POPULATION STRUCTURE AND THE HUMAN DEVELOPMENT INDEX*

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January 30, 2018

Abstract

This paper provides an alternative way of measuring human development that takes explicitly into account the differences in the countries' population structures. The interest of this proposal stems from two complementary elements. First, that there is an enormous diversity in the population structures of those countries analysed in the Human Development

*The first author acknowledges financial support from project ECO2015-65820-P (MINECO/FEDER,UE) The second author also wishes to acknowledge financial support from Ministerio de Economía, under Project ECO2017-86245-P, as well as Junta de Andalucía un Project SEJ426. The third author acknowledges financial support from the Spanish MEC under project ECO2015-65408-R (MINECO/FEDER).

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Reports, particularly the shares of old people in the population. Second, that demographic characteristics are relevant in the evaluation of development possibilities. We propose to change the way of measuring health, education and material wellbeing, in order to take into account those differences in the population structures. Regarding the health component, we substitute Life Expectancy at Birth by Life Potential (the average life expectancy of the current population); concerning education, we change the average between Mean Years of Schooling and Expected Years of Schooling by the Education Potential (a variable that mimics life potential in this context). As for the material well-being, we propose using the Gross National Income per adult, instead of per capita, while keeping logs in the evaluation. The resulting indicator, called Demographically Adjusted Human Development Index, is the geometric mean of the three new variables suitably normalised. We analyse empirically the effect induced by these changes in the evaluation of human development by comparing this way of measurement with the conventional Human Development Index (HDI) for 168 countries.

Keywords: Human development, health, education, income, life potential, education potential.

JEL Classification: O15, I31

1 Introduction

The United Nations Human Development Index (HDI) is probably the most successful multidimensional welfare indicator elaborated so far. Its construction, following some of the ideas in Sen (1987), is relatively simple and intuitive. It starts by selecting three basic dimensions related to human development, health, education, and material wellbeing. Next, there is a choice of variables that associates empirical data to those dimensions. Finally, the measures of the three dimensions so obtained are aggregated as an average. Besides its ability to capture some of the basic traits of human welfare in an easily understandable way, the HDI has shown a relevant relationship with economic growth (e.g. Suri et al., (2011)).

There has been a vivid discussion on this construct, since its inception in 1990, debating all its features: the number and nature of the selected dimensions, the choice of the variables that approximate those dimensions, and the aggregation procedure. The original HDI was substantially reformulated in 2010 in response to the different critiques and alternative proposals that appeared in the literature. The main changes introduced referred to the way of measuring education, the substitution of the arithmetic mean by the geometric mean as the aggregator function, and the introduction of distributive considerations into the measurement.[1] Needless to say, the new formulation is still subject to criticisms and new alternatives have been proposed (see Seth and Villar (2017a,b) and the references provided there). Fukuda-Parr et al., (2009), for instance, propose to include social rights proxies into de index. Lind (2004) defines the Time Allocation Index (TAI), which considers how people distribute their time on knowledge, long life, and wealth production. Bilbao-Ubillos (2013) proposes a measure that combines a wider variety of variables (such as poverty, gender situation, and personal safety) with a dynamic factor of

[1] There were also substantial changes in the design of some complementary measures, particularly regarding poverty.

human development.

The aim of this paper is to enlarge that discussion by opening a way of introducing the demographic structure in the construction of the human development index. We understand that the design of an indicator of development, which is supposed to focus on capabilities rather than on realizations, should take into account the differences in the population structure. The reason is twofold. First, because the differences in the demographic structure among countries are huge, in particular regarding the shares of young and old people (see the examples in Figure 1 below). And second, because those differences have a bearing on the development capabilities as the population structure clearly affects the capacity of societies to keep or improve their living standards.

The United Nations has shown concern for the effects of demographic changes, in particular regarding population ageing: "Population ageing ... is poised to become one of the most significant social transformations of the twenty-first century, with implications for nearly all sectors of society, including labour and financial markets, the demand for goods and services, such as housing, transportation and social protection, as well as family structures and inter-generational ties." (United Nations (2015), p. 1). Yet, none of the variables selected to measure the three dimensions of human development, health, education and material wellbeing, take into account the demographic structure. Life expectancy at birth, which is the variable associated with health, is an expected value for the new born, independent on the shares of young and old people in the population. Education is approximated by the arithmetic mean of two different variables: the mean years of schooling (the number of years of education achieved by people aged 25 or more) and the expected years of schooling (the number of years of schooling that a child of school entrance age can expect to receive under the prevailing patterns of age-specific enrollment rates). There is no reference to the shares of people aged between 6 and 24, on the one hand, and 25 or

more, on the other, which are relevant to determine the impact of changes in schooling. Finally, material wellbeing is associated with per capita Gross National Income (GNI), in logs, which is a variable that measures present achievements but again ignores the population structure (in particular the share of the working age population).

Our purpose here is to open a discussion on the need of introducing demographic considerations in the measurement of human development. We do so by proposing a variant of the HDI that takes into account the different population structures. This certainly requires introducing alternative ways of measuring the HDI components, even though we earnestly try to minimise the data requirements for the sake of feasibility. Regarding the health dimension we propose to use the variable *life potential* (Pinilla and Goerlich (2003)), which corresponds to the life expectancy of the present population (this is, the average number of life years remaining). Concerning education we shall introduce the notion of *education potential*, which can be regarded as an extension of the idea of life potential to this context. We shall show that this notion can be approximated by a weighted average of MYS and EYS with weights given by the corresponding population shares. Our way of approaching material wellbeing is in terms of the *GNI per adult, in logs* (see the discussion in Herrero et al., (2010), though). Using the adult population rather than the total one incorporates in an elementary way the differences in the population structure and has already become a standard reference in the analysis of wealth distribution (see Shorrocks et al., (2015)). Each of those three variables is normalized as the share of a reference value, in order to get partial indices between zero and one.[2] Finally, the alternative human development index we propose, called Demographically Adjusted Human Development Index (DAHDI, hereafter), is the geometric mean of the three partial indicators.

The rest of the paper is organized as follows. In Section 2 we introduce and justify the new

[2]We depart here from the HDI normalization strategy because the use of max and min goalposts induces some inconsistencies in the aggregation process, as discussed in Herrero et al., (2012).

variables we propose. We shall see that substituting life expectancy at birth by life potential is a major change of perspective, while the other changes have a smaller impact. In Section 3, we formally define the Demographically Adjusted Human Development Index we propose. Section 4 presents the main empirical findings and states the similarities and differences between our proposal and the current HDI. A few final comments are gathered in Section 5.

2 The choice of variables

We assume from the start that human development is associated with the three dimensions included in the HDI, health, education and material wellbeing. One may well argue that other dimensions are needed (e.g. sustainability), but this is not the subject of our discussion. We interpret, though, that human development capabilities are conditioned by the demographics so that any meaningful indicator should take into account this aspect. This approach leads to a choice of the variables associated with those three dimensions that differ from those present in the HDI. We devote this section to present and justify those alternative choices, with the self-imposed restriction of minimising the changes that require additional statistical information.

2.1 Health: life potential.

We propose here to change life expectancy at birth by *life potential* (LEB and LP, respectively, for short). Life potential refers to the average remaining life of a society and thus reflects the average of the life expectancy of the different generations, i.e. this variable discounts that part of the expected life already "used" (see Pinilla and Goerlich (2003)).

Let us present now the formal definition of life potential and then comment on its meaning and implications. For a given country i and age $x \in \mathbb{Z}_+$, let n_i^x denote the number of individuals in

the society i with age x, and let n_i be the total population ($n_i = \sum_{x=0}^{\infty} n_i^x$). If e_x represents the expected numbers of years a person aged x will still live, the *life potential* is given by:

$$\text{LP} = \frac{1}{n_i} \sum_{x=0}^{\infty} n_i^x e_x.$$

The formula makes it clear that life potential takes into account the demographic structure. In contrast, life expectancy at birth simply corresponds to e_0.

The choice of life potential, rather than life expectancy at birth, is motivated by a consistency requirement regarding the philosophical principles behind the HDI (i.e. focusing on capabilities). To see this note that life expectancy at birth is a variable constructed in such a way that it turns out to be independent on the demographic structure.[3] As a consequence, it typically gives high scores in the health component to those countries with a higher share of old people. This last aspect is most arguable in the context of evaluating development capabilities because it ignores the differences in the working age population and, consequently, in the actual capacity of the labour force. Life potential, on the contrary, indicates the remaining years of life of a representative individual of the society, and therefore, takes into account both life expectancy and the demographic composition.

The difference between both concepts can be illustrated by the following analogy. We can think of life years as the matches in a matchbox. Life expectancy at birth tells us how many matches you get when receiving a new matchbox in a given country, while life potential tells us how many matches you would find in the matchbox held by an average citizen.

It is not difficult to foresee that this change of variable will typically penalise those developed countries with high values of life expectancy at birth but with a large proportion of old people. And vice-versa: countries with a wider base in their population pyramids will get a better score in this dimension. The final effect will clearly depend on the relative differences in life expectancy

[3] This is so for a reason: avoiding the composition effect that derives from the use of mortality rates.

values and population structures by age. One would also expect to find high correlation between LEB and LP in countries with a similar population structure.

Figure 1 shows the population pyramids for six illustrative cases, whose life expectancy at birth is given in parentheses: Germany (80.9), Honduras (73.1), India (68), Japan (83.5), Nigeria (52.8), and United States (79.1). Comparing these data with the population structures in Figure 1 makes it clear that measuring life expectancy at birth or life potential is going to be very important regarding the picture we get from the relative situation of the different countries.

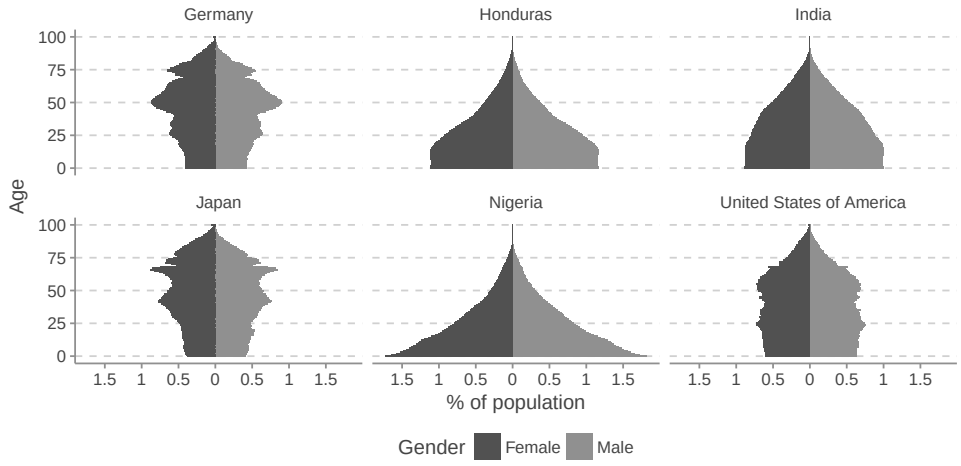

Figure 1: Population pyramids of several countries in 2015.

In order to calculate the life potential we combine the data from two sources. The World Health Organization provides the life expectancy for each gender and group of age.[4] The US Census Bureau database contains the countries population by single year of age and gender. Following the definition above, we compute the life potential as the population-weighted sum of the life expectancy of the people within each age range. All data refer to year 2015. Table 1 shows the main statistics for both variables.[5]

[4]The groups are: [0,1], [2,4], [5,9], [10,14], ..., [95,99], [100,∞].

[5]For the LEB we have used the data provided by United Nations for 2015.

Statistic	LP	LEB
Min	37.4	49.0
Median	47.5	73.4
Mean	46.9	71.4
Max.	54.9	85.3
Coeff. of Variat.	0.08	0.11

Table 1: Descriptive statistics for LP and LEB.

The coefficient of variation is higher in the LEB (0.11) than in the LP (0.08), that is, countries are slightly more heterogeneous with respect to the life expectancy at birth than with respect to the life potential. The relative range of values (maximum minus minimum over the mean) for LEB is also larger in LEB (0.51) than in LP (0.37). We complete the comparison by showing that LP and LEB are not correlated at all ($\rho = -0.05$).[6]

[6]Even though the LP and the LEB are not correlated, when we restrict to particular areas like Europe we observe that both variables are related ($\rho = 0.82$).

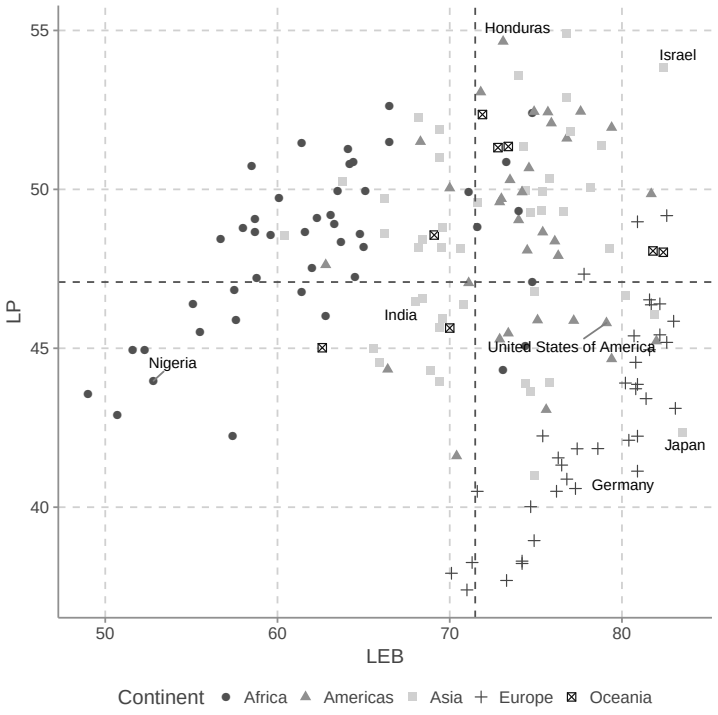

Figure 2: Correlation between LP and LEB.

In Figure 2 each dot represents a country, whose colour and shape depend on the continent to which the country belongs to. The LEB is on the horizontal axis and the life potential is on the vertical one. The dashed lines indicate the mean of each variable. As we can observe, most of the European countries have very high life expectancy at birth but rather low life potential. This is because they have aged populations and, in many cases, their demographic structure looks like Germany in Figure 1. The situation of Africa, for instance, is very different: almost all African countries are below the LEB mean, whereas most of them perform better than the world's LP average.

Table 5 details the results for all the countries in the dataset. Countries are sorted according to its life potential. The fourth and fifth columns refer to their position in the ranking for the life potential and life expectancy at birth, respectively. As we can observe, the differences are important. Some of the European countries that perform really well with respect to the

life expectancy at birth go down more than 100 positions in the LP ranking. Japan (first in LEB) is in the 146th position for LP, the biggest jump. On the opposite side, many American countries perform much better in life potential than in life expectancy at birth. Honduras, Guatemala, or Panama occupy top positions in the ranking, together with other countries of the Arabian peninsula like Oman or Jordan. The case of Israel is special, it seems to get a good balance between life expectancy at birth and life potential, performing significantly well in both measures.

2.2 Education: education potential.

The HDI measures educational achievements as the simple average of the mean years of schooling (MYS) and the expected years of schooling (EYS). The MYS is the average number of years of education received by people aged 25 and older, converted from education attainment levels using official duration of each level. The EYS is the number of years of schooling that a child of school entrance age is expected to obtain under the prevailing patterns of age-specific enrolment rates. We have already mentioned that using the simple arithmetic mean between both components amounts to disregarding the population structure. Note that the impact on the development capabilities of this variable depends very much on the share of people between 6 and 25 in the whole population.

We can apply here a similar approach to that used for the health variable and define the *education potential* by analogy. This would require computing the educational achievements of the different cohorts of people above 25 and estimates of the expected years of schooling of those between 6 and 24. Getting the data to compute this value is going to be extremely difficult, if not impossible, for many countries. Yet we can get a reasonable approximation. For those above 25 we keep the MYS as a good proxy of their achievements in education, while for the population

below 24 we use a weighted version of the EYS (called WEYS), which takes into account the population structure and the school life expectancies within each of the three education levels (primary, secondary, and tertiary).

We explain now the construction of the WEYS. For a given country i, let us consider the following variables:[7]

- EAP_i: Entrance age to primary education (age)
- TDP_i: Theoretical duration of primary education (number of years).
- TDS_i: Theoretical duration of secondary education (number of years).
- SEP_i: School life expectancy within primary education (number of years).
- SES_i: School life expectancy within secondary education (number of years).
- SET_i: School life expectancy within tertiary education (number of years).
- ERP_i: Enrollment in primary education (number of students).
- ERS_i: Enrollment in secondary education (number of students).
- ERT_i: Enrollment in tertiary education (number of students).

From these, we can obtain other variables required for the computation of the WEYS.

- EAS_i: Entrance age to secondary education

$$\text{EAS}_i = \text{EAP}_i + \text{TDP}_i$$

[7]For the MYS we have used the data from the United Nations in 2015. The rest of the variables are obtained from the dataset the UNESCO Institute for Statistics provided by the World Bank, and, for each country, they refer to the last available data in the database. As in the case of health, the data on the population are obtained from the US Census Bureau.

- EAS_i: Entrance age to tertiary education

$$\text{EAT}_i = \text{EAS}_i + \text{TDS}_i$$

- EYST_i: Expected years of foreseen education of a person that starts the tertiary level.

$$\text{EYST}_i = \text{SET}_i$$

- EYSS_i: Expected years of foreseen education of a person that starts the secondary level.

$$\text{EYSS}_i = \text{SES}_i + \frac{\text{ERT}_i}{\text{ERT}_i} \cdot \text{SET}_i$$

- EYSP_i: Expected years of foreseen education of a person that starts the primary level.

$$\text{EYSP}_i = \text{SEP}_i + \frac{\text{ERS}_i}{\text{ERP}_i} \cdot \text{SES}_i + \frac{\text{ERS}_i}{\text{ERP}_i} \cdot \frac{\text{ERT}_i}{\text{ERS}_i} \cdot \text{SET}_i$$

If $n_i^{[a,b]}$ denotes the population of country i with ages between a and b, the *weighted expected years of schooling* (WESY) is given by:

$$\text{WEYS}_i = \frac{1}{n_i^{[\text{EAP}_i,24]}} \left[n_i^{[\text{EAP}_i,\text{EAS}_i-1]} \cdot \text{EYSP}_i + n_i^{[\text{EAS}_i,\text{EAT}_i-1]} \cdot \text{EYSS}_i + n_i^{[\text{EAT}_i,24]} \cdot \text{EYST}_i \right]$$

To sum up, the WEYS is a proxy of the years of education an individual that ages between the school entrance age and 24 expects to get.

Following the same reasoning as in the previous section, we define the education potential as the weighted average of the educational achievements of people above 25 (the MYS) and the expectancy of those below 25 (the WEYS). The weights are given by the corresponding population shares. This construct provides a much better measure of the impact of the changes in educational achievements as it implicitly incorporates a reference to the velocity with which those changes are going to spread. The formal expression of the *education potential* is:

$$\text{EP}_i = \frac{1}{n_i^{[\text{EAP}_i,+\infty]}} \left[n_i^{[\text{EAP}_i,24]} \cdot \text{WEYS}_i + n_i^{[25,+\infty]} \cdot \text{MYS}_i \right]$$

In order to make a proper comparison between our proposal and the variables used by the United Nations, we construct the corresponding partial indices. Notice that we need those partial indices because, unlike the case of health, in the HDR the education component consists of two parts (MYS and EYS).

$$\mathrm{EI}_{\mathrm{UN}} = \frac{1}{2}\left[\frac{\mathrm{MYS}}{15} + \frac{\mathrm{EYS}}{18}\right]$$

and

$$\mathrm{EI} = \frac{\mathrm{EP}}{13}$$

For the normalization of the MYS and EYS we keep the upper bounds of Jahan (2015), while for the EP we use 13. Table 2 shows the main statistics for both variables.

Statistic	EYS	MYS	EP
Min	4.1	1.4	1.8
Median	13.3	8.5	7.5
Mean	13.0	8.2	7.2
Max.	20.2	13.1	12.3
Coeff. of Variat.	0.21	0.37	0.37

Table 2: Descriptive statistics for EYS, MYS, and EP.

As we did for the health component, Figure 3 illustrates the relationship between $\mathrm{EI}_{\mathrm{UN}}$ and EI. Each dot represents a country, whose colour and shape depend on the continent to which the country belongs. The $\mathrm{EI}_{\mathrm{UN}}$ is on the horizontal axis and the EI is on the vertical one. The dashed lines indicate the mean of each variable. Unlike the case of health, the two ways of measuring the education component exhibit a very high correlation ($\rho = 0.97$). Hence, European

countries perform well in both indicators (they are above the average), while the achievements of Africa are poor for any of the measures (below the average in both cases).

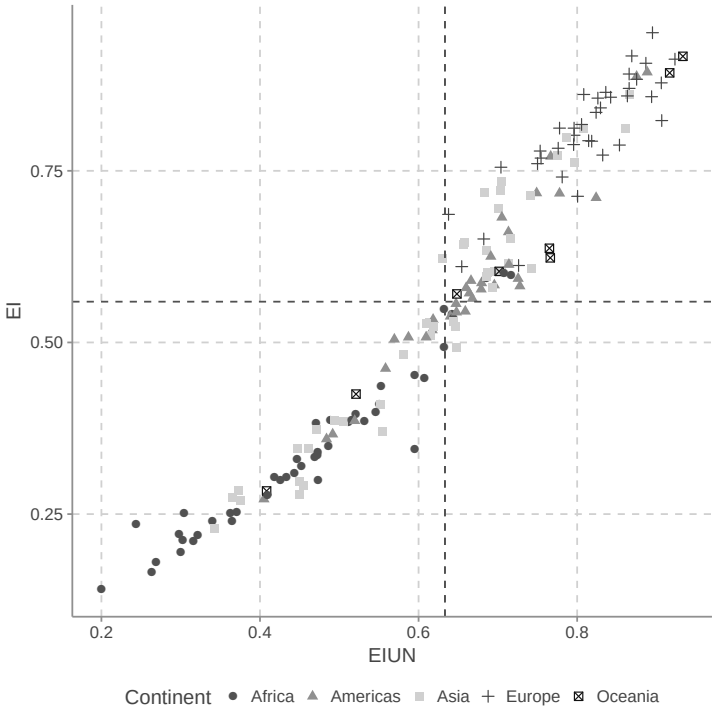

Figure 3: Correlation between EI and EI_{UN}.

Table 6 lists all the countries, ordered according to the education indicator EI. The first column refers to the country. The second, third, and fourth columns refer to the EP, EYS, and MYS, respectively. Columns sixth and seventh are for the EP and EI_{UN}. Columns eighth and ninth refer to the position in the raking according to EP and EI_{UN}, while the last column is the difference between those positions. The changes are not as relevant as in the case of health. Countries both at the very top and at the very bottom do not exhibit big jumps, thus, in general, if they perform well or bad for one indicator they also do it for the other. But still, from a conceptual point of view, the EP is more consistent with the interpretation of the human development index as a measure of the current welfare of a society by means of the achievements of a presentative individual.

2.3 Income: GNI per adult

Our proposal regarding the variable to approach material wellbeing is taking the Gross National Income per adult, rather than per capita. This is a relatively simple way of incorporating the demographic structure when the information on the size and composition of households is not available for all countries. This approach has been successfully applied to the analysis of wealth distribution (see Shorrocks et al., (2015)).

Making income or wealth comparisons between countries with different population sizes and structures puts always the question of how to choose the appropriate units of analysis. There is some consensus on the use households adjusted by size and composition by recurring to some equivalence scale (see Harttgen and Klasen (2012) for an application to the HDI). When information on households is not available, or membership cannot be clearly ascertained, or household structures are very different, one may consider preferable refer the analysis to the individuals, rather than to the households. The most common option is taking per capita values. Using the adult population, instead of the whole population, seems preferable to us for two main reasons. First, because it permits taking into account in a very simple way the demographic differences. And second, because the command over the family resources is typically in the hands of the adults and the children have little decision power.

Statistic	GNIpa	GNIpc
Min	1095	581
Median	15920	10980
Mean	22840	16820
Max.	144200	123100
Coeff. of Variat.	0.98	1.06

Table 3: Descriptive statistics for GNI per adult and per capita.

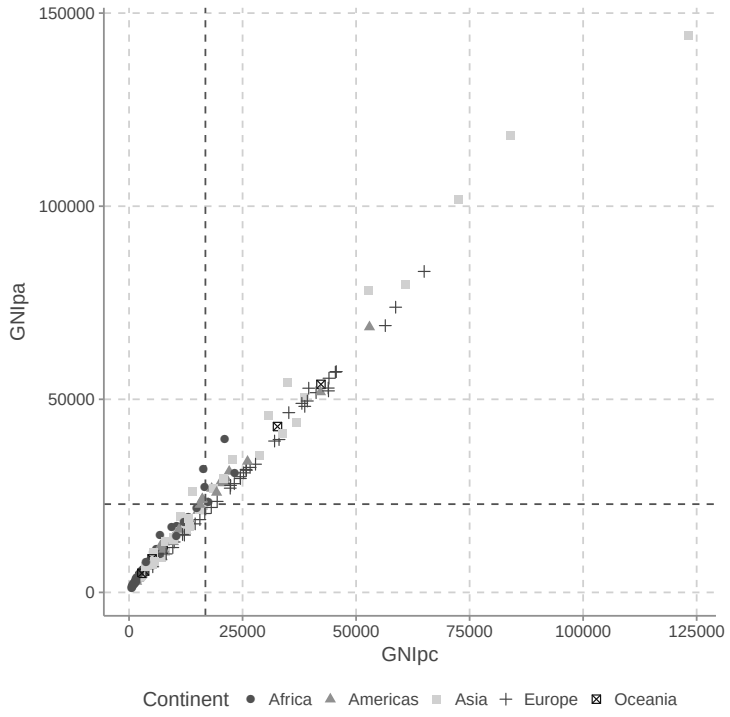

Figure 4: Correlation between the GNI per adult and per capita.

There are not important changes in the ordering of countries when we substitute the GNI per capita by the GNI per adult, and the big jumps are scarce. This is far from unexpected, due to the large dispersion of those values. The details on these variables and their rankings are in Table 7.

3 The alternative human development index.

In the previous section we have introduced the variables we propose to measure the achievements in each of the three dimensions that the HDI considers. Regarding health, we propose using life potential rather than life expectancy at birth. With respect to education, we consider using the education potential, rather than the arithmetic mean between the EYS and the MYS. Finally, we opt to approach material wellbeing in terms of GNI per adult, without logs, rather than GNI per capita. Let us now present the closed formula of the *Demographically Adjusted Human Development Index*, DAHDI.

$$\text{DAHDI} = \left[\frac{\text{LP}}{56} \cdot \frac{\text{EP}}{13} \cdot \frac{\log(\text{GNIpa})}{\log(85000)}\right]^{\frac{1}{3}}$$

in contrast with the human development index used by United Nations

$$\text{HDI} = \left[\frac{\text{LEB} - 20}{85 - 20} \cdot \frac{1}{2}\left(\frac{\text{EYS}}{18} + \frac{\text{MYS}}{15}\right) \cdot \frac{\log(\text{GNIpc}) - \log(100)}{\log(75000) - \log(100)}\right]^{\frac{1}{3}}.$$

There are two aspects worth mentioning when comparing the DAHDI and the conventional HDI. First, that both measures share the same aggregation formula (a geometric mean). The advantage of the geometric mean vis a vis the arithmetic mean is already well established (see for instance Herrero et al., (2010)). So, our proposal does not differ in this respect from the current HDI. Second, that both formulae differ in their normalization strategies. As shown in Herrero et al., (2012), the normalization applied in the HDI to health and income leads to significant drawbacks, mostly due to the use of lower bounds that may artificially alter the raking of the countries. We only use, therefore, the max values to normalize each variable.

Statistic	HDI	DAHDI
Min	0.34	0.44
Median	0.72	0.75
Mean	0.69	0.72
Max.	0.94	0.91
Coeff. of Variat.	0.21	0.15

Table 4: Descriptive statistics HDI and DAHDI.

The numerical results and comparisons are detailed in Table 8, where the first column is the country, the columns two, three, and four are for the partial indices of health $\left(\text{HI} = \frac{\text{LP}}{56}\right)$, education $\left(\text{EI} = \frac{\text{EP}}{13}\right)$, and income $\left(\text{YI} = \frac{\text{GNIpa}}{85000}\right)$, respectively. The fifth and the sixth columns correspond to the DAHDI and the HDI. Finally, columns seven, eight, and nine describe the position of the country according to the DAHDI, the HDI, and the changes in the ranking.

Our first finding is that the DAHDI and the HDI are ordinaly different. Beyond the mere observation of the changes in the orderings in Table 8, both the Kendall's τ-test and the Spearman's ρ-test (with p-values smaller than $2.2 \cdot 10^{-16}$ in both cases) indicate that the introduction of the population structure in the human development index has a significant impact on the countries ranking. Note that there are countries such as Norway, Switzerland, USA, or Australia that perform quite well in both indices. Yet, there are other countries whose population structures impact more deeply in their human development. This is the case of Spain, Italy, and Greece (all of them in the south of Europe with many socio-economic similarities) that go down in the ranking more than 12 positions. Portugal is an extreme case, since it losses 39 positions, the biggest jump down.

Figure 5 presents the distribution of the DAHID and the HDI, normalizing to one the highest value achieved by a country with each index. Note that here the same point in the horizontal axis may correspond to different countries, depending on the chosen index. The graphic shows a different picture of the distribution of the development levels, depending on the indicator. We observe that the relative level of human development of the most developed countries does not change very much from one to other indicator. Those countries with medium or low level of development, though, exhibit relevant differences. Also note that the DAHDI shrinks the distribution, with the result that the least developed country represents 47.6% of the most developed one, whereas in the case of the HDI this figure is a 36.8%.

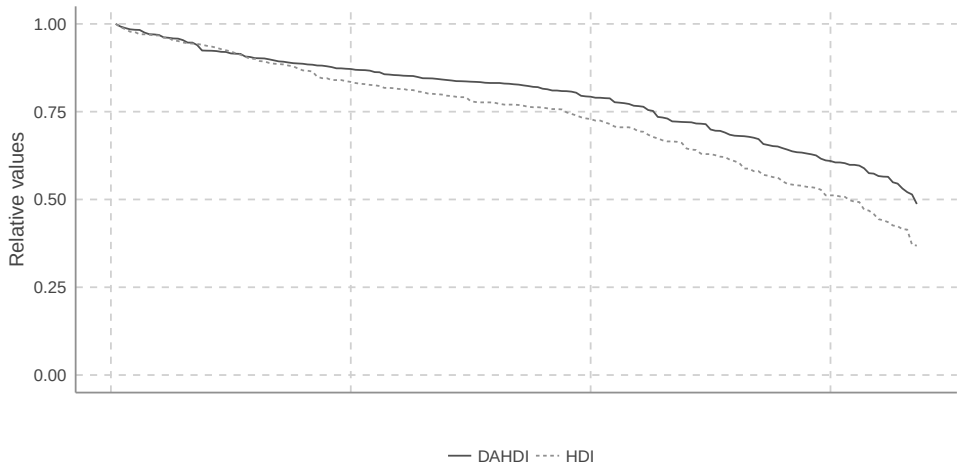

Figure 5: Relative distributions of the DAHDI and the HDI.

We plot in Figure 6 the cumulative distribution of both indices. We observe that the left and right tails are shorter for the HDI than for the DAHDI, which indicates that: (a) There are more countries with a poor performance in the HDI than in the DAHDI (absolute zeros excluded); and (b) Less countries achieve the highest level of human development with the HDI than with the DAHDI. This figure also illustrates that the distribution of values is more even (almost constant marginal increments) in the case of the standard HDI.

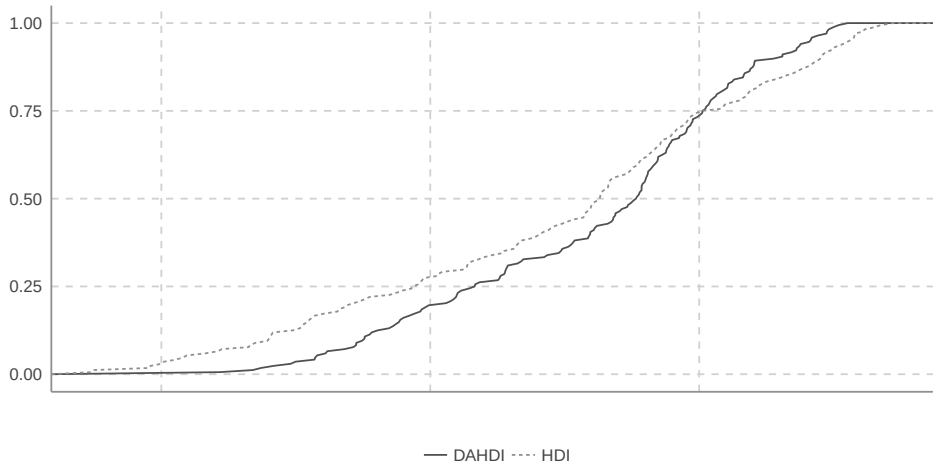

Figure 6: Cumulative distributions of the DAHDI and the HDI.

3.1 Cluster analysis

We complete our study by classifying the countries into four different categories according to their level of human development, as the United Nations does. Yet, we follow Abad-González and Martínez (2016) and apply clustering techniques to this task, not imposing any a priory grouping (the Human Development Reports consider an exogenous classification). Generally speaking, clustering methods are based on identifying a partition of observations such that observations within each cluster or group are as similar as possible and observations between different clusters or groups are as dissimilar as possible. We use a hierarchical method, in particular we apply the Ward algorithm discussed by Kaufman and Rousseeuw (1990) and Legendre and Legendre (2012). This method collapses, at each stage, the two clusters whose union minimizes the distance to any other third cluster. The results are in Tables 9 (for DAHDI) and 10 (for HDI) below.

We observe that the set of high human development countries is much larger for the DAHDI than for the HDI. We also find that there are fewer hight and medium development countries

according to the DAHDI. The low tail of the distribution does not exhibit significant changes. Not surprisingly, some countries change of group. Portugal, for instance, moves from high development in HDI to medium development in DAHDI. Other countries, such as Turkey or Cameroon, upgrade their category.

4 Final remarks

We have presented in this paper the *demographically adjusted human development index* (DAHDI). This new measure stems from the basic consideration that a welfare index that follows the capability approach should take into account the population structures, as it aims at capturing not only achievements but also possibilities. A summary inspection of the data shows that there are countries with similar achievements but with rather different balance of young and old people in their populations, thus confronting very different paths to keeping or improving welfare.

Our proposal is decidedly a very conservative one. Indeed, we suggest very minor changes to the current HDI. We keep the three key dimensions of human development (health, education and material well-being) and we also maintain the aggregation formula (the geometric mean of the partial indices). The new variables we choose to approximate each dimension are very close to the conventional ones. Regarding the health component, we move from life expectancy at birth (LEB) to life potential (LP). For education we change the average between mean years of schooling (MYS) and expected years of schooling (EYS) by the education ootential (EP). As for the material well-being variable, we simply substitute the GNI per capita for the GNI per adult, keeping logs in the evaluation. Finally, we slightly changed the normalization strategy to avoid some possible inconsistencies. This strategy reduces the informational cost of implementing this new indicator and makes it easier to compare it with the conventional HDI.

Needless to say, this is not the only way of introducing the demographic structure in the measurement of human development. Yet this is a consistent approach of doing it and it is to be interpreted as an initial platform to open the discussion on the role of the demographic differences in the evaluation. The empirical analysis presented shows clearly that even those relatively minor changes induce substantial alterations of the overall index. Demographers tend to consider three different population structures, in terms of the shape of the corresponding population pyramids. The first one is the expansive type, which corresponds to societies with larger shares of young people in the population. This type of age-sex distribution takes the form of a true pyramid and is usually found in countries with very large fertility rates and lower than average values or life expectancy at birth. The age-sex distributions of many less developed countries display expansive population pyramids. The second one is the constrictive type, characterized by low shares of young people in the population and results in a sort of rhomboidal distribution. European countries, such as Greece, Italy, Portugal, Spain or Switzerland fall into this type of pyramid. The last type is that of a stationary or near-stationary population pyramid, that present a rectangular shape (even though there are always smaller figures for the oldest age groups). The age-sex distributions of some European countries, especially Scandinavian ones, as well as the United States, fall into this category.

The effect of different types of population pyramids on the variables chosen is quite apparent. Take the case of the comparison between LEB and LP. We find countries with similar LEB but different types of pyramids that yield very different LP. A case in point is that of Israel (with an expansive pyramid) and Australia (with a near-stationary pyramid); both have the same LEB, 82.4, but they have very different LP (53.8 and 48.0, respectively). Regarding the LEB they are both in position 6 in the ranking, while regarding LP they occupy positions 3 and 83, respectively. Japan, with a constrictive pyramid, has a LEB of 83.5 years and a LP of 42.3, dropping from the first position in terms of LEB to position 146 in terms of LP. As for

the income component, we may consider Azerbaijan (with a near-stationary pyramid), Belarus (with a constrictive one), and Gabon (with an expansive pyramid). They have a GNI per capita of 16676, 16428, and 16367, respectively, occupying positions 57, 60 and 61. Their GNI per adult are 22470.90, 20426.92, and 31948.94, that puts them at the 63, 68, and 37 positions, respectively.

Figure 7: Population pyramids of several countries in 2015.

We find that countries with expansive population pyramids do better in terms of LP than in terms of LEB, and obtain better scores with the new way of measuring human development. The contrary happens for those countries with constrictive population pyramids (something that can also be observed, with less intensity, for countries with near-stationary pyramids). The introduction of the population structure in the education variable has little effect (EP is highly correlated with EI), but its introduction has been made for consistency reasons (see Lutz and KC (2013) for a discussion).

Let us point out that this approach to human development helps paying attention to the consequences of an aging population. This does not mean that we consider that countries with older populations have less chances of economic progress or that countries with high fertility rates

are better positioned.[8] Yet the shares of young and old people in the population are relevant variables for a sustainable development. Ignoring the existing differences in those variables provides a distorted view of human development, making some developed countries look artificially better.

Also note that this approach induces a positive view of immigration in those countries with constrictive population pyramids as it typically improves the share of young people in the population and the size of the labor force. Immigration may translate into positive effects for the recipient countries, both regarding LP and GNI per adult.

[8]Population ageing is an important phenomenon with many implications to be taken into account, but this does not mean that there is a negative relationship between ageing and economic growth (see Bloom et al., (2010), Maestas et al., (2016), Acemoglu and Restrepo (2017)).

References

Abad-González, J. and Martínez, R. (2016). Endogenous categorization of the human development. *Applied Economics Letters*, 24:243–246.

Acemoglu, D. and Restrepo, P. (2017). Secular stagnation? The effect of aging on economic growth in the age of automation. *NBER Working Papers*, 23077.

Bilbao-Ubillos, J. (2013). Another Approach to Measuring Human Development: The Composite Dynamic Human Development Index. *Social Indicators Research*, 111:473–484.

Bloom, D. E., Canning, D., and Fink, G. (2010). Implications of population ageing for economic growth. *Oxford Review of Economic Policy*, 26:583–612.

Fukuda-Parr S., Lawson-Remer, T., and Randolph, S. (2009). An Index of Economic and Social Rights Fulfillment: Concept and Methodology. *Journal of Human Rights*, 8:195–221.

Harttgen, K. and Klasen, S. (2012). A household-based human development index. *World Development*, 40:878–899.

Herrero, C., Martínez, R., and Villar, A. (2010). Multidimensional social evaluation: An application to the measurement of human development. *Review of Income and Wealth*, 56:483–497.

——— (2012). A newer human development index. *Journal of Human Development and Capabilities*, 13:247–268.

Jahan, S. (2015). *Human Development Report 2015*. United Nations.

Kaufman, L. and Rousseeuw, P. (1990). Finding Groups in Data: An Introduction to Cluster Analysis. Wiley

Legendre, P. and Legendre, L. (2012). Numerical Ecology. Elsevier.

Lind, N. (2010). Values Reflected in the Human Development Index. *Social Indicators Research*, 66:283–293.

Lutz, W. and KC, S. (2013). Demography and human development: Education and population projections. *Occasional Paper UNDP Human Development Report Office*, 4.

Maestas, N., Mullen, K., and Powell, D. (2016). The effect of population aging on economic growth, the labor force and productivity. *NBER Working Papers*, 22452.

Pinilla, R. and Goerlich, F. (2003). Renta per cápita y potencial de calidad de vida (QLP) en España (1981-1999). *Working Paper IVIE*, 2.

Sen, A. (1987). *Commodities and Capabilities*. Oxford University Press.

Seth, S. and Villar, A. (2017a). Human development, inequality and poverty: Empirical findings. In C. D'Ambrosio, editor, *Handbook of Research on Economic and Social Wellbeing*. Edward Elgar.

——— (2017b). The measurement of human development and poverty. In C. D'Ambrosio, editor, *Handbook of Research on Economic and Social Wellbeing*. Edward Elgar.

Shorrocks, A., Davies, J., and Lluberas, R. (2015). *Global wealth report 2015*. Crédite Suisse, Zurich.

Suri, T., Boozer, M. A., Ranis, G., and Stewart, F. (2011). Paths to success: The relationship between human development and economic growth. *World Development*, 39:506–522.

United Nations (2015). *World Population Ageing 2015*. UN Department of Economic and Social Affairs, Population Division.

Appendix A. Tables.

Country	LP	LEB	Rank_{LP}	Rank_{LEB}	Diff. rankings
Oman	54.9	76.8	1	44	43
Honduras	54.7	73.1	2	90	88
Israel	53.8	82.4	3	6	3
Jordan	53.6	74.0	4	82	78
Guatemala	53.1	71.8	5	96	91
Maldives	52.9	76.8	6	44	38
Sao Tome and Principe	52.6	66.5	7	126	119
Panama	52.5	77.6	8	37	29
Nicaragua	52.4	74.9	9	64	55
Jamaica	52.4	75.7	10	55	45
Algeria	52.4	74.8	11	68	57
Vanuatu	52.4	71.9	12	95	83
Timor-Leste	52.3	68.2	13	122	109
Ecuador	52.1	75.9	14	52	38
Costa Rica	51.9	79.4	15	30	15
Iraq	51.9	69.4	16	114	98
United Arab Emirates	51.8	77.0	17	41	24
Mexico	51.6	76.8	18	44	26
Bolivia (Plurinational State of)	51.5	68.3	19	121	102
Senegal	51.5	66.5	20	126	106
Niger	51.5	61.4	21	150	129
Brunei Darussalam	51.4	78.8	22	33	11
Saudi Arabia	51.4	74.3	23	77	54
Samoa	51.3	73.4	24	86	62
Tonga	51.3	72.8	25	94	69
Ethiopia	51.3	64.1	26	138	112
Tajikistan	51.0	69.4	27	114	87

Country	LP	LEB	Rank_{LP}	Rank_{LEB}	Diff. rankings
Gabon	50.9	64.4	28	136	108
Cabo Verde	50.9	73.3	29	88	59
Rwanda	50.8	64.2	30	137	107
Uganda	50.7	58.5	31	158	127
Peru	50.7	74.6	32	72	40
Viet Nam	50.3	75.8	33	54	21
Dominican Republic	50.3	73.5	34	84	50
Yemen	50.2	63.8	35	139	104
Qatar	50.1	78.2	36	35	-1
Belize	50.0	70.0	37	108	71
Madagascar	50.0	65.1	38	132	94
Sudan	50.0	63.5	39	141	102
Kuwait	50.0	74.4	40	75	35
Iran (Islamic Republic of)	49.9	75.4	41	58	17
Venezuela (Bolivarian Republic of)	49.9	74.2	42	79	37
Egypt	49.9	71.1	43	102	59
Chile	49.9	81.7	44	14	-30
Zambia	49.7	60.1	45	153	108
Pakistan	49.7	66.2	46	128	82
El Salvador	49.7	73.0	47	91	44
Paraguay	49.6	72.9	48	92	44
Bangladesh	49.6	71.6	49	98	49
Turkey	49.3	75.3	50	60	10
Morocco	49.3	74.0	51	82	31
Bahrain	49.3	76.6	52	46	-6
Malaysia	49.3	74.7	53	70	17
Mauritania	49.2	63.1	54	143	89
Iceland	49.2	82.6	55	4	-51
Congo	49.1	62.3	56	147	91

Country	LP	LEB	Rank_{LP}	Rank_{LEB}	Diff. rankings
Democratic Republic of the Congo	49.1	58.7	57	156	99
Colombia	49.0	74.0	58	82	24
Ireland	49.0	80.9	59	20	-39
Comoros	48.9	63.3	60	142	82
Libya	48.8	71.6	61	98	37
Nepal	48.8	69.6	62	110	48
Mali	48.8	58.0	63	159	96
Burkina Faso	48.7	58.7	64	156	92
Bahamas	48.7	75.4	65	58	-7
Kenya	48.7	61.6	66	149	83
Lao Peoples Democratic Republic	48.6	66.2	67	128	61
Namibia	48.6	64.8	68	134	66
Benin	48.6	59.6	69	154	85
Micronesia (Federated States of)	48.6	69.1	70	117	47
Afghanistan	48.6	60.4	71	152	81
Burundi	48.4	56.7	72	163	91
Cambodia	48.4	68.4	73	120	47
Antigua and Barbuda	48.4	76.1	74	51	-23
Eritrea	48.3	63.7	75	140	65
United Republic of Tanzania	48.2	65.0	76	133	57
Bhutan	48.2	69.5	77	112	35
Philippines	48.2	68.2	78	122	44
Kyrgyzstan	48.2	70.6	79	105	26
Lebanon	48.2	79.3	80	31	-49
Brazil	48.1	74.5	81	73	-8
New Zealand	48.1	81.8	82	12	-70
Australia	48.0	82.4	83	6	-77
Argentina	47.9	76.3	84	48	-36
Haiti	47.6	62.8	85	144	59

Country	LP	LEB	Rank_{LP}	Rank_{LEB}	Diff. rankings
Djibouti	47.5	62.0	86	148	62
Albania	47.3	77.8	87	36	-51
Botswana	47.2	64.5	88	135	47
Guinea	47.2	58.8	89	155	66
Tunisia	47.1	74.8	90	68	-22
Suriname	47.1	71.1	91	102	11
Zimbabwe	46.8	57.5	92	161	69
Sri Lanka	46.8	74.9	93	64	-29
Ghana	46.8	61.4	94	150	56
Cyprus	46.7	80.2	95	28	-67
Uzbekistan	46.6	68.4	96	120	24
Norway	46.5	81.6	97	16	-81
India	46.5	68.0	98	124	26
Mozambique	46.4	55.1	99	165	66
France	46.4	82.2	100	8	-92
Azerbaijan	46.4	70.8	101	104	3
Luxembourg	46.4	81.7	102	14	-88
Republic of Korea	46.1	81.9	103	11	-92
Malawi	46.0	62.8	104	144	40
Syrian Arab Republic	45.9	69.6	105	110	5
Saint Lucia	45.9	75.1	106	62	-44
Equatorial Guinea	45.9	57.6	107	160	53
Uruguay	45.9	77.2	108	40	-68
Switzerland	45.9	83.0	109	3	-106
United States of America	45.8	79.1	110	32	-78
Mongolia	45.7	69.4	111	114	3
Fiji	45.6	70.0	112	108	-4
Cameroon	45.5	55.5	113	164	51
Grenada	45.5	73.4	114	86	-28

Country	LP	LEB	Rank_{LP}	Rank_{LEB}	Diff. rankings
Sweden	45.4	82.2	115	8	-107
United Kingdom	45.4	80.7	116	24	-92
Saint Vincent and the Grenadines	45.3	72.9	117	92	-25
Canada	45.2	82.0	118	10	-108
Spain	45.2	82.6	119	4	-115
Mauritius	45.1	74.4	120	75	-45
Papua New Guinea	45.0	62.6	121	146	25
Turkmenistan	45.0	65.6	122	131	9
Angola	45.0	52.3	123	167	44
Chad	45.0	51.6	124	168	44
Netherlands	45.0	81.6	125	16	-109
Cuba	44.7	79.4	126	30	-96
Malta	44.6	80.6	127	25	-102
Belgium	44.6	80.8	128	22	-106
Myanmar	44.5	65.9	129	130	1
Guyana	44.3	66.4	130	127	-3
Seychelles	44.3	73.1	131	90	-41
Indonesia	44.3	68.9	132	118	-14
Nigeria	44.0	52.8	133	166	33
Kazakhstan	44.0	69.4	134	114	-20
China	43.9	75.8	135	54	-81
Denmark	43.9	80.2	136	28	-108
Thailand	43.9	74.4	137	75	-62
Portugal	43.9	80.9	138	20	-118
Finland	43.7	80.8	139	22	-117
Armenia	43.6	74.7	140	70	-70
Swaziland	43.6	49.0	141	171	30
Austria	43.4	81.4	142	17	-125
Italy	43.1	83.1	143	2	-141

Country	LP	LEB	Rank_{LP}	Rank_{LEB}	Diff. rankings
Barbados	43.1	75.6	144	56	-88
Central African Republic	42.9	50.7	145	169	24
Japan	42.3	83.5	146	1	-145
The former Yugoslav republic of Macedonia	42.2	75.4	147	58	-89
South Africa	42.2	57.4	148	162	14
Greece	42.2	80.9	149	20	-129
Slovenia	42.1	80.4	150	26	-124
Czech Republic	41.8	78.6	151	34	-117
Poland	41.8	77.4	152	38	-114
Trinidad and Tobago	41.6	70.4	153	106	-47
Slovakia	41.6	76.3	154	48	-106
Bosnia and Herzegovina	41.3	76.5	155	47	-108
Germany	41.1	80.9	156	20	-136
Georgia	41.0	74.9	157	64	-93
Estonia	40.9	76.8	158	44	-114
Croatia	40.6	77.3	159	39	-120
Montenegro	40.5	76.2	160	50	-110
Republic of Moldova	40.5	71.6	161	98	-63
Romania	40.0	74.7	162	70	-92
Hungary	39.2	75.2	163	61	-102
Serbia	38.9	74.9	164	64	-100
Lesotho	38.6	49.8	165	170	5
Latvia	38.3	74.2	166	79	-87
Belarus	38.3	71.3	167	100	-67
Bulgaria	38.2	74.2	168	79	-89
Russian Federation	37.9	70.1	169	107	-62
Lithuania	37.7	73.3	170	88	-82
Ukraine	37.4	71.0	171	103	-68

Country	LP	LEB	Rank_{LP}	Rank_{LEB}	Diff. rankings

Table 5: Values and rankings for life potential and life expectancy at birth.

Country	EP	EYS	MYS	EI	EI_{UN}	R_{EI}	$R_{EI_{UN}}$	Diff. ranking
Germany	12.4	16.5	13.1	0.951	0.895	1	6	5
Lithuania	11.9	16.4	12.4	0.917	0.869	2	12	10
Australia	11.9	20.2	13.0	0.917	0.933	3	1	-2
Denmark	11.9	18.7	12.7	0.913	0.923	4	2	-2
United Kingdom	11.8	16.2	13.1	0.907	0.887	5	9	4
United States of America	11.6	16.5	12.9	0.894	0.888	6	8	2
New Zealand	11.6	19.2	12.5	0.893	0.917	7	3	-4
Switzerland	11.6	15.8	12.8	0.891	0.866	8	14	6
Canada	11.5	15.9	13.0	0.887	0.875	9	10	1
Estonia	11.5	16.5	12.5	0.883	0.875	10	10	0
Norway	11.4	17.5	12.6	0.878	0.906	11	5	-6
Czech Republic	11.3	16.4	12.3	0.870	0.866	12	15	3
Belarus	11.2	15.7	12.0	0.864	0.836	13	20	7
Republic of Korea	11.2	16.9	11.9	0.862	0.866	14	13	-1
Russian Federation	11.2	14.7	12.0	0.861	0.808	15	28	13
Slovenia	11.2	16.8	11.9	0.859	0.863	16	16	0
Netherlands	11.2	17.9	11.9	0.858	0.894	17	7	-10
Sweden	11.1	15.8	12.1	0.857	0.842	18	19	1
Slovakia	11.1	15.1	12.2	0.856	0.826	19	23	4
Belgium	10.9	16.3	11.3	0.842	0.829	20	22	2
Poland	10.9	15.5	11.8	0.835	0.824	21	24	3
Ireland	10.7	18.6	12.2	0.823	0.907	22	4	-18
Latvia	10.6	15.2	11.5	0.818	0.806	23	30	7
Croatia	10.6	14.8	11.0	0.812	0.778	24	38	14
Ukraine	10.6	15.1	11.3	0.812	0.796	25	34	9
Israel	10.6	16.0	12.5	0.812	0.861	26	17	-9
Japan	10.6	15.3	11.5	0.812	0.808	27	28	1
Austria	10.4	15.7	10.8	0.802	0.796	28	34	6

Country	EP	EYS	MYS	EI	EI_{UN}	R_{EI}	$R_{EI_{UN}}$	Diff. ranking
Georgia	10.4	13.8	12.1	0.799	0.787	29	36	7
France	10.3	16.0	11.1	0.794	0.814	30	27	-3
Finland	10.3	17.1	10.3	0.793	0.818	31	26	-5
Montenegro	10.2	15.2	11.2	0.788	0.796	32	35	3
Iceland	10.2	19.0	10.6	0.787	0.853	33	18	-15
Luxembourg	10.2	13.9	11.7	0.783	0.776	34	40	6
Bulgaria	10.1	14.4	10.6	0.779	0.753	35	46	11
Greece	10.0	17.6	10.3	0.773	0.832	36	21	-15
Cyprus	10.0	14.0	11.6	0.773	0.776	37	41	4
Cuba	10.0	13.8	11.5	0.771	0.767	38	42	4
Romania	10.0	14.2	10.8	0.769	0.754	39	45	6
Kazakhstan	9.9	15.0	11.4	0.763	0.797	40	32	-8
Serbia	9.9	14.4	10.5	0.760	0.750	41	47	6
Republic of Moldova	9.8	11.9	11.2	0.755	0.704	42	64	22
Italy	9.6	16.0	10.1	0.741	0.781	43	37	-6
Armenia	9.6	12.3	10.9	0.735	0.705	44	61	17
Azerbaijan	9.4	11.9	11.2	0.721	0.704	45	64	19
Uzbekistan	9.3	11.5	10.9	0.719	0.683	46	75	29
Chile	9.3	15.2	9.8	0.718	0.749	47	48	1
Barbados	9.3	15.4	10.5	0.717	0.778	48	38	-10
Sri Lanka	9.3	13.7	10.8	0.714	0.741	49	50	1
Spain	9.3	17.3	9.6	0.713	0.801	50	31	-19
Argentina	9.2	17.9	9.8	0.711	0.824	51	24	-27
Kyrgyzstan	9.0	12.5	10.6	0.696	0.701	52	66	14
Albania	8.9	11.8	9.3	0.687	0.638	53	96	43
Trinidad and Tobago	8.9	12.3	10.9	0.682	0.705	54	61	7
Bahamas	8.6	12.6	10.9	0.661	0.713	55	58	3
Mongolia	8.5	14.6	9.3	0.652	0.716	56	55	-1
The former Yugoslav republic of Macedonia	8.5	13.4	9.3	0.651	0.682	57	76	19

Country	EP	EYS	MYS	EI	EI_{UN}	R_{EI}	$R_{EI_{UN}}$	Diff. ranking
Tajikistan	8.4	11.2	10.4	0.645	0.658	58	84	26
Turkey	8.4	14.5	7.6	0.643	0.656	59	85	26
Tonga	8.3	14.7	10.7	0.637	0.765	60	44	-16
Malaysia	8.2	12.7	10.0	0.634	0.686	61	72	11
Venezuela (Bolivarian Republic of)	8.1	14.2	8.9	0.625	0.691	62	70	8
Fiji	8.1	15.7	9.9	0.623	0.766	63	43	-20
Turkmenistan	8.1	10.8	9.9	0.622	0.630	64	99	35
Bahrain	8.0	14.4	9.4	0.615	0.713	65	58	-7
Uruguay	8.0	15.5	8.5	0.614	0.714	66	56	-10
Portugal	8.0	16.3	8.2	0.612	0.726	67	52	-15
Bosnia and Herzegovina	7.9	13.6	8.3	0.611	0.654	68	86	18
Saudi Arabia	7.9	16.3	8.7	0.608	0.743	69	49	-20
Jordan	7.9	13.5	9.9	0.604	0.705	70	61	-9
Samoa	7.8	12.9	10.3	0.604	0.702	71	65	-6
Brunei Darussalam	7.8	14.5	8.8	0.603	0.696	72	67	-5
Qatar	7.8	13.8	9.1	0.601	0.687	73	71	-2
South Africa	7.8	13.6	9.9	0.601	0.708	74	59	-15
Mauritius	7.8	15.6	8.5	0.599	0.717	75	54	-21
United Arab Emirates	7.7	13.3	9.5	0.596	0.686	76	72	-4
Seychelles	7.7	13.4	9.4	0.594	0.686	77	74	-3
Grenada	7.7	15.8	8.6	0.593	0.726	78	53	-25
Costa Rica	7.7	13.9	8.4	0.590	0.666	79	80	1
Panama	7.6	13.3	9.3	0.587	0.679	80	77	-3
Antigua and Barbuda	7.6	14.0	9.2	0.584	0.696	81	68	-13
Belize	7.6	13.6	10.5	0.582	0.728	82	51	-31
Saint Lucia	7.5	12.6	9.3	0.580	0.660	83	82	-1
Iran (Islamic Republic of)	7.5	15.1	8.2	0.579	0.693	84	69	-15
Brazil	7.5	15.2	7.7	0.578	0.679	85	78	-7
Peru	7.4	13.1	9.0	0.572	0.664	86	81	-5

Country	EP	EYS	MYS	EI	EI_{UN}	R_{EI}	$R_{EI_{UN}}$	Diff. ranking
Micronesia (Federated States of)	7.4	11.7	9.7	0.571	0.648	87	88	1
Jamaica	7.3	12.4	9.7	0.564	0.668	88	79	-9
Mexico	7.2	13.1	8.5	0.556	0.647	89	90	1
Libya	7.1	14.0	7.3	0.548	0.632	90	98	8
Saint Vincent and the Grenadines	7.1	13.4	8.6	0.545	0.659	91	83	-8
Ecuador	7.1	14.2	7.6	0.544	0.648	92	89	-3
Algeria	7.0	14.0	7.6	0.542	0.642	93	94	1
Bolivia (Plurinational State of)	7.0	13.2	8.2	0.538	0.640	94	95	1
Colombia	6.9	13.5	7.3	0.533	0.618	95	100	5
Oman	6.9	13.6	8.0	0.530	0.644	96	92	-4
China	6.9	13.1	7.5	0.530	0.614	97	104	7
Botswana	6.9	12.5	8.9	0.528	0.644	98	93	-5
Philippines	6.9	11.3	8.9	0.528	0.611	99	105	6
Thailand	6.8	13.5	7.3	0.524	0.618	100	100	0
Lebanon	6.8	13.8	7.9	0.523	0.647	101	91	-10
Dominican Republic	6.7	13.1	7.6	0.518	0.617	102	102	0
Indonesia	6.6	13.0	7.6	0.511	0.614	103	103	0
Suriname	6.6	12.7	7.7	0.508	0.609	104	106	2
Paraguay	6.6	11.9	7.7	0.508	0.587	105	110	5
Guyana	6.6	10.3	8.5	0.505	0.569	106	112	6
Tunisia	6.4	14.6	6.8	0.493	0.632	107	98	-9
Kuwait	6.4	14.7	7.2	0.492	0.648	108	87	-21
Viet Nam	6.3	11.9	7.5	0.482	0.581	109	111	2
El Salvador	6.0	12.3	6.5	0.462	0.558	110	113	3
Egypt	5.9	13.5	6.6	0.453	0.595	111	108	-3
Gabon	5.8	12.5	7.8	0.448	0.607	112	107	-5
Ghana	5.7	11.5	7.0	0.437	0.553	113	115	2
Vanuatu	5.5	10.6	6.8	0.425	0.521	114	120	6
Swaziland	5.3	11.3	7.1	0.410	0.551	115	117	2

Country	EP	EYS	MYS	EI	EI_{UN}	R_{EI}	$R_{EI_{UN}}$	Diff. ranking
Syrian Arab Republic	5.3	12.3	6.3	0.409	0.552	116	116	0
Zimbabwe	5.2	10.9	7.3	0.400	0.546	117	118	1
Namibia	5.1	11.3	6.2	0.395	0.521	118	121	3
Kenya	5.0	11.0	6.3	0.387	0.516	119	123	4
Cameroon	5.0	10.4	6.0	0.387	0.489	120	128	8
Iraq	5.0	10.1	6.4	0.387	0.494	121	126	5
Nicaragua	5.0	11.5	6.0	0.386	0.519	122	122	0
Cabo Verde	5.0	13.5	4.7	0.385	0.532	123	119	-4
India	5.0	11.7	5.4	0.384	0.505	124	125	1
Congo	5.0	11.1	6.1	0.384	0.512	125	124	-1
Sao Tome and Principe	5.0	11.3	4.7	0.383	0.471	126	135	9
Timor-Leste	4.8	11.7	4.4	0.373	0.472	127	134	7
Maldives	4.8	13.0	5.8	0.370	0.554	128	114	-14
Honduras	4.8	11.1	5.5	0.366	0.492	129	127	-2
Guatemala	4.7	10.7	5.6	0.359	0.484	130	130	0
Madagascar	4.5	10.3	6.0	0.349	0.486	131	129	-2
Lao Peoples Democratic Republic	4.5	10.6	5.0	0.346	0.461	132	137	5
Bangladesh	4.5	10.0	5.1	0.345	0.448	133	142	9
Zambia	4.5	13.5	6.6	0.344	0.595	134	108	-26
Comoros	4.4	11.5	4.6	0.341	0.473	135	132	-3
Democratic Republic of the Congo	4.4	9.8	6.0	0.337	0.472	136	133	-3
Morocco	4.3	11.6	4.4	0.333	0.469	137	136	-1
Nigeria	4.3	9.0	5.9	0.331	0.447	138	143	5
Uganda	4.2	9.8	5.4	0.320	0.452	139	139	0
Malawi	4.0	10.8	4.3	0.310	0.443	140	144	4
Equatorial Guinea	4.0	9.0	5.5	0.305	0.433	141	145	4
Benin	3.9	11.1	3.3	0.303	0.418	142	147	5
Angola	3.9	11.4	4.7	0.301	0.473	143	131	-12
United Republic of Tanzania	3.9	9.2	5.1	0.299	0.426	144	146	2

Country	EP	EYS	MYS	EI	EI_{UN}	R_{EI}	$R_{EI_{UN}}$	Diff. ranking
Cambodia	3.9	10.9	4.4	0.298	0.449	145	141	-4
Nepal	3.8	12.4	3.3	0.292	0.454	146	138	-8
Pakistan	3.7	7.8	4.7	0.284	0.373	147	152	5
Papua New Guinea	3.7	9.9	4.0	0.284	0.408	148	149	1
Rwanda	3.6	10.3	3.7	0.278	0.409	149	148	-1
Bhutan	3.6	12.6	3.0	0.278	0.450	150	140	-10
Afghanistan	3.6	9.3	3.2	0.274	0.365	151	154	3
Haiti	3.5	8.7	4.9	0.272	0.405	152	150	-2
Myanmar	3.5	8.6	4.1	0.272	0.376	153	151	-2
Burundi	3.3	10.1	2.7	0.254	0.371	154	153	-1
Djibouti	3.3	6.4	3.8	0.252	0.304	155	161	6
Mauritania	3.3	8.5	3.8	0.251	0.363	156	156	0
Mozambique	3.1	9.3	3.2	0.240	0.365	157	154	-3
Central African Republic	3.1	7.2	4.2	0.239	0.340	158	158	0
Eritrea	3.1	4.1	3.9	0.235	0.244	159	167	8
Yemen	3.0	9.2	2.6	0.230	0.342	160	157	-3
Sudan	2.9	7.0	3.1	0.221	0.298	161	164	3
Guinea	2.9	8.7	2.4	0.219	0.322	162	159	-3
Senegal	2.8	7.9	2.5	0.212	0.303	163	162	-1
Ethiopia	2.7	8.5	2.4	0.211	0.316	164	160	-4
Mali	2.5	8.4	2.0	0.195	0.300	165	163	-2
Chad	2.3	7.4	1.9	0.180	0.269	166	165	-1
Burkina Faso	2.1	7.8	1.4	0.165	0.263	167	166	-1
Niger	1.8	5.4	1.5	0.141	0.200	168	168	0

Table 6: Values and rankings for MYS, EYS, EP, and its partial indices.

Country	GNIpa	GNIpc	R_{GNIpa}	R_{GNIpc}	Diff. ranking
Qatar	144217.91	123124	1	1	0
Kuwait	118210.93	83961	2	2	0
Brunei Darussalam	101779.08	72570	3	3	0
Norway	83107.19	64992	4	4	0
United Arab Emirates	79848.12	60868	5	5	0
Saudi Arabia	78253.38	52821	6	9	3
Luxembourg	73842.55	58711	7	6	-1
Switzerland	69081.72	56431	8	7	-1
United States of America	68684.29	52947	9	8	-1
Sweden	57168.05	45636	10	10	0
Netherlands	57025.59	45435	11	11	0
Denmark	55452.39	44025	12	12	0
Oman	54305.86	34858	13	25	12
Australia	53865.87	42261	14	15	1
Austria	52911.48	43869	15	14	-1
Ireland	52868.87	39568	16	18	2
Germany	52178.05	43919	17	13	-4
Canada	51895.04	42155	18	16	-2
Belgium	51717.67	41187	19	17	-2
Bahrain	50551.16	38599	20	21	1
United Kingdom	49557.53	39267	21	19	-2
France	48946.64	38056	22	22	0
Finland	48169.72	38695	23	20	-3
Iceland	46542.23	35182	24	24	0
Israel	45696.65	30676	25	30	5
Japan	43955.34	36927	26	23	-3
New Zealand	42945.10	32689	27	28	1
Republic of Korea	41082.44	33890	28	26	-2

Country	GNIpa	GNIpc	R_{GNIpa}	R_{GNIpc}	Diff. ranking
Equatorial Guinea	39713.21	21056	29	48	19
Italy	39579.33	33030	30	27	-3
Spain	39189.55	32045	31	29	-2
Cyprus	35377.50	28633	32	31	-1
Malaysia	34355.94	22762	33	42	9
Trinidad and Tobago	33897.76	26090	34	34	0
Slovenia	33193.50	27852	35	32	-3
Czech Republic	32360.41	26660	36	33	-3
Gabon	31948.94	16367	37	61	24
Portugal	31837.33	25757	38	36	-2
Slovakia	31620.53	25845	39	35	-4
Argentina	31322.25	22050	40	45	5
Estonia	30957.03	25214	41	37	-4
Seychelles	30808.24	23300	42	40	-2
Lithuania	29960.11	24500	43	39	-4
Bahamas	29605.19	21336	44	46	2
Kazakhstan	29508.32	20867	45	49	4
Greece	29491.50	24524	46	38	-8
Chile	28370.32	21290	47	47	0
Antigua and Barbuda	28342.13	20070	48	50	2
Poland	28161.45	23177	49	41	-8
Russian Federation	27705.13	22352	50	43	-7
Botswana	27380.73	16646	51	58	7
Latvia	26987.74	22281	52	44	-8
Panama	26910.15	18192	53	54	1
Turkey	26857.97	18677	54	53	-1
Iraq	26249.63	14003	55	70	15
Uruguay	25874.07	19283	56	52	-4
Venezuela (Bolivarian Republic of)	24209.75	16159	57	62	5

Country	GNIpa	GNIpc	R_{GNIpa}	R_{GNIpc}	Diff. ranking
Mexico	23986.39	16056	58	63	5
Lebanon	23624.09	16509	59	59	0
Croatia	23559.55	19409	60	51	-9
Mauritius	23319.33	17470	61	56	-5
Suriname	22748.90	15617	62	64	2
Azerbaijan	22470.95	16428	63	60	-3
Romania	21991.19	18108	64	55	-9
Libya	21872.10	14911	65	68	3
Iran (Islamic Republic of)	21458.47	15440	66	66	0
Brazil	21179.08	15175	67	67	0
Belarus	20426.92	16676	68	57	-11
Jordan	19538.87	11365	69	83	14
Algeria	19511.21	13054	70	74	4
Turkmenistan	19073.50	13066	71	73	2
Bulgaria	18846.54	15596	72	65	-7
Costa Rica	18643.82	13413	73	71	-2
South Africa	18291.10	12122	74	79	5
Dominican Republic	17799.42	11883	75	81	6
Montenegro	17750.21	14558	76	69	-7
Colombia	17250.50	12040	77	80	3
Egypt	17159.67	10512	78	88	10
Thailand	16971.14	13323	79	72	-7
Namibia	16890.90	9418	80	96	16
Maldives	16716.97	12328	81	77	-4
Peru	16304.45	11015	82	84	2
Barbados	16024.19	12488	83	76	-7
Ecuador	16011.32	10605	84	87	3
China	15824.61	12547	85	75	-10
Mongolia	15727.47	10729	86	86	0

Country	GNIpa	GNIpc	R_{GNIpa}	R_{GNIpc}	Diff. ranking
Grenada	15403.07	10939	87	85	-2
The former Yugoslav republic of Macedonia	14995.16	11780	88	82	-6
Serbia	14841.52	12190	89	78	-11
Tunisia	14302.42	10404	90	89	-1
Indonesia	14215.18	9788	91	92	1
Sri Lanka	13753.78	9779	92	93	1
Saint Vincent and the Grenadines	13667.19	9937	93	91	-2
Angola	13636.22	6822	94	110	16
Philippines	13229.95	7915	95	99	4
Saint Lucia	13090.54	9765	96	94	-2
Albania	13062.53	9943	97	90	-7
Belize	12995.36	7614	98	101	3
Guatemala	12039.47	6929	99	108	9
Bosnia and Herzegovina	11618.19	9638	100	95	-5
Congo	11313.89	6012	101	113	12
Jamaica	11279.83	7415	102	103	1
Fiji	11174.52	7493	103	102	-1
Paraguay	11134.82	7643	104	100	-4
El Salvador	11085.00	7349	105	104	-1
Bhutan	10625.16	7176	106	106	0
Nigeria	10578.49	5341	107	119	12
Armenia	10515.04	8124	108	98	-10
Timor-Leste	10460.00	5363	109	118	9
Guyana	10040.16	6522	110	111	1
Morocco	10025.72	6850	111	109	-2
Ukraine	9958.15	8178	112	97	-15
Swaziland	9703.99	5542	113	116	3
Cabo Verde	9582.25	6094	114	112	-2
Bolivia (Plurinational State of)	9442.39	5760	115	114	-1

Country	GNIpa	GNIpc	R_{GNIpa}	R_{GNIpc}	Diff. ranking
Cuba	9201.36	7301	116	105	-11
Georgia	9084.83	7164	117	107	-10
Samoa	8740.65	5327	118	120	2
Tonga	8675.41	5069	119	123	4
India	8288.46	5497	120	117	-3
Pakistan	8021.11	4866	121	124	3
Uzbekistan	7933.28	5567	122	115	-7
Lao Peoples Democratic Republic	7928.85	4680	123	125	2
Zambia	7911.68	3734	124	131	7
Sudan	7207.45	3809	125	130	5
Viet Nam	7149.92	5092	126	122	-4
Ghana	6945.38	3852	127	129	2
Nicaragua	6851.48	4457	128	127	-1
Yemen	6775.80	3519	129	133	4
Myanmar	6715.34	4608	130	126	-4
Honduras	6664.32	3938	131	128	-3
Republic of Moldova	6638.81	5223	132	121	-11
Mauritania	6554.59	3560	133	132	-1
Sao Tome and Principe	5849.75	2918	134	139	5
Micronesia (Federated States of)	5528.19	3432	135	134	-1
Cameroon	5519.29	2803	136	140	4
Djibouti	5355.62	3276	137	135	-2
Kenya	5273.47	2762	138	142	4
Vanuatu	4938.50	2803	139	140	1
United Republic of Tanzania	4923.90	2411	140	146	6
Bangladesh	4920.37	3191	141	136	-5
Kyrgyzstan	4682.96	3044	142	137	-5
Cambodia	4669.09	2949	143	138	-5
Syrian Arab Republic	4459.88	2728	144	143	-1

Country	GNIpa	GNIpc	R_{GNIpa}	R_{GNIpc}	Diff. ranking
Chad	4295.12	2085	145	149	4
Senegal	4279.13	2188	146	148	2
Papua New Guinea	4166.04	2463	147	145	-2
Tajikistan	4113.14	2517	148	144	-4
Nepal	3758.76	2311	149	147	-2
Afghanistan	3705.82	1885	150	150	0
Uganda	3629.70	1613	151	154	3
Benin	3552.95	1767	152	151	-1
Mali	3449.12	1583	153	156	3
Burkina Faso	3309.91	1591	154	155	1
Zimbabwe	2914.22	1615	155	153	-2
Ethiopia	2898.05	1428	156	159	3
Haiti	2821.29	1669	157	152	-5
Rwanda	2819.85	1458	158	157	-1
Comoros	2764.79	1456	159	158	-1
Madagascar	2511.24	1328	160	160	0
Mozambique	2354.84	1123	161	162	1
Eritrea	2145.21	1130	162	161	-1
Guinea	2126.13	1096	163	163	0
Niger	2073.41	908	164	164	0
Malawi	1615.30	747	165	166	1
Burundi	1583.05	758	166	165	-1
Democratic Republic of the Congo	1351.41	680	167	167	0
Central African Republic	1094.73	581	168	168	0

Table 7: Values and rankings for the GNI per capita and per adult.

Country	HI	EI	YI	DAHDI	HDI	R_{DAHDI}	R_{HDI}	Diff. R.
Australia	0.858	0.917	0.960	0.910	0.935	1	2	1
Israel	0.961	0.812	0.945	0.904	0.894	2	15	13
Norway	0.831	0.878	0.998	0.900	0.944	3	1	-2
New Zealand	0.858	0.893	0.940	0.896	0.913	4	10	6
United States of America	0.818	0.894	0.981	0.895	0.915	5	8	3
Switzerland	0.819	0.891	0.982	0.895	0.930	6	3	-3
United Kingdom	0.811	0.907	0.952	0.888	0.907	7	12	5
Ireland	0.875	0.823	0.958	0.884	0.916	8	6	-2
Denmark	0.784	0.913	0.962	0.883	0.923	9	4	-5
Canada	0.808	0.887	0.957	0.882	0.913	10	10	0
Sweden	0.811	0.857	0.965	0.875	0.907	11	12	1
Germany	0.735	0.951	0.957	0.874	0.916	12	6	-6
Netherlands	0.803	0.858	0.965	0.873	0.922	13	5	-8
Republic of Korea	0.823	0.862	0.936	0.872	0.898	14	14	0
Iceland	0.878	0.787	0.947	0.868	0.899	15	13	-2
Belgium	0.796	0.842	0.956	0.862	0.890	16	18	2
Luxembourg	0.828	0.783	0.988	0.862	0.892	17	16	-1
France	0.829	0.794	0.951	0.855	0.888	18	19	1
Austria	0.775	0.802	0.958	0.841	0.885	19	20	1
Czech Republic	0.747	0.870	0.915	0.841	0.870	20	25	5
Cyprus	0.833	0.773	0.923	0.841	0.850	21	30	9
Slovenia	0.752	0.859	0.917	0.840	0.880	22	22	0
Finland	0.781	0.793	0.950	0.838	0.883	23	21	-2
Estonia	0.730	0.883	0.911	0.838	0.861	24	27	3
Slovakia	0.742	0.856	0.913	0.834	0.844	25	31	6
Japan	0.756	0.812	0.942	0.833	0.891	26	17	-9
Chile	0.890	0.718	0.903	0.833	0.832	27	37	10
Poland	0.747	0.835	0.903	0.826	0.843	28	32	4

Country	HI	EI	YI	DAHDI	HDI	R_{DAHDI}	R_{HDI}	Diff. R.
Lithuania	0.673	0.917	0.908	0.825	0.839	29	33	4
Argentina	0.856	0.711	0.912	0.822	0.836	30	35	5
Saudi Arabia	0.917	0.608	0.993	0.821	0.837	31	34	3
Brunei Darussalam	0.918	0.603	1.000	0.821	0.856	32	28	-4
United Arab Emirates	0.926	0.596	0.994	0.818	0.835	33	36	3
Kazakhstan	0.785	0.763	0.907	0.816	0.788	34	50	16
Qatar	0.894	0.601	1.000	0.813	0.850	35	30	-5
Spain	0.807	0.713	0.932	0.812	0.876	36	23	-13
Italy	0.770	0.741	0.933	0.810	0.873	37	24	-13
Greece	0.754	0.773	0.907	0.809	0.865	38	26	-12
Azerbaijan	0.828	0.721	0.883	0.808	0.751	39	70	31
Russian Federation	0.677	0.861	0.901	0.807	0.798	40	44	4
Croatia	0.725	0.812	0.887	0.805	0.818	41	41	0
Bahamas	0.869	0.661	0.907	0.805	0.790	42	49	7
Bahrain	0.880	0.615	0.954	0.803	0.824	43	39	-4
Belarus	0.683	0.864	0.874	0.802	0.798	44	44	0
Malaysia	0.880	0.634	0.920	0.801	0.779	45	55	10
Turkey	0.881	0.643	0.898	0.798	0.761	46	65	19
Jordan	0.957	0.604	0.870	0.795	0.748	47	72	25
Latvia	0.684	0.818	0.899	0.795	0.819	48	40	-8
Sri Lanka	0.836	0.714	0.840	0.794	0.757	49	66	17
Oman	0.981	0.530	0.961	0.793	0.793	50	47	-3
Venezuela (Bolivarian Republic of)	0.891	0.625	0.889	0.791	0.762	51	64	13
Cuba	0.798	0.771	0.804	0.791	0.769	52	60	8
Panama	0.937	0.587	0.899	0.790	0.780	53	54	1
Montenegro	0.723	0.788	0.862	0.789	0.802	54	43	-11
Albania	0.845	0.687	0.835	0.785	0.733	55	78	23
Romania	0.715	0.769	0.881	0.785	0.793	56	47	-9
Costa Rica	0.928	0.590	0.866	0.780	0.766	57	62	5

Country	HI	EI	YI	DAHDI	HDI	R_{DAHDI}	R_{HDI}	Diff. R.
Uzbekistan	0.832	0.719	0.791	0.779	0.675	58	104	46
Barbados	0.769	0.717	0.853	0.778	0.785	59	51	-8
Georgia	0.732	0.799	0.803	0.777	0.754	60	69	9
Armenia	0.779	0.735	0.816	0.776	0.733	61	78	17
Tonga	0.916	0.637	0.799	0.776	0.717	62	91	29
Trinidad and Tobago	0.743	0.682	0.919	0.775	0.772	63	58	-5
Bulgaria	0.683	0.779	0.867	0.773	0.782	64	53	-11
Mexico	0.922	0.556	0.889	0.769	0.756	65	67	2
Antigua and Barbuda	0.864	0.584	0.903	0.769	0.783	66	52	-14
Iran (Islamic Republic of)	0.891	0.579	0.879	0.768	0.766	67	62	-5
Mongolia	0.815	0.652	0.851	0.768	0.727	68	83	15
Uruguay	0.819	0.614	0.895	0.766	0.793	69	47	-22
Serbia	0.695	0.760	0.846	0.765	0.771	70	59	-11
Kyrgyzstan	0.860	0.696	0.745	0.764	0.655	71	110	39
Samoa	0.917	0.604	0.800	0.762	0.702	72	96	24
Peru	0.905	0.572	0.855	0.762	0.734	73	76	3
Algeria	0.936	0.542	0.870	0.761	0.736	74	75	1
Ukraine	0.668	0.812	0.811	0.761	0.747	75	74	-1
Kuwait	0.892	0.492	1.000	0.760	0.816	76	42	-34
Portugal	0.783	0.612	0.913	0.759	0.830	77	38	-39
Brazil	0.859	0.578	0.878	0.758	0.755	78	68	-10
Belize	0.894	0.582	0.835	0.757	0.715	79	92	13
Jamaica	0.936	0.564	0.822	0.757	0.719	80	90	10
Turkmenistan	0.803	0.622	0.868	0.757	0.688	81	100	19
Ecuador	0.930	0.544	0.853	0.756	0.732	82	80	-2
Tajikistan	0.911	0.645	0.733	0.755	0.624	83	119	36
Seychelles	0.791	0.594	0.911	0.754	0.772	84	58	-26
Mauritius	0.805	0.599	0.886	0.753	0.777	85	56	-29
Republic of Moldova	0.723	0.755	0.775	0.751	0.693	86	98	12

Country	HI	EI	YI	DAHDI	HDI	R_{DAHDI}	R_{HDI}	Diff. R.
Libya	0.871	0.548	0.880	0.749	0.724	87	86	-1
Fiji	0.815	0.623	0.821	0.747	0.727	88	83	-5
Former Yugoslav rep. of Macedonia	0.754	0.651	0.847	0.746	0.747	89	74	-15
Grenada	0.812	0.593	0.850	0.742	0.750	90	71	-19
Colombia	0.876	0.533	0.859	0.738	0.720	91	88	-3
Dominican Republic	0.898	0.518	0.862	0.738	0.715	92	92	0
Botswana	0.843	0.528	0.900	0.738	0.698	93	97	4
Bolivia (Plurinational State of)	0.920	0.538	0.806	0.736	0.662	94	109	15
Lebanon	0.860	0.523	0.887	0.736	0.769	95	60	-35
Saint Lucia	0.819	0.580	0.835	0.735	0.729	96	81	-15
South Africa	0.754	0.601	0.865	0.732	0.666	97	107	10
Philippines	0.860	0.528	0.836	0.724	0.668	98	105	7
Suriname	0.840	0.508	0.884	0.722	0.714	99	94	-5
Micronesia (Federated States of)	0.867	0.571	0.759	0.722	0.640	100	113	13
Gabon	0.908	0.448	0.914	0.719	0.684	101	102	1
Bosnia and Herzegovina	0.738	0.611	0.825	0.719	0.733	102	78	-24
Saint Vincent and the Grenadines	0.809	0.545	0.839	0.718	0.720	103	88	-15
Paraguay	0.886	0.508	0.821	0.717	0.679	104	103	-1
China	0.784	0.530	0.852	0.707	0.727	105	83	-22
Thailand	0.784	0.524	0.858	0.706	0.726	106	85	-21
Tunisia	0.841	0.493	0.843	0.704	0.721	107	87	-20
Egypt	0.891	0.453	0.859	0.703	0.690	108	99	-9
Indonesia	0.791	0.511	0.842	0.698	0.684	109	102	-7
Viet Nam	0.899	0.482	0.782	0.697	0.666	110	107	-3
El Salvador	0.888	0.462	0.821	0.696	0.666	111	107	-4
Guyana	0.792	0.505	0.812	0.687	0.636	112	114	2
Iraq	0.926	0.387	0.896	0.685	0.654	113	111	-2
Maldives	0.944	0.370	0.857	0.669	0.706	114	95	-19
Vanuatu	0.935	0.425	0.749	0.668	0.594	115	124	9

Country	HI	EI	YI	DAHDI	HDI	R_{DAHDI}	R_{HDI}	Diff. R.
Namibia	0.868	0.395	0.858	0.665	0.628	116	116	0
Ghana	0.835	0.437	0.779	0.658	0.579	117	129	12
Timor-Leste	0.933	0.373	0.815	0.657	0.595	118	123	5
Cabo Verde	0.908	0.385	0.808	0.656	0.646	119	112	-7
Guatemala	0.948	0.359	0.828	0.656	0.627	120	118	-2
Nicaragua	0.937	0.386	0.778	0.655	0.631	121	115	-6
Honduras	0.976	0.366	0.776	0.652	0.606	122	121	-1
Congo	0.877	0.384	0.822	0.652	0.591	123	126	3
Sao Tome and Principe	0.940	0.383	0.764	0.650	0.555	124	132	8
Swaziland	0.778	0.410	0.809	0.637	0.531	125	139	14
Kenya	0.869	0.387	0.755	0.633	0.548	126	134	8
India	0.830	0.384	0.795	0.633	0.609	127	120	-7
Syrian Arab Republic	0.820	0.409	0.740	0.629	0.594	128	124	-4
Zambia	0.888	0.344	0.791	0.623	0.586	129	128	-1
Cameroon	0.813	0.387	0.759	0.621	0.512	130	142	12
Morocco	0.881	0.333	0.812	0.620	0.628	131	116	-15
Lao Peoples Democratic Republic	0.868	0.346	0.791	0.619	0.575	132	130	-2
Zimbabwe	0.836	0.400	0.703	0.617	0.509	133	144	11
Equatorial Guinea	0.819	0.305	0.933	0.615	0.587	134	127	-7
Bangladesh	0.885	0.345	0.749	0.612	0.570	135	131	-4
Madagascar	0.892	0.349	0.690	0.599	0.510	136	143	7
Nigeria	0.785	0.331	0.816	0.596	0.514	137	141	4
Uganda	0.906	0.320	0.722	0.594	0.483	138	150	12
Comoros	0.874	0.341	0.698	0.593	0.503	139	147	8
Angola	0.803	0.301	0.839	0.588	0.532	140	138	-2
Pakistan	0.888	0.284	0.792	0.584	0.538	141	136	-5
Bhutan	0.860	0.278	0.817	0.580	0.605	142	122	-20
United Republic of Tanzania	0.860	0.299	0.749	0.578	0.521	143	140	-3
Cambodia	0.865	0.298	0.744	0.577	0.555	144	132	-12

Country	HI	EI	YI	DAHDI	HDI	R_{DAHDI}	R_{HDI}	Diff. R.
Benin	0.867	0.303	0.720	0.574	0.480	145	152	7
Democratic Republic of the Congo	0.876	0.337	0.635	0.572	0.433	146	159	13
Nepal	0.871	0.292	0.725	0.569	0.548	147	134	-13
Rwanda	0.907	0.278	0.700	0.561	0.483	148	150	2
Afghanistan	0.867	0.274	0.724	0.556	0.465	149	156	7
Mauritania	0.879	0.251	0.774	0.555	0.506	150	145	-5
Myanmar	0.795	0.272	0.776	0.552	0.536	151	137	-14
Papua New Guinea	0.804	0.284	0.734	0.551	0.505	152	146	-6
Malawi	0.822	0.310	0.651	0.549	0.445	153	157	4
Djibouti	0.849	0.252	0.756	0.545	0.470	154	154	0
Haiti	0.850	0.272	0.700	0.545	0.483	155	150	-5
Yemen	0.897	0.230	0.777	0.543	0.498	156	148	-8
Sudan	0.892	0.221	0.783	0.536	0.479	157	153	-4
Senegal	0.919	0.212	0.737	0.523	0.466	158	155	-3
Burundi	0.865	0.254	0.649	0.522	0.400	159	164	5
Eritrea	0.863	0.235	0.676	0.516	0.391	160	166	6
Mozambique	0.829	0.240	0.684	0.514	0.416	161	161	0
Ethiopia	0.915	0.211	0.702	0.514	0.442	162	158	-4
Guinea	0.843	0.219	0.675	0.500	0.411	163	162	-1
Mali	0.871	0.195	0.718	0.496	0.419	164	160	-4
Central African Republic	0.766	0.239	0.617	0.484	0.350	165	167	2
Chad	0.803	0.180	0.737	0.474	0.392	166	165	-1
Burkina Faso	0.869	0.165	0.714	0.468	0.402	167	163	-4
Niger	0.919	0.141	0.673	0.443	0.348	168	168	0

Table 8: Values, component, and ranking of the DAHDI.

Development	Countries
Very high	Albania, Argentina, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Belarus, Belgium, Brunei Darussalam, Canada, Chile, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Latvia, Lithuania, Luxembourg, Malaysia, Montenegro, Netherlands, New Zealand, Norway, Oman, Panama, Poland, Qatar, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Slovakia, Slovenia, Spain, Sri Lanka, Sweden, Switzerland, Turkey, United Arab Emirates, United Kingdom, United States of America, Venezuela (Bolivarian Republic of)
High	Algeria, Antigua and Barbuda, Armenia, Barbados, Belize, Bolivia (Plurinational State of), Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, El Salvador, Fiji, Gabon, Georgia, Grenada, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Kuwait, Kyrgyzstan, Lebanon, Libya, Mauritius, Mexico, Micronesia (Federated States of), Mongolia, Paraguay, Peru, Philippines, Portugal, Republic of Moldova, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Serbia, Seychelles, South Africa, Suriname, Tajikistan, Thailand, The former Yugoslav republic of Macedonia, Tonga, Trinidad and Tobago, Tunisia, Turkmenistan, Ukraine, Uruguay, Uzbekistan, Viet Nam
Medium	Bangladesh, Cabo Verde, Cameroon, Congo, Equatorial Guinea, Ghana, Guatemala, Honduras, India, Kenya, Lao Peoples Democratic Republic, Maldives, Morocco, Namibia, Nicaragua, Sao Tome and Principe, Swaziland, Syrian Arab Republic, Timor-Leste, Vanuatu, Zambia, Zimbabwe
Low	Afghanistan, Angola, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Guinea, Haiti, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Nigeria, Pakistan, Papua New Guinea, Rwanda, Senegal, Sudan, Uganda, United Republic of Tanzania, Yemen

Table 9: Distribution of countries in four groups according to the DAHDI.

Development	Countries
Very high	Argentina, Australia, Austria, Bahrain, Belgium, Brunei Darussalam, Canada, Chile, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Qatar, Republic of Korea, Saudi Arabia, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Arab Emirates, United Kingdom, United States of America
High	Albania, Algeria, Antigua and Barbuda, Armenia, Azerbaijan, Bahamas, Barbados, Belarus, Belize, Bolivia (Plurinational State of), Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, China, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Egypt, El Salvador, Fiji, Gabon, Georgia, Grenada, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kazakhstan, Kyrgyzstan, Lebanon, Libya, Malaysia, Maldives, Mauritius, Mexico, Mongolia, Montenegro, Oman, Panama, Paraguay, Peru, Philippines, Republic of Moldova, Romania, Russian Federation, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Serbia, Seychelles, South Africa, Sri Lanka, Suriname, Thailand, The former Yugoslav republic of Macedonia, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Ukraine, Uruguay, Uzbekistan, Venezuela (Bolivarian Republic of), Viet Nam
Medium	Bangladesh, Bhutan, Cabo Verde, Congo, Equatorial Guinea, Ghana, Guatemala, Guyana, Honduras, India, Lao Peoples Democratic Republic, Micronesia (Federated States of), Morocco, Namibia, Nicaragua, Syrian Arab Republic, Tajikistan, Timor-Leste, Vanuatu, Zambia
Low	Afghanistan, Angola, Benin, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Guinea, Haiti, Kenya, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Nigeria, Pakistan, Papua New Guinea, Rwanda, Sao Tome and Principe, Senegal, Sudan, Swaziland, Uganda, United Republic of Tanzania, Yemen, Zimbabwe

Table 10: Distribution of countries in four groups according to the HDI.