



## ANALYZING THE COMPOSITION OF HDI IN EUROPEAN COUNTRIES

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### **Abstract:**

*Human Development Index (HDI) measures development in a country by combining indicators of life expectancy, education level and income. In 2013, 187 countries were included in this index, which aims to expand the coverage area as additional statistics become more available. HDI, which is published by UNDP, may be the most comprehensive indicator, but it is not fully compatible enough to measure the human development level in a global perspective. Human Development Index explicitly explains the development of a country as being more than an economic growth tool or material wealth. In this way, this index is distinguished from many other performance indicators. This article aims to analyze the proportion of the three indicators on 37 European countries.*

**Key words:** *human development index, education, gross domestic product, life expectancy*

### **1. Introduction**

Human development is complemented by a series of conceptual frameworks that share similar underlying motivations. These series have different emphases, and add value in different ways.

In the recent reports of human development index, the concept of human development is associated with different key concepts, in this way showing the synergies between them, but also distinctive contribution to the human development framework. Thus, comparisons are made with: human rights, happiness, Millennium Development Goals and human security.

In 1990, United Nations Development Programme launched the first Human Development Report which contained the first index, Human Development Index (HDI). Subsequently, Human Development Reports were made almost every year since 1990. The reports apply the concept of human development in various topics, such as the environment, poverty, gender, globalization, cultural freedoms, migration and just

to name a few. These annual reports also include the statistical Human Development index and other relevant information related of human development in many countries (over 150 countries).

The Human Development Report from 1990 gave a fundamental and clear definition of the human development concept. This was the only report that focused on concepts regarding human development and measures it, so it provides the richest input than any other reports. Therefore, the first chapter of the report from 1990 is entitled "Defining and measuring human development" and it opens with the words that became famous in economic literature: "People are the real wealth of a nation". Also, the main objective of human development is to create an environment that allows people to live a healthy, long and creative life. This may seem to be only a simple truth. But, in many cases it is forgotten in the immediate concern due to the accumulation of more commodities and financial wealth (UNDP, 1990).

This goal is so often overlooked, but yet is not new. Lagrange, Smith, Ricardo, Aristotle, Marx and Mill were pronounced for similar and related positions. A renewed attention to their work is necessary given the unequal progress in human development countries, the economic crisis and the adjustments of the 1980s. Thus, they consider that the expansion of production and wealth represents only a mean, so the final result of human development must be the welfare of people worldwide.

The paragraphs on "Defining human development" represent only one page. They include a box (that is republished in Appendix 1 of the report) which, like many other subsequent reports, throws weight to the concept of human development. The three substantial paragraphs that are presented below are interspersed with different clarifications on the links between human development and various items such as welfare, basic needs and income.

Both, box and text "Defining human development" begins with what become a standard formula that explains the concept of human development as being a process of enlarging people, followed by some examples of what could be the key elements - which can be named the dimensions of human development.

I found that this structure is followed quite easily in the reports from coming years, but the wording and examples fluctuate in time. In this way, the first paragraph from the report of 1990 is giving the first definition of human development. It defines the concepts as a process of enlarging people choices. In this order, the main choices are to live a healthy and long life, to enjoy a decent standard of living and to be educated. Additional choices may include guaranteed human rights, political freedom, and self-respect -thus, what Adam Smith called in his papers the ability to mix with other people, in order not to have some shame when appearing in public.

The second paragraph of the first report is focusing on human development, in which the concept is considered both a process and a realized welfare. Also, the second feature of this definition shows a distinction between human capacity building which allows people to act, and how people actually act - responsibly or not - to advance their own welfare, in order to contribute to economic growth and also to pursue leisure activities. These aspects of human development are less prominent in

subsequent descriptions of the report. The term of human development denotes the expansion of people's choices and their welfare achieved. Also, it helps to distinguish between the two sides of human development. One side is the formation of human capabilities, like knowledge or improved health. The other side refers to the capacity of utilization achieved by the people, for their work or leisure.

The third paragraph of the report from 1990 provides a number of important explanations and qualifications. First, it attaches the economic system – such as the production and distribution of raw materials – in the human lives, referring to how these kinds of commodities are developed by human capabilities, but also how people use these capabilities. Second, it also clarifies a concern for freedom, both as freedom for opportunity as well as freedom like a dynamic process. Finally, due to its scale and its generality, it is stated that human development refers to countries in all levels of development. Human development meets the production and distribution of raw materials with the expansion and utilization of human capacity. Also, it focuses on choices – such as on what people should have, be and do in order to be able to ensure their own existence. Furthermore, human development is not only concentrated on basic needs, but it also applies equally to highly developed and less developed countries.

In this paper I propose to analyze the importance that each component has on Human Development Index in the European countries. The paper is structured as follows. In Section 2, I reviewed the economic literature on various aspects of the index. Section 3 presents the empirical methodology used to measure the impact of various dimensions on the index and used data. In Section 4, I showed the results of empirical investigation. Section 5 contains the most important findings of the analysis.

## **2. Literature review**

Human Development Index indicates achievements in the standard of living of a population in terms of the levels reached by different attributes regarding quality of life, such as education level and life expectancy at birth.

Chakravarty (2003) characterize axiomatically a general measure of achievement living standards. In his work, the author considers Human Development Index as a general index that allows percentage calculation of contributions on individual qualities to achieve the overall realization and therefore to identify the qualities that are more / less sensitive to realization. This breakdown is important in political terms.

Blanchflower and Oswald (2005) analyze the welfare of Australia through the human development index. Australia currently occupies the second place in the world, the index value was higher than all other English speaking nations in the period 1980-1990. Researchers analyze the economic activity, the implications of policy makers and explore the place that Australia occupies in subjective welfare of international ranking. Using new data on a sample of approximately 50,000 people in 35 nations, the paper shows that Australians have some of the lowest levels of satisfaction in the

world regarding their job. The author's goal is not to reject HDI methods, but rather to support that there are more research to do in this area.

Ravallion (2010) examines the compromises contained in the latest version of the HDI, as shown in the United Nations Development Programme (2010). The author presents the transformation suffered by the index and its assessments on longevity and education. Also, it tries to answer the question whether implied valuations of HDI send the right signals to governments that attempt to monitor and promote human development. Also, the author aims to show that disturbing compromises found in the report from 2010 could largely be avoided by using an alternative aggregation function that exists in the economic literature, such as a more general form of HDI calculation, such as that proposed by Chakravarty (2003). The new way of calculating the indicator in the report of 2010 is much more complicated and problematic. Life expectancy in poor countries has been substantially devalued, although it seems unlikely that this is done intentionally. Index evaluation on longevity in the poorest country is now only 0.006% of its value in the richest country - a much bigger difference than their average income (for which the poorest country was 0.2% of national income per capita of the richest country). A poor country facing a decline in life expectancy due to a collapse in its health system already weak could be seen little better and even indicate a low rate of economic growth. By contrast, addition school assessments increased for many countries and they seem high - some of them are four times higher than typical assessments placed on the labor market on further schooling.

Mărginean (2012) analyzes the evolution of human development in Romania between 1985-2011. The author finds that the use of new ways on calculating the Human Development Index ranks Romania on a better position, even if the historical trend has not changed. According to both old and new methods of calculations, HDI values fell in Romania in the early years of transition, but the decreased in this period was recovered only in the period 2000-2005, while a slight increase was recorded in the report from 2009. However, performance in Romania in terms of human development was recorded by average years of schooling indicator and expected years of schooling indicator.

Lipták (2013) analyzes and quantifies the development of human resources for NUTS 2 regions in Romania and Hungary for the period 2004-2007. This is done using the Modified Human Development Index (MHDI). This index was developed by Central Statistical Office of Hungary. Theories say that this multidimensional alternative measure expresses best human development elements in a specific area. Estimated MHDI at NUTS 2 level had spectacular results. MHDI calculation at regional level can help the regional development experts in determining accurate sub regional development. This alternative measure is considered to be useful and substantial due to its complexity.

Salas-Bourgoin (2014) proposed a Modified Human Development Index with three components: human capabilities, choices and opportunities, on 117 countries in 2012 year. The dimension of human capabilities is education which is measured by mean years of schooling for adults and expected years of schooling for children. The

choices have two dimensions: employment (employment – to population ratio and non-vulnerable in total population) and goods and services (Gross National Income per capita). The third component is measured by the dimensions: health (life expectancy at birth), and freedom (democracy index). The values of Modified Human Development Index are lower than HDI score, which show the strengths and weaknesses of different countries.

### **3. Methodology and data source**

HDI is an index developed arbitrarily (Mărginean, 2012). Human Development Index comprises three basic elements: longevity (measured by life expectancy at birth), environment education (calculated as a weighted arithmetic average between the average years of schooling and expected years of schooling); standard of living (expressed in GNI per capita calculated at purchasing power parity).

The HDI measures the relative distance that separates every country of the world from the prioritized goals for social development, namely providing an overall assessment of progress and different strategies followed by states to achieve human welfare. The index is calculated as a geometric average of the three dimensions: health, education and living standard.

HDI level varies on a scale between 0 and 1, so that the level of human development is the greater the more close to the value 1.

To analyze the impact of these variables on the HDI, I have created the following panel data regression. The used methodology is generalized method of moments.

$$HDI_{it} = c + LEB_{it} + MYS_{it} + EYS_{it} + GNI_{it} + \varepsilon_{it} \quad (1)$$

where:

HDI - Human Development Index

LEB - life expectancy at birth

MYS - mean years of schooling

EYS - expected years of schooling

GNI - gross national income

i - Continental (if Europe or America, Africa, Asia or Oceania)

t - time (t = 2005, ..., 2013)

$\varepsilon_{it}$  - residual value

The analyzed period covers 2005-2013 periods. The frequency data is annual. Data were collected from the database of the United Nations Development Programme. The sample comprises 37 countries in Europe (Annex 1). In the sample of

European countries: 9 countries have a very high Human Development rank, 25 countries have high human development, and 3 countries have a medium rank.

Annex 2 presents descriptive statistics of the analyzed variables. It is noted that the variables show a positive trend during the period under review. Asymmetry coefficients show that the distributions of the analyzed series have a right asymmetry. As regards the kurtosis coefficients is observed that the series are leptokurtic.

#### 4. Results

The empirical results obtained shows that gross national income is the most representative variable on the Human Development Index; R-squared has a value of 72%. The second variable of importance is expected years of schooling, where R<sup>2</sup> has 63%. The next variable of importance is life expectancy at birth, with a value of 52%. Mean years of schooling is less important for European countries (44%).

**Table 1: Empirical results**

<b>Europa</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
<b>C</b>	0.003043* (7.303931)	-0.0007** (-1.08327)	0.002893* (4.778254)	0.004058* (8.724768)
<b>GNI</b>	0.125355* (28.91146)			
<b>LIFE</b>		1.879269* (19.10428)		
<b>MEAN</b>			0.32394* (16.24919)	
<b>EXPE</b>				0.349047* (23.8332)
<b>R<sup>2</sup></b>	0.716336	0.524407	0.443731	0.631822

Source: Own processing in Eviews

Note: \*, \*\* represents significance level of 1% and 5% confidence level. In parentheses are the t-statistic values.

I propose that in future research to identify another indicator or indicators to measure mean years of schooling, which has a greater impact on HDI. Therefore it could identify another indicators for European countries that have a greater impact on HDI, more than 75%.

## **5. Conclusions**

An important lesson for future synthetic indicators is the need of transparency regarding the tradeoffs implicit especially in complicated indices. These compromises are keys in understanding the properties and implications of the index.

Human Development Index was introduced in 1990 as an alternative to national income per capita usage as a success metric development. By 2010, the index was equal to weighted average scaled achievements in three dimensions: life expectancy, education and income. Simplicity the Human Development index gave a transparency that was appealed by most users, although HDI has never been as simple as someone might think at first glance, given the changes incorporated into its components. In over 20 years, human development reports (and many reports that are represented at national level), were applauded by those countries which had good values of the index and offered advice on how someone might obtain higher values.

Economists cannot act as legal authorities, but the moral responsibility is not to forget their ethical issues (Teulon, 2014).

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**Annex 1: HDI values for European countries**

<b>Country</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Albania	0.689	0.694	0.699	0.703	0.705	0.708	0.714	0.714	0.716
Austria	0.851	0.857	0.861	0.868	0.87	0.877	0.879	0.88	0.881
Belgium	0.865	0.868	0.871	0.873	0.873	0.877	0.88	0.88	0.881
Bulgaria	0.749	0.753	0.759	0.766	0.767	0.773	0.774	0.776	0.777
Croatia	0.781	0.788	0.796	0.801	0.8	0.806	0.812	0.812	0.812
Cyprus	0.828	0.832	0.838	0.844	0.852	0.848	0.85	0.848	0.845
Czech Republic	0.845	0.848	0.853	0.856	0.856	0.858	0.861	0.861	0.861
Denmark	0.891	0.893	0.895	0.896	0.895	0.898	0.899	0.9	0.9
Estonia	0.821	0.827	0.832	0.832	0.827	0.83	0.836	0.839	0.84
Finland	0.869	0.874	0.877	0.878	0.873	0.877	0.879	0.879	0.879
France	0.867	0.87	0.873	0.875	0.876	0.879	0.882	0.884	0.884
Germany	0.887	0.896	0.899	0.902	0.901	0.904	0.908	0.911	0.911
Greece	0.853	0.859	0.857	0.858	0.858	0.856	0.854	0.854	0.853
Hungary	0.805	0.81	0.813	0.814	0.816	0.817	0.817	0.817	0.818
Iceland	0.888	0.89	0.894	0.886	0.885	0.886	0.89	0.893	0.895
Ireland	0.89	0.895	0.901	0.902	0.898	0.899	0.9	0.901	0.899
Italy	0.858	0.863	0.867	0.868	0.866	0.869	0.872	0.872	0.872
Latvia	0.786	0.796	0.804	0.813	0.814	0.809	0.804	0.808	0.81
Lithuania	0.806	0.814	0.82	0.827	0.833	0.829	0.828	0.831	0.834
Luxembourg	0.876	0.877	0.88	0.882	0.876	0.881	0.881	0.88	0.881
Malta	0.801	0.801	0.802	0.809	0.818	0.821	0.823	0.827	0.829
Moldova	0.639	0.645	0.646	0.652	0.646	0.652	0.656	0.657	0.663
Netherlands	0.888	0.895	0.901	0.901	0.9	0.904	0.914	0.915	0.915
Norway	0.935	0.938	0.938	0.937	0.937	0.939	0.941	0.943	0.944
Poland	0.803	0.808	0.812	0.817	0.82	0.826	0.83	0.833	0.834
Portugal	0.79	0.794	0.8	0.805	0.809	0.816	0.819	0.822	0.822
Romania	0.75	0.759	0.769	0.781	0.781	0.779	0.782	0.782	0.785
Russian Federation	0.75	0.757	0.765	0.77	0.77	0.773	0.775	0.777	0.778
Serbia	0.732	0.735	0.739	0.743	0.742	0.743	0.744	0.743	0.745
Slovakia	0.803	0.81	0.817	0.824	0.826	0.826	0.827	0.829	0.83
Slovenia	0.855	0.861	0.865	0.871	0.875	0.873	0.874	0.874	0.874
Spain	0.844	0.848	0.852	0.857	0.858	0.864	0.868	0.869	0.869
Sweden	0.887	0.889	0.891	0.891	0.888	0.895	0.896	0.897	0.898
Switzerland	0.901	0.905	0.905	0.903	0.909	0.915	0.914	0.916	0.917
Turkey	0.687	0.698	0.706	0.71	0.716	0.738	0.752	0.756	0.759
Ukraine	0.713	0.72	0.726	0.729	0.722	0.726	0.73	0.733	0.734
United Kingdom	0.888	0.885	0.887	0.89	0.89	0.895	0.891	0.89	0.892



**Annex 2: Descriptive statistics of variables**

<b>EUROPA</b>	<b>HDI</b>	<b>LEB</b>	<b>MYS</b>	<b>EYS</b>	<b>GNI</b>
Mean	0.006914	0.004053	0.012414	0.008181	0.03088
Median	0.003448	0.002516	0	0	0.01869
Maximum	0.078189	0.035714	0.231707	0.183099	0.575296
Minimum	-0.03732	0	-0.11321	-0.15873	-0.22967
Std. Dev.	0.013497	0.005201	0.027754	0.030735	0.091126
Skewness	2.70123	3.106762	3.398108	1.236763	2.742221
Kurtosis	11.82521	13.27366	22.61783	15.70902	14.95083
Jarque-Bera	1485.61	2000.164	5980.791	2325.969	2399.007
Probability	0	0	0	0	0
Observations	333	333	333	333	333

Source: Own processing in Eviews