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Athanassios PAPADASKALOPOULOS,
George M. KORRES,
George POLYCHRONOPOULOS

REVIEW ON THEORY AND EVIDENCE OF POVERTY, GROWTH, AND INEQUALITY

Abstract

How is inequality generated and how it reproduces over time? This has been a major concern of sociology scientists for more than a century. The changes in aggregate or average income is a good measure for economic growth but is far from being the only one. There is an increasing «inequality» throughout the world. Over the period 1960–2000, averaged per-capita income in the richest 5% of the world's nations was about twenty-nine times the corresponding figure for the poorest 5%. Poverty also affects other forms of economic and social functioning. The measurement of poverty is based on the notion of poverty line which is constructed from monetary estimates of minimum needs. Poverty is highly correlated with the lack of education, and there is close connection between nutrition and poverty. The measurement of inequality is highly controversial. It is a field in which social judgments are highly diverse and translate themselves into differences in social judgments, such as the measure of inequality or the choice of equivalence scale. Social and economic indicators demonstrate the data for the population-based measures of economic, social and health outcomes and answer the question about inequality and well-being. This article is an attempt to examine the relationship between inequality and the process of socio-economic development, to overview the theories of income inequality, to measure the income distribution, and moreover, to investigate the role and the effects on socio-economic growth.

Athanassios Papadaskalopoulos, Mailing address: Professor, Dr., Department of Economic and Regional Development, Pandeion University of Social and Political Sciences, Greece.
George M. Korres, Assistant Professor, University of Aegean, Department of Geography, Greece.
George Polychronopoulos, Professor Dr., School of Business Administration and Economics, Technological Educational Institute, Greece.

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1. Introduction

The topic of this survey is highly controversial. It is a field in which there are large differences in social judgments, and translates itself into differences in the tools that are applied, such as the measure of inequality or the choice of equivalence scale. For historical and social reasons, different countries put different weights on costs and benefits of redistributing income. For instance, Anglo-Saxon countries have a relatively low degree of government intervention in the economy and place more emphasis on incentives. The fundamental implication of poverty is that the poor lack access to market, especially to markets for credit, insurance, land, and labour. Early evidence suggests that developing countries appear to have higher inequality on average than their developed counterparts. To describe it is no easy task, mainly because, in abstract terms, inequality means very little, and when we try to define inequality we may discover its multidimensional nature. Given this multidimensional nature of inequality, our specific objectives in this article are to use the available data to document some of the dimensions of inequality applying to economic growth.

Poverty lines are widely perceived as occupying a central role in analysis of poverty. A considerable body of literature already exists on different types and categories of poverty indicators. In fact, setting a poverty line often draws much attention and intellectual effort in studies of poverty. This paper reviews the uses to which poverty lines are put. This article also provides a broad panorama of poverty measurement methodologies. In addition, the purpose of this article is to analyze facts on the distributions of income. We provide a quantitative description of these three most often discussed dimensions of inequality.

The main objective of this paper is to review the main theories regarding the measurement of income, redistribution issues, and the impact on economic growth and social development. Moreover, we will pay attention to both the intrinsic and the functional features of inequality. First, we will analyze the issues

of inequality, income distribution and poverty. In addition, we tried to measure the relationship between inequality and economic growth from two «*directions*». Complete measures, (such as the Kuznets ratios, the mean absolute deviation, the coefficient of variation, the Gini coefficient) of inequality exist which assign a high degree of inequality to income distribution. Inequality in incomes may be compatible with overall equality simply because a society might display a high degree of mobility, movement of people from one income class to another. The theoretical part reviewed the theory of definitions, measurements and the effects of income distribution. Though it is theoretical, we will analyze the empirical data for a number of selected countries in order to make some inter-country comparisons and conclusions about inequality and poverty dimensions, income distribution, and social implications on growth and development.

2. The Measurement of Poverty and Development

As a multidimensional phenomenon, poverty is defined and measured in a multitude of ways. Given the complexity of the issues, the best introduction to poverty measurement is through the multifaceted nature of the phenomenon and different concepts of it. The following paragraphs describe different concepts of poverty and attempt to make a distinction between poverty and other closely related concepts.

Poverty can be viewed in absolute and relative terms. Absolute poverty refers to subsistence below minimum, socially acceptable living conditions, usually based on nutritional requirements and other essential goods. Relative poverty compares the lowest segments of a population with upper segments, usually measured in income quintiles or deciles. Absolute and relative poverty trends may move in opposite directions. For example, relative poverty may decline while absolute poverty increases. Even within so-called absolute poverty, countries can often be distinguished in indigence, or primary poverty and secondary poverty (sometimes referred to as extreme and overall poverty). Indigence usually refers to those who do not have access to basic necessities for human survival, while other forms of poverty refer to degrees of deprivation above that threshold.

Amartya Sen points out that the dual nature of poverty can be the absolute notion in the space of capabilities, though relative in that of commodities or characteristics. For example, households incapable of obtaining sufficient food for survival are considered absolutely poor. However, the costs and composition of that food basket may vary considerably between households across different groups, regions and countries. Economists have traditionally based their work on the objective approach, mainly because of the obstacles encountered when trying to aggregate multiple individual utilities across population. Poverty can also be viewed in absolute and relative terms. Although often perceived as mutually exclusive, this aspect of poverty can actually apply simultaneously.

The two «common» basic income measures of poverty are: *poverty line* and *per capita GDP*. Poverty lines are established by costing a minimum basket of essential goods for basic human survival using consumption/expenditure data of non-poor households. The prevalence of poverty is then calculated as the percentage of population whose income lies below that threshold. Some of the attractive features of this type of indicators are:

- they are aggregates of multiple inputs;
- they are expressed in units that are of immediate and wide-spread relevance, and;
- they are theoretically objective, i.e. they weigh inputs to well-being according to how the «real world» values them.

The big advantage of social indicators is that they measure goods and services directly in terms of human welfare (rather than indirectly, as in the case of income measures). For example, a rise in housing or essential transport costs would be considered as decline in welfare using social indicators, while income measures would record this as an increase. Social indicators can be classified into two broad categories: basic needs and impact on quality of life. Social indicators span a wide field, and add a qualitative dimension to income measures. One of the best measures of severe poverty is access to food. It is scale-measured (calorie intake relative to requirement) and very indicative since the absolutely poor spend up to 80 percent of their «income» on food and this proportion does not immediately decline as incomes rise.

Some difficulties associated with social indicators are the following:

- there is no easy way of aggregating them into a composite measures, and;
- they are usually expressed in units that do not trigger the same kind of familiarity and universality as monetary ones.

Poverty is an extreme form of underdevelopment. As such, it is not surprising that many poverty indicators are the same as those used to measure development. This is particularly true for the so-called social indicators (e.g. access to basic social services, infant mortality, etc.). It is also true for indicators that measure processes and opportunities, outlined in the classification framework below. The Human Development Index (HDI) has sometimes been erroneously interpreted as a measure of Sustainable Human Development (SHD). For example, many national human development reports have disaggregated the HDI by region and used the results to illustrate varying degrees of SHD within the country. Although the HDI is certainly an improvement in comparison to per capita income as a measure of sustainable human development, as the latter captures only a few of its characteristics.

Furthermore, in order to develop the absolute poverty line, welfare is assumed to be linked to the consumption of goods (and services). The basic idea in setting the absolute poverty line is to identify a basket of minimum essential consumption items. Those people who do not have sufficient resources to obtain

the basket are considered poor and those who do have sufficient resources are considered nonpoor.

The Human Poverty Index (HPI) informs us, in synthesized form, about longevity (percentage of the population expected to die before the age of 40), adult illiteracy, access to health services and to safe water, and five malnutrition rates. However, many other elements of poverty, as perceived from a human capability perspective, are not included in the HPI. In fact, the HPI depicts certain key and easily measurable elements of human poverty.

The most commonly used method is to determine the average level of total expenditure of those people whose food expenditures are just equal to the food poverty line. This level of total expenditure is then used as the final poverty line. (We shall call this the «*traditional*» poverty line.)

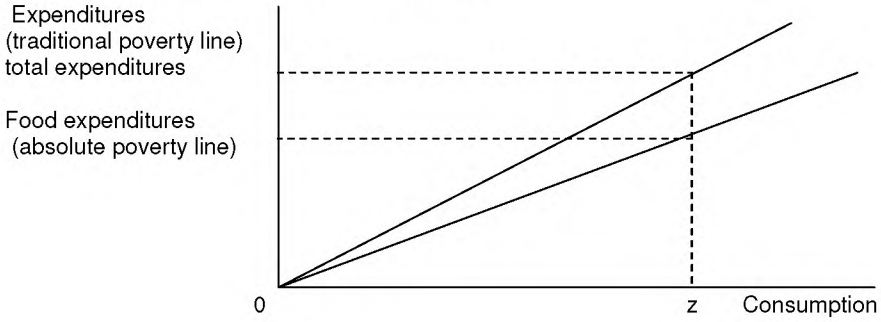
In Figure 1, the line marked *total* indicates the average total expenditure of households with any given level of food expenditure. The vertical distance between the lines marked *total* and *food* then represents nonfood expenditure. Suppose that the food poverty line is set at value of *z*. To obtain the traditional poverty line we simply find the total expenditure of people spending *z* on food. For the austere poverty line we look for people whose total expenditure is *z*, measure their nonfood expenditure, and add it to *z* to obtain the final poverty line. The two final poverty lines are shown on the vertical axis. One practical question is how to find these final poverty lines if, as there is likely no group of people with total expenditure, or food expenditure, exactly equal to the food poverty line. One possibility is to estimate an econometric model of food expenditure as function of total expenditure and other household characteristics; (this relationship between food and total spending is termed the *Engel curve*.) The resulting estimates may be used to predict the nonfood expenditure of households with a given level of food expenditure. There are essentially two approaches to the poverty line (PL). In the first one, the PL is fully defined, calculating the cost of a basket of goods considered as the minimum required consumption. The second approach goes beyond this to include such factors as time, access to free services, basic asset ownership.

If the concept of poverty, in its definitional dimensions, is to be useful at all, it has to be restricted to those human needs whose satisfaction depends on economic conditions, i.e. those that are structurally determined. Otherwise, poverty gets confused with other dimensions of human suffering or human disadvantage.

Development is assessed by growth in GDP, the aggregate of goods and services measurable with money. Poverty, under the same logic, is measured with income, as a sum of money. A non-structured and variable list of social indicators is handled in parallel; they are not directly or immediately incorporated in the measurement of poverty or development.

Figure 1:

Traditional and absolute poverty line



In conclusion, we can summarize the main measures for human poverty and development:

- *Human Poverty Index (HPI)*: Human poverty index is a composite index measuring deprivations in the three basic dimensions captured in the human development index—longevity, knowledge and standard of living.
- *Human Development Index (HDI)*: Human development index is a composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge, and decent standard of living.
- *Gini Index*: It measures the extent to which the distribution of income (or consumption) among individuals or households within a country deviates from a perfect equality, a value of 100% perfect inequality.

3. The Meaning of Inequality

What do we mean by inequality comparisons? Income inequality has become an increasingly important issue of public policy in industrialized countries in recent years. Although macroeconomic conditions have been favorable in many of these countries, the distribution of income within and across countries has remained uneven. In fact, in several countries, income inequality has risen. As a result, policy-makers have become concerned that large segments of the population are not getting the benefits of economic growth.

Depending on the particular context we may be interested in distribution of current expenditure or income flows, distribution of wealth (or asset stocks), or even distribution of lifetime income.

The basic question that any study of inequality has to address is «Inequality of what»? When people talk about inequality, they talk about unequal distribution of opportunities, talents, earnings, income, wealth, consumption, leisure, bequest, luck, and so on. Often people treat some of these variables, especially income and wealth, as if they are more or less the same. But are they? In our view, an accurate description of inequality should acknowledge its multidimensional nature, and it should consider as many of these dimensions as possible.

In light of the inequality facts, we suggest that the following elements are important ingredients for a reliable theory of inequality. *Earnings, income, and wealth* - the key variables usually including the labor earnings, income, and wealth. The definitions of these variables are as follows:

- *Earnings*: we can follow the common definition of labor earnings that includes the wages and salaries of all kinds plus a fraction of business income. Business income includes income from professional practices, business, and farm sources. The value for the fraction of business and farm income that we impute to labor earnings is the sample-wide ratio of unambiguous labor income (wages plus salaries) to the sum of unambiguous labor income and unambiguous capital income. In most of the studies the labour income (earnings) includes gross wage, salary income, and farm and non-farm self-employment income. This measure can provide us with information on the outcome of labour supply and the early retirement decisions.
- *Income*: most of the studies are defining income as all kinds of revenue before taxes. The most common definition of income includes both government and private transfers. Factor income besides earnings includes cash property income (that is, cash interest, rents, dividends, and annuities) and royalties but excludes capital gains and all other forms of lump-sum payments. Gross income adds social and private transfers to factor income. We can also calculate the disposable income by subtracting income taxes, mandatory employee contributions for the self employed from gross income. Disposable personal income provides a measure of the resources that households can actually allocate to either savings or consumption after taxes are paid and allows us to compare the progressiveness of tax systems across different countries.
- *Wealth*: we can finally define wealth as the net worth of households. This includes the value of financial and real assets of all kinds and of various kinds of debts.
- *Transfers*: Income transfers usually distort the labor / leisure decision, and they allow households to survive without work. Government transfer might be an important channel through which the government redistributes income.

4. Measuring Economic Inequality

Although the concepts of poverty and equity are very distinct, poverty indicators are often associated with measures of equity. To obtain a general picture of equity in a country would be to consider poverty itself as a form of inequity and to calculate the poverty threshold as a function of median income or average earnings.

Poverty refers to different forms of deprivation that can be expressed in a variety of terms (i.e., income, basic needs, human capabilities), whereas equity is concerned with distribution within a population group. Despite the clear distinction between the two concepts, analysis of poverty often employs indicators of equity because of inherent linkages between the two.

4.1 The Measures of Inequality

We can use several measures of inequality. Most of the times the entire population and their incomes should not alter inequality.

Figure 2:

Functional and personal distribution of income

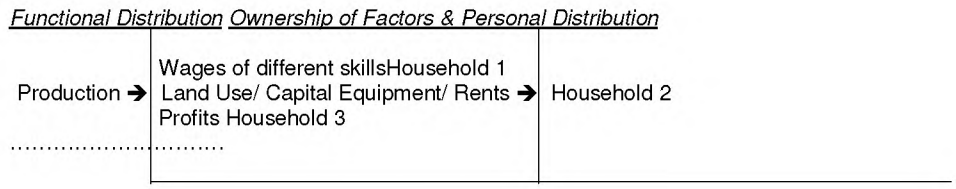


Figure 2 illustrates the «*functional distribution of income*», explaining how income is generated from the production process, where the production involves payments for the labour, land use and capital equipment (in the form of rents) and non-labour inputs (in the form of profits). Figure 2 also depicts the personal distribution explaining how income is distributed to households. The functional distribution tells us much about the relationship between inequality and other features of development, such as growth.

According to the first and most famous developed theory of inequality – that of Simon Kuznets (1955) – inequality rises at low levels of per capita income

and then falls. According to Alesina and Rodrik (1994), high economic inequality might retard economic growth by setting up political demands for redistribution.

By another policy scenario, it is possible to adopt a tax-system that transfers large quantities of wealth to the government and then to redistribute these to the poor. However, in order to redistribute large quantities of wealth it is necessary to know who has the wealth. There exist enormous quantities of wealth that are not even subject to taxes simply because the information base required to implement such taxes does not exist.

It may also be of interest to know not only how much people earn, but how they earn. This is the distinction between functional and personal income distribution. Functional distribution tells us about the returns to different factors of production, such as labour (of different skills), capital equipment of various kinds, land, and so on. Another quite important step is to describe how these different factors of production are owned by individuals in society.

If there is a great deal of disparity in the incomes of people in a society, the signs of such economic inequality are often quite visible. Moreover, it might be useful to try to «*measure*» inequality. This means that we should develop or examine inequality indices that allow the ranking of income or wealth distributions in two different situations (countries, regions, points of time and so on).

Suppose that society is composed of n individuals. We can use the index i to stand for a generic individual; $i = 1, 2..., n$. An income distribution is a description of how much income y_i is received by each individual i: $(y_1, y_2, ..., y_n)$. These criteria allow us to view income distributions in a slightly different way. Typically, no data set is rich enough to tell us the incomes of every single individual in the country.

It is also possible to argue that only relative incomes should matter and the absolute levels of these incomes should not. If one income distribution is obtained from another by scaling everybody's income up or down by the same percentage, then inequality should be no different across the two distributions.

Another interesting position criterion for evaluating inequality was formulated by Dalton (1920). The criterion is fundamental to the construction of measures of inequality. Let $(y_1, y_2, ..., y_n)$ be an income distribution and consider two incomes y_i and y_j with $y_i \leq y_j$. A transfer of income from the «*richer*» individual to the «*poorer*» individual will be called a regressive transfer. The Dalton principle states that if one income distribution can be achieved from another by constructing a sequence of regressive transfers, then the former distribution must be deemed more unequal than the latter. Furthermore, we can take each income distribution and assign a value to it and we can examine the inequality of that distribution. A higher value of the measure signifies the presence of greater inequality. Thus an inequality index can be interpreted as a function of the form

$$I = I\,(y_1, y_2, ..; ....., y_n),$$

defined over all conceivable distributions of income $(y_1, y_2, ..., y_n)$.

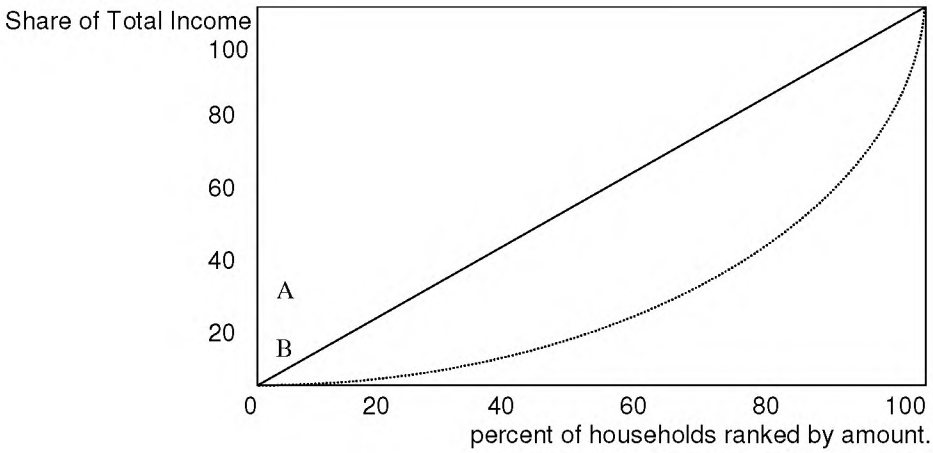
4.2. The Lorenz curve and Gini coefficients

The Lorenz curve provides information on inequality. In order to draw it, we first sort the households by their income, starting with the ones with the lowest income. We then plot the relationship between the cumulative percentage of the population on the horizontal axis, and the proportion of the total income earned by each cumulative percentage on the vertical axis. In the case of perfect equality everybody earns the same proportion of total income and the Lorenz curve coincides with the 45-degree line. In the case of perfect inequality, just one family earns all of the total income in the economy. The Lorenz curve stays flat until the very last household is reached and then it jumps to 100 because the last family earns the whole income of the economy. Figure 3 presents an intermediate case we may observe in the real life where the Lorenz curve lies between perfect equality and perfect inequality lines.

According to the Lorenz curve criterion, the Lorenz curve begins and ends on the 45° line. The poorest 0% earn 0% of national income by definition and the poorest 100% is just the whole population, and so must earn 100% of the income. With increasing inequality, the Lorenz curve starts to fall below the diagonal. The slope of the curve at any point is simply the contribution of the person at that point to the cumulative share of national income.

Figure 3:

The Lorenz Curve



Another common and well-known measure is the Gini coefficient. The Gini coefficient is a summary statistics of inequality derived from Lorenz curve. In Figure 3, the Gini coefficient is defined as the ratio of area A which is the area between the Lorenz curve and the perfect equality line to area A and B which is the area between the perfect equality and the perfect inequality lines. Gini coefficient provides a summary measure of inequality over the whole range of distribution. Gini coefficient varies between zero and one. It is equal to zero in the case of perfect equality which means that every household earns the same, and equal to one in the case of perfect inequality which means that one household earns everything.

4.3. Inequality and Saving

The growth process is unlikely to leave inequality unchanged. The question then arises of whether this feedback creates a virtuous cycle in which redistributive policy can be used to reduce inequality and would accelerate growth and consequently induce to further reductions in inequality. Or on the contrary, does growth initiate a vicious circle because it increases inequality?

Growth and inequality are directly affecting savings, income and investment. The effect of reduction in income inequality on the rate of saving and consequently on the rate of growth is likely to be complex. In a less developed country, redistributive policy may bring down the rate of savings and consequently the rate of growth.

Figure 4 illustrates redistribution in the region that brings down the national savings rate. With redistribution, no person saves anything. While in a developing country the situation is quite different as redistributive policy raises the average savings rate. Income distribution determines not only the level of consumption, but also its pattern of composition. At the same time, the overall pattern of expenditure in a society has implications for distribution of income.

Figure 4 illustrates this feedback. For instance, the different products that are demanded by consumers must be produced and supplied and, therefore, demands derived for factors of production and influence division of payments into wages, returns on capital equipment, rents on properties, etc.

The view that wealth inequality should be growth-enhancing is based on the following three arguments: first, according to Kaldor's hypothesis the marginal propensity to save of the rich is higher than that of the poor. The second argument has to do with the investment indivisibilities, and the third deals with incentive considerations.

Figure 4:

Savings and income

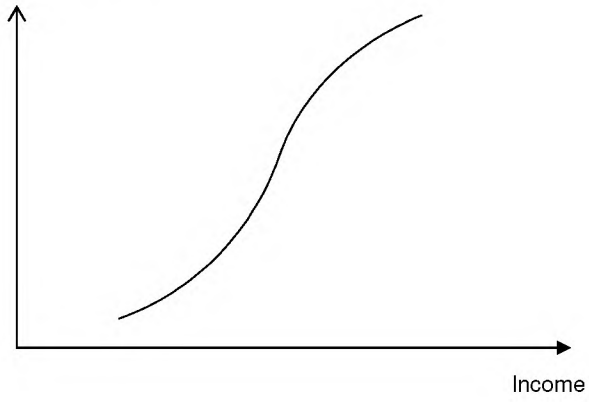
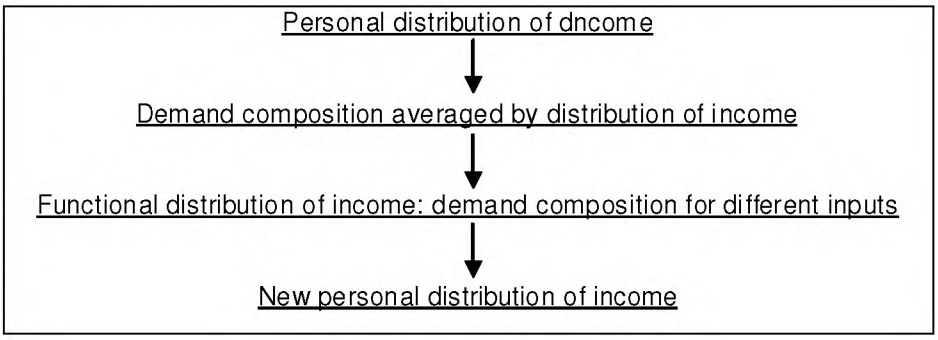


Figure 5:

From personal distribution of income to new personal distribution of income via product demand



5. Data Analysis of Poverty and Inequality

What is a good proxy for inequality? We can use the wealth or asset, but data on these are extremely hard to find and use. Another proxy for wealth inequality can be either the inequality of income or the inequality of land at that time; however, these are imperfect proxies. Data on inequality and growth is not very meaningful because we run into several problems of endogeneity.

Early evidence suggests that developing countries appear to have higher inequality, on average, than their developed counterparts. However, there are no sufficient data to comprehensively investigate inequality in a single country over time, so the majority of studies rely on analysis of inequality over a cross-section of the countries. The first cross-section study with evidence for the inverted-U were that of Paukert (1973) and Ahluwalia (1976) in which countries displayed wide variation of inequality and appeared to support the inverted-U over a large sample of countries. The development of endogenous growth theory and the availability of comparable data on national incomes and growth rates for a large cross-section of the countries had allowed for the empirical analysis of causes of national differences in growth rates. Several studies have examined the impact of inequality upon economic growth. Unfortunately, the absence of data on the distribution of wealth for a sufficient number of countries forces researchers to use proxies in empirical studies. The most common approach is to use data on income inequality as proxy for wealth inequality.

According to the «Growth Accounting» of Solow (1957) model, poor countries tend to grow faster than rich countries. Countries converge to their balanced growth paths, and there is an incentive for capital to flow from rich to poor countries and if there are lags in the diffusion of knowledge, income differences can arise because some countries are not yet employing the best available technologies. Baumol (1986) examines convergence from 1870 to 1979 among the 16 industrialized countries and regress in output growth over this period on a constant and initial income. He estimates the following equation:

$$ln[(Y/N)_{i,\ 1979}] - ln[(Y/N)_{i,\ 1870}] = \alpha + b\ ln[(Y/N)_{i,\ 1870}] + \varepsilon_i,$$

where $ln(Y/N)$ indicates the log income per person, ε is the error term and indicates the indexes of countries. The empirical results suggested that there is almost a perfect convergence (value b of -1 indicates perfect convergence, while a value of 0 implies that growth is uncorrelated with initial income and thus there is no convergence).

However, De Long (1988) noticed some problems of this model. The main problem is related to the sample selection because the countries that were not rich a hundred years ago are in the sample only if they grew rapidly over the next hundred years, while in contrast countries that were rich a hundred years ago are generally included in the sample even if their subsequent growth was

only moderate. De Long tried to eliminate this problem and did not base on this variable of growth over the period 1970–1979, however the lack of data makes it impossible to include the entire world. Unfortunately it is not possible to estimate these models using these data because there are different hypotheses that make identical predictions about these data. In general, we can get only rough estimates for international studies when using cross-section data and we should treat these very carefully.

Alesina and Rodrik (1994) regressed per capita income growth over the period 1960–1985 on a variety of independent variables, such as initial per capita income and a measure of initial human capital. The independent variables are per capita income in 1960 (GDP60), primary enrollment rates in 1960 (Prim60), the Gini coefficient on income in 1960, the initial Gini coefficient for land distribution (LandGini). Their regression results indicated a substantial negative relationship between initial inequality and subsequent growth. Particularly strong was the influence of Gini coefficient that represents the initial inequality in land holdings. The Gini coefficient for land is especially significant, while the Gini coefficient for land is only significant at the 10% level. Table 1 summarizes the results of regressions using Gini coefficients for initial land distributions.

There are at least three reasons why inequality may have a direct negative effect on growth:

(a) inequality reduces investment opportunities,
(b) inequality worsens borrowers' incentives and
(c) inequality generates macro-economic volatility.

A common measure used for inequality is the male earnings. The summary of these results are indicated in Table 2. Table 2 includes ten countries for which we have information on trends in overall inequality and trends in return of education. It also shows the absolute change in inequality in each country measured as a percentage of the absolute change in inequality in the United States. For instance, the ++ in column 3 for Canada means that the increase in overall inequality in Canada was 50 to 80 percent as large as in the United States.

Table 1:

Initial Inequality and Subsequent Growth

Variables:	*Effect on per capita growth 1960–1985*
Constant	6.22 (4.69)
GDP (60)	–0.38 (3.25)
Prim (60)	2.66 (2.66)
Gini (60)	–3.47 (1.82)
LandGini	–5.23 (4.38)

Source: Alesina and Rodrik (1994)
Note: Figures in parentheses denote t – values.

Table 2:

Changes in male earnings over the 1980s in industrialized countries

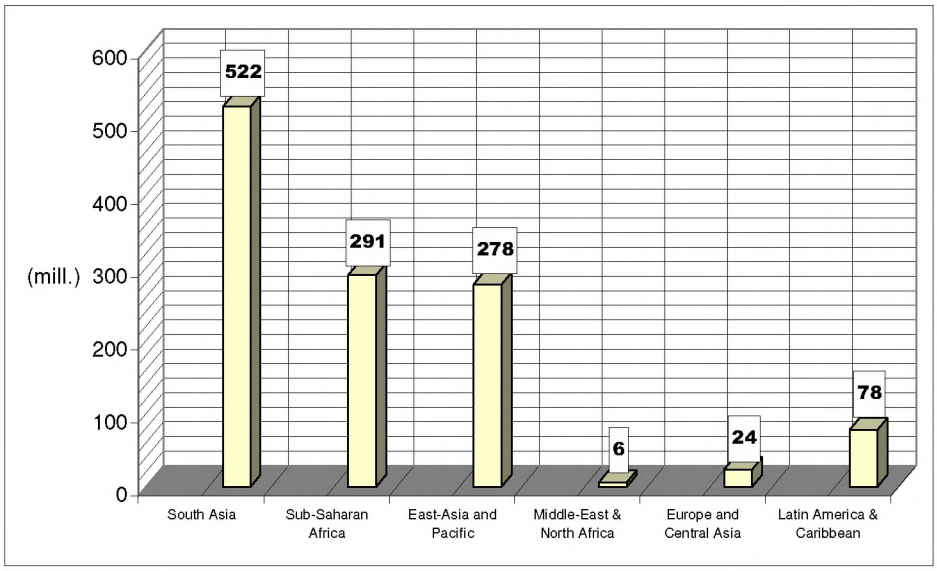
Country/ authors (1)	Year (2)	Overall earnings inequality (3)	Returns to experience (4)	Returns to education or occupation (5)	Earnings inequality within group (6)
Australia:					
Borland (1992)	1981–1989	+	++	mixed	++
Gottschalk & Joyce (1995)	1981–1985	++	+++	–	+++
Gregory (1993)	1976–1990	+++			
Canada:					
Blackburn & Blom (1994)	1979–1987	++	++	–	+++
Gottschalk & Joyce (1995)	1981–1987	++	++	+	++
Finland:					
Erickson & Jantti (1994)	1980–1990	0	0	0	0
Gottschalk & Joyce (1995)	1987–1991	+	–	–	0
France:					
Katz, Loveman, Blanchflower (1995)	1976–1987	+	+	0	mixed
Gottschalk & Joyce (1995)	1979–1984	++	+++	–	+
Germany:					
Abraham–Houseman (1995)	1983–1988	0	0	0	
Israel:					
Gottschalk & Joyce (1995)	1979–1986	+	+++	++	0
Italy:					
Errickson & Ichino (1995)	1978–1987	0	0	0	–
Japan:					
Katz, Loveman, Blanchfl. (1995)	1974–1990	+	mixed	+	
Netherlands:					
Hartog, Osterbeek, (1992)	1979–1989	0	0	–	+
Gottschalk & Joyce (1995)	1983–1987	+	+++	–	+
Sweden:					
Edin & Holmund (1995)	1984–1991	++	+	++	+++
Gottschalk & Joyce (1995)	1981–1987	+	–	+++	+++
United Kingdom:					
Katz, Blanchflower (1995)	1979–1990	+++	++	++	+++
Gottschalk & Joyce (1995)	1979–1986	+++	+++	+++	+++

Sources: various studies (see authors in the above Table). Also, republished in the article of Gottschalh Peter and Smeeding Timothy, «Gross national comparisons of earnings and income inequality», (Journal of Economic Literature, volume XXXV, June 1997).

Note: +++ increase in inequality at least 80 percent as large as in the United States.
++ increase 50 to 80 percent as large as in the United States.
+ increase 10 to 50 percent as large as in the United States.
0 increase from –10 to +10 percent of change in the United States.
– decrease greater than –10.

Figure 6:

People living on less than $1 a day (in millions) (1998)



Source of data: World Bank (2001).

The countries break down into four groups: the first consists of countries that experienced at least as large an increase in inequality as in the United States, this group includes only the United Kingdom. The second group which experienced substantial increases in inequality but less than the United States and the United Kingdom includes Canada, Australia and Israel. The third group includes France, Japan, the Netherlands, Sweden and Finland with positive but quite small changes in earnings inequality over the 1980's.

Figure 6 illustrates people living in extreme poverty, and in particular those living on less than one dollar per day. Moreover, Figure 7 presents the malnutrition (another dimension of poverty) and indicates the proportion of children under age five who are underweight. The diagram includes moderate and severe underweight, which is defined below as two standard deviations from the median weight for age of the reference population. Finally, Figure 8 illustrates the world population and the number of people in extreme poverty.

Table3:

The main indices of poverty and development for selected countries

Country	Human poverty index (HPI)	Human development index (HDI) 1998	Gender related development index (GDI) 1999	GDP per capita (1995 US$)	GNP per capita, annual growth rate 1990–98, (%)
Canada	11.8	0.935	0.932	20,548	0.9
Norway	7.3	0.934	0.932	36,806	3.4
United States	15.8	0.929	0.927	29,683	1.8
Australia	12.2	0.929	0.927	21,881	2.7
Iceland	–	0.927	0.925	29,488	1.6
Sweden	7.6	0.926	0.923	27,705	0.5
Belgium	12.4	0.925	0.921	28,790	1.7
Netherlands	8.2	0.925	0.919	28,154	2.1
Japan	11.2	0.924	0.916	42,081	1.1
United Kingdom	14.6	0.918	0.914	20,237	1.6
Finland	8.6	0.917	0.913	28,075	1.2
France	11.1	0.917	0.914	27,975	1.2
Switzerland	–	0.915	0.910	44,908	–0.2
Germany	10.4	0.911	0.905	31,141	–
Denmark	9.3	0.911	0.909	37,449	2.5
Austria	–	0.908	0.901	30,869	1.6
Luxembourg	10.5	0.908	0.895	46,591	1.9
Ireland	15.0	0.907	0.896	23,422	6.0
Italy	11.9	0.903	0.895	19,574	1.0
New Zealand	12.8	0.903	0.900	16,427	1.0
Spain	11.6	0.899	0.891	15,644	1.8
Israel	–	0.883	0.877	15,978	2.0
Greece	–	0.875	0.869	12,069	1.4
Malta	–	0.865	0.848	18,620	12.1
Portugal	–	0.864	0.858	11,672	2.4
Korea, Republic	–	0.854	0.847	11,123	4.1
Czech, Republic	–	0.843	0.841	5,142	–1.6
Hungary	–	0.817	0.813	4,920	0.2
Poland	–	0.814	0.811	3,877	3.7
Mexico	10.4	0.784	0.775	4,459	1.2
Turkey	16.4	0.732	0.716	3,167	2.8
OECD	–	0.893	0.889	20,360	1.5
Eastern Europe and the CIS	–	0.777	0.774	5,620	–4.3
Latin American and the Caribbean	–	0.758	0.748	6,470	1.9
East Asia	–	0.716	0.710	3,570	7.1
South Asia	–	0.560	0.542	2,110	3.6
All developing countries	–	0.642	0.634	3,260	3.3
Arab States	–	0.635	0.612	4,520	0.5
World	–	0.712	0.706	6,400	1.0

Source: Human Development Report, (2001).

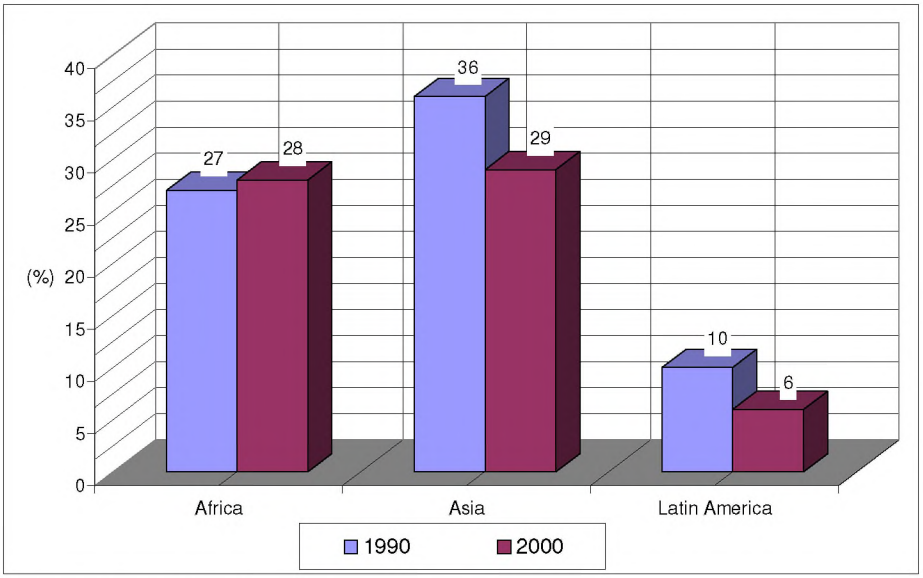
Note: The highest value in a country group is determined on the basis of the fourth decimal place, not shown here. The highest value for each of the indices is presented in bold. Data referred to GNP per capita (annual growth rate percentages) are calculated on the basis of constant (1995 US$) series, while growth rates over intervals are computed averages.

Table 3 illustrates the main indices for development and poverty, namely the Human Poverty Index, Human Development Index, Gender Development Index, GDP figures, and GNP growth rates. These figures indicated the economic variables, (namely GDP figures and Human Development Index), as they are far better for the advanced-industrialized countries («leading» countries), like the United States and the United Kingdom, Japan and Switzerland. However, the figures related to poverty, (namely, Poverty Development Index), seem to be similar for all countries («leading» and «follower» countries) and even worst for some of the leading countries, like Japan, the US and the UK, underlying the main problem and dimensions of famine. The exception is only for the countries with concrete social planning and policy like Norway and Sweden.

The Human Development Index (HDI) is a simple average of the life expectancy index, educational attainment index, and adjusted GDP per capita (PPP US$) index, and so is derived by dividing the sum of these three indices by 3. For the Human Development Index (HDI), the greater the value (close to 1), the better the country's performance. The Gender Development Index (GDI) uses the same variable as the HDI. The difference is that the GDI adjusts the average achievement of each country in life expectancy, educational attainment and income in accordance with the disparity in achievement between women and men.

Figure 7:

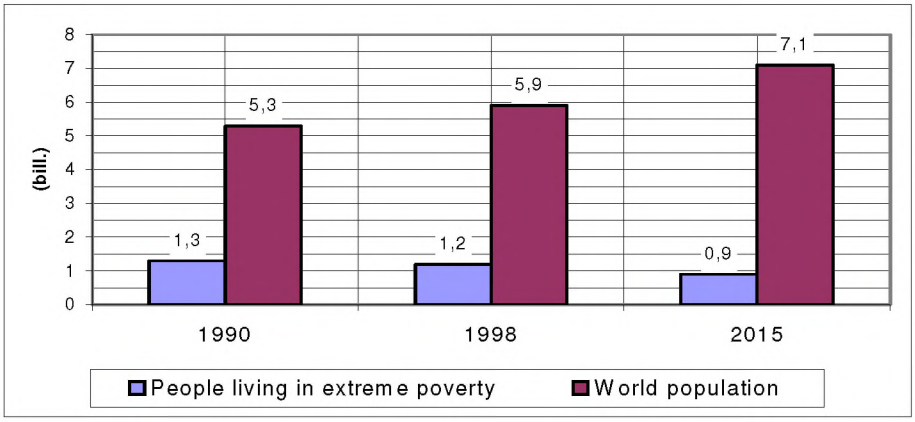
Proportion of children under age five who are underweight (percent)



Source of Data: World Bank (2001).

Figure 8:

World population and number of people in extreme poverty



Source of Data: World Bank (2001)

For the Gender Development Index (GDI), the greater the value, the better the country's performance. For the Human Poverty Index (HPI), the bold figure refers to the lowest value in the country group. For the Human Poverty Index (HPI), the lower the value, the better the country's performance. Human Development Index (HDI) is based on three indicators as measured by life expectancy at birth, educational (measured by adult literacy rate at two third weights, and the combined gross primary-secondary and tertiary enrolment ratio at one third weight), and finally from standard of living (measured by GDP per capita at PPP US$).

A more detailed analysis for poverty is given in Table 4. Table 4 illustrates some of the main indices for a number of selected countries (underdevelopment or less favoured regions). Rural population below the national poverty line is the percentage of the rural population living below the rural poverty line determined by national authorities. Urban population below the national poverty line is the percentage of the urban population living below the urban poverty line determined by national authorities. Finally, the total population below the national poverty line is the percentage of the total population living below the national poverty line.

National estimates are based on population-weighted subgroup estimates from household surveys. Population below $1 a day and population below $2 a day are the percentages of the population living below those levels of consumption or income at 1993 prices, adjusted for purchasing power parity.

Table 4:

The main indices of poverty and population for selected countries

Country	Population below the poverty line			Population below $1 a day (%)	Population below $2 a day (%)
	Rural	Urban	National		
Algeria (1988)	16.5	7.3	12.2	< 2	15.1
Bangladesh (1991–1992)	46.0	23.3	42.7	–	–
Chile (1994)	–	–	21.6	4.2	20.3
China (1996)	7.9	< 2	6.0	18.5	53.7
Ecuador (1994)	47.0	25.0	35.0	20.2	52.3
Mexico (1988)	–	–	10.1	17.9	42.5
Pakistan (1991)	36.9	28.0	34.0	31.0	84.7
Panama (1997)	64.9	15.3	37.3	10.3	25.1
Paraguay (1991)	28.5	19.7	21.8	19.4	38.5
Romania (1994)	27.9	20.4	21.5	2.8	27.5
Sri-Lanka (1985–1986)	45.5	26.8	40.6	6.6	45.4
Turkey (1994)	–	–	–	2.4	18.0
Zambia (1991)	88.0	46.0	68.0	72.6	91.7
Zimbabwe (1990–1991)	31.0	10.0	25.5	36.0	64.2

Source: World Development Report, 2000, World Bank.

International comparisons of poverty data entail both conceptual and practical problems. Different countries have different definitions of poverty, and consistent comparisons between countries based on the same definition can be difficult. Table 5 illustrates the distribution of income or consumption. Gini coefficient measures the extent to which the distribution of income (or in some cases consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution.

National poverty lines tend to have greater purchasing power parity in rich countries where more generous standards are used than in poor countries. International poverty lines attempt to hold the real value of the poverty line constant between countries. The standard of 1$ per day is measured in 1985 international prices and adjusted to local currency applying PPP. However, problems can arise in comparing poverty measures within countries as well as between them. For example, the cost of food and the cost of living are typically higher in urban than in rural areas, so the nominal value of the urban poverty line should be higher than the rural poverty line.

Finally, as we have mentioned before, the Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality expressed as percentage of the maximum area under the line. As defined, a Gini index of

zero would represent perfect equality and an index of 100 would imply perfect inequality. Percentage share of income or consumption is the share that accrues to deciles or quintiles of the population ranked by income or consumption. Percentage shares by quintiles may not add up to 100 because of approximation.

Data on personal or household income or consumption come from nationally representative household surveys. The income distribution and Gini indices for the high income economies are calculated directly from the Luxembourg Income Study database using an estimation method consistent with that applied for developing countries.

As Table 5 indicates, the more advanced-industrialized («leading» countries), like the United States, the United Kingdom and Switzerland show more inequality than those of their less-advanced («follower» countries) indicating the need for a more consistent and efficient social policy and planning against poverty and famine. Additionally, during the last decade an extremely rapid growth of poverty and inequality of income distribution occurred in Russia, Ukraine and other CIS transition economies (Siskos, 2001).

Table 6 illustrates the recent classification using the measure of income (Gross National Product per capita) in all countries over the world. Both the slower rate and unequal spread of global growth are the cause for concern from the point of view of reducing absolute poverty and raising the minimal levels of living of people around the world.

In the long run, the economic growth undoubtedly can be an important factor in reducing poverty. But the benefits of growth do not automatically trickle down to those who need them the most. Much depends on the character of growth itself and on the nature of redistributive and public expenditure policy in place. Income inequality within nations is undoubtedly a major factor underlying human development or deprivation.

More equal distribution of wealth and income is the basis of a more equal distribution of the good things including education, health and the ability to participate in social life. Some international differences in inequality may derive from relatively deep-seated historical differences. Nevertheless, at least since the time of Simon Kuznets, economists have hypothesized that income inequality varies with per capita income. Specifically, Kuznets hypothesized that inequality at first rises with per capita income, reaches a peak and thereafter declines as income continues to grow. We fitted a cross-country Kuznets relation with the ratio of the income share of the richest 20 per cent relative to that of the poorest 40 per cent serving as the measure of inequality. For income, we employed the Penn Table per capita income at international constant prices.

The regression result is as follows:

$$(INEQUALITY)it = -37.584 + 10.924\ln(yIP-85)it - 0.712[\ln(yIP-85)it]2 \quad (12)$$
$$(8.546) \qquad (2.154) \qquad (0.134)$$
$$(\text{adjusted } R^2 = 0.124).$$

Table 5:

Main indices of income distribution & consumption for selected countries

Country	Gini index	Percentage share of income or consumption			
		Lowest		Highest	
		10%	20%	10%	20%
Canada (1994)	31.5	2.8	7.5	23.8	39.3
Norway (1995)	25.8	4.1	9.7	21.8	35.8
United States (1997)	40.8	1.8	5.2	30.5	46.4
Australia (1994)	35.2	2.0	5.9	25.4	41.3
Sweden (1992)	25.0	3.7	9.6	20.1	34.5
Belgium (1992)	25.0	3.7	9.5	20.2	34.5
Netherlands (1994)	32.6	2.8	7.3	25.1	40.1
Japan (1993)	24.9	4.8	10.6	21.7	35.7
United Kingdom (1991)	36.1	2.6	6.6	27.3	43.0
Finland (1991)	25.6	4.2	10.0	21.6	35.8
France (1995)	32.7	2.8	7.2	25.1	40.2
Switzerland (1992)	33.1	2.6	6.9	25.2	40.3
Germany (1994)	30.0	3.3	8.2	23.7	38.5
Denmark (1992)	24.7	3.6	9.6	20.5	30.4
Austria (1987)	23.1	4.4	10.4	19.3	33.3
Ireland (1987)	35.9	2.5	6.7	27.4	42.9
Italy (1995)	27.3	3.5	8.7	21.8	36.3
New Zealand (1991)	43.9	0.3	2.7	29.8	46.9
Spain (1990)	32.5	2.8	7.5	25.2	40.3
Israel (1992)	35.5	2.8	6.9	26.9	42.5
Greece (1993)	32.7	3.0	7.5	25.3	40.3
Portugal (1995)	35.6	3.1	7.3	28.4	43.4
Korea, Republic (1993)	31.6	2.9	7.5	31.7	47.4
Czech, Republic (1996)	25.4	4.3	10.3	22.4	35.9
Hungary (1996)	30.8	3.9	8.8	24.8	39.9
Poland (1996)	32.9	3.0	7.7	26.3	40.9

Source: Human Development Report, 2000, UNDP.

The Penn Table is the source for country-wise annual time series data (1960–1992) on all variables involving valuations of international prices including the measure of trade openness. Whereas, yIP-85 is per capita GDP at constant 1985 international prices, chain index (in US$) and yIP-curr is per capita GDP at current international prices (in US$).

The regression strongly supports the Kuznets U-curve hypothesis with the peak inequality at a per capita income of $2,146. The Kuznets process implies that economic growth at low levels of income tend to be unequalizing. It suggests also why high levels of poverty may persist stubbornly unless proactive poverty alleviation programs and transfers are deliberately instituted.

Table 6:

Classification of countries, according to their income aggregates

High income (GNP per capita of $9,266 or more in 1999) (48 countries and areas)	Middle income (GNP per capita of $756–9,265 in 1999) (78 countries and areas)		Low income (GNP per capita of $755 or less in 1999) (36 countries and areas)	
Australia	Albania	Latvia	Angola	Myanmar
Austria	Algeria	Lebanon	Armenia	Nepal
Bahamas	Argentina	Libyan Arab Jamahiriya	Azerbaijan	Nicaragua
Belgium	Bahrain	Lithuania	Bangladesh	Niger
Brunei Darussalam	Barbados	Macedonia, TFYR	Benin	Nigeria
Canada	Belarus	Malaysia	Bhutan	Pakistan
Cyprus	Belize	Maldives	Burkina Faso	Rwanda
Denmark	Bolivia	Malta	Burundi	Senegal
Finland	Botswana	Mauritius	Cambodia	Sierra Leone
France	Brazil	Mexico	Cameroon	Sudan
Germany	Bulgaria	Morocco	Central African Republic	Tajikistan
Greece	Cape Verde	Namibia	Chad	Tanzania, U. Rep. Of
Hong Kong, China (SAR)	Chile	Oman	Comoros	Togo
Iceland	China	Panama	Congo	Turkmenistan
Ireland	Colombia	Papua New Guinea	Congo, Dem. Rep. of the	Uganda
Israel	Costa Rica	Paraguay	Crte d'Ivoire	Ukraine
Italy	Croatia	Peru	Eritrea	Uzbekistan
Japan	Czech Republic	Philippines	Ethiopia	Viet Nam
Kuwait	Djibouti	Poland	Gambia	Yemen
Luxembourg	Dominican Republic	Romania	Georgia	Zambia
Netherlands	Ecuador	Russian Federation	Ghana	Zimbabwe
New Zealand	Egypt	Samoa (Western)	Guinea	
Norway	El Salvador	Saudi Arabia	Guinea-Bissau	
Portugal	Equatorial Guinea	Slovakia	Haiti	
Qatar	Estonia	South Africa	India	
Singapore	Fiji	Sri Lanka	Indonesia	
Slovenia	Gabon	Suriname	Kenya	
Spain	Guatemala	Swaziland	Kyrgyzstan	
Sweden	Guyana	Syrian Arab Republic	Lao People's Dem. Rep.	
Switzerland	Honduras	Thailand	Lesotho	
United Arab Emirates	Hungary	Trinidad and Tobago	Madagascar	
United Kingdom	Iran, Islamic Rep. of	Tunisia	Malawi	
United States	Jamaica	Turkey	Mali	
	Jordan	Uruguay	Mauritania	
	Kazakhstan	Venezuela	Moldova, Rep. Of	
	Korea, Rep. Of		Mongolia	
			Mozambique	

Source: Human Development Report, United Nations (2001).
Note: Data are based on World Bank classifications (effective as of 1 July 2000).

5. Conclusions

The question of how inequality is generated and how it reproduces over time has been a major concern of social scientists for more than a century. Yet the relationship between inequality and the process of economic development is far from being well understood. In this paper we have analyzed the relationship between inequality and economic growth. Furthermore, we have examined the recent empirical findings, the negative impact of inequality and the positive effect of redistribution upon growth.

The literature on the measurement of income inequality reveals a variety of attitudes and approaches to the choice of appropriate criteria. On the other hand, some economists prefer to derive cardinal or ordinal indices by explicitly defining properties or axioms which inequality indices or social welfare functions ought to fulfill. Summarizing the conclusions, we could classify poverty measurement instruments as multidimensional. Poverty can be approached from either subjective (utility) and/or objective (sometimes referred to as welfare) perspectives. Most conventional poverty measures are of the objective type (e.g. poverty lines, basic needs.). Only relatively recently studies have taken a serious interest in measuring subjective perceptions of poverty. This approach has required the development of new methodologies for poverty assessment, such as participatory poverty appraisals, etc.

We are looking for various measures of income and how they are distributed across countries. The government have some commitment to reducing income inequality. However, they go about this task with different intensities and they use rather different tools to achieve it. Inequality has an effect on aggregate output. The greater the equality in wealth distribution, the greater the degree of economic efficiency.

Inequality started rising in several countries since mid of 1980's. Empirical studies provided some useful lessons for public policy. First, according to economic theory there is a tradeoff between redistribution and efficiency. Transferring more income to the poorer people tends to reduce their work effort during their working years and may induce them to retire early.

A complete ranking can of course be achieved by applying a summary measure of inequality, like, for example, the Gini coefficient. The trouble is that this presumes a degree of agreement about social judgments which does not seem to be found in reality. To put it in another way, the adoption of a single summary measure does not allow for difference of views regarding distributional justice. We have argued that one should neither conceal such differences, nor despair. We have suggested an intermediate approach using two main instruments in order to find some common ground. We have argued that dominance conditions may provide tools which are both powerful and easy to apply in empirical results. The best known of these are the Lorenz curve and the Gini coefficient and these are in widespread use.

In summary, from the main cross-countries studies using the most important poverty and inequality indicators, we can conclude, in hand, that there is a widening «*poverty-gap*» among and inside less-favoured regions (or otherwise underdeveloped countries) and those of developed countries (or advanced regions). Additionally, for the last two decades there has been an apparent rapid growth of poverty and inequality of income distribution, especially for the industrialized countries.

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