

The Expanding Global Income Gap: How Reliable is the Evidence?

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Employing exchange rate determined per capita GDPs, the article demonstrates a very sharp increase in global income inequality. In 1960, the gap between country groups representing the poorest and richest population deciles equalled 40, and there were widespread fears that the large income gap was a threat to sustainable global economic expansion. By 1995, the poor group per capita incomes had declined by almost 50 per cent in real terms, and the gap had widened to 140. These findings are in sharp contrast to the results from the increasingly fashionable assessments employing PPP-adjusted income figures. The latter show a positive income trend for the poorest decile, and an insignificant increase in the rich/poor income gap. It is well known that exchange rate determined international GDP comparisons exaggerate the income gaps between rich and poor nations. But it is far from obvious that PPP adjustments yield results that are superior to those obtained with the help of exchange rates, when the relative gaps are compared at different points in time, or when per capita incomes are tracked over long time periods in individual countries or country groups. Our dramatic results, therefore, represent a very important second opinion on what has happened to global income distribution.

I. INTRODUCTION

In the 1960s, there were lively debates among those involved with development economics and related disciplines, about the exceedingly skewed global income distribution. Using official exchange rates, it could be shown that the rich industrialised North West disposed of per capita material resources about 30 times as large as the developing countries of Asia, Africa and Latin America. Although PPP assessments did not exist at the time, it was

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known that the use of exchange rates, official or market determined, tended to exaggerate the differences in material welfare, importantly because they failed to take account of the typically low price levels of non-traded goods in poor countries. Even after crude adjustments for domestic prices, however, the gap remained huge [Kindleberger, 1958]. Very large numbers of people were exceedingly poor, and could survive only under abominable conditions.

Many of those participating in the debates argued for energetic action to reduce the income disparities by raising the material standards of the poor countries. Resource transfers from rich to poor nations, in the form of grants, or loans on concessional terms, were seen as a key instrument to speed up economic growth. The required sacrifice by the rich was motivated partly on moral grounds, but perceived self-interest also played an important role. One self-interest argument put forth with force was that a perseverance of the wide gap endangered world peace, and thus threatened sustainable world economic growth. The poor and destitute countries would cause all kinds of troubles to the world community, restraining global economic development in consequence. Expenditure on foreign aid could therefore be justified on the ground that it would preserve peace and so permit a faster improvement of material welfare to the rich in an increasingly egalitarian world [US Senate, 1957; Agency for International Development, 1963; North-South, A Program for Survival, 1980].

With hindsight, it is easy to point to two crucial fallacies in the above reasoning. First, foreign aid did not at all prove to be an efficient stimulant to economic expansion. Research has by and large failed to ascertain a clear-cut positive relationship between development assistance and income growth. If anything, the studies of the issue suggest that growth has been stifled in many cases by lavish foreign aid receipts [Weisskopf, 1972; Bauer and Yamey, 1982; Bowles, 1987; DeVyllder, 1994; Burnside and Dollar, 1997; Economist, 1999], but as is apparent from a very recent analysis [Hansen and Tarp, 2000], the issue is still in the open. And second, it would appear that only in rare cases have the countries which failed to grow, and so remained at the bottom of the world income ladder, developed into serious international troublemakers. Instead, the very poor have tended to fade away and to be increasingly ignored by the world community. A highly skewed global distribution of income is apparently not threatening the sustenance of economic development. Thus, both the prescriptions for breaking out of the poverty trap, and the implications of poverty for the international community, appear to have been wrong.

But what has actually happened to the income gap between rich and poor countries in the decades since 1960? A number of studies, most with their thrust in other directions, contain data in response to this query, and a majority of them indicate that the gap has widened. For example, Sachs and Warner [1995] do not find any tendency towards income convergence in a sample of

122 countries between 1970 and 1989, suggesting that the gap had remained unchanged. Pritchett [1995] concludes that the 'ratio of GDP per capita of richest to poorest country' rose from 38.1 in 1960 to 51.6 in 1985, that is, by 40 per cent, while the data presented by Sheehy [1996] show that the income gap between the richest 11 and the poorest 10 countries in 1960, had increased by 20 per cent in the subsequent 28 years.

One feature that virtually all contemporaneous comparisons of income across countries have in common is the use of purchasing power parities (PPP), with a great majority relying on the Summers and Heston Penn World Tables which in their consecutive versions provide PPP data for an expanding set of countries over an increasing period of time. The use of official or commercial exchange rates has gone completely out of fashion in such comparisons, despite the known deficiencies that continue to afflict the PPP methodology (see section VI for a further discussion).

The trends in world income distribution are of crucial significance, for even if a growing income gap between rich and poor will not result in an upsetting global revolution, and hence does not threaten sustainability, it may well preserve destitution, misery and suffering among large income groups. Hence, a strong case can be made for a second opinion, in which the old tradition is employed, using exchange rates of the day to determine per capita income levels.

The purpose of the present study, then, is quite straightforward. Even a cursory look at the exchange rate determined per capita GDPs reveals a huge increase of the income gap between the rich and the poor over the 35-year period 1960–95. We want to record the size of the gap at the beginning and end of the period. We also want to clarify the shifting country composition of the very rich and very poor nations, at the two points in time, and to review the evidence, to see if some ready explanations can be provided to what occurred. Finally, we want to compare our results with those that emerge when PPPs are used.

Section II discusses the approaches and data we use. In section III we present the results for 1960 and 1995, while section IV discusses the dynamics of the change. In section V, we compare our results with those emerging from the use of PPP-adjusted numbers. The differences between the results from using the two approaches are striking. A brief discussion of the problems and weaknesses afflicting the respective methodologies follows in section VI. We wish to warn the reader that our methodological proficiency is insufficient for resolving the causes to the large discrepancies we find. Section VII, finally, summarises our conclusions.

II. APPROACHES AND DATA

In what follows we present per capita GDPs for the ten per cent of world population that lived in the world's richest and poorest countries, respectively.

To achieve precisely ten per cent, the population and GDP of borderline countries have been split up, with only the share required to reach the ten per cent level included. Throughout our exercise, therefore, population, and not countries, constitutes our weight. No consideration is given to income distribution *within* countries. The computations have been done for 1960 and 1995, respectively.

Our prime interest is in demonstrating the widening of the gap, that is, the increasing levels of *inequality*. But in doing so, we note that the poor have become much poorer during the period covered by our investigation, so we also have a brief discussion of the *poverty* issues.

The statistical sources that we have employed are listed in the reference section. For data on GDP, we have relied primarily on the statistical appendices of the World Bank's annual publication, *World Development Report*, but some missing numbers have been obtained from elsewhere. Even so, the coverage remains incomplete. The GDP data contained in our tables relate to 98 per cent of world population in 1960. By 1995, that coverage had declined to 94 per cent. For some of the poorest countries reviewed in the tables which follow, we have been unable to obtain GDP data for both years. This is true for Guinea-Bissau and Vietnam in 1960, and for Burma, Somalia, Yemen and Zaire in 1995. In the case of Germany, we have aggregated the GDP for the eastern and western parts in 1960.

The GDP numbers, all in US dollars, have been obtained by using the official or commercial exchange rates of the day. They are expressed in 1995 prices, unless otherwise stated. The actual dollar values for 1960, have been adjusted with the help of the G-5 GDP/GNP deflator (expressed in US\$), provided in the listed World Bank sources. This is clearly a simplifying shortcut, bound to distort in some measure, but, then, so would any other choice of a single deflator for the material we handle.

In what follows, the country rankings are based on an ascending GDP/capita level, as given by the World Bank material, with the highest numbers assigned to the richest. Note that the global number of countries, for which the World Bank provides the relevant data, was higher in 1995 (133) than in 1960 (120), on account of independence or country split-ups in most cases.

III. THE RESULTS

The essence of our results is presented in Table 1. Global GDP/capita increased by 53 per cent over the 35-year period, from \$3,394 in 1960 to \$5,179 in 1995. Looking at the richest and poorest deciles of world population, however, the table shows that the per capita income of the former rose by 86 per cent, or from \$16,500 to \$30,700. The latter group, in contrast, fared much less well. It

was not merely a question of stagnation. The poorest decile of world population, in fact, experienced an extraordinary average income reduction of almost 50 per cent, from \$418 in 1960 to \$214 in 1995. The gap between the richest and poorest deciles, about 40:1 in the beginning of the period, had risen to more than 140:1 35 years later.

Global GDP rose from \$10,100 billion in 1960 to \$27,600 billion in 1995. The share of that total accruing to the richest decile increased from 47.4 per cent to 58.7 per cent in the period under scrutiny, that of the poor declined from 1.3 per cent to a mere 0.4 per cent.

The richest and poorest groups were of course not the same at the two points in time. Global population covered by our data expanded from 3.0 billion in 1960 to 5.3 billion in 1995, so the deciles under investigation involved almost twice the number of people in the latter year. Also, there were very important shifts in the country composition of the deciles, on account of differences in growth performance.

We begin by a scrutiny of the alterations in the richest group. Tables 2 and 3 provide the detail. In 1960, France was the borderline country comprised in the richest ten per cent; by 1995, that position had been taken over by the US. With these countries included, the tables exceed the ten per cent of global population levels. Hence, only that proportion of their populations and GDPs, which is needed to attain ten per cent of the global population total, is comprised in calculating the gap numbers in Table 1.

The number of countries in the richest group rose from nine in 1960 to ten in 1995. The per capita income range of the rich group rose from \$9,400–34,500 in 1960 to \$26,400–42,900 in 1995. Clearly, the bottom of the range rose much more than the top, evening out the income disparities within the group from 3.7:1 to 1.6:1.

Only three nations are found in both tables, with Switzerland ascending, the US descending, and France all through at or near the bottom of the richest countries' group. The Anglo-Saxon countries dominate the group in 1960, but by 1995, four of them have dropped out, and only the US remains, at the bottom of the rich league. The 1995 table has a broader European presence

TABLE 1
AVERAGE GDP PER CAPITA, WORLD, RICHEST 10% AND POOREST 10% OF WORLD
POPULATION, 1960 AND 1995, AND GAP BETWEEN RICH AND POOR

	1960	1995	Percentage change
World	3394	5179	52.6
10% richest	16528	30665	85.5
10% poorest	418	214	-48.8
Gap (rich/poor)	39.5	143.3	262.8

TABLE 2
COUNTRIES WITH THE HIGHEST PER CAPITA INCOME IN 1960

Rank	Country	Population		GDP \$ million	GDP/cap \$
		Million	% of world population		
112	France	45.67	1.52	430,850	9,434
113	United Kingdom	52.37	1.74	512,486	9,785
114	Australia	10.63	0.35	117,433	11,046
115	Switzerland	5.36	0.18	61,335	11,439
116	New Zealand	2.37	0.08	28,264	11,921
117	Sweden	7.48	0.25	100,072	13,379
118	Canada	18.27	0.61	286,444	15,682
119	USA	180.67	6.02	3,624,847	20,063
120	Kuwait	0.29	0.01	10,060	34,453
	Total	323.12	10.76	5,171,790	

TABLE 3
COUNTRIES WITH THE HIGHEST PER CAPITA INCOME IN 1995

Rank	Country	Population		GDP \$ million	GDP/cap \$
		Million	% of world population		
124	USA	263.1	4.94	6,952,020	26,423
125	France	58.1	1.09	1,536,089	26,439
126	Belgium	10.1	0.19	269,081	26,642
127	Singapore	3.0	0.06	83,695	27,898
128	Austria	8.1	0.15	233,427	28,818
129	Germany	81.9	1.54	2,415,764	29,497
130	Denmark	5.2	0.10	172,220	33,119
131	Norway	4.4	0.08	145,954	33,171
132	Japan	125.2	2.35	5,108,540	40,803
133	Switzerland	7.0	0.13	300,508	42,930
	Total	566.1	10.63	17,217,298	

(seven, compared to four in 1960), with two Asian newcomers, Japan and Singapore.

Tables 4 and 5 list the corresponding data for the poorest country groups. As for the rich, the country lists exceed the ten per cent global population levels. In 1960, the (richest) borderline country among the poor is China, but the population of this country alone is more than 21 per cent of the world total. The countries listed in Table 4, therefore, account for no less than 27 per cent of global population. In consequence, given the method we have chosen to use, only one-fifth of China's population and GDP is comprised in the measurements of the poorest decile. By 1995, Uganda emerges as the (richest) borderline country (Table 5), with a very marginal participation in the poorest decile.

TABLE 4
COUNTRIES WITH THE LOWEST PER CAPITA INCOME IN 1960

Rank	Country	Population		GDP \$ million	GDP/cap \$
		Million	% of world population		
1	Lesotho	0.86	0.03	215	251
2	Ethiopia	24.25	0.81	6,456	266
3	Rwanda	3.03	0.10	861	284
4	Nepal	10.03	0.33	2,941	293
5	Burkina Faso	4.87	0.16	1,435	295
6	Malawi	3.45	0.11	1,148	333
7	Tanzania	10.88	0.36	3,946	363
8	Yemen	0.98	0.03	364	373
9	Somalia	2.96	0.10	1,148	388
10	Laos	2.31	0.08	907	393
11	Burma	22.84	0.76	9,182	402
12	Bangladesh	54.62	1.82	22,740	416
13	Chad	3.04	0.10	1,291	424
14	Zaire	16.46	0.55	7,086	430
15	Mali	4.49	0.15	1,937	432
16	China	650.66	21.67	306,817	472
	Total	815.71	27.17	368,474	

The countries comprised in the poorest decile are smaller, on average, than those in the richest decile. Tables 4 and 5 comprise 16 and 22 nations, respectively, about twice as many as the rich. The per capita income range of the poor group fell from \$251–472 to \$91–295 during the period under consideration. In contrast to the developments among the rich, the income disparities within the poor group widened, from 1.9:1 to 3.2:1

The country composition in the poor group is much more stable than in the rich group. Nine of the 16 poorest nations in 1960 are listed again in the poorest group in 1995. Among the ones for which we have data on GDP in both years, only China, Laos and Lesotho succeeded in escaping from the poorest group in the period under investigation.

The more numerous group of poor countries in 1995 contains 13 new recruits. There are, first, Guinea-Bissau and Vietnam, for which 1960 numbers are not available. And there is a set of 11 countries, half of the total in the group, whose average incomes fell particularly sharply during the period. Mozambique, Burundi, Sierra Leone, Niger, Madagascar, Togo, Nigeria, Benin, Cambodia, Haiti and Uganda belong here.

In 1960, 10 out of 16 poor countries represent Africa, accounting for one-quarter of the total population in the poorest decile. By 1995, 17 of the 22 countries are African, and the continent accounts for more than half of the group. Poverty, as we measure it, has clearly become more Africa-focused

over time. India, often regarded as the poverty archetype, is conspicuously absent from the compilations of Tables 4 and 5.

We have so far concentrated completely on the rich and poor population deciles, which constitute the focus of our investigation. But it is instructive to parenthetically widen the vista, and consider the change in *global* income distribution between 1960 and 1995. Figure 1 plots rising GDP per capita numbers by country over increasing global population shares for each of the two years.

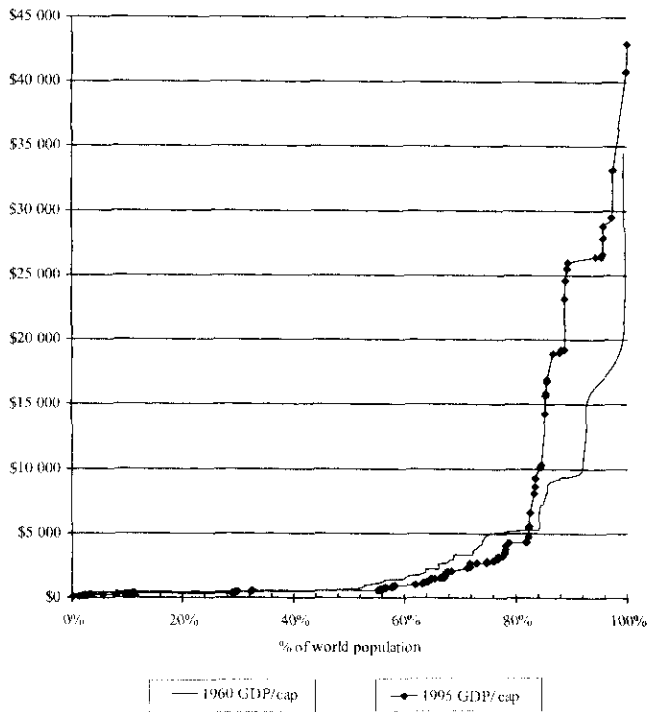
The startling income decline among the poor is so small in absolute numbers that it is barely perceptible in the figure.¹ In contrast, the increased income of the richest decile emerges starkly from the graphics. But an equally impressive change revealed by the figure is the very large increase in the level of income of the 85–90th population percentile. In absolute numbers, this increase is at a par with that of the richest ten per cent. But it is much greater in relative numbers. The historically exceptional economic growth of East Asia explains most of this upward shift.

TABLE 5
COUNTRIES WITH THE LOWEST PER CAPITA INCOME IN 1995

Rank	Country	Population		GDP \$ million	GDP/cap \$
		Million	% of world population		
1	Mozambique	16.2	0.30	1,469	91
2	Ethiopia	56.4	1.06	5,287	94
3	Tanzania	29.6	0.56	3,602	122
4	Malawi	9.8	0.18	1,465	149
5	Burundi	6.3	0.12	1,062	169
6	Rwanda	6.4	0.12	1,128	176
7	Chad	6.4	0.12	1,138	178
8	Sierra Leone	4.2	0.08	824	196
9	Nepal	21.5	0.40	4,232	197
10	Niger	9.0	0.17	1,860	207
11	Burkina Faso	10.4	0.20	2,325	224
12	Madagascar	13.7	0.26	3,198	233
13	Guinea-Bissau	1.1	0.02	257	234
14	Togo	4.1	0.08	981	239
15	Nigeria	111.3	2.09	26,817	241
16	Bangladesh	119.8	2.25	29,110	243
17	Mali	9.8	0.18	2,431	248
18	Benin	5.5	0.10	1,522	277
19	Vietnam	73.5	1.38	20,351	277
20	Cambodia	10.0	0.19	2,771	277
21	Haiti	7.2	0.14	2,043	284
22	Uganda	19.2	0.36	5,655	295
	Total	551.4	10.35	119,528	

FIGURE 1

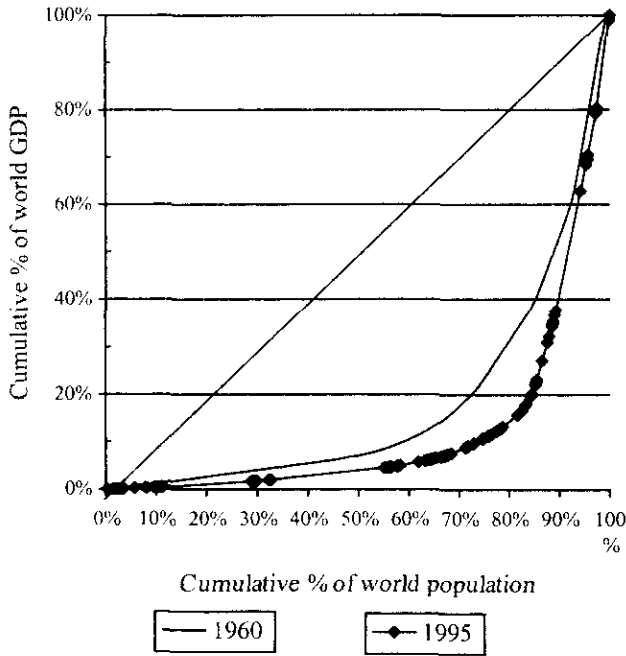
1960 AND 1995 GDP PER CAPITA ACCORDING TO SHARE OF WORLD POPULATION



An alternative way to analyze world income distribution is to construct Lorenz curves for the two periods under investigation. Figure 2 does that, using our data. If world GDP was evenly distributed between all countries the Lorenz curve would lie along the diagonal (45-degree line) in the figure. Clearly this is not so either in 1960 or in 1995. The actual curves are skewed to the right, implying an unequal distribution of world GDP (income). Furthermore, throughout, the Lorenz curve for 1995 is to the right of the 1960 curve, implying that the overall income distribution is more unequal in 1995 than it was in 1960. In 1960 the cumulative GDP for the poorest 50 per cent of world population accounted for seven per cent of world GDP, a share that had declined to around 4 per cent by 1995.

Another measure used frequently to analyse income distribution is the so-called Gini coefficient. It can vary from 0 (perfect equality) to 1 (perfect inequality), where 0 would mean that the Lorenz-curve lies along the 45

FIGURE 2
WORLD LORENZ CURVES 1960 AND 1995



degree line in Figure 2. Typically the Gini coefficient for a country considered to be relatively equitable, would be in the 0.20–0.35 range, while for a country with highly unequal income distribution, it would lie in the 0.5–0.7 range [Todaro, 1997]. For our global GDP data, we found a Gini coefficient of 0.66 in 1960, and 0.76 in 1995, reinforcing our earlier finding of an increased inequality in the distribution of world GDP.

Thus, an analysis of the global figures reinforces the findings based on a scrutiny of the richest and poorest deciles: Income distributions have become increasingly skewed.

IV. THE PROGRESS TOWARDS ENRICHMENT AND IMPOVERISHMENT

Table 6 lists all the countries that figure in the rich decile group in 1960 and/or in 1995. It provides the compound growth rates for population, GDP and GDP/capita for each. Table 7 does the same for the poor decile group. Entries in Italics in both tables indicate that the country belonged to the richest or

poorest decile in 1995. We comment selectively on the changes in GDP/capita level that have occurred among the members of each group.

All the countries listed in Table 6 recorded positive growth rates for GDP and, with one exception, also for GDP/capita. As will instantly be apparent from a scrutiny of Table 7, this contrasts starkly with the experience of the poor. The positive performance of the rich has undoubtedly to do with reasonable economic management – all the countries represented variations of basic market economies. The success obviously also had to do with the absence of internal strife or foreign aggression (Kuwait's severe but brief devastation in the war with Iraq in 1990 is the exception).

The rate of population growth appears to be negatively related to GDP/capita performance among the countries listed in Table 6, but this observation does not imply causality. Kuwait, the richest nation of all in 1960, dropped out from the rich country group by 1995. It stands out in Table 6 as the only nation among the rich, recording a substantial negative growth rate in its GDP/capita. This is not the result of an exceptionally slow growth of GDP. In fact, five of the 16 countries listed record a lower rate of growth of total GDP. Instead, the exceptional case of Kuwait is due to the extraordinary increase in the country's population, from a very small base in the initial year, the result of large-scale immigration.

Relatively fast population growth in Australia, Canada, New Zealand and the US provide a part reason for the retreat of these nations in the ranking of the rich, although Canada, New Zealand and the US also recorded the lowest growth in total GDP. The continued presence of the US in the rich decile in 1995 is primarily due to its high initial GDP/capita level. The relatively slow population growth in Austria, Belgium, Denmark, Germany and Norway contributed to the enlargement of the European presence in the rich group in 1995. Nevertheless, Sweden and the UK dropped out from the rich league, despite a very low population increase.

Japan and Singapore stand out in the sample of countries listed in table 6, by recording by far the fastest increases in GDP as well as GDP/capita. The two started out as middle-income countries in 1960. One may argue that their outstanding performance is due, in some measure, to catch-up, the advantage of latecomers in economic development, who can benefit from the adoption of growth-promoting technology developed by others.

Our commentary on Table 7 begins by the observation that the availability of data for the poor is far less systematic than for the rich and that the reliability of the numbers is weak. For example, the table shows seven countries comprised in the poorest decile in 1960, which are not included in the group in 1995. Four of these, Burma, Somalia, Yemen and Zaire, have been excluded from the poorest decile in the latter year, but the cause is not that they have prospered. The likelihood is that they continue in dire poverty, and the

TABLE 6
RICH COUNTRIES: COMPOUND ANNUAL GROWTH 1960-95, PER CENT

Rank		Country	Population	GDP	GDP/capita
1960	1995				
114	118	Australia	1.53	3.15	1.59
101	128	Austria	0.40	4.82	4.40
107	126	Belgium	0.29	3.49	3.19
118	119	Canada	1.39	1.98	0.58
110	130	Denmark	0.36	4.06	3.68
112	125	France	0.69	3.70	2.99
105;108	129	Germany	0.32	3.80	3.47
90	132	Japan	0.82	8.28	7.40
120	112	Kuwait	5.16	2.82	-2.22
116	113	New Zealand	1.20	2.03	0.82
109	131	Norway	0.59	4.32	3.71
86	127	Singapore	1.73	8.37	6.53
117	123	Sweden	0.47	2.39	1.91
115	133	Switzerland	0.76	4.65	3.85
113	116	United Kingdom	0.32	2.22	1.90
119	124	USA	1.08	1.88	0.79

reason for their exclusion is that the World Bank has been unable to collect meaningful data on their economies in recent years.

All except two among the 23 countries in Table 7, for which GDP/capita growth numbers are available, have experienced falling average incomes. There is not much to show for the economic development efforts between 1960 and 1995 in this country group. Eight of the nations even exhibit negative total GDP trends. Only three countries in the poorest decile in 1960 have had a sufficiently strong economic performance to permit them to break out of the group in the following 35 years. The most impressive is Lesotho, poorest among the poor in 1960, which succeeded to more than double its per capita GDP in the following 35 years.

China's performance is much bleaker, in comparison. Its average income rose, surprisingly, by less than 25 per cent. The country's very impressive growth performance since 1980 was preceded by two decades of easily forgotten stagnation and decline. The third country is Laos, whose GDP/capita actually declined in the period under scrutiny. This nation's rise to above the poorest decile by 1995 is primarily explained by the much faster decline into poverty by so many other low-income nations.

Out of the remaining 20 countries with recorded declines in average incomes, no less than 12 joined the poorest decile only after 1960. Internal strife, sometimes combined with external aggression, along with incompetent and corrupt economic management, explains the deepening poverty of the group. Mozambique, the poorest of all in 1995, was the worst performer. Its

per capita GDP fell by an average of 5.8 per cent per year, or from \$731 in 1960 (it was then a colony of Portugal) to a mere \$91 in 1995. Countries which recorded income declines of more than three per cent per year comprise Cambodia, whose extended internal and external conflicts caused economic regress, and Madagascar, Nigeria and Tanzania, where the inability of the political system to manage the economy must take the major blame for the contractions that occurred. A three per cent average annual income decline over a 35-year period, it should be noted, implies a 66 per cent fall in the GDP/capita, much worse than anything that happened in the industrialised world during the 1930s Great Depression, or in the transformation of post-communist economies in the 1990s. The worst post-communist performers lost just above half of their per capita GDPs between 1990 and 1995 [World Bank, 1997].

TABLE 7
POOR COUNTRIES: COMPOUND ANNUAL GROWTH 1960-95, PER CENT

Rank		Country	Population	GDP	GDP/capita
1960	1995				
12	16	Bangladesh	2.27	0.71	-1.53
25	18	Benin	2.85	0.81	-1.99
5	11	Burkina Faso	2.19	1.39	-0.79
11		Burma	1.95		
18	5	Burundi	2.33	-0.71	-2.97
43	20	Cambodia	1.80	-1.77	-3.50
13	7	Chad	2.15	-0.36	-2.46
16	42	China	1.76	2.37	0.60
2	2	Ethiopia	2.44	-0.57	-2.94
	13	Guinea-Bissau	2.28		
20	21	Haiti	1.90	0.15	-1.72
10	30	Laos	2.17	1.91	-0.26
1	38	Lesotho	2.45	4.57	2.07
35	12	Madagascar	2.65	-0.55	-3.12
6	4	Malawi	3.03	0.70	-2.26
15	17	Mali	2.26	0.65	-1.57
36	1	Mozambique	2.24	-3.68	-5.79
4	9	Nepal	2.20	1.05	1.13
26	10	Niger	3.03	0.10	-2.84
33	15	Nigeria	3.60	0.49	-3.01
3	6	Rwanda	2.16	0.78	1.35
22	8	Sierra Leone	1.62	-1.25	-2.82
9	-	Somalia	-0.05		
7	3	Tanzania	2.90	-0.26	-3.07
28	14	Togo	3.00	0.37	-2.55
21	22	Uganda	2.82	1.09	-1.68
24	19	Vietnam			
8	-	Yemen PDR			
14	-	Zaire	2.97		

The economic history of Nigeria is particularly remarkable. The development of the country's oil riches made it one of the fortunate few in the developing world, with unusual preconditions for economic growth in the period under review. Oil exploitation started on a significant scale only in the mid-1960s. Oil incomes exploded in the 1970s, as the country became a leading international supplier, and as OPEC quadrupled prices in the middle of the decade. The second oil shock at the end of the 1970s provided a further substantial income boost, and yet, in terms of per capita economic performance, the country is close to the bottom of the international league.

We end the present discourse by an unresolved concern. In the 1960s, per capita income levels of around \$350 in 1995 prices (\$50 in money of the day) were considered by many development researchers and practitioners as a bare minimum for national sustenance. Table 4 above showed six countries, representing 1.5 per cent of world population, with GDP/capita below this level in 1960. In 1995, however, all the countries in the poorest decile, listed in Table 5, had substantially lower incomes. The six poorest, 2.3 per cent of world population, had an average per capita income of \$112 in 1995 money, less than \$20 at 1960 prices. Clearly, either the presumption of the 1960s about required income for survival was wrong, or there is a serious fallacy in the evolution of our exchange rate-based GDP/capita time series. Section VI below provides some possible though improbable distortions of this kind.

V. THE PPP-DETERMINED GAPS

In this section some of our results are compared with those obtained when *PPP-adjusted data are employed*. We use two PPP-based sources for our comparisons. The first, Summers and Heston [1997] is the dominant work in the field. The second is a detailed study for the OECD by Maddison [1995].

In our first comparison, we repeat the main calculations from the previous sections, using Summers and Heston's PPP-adjusted data. We use the RGDPC variable (real GDP per capita in constant dollars at international prices) from Penn World Table Mark 5.6 (PWT 5.6) as our per capita income measure. The choice in this regard is prompted by the fact that this variable is recommended by Summer and Heston [1991] for inter-temporal GDP comparison. To ensure comparability between our previous calculations and the ones based on the Summers and Heston numbers, we use the same total country sets and population data throughout (the country composition of the rich and poor groups, however, is different from that given in earlier sections). Summers and Heston's data-set, however, does not comprise 1995. In fact, 1985 is the last year for which their country set is complete (153 countries). For later years, the coverage shrinks, to only 90 countries in 1992. Furthermore, 1985 is a benchmark year, in which quite a number of purchasing

power assessments were actually undertaken. Both reasons have prompted us to base our calculations on their 1985 numbers, which we extend to 1995 by using the average exchange rate based GNP/capita growth for the 1985–95 period, as reported in the World Bank's *World Development Report 1997* [1997: Table 1, 214–215]. The approach we have employed introduces some distortion to the PPP approach, but, if anything, this distortion should yield results that are closer to, and not more distant from, those presented in earlier sections.

The results of our comparison are summarised² in Table 8. Per capita growth is higher for both the poor and the rich, when the PPP method is used. The gap is smaller at both points in time, as would be expected. But in one crucial respect, the emerging difference between the two approaches is truly remarkable. For the poor group, the exchange rate determined data reveal a per capital income decline by almost 50 per cent over the 35-year period. The PPP-adjusted figures, in contrast, show an increase of close to 60 per cent. The exchange rate determined gap almost triples, while the PPP-adjusted one increases by an unremarkable 28 per cent.

We also calculate global Gini-coefficients, using the PPP-adjusted figures. In contrast from the results we derived when exchange rate determined incomes were used, we now obtain Gini coefficients of 0.54 in 1960 and of 0.49 in 1995. Both imply a more even global income distribution, and, remarkably, they also indicate that income distribution is more even in 1995 than it was in 1960. The fact that the PPP-determined gap between the richest and poorest decile has increased can be reconciled with the decline in the gini-coefficient by growth in the middle income countries surpassing that experienced by the richest decile.

The development of the PPP-adjusted Gini coefficient, noted above, is in stark contrast to the results found by Milanovic [1999], who computed Gini coefficients, combining both within- and between-country inequalities measured in PPP-terms. His results showed that the world Gini-coefficient has

TABLE 8

AVERAGE PPP-ADJUSTED GDP PER CAPITA, EXPRESSED IN CONSTANT 1995 US DOLLARS, AND GAP BETWEEN RICH AND POOR (NUMBERS IN PARENTHESES REPEAT THE FIGURES FROM TABLE 1 OBTAINED BY THE USE OF EXCHANGE RATE DETERMINED GDP)

	1960		1995		Change %	
World	4005	(3394)	8454	(5179)	111	(53)
10% richest	15540	(16528)	31966	(30665)	105	(86)
10% poorest	873	(418)	1384	(214)	58	(-49)
Gap (rich/poor)	18	(40)	23	(143)	28	(263)

increased from 0.63 to 0.66 during the six-year period 1988 to 1996. This is more in line with the change in the exchange rate based Gini coefficients we found earlier in our study. It should be noted, however, that in contrast to Milanovic, all our computations abstract from within-country inequalities.

Given the structure and coverage of Maddison's data, our second comparison is organised in a somewhat different manner, but the outcome is quite similar. We first try out a comparison of rich and poor aggregates. We then compare numbers for some individual poor countries. Our exchange rate based per capita GDP for the US, expressed in 1995 money, rises from \$20,060 in 1960 to \$26,420 in 1995, or by 31 per cent. Maddison's PPP-adjusted numbers expressed in 1990 prices, go up from \$11,190 in 1960 to \$22,570 in 1992, an increase of more than 100 per cent.

Our poorest decile GDP/capita, in 1995 dollars, falls from \$418 in 1960 to \$214 in 1995, or by 49 per cent. Maddison's PPP figure for Africa, the nearest group for the purpose of comparison (1990 prices) *increases* from \$1,010 in 1960 to \$1,280 in 1992. The gap between the US and the respective poor groups in 1960 is 48 in our material, and 11 in Maddison's. The ratio of the two gaps equals 4.4. In the 1990s, our gap has grown to 124, but Maddison's increases to less than 18, so the ratio between the two rises to 6.9.

An even more striking difference emerges when individual poor countries are reviewed. This appears from Table 9 below. The PPP-adjusted series record a vastly superior economic development performance for the selected poor countries comprised in the table.

Two features come out starkly in both comparisons. First, the gaps between rich and poor are much smaller when PPP adjustments are made. This is unsurprising. It has long been known that exchange rate determined per capita GDPs tended to suppress the income level estimates in poor countries, because they fail to take account of the typically low prices of non-traded goods in such

TABLE 9
GDP/CAPITA IN \$ IN SOME POOR COUNTRIES A COMPARISON BETWEEN
EXCHANGE RATE BASED (1995 PRICES) AND PPP-ADJUSTED (1990 PRICES)
ESTIMATES

Country	Exchange rate based			PPP-adjusted		
	1960	1995	Change %	1960	1992	Change %
Bangladesh	416	243	-42	536	720	34
China	472	581	23	878	3098	254
Ethiopia	266	94	-65	302	300	-1
Nigeria	701	241	-66	645	1152	79
Tanzania	363	122	-66	498	601	21

countries, and so exaggerate the difference between rich and poor nations. Second, the PPP adjusted series yield vastly superior economic performance records over time for the poor countries. This is surprising. The PPP approach, in consequence, results in little changing gaps between the rich and poor over time, in stark contrast to the results obtained from our exchange rate determined per capita income analysis.

Which numbers mirror the reality? Are we right to be complacent by accepting the absolute improvement of conditions in poor economies, and the ensuing relative stability of global income distribution, as revealed by the PPP-adjusted measurements? Or should we be concerned about the increasingly extreme levels of poverty and the sharply widening gaps between rich and poor, indicated by the traditional exchange rate determined income measures?

VI. FURTHER REFLECTIONS, ON THE DATA

PPP-adjusted GDPs, total and per capita, have established a virtual monopoly for inter-country income comparisons, and for tracking income developments over time. Exchange rate determined GDPs have, by and large, gone out of fashion in exercises of such nature. This is surprising, given that a broad methodological consensus on how PPP is to be used has not yet been established. For example, Maddison [1995] notes that alternative measures of PPP-adjusted average income in China in 1990 differ between \$1,135 and \$4,264, a wide range. Furthermore, a variety of fallacies continue to afflict the relatively new PPP methodology. As appears from its name, the Purchasing Power Parity approach involves a reassessment of national incomes using a common set of prices for the countries under scrutiny. This laborious task is undertaken at regular intervals in most rich countries, but only on rare occasions in poor ones. PPP-adjusted time series of income are then established based on the benchmark year(s) when an assessment was actually undertaken, and using the growth rates indicated in the standard national accounts for non-benchmark years, without further adjustment for purchasing power or weights. When the time series is long and the benchmark years few and far between, this is bound to result in sizeable purchasing power distortions, and it is not entirely clear what the series is measuring. The unclarity becomes even more serious for the significant set of poor nations where full-fledged PPP assessments have never been undertaken.

Exchange rate determined per capita GDPs, too, suffer from serious fallacies when it comes to international comparisons. We have already noted that they tend to exaggerate the income gaps between rich and poor nations, since they do not take account of the typically low prices for non-traded goods in the latter. Sudden and large exchange rate changes also tend to create havoc for income comparison employing this approach.

The focus of our interest has been on the change in per capita income over a long period of time. As noted, the two approaches yield very different results in this respect. The exchange rate determined income change of poor countries is far worse than that derived after PPP adjustments. A systematic bias in one or the other approach must be at work, and this bias apparently has its strongest impact on the poor countries, in which PPP assessments are rare.

We have considered some possible biases that might afflict the exchange rate based approach chosen as the main tool for our investigations. To explain the discrepancy noted above, the bias would have to be substantial and persevering. One cause could be a continued expansion of the unrecorded subsistence sector in poor countries, resulting in an *increasing* underestimate of the GDP as traditionally determined. Another could follow from a continuous *increase* in the overvaluation of domestic currencies in poor countries. We do not believe that such systematic and continuous shifts have occurred. Historical experience suggests that the unrecorded subsistence sector is shrunk, and not expanded, over time. It is probable that the currencies of the poor countries became increasingly overvalued in the late 1960s and 1970s, when import controls were widely used to maintain a balanced trade account, but then, this practice went out of fashion in the late 1980s and 1990s. On this count too, therefore, a continued increase in the distortion is implausible.

We tentatively conclude that with the present state of the income measurement art, exchange rate determined long-run investigations provide reasonably trustworthy trends, even though they get the levels wrong. Our finding of a sharp widening of the rich/poor income gap in the past 35 years cannot be easily refuted, and has to be taken seriously, whatever the outcome of the alternative PPP-based exercises.

VI. A SUMMARY OF CONCLUSIONS

Our analyses of exchange rate based real GDP/capita developments between 1960 and 1995 point to a very sharp widening of the income gaps between the rich and the poor nations. The numbers show an 85 per cent increase of the GDP/capita among the richest decile of world population, and a remarkable decline of almost 50 per cent in the poorest decile. The share of global GDP accruing to the rich group rose from 47 per cent to 59 per cent in the period under scrutiny; that accruing to the poor group declined from 1.3 per cent to a mere 0.4 per cent. The per capita income gap between the two deciles rose from about 40 in 1960 to more than 140 in 1995. Yet, the widespread fears that a highly skewed income distribution would pose a threat to sustainable global economic growth, have not materialised.

The calculations we present additionally demonstrate that the distribution of global GDP, too, has grown more inequitable between 1960 and 1995. The

world Gini coefficient increased from 0.66 to 0.77. Our findings contrast sharply with the results that emerge when PPP-adjusted income figures are employed. The latter show a positive income trend for the poorest country group, and an insignificant increase in the rich/poor country income gaps.

It has long been known that exchange rate determined international GDP comparisons tend to exaggerate the income gaps between rich and poor nations, and that PPP adjustments provide a more realistic comparison at any point in time. But the PPP-method for measuring incomes is relatively new, with a wide consensus on the way it should be used, remaining to emerge. Also, PPP-determined income assessments for poor countries are still far-between in time, when they exist at all. Hence, it is far from obvious that PPP adjustments yield results that are superior to those obtained with the help of exchange rates, when the relative gaps are assessed at different points in time, or when per capita incomes are compared over long time periods in individual countries or country groups.

NOTES

1. It does not become significantly more perceptible when a semi-log scale is used.
2. Readers interested in further details emerging from our use of the Summers and Heston data set can contact Bo Jonsson at Bo.Jonsson@ies.luth.se.

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