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Notes and Comments

Inequality of Income and of Disutility

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Income has been distributed unequally since times immemorial. Efforts to statistically estimate income distributions and income inequality date back to the beginning of econometrics. The Pareto distribution and the Gini concentration index are among the most well-known examples.

There is inequality among the incomes of the people who constitute a nation; there is also inequality among the per capita incomes of different nations. We may presume that the latter type of inequality has increased substantially since the Western world started its economic development, but the actual measurement of this increase is seriously hampered by the fact that the per capita incomes of different nations are expressed in different currencies. Attempts to express these per capita incomes in a common currency by means of the usual exchange rates will typically lead to substantial errors.

In recent years, Kravis and his colleagues [1;2;3] have made extensive efforts to overcome this problem. Rather than using exchange rates, they collected price data for narrowly defined goods and used these to establish purchasing power parities for small groups of goods (such as "fresh vegetables"). Then they started aggregating such groups to broader groups, which yields volumes measured as expenditures expressed in "international dollars." This work is unavoidably complicated and laborious; the implication is that it can be done only for a limited number of countries, and that rough extrapolations are necessary in order to obtain estimates for a large number of countries. In Kravis *et al.* [2], there are such estimates of the per capita incomes (GDP per capita) for more than 100 countries, mostly in the non-communist world.

Earlier I used these estimates to measure inequality between and within countries. Before presenting these figures, which refer to 1970, I should mention that the within-country inequality presents serious measurement problems, since there are

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few countries for which comparable income distributions are available. Basically, I used the statistical regularity observed by Paukert [4] for the income inequalities of countries at different levels of GDP per capita; for details I refer to [5].

The results are shown in Table 1. The first entry in column (1) is world per capita income expressed with the U.S. per capita income as a numeraire. The next five entries are regional per capita incomes, which display substantial differences. The North (21 countries) consists of the U.S., Canada, Japan, Korea, Western Europe and Hungary. The South consists of Australia, New Zealand, South Africa, Chile, Argentina and Uruguay. Tropical (and semitropical) America contains 19 countries south of the U.S. and in the Caribbean; tropical Africa consists of 36 countries, and Asia of 28 (from Turkey and the Middle East to Indonesia, the Philippines and Papua). The successive population shares of the five regions are 0.293, 0.030, 0.096, 0.135 and 0.446; the income shares are 0.715, 0.044, 0.076, 0.043 and 0.122. In the last two lines of Table 1, the first two and the last three regions are combined into two super-regions.

Table 1

Per Capita Income and Income Inequality

	Income per Capita (1)	Income inequality		
		Total (2)	International (3)	Average national (4)
World	0.294	0.91	0.58	0.32
Five regions				
North	0.717	0.36	0.08	0.28
South	0.428	0.44	0.06	0.38
Tropical America	0.233	0.48	0.05	0.42
Tropical Africa	0.094	0.44	0.11	0.34
Tropical Asia	0.081	0.45	0.13	0.32
Two super-regions				
North + South	0.690	0.38	0.09	0.29
Tropical Middle	0.105	0.53	0.20	0.34

The last three columns of the table concern income inequality, measured as the (natural) logarithm of the ratio of arithmetic mean income to geometric mean income. This particular measure has the advantage of permitting an additive decomposition: total inequality equals the sum of the inequality of the per capita incomes across countries (international inequality) and the average within-country inequality (average national inequality), the average being a weighted mean with the population shares as weights. The figures in the top row show that, for the world as a whole, international inequality accounts for (0.58)/(0.91) or about 65 percent of total inequality.

For the five regions, international inequality accounts for a much smaller proportion of total inequality, because these regions are more homogeneous with respect to the per capita incomes of their constituent countries. To a large extent this is also true for the two super-regions. The inequality of the per capita incomes of the latter two regions equals 0.42 (not shown in the table). This figure accounts for over 70 percent of total international inequality 0.58 at the top of column (3), and for about 45 percent of total world inequality 0.91 at the top of column (2).

Such an income-inequality picture is perfectly legitimate, but it is also possible to consider the inequality of the utility derived from income. To do so, we have to apply the utility-maximizing framework of consumption theory. Recently a monograph [6] was completed on the use of the data of Kravis *et al.* [1] for the estimation of a system of consumer demand equations across countries. Implementing such a system involves the assumption of identical tastes across countries. This excludes the possibility of using narrowly defined goods, because cultural differences violate this assumption for such goods.

Accordingly, it is appropriate to use a limited number of broad groups of consumer goods. Eight such groups were used. food, clothing, rent, furniture, medical care, transport, recreation and education, and other expenditures. The simplest specification consistent with the data is based on a utility function which is additive in the eight goods. This utility function has a finite maximum; hence, the excess of this maximum over the utility level actually attained can be viewed as the disutility, which is always positive. It should be possible to construct a table, similar to Table 1, which contains per capita disutilities and disutility inequalities. Such a table, when presented for a number of years, would serve a very useful purpose for the analysis of the distribution of disutility and its development over time.

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