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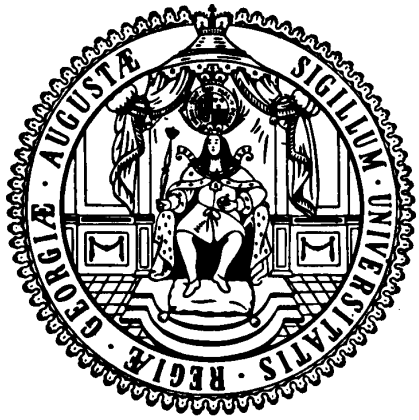

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An empirical assessment of thirty-two countries

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Inequality in Human Development: An empirical assessment of thirty-two countries

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Abstract

One of the most frequent critiques of the HDI is that is does not take into account inequality within countries in its three dimensions. We use a simple approach, which allows to compute the three components and the overall HDI for quintiles of the income distribution. This allows to compare the level in human development of the poor with the level of the non-poor within countries, but also across countries. This is an application of the method presented in Grimm et al. (2008) to a sample of 21 low and middle income countries and 11 industrialized countries. Our results show that inequality in human development within countries is high both in developed and industrialized countries. In fact, the HDI of the lowest quintiles in industrialized countries is often below the HDI of the richest quintile in many middle income countries. We also find, however, a strong overall negative correlation between the level of human development and inequality in human development.

Key words: Human Development, Income Inequality, Differential Mortality, Inequality in Education.

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Motivation

One of the important short-comings of the United Nations Development Programme's (UNDP) Human Development Index (HDI) is that it neglects the distribution of achievements within each component of the HDI. It may well be that a country performs well in the aggregate HDI but has a very unequal distribution within the country. The Human Development Report (HDR) 2006 (UNDP, 2006) made an important step to address this issue. Based on a method and computations described in detail in Grimm *et al.* (2008), the HDR presented for a sample of 13 low and middle income and 2 high income countries a HDI for all five income quintiles of these countries. Households were sorted by income quintile and then for each income quintile, the life expectancy, education, and income indices were calculated to generate an income quintile-specific HDI. The results showed that across all countries inequality in human development was very high, was typically larger in developing countries, and particularly sizable in Africa. This was not only due to an unequal income distribution, but also to substantial inequalities in education and life expectancy. In some middle income developing countries the richest quintile ranked among the high human development countries, whereas the poorest quintile ranked among the low human development countries. But also in rich countries, the differentials were large. For example, the poorest income quintile in the US reaches only position 43 in a general HDI country ranking. Among the low and middle income countries the results showed that in that sample there was no clear relationship between the level of human development and inequality in human development as measured by the ratio of the HDI for the richest and poorest quintiles.

The findings motivated UNDP to request an extension of the analysis to more countries to be included in "*Human Development Indices: A statistical update 2008*". The extension should in particular also include more rich countries. Surprisingly the computation of a comparable quintile-specific HDI is more difficult for rich than for middle and low income countries due

to higher difficulties to generate appropriate and harmonized micro data. As discussed below, this required some simplifying assumptions that were not necessary for the low and middle-income countries. This paper describes this extension and presents the main results. The additional high income countries could be included thanks to the support of the Luxembourg Income Study (LIS) research group. In what follows the general methodology is not repeated. The interested reader should refer to Grimm *et al.* (2008).

The inclusion of additional low and middle income countries

Additionally included low and middle income countries are Brazil, Ethiopia, Ghana, Guatemala, India, Kyrgyz Republic, Paraguay and Peru. The methodology applied to compute the quintile-specific HDI was the same as the methods used for the countries included in the first round (see Grimm et al., 2008). To summarize them, we begin by using a household income survey to sort individuals in quintiles of household income per capita and then compute quintile-specific mean incomes (scaled such that the overall survey mean matches GDP per capita as used in the HDR), and quintile-specific literacy and enrolment rates. Demographic and Health Surveys were used to compute child mortality by income quintiles (approximated by asset quintiles), which were then transformed using standardized mortality tables into life expectancies at birth. In a last step each indicator is converted into an index number using the same method as for the general HDI and the average over all three dimensions—life expectancy, education and income—is computed.

For the low and middle income countries we report in our tables for each country the years in which the household income survey and the Demographic and Health Survey we use were undertaken. We tried of course to take the most recent data available and to keep the time lag between both surveys as short as possible. However, that was not possible for all countries

(see Table A1). To facilitate comparisons with the overall HDI computed by UNDP, we rescaled our results always to match UNDP's actual overall HDI for that year.

The inclusion of additional high income countries

Additionally included high income countries are Australia, Canada, France, Germany, Italy, The Netherlands, Poland, Spain, and Sweden. The first round comprised only two high income countries; Finland and the USA. The application of our approach to high income countries entails some additional problems. The data availability is very different in developing and industrialized countries. Whereas for a long time access to disaggregated and harmonized income, education and health data was much better in industrialized countries than in developing countries, today it seems to be the other way around. For many developing countries there exist today, as described above, at least roughly comparable income, education and health data thanks to the household income surveys and Demographic and Health Surveys. In many industrialized countries, such standardized surveys are either absent or not easily accessible. Moreover, due to very low infant and child mortality levels in rich countries, we could not apply our methods of deducing life expectancy from infant or child mortality rates available in household survey data as the absolute number of infant and child deaths are too low in such surveys to calculate life expectancies (and its differential by income) with any reliability. Therefore we had to make some simplifying but reasonable assumptions. We proceeded as follows.

Matters are easiest for the income component. Here we can rely on the Luxemburg Income Study (LIS), which produces harmonized micro data sets on income, demographics, labour market status and expenditures on the level of households and individuals for 30 OECD

countries.[2] These data are of very high quality and probably more reliable than the income/expenditure data available in many developing countries. LIS computed based on harmonized income data for each of the included high income countries mean household income per capita for each quintile. Then, as for the low and middle income countries, we simply scaled these quintile-specific mean incomes using the ratio between GDP per capita and household income per capita such that the overall mean matched GDP per capita and converted them in USD PPP. In a last step we transformed the mean incomes into logarithms and computed using the usual maximum and minimum values of log(40,000 USD PPP) and log(100 USD PPP) the index number.

To derive the quintile-specific education indices we also used data from the LIS. However, the LIS data sets do not have educational enrolment or adult literacy information. They only provide information on educational achievements by levels of education passed. Therefore, we assume no inequality in adult literacy (based on the presumption of universal adult literacy in those countries)[3] and use the schooling achievement differential by income for 2000 as reported in the Luxembourg Income Study to estimate income differentials in enrolments, after which we rescale again.[4]

Hence, we took the LIS information on educational attainment in each quintile, i.e. the percentage of persons in each quintile falling in groups such as 'never attended school', '1-4

[2] For details see: http://www.lisproject.org.

[3] Clearly this is a debatable assumption as a significant share of the population in OECD countries is functionally illiterate (OECD, 1997). But unfortunately, these analyses do not provide adult literacy rates by income quintiles. Also, the standard used to measure functional illiteracy in OECD countries was somewhat higher than the standard used in developing countries. As we want to have these measures comparable across countries, it is probably safe to assume that literacy is near universal in OECD countries at the level consistent with literacy information from developing countries (which is often based on having passed 5 or more years of schooling, or self-reported literacy as the basic ability to read and write).

[4] Alternatively, enrolment rates by income quintile could probably be generated from national household income surveys (or co-ordinated surveys such as the European Household Panel Survey) but this would mean that we rely on two different income measures to calculate the two different components (as we had to do with the HIS and the DHS for developing countries).

years of elementary school', '5-8 years of elementary school', …, 'university certificate', and derived from this the share of persons attending a first, second, third etc. year in school. Linking that information to age, it is possible to derive for each quintile an enrolment rate for the children and adults between 5 and 23 years old. These rates were then again rescaled such that the average matched the average reported by UNDP. In a last step we computed the weighted average for each quintile by counting adult literacy with a weight of 2/3 and enrolment with a weight of 1/3.

By far the most difficult issues arise however with the life expectancy component. As already stated, using quintile-specific child mortality to derive an estimate of quintile specific life expectancy from household surveys would not be possible as child mortality in most OECD countries is so low that no meaningful differentials by income could be identified. Moreover, child mortality in these countries is much related to premature births, genetic defects, complications during birth and due to accidents all of which not closely related to income. In fact, it is likely that existing income differentials in life expectancy in rich countries are largely due to mortality differentials beyond childhood. In principle, one could try to rely on census or census-like sample surveys with large numbers of observations. An alternative would be to rely on death registrations. These data sources are generally used in rich countries to calculate mortality rates and associated life expectancy statistics. But these data sources usually do not include incomes and cannot be used to calculate income differentials. Two exceptions are the USA and Finland where specialized analyses on the link between incomes and mortality were undertaken. We therefore considered the results from Rogot *et al.* (1997) and Martikainen *et al.* (2001) on the life expectancy differential by incomes. These data are based on linked income survey data with vital registration data and are covering the adult mortality experience for 1979-85 for the USA, and 1991-96 for Finland. Given that the data for Finland is more recent than the one for the USA, we used the absolute mortality

differentials observed for Finland and assumed that those differentials are applicable for the other high income countries as well. More precisely we matched Finland's mortality experience by income quintile with the model life tables 'North' (Coale and Demeny, 1983) and derived quintile specific life expectancy at birth.[5] These numbers, i.e. the inequality in life expectancy of Finland, were then taken and re-scaled such that we match the overall life expectancy level used by UNDP to construct the HDI.

In a last step we constructed for each quintile the HDI by averaging over the three dimension indices. In doing this, we rescaled each value for each index to the UNDP's reported HDI value of the year 2006 to make all values comparable.

Results

Table 1 shows the HDI by income quintile, the HDI, and the ratio of the HDI for the richest quintile to the poorest quintile and the HDI ranking for the richest and poorest quintile (using the HDI values from the HDR 2006) for the sample countries.

Please insert Table 1 here

The results reveal very stark differences in human development between the richest and the poorest quintile. In contrast to comparisons in income inequality (where Latin America is the most unequal region), African countries show more inequality in the HDI by income quintiles than Latin American countries. This tendency was already visible in the smaller sample analyzed in Grimm *et al.* (2008). In Brazil, Guatemala and Peru the ratio of the HDI between the richest and the poorest quintile is about 1.7, whereas it is around 2 in Burkina Faso, Guinea and Madagascar. The reasons for this are two-fold. First, due to the logarithmic

[5] The 'income' that is referred to in these studies does not closely match annual household per capita income that we would use for the income component which causes a further complication.

transformation of income in the HDI income inequality is attenuated. The assumption behind the logarithmic transformation is that the well-being-effects of higher incomes among the rich are declining with higher incomes. Thus what is being measured here is not the differential in incomes but, in line with the general treatment of the income component in the HDI, the differential in important aspects of quality of life such as nutrition, housing, clothing, and other aspects that are closely correlated with incomes. Hence, Latin American countries which have typically a high income inequality appear less unequal as they actually are (cf. Table 2). Moreover, African countries still have a relatively high degree of inequality in literacy and educational attainment (cf. Table 3). This is not anymore the case in most Latin American countries where among other things the efforts to reach the MDG show the first fruits. One should note, however, that education is only using literacy and enrolment rates and says little about educational quality which is likely to differ much more strongly between the rich and the poor. Inequality in life expectancy is not significantly different in Latin America and Africa. In both regions inequality is with a few exceptions pronounced, but with an important variance across countries. Some of this may be related to data quality issues and the assumptions that were made in order to derive at these estimates. It appears however that in the developing countries inequality in life expectancy is smaller than other forms of inequality (cf. Table 4). However, it should be emphasized that in South-Africa and Zambia, both countries are strongly hit by the AIDS epidemic, the level of life expectancy is particularly low and the inequality particularly high.

Please insert Table 2 here

Please insert Table 3 here

Please insert Table 4 here

Moreover, regarding the inequality in life expectancy, three additional cautionary notes are important, however. To some extent, smaller inequality is to be expected given that life expectancy is effectively bounded above, i.e. there are limits to life expectancy that even high income populations run up against. Second, the differences in actual life expectancy (rather than the life expectancy index) are still substantial with gaps between the poorest and richest quintile amounting to more than 10 years in several countries. Third, even seemingly smaller differentials in life expectancy may be seen as just as important, or even more important, than larger differentials in the other components. After all, the chance to live and be free from the fear of premature mortality is a fundamental precondition for all other aspects of life.

The Asian countries included—Indonesia, Vietnam and Kyrgyz Republic—show compared to the other countries lower inequality. The exception is India, where the ratio of the HDI between the richest and the poorest quintile is also about 1.6.

As our previous results for Finland and the USA in Grimm *et al.* (2008) already showed, inequality in human development in high income countries is significantly lower than in middle and low income countries. For most countries included the ratio of the HDI between the richest and the poorest quintile is 'only' about 1.1-1.2. Exceptions are Poland, Spain and the USA where this ratio exceeds the value of 1.2. In these countries the relative high inequality stems mainly from income inequality and in the case of Poland also from education inequality.

The rank positions of the different quintiles allow further interesting interpretations. For example, the richest quintile in Bolivia is at rank 34, i.e. among the countries with high human development, actually at the same level as Poland, whereas the poorest quintile is at rank 132. The average HDI in Bolivia was in the last year's report at rank 113. In some Sub-

Saharan African countries such as Cameroon, Guinea and Madagascar the richest quintile achieves a level similar to those countries with medium human development, i.e. far above the threshold of 0.5. In contrast the poorest quintiles of these countries all rank among the 15 countries with the lowest HDI. Put differently, the differences within countries are as high as the differences between high and medium as well as medium and low human development countries. Also among rich countries, the differences are sizable. While the richest quintile in all included industrialized countries (except Poland) would top the list of human development achievements, the poorest quintiles would only be at rank 30 or lower. In Spain and the USA the poorest quintile would even only occupy position 44 and 43 respectively, considerably worse off than the richest quintile in South Africa, Colombia, Bolivia, or Indonesia.

Figure 1 shows the relationship between the level of human development and inequality in human development. Whereas we were not able to derive a clear relationship between both variables with our smaller sample analyzed in Grimm *et al.* (2008), here we see a relatively pronounced negative correlation. Countries with a higher level of human development also have a lower inequality in human development. The correlation coefficient is about -0.85 across all countries and -0.59 and -0.24 within developing and industrialized countries respectively. However, the figure clearly shows regional clusters. Within these regional clusters the correlation between both variables is close to zero.

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Table 1
Quintile specific HDI by country

Country	Q=1	Q=2	Q=3	Q=4	Q=5	All	Ratio Q5/Q1	Ranking All	Ranking Q=1	Ranking Q=5
Developing Countries										
Colombia (2003/2005)	0,662	0,743	0,785	0,839	0,932	0,787	1,408	77	123	23
Brazil (1996/1997)	0,610	0,768	0,874	0,941	0,997	0,807	1,635	64	129	1
Peru (2000/1994)	0,578	0,717	0,850	0,898	0,945	0,788	1,636	76	134	18
Paraguay (1990/1998)	0,644	0,713	0,756	0,846	0,898	0,752	1,395	97	127	29
Vietnam (2004/2002)	0,626	0,688	0,741	0,764	0,834	0,719	1,332	109	128	52
Indonesia (2000/2003)	0,613	0,687	0,726	0,783	0,880	0,725	1,435	108	129	34
South Africa (2000/1998)	0,539	0,622	0,678	0,721	0,789	0,671	1,465	123	142	76
Bolivia (2002/2003)	0,577	0,676	0,732	0,788	0,897	0,722	1,555	109	134	29
Kyrgyz Republic (1997/1998)	0,622	0,681	0,716	0,728	0,844	0,694	1,358	118	128	50
Nicaragua (2001/2001)	0,570	0,665	0,709	0,760	0,893	0,706	1,567	113	134	31
Guatemala (1995/2000)	0,575	0,666	0,747	0,831	0,901	0,706	1,566	113	134	29
India (1999/1997)	0,495	0,573	0,642	0,703	0,812	0,609	1,642	129	157	61
Ghana (1998/1998)	0,412	0,506	0,559	0,606	0,727	0,533	1,764	143	168	108
Cameroon (2001/2004)	0,410	0,473	0,518	0,554	0,630	0,515	1,539	150	169	128
Madagascar (2001/1997)	0,379	0,506	0,544	0,614	0,749	0,533	1,975	143	174	98
Guinea (1995/1999)	0,278	0,394	0,466	0,577	0,690	0,424	2,481	167	178	118
Cote d'Ivoire (1998/1999)	0,349	0,414	0,430	0,525	0,558	0,432	1,601	166	177	135
Zambia (2002/2002)	0,343	0,414	0,458	0,504	0,612	0,452	1,786	161	177	129
Ethopia (2000/2000)	0,288	0,323	0,376	0,416	0,546	0,384	1,895	171	178	142
Mozambique (2002/2003)	0,272	0,333	0,357	0,400	0,503	0,366	1,846	177	178	155
Burkina Faso (2003/2003)	0,269	0,320	0,361	0,394	0,520	0,369	1,929	177	178	149
Industrialized countries										
Australia (2001)	0,891	0,932	0,960	0,985	0,992	0,969	1,113	1	32	1
Canada (2000)	0,888	0,926	0,954	0,982	0,989	0,967	1,114	3	34	1
Finnland (2000)	0,891	0,917	0,942	0,970	0,981	0,954	1,101	8	32	1
France (2000)	0,878	0,915	0,940	0,968	0,989	0,955	1,126	7	34	1
Germany (2000)	0,866	0,902	0,936	0,962	0,979	0,941	1,131	20	41	1
Italy (2000)	0,858	0,895	0,927	0,961	0,989	0,945	1,152	18	45	1
Netherlands (1999)	0,886	0,923	0,947	0,974	0,983	0,959	1,109	5	34	1
Poland (1999)	0,790	0,834	0,861	0,894	0,945	0,875	1,197	35	76	18
Spain (2000)	0,848	0,888	0,926	0,959	0,989	0,948	1,166	15	48	1
Sweden (2000)	0,898	0,927	0,947	0,974	0,984	0,959	1,096	5	29	1
USA (2000)	0,834	0,900	0,940	0,974	0,982	0,951	1,178	12	52	1

Note: For developing countries the years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the year 2006.
Source: Luxembourg Income Study (LIS), Household Income Survey (HIS), and Demographic and Health Surveys (DHS) (see Table A1), Human Development Report (UNDP, 2006); calculations by the authors.

Table 2
Quintile specific GDP indices by country

Country	Q=1	Q=2	Q=3	Q=4	Q=5	All	Ratio Q5/Q1
Developing Countries							
South Africa (2000/1998)	0,433	0,600	0,727	0,885	1,000	0,753	2,311
Brazil (1996/1997)	0,503	0,668	0,777	0,897	1,000	0,750	1,986
Colombia (2003/2005)	0,420	0,578	0,684	0,800	1,000	0,694	2,378
Paraguay (1990/1998)	0,366	0,571	0,684	0,778	0,885	0,617	2,415
Peru (2000/1994)	0,422	0,616	0,748	0,866	1,000	0,711	2,369
Guatemala (1995/2000)	0,431	0,602	0,735	0,877	1,000	0,659	2,318
Nicaragua (2001/2001)	0,245	0,462	0,568	0,672	0,903	0,556	3,680
Indonesia (2000/2003)	0,427	0,529	0,597	0,673	0,836	0,591	1,955
Bolivia (2002/2003)	0,398	0,526	0,609	0,698	0,887	0,613	2,231
Vietnam (2004/2002)	0,393	0,464	0,518	0,580	0,722	0,528	1,838
India (1999/1997)	0,366	0,493	0,578	0,677	0,907	0,535	2,475
Guinea (1995/1999)	0,129	0,364	0,518	0,696	1,000	0,408	7,727
Cameroon (2001/2004)	0,340	0,433	0,500	0,571	0,732	0,507	2,154
Ghana (1998/1998)	0,247	0,378	0,465	0,557	0,699	0,421	2,828
Cote d'Ivoire (1998/1999)	0,339	0,433	0,497	0,568	0,718	0,468	2,118
Kyrgyz Republic (1997/1998)	0,343	0,441	0,509	0,589	0,724	0,484	2,112
Mozambique (2002/2003)	0,115	0,242	0,325	0,412	0,639	0,334	5,548
Burkina Faso (2003/2003)	0,218	0,317	0,388	0,468	0,683	0,405	3,131
Madagascar (2001/1997)	0,136	0,275	0,370	0,474	0,649	0,363	4,765
Zambia (2002/2002)	0,236	0,354	0,433	0,519	0,728	0,423	3,081
Ethopia (2000/2000)	0,146	0,238	0,298	0,365	0,531	0,309	3,631
Industrialized countries							
Australia (2001)	0,807	0,908	0,957	1,000	1,000	0,980	1,239
Canada (2000)	0,809	0,909	0,958	1,000	1,000	0,986	1,237
Finnland (2000)	0,846	0,908	0,944	0,986	1,000	0,968	1,182
France (2000)	0,807	0,888	0,935	0,983	1,000	0,963	1,239
Germany (2000)	0,817	0,897	0,942	0,989	1,000	0,964	1,224
Italy (2000)	0,765	0,861	0,915	0,966	1,000	0,947	1,308
Netherlands (1999)	0,827	0,915	0,963	1,000	1,000	0,985	1,210
Poland (1999)	0,665	0,757	0,807	0,854	0,955	0,834	1,436
Spain (2000)	0,763	0,856	0,905	0,961	1,000	0,944	1,310
Sweden (2000)	0,836	0,916	0,955	1,000	1,000	0,974	1,197
USA (2000)	0,784	0,894	0,958	1,000	1,000	1,000	1,276

Note: For developing countries the years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the year 2006.
Source: Luxembourg Income Study (LIS), Household Income Survey (HIS), and Demographic and Health Surveys (DHS) (see Table A1), Human Development Report (UNDP, 2006); calculations by the authors.

Table 3
Quintile specific education indices by country

Country	Q=1	Q=2	Q=3	Q=4	Q=5	All	Ratio Q5/Q1
Developing Countries							
Peru (2000/1994)	0,848	0,846	0,884	0,910	0,919	0,885	1,084
Kyrgyz Republic (1997/1998)	0,897	0,911	0,927	0,936	0,955	0,919	1,065
Bolivia (2002/2003)	0,734	0,847	0,903	0,938	0,970	0,885	1,322
Colombia (2003/2005)	0,798	0,845	0,878	0,899	0,944	0,874	1,183
Paraguay (1990/1998)	0,805	0,831	0,866	0,892	0,903	0,864	1,122
Brazil (1996/1997)	0,682	0,854	0,935	0,986	1,000	0,888	1,467
Vietnam (2004/2002)	0,766	0,790	0,804	0,848	0,862	0,813	1,125
South Africa (2000/1998)	0,836	0,840	0,846	0,846	0,846	0,843	1,012
Indonesia (2000/2003)	0,746	0,807	0,840	0,874	0,921	0,832	1,234
Cameroon (2001/2004)	0,505	0,579	0,624	0,656	0,699	0,622	1,383
Zambia (2002/2002)	0,554	0,620	0,667	0,728	0,784	0,665	1,417
Nicaragua (2001/2001)	0,723	0,739	0,775	0,801	0,840	0,774	1,163
Guatemala (1995/2000)	0,575	0,677	0,753	0,814	0,867	0,709	1,509
Ghana (1998/1998)	0,475	0,581	0,625	0,672	0,737	0,605	1,552
Madagascar (2001/1997)	0,523	0,678	0,693	0,734	0,931	0,671	1,781
India (1999/1997)	0,548	0,629	0,690	0,705	0,700	0,640	1,276
Mozambique (2002/2003)	0,436	0,463	0,464	0,468	0,528	0,474	1,211
Ethopia (2000/2000)	0,265	0,317	0,361	0,423	0,537	0,390	2,030
Cote d'Ivoire (1998/1999)	0,373	0,424	0,456	0,498	0,555	0,450	1,486
Guinea (1995/1999)	0,268	0,381	0,389	0,428	0,407	0,361	1,520
Burkina Faso (2003/2003)	0,193	0,205	0,226	0,256	0,370	0,258	1,920
Industrialized countries							
Australia (2001)	0,976	0,977	0,988	1,000	1,000	0,993	1,024
Canada (2000)	0,974	0,968	0,981	1,000	1,000	0,991	1,026
Finnland (2000)	0,969	0,963	0,981	1,000	1,000	0,993	1,032
France (2000)	0,946	0,957	0,961	0,977	1,000	0,978	1,057
Germany (2000)	0,918	0,926	0,960	0,972	0,992	0,954	1,080
Italy (2000)	0,931	0,924	0,943	0,973	1,000	0,965	1,074
Netherlands (1999)	0,968	0,968	0,970	0,992	0,999	0,985	1,032
Poland (1999)	0,905	0,926	0,938	0,968	1,000	0,952	1,105
Spain (2000)	0,900	0,908	0,949	0,970	1,000	0,971	1,112
Sweden (2000)	0,973	0,959	0,959	0,972	0,981	0,974	1,008
USA (2000)	0,923	0,945	0,965	1,000	1,000	0,968	1,083

Note: For developing countries the years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the year 2006.
Source: Luxembourg Income Study (LIS), Household Income Survey (HIS), and Demographic and Health Surveys (DHS) (see Table A1), Human Development Report (UNDP, 2006); calculations by the authors.

Table 4
Quintile specific life expectancy indices by country

Country	Q=1	Q=2	Q=3	Q=4	Q=5	All	Ratio Q5/Q1
Developing Countries							
Colombia (2003/2005)	0,767	0,805	0,792	0,817	0,851	0,793	1,110
Vietnam (2004/2002)	0,718	0,810	0,902	0,865	0,917	0,816	1,277
Paraguay (1990/1998)	0,760	0,736	0,717	0,867	0,905	0,775	1,191
Peru (2000/1994)	0,464	0,688	0,917	0,917	0,917	0,766	1,976
Nicaragua (2001/2001)	0,742	0,793	0,785	0,808	0,936	0,789	1,263
Brazil (1996/1997)	0,644	0,782	0,911	0,940	0,991	0,783	1,538
Indonesia (2000/2003)	0,665	0,724	0,741	0,801	0,883	0,752	1,328
Kyrgyz Republic (1997/1998)	0,626	0,690	0,713	0,659	0,854	0,678	1,365
Guatemala (1995/2000)	0,719	0,717	0,751	0,801	0,835	0,750	1,161
Bolivia (2002/2003)	0,599	0,655	0,685	0,727	0,834	0,668	1,392
India (1999/1997)	0,570	0,597	0,657	0,727	0,830	0,652	1,458
Madagascar (2001/1997)	0,479	0,566	0,570	0,634	0,667	0,564	1,392
Ghana (1998/1998)	0,513	0,559	0,588	0,588	0,744	0,574	1,449
Ethopia (2000/2000)	0,453	0,413	0,468	0,459	0,568	0,454	1,255
South Africa (2000/1998)	0,347	0,426	0,461	0,432	0,521	0,418	1,499
Guinea (1995/1999)	0,437	0,436	0,490	0,606	0,663	0,505	1,516
Burkina Faso (2003/2003)	0,397	0,440	0,469	0,458	0,506	0,445	1,273
Cote d'Ivoire (1998/1999)	0,334	0,386	0,338	0,510	0,403	0,378	1,205
Cameroon (2001/2004)	0,383	0,406	0,430	0,435	0,460	0,416	1,198
Mozambique (2002/2003)	0,266	0,295	0,282	0,322	0,341	0,291	1,282
Zambia (2002/2002)	0,238	0,269	0,274	0,267	0,323	0,270	1,359
Industrialized countries							
Australia (2001)	0,890	0,912	0,934	0,956	0,977	0,934	1,097
Canada (2000)	0,881	0,902	0,924	0,946	0,967	0,924	1,097
Finnland (2000)	0,858	0,879	0,901	0,923	0,943	0,901	1,099
France (2000)	0,880	0,901	0,923	0,945	0,966	0,923	1,098
Germany (2000)	0,861	0,882	0,904	0,926	0,946	0,904	1,098
Italy (2000)	0,880	0,901	0,923	0,945	0,966	0,923	1,097
Netherlands (1999)	0,864	0,885	0,907	0,929	0,949	0,907	1,098
Poland (1999)	0,798	0,818	0,839	0,860	0,879	0,839	1,102
Spain (2000)	0,880	0,901	0,923	0,945	0,966	0,928	1,098
Sweden (2000)	0,885	0,906	0,928	0,950	0,971	0,928	1,097
USA (2000)	0,795	0,860	0,897	0,923	0,945	0,884	1,190

Note: For developing countries the years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the year 2006.
Source: Luxembourg Income Study (LIS), Household Income Survey (HIS), and Demographic and Health Surveys (DHS) (see Table A1), Human Development Report (UNDP, 2006); calculations by the authors.

Figure 1
The relation between the level and inequality in human development

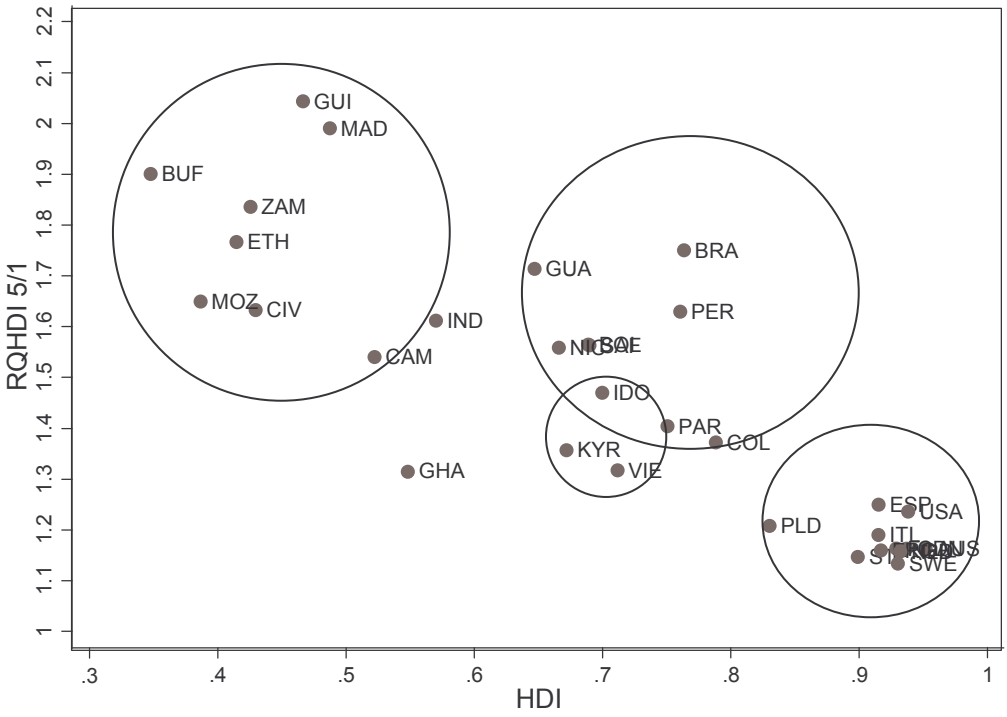

Table A1
Data sources

Country	Year	Type of survey
Developing countries		
Brazil	1996	Demographic and Health Survey (DHS)
	1997	Living Standard Measurement Survey (LSMS)
Ethiopia	2000	Demographic and Health Survey (DHS)
	2000	Welfare Monitoring/Income, Consumption and Expenditure Survey
Ghana	1998	Demographic and Health Survey (DHS)
	1998	Ghana Living Standard Survey No. 4
Guatemala	1995	Demographic and Health Survey (DHS)
	2000	Living Standard Measurement Survey (LSMS)
India	1999	Demographic and Health Survey (DHS)
	1997	NSS Household Consumer Expenditure Survey (53rd Round)
Kyrgyz Republic	1997	Demographic and Health Survey (DHS)
	1998	Living Standard Measurement Survey (LSMS)
Paraguay	1990	Demographic and Health Survey (DHS)
	1998	Encueata Integrada De Hogares (Programa MECOVI)
Peru	2000	Demographic and Health Survey (DHS)
	1994	Living Standard Measurement Survey (LSMS)
Burkina Faso	2003	Demographic and Health Survey (DHS)
	2003	Enquete Prioritaire sur les Conditions de Vie des Menages (EP)
Bolivia	2003	Demographic and Health Survey (DHS)
	2002	Living Standard Measurement Survey (LSMS)
Cote d'Ivoire	1999	Demographic and Health Survey (DHS)
	1998	Enquete de Niveau de Vie des M¶enages (ENV)
Cameroon	2004	Demographic and Health Survey (DHS)
	2001	Enquete Camerounaise auprµes des M¶enages (ECAM)
Colombia	2005	Demographic and Health Survey (DHS)
	2003	Encuesta de Calidad de Vida
Indonesia	2003	Demographic and Health Survey (DHS)
	2000	Demographic and Health Survey (DHS)
Madagascar	1997	Demographic and Health Survey (DHS)
	2001	Enquete auprµes des Menages (EPM)
Mozambique	2003	Demographic and Health Survey (DHS)
	2002	Inquerito Nacional aos Agregados Familiares sobre as Condicoes de Vida
Nicaragua	2001	Demographic and Health Survey (DHS)
	2001	Encuesta Nacional de Hogares sobre Medicion de Nivel de Vida (EMNV)
South Africa	1998	Demographic and Health Survey (DHS)
	2000	Income and Expenditure Survey
Vietnam	2002	Demographic and Health Survey (DHS)
	2004	Living Standard Measurement Survey (LSMS)
Zambia	2002	Demographic and Health Survey (DHS)
	2002	Living Standard Measurement Survey (LSMS)

Country	Year	Type of survey
Industrialized countries		
Australia	2001	Luxembourg Income Study (LIS)
Canada	2000	Luxembourg Income Study (LIS)
Finnland	2000	Luxembourg Income Study (LIS)
France	2000	Luxembourg Income Study (LIS)
Germany	2000	Luxembourg Income Study (LIS)
Italy	2000	Luxembourg Income Study (LIS)
Netherlands	1999	Luxembourg Income Study (LIS)
Poland	1999	Luxembourg Income Study (LIS)
Spain	2000	Luxembourg Income Study (LIS)
Sweden	2000	Luxembourg Income Study (LIS)
USA	2000	Luxembourg Income Study (LIS)