Lecture notes 8: Income distribution and Income Inequality

Income distribution and Income Inequality

Why the interest about the **distribution of income**?

- Because of its relation to poverty:

  Holding the average level of income fixed, a more unequal income distribution means more poverty.

  An example: In 1995, Per Capita Income in Paraguay ($4,670) was twice PCY in Egypt ($2,960). But 19.4% in Paraguay had a PCY less 1$ compared to 3.1% in Egypt.

  The difference was in the ID: Egypt relatively equal ID, while Paraguay is one of the most unequal countries in the world.

- ID also intimately tied with the process of economic growth.
- Reducing inequality is frequently an important goal of governments.

.

Income Inequality: The Facts

Table 1. US in 2001. HH divided into five income “quintiles,” each 20% of pop, first q Includes HH with lowest income, fifth q – HH with highest income.

Table 1: Household Income in the United States by Quintiles

Quintile	Average HH Income	Share of Total HH Income (%)
1’st (lowest)	$10,186	3.5
2’nd	$25,321	8.7
3’rd	$42,492	14.6
4’th	$66,939	23.0
5’th (highest)	$145,811	50.1

Figure 1: Percentage of HH in Income categories.

Mean income higher than the median, not unusual, ID are always **skewed** – have a long right tail, rather than being symmetric around their means.

Using the Gini Coefficient to Measure Income Inequality

Figure 2:

Gini coefficient: a measure of income inequality based on the **Lorenz curv**e.

Based on table 1 data:

• The Lorenz curve has a bowed shape because of income inequality.

• If income were perfectly equally distributed, then the poorest 20% of HH would receive 20% of total HH income, and so on.

• In this case, the Lorenz curve would be a straight line with a slope of one;

• This is the “line of perfect equality” in Figure 2.

• The more bowed-in is the Lorenz curve, the more unequally income is distributed.

• Use this property of the Lorenz curve to construct an index that summarizes inequality in a single number.

• The Gini coefficient measures the area between the Lorenz curve and the line of perfect equality and dividing this area by the total area under the line of perfect equality.

Figure 13.1
Income Distriubtion in the United States

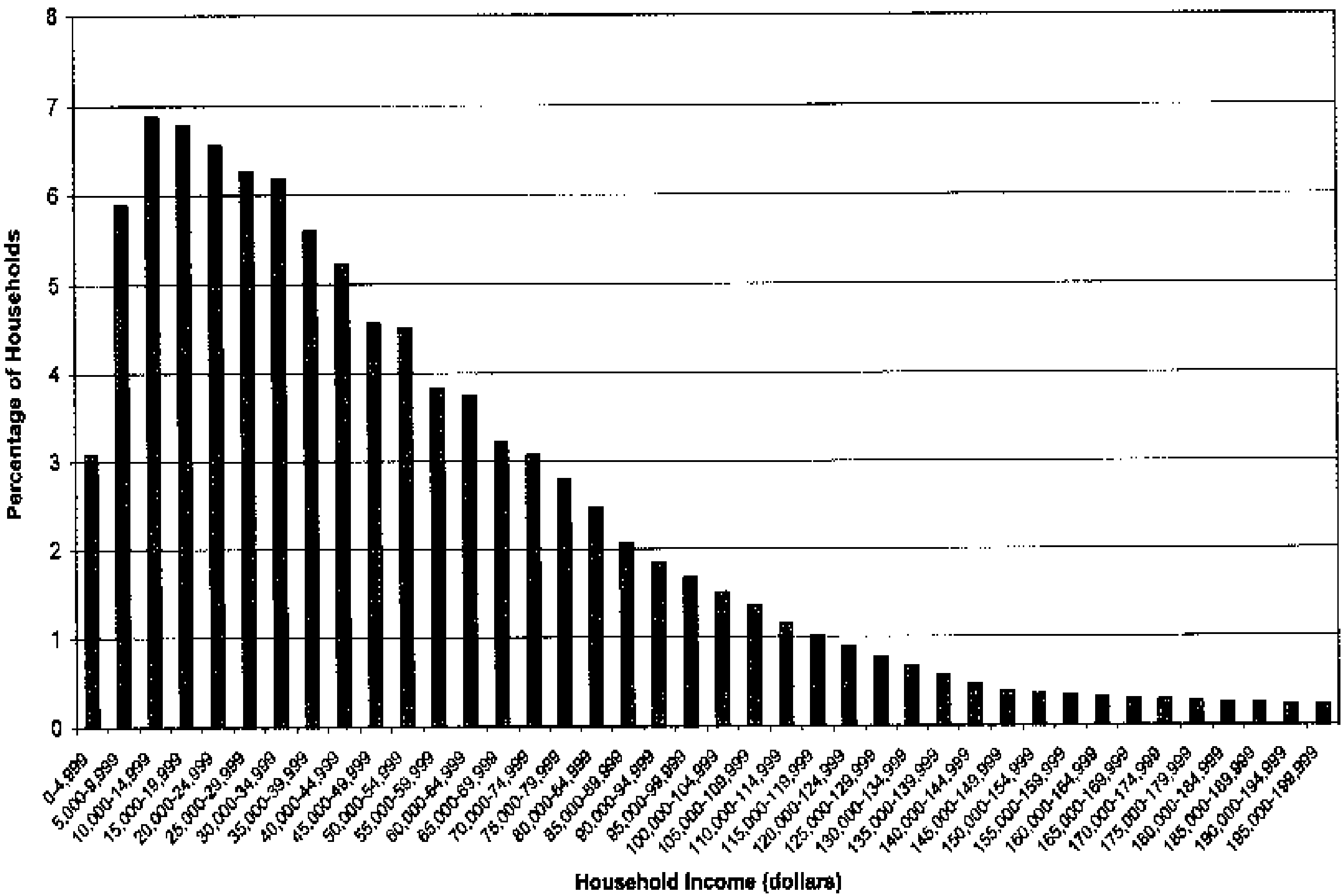
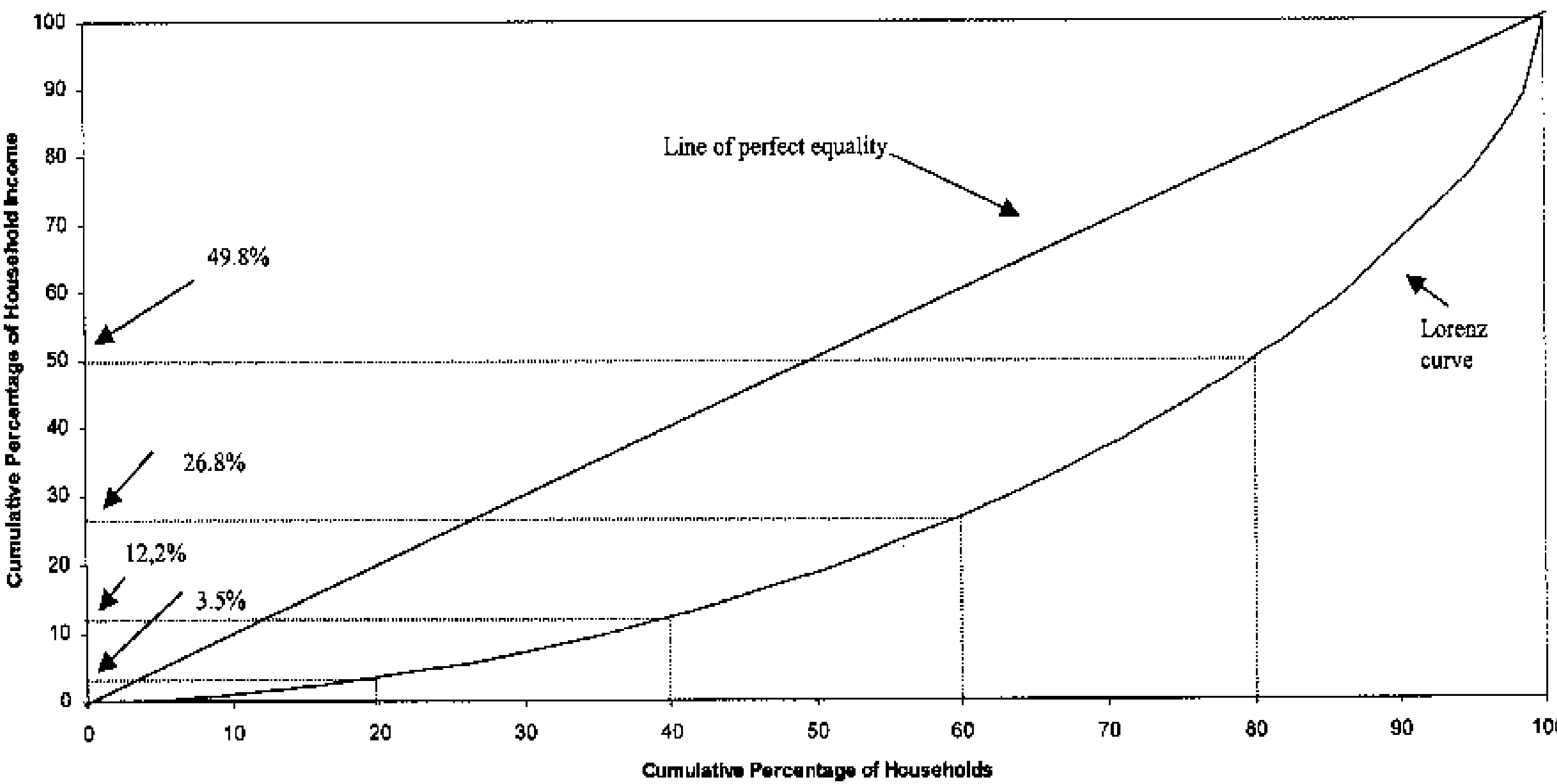


Figure 13.2
The Lorenz Curve for the United States



- The more bowed-in is the Lorenz curve, and thus the more unequal is the distribution of income, the higher will be the value of the Gini coefficient.
- If income is perfectly equally distributed, then the value of the Gini coefficient will be zero.
- If income is as unequally distributed as possible – that is, if a single HH receives all HH income in the country – then the Gini coefficient will be one.
- The Gini coefficient for US data in Figure 2 is 0.466.

The Kuznets Hypothesis

- In 1955, Simon Kuznets hypothesized that as a country developed, inequality would first rise and then later fall.
- Kuznets' theory implies that if we graphed the level of inequality as a function of the level of development, the data would trace out an inverted-U shape - Kuznets Curve.

1. Evidence of a Kuznets curve in a single country over time (Figure 3, Kuznets curve evident).
2. Or in a single point in time at a cross section of countries that have different levels of income (Figure 4).

In Figure 4, Kuznets curve hard to find:

- There are many other factors, that affect a country's level of inequality.
- Once these factors are accounted for in the analysis, the Kuznets curve appears.

1. If there *is* a Kuznets curve – then it is theoretically possible that economic growth can actually be bad for the poorest people in a country.
2. Specifically, the effect of growth in raising the average level of income might be counteracted by the effect of widening inequality in moving the poorest people further below the average.

Figure 13.3

The Kuznets Curve

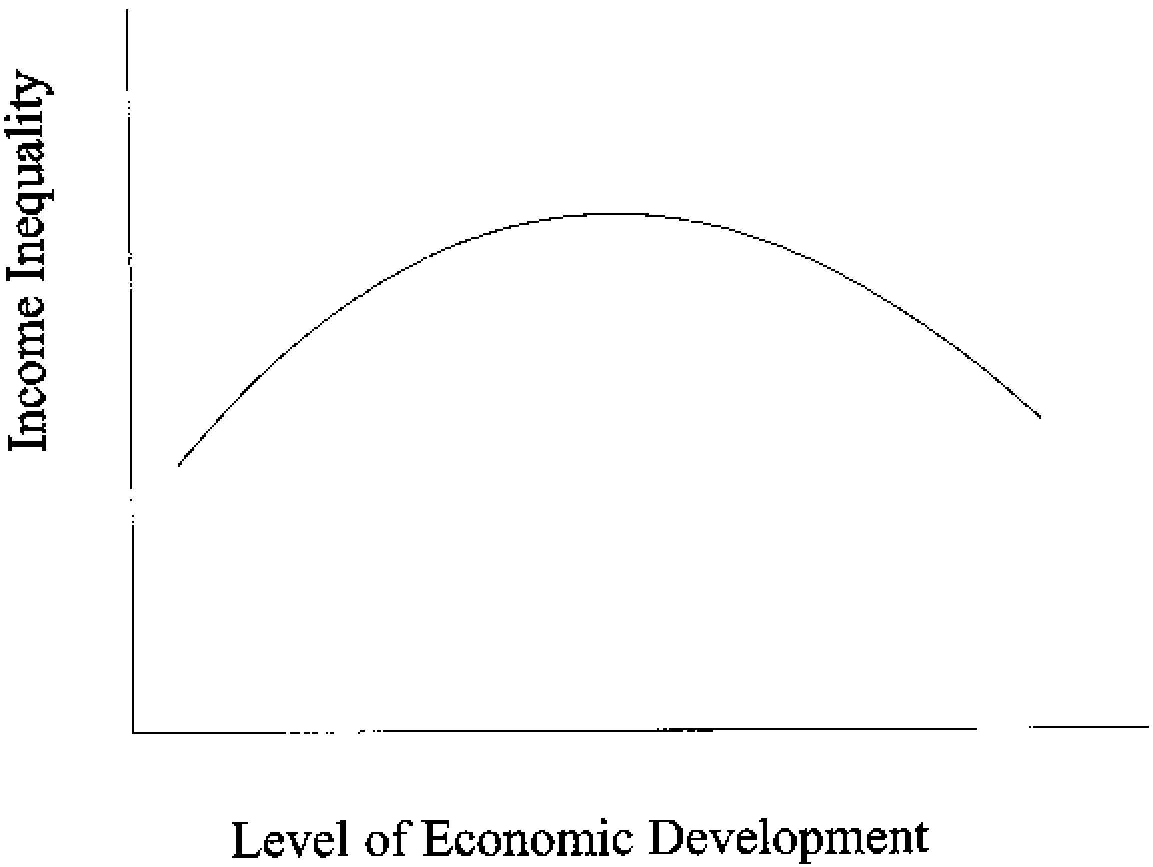
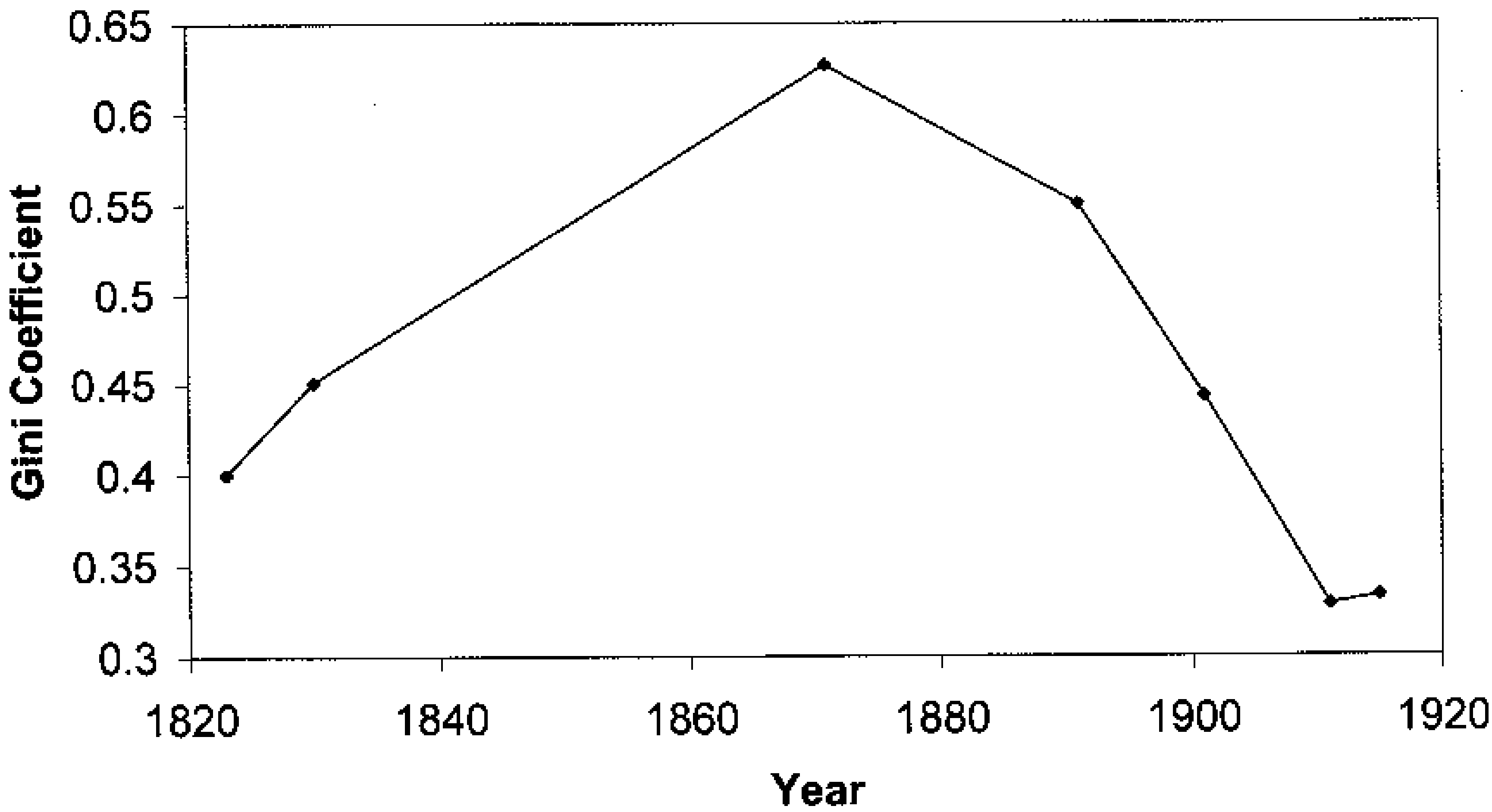


Figure 13.3
The Kuznets Curve in England and Wales 1823-1915



3.2 Sources of Income Inequality

Why do countries differ in their levels of income inequality?

Why is there income inequality at all? because people differ in many ways which are relevant to their incomes:

•in human capital (education and health),

•in where they live (city vs. countryside),

•in their ownership of physical capital,

•in the particular skills they have,

•in their luck.

Differences translated into differences in income by the economic environment.

Figure 6: Differences between countries or changes over time have their source in either the return to education or the distribution of education.

Figure 7 looks at the effect of changing the return to education.

Figure 8 does a similar analysis of the effect of changing the distribution of education.

Many of the characteristics that affect an individual's income are not observable by economists. E.X, we can gather data on education and health, but not on their persistence, energy, or ambition, even though these factors are clearly important in determining income.

Sources of Income Inequality

Why do countries differ in their levels of income inequality?

Why is there income inequality at all? because people differ in many ways which are relevant to their incomes:

- in human capital (education and health),
- in where they live (city vs. countryside),
- in their ownership of physical capital,
- in the particular skills they have,
- in their luck.

These Differences are translated into differences in income by the economic environment.

Figure 6: Differences between countries or changes over time have their source in either the return to education or the distribution of education.

The Determination of Income Inequality

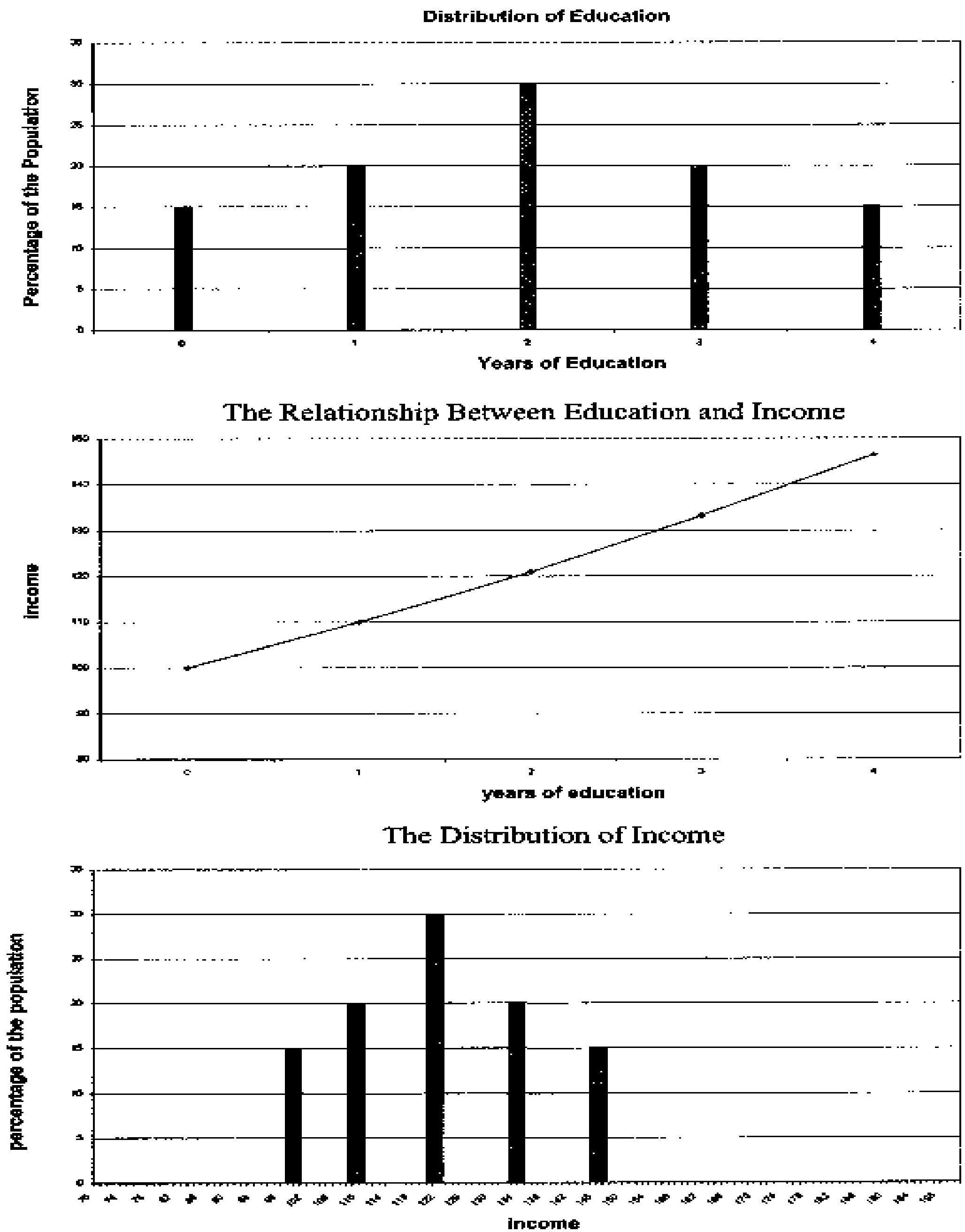
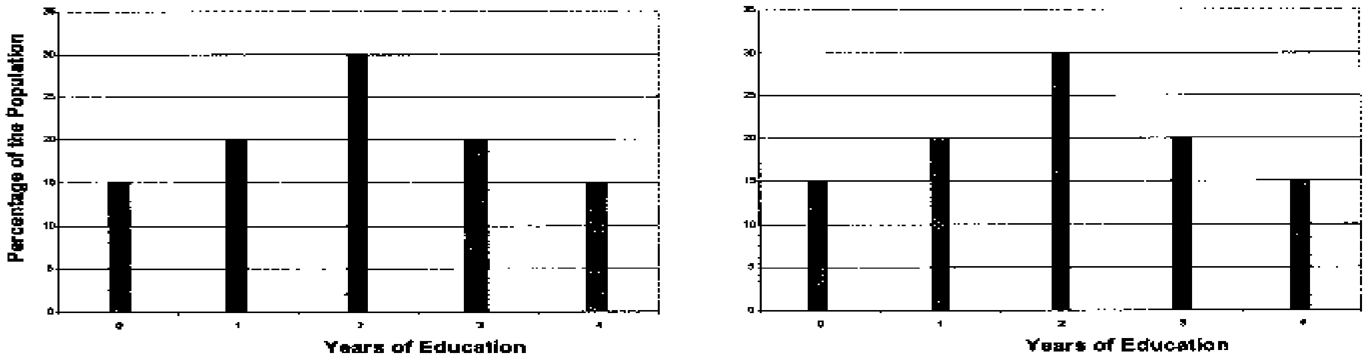
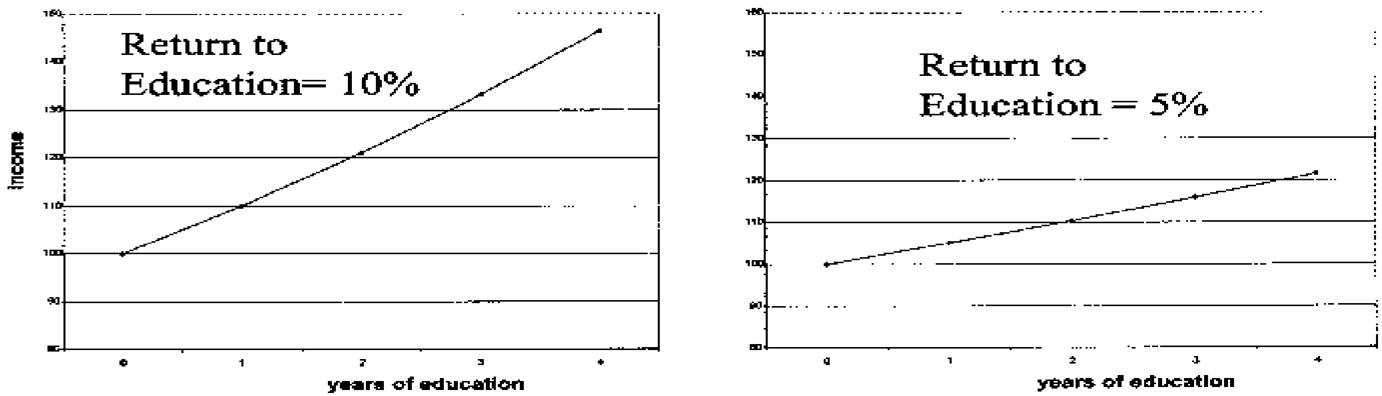


Figure 13.7
How the Return to Education Affects the Distribution of Income

The Distribution of Education



The Relationship Between Education and Income



The Distribution of Income

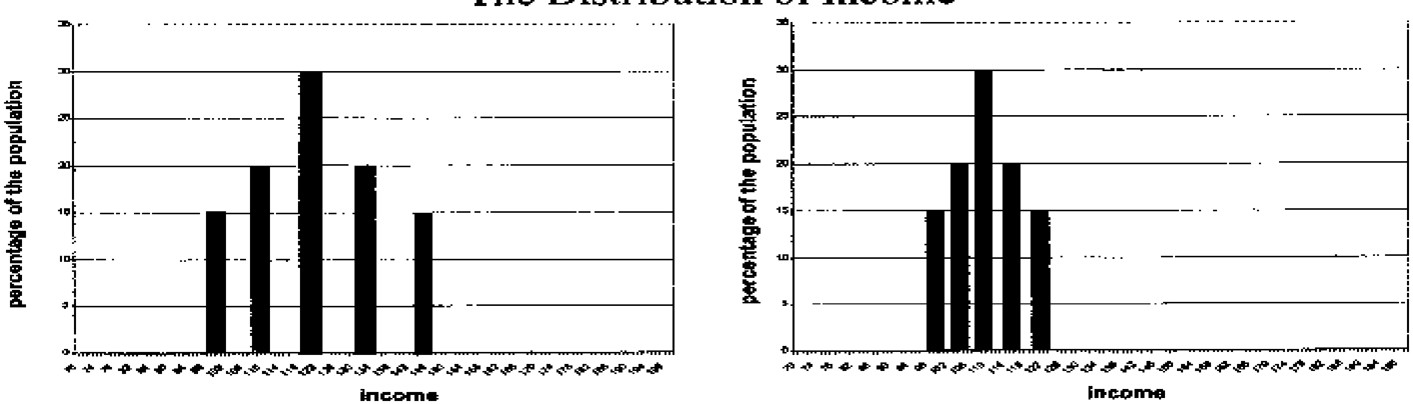
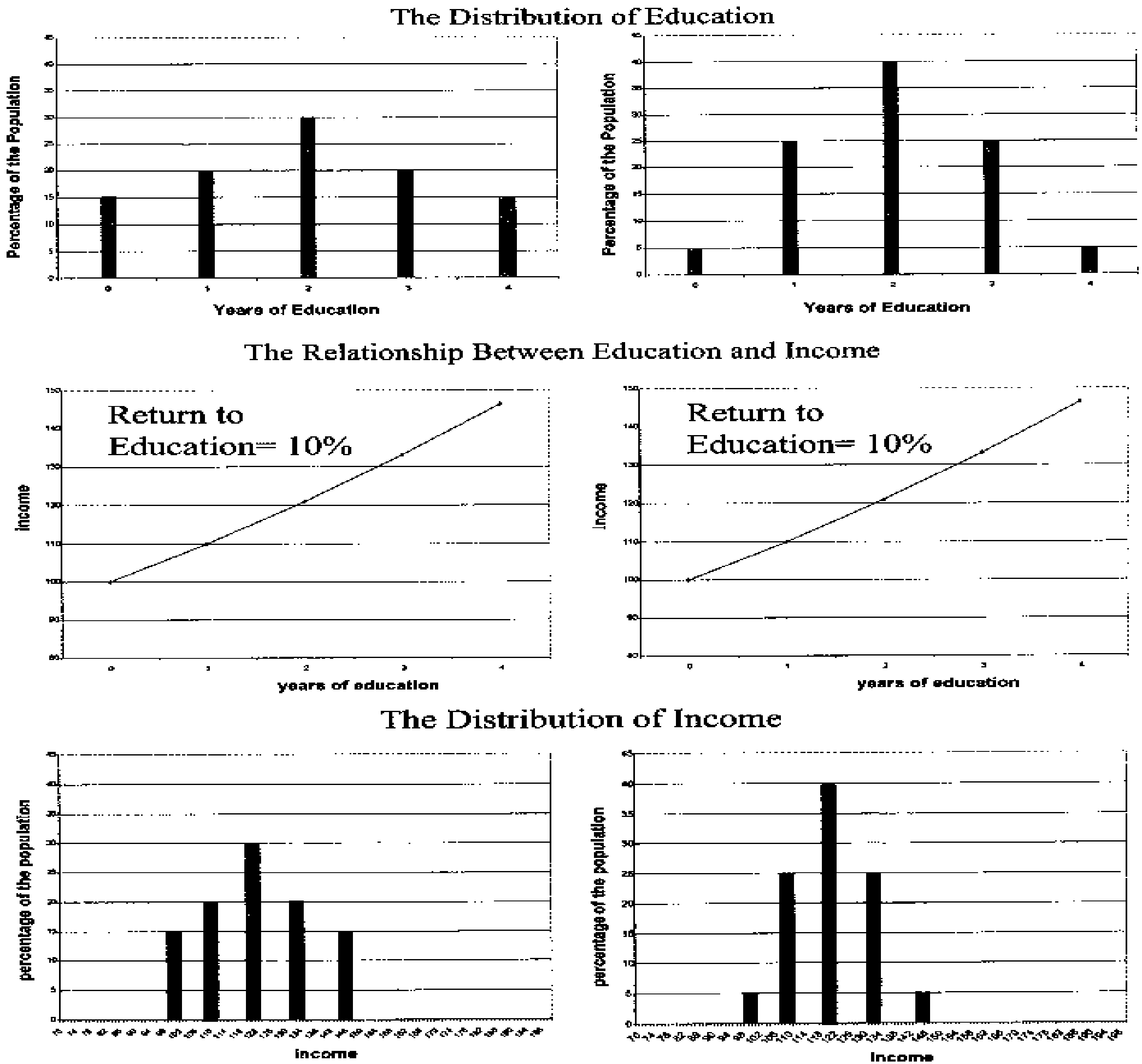


Figure 13.8
How the Distribution of Education Affects the Distribution of Income



Despite these difficulties, the framework is useful for understanding:

- The determinants of inequality
- Simon Kuznets' hypothesis:

• Kuznets reasoned that the initial effects of economic growth – due to arrival of new technologies and changes in the structure of the economy

• Would be to raise the rate of return to skills (education and entrepreneurial ability) because skilled workers are better at adapting to new modes of production.

• Similarly, new technologies will raise the rate of return to physical capital, because technologies are often embodied in new capital goods.

• Since skills and capital are found at the high end of the income distribution, this increase in the rate of return to them would raise income inequality.

Over time, however, new forces would begin to operate:

• First, the distribution of the qualities that determined income distribution would change over time in a way that lowered inequality:

- The higher return to skills would induce unskilled workers (or their children) to get an education,
- and similarly workers would migrate out of regions or sectors which were falling behind, and into fast growing areas.

• Second, as technological progress and structural change slow down, the rates of return to skills will decline, and this will also tend to reduce income inequality.

Explaining the Recent Rise in Inequality

- Figure 9 shows the Gini coefficient in the US over the period 1947-2001.
- Starting in the 1970s, income inequality has increased dramatically.
- This rise in inequality has been also observed in most other DC.

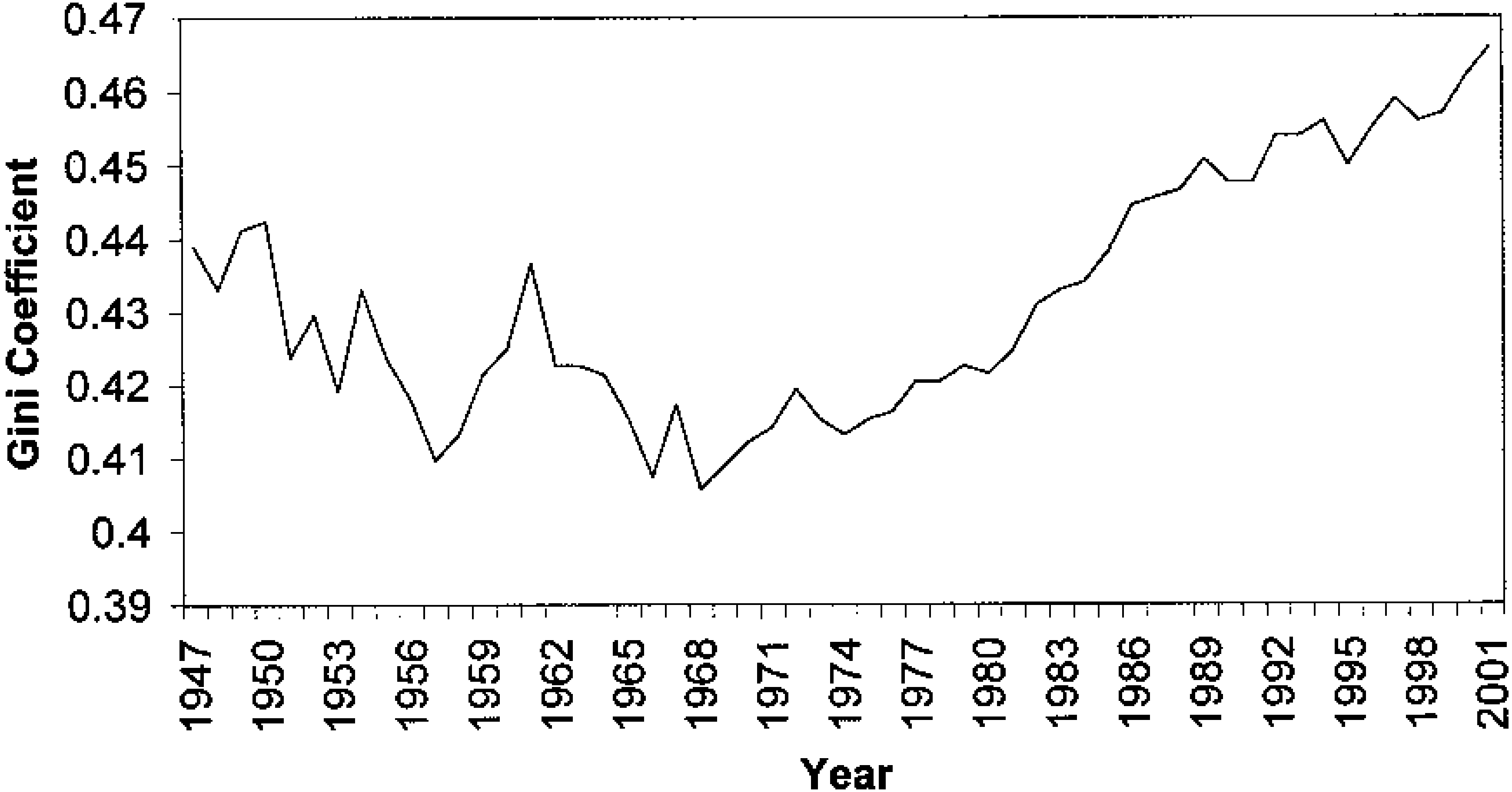
Several possible explanations for this phenomenon:

Technological change:

- Introduction of a new technology, information technology, increased the rate of return to certain characteristics of workers – most importantly education:
- Computers complemented skills of educated workers, making them more productive while doing little to raise the productivity of uneducated workers.
- In 1993, for example, 70% of workers who had a college education used a computer in their jobs, while only 10% of workers with less than high school education did so.
- New technology also led to a high return to flexibility (to work with a new technology) or entrepreneurial spirit.
- In the long run the level of inequality will return to previous level.

Figure 13.9

Income Inequality in the United States: 1947-2001



An increase in international trade:

• Trade changes the effective scarcity of different inputs. The opening up of trade lowers the rate of return to qualities that are scarce in a given country but plentiful elsewhere.

• Similarly trade raises the rate of return to qualities that are plentiful in a given country but scarce in the world as a whole.

• The effect of trade on inequality in a given country depends on how the skills whose returns are affected are distributed in the population.

• A second effect of trade is to change the payoff to living in different regions of a country.

• Observers of the labor market have pointed to the rise of a “superstar” dynamic in many occupations, by which people with the highest levels of some qualities earn much more than people who are only slightly lower in their qualifications.

The Effect of Inequality on Economic Growth

- Inequality and the Accumulation of Physical Capital

One channel through which income inequality can have a beneficial effect on economic growth is via saving rates:

- Inequality is related to the saving rate because saving rates tend to rise with income.
- The more unequal is income – the higher will be the total amount of saving.

Take $1 of income away from a HH in the richest quintile and gave it to a HH in the poorest quintile > would reduce inequality > because saving of poor (8.6 cents per $) is smaller than saving of rich (23.0 cents per $) the effect of redistributing income would be to reduce total savings by 14.4 cents (=23.0 - 8.6) for every $ transferred.

Saving rates and income quintile

Income Quintile	Median,Saving Rate
1 (lowest)	8.6%
2	12.9%
3	16.3%
4	18.0%
5 (highest)	23.0%

Inequality and the Accumulation of Human Capital

More unequal distribution of income leads to lower human capital accumulation:

- Consider two people, one rich and one poor. Each person can invest in his own human capital or in physical capital.
- Marginal product of own human capital goes down and of own physical capital does not (because any single person's investment is minuscule in relation to the national level of capital).

Figure 10: Makes it clear that a poor person will invest in human capital rather than in physical capital, because it is always better to invest in the form of capital with the highest marginal product. But the rich will invest their marginal dollars in physical capital.

We now consider how inequality affects the accumulation of human capital. The poor will invest all of his wealth in his own human capital; the rich will invest most of wealth in physical capital.

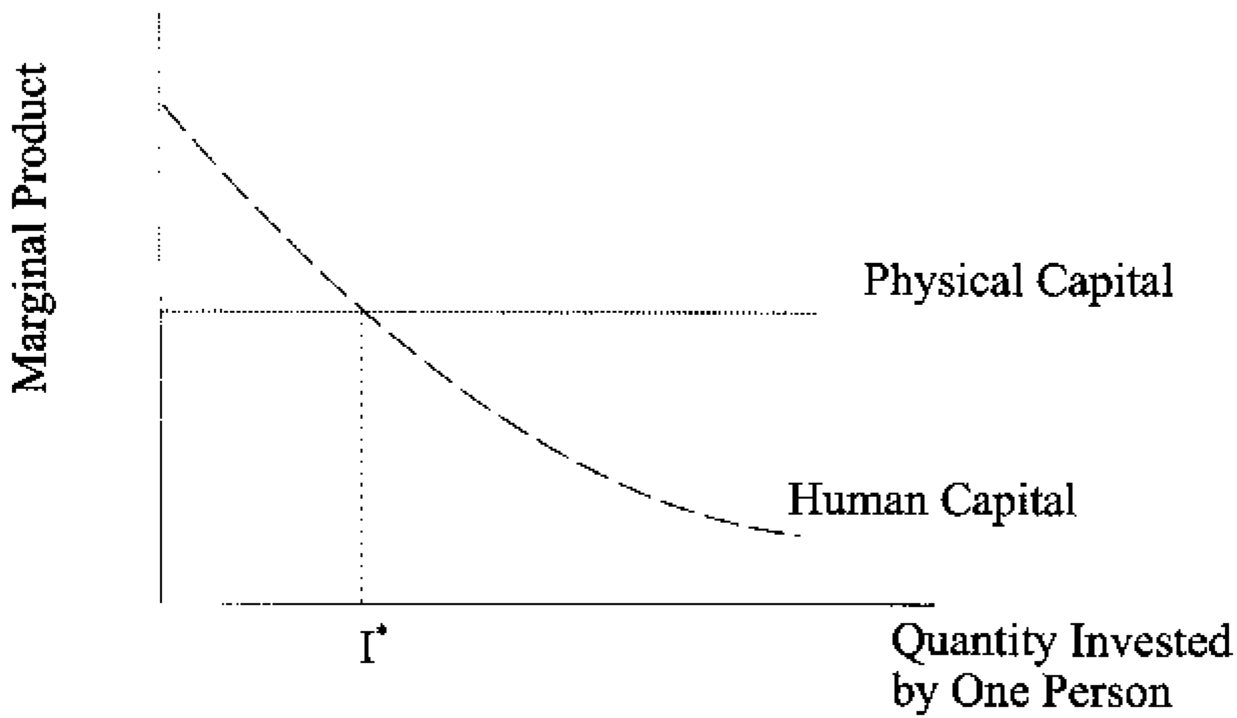
Notice that the marginal product of the last dollar invested by the poor is higher than the marginal product of the last dollar invested by the rich. Thus if income is redistributed from the rich to the poor, two things will happen:

• First, HC accumulation will rise, since the poor will invest his extra money in human capital, while the rich will reduce his investment in physical capital.

• Second, total output will go up, because the marginal product of HC invested in by the poor is higher than the marginal product of physical capital that the rich invests in.

Figure 13.10

Marginal Products of Physical and Human Capital



- The different effects of inequality on physical and human capital accumulation – beneficial in the case of physical capital, and harmful in the case of human capital – suggest that inequality may have different effects on the pace of economic growth at different stages of growth.

- The driving force of nineteenth century economic growth was accumulation of physical capital. Thus in this period, inequality may have had a positive effect on economic growth.

- However, economic growth in the last several decades, at least among the most developed countries, has been driven by human rather than physical capital accumulation. In this circumstance, inequality is detrimental to growth.

Inequality, Redistribution, and Efficiency

How inequality may affect a country's productivity?

• Through the channel of **income redistribution,** through taxation.

• Taxation leads to inefficiency.

Figure 11: the median level of pre-tax income and the tax rate favored by the worker with that level of pre-tax income. Notice that the median level of pre-tax income is below the mean level of pre-tax income – this corresponds to the fact that median income is *always* below the mean. Thus the tax rate selected by the median voter will be above zero.

What happens when the distribution of pre-tax income changes, holding constant mean income. Suppose income becomes *more* unequal. The wider is the distribution of income, the further will the median level of pre-tax income be below the mean. If two countries have the same average pre-tax income, the median level of pre-tax income will be lower in the country with a more unequal ID.

As figure 12 shows, lower median pre-tax income leads to a higher rate of taxation favored by the median voter. Thus higher inequality leads to more redistribution and more taxation – and, a lower level of efficiency. Through this channel, inequality lowers the average level of income.

Figure 13.11

The Relationship Between Income and Desired Tax Rate

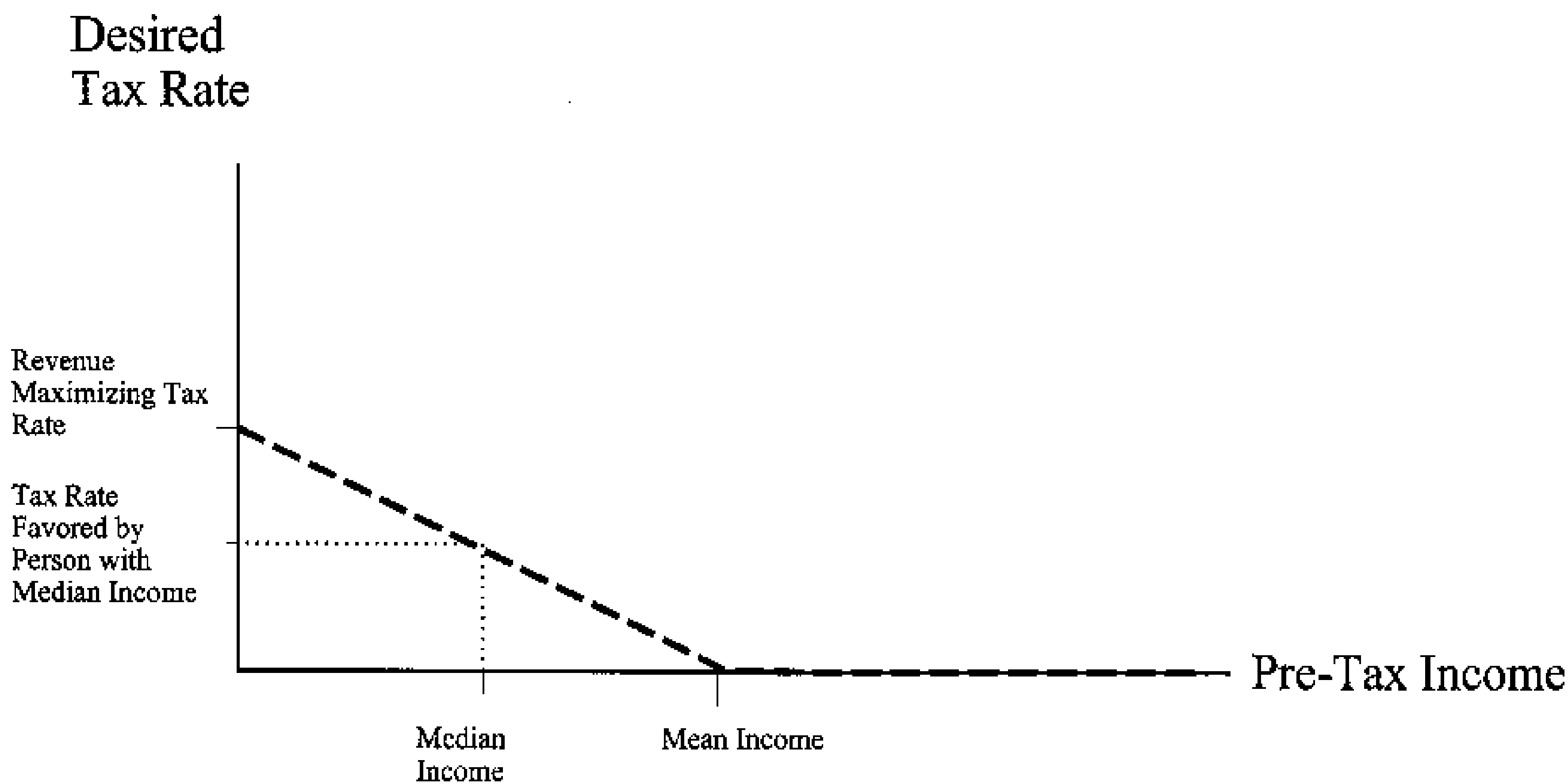
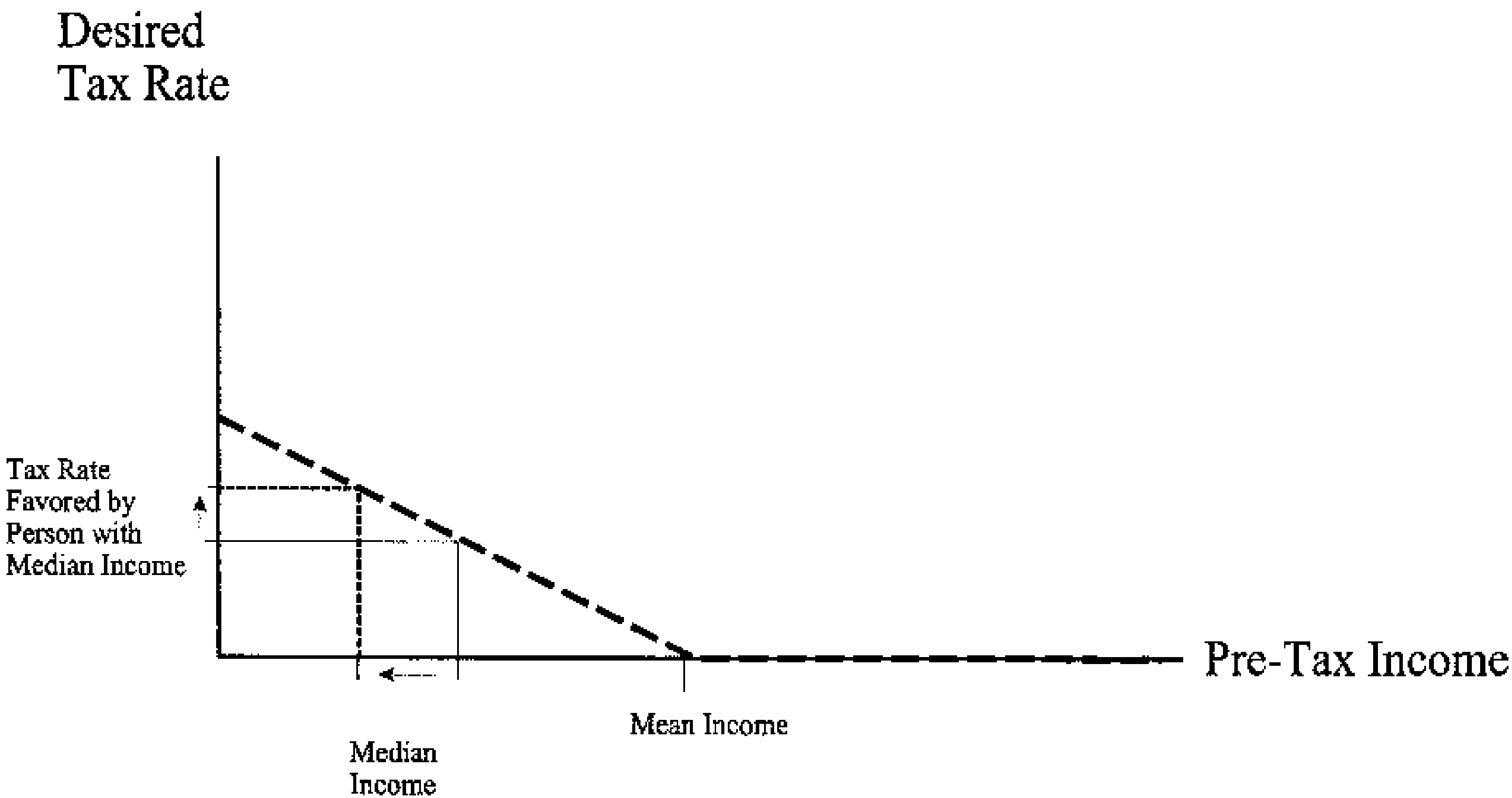


Figure 13.12

The Effect of Increased Income Inequality on the Tax Rate



Inequality and Sociopolitical Unrest

• The model of fiscal policy took a very simplistic view of the political process: if there were more inequality, there would be more demand for redistribution, and therefore more redistribution would take place.

• A more realistic view of the political process would acknowledge that simple majority voting is not a good characterization of how decisions are made. This is true both in countries which are formal democracies, as well as in countries which are not democracies.

• Given this observation, we might draw a different conclusion: that countries in which the distribution of income is more unequal might have more *pressure* for redistribution, but not necessarily more actual redistribution.

• The pressure for redistribution is expressed in several ways, all of them having a negative effect on growth. One expression is through political instability as different groups compete for power.

• Such an unstable political situation would discourage investment, because, for example, people who built factories would fear that their property might be confiscated following some future revolution or other change in government.

- A second expression of the pressure for redistribution is crime. Property crime is often the attempt by poor people to redistribute resources through channels other than the political system .

- Other forms of social unrest which can be motivated by severe inequality, such as rioting, also lead to the destruction of property, even if they do not result in a redistribution of income .

- Crime wastes both the time and energy of criminals themselves, and also the resources of those who have to spend money preventing it.

- By this logic, greater inequality requires a larger government, and thus reduced economic efficiency, simply to secure the property rights of the rich .

Empirical Evidence on the Effect of Inequality on Growth

• Available statistical data is simply unable to answer this question.

• While some economists claim to find evidence that inequality is on average bad for growth, others claim the data point in the opposite direction.

• One of the obstacles to getting a clear answer is that inequality itself is difficult to measure.

• Thus we cannot say that there is *no* effect of inequality on growth, only that the data are not yet sufficient to tell us what it is.

• The effect of inequality may depend on a country's stage of growth, as well as other factors, like whether it is open to capital flows from abroad. In a country where growth is driven by physical capital accumulation, inequality will be more conducive to growth than in a country where growth is driven by human capital accumulation.

• Similarly, in a country open to flows of physical capital from abroad inequality will be less conducive to growth than in a country that is closed to capital flows.

• Economists have been more successful in examining the individual channels discussed above by which inequality might affect growth. This examination does not answer the question of inequality's overall effect on growth, but it does provide evidence on which of the channels discussed are likely to be important.

• In countries where I inequality is higher, accumulation of HC through education is lower.

• A related finding is that in C where income inequality is higher, the TFR is higher. This is another channel through which income inequality is bad for growth because high fertility exerts a negative effect on growth.

• Economists constructed an index of sociopolitical instability (politically motivated assassinations, deaths due to mass domestic violence, coups, democracy status). The smaller this index, the less the degree of instability in the country. Figure 13: the less equal the ID the higher degrees of instability.

• There is no evidence that higher income inequality leads to a higher level of redistributive taxation. Indeed, countries with higher inequality tend to have *lower* taxes than countries where income inequality is low. One explanation for this is that where income inequality is high, political power is firmly controlled by the wealthy, who are able to prevent redistribution.

More empirical evidence

• As an alternative to these statistical analyses, some economist have looked at the historical evidence on economic growth to learn about the effects of inequality.

• The most clear case of the importance of inequality in affecting economic growth is the contrasting histories of La America, on the one hand, and the US and Canada, on the other.

• The gap in inequality between the two regions can be traced back to their colonization by Europeans starting in the sixteenth century. Many of the Latin American colonies specialized early on in the cultivation of sugar, coffee, and other exportable crops. Production for export onto the world market led to the organization of agriculture into large plantations, and resulted in an extremely unequal distribution of income – a phenomenon exacerbated by the use of slaves.

• In other parts of Latin America, notably Peru and Mexico, rich mineral resources and the ability of Europeans to exploit dense native populations led to the formation of large estates.

• By contrast, the colonies that would eventually become the US and Canada, were neither able to grow highly prized commodities like sugar, nor well endowed with valuable minerals or dense native populations that could be effectively harnessed. As a result, the colonies were economically far more marginal than their neighbors to the south.

• The majority of labor in the colonies that would become the US and Canada was supplied by voluntary European immigrants and their descendants, as opposed to slaves and natives Americans. The relatively homogenous population of these regions, and the absence of plantation-style agricultural production for export, led to an economy based on small family farms, resulting in a relatively equal distribution of income.

• The American South, growing export crops like rice, tobacco, and cotton, and using slave labor was closer to the Latin American model, but even here the use of slaves and the level of income inequality were more modest than in the sugar growing regions.

• The patterns of relative inequality in North and South America persisted long after the economic bases which underlay their initial differences in inequality (that is, slavery, the primacy of coffee and sugar as export crops, etc.) had disappeared. Indeed they persist today: many of the most unequal countries in the world are located in South America. One factor which allowed for this persistence was the extent to which inequality was built into the political institutions in the two regions. The United States and Canada were far ahead of Latin America in the fraction of the population that was eligible to vote, and in democratic innovations such as the secret ballot.

- The institutional structure in Latin America placed power within the hands of a small elite, which was able to effectively extract resources from the majority of the population. In the US and Canada, political institutions restricted the power of government, protected private property, and assured the rule of law
- One of the most important effects of inequality was on investment in HC. The US and Canada were leaders in the public provision of education. In contrast, the elites that governed the highly unequal countries of Latin America had little interest in supporting schooling, both because they gained little economically from it, and because a more educated population might want a larger share of political power. By 1870, both Canada and the United States had reached 80% literacy, a level that would not be reached in the rest of the Americas for 75 years.

- The failures to invest in HC and to construct institutions of the type conducive to economic growth, along with the instability that resulted from conflict over income distribution, were among the major contributors to Latin America’s failure to keep up with the US and Canada. Looking over the span of centuries, it is easy to see the negative effect of income inequality on growth. Unfortunately it is also clear from this history just how persistent inequality can be.