population, not just those below the poverty line. As with poverty, there are a few different measures and tools that are commonly used to convey inequality: Lorenz curves, Gini coefficients, income shares, and Kuznets ratios.

### 1.1.1 Lorenz curves

Analogous to the poverty profile, a Lorenz curve is a graphical representation of inequality. In order to construct a Lorenz curve:

1. Rank individuals from poorest to richest;
2. Represent the cumulative percentage of the population on horizontal axis and cumulative percentage of expenditures on the vertical axis.

We can construct a Lorenz curve for income, as well as for other variables of interest such as land, education and livestock. One useful feature of the Lorenz curves is that we can use them to compare equality between two populations. If one curve is further away from the 45 degree line, we can unambiguously say that inequality is higher. However, Lorenz curves can cross, in which case visual inspection may not be enough so we need an indicator to assess inequality. In these notes, we'll discuss the Gini coefficient and Kuznets ratios.



### 1.1.2 Inequality indicators

#### 1) Gini coefficient

$$G = \frac{A}{A+B} = \frac{2}{n\mu} \text{cov}(y, r), \quad 0 \leq G \leq 1,$$

where  $A$  is the area between the 45 degree line and the Lorenz curve and  $B$  is the area between the Lorenz curve and the outerbox, or  $n$  is the population,  $\mu$  is the average expenditures,  $y$  are the expenditures of each household, and  $r$  is the ranking of households. The Gini coefficient is the most frequently used measure of inequality and runs from 0 (complete equality) to 1 (maximum inequality). However, there are a few inconveniences: (1) it is not additively decomposable among subgroups of the population (though it is decomposable by income source), (2) it presents less information about the distribution of income compared to the Lorenz curve, (3) two economies with different Lorenz curves can have the same GINI coefficient.

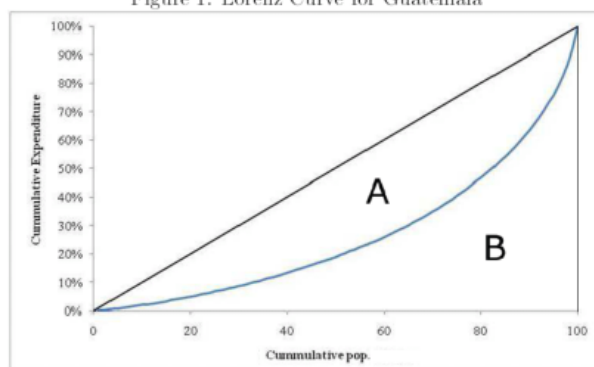
**2) Income shares and Kuznets ratios** Income shares provide information such as the share of income held by the richest 10% of the population (30% in the US and 45% in Brazil). Conversely, the Kuznets ratios provide the ratio of percentage of total income held by the richest X% (say 20%) to the income held by the poorest Y% (say 40%). The latter is a good indicator of what happens at the extremes of income or expenditure distribution.

### Example: Inequality in Guatemala

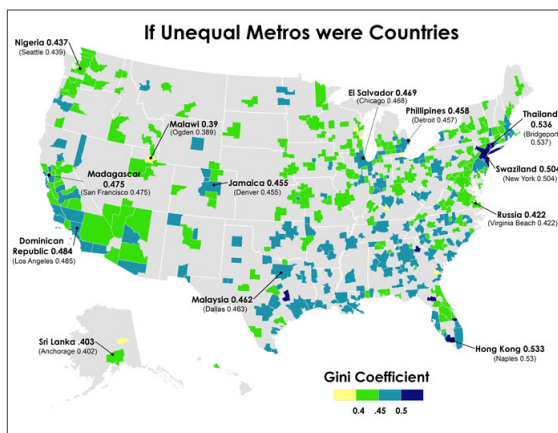
Table 1: Inequality in Guatemala

| Inequality in Guatemala        |                     |                                 |                              |
|--------------------------------|---------------------|---------------------------------|------------------------------|
| Decile                         | Average expenditure | Cummulative Expenditures (US\$) | Cummulative Expenditures (%) |
| 1                              | 188                 | 188                             | 1.9%                         |
| 2                              | 282                 | 469                             | 4.9%                         |
| 3                              | 363                 | 832                             | 8.6%                         |
| 4                              | 447                 | 1279                            | 13.2%                        |
| 5                              | 548                 | 1826                            | 18.9%                        |
| 6                              | 677                 | 2504                            | 25.9%                        |
| 7                              | 865                 | 3369                            | 34.9%                        |
| 8                              | 1137                | 4505                            | 46.7%                        |
| 9                              | 1618                | 6123                            | 63.4%                        |
| 10                             | 3531                | 9654                            | 100.0%                       |
| Gini                           |                     | 0.47                            |                              |
| Kuznets (top 10% : bottom 10%) |                     | 18.8                            |                              |
| Kuznets (top 20% : bottom 20%) |                     | 11.0                            |                              |

Figure 1: Lorenz Curve for Guatemala

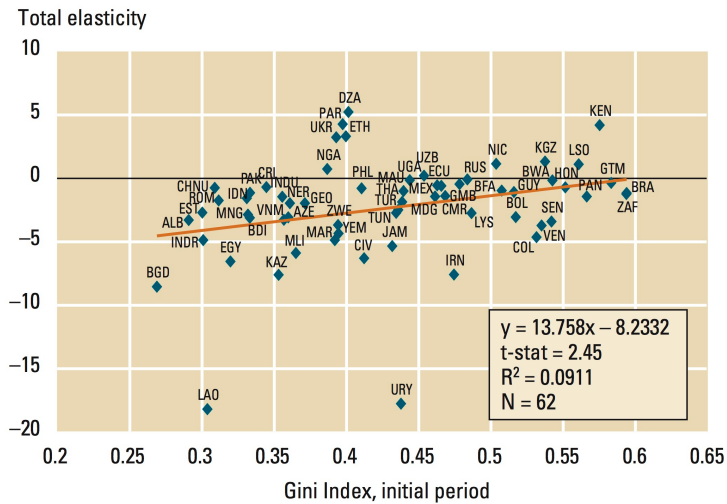
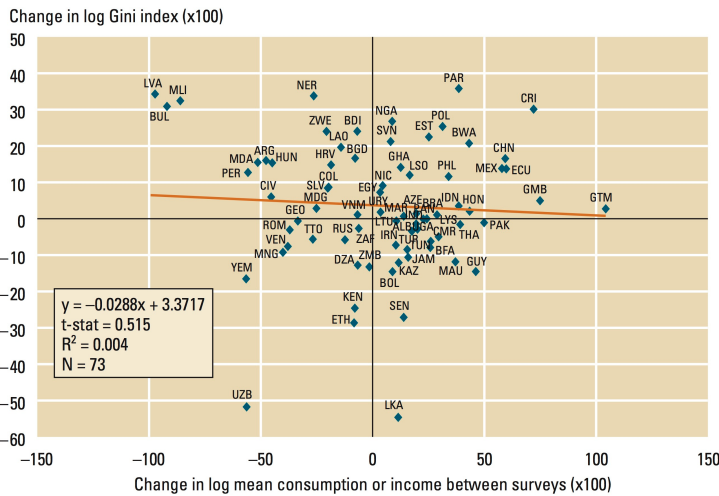
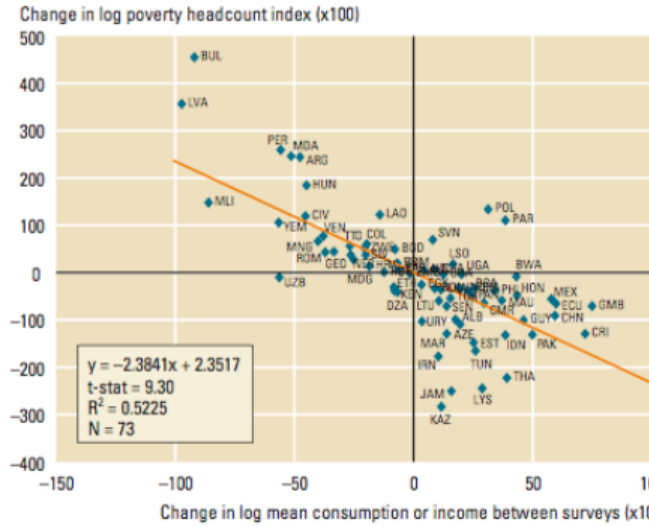
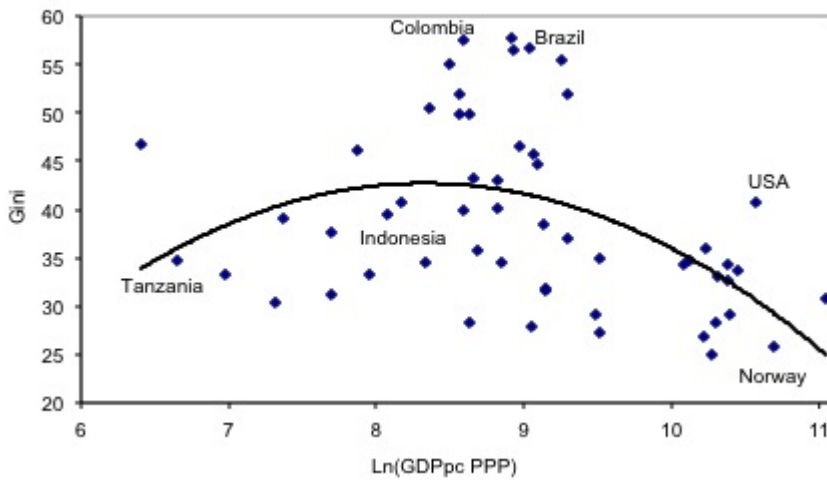


### Example: US Metro Areas vs. Developing Countries



Source: <http://www.theatlanticcities.com/>

## 2 Interpreting Graphs



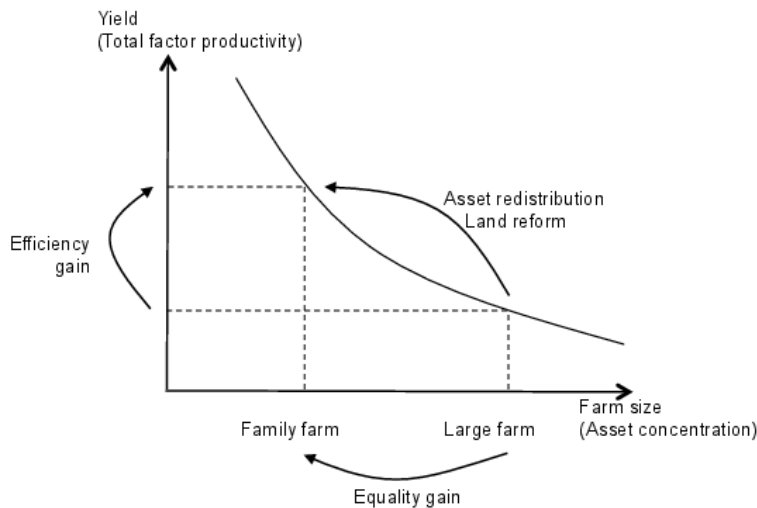
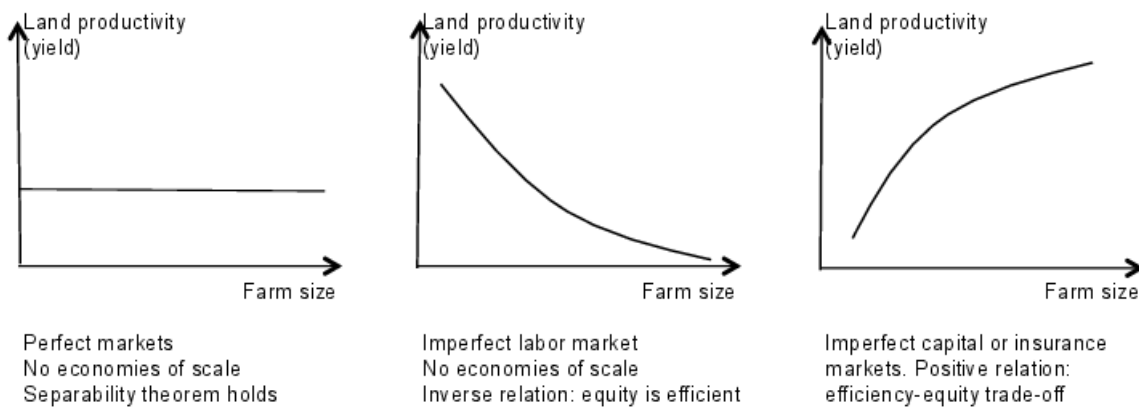
### 2.1 Impact of inequality on growth: causal channels

1. (+)  $\uparrow$  Inequality  $\Rightarrow \uparrow$  aggregate savings  $\Rightarrow \uparrow$  aggregate investment  $\Rightarrow \uparrow$  growth
2. (+/-) In the presence of **market failures**,  $\uparrow$  inequal distribution of assets/labor  $\Rightarrow \uparrow / \downarrow$  efficiency  $\Rightarrow \uparrow / \downarrow$  growth
3. (-)  $\uparrow$  Inequality  $\Rightarrow \uparrow$  instability  $\Rightarrow \uparrow$  crime/destruction of assets  $\Rightarrow \downarrow$  growth
4. (-)  $\uparrow$  Inequality  $\Rightarrow$  poorer median voter  $\Rightarrow \uparrow$  redistributive policies/taxes  $\Rightarrow \downarrow$  savings/investment  $\Rightarrow \downarrow$  growth

### 2.1.1 Non-separability

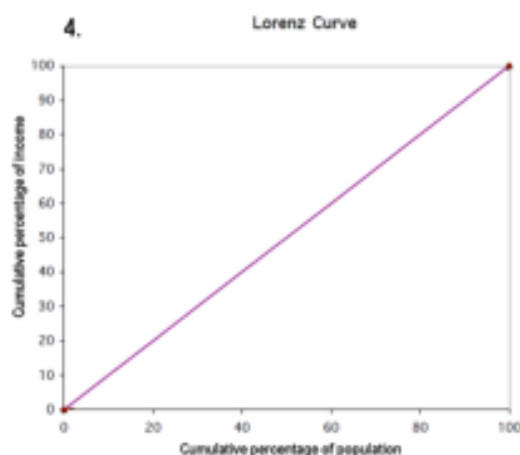
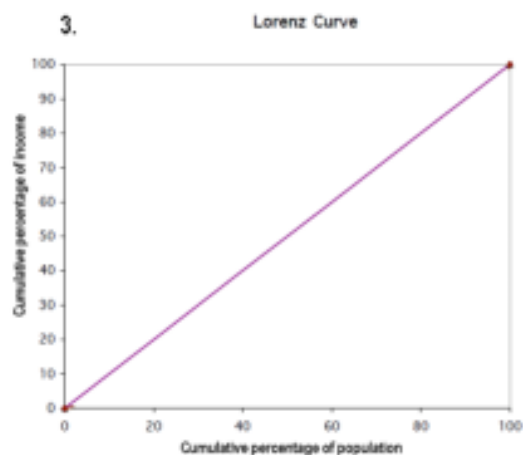
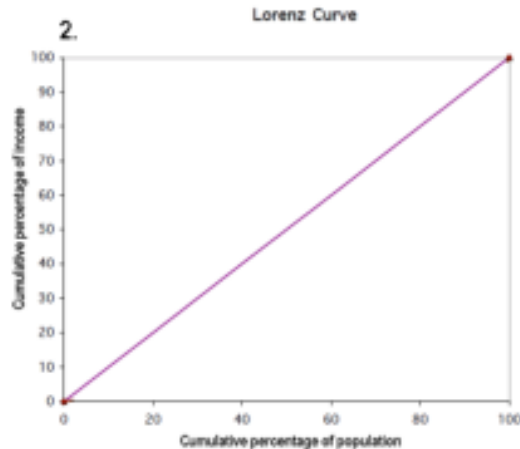
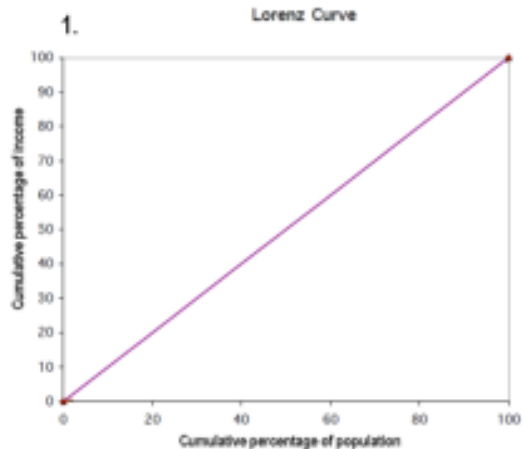
If market are perfect, the separability theorem holds: asset ownership does not affect efficiency in resource use. Who owns what affects the distribution of income but not the efficiency. In other words: the size of the pie (the economy) is unaffected by how the pie is cut (income distribution). For example, assuming no economies of scale, farm size does not affect yields.

However, if there are market failures, efficiency is affected by asset ownership (“non-separability”). On the one hand, there may be market failures in the labor market when hired labor (which requires search and supervision costs) is more expensive than self-employed labor (because people are the residual claimant [the ones who keep any remaining profit] on their effort). On the other hand, capital and insurance markets can be imperfect when capital and insurance are cheaper and more accessible to wealthier individuals. Where such market failures exist, greater equality may lead to efficiency gains.



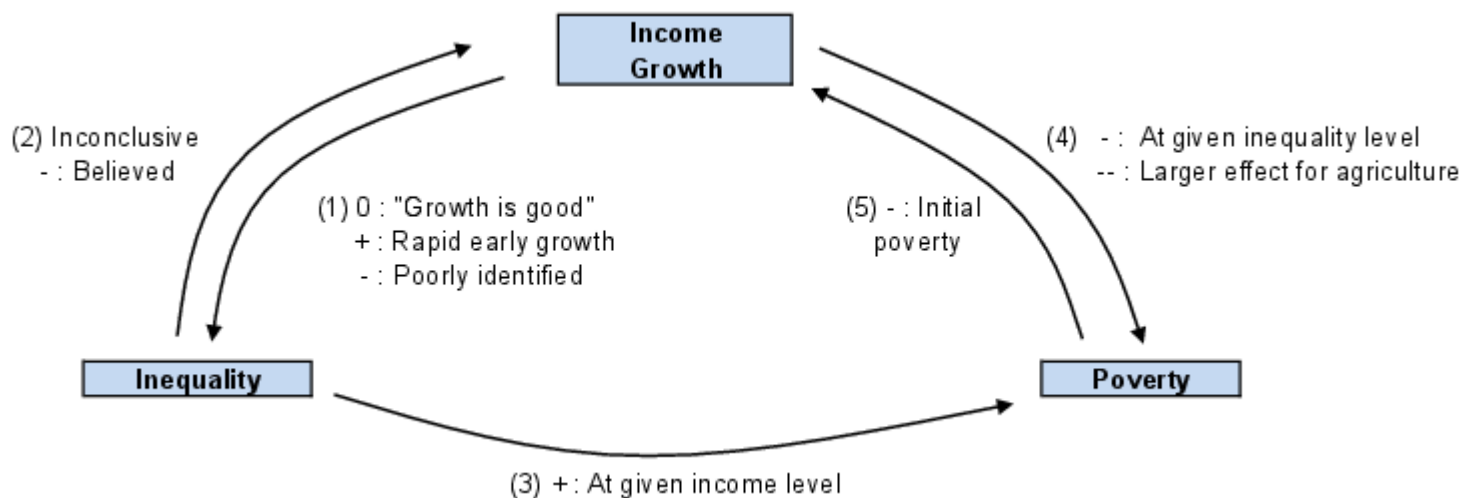
## 3 Exercises

### 3.1 Lorenz Curves



#### Development Triangle

GDP growth, Poverty, and Inequality are highly interrelated dimensions of development. The "development triangle" will help you keep track of the inter-relations between these dimensions as we proceed in the course. The arrows or channels represent what the current consensus is in Development Economics about how improvements in each dimension have been found to influence the two other dimensions empirically, though in some cases the evidence is mixed, and you might be able to think of reasons why the impact in one direction or another could be ambiguous. (+) indicates an increasing relationship and (-) indicates a decreasing relationship - not "good" and "bad".



1. Growth  $\Rightarrow$  Poverty (-): Growth generally reduces poverty, and pro-poor growth (for example, among subsistence farmers) reduces poverty more. A cross country regression gives a elasticity of poverty reduction with respect to growth of 2.38 (2.38% reduction in  $P_0$  with 1% growth). Note that growth tends to be more effective in reducing poverty in the presence of a lower Gini coefficient (more equal).
2. Poverty  $\Rightarrow$  Growth (-): Poverty is thought to reduce growth, as poor households lack assets and/or capital that would enable them to contribute to growth.
3. Growth  $\Rightarrow$  Inequality (0/+): Overall, empirically we observe Kuznet's "inverted-U" where very poor and very rich countries tend to have lower inequality than middle-income countries, but there is no clear overall causal relationship from growth to inequality (several papers have tried to establish causal relations in one direction or another, but Banerjee and Duflo have shown problems with this whole body of work), and the average elasticity of inequality with respect to growth is approximately zero in cross-country regressions. In a few cases like China and Vietnam, however, rapid early growth is seen to increase inequality, as a small portion of the population is able to take part in growth opportunities.
4. Inequality  $\Rightarrow$  Growth (?): This relationship is ambiguous, since there are several ways in which inequality can influence growth, but the aggregate impact is thought to be probably (but not certainly) negative. (See more below.)
5. Inequality  $\Rightarrow$  Poverty (+): In most cases, a reduction in inequality necessarily reduces poverty. Inequality also slows the rate at which growth reduces poverty