

Chapter 7: Inequality and Development: Interconnections

Do you think inequality increases as incomes go up or vice versa? Why? This chapter deals with these questions.

Reduction of inequality may be a goal in itself for some of us and not for others. But, even if we are not interested in reduction of inequality as an objective by itself, we will still be interested in inequality for functional reasons (i.e., inequality may affect the way an economy functions).

In low-income countries, the functional aspects of inequality are more serious than in high-income countries. With low-incomes distributed unevenly, saving rates, poverty, nutrition levels and the capacity to work will all be affected severely. The effects of inequality on economic performance are stronger in poor countries.

Connections between inequality and other aspects of development often run in both directions.



Let's think of a model in which individuals hold the endowments of goods, factors of production (inputs) and shares in firms. Individuals buy and sell goods and inputs and can transform inputs into outputs via a production function. Market prices equate supply and demand in each market. In the end, each individual attains a level of consumption. Some borrow, others save.

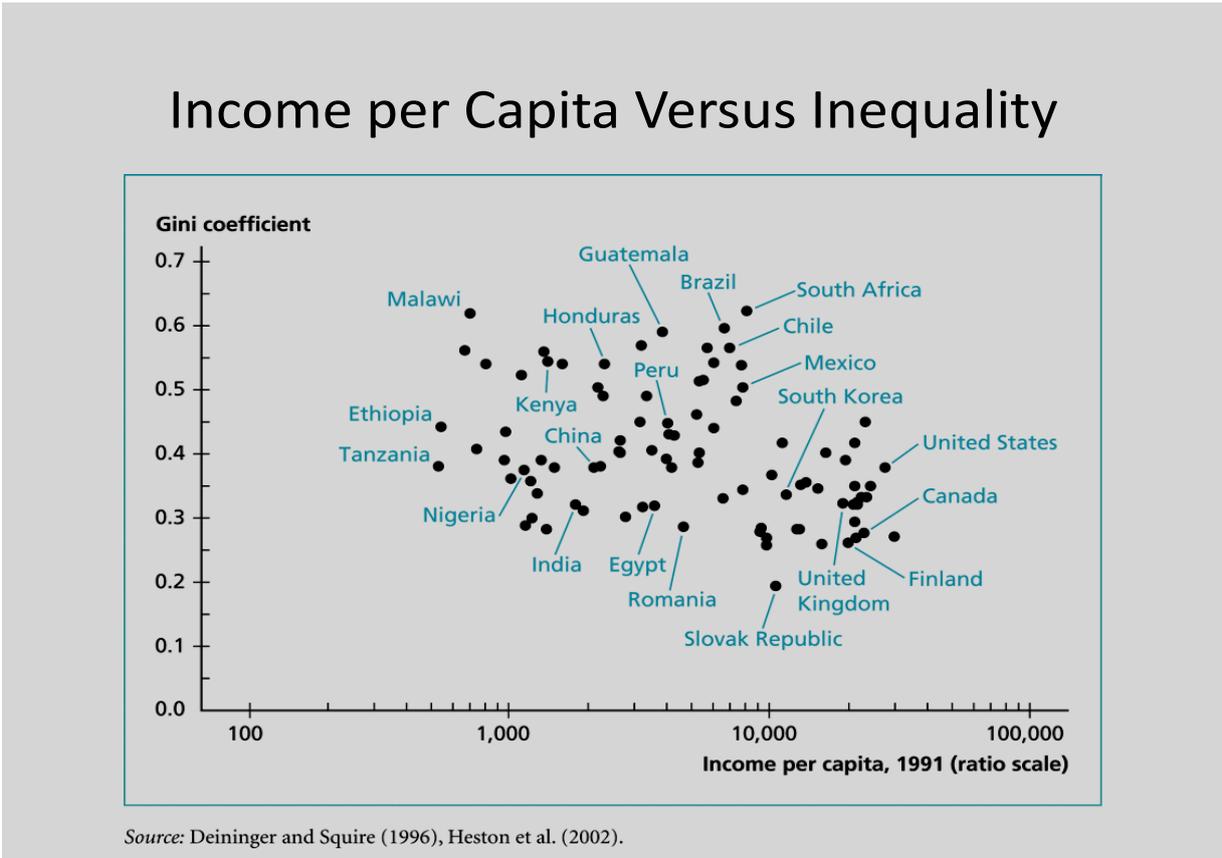
<u>Time = t-2</u>	<u>Time = t-1</u>	<u>Time = t</u>	<u>Time = t+1</u>	<u>Time = t+2</u>
...	Endowments	Endowments	Endowments	...
...	Factors of production	Factors of production	Factors of production	...
...	Shares in Firms	Shares in Firms	Shares in Firms	...
...	⇓	⇓	⇓	...
...	Production	Production	Production	...
...	Trade	Trade	Trade	...
...	⇓	⇓	⇓	...
...	Consumption	Consumption	Consumption	...
...	Save/Borrow	Save/Borrow	Save/Borrow	...
...	⇓	⇓	⇓	...
(Go to Time=t-1)	(Go to Time t)	(Go to Time t+1)	(Go to Time t+2)	...

The above processes determine the distribution of income in the economy. But, where do the initial endowments come from? What determines *their* distribution?

The level and distribution of today's endowments were determined yesterday. In other words, given yesterday's distribution and yesterday's economic interaction in the marketplace, we generate a new distribution of endowments for today. For example, savers added to their past stocks of endowments and borrowers drew on their endowments. The level of saving was determined by the amount of yesterday's production. Similarly, yesterday's distribution was determined by what was given the day before and what kind of economic interactions took place.

If this is the case, then how much does history matter in determining inequalities? Do inequalities diminish over time, as economies get richer? If not, why do they persist and what effects does this have on economic development?

Inequality, income and growth:



In the picture above, we do not see a clear relationship between inequality (as measured by the Gini coefficient) and the level of development (as measured by per capita income). How can we test whether there is any significant relationship between these two variables?

The inverted-U hypothesis: Kuznets (1955). Compared a set of developing countries with a set of developed countries. Looked at the ratio of the income share of the richest 20% to that of the poorest 60% of the population. Found that developing countries displayed higher inequality:

India: 1.96

Sri Lanka: 1.67

Puerto Rico: 2.33

United States: 1.29

United Kingdom: 1.25.

A later study (Kuznets, 1963) provided further evidence. This study found that income shares of upper income groups are higher, while the income shares of lower income groups are lower in developing countries than in developed countries.

Thus, based on this crude evidence, it appears that economic development benefits some groups first and leaves the other groups to catch up later. In the initial phase, inequality increases. Later, as the benefits of development are shared by other groups, inequality falls. This hypothesis suggests that if we plot per capita income on one axis and inequality measure on the other, we will get an inverted-U shape.

Testing the Inverted-U hypothesis:

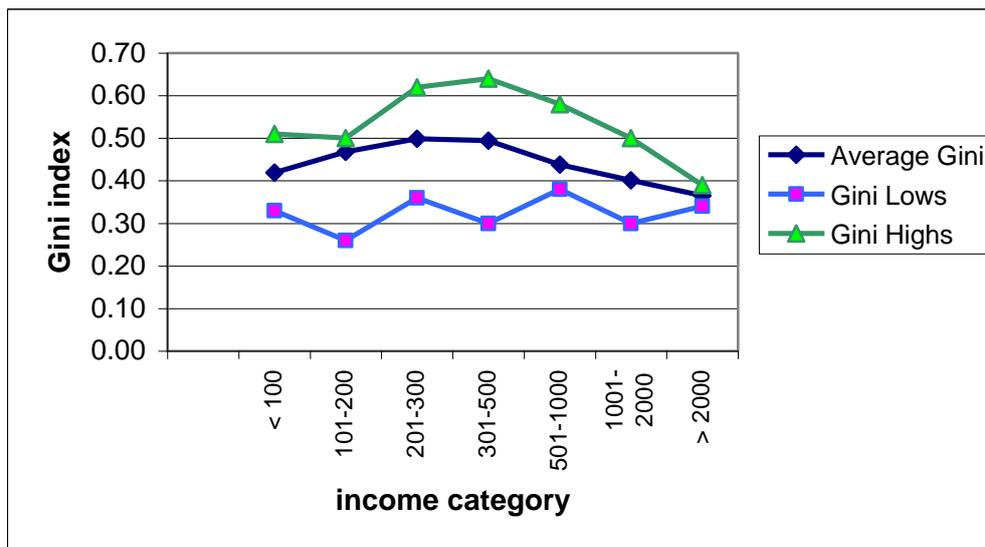
Ideally, we would like to track a country over time and report the changes in inequality.

Problem: Lack of data.

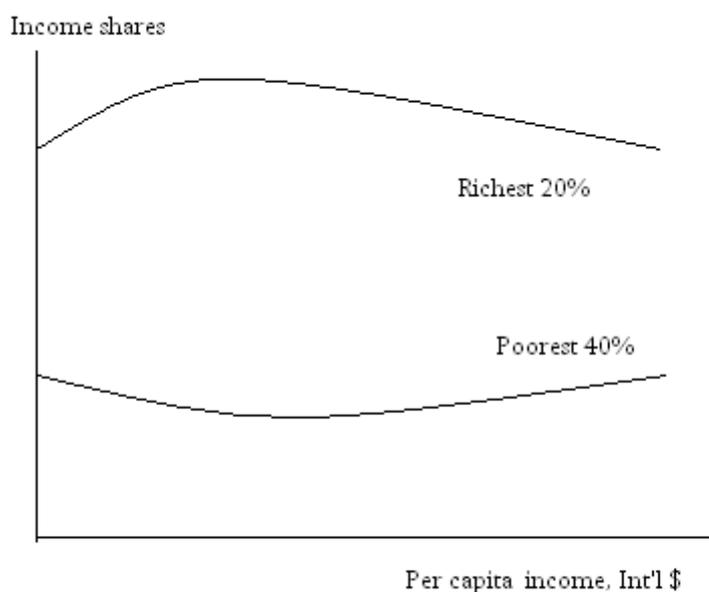
An alternative is to carry out a cross-sectional analysis. This entails examining variations in inequality across countries that are at different stages of development. This method has the advantage that we can obtain inequality data from countries at very different stages of development. The disadvantage is that, it is difficult to control for country-specific characteristics. Unless we firmly believe that there is nothing to be learned about one country from studying another country, there is useful information to be obtained from such a study.

Study by Paukert (1973): A sample of 56 countries was grouped according to per capita GDP in 1965. These income groups and their average, lowest and highest Gini coefficient values are reported below. We can say by looking at the averages that the evidence is in favor of the Kuznets hypothesis. However, there is considerable variation within each income group, which tells us that the inverted-U pattern is not inevitable in each country's history of development.

Income category (1965)	Average Gini	Gini Lows	Gini Highs
< 100	0.419	0.33	0.51
101-200	0.468	0.26	0.5
201-300	0.499	0.36	0.62
301-500	0.494	0.3	0.64
501-1000	0.438	0.38	0.58
1001-2000	0.401	0.3	0.5
> 2000	0.365	0.34	0.39



Using a larger dataset and plotting the income shares of the poorest 40% and the richest 20% of the population versus per capita incomes in the latest year for which these are available (which is 1993 at the time our textbook was written), Debraj Ray shows that the income share of the richest 20% rises and then falls with per capita income, while the share of the poorest 40% slightly falls before it rises. (Check out the following graph.) Therefore, at crude cross-sectional level (i.e. without controlling for any factors), the evidence is in favor of the inverted-U hypothesis.



The cross-sectional study by Ahluwalia (1976), which analyzed a sample of 40 developing, 14 developed and 6 socialist countries ran the following regression:

$$s_{ij} = A + by_j + cy_j^2 + D_j + error,$$

where s_{ij} is the income share of the i^{th} quintile in country j , y_j is log per capita GNP in country j and D_j is the socialist country dummy.

Why do both y and y -squared enter the regression?

What signs (positive or negative) should b and c have for the function $f(y) = A + by + cy^2$ to display a U shape? (Hint: Take first and second derivatives.)

You can show that b and c should be of different signs.

It turns out that for all quintiles but the highest, income share tends to fall initially with a rise in per capita income, then rises beyond a certain point (that is, $b < 0$ and $c > 0$). For the top quintile, the opposite is true.

Income share	b	c	D	R^2
Top 20%	89.95 (4.48)	-17.56 (4.88)	-20.15 (6.83)	0.58
Middle 40%	-45.59 (3.43)	9.25 (3.88)	8.21 (4.20)	0.47
Lowest 20%	-16.97 (3.71)	3.06 (3.74)	5.54 (8.28)	0.54

So far, the evidence appears to be in favor of the inverted-U hypothesis!

However, there are reasons to be skeptical.

First, there is too much variation in the data. Per capita income alone can explain only half of the variation in inequality. Of course, a country might follow the inverted-U pattern if left to itself, but there are other factors such as government policy that may interfere. In other words, although there is a bias towards an inverted-U pattern, there is no inevitability.

Second, the inverted-U pattern is an artifact of the inequality measures that we use. We know that as economies develop, people move from agriculture to industry. Suppose that income in the agricultural sector is 100 and the income in the industrial sector is 200. For simplicity, suppose that there are five individuals and they move from agr. to industry one by one. The Gini coefficient and the CV first rise and then fall. Yet, during the process Lorenz curves cross, so we cannot tell for sure whether inequality has actually gone up or down! (One solution to this problem is to look at income shares of different groups, as done by Ahluwalia, 1976, instead of using aggregate measures of inequality.)

(Exercise: Show that the Gini coefficient and the CV first rise and then fall during the transition from agriculture to industry as described above.)

Third, the functional form implied by the equation $s_{ij} = A + by_j + cy_j^2 + D_j + error$ is not the only form that yields an inverted-U shape. An alternative functional form is

$s_{ij} = A + by_j + c \frac{1}{y_j} + D_j + error$. What should be done here is to use theory as the guide. The

problem is that there are many reasons to expect connections between per capita income and inequality and each reason can give us a different functional form to test.

One main problem with cross-sectional analysis is that by pooling all countries we impose that all countries have the same income-inequality relationship, not only qualitatively, but also quantitatively, i.e. that they have the same parameters and thus the same curve.

The opposite extreme is to assume that each country has a separate curve and do time series analysis. In other words, each country is different and nothing can be gained by pooling the data. Here, the problem, of course, is to find the data.

What is the middle ground?

1. We can impose the same functional form, yet allow parameters to vary by country, such as in

$$Inequality_{it} = A_i + b_i y_{it} + c_i \frac{1}{y_{it}} + error, \text{ where } i \text{ represents country and } t \text{ time.}$$

2. We can impose that b and c be the same across countries, but allow the constant to be different. This means that the curves have the same shape but different location. Some countries have some structural reasons to have higher or lower inequality, therefore their curves are shifted up or down.

The *Latin effect*? Most of the high-inequality middle income countries are Latin

American. Could the inverted-U shape be formed by these countries? Deininger and Squire (1996) found that when a Latin dummy is included in the regression, the inverted-U shape largely vanishes. This finding suggests that even if there is no such relationship, structural differences in inequality across countries may create an inverted-U shape illusion.

3. We can analyze countries separately. When this is done, for some countries such as *the U.S., the U.K and India*, there is evidence of a direct-U shaped relationship. For some countries for which an inverted-U relationship can be found, the finding is sensitive to outliers or recent structural changes. The inverted-U shape survives only for *Mexico, Trinidad and the Philippines*. For many countries, there is no significant relationship between inequality and income levels.

Income and Inequality: Uneven and compensatory changes:

What are the main arguments in favor of the inverted U-shape? Is economic development first uneven, then compensatory?

- The transfer of people from the relatively poor sectors of the economy to the relatively advanced sectors creates a “dual economy” (see the Lewis model of rural-urban interaction below), where the economically backward and progressive sectors coexist. The advanced sector feeds on the backward sector to grow. Only after countries complete the transition that the level of inequality declines.
- Technical progress initially benefits a small number of people in the industrial sector, but not those in the agriculture (usually the majority of the population), thus inequality rises. In time, the benefits trickle down to the backward sector and inequality falls.
- Technical progress may be biased against unskilled labor and may reduce wages. In time, as the level of education increases, the initial skill differences are compensated for.
- Industrialization brings enormous benefits to those with the financial endowments and the entrepreneurial drive to take advantage of the new opportunities. In time, wages go up as the economy expands and demand increases.

In sum, although these arguments may help explain the differences in inequality across countries, we cannot say that each country must follow an inverted-U path. There may be many other factors at work. In fact, it is possible that countries go through alternating cycles of increasing and decreasing inequality.

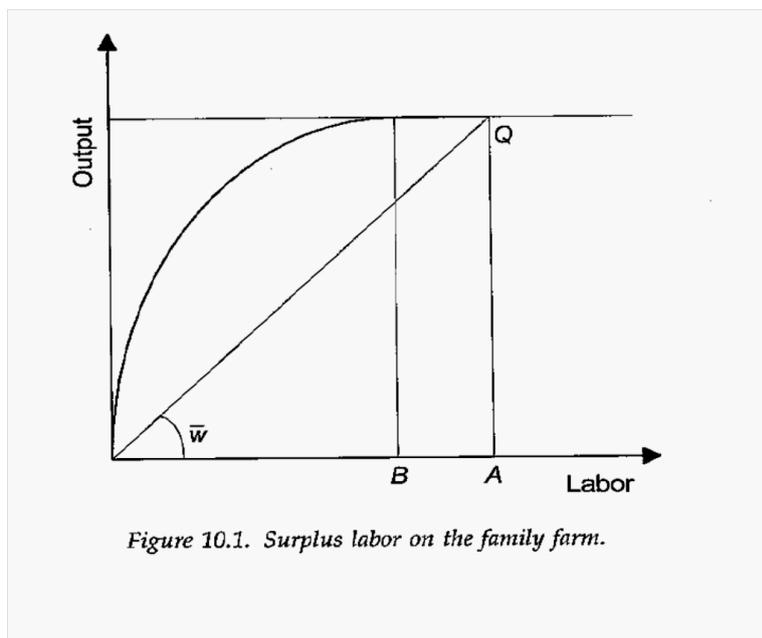
Digression: The Lewis Model (Ray, Ch. 10.2.2)

“Dual economy”: The coexistence of a “traditional” and a “modern” sector. (“Traditional” refers to the traditional forms of economic organization based on family labor as opposed to wage labor; overall output distributed not in the form of wages and profits, but in the form of shares that accrue to each family member. “Modern” describes production organized on

capitalist principles, relies on the use of wage labor and is carried out for profit.) We can label the two sectors as “agriculture” and “industry”.

Lewis proposed a framework of economic development in which the traditional sector is viewed as a supplier of labor, while the modern sector soaks up this supply. Capital accumulation in the modern sector is the engine of development. The assumption is that labor is virtually unlimited in supply, but the rate of savings and investment limits the pace of development (consistent in this sense with the Harrod-Domar view of economic development). The large surplus of labor in the traditional sector can be removed at little or no opportunity cost.

See Figure 10.1 in Ray’s textbook, copied below.



Production function of a family farm.

Fixed land.

Diminishing returns to labor, concave production function that levels off after a certain level of labor input. (Marginal product of labor falls to zero. After this point any additional labor is surplus labor.)

Asymmetry between traditional and modern sectors:

1. Asymmetry in production methods: Labor intensive vs. capital intensive.
2. Asymmetry in the organization of production: For a firm, wage payment to labor is a cost item. On the other hand, income received by each family member is valuable to a family farm. Assume that income is shared equally among family members. Then, it is easy to see that income is not equal to marginal product but to average product. It is not harder to see that a family farm employs labor beyond the point where marginal product of labor is zero. Refer to Fig 10.1 here.

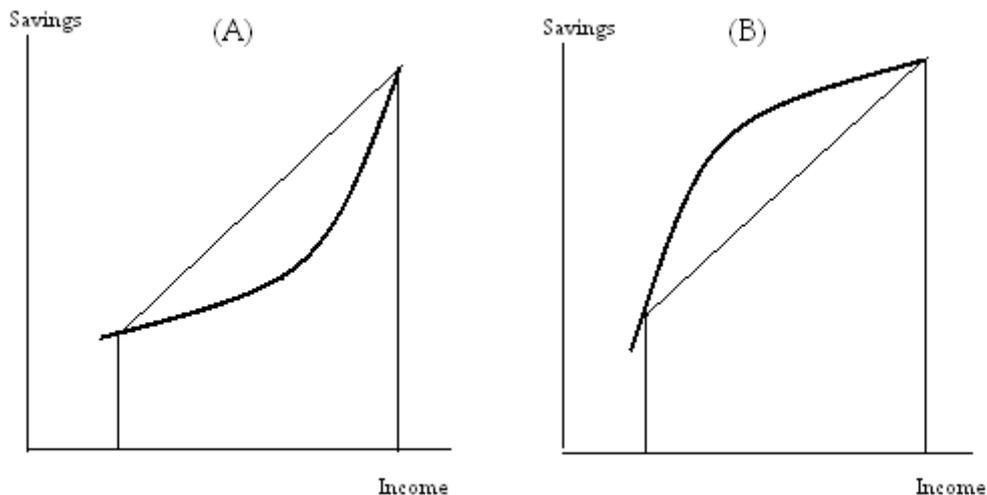
It is crucial that as surplus labor is removed from agriculture, the level of agricultural output is maintained and that there is surplus agricultural output which can be used to feed the workers in the modern sector and keep them in the modern sector. Lack of food supply to the modern sector can destroy the industrialization process.

Development occurs as surplus labor in the traditional sector is moved to the modern sector.

Inequality, Savings, Income and Growth

We know that the saving rate affects the long-run per capita income and sometimes the growth rate. How does the saving rate change as inequality changes in an economy?

The answer depends on the marginal savings rate behavior. Suppose that as income increases the marginal saving rate increases. Then, if we transfer one TL from a poor person to rich person, more will be saved than before. If the saving function is as in figure (A), then lowering inequality will lower the savings rate in the economy. On the other hand, if the saving function is as in figure (B), then lowering inequality will increase the savings rate in the economy. If the marginal savings rate were unaffected by income (if the saving function were a straight line), then there would be no change in the average saving rate.



These theoretical arguments have strong policy implications. According to people who oppose redistributive taxation (or regulation in general), a moderate or high level of inequality helps to concentrate resources in the hands of those who are willing to save and invest, and thus help increase the growth rate. Those who oppose this view argue that a certain degree of redistribution can boost savings and the growth rate.

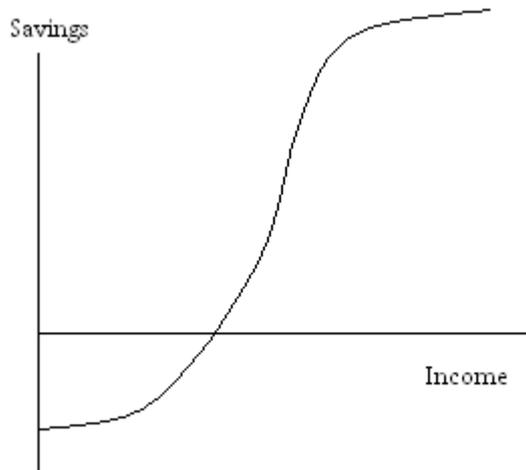
So, how does the picture that shows income-savings relationship look like in reality?

There are three main factors that should be considered. In reality, savings are determined by:
1. Subsistence needs, 2. Conspicuous consumption, 3. Aspirations and savings.

Evidently, the effect of a reduction in inequality on savings and growth is likely to be complex. In a very poor country, redistributive policies will most probably bring down the

rate of savings (look at the initial part of the following graph). We are caught in a double bind here. The deprivation of poor societies calls for redistributive policies, which might bring down both the savings and the growth rates.

For middle-income countries, though, such policies may generate a surge of savings at the national level, because they create a large and ambitious middle class with aspirations.



Inequality, Political Redistribution, and Growth

High inequality might retard growth by generating political pressures for redistribution. What are the possible channels?

- If the mean income in an economy exceeds the median income, then a system of majority voting tends to favor redistribution of resources from rich to poor. These redistributions may involve explicit transfer payments but can also involve public-expenditure programs (such as education and child care) and regulatory policies.

(Exercise: Show the outcome of majority voting in an economy where mean income exceeds the median income, incomes are taxed at rate t , taxes collected are distributed equally as a subsidy.)

A greater degree of inequality (measured, for example, by the ratio of mean to median income) motivates more redistribution through the political process. Typically, the transfer payments and the associated tax finance will distort economic decisions.

A greater amount of redistribution creates more distortions and tends, therefore, to reduce investment. Economic growth declines accordingly, at least in the transition to the steady state. Since a greater amount of inequality (measured before transfers) induces more redistribution, it follows through this channel that inequality would reduce growth.

- A negative effect of inequality on growth may arise in the political economy models when the rich prevent redistributive policies through lobbying and buying of votes of legislators. But then a higher level of economic inequality would require more of these actions to prevent redistribution of income through the political process. The lobbying activities would consume resources and promote official corruption and tend accordingly to hamper economic performance. Therefore, inequality can have a negative effect on growth through this channel even if no redistribution of income takes place in equilibrium.

Redistribution takes two forms: Redistributing existing wealth and redistributing increments to wealth.

An example to the first form of redistribution is land reform. However, the creation and implementation of such policies require strong political will, as well as a good database that contains the necessary data. Both conditions often fail to be satisfied.

Given these difficulties governments usually turn to redistributing increments to wealth, such as taxing business profits and increasing taxes on high incomes. Easier to implement as they may be, such policies tend to bring down the rate of savings, investment and growth.

Evidence on inequality and growth:

Does initial inequality retard growth?

To overcome endogeneity issues, we need data on inequality at the start of a relatively long time period, and growth data for the subsequent period.

Ideally, we would like to use wealth inequality data, but since these are hard to find we use proxies. Income inequality is an imperfect proxy. So is land inequality, however these data might be easier to find. In addition, it might be a better proxy if agriculture is or has been very important in the economy (which is the case in many developing countries anyway!). (One problem with land inequality data is that in countries that were subject to land reform through the imposition of a ceiling on land holdings, land belonging to a single individual may be held under many different names.)

Alesina and Rodrik (1994) regressed per capita income growth over 1960-85 on initial per capita income, a measure of initial human capital, initial income inequality and initial land inequality.

	<i>Effect on per capita growth, 1960-85</i>
GDP60	-0.38 (3.25)
Prim60	2.66 (2.66)
Gini60	-3.47 (1.82)
LandGini	-5.23 (4.38)

Note: The regression has a constant. Figures in parentheses are t-values.

The regression results indicate a strong negative relationship between initial land inequality and per capita growth. The results do not change when we allow for structural differences among democratic and undemocratic political systems by adding a democracy dummy. The dummy is not significant in the regression, and neither its interaction with land inequality. It appears that political systems play little role in the growth-inequality relationship.

What drives the negative relationship between inequality and growth? It is still an open question. It might be that lower inequality encourages savings and investment. It might be that higher inequality raises demands for redistribution and thus hampers growth, as we have seen before. Other thoughts?

A more recent study by Barro¹ tests the relationship between inequality and growth in the period 1965-1995 for a large number of countries.

The regression framework is:
 Growth = F(y, y*), where average growth rate is expressed as a function of y (the current level of per capita income) and y* (the set of variables that are thought to determine growth rate).

In the table below (Table 1), we can see the list of the variables and the estimated coefficients. Standard errors are in parentheses.

Table 1. Panel regressions for growth rate.

Independent Variable	Estimated Coefficient in Full Sample	Estimated Coefficient in Gini Sample
log(per capita GDP)	0.123 (0.027)	0.101 (0.030)
log(per capita GDP) squared	-0.0095 (0.0018)	-0.0081 (0.0019)
Government consumption/GDP	-0.149 (0.023)	-0.153 (0.027)
Rule-of-law index	0.0173 (0.0053)	0.0103 (0.0064)
Democracy index	0.053 (0.029)	0.041 (0.033)
Democracy index squared	-0.047 (0.026)	-0.036 (0.028)
Inflation rate	-0.037 (0.010)	-0.014 (0.009)
Years of schooling	0.0072 (0.0017)	0.0066 (0.0017)
log(total fertility rate)	-0.0250 (0.0047)	-0.0303 (0.0054)
Investment/GDP	0.059 (0.022)	0.062 (0.022)
Growth rate of terms of trade	0.164 (0.028)	0.122 (0.035)
Numbers of observations	79, 87, 84	39, 56, 51

Now, what is the effect of inequality on growth?
 In the next table (Table 4), we see the estimated coefficients of the inequality indicator (Gini coefficient) when this variable is added to the regression described above. (Only the

¹ Barro, Robert, "Inequality and Growth in a Cross-Section of Countries" (Journal of Economic Growth, 2000)

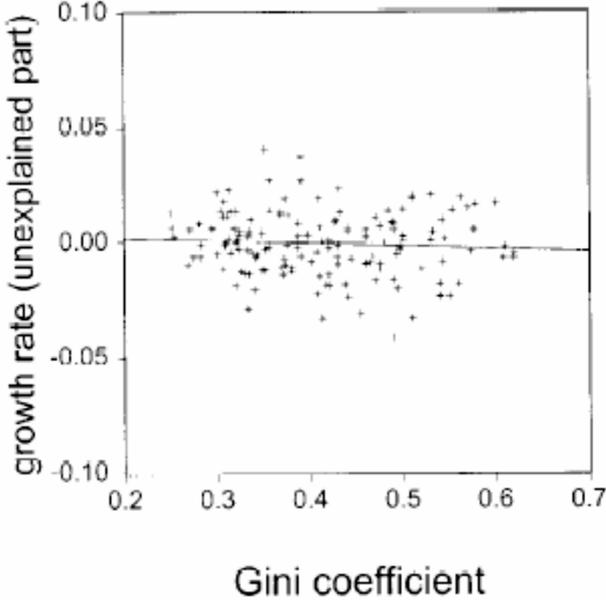
coefficients of the inequality indicators are shown. Each row in the table shows a different specification.)

Table 4. Effects of Gini coefficients on growth rates and investment ratios.

	Gini	Gini* log(GDP)	Gini (low GDP)	Gini (high GDP)
Growth rate regressions				
	0.000			
	(0.018)			
	-0.328	0.043		
	(0.140)	(0.018)		
			-0.033	0.054
			(0.021)	(0.025)

The estimated coefficient on the the Gini coefficient is essentially zero (see the second column in Table 4). The figure below shows the implied partial relation between the growth rate and the Gini coefficient. (The variable plotted on the vertical axis is the growth rate net of estimated effect of all explanatory variables aside from the Gini coefficient. The value plotted was also normalized to make its mean equal to zero.)

Therefore, keeping all other variables constant, differences in the Gini coefficient have no significant relation with economic growth. One interpretation is that various effects are offsetting each other.



More interesting results emerge when the effect of the Gini coefficient on growth is allowed to depend on the level of economic development. (That is, two terms enter the regression; the Gini itself and its interaction with log per capita GDP.) In this case, the coefficients are both significant (see the third column in Table 4).

This estimated relation implies that the effect of inequality on growth is negative for values of per capita GDP below \$2070 (1985 US dollars) and then becomes positive. The estimated marginal impact of the Gini coefficient ranges from a low of -0.09 for the poorest country to 0.12 for the richest. (To see what the marginal effect is take the derivative of the regression equation with respect to GDP.)

Next, the growth system is reestimated with the Gini coefficient allowed to have two separate coefficients. One coefficient applies for values of per capita GDP below \$2070 (the break point estimated above) and the other for values of per capita GDP above \$2070. The results, shown in Table 4, are that the estimated coefficient of the Gini coefficient is -0.033 (0.021) in the low range of GDP and 0.054 (0.025) in the high range. These estimated values are jointly significantly different from zero and also significantly different from each other.

Inequality and demand composition:

As incomes increase, not only the level but the composition of demand changes as well. The changing composition of demand has implications for distribution of income via changing derived demands for the factors of production.

As an example, suppose there are two inputs of production: capital and labor. Suppose everyone owns the same amount of labor but different amounts of capital. There are two goods: a mass consumption good and a luxury good. Will the initial level of inequality remain the same over time?

The answer depends on derived demand patterns. In this example, there will be a proportionately larger demand for the luxury good due to the existing income inequality. If the production of this good is capital intensive, then inequality begets (causes, produces) inequality, since the large demand for the luxury good will increase the return to capital and will make the rich richer. If, on the other hand, the production of the luxury good is labor-intensive, then inequality will be reduced.

As a real-life example, consider England and the US during the nineteenth century. The manufacturers in the US were good at mass production. Some of these goods were produced in high quality by skilled artisans in England. In the US, there was a large demand for such products by a large middle class, who could not afford the skill-intensive and expensive versions of the same products produced in England. Mass production ensured the existence of a large middle class whose demands sustained mass production. On the other hand, in England, the production of skill-intensive products did not generate a middle class and initial inequalities continued to exist.

Inequality, Capital Markets and Development:

Before a loan is advanced, the potential borrower is typically screened for his past actions, and his predicted ability and willingness to repay. The borrower is usually asked for a collateral (“teminat” in Turkish) as well. The reason for the screening and collateral

requirement is that the borrower might default on his credit, if this is possible under the existing social and legal rules.

In the case of shopping at a grocery store, under the current social and legal rules, we can not imagine paying for the good and not being able to receive it. The grocery store functions because, even if such situations exist, they are exceptions rather than rules.

In the case of a loan, for the market to function properly, there has to be a clear statement of the underlying contract and a clear and well-defined mechanism for punishing deviations from the norm. A small farmer, who seeks a loan and uses his assets as collateral makes every effort to pay the loan back, because he knows that he will lose his collateral as well as his future loans in the case of default.

Therefore, what you have as collateral and the perceived extent to which you value the future relative to the present determines your borrowing possibilities.

In unequal societies, the poor may lack access to credit markets if they do not have collateral. The potential borrower may be honest, but still no lender will want to take the risk. In fact, a missing or imperfect credit market is a basic characteristic of unequal societies.

As a numerical example that illustrates why credit markets might be shut down for those who have little collateral, let's imagine that I borrow \$200,000 to start a business and I put up \$100,000 worth of personal assets that can be used as collateral. The interest rate on the loan is 10% per year and I have to pay the loan back in one year. The business is known to generate a profit of \$250,000 in a year. If I default on the loan, my assets will be seized by the bank. There is a 50% chance that I will get caught, in which case my entire profit will be seized. If I get caught I also go to jail, whose expected value is a \$50,000 loss.

Let's compare the costs of paying back and defaulting:

	<i>Pay back</i>	<i>Default</i>
Direct payment	220,000	0
Collateral loss	0	110,000
Jail	0	50,000
Profit loss	0	125,000
<i>Total</i>	<i>220,000</i>	<i>285,000</i>

Here, the costs of defaulting exceed the costs of paying back, so I pay the loan back.

Let's repeat the same exercise, but this time with \$20,000 worth of personal assets. We can see that in this case the cost of paying back exceeds the cost of default (\$197,000), so defaulting is the better option. If you were the loan officer, would you approve my loan application?

A missing or imperfect credit market might influence economic outcomes by affecting the choice of occupations or investments and thereby the evolution of inequality.

Let's go over the example and derive the minimum collateral requirement formally:

Assume that the start-up cost of the business (and the loan amount) is I . The business hires m workers, pays each a wage of w_t and produces an output worth q . At the end of the year, if the loan is paid back with interest r , the net profit of the business is $(q - mw_t) - (1 + r)I$.

The initial level of wealth of the entrepreneur is W . If the entrepreneur defaults, he loses his collateral plus interest $W(1+r)$. If the entrepreneur defaults and gets caught, he will pay a fine F (the monetary cost of being imprisoned) and will lose a fraction λ of his profit.

If he pays back the loan, he will pay back $I(1+r)$.

If he defaults, his loss will be $W(1+r) + F + \lambda(q - mw_t)$.

The entrepreneur will honor the loan if

$$I(1+r) \leq W(1+r) + F + \lambda(q - mw_t), \text{ or if } W \geq I - \frac{F + \lambda(q - mw_t)}{1+r}.$$

With a value of W lower than this threshold, this person will not be able to convince the bank that he will pay back. As a consequence, he will not be able to be an entrepreneur even if he wants to.

Question: How does the critical level of W change with changes in F , λ and w ?

Wealth distributions and equilibrium:

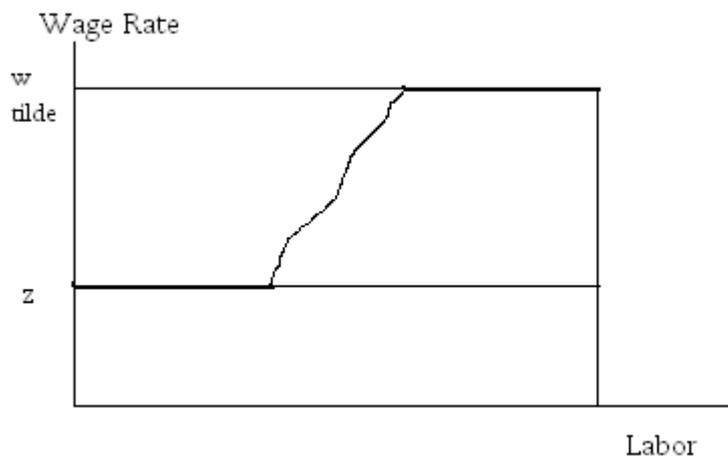
Notice that the threshold wealth is a function of the wage rate. For a given wage rate, the starting distribution of wealth tells us the fraction of individuals who are able to start a business (i.e. those who have sufficient wealth).

What is the equilibrium wage rate? Derive labor supply and labor demand curves.

First, labor supply! We know that the higher the wage rate, the lower is the fraction of those who have sufficient wealth to start a business. Those who cannot be entrepreneurs will choose between two sectors: subsistence and labor market.

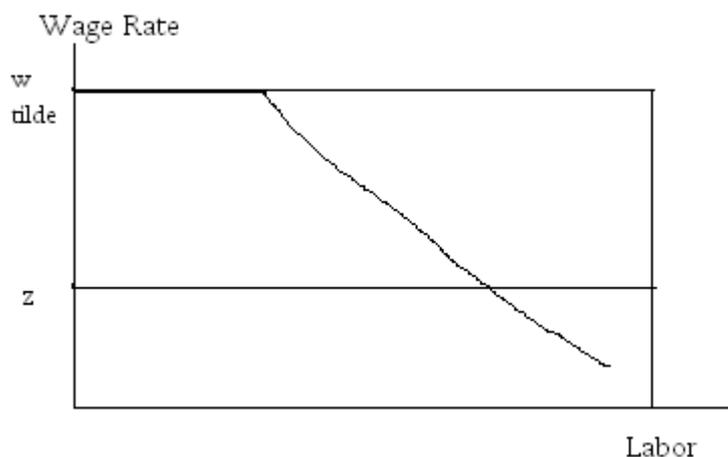
When wages are less than z (the subsistence income), everybody who cannot become an entrepreneur chooses the subsistence sector. At $w = z$, there is a jump, because these individuals move to the labor market. As w increases, more and more people get shut out of entrepreneurship and labor supply increases. At a high enough wage, \tilde{w} (read “w tilde”), the profit from running a business becomes equal to labor income. ($(q - mw_t) - (1 + r)I = \tilde{w}$).

After this point, everyone will be in the labor market. The following diagram shows the labor supply curve.

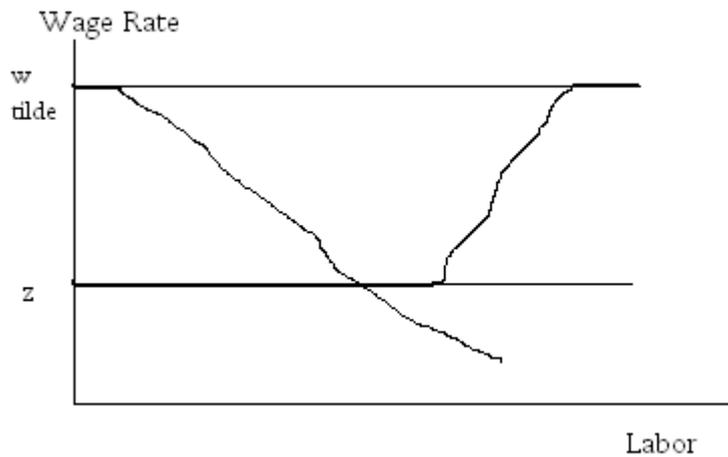


Now, labor demand!

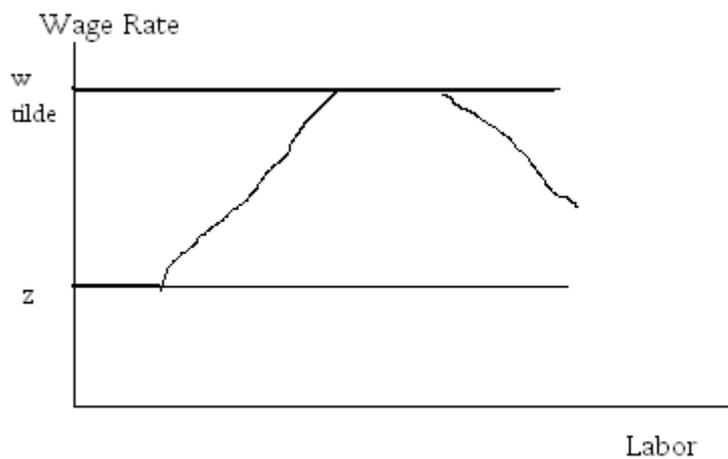
At a high wage rate that exceeds \tilde{w} , there is no demand for labor since no one wants to be an entrepreneur. When $w = \tilde{w}$, some people enter entrepreneurship. As the wage rate falls further, more individuals are able to start a business, and labor demand increases. The following diagram shows the labor demand curve.



Putting the two together, we get the equilibrium wage rate. Let's look at various scenarios. If inequality is high in the economy, then there are a high number of individuals with little wealth. This means that there are many who will choose between subsistence and labor market. At any wage that exceeds z , there will be a sizable supply of labor. Since there are a few entrepreneurs, labor demand is low. This situation is shown below. The equilibrium wage rate is z . Entrepreneurial profits are high since wages are low.



If the level of inequality is low (or the economy is very rich) and the number of those who qualify for entrepreneurship is high, then labor supply will be low, since individuals will demand wages to be high enough to provide an attractive alternative to entrepreneurship. The demand for labor will be high. The equilibrium wage rate will be \tilde{w} . The incomes in the economy are equalized.



The third scenario is the intermediate case: moderate inequality or average wealth in the economy.

Draw the diagram yourselves...

Inequality begets inequality? How?

The Tunnel Effect: (Hirschman and Rothschild, 1973)

How well do people tolerate inequality?

Do they get more intolerant as development progresses?

Imagine that you are stuck in a traffic jam in the left lane of a two-lane tunnel. Both lanes are in the same direction. Currently no car is moving in either lane. Suddenly, cars in the right lane begin to move. How would you feel? How would you feel if cars kept moving ahead in the right lane but there were no sign of things clearing up in your lane?

Now suppose that an individual's welfare at any point in time depends on his current as well as expected future income. Suppose this individual sees an improvement in the economic or social position of some people around him. The response of this individual will depend on his beliefs about the chances of improvement in his own position. If he believes that others' progress indicates that he will make progress soon, he feels better off due to his higher expectations about future income. Hirschman and Rothschild described such an increase in an individual's utility, and hence a tolerance of greater inequality, resulting from an increase in others' position as the tunnel effect.

Of course, if this individual's position fails to improve for a long time, initial tolerance may turn to frustration and anger. In some cases, increased inequality may not be tolerated at all if individuals do not see a link between their own fortunes and the others'. Sharp differences among racial, cultural, social or economic groups may prepare the ground for such intolerance.

In general, we would expect more homogenous societies to have higher tolerance for inequality than heterogenous ones. However, within the same country, the level of tolerance may change over time. An example is Mexico, where tolerance was high in the initial phases of development, but continuing inequality led to violent protests in 1968.

In conclusion, the tunnel effect hypothesis tells us that development strategy has to be devised by keeping in mind the social and political context. If the tunnel effect is weak (i.e., tolerance for inequality is low), then following a growth oriented development strategy and postponing distribution is not likely to be successful.

Who favors policies that redistribute incomes from the rich to the poor? The rich or the poor? Currently poor people on a rising trajectory may well oppose redistribution, and currently well-off people on a downward trajectory may well favor it. Past mobility experiences can have persistent effects on attitudes to redistribution at given current incomes.

Upward mobility can also explain why some poor people resist lasting redistributions, and hence why we do not see more pressure for redistribution in democracies where the median voter has an income below the mean.

⇒ Paper by Ravallion and Lokshin (2000), "Who wants to redistribute? The tunnel effect in 1990s Russia", *Journal of Public Economics*, p.87-104.

Abstract: Support for governmental redistribution tended to be greater for the poor than the rich in a representative sample of Russian adults in 1996. However, support for redistribution

is higher amongst those who expect their welfare to fall, and this effect is strongest amongst the currently well-off. A rising trajectory inhibits demand for redistribution. Support is also stronger in rural areas, amongst those with less schooling, those who fear losing their job, the elderly, and amongst women. Our results are consistent with Albert Hirschman's idea of a 'tunnel effect', whereby prospects of mobility (in both directions) influence demand for governmental redistribution.

From the "Conclusions" section of the paper: "It is plain from our investigation that attitudes to governmental redistribution in Russia are driven by more than whether or not a person thinks he or she would currently gain or lose. Seventy-two percent of the nearly 7000 adults surveyed in October 1996 indicated that they favor governmental action to reduce incomes of the rich. But the remaining 28% were clearly not just the currently 'rich' in any obvious sense."

"... Expectations of future welfare clearly play an important role. Amongst those who think that their welfare is going to fall in the near future, support for redistribution is high, even amongst the currently 'rich'. And there is relatively little support amongst families that are currently well-off and who expect to see their welfare rise over time."

"... The Russian tunnel effect in the 1990s entailed that only a small minority of people experienced or expected rising living standards, while the bulk suffered or feared contraction. This situation appears to have fueled a strong demand for redistribution. This exists even amongst many of those who are currently well-off, but who fear for the future. By contrast there is negligible demand for redistribution amongst the well-off who are on a rising trajectory."