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Introduction

On September 21-22, 2015, 6th International Scientific Conference “Quality of Life 2015. Human and Ecosystems Well-being” was held in Wrocław.

The conference was a part of the cycle of the conferences on the topic of quality of life that have been organized by the Department of Statistics (Wrocław University of Economics) since 1999. The aim of the cycle is to participate in the still rising all over the world wave of scientific studies on quality of life: ethical background and definitions of quality of life, investigating (how to measure it), presenting the results of differences of quality of life over time and space, its interdependences with natural environment, mathematical methods useful for the methodology of measuring quality of life and finally – possible methods of improving it. The conferences are meant to integrate the Polish scientific community doing research on these topics as well as to make contacts with foreign scientists.

This year our honorary guest was Professor Filomena Maggino, past President of International Society for Quality-of-Life Studies (ISQOLS), who presented a plenary lecture.

We hosted about 30 participants, among them scientists from Spain, Romania, Italy and Japan. We had 24 lectures on such a variety of topics as carbon footprint and mathematical properties of some estimators. The common background of all of them was to better comprehend, measure and possibly to improve the quality of humans' life.

The present volume contains the extended versions of some selected lectures presented during the conference. We wish to thank all of the participants of the conference for co-creating very inspiring character of this meeting, stimulating productive discussions and resulting in some potentially fruitful cooperation over new research problems. We wish also to thank the authors for their prolonged cooperation in preparing this volume, the reviewers for their hard work and for many valuable, although anonymous, suggestions that helped some of us to improve their works.

Finally, we wish to thank the members of the Editorial Office of Wrocław University of Economics for their hard work while preparing the edition of this volume, continuous kindness and helpfulness exceeding their duties of the job.

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HUMAN DEVELOPMENT INDEX REVISITED*

NOWE SPOJRZENIE NA WSKAŹNIK ROZWOJU SPOŁECZNEGO

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Summary: The paper provides important information about Human Development Index (HDI) methodology which was modified around the year 2011. The old method and the its new version is discussed and evaluated from the point of view of policy making and sustainability. The paper recalls some recent assessments of HDI for the European Union and especially for Poland. This presentation is based on the United Nations Development Programme reports and supplemented by explanatory comments with regard to selected criteria and issues of HDI.

Keywords: quality of life indicators, Human Development Index.

Streszczenie: Artykuł dostarcza ważnych informacji na temat metodyki obliczania Wskaźnika Rozwoju Społecznego (Human Development Index – HDI). Metoda liczenia HDI była stopniowo przekształcana i ostatnio została zmieniona w 2011 roku. Artykuł przedstawia starą i nową metodę liczenia HDI z uwzględnieniem ich podstaw formalnych i ideowych. Następnie uwzględnia problem przydatności wskaźnika dla podejmowania decyzji dotyczących rozwoju społeczno-gospodarczego oraz dla monitorowania rozwoju trwałego i zrównoważonego. Wymienia również i komentuje ostatnie dostępne oszacowania HDI dla Unii Europejskiej i Polski. Wyniki zaczerpnięto z raportów agendy Organizacji Narodów Zjednoczonych zajmującej się Planowaniem Rozwoju. Wyliczone wartości wskaźników uzupełniono wyjaśniającym komentarzem odnoszącym się do wybranych kryteriów i aspektów HDI. W zakończeniu wymieniono kierunki rozwoju wskaźnika HDI, a w szczególności pokrewne mierniki mające służyć pomiarowi nowych wymiarów rozwoju trwałego i zrównoważonego.

Słowa kluczowe: wskaźniki jakości życia, Wskaźnik Rozwoju Społecznego.

* This paper was elaborated after my seminar “Sustainable Development and its Indicators” at the Faculty of Economic Sciences, University of Warsaw with a little help of my foreign students: Gadir Baydili, Hung Duy Dinh, Lili Guo, Punhan Huseynov, Ping Li.

1. Introduction

Human Development Index (HDI) is a synthetic indicator of human development that is published by the United Nations Development Programme (UNDP). The HDI provides an alternative to the common practice of evaluating a country's progress in development based on per capita Gross Domestic Product (GDP). The HDI is the leading indicator of the Human Development Report which is an independent report commissioned by the UNDP. The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development.

The HDI has a significant impact on drawing the attention of governments, corporations and international organizations to aspects of development that focus on the expansion of choices and freedoms. The HDI has enabled innovative thinking about progress by capturing the simple yet powerful idea that development is about much more than income.

However, the original HDI has its obvious and immanent constraints. The HDI does not address inequalities, poverty, human security, empowerment, and does not reflect directly on environmental and sustainability aspects. Recently, over the years the Human Development Report published by UNDP has introduced new measures to evaluate progress in reducing poverty and empowering women.

Human Development Index (HDI) was launched in the nineties of the twenty century by Pakistani economist Mahbub ul Haq. HDI is a single number statistic as a frame of reference for both social and economic development. HDI is a statistic used to rank countries in a sport-like manner. HDI is a very useful tool applied to assess the accomplishments of the nation in a process of increasing broadly understood the quality of life. Basically, it is probably the best known composite record of social and economic prosperity.

The general evaluation of a nation is based on individuals' wellbeing but is expressed by a single number in non-monetary terms per one country and per one year. Since being proposed in the 1990s, the HDI indicator became very popular and raised the problem of measurement and examining of social advancement, both in academic and political circles, and also in public discussion concerning issues of human wellbeing and its improvement.

A relative simplicity of the calculation method of HDI combined with the essential message that improvement is about more than economic growth has added to its fame. The New York Times states: "So far only one measure has succeeded in challenging the hegemony of growth-centric thinking. This is known as the Human Development Index (...)" [Gertner 2010]. HDI has been highly successful because its annual reports are attractive and cited in many countries and the world media. The HDI pretends to be a key measure of human society improvement because it quantifies the accomplishments of a nation in three fundamental spheres of human life improvement.

Human Development Report was published first in 1990. Since then UNDP is publishing HDI estimates annually and pretends to report that improvement is strictly connected with the extension of individuals' freedom, their wellbeing and great lives. The present formula of HDI is the geometric mean of standardized estimates from each of three measurements: a long and healthy life, being knowledgeable, and having a decent standard of living. The specialized technical notes of UNDP describe the progress to compute the HDI, information sources and the concept used to justify the system of wages [UNDP 2015]¹. However, in addition to the UNDP very positive work, it has to be stressed that HDI is just one more measurement tool to monitor the human progress.

2. Old method of HDI calculation

The Human Development Index (HDI) is a synthetic measure of achievements in key dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. The standard formula characterizing the HDI was accepted by the United Nations Development Program. The strategy for computing HDI started in the nineties and has been evolving from the beginning of 2010. HDI started to upgrade the new elucidation of three measurements. However, before the year 2011 there was a basic system to portray the components as it is followed below. The original HDI was used last time in the 2009 Human Development Report.

The original HDI incorporated three dimensions with respect to the three indexes:

1. Life expectancy at birth, as an index of population health and longevity contributing to the HDI.
2. Knowledge and education, as an index measured by the adult literacy rate and the combined primary, secondary, and tertiary gross enrollment ratio.
3. Standard of living, as it was indicated by the index of Gross Domestic Product (GDP) per capita and at Purchasing Power Parity.

In general, three dimensions were reported in three different units. Thus, there was a need changing "x" as a crude variable into an unit-less record value " x_{index} " standardized between 0 and 1. The most simple standardization formula was applied to calculate an index of a variable "x":

$$x_{\text{index}} = \frac{x - \min(x)}{\max(x) - \min(x)},$$

where "x" was the actual value of a variable, while "min(x)" and "max(x)" were the lowest and highest values the variable "x" could attain, respectively.

¹ For a full elaboration of the strategy behind the indicator and its scientific justification, see: [Anand, Sen 2000; Maddison 2010; Oeppen, Vaupel 2002; Kahneman, Deaton 2014; Klugman et al. 2011; Riley 2005].

The first key component of original HDI method was Life Expectancy Index (LEI). It was computed applying the basic minimum estimation of 25 years of life and the highest estimation of 85 years of life. In the formula Life Expectancy (LE) was the actual value recorded for the nation in question:

$$LEI = \frac{LE - 25}{85 - 25}.$$

Knowledge and education was the second component of HDI. Education Index (EI) was measured by the Adult Literacy Ratio (ALR) divided by 100 with 2/3 weighting and the combined primary, secondary, and tertiary Gross Enrollment Ratio (CGER) divided by 100 with 1/3 weighting were finally represented in the education index:

$$ALI = \frac{ALR - 0}{100 - 0},$$

$$GEI = \frac{CGER - 0}{100 - 0},$$

$$EI = \frac{2}{3} ALI + \frac{1}{3} GEI.$$

The third component of HDI was Gross Domestic Product Index (GDPI) and referred directly to Gross Domestic Product (GDP) – the most common and accepted economic indicator of economic activity. The standard of living dimension was measured by GDP per capita with the reference minimum income set on \$100 (PPP) and the maximum income set on \$40000 (PPP):

$$GDPI = \frac{\log(GDP) - \log(100)}{\log(40000) - \log(100)}.$$

The final assessment and official result for a country in question and per year was the mathematic formula of HDI which was the unitless arithmetic mean of all three indexes given above:

$$HDI = \frac{1}{3} (LEI + EI + GDPI).$$

3. New framework for HDI

Published on the 4th of November 2010 Human Development Report (and updated on the 10th of June 2011) was the new HDI calculated as the geometric mean of normalized indexes for each of the three dimensions. Since then and today, HDI combines the same three dimensions but in a slightly different way:

1. Life expectancy at birth is measured by an index of life expectancy which intentionally expresses the genetic, medical and environmental quality of life.

2. Knowledge and education is measured using an index combining two sub-indexes: mean years of schooling and expected years of schooling. They should express the average level of education of the society and the prospect to improve individual education.

3. A decent standard of living is associated with the wealth of the nation measured by an index of Gross National Income (GNI) per capita and at Purchasing Power Parity (PPP).

The old formula of HDI, until 2011, was specific in several points:

- HDI was a sum contributed by 3 uniformly weighted factors: LEI (Life Expectancy Index), EI (Education Index), GDPI (Gross Domestic Product Index);
- Minimum LE set at the level of 25 years;
- Education Index as a weighted sum of Adult Literacy Rate and Gross Enrollment Index;
- Living standard evaluation based upon Gross Domestic Product;
- Maximum GDP set at the level of \$40000.

The most obvious differences concern the reference value for Life Expectancy, interpretation of education component, using GNI instead of GDP, and of course the mathematics of the final index value. Thus, modification to HDI, 2011 onwards, can be summarized as follows:

- HDI is a geometric mean of three components: LEI (Life Expectancy Index), EI (Education Index), II (Income Index);
- Minimum LE set at the level of 20 years;
- Education Index calculation based upon Mean Years of Schooling (MYS) and Expected Years of Schooling (EYS) defined as follows:
 - MYS: Years that a 25-year-old person or older has spent in schools;
 - EYS: Years that a 5-year-old child will spend with his education in his whole life;
- The Gross National Income (GNI) used instead of GDP because:
 - GNI is the total domestic and foreign output claimed by residents of a country, consisting of Gross Domestic Product (GDP) plus factor incomes earned by foreign residents, minus income earned in the domestic economy by non-residents;
 - GNI better than GDP describes the standard of living in the country;
- Maximum GNI, in the 2014 Human Development Report set at the level of \$75000.

The latest modification in HDI methodology includes the change in maxima for normalization of dimensional indices – previously they were equal to the observed maxima over the period since 1980. Now they are fixed at 85 years for LE, 15 years for MYS, 18 years for EYS, and \$75,000 for GNI per capita. The previously used approach of “observed maxima” was criticized mainly on the grounds that the HDI

of the country should depend only on the country's own achievements, however, when using the observed maxima the HDI also depended on other countries, on those whose values were used as maxima. For example the HDI of Brazil also depended on how long Japanese lived, how well American adults were educated, and how high GNI per capita in Qatar was.

The other recent change is in the way the education indicators are aggregated. Geometric aggregation previously proposed for a new method of calculation was criticized on the grounds that a typical developing country has a (much) higher value of expected years of schooling than of mean years of schooling. By aggregating these two indicators with the geometric mean such a country is “penalized” because of the difference, although the country is improving education level by having more children attending school at all levels. The use of the arithmetic mean provides an equal treatment to both indicators. However, these changes have a minimal impact on values and ranks.

4. New method of HDI calculation

Basically, as it was necessary in the old formula of HDI, the same standardization equation was applied: in general, the index is equal to the actual value minus the minimum value divided by the difference between the maximum and the minimum values. Obviously, the minimum and the maximum values (goalposts) were set in order to transform the indicators expressed in different units into indices between 0 and 1. These goalposts act as the “natural zeroes” for the minimum value and as the “aspirational goals” for the maximum value, respectively, from which component indicators are standardized. However, as it was already shown and discussed in the previous section of this paper, several modifications were applied to the goalposts.

The justification for placing the natural zero for Life Expectancy at 20 years is based on historical evidence that no country in the 20th century had life expectancy of less than 20 years [Maddison 2001; Oeppen, Vaupel 2002; Riley 2005]. The maximum LE is fixed at 85 years. Intentionally, health of the nation is represented by Life Expectancy (LE) and Life Expectancy Index (LEI) is calculated as follows:

$$LEI = \frac{LE - 20}{85 - 20}.$$

Society can subsist without formal education, justifying the education minimum of 0 years. The maximum for mean years of schooling is fixed at 15 years because this is the projected maximum of this indicator for 2025. The maximum for expected years of schooling is determined at 18 years because this is equivalent to achieving a master’s degree in most countries. For the education dimension, the standardizing equation is first applied to each of the two indicators, MYS and EYS, to calculate two indexes: MYSI and EYSI. Next, the arithmetic mean of the two resulting indices is taken to calculate the Education Index (EI):

$$\begin{aligned} \text{MYSI} &= \frac{\text{MYS}}{15}, \\ \text{EYSI} &= \frac{\text{EYS}}{18}, \\ \text{EI} &= \frac{\text{MYSI} + \text{EYSI}}{2}. \end{aligned}$$

The minimum value for Gross National Income (GNI) per capita set on \$100 is justified by the considerable amount of unmeasured subsistence and nonmarket production in economies close to the minimum, which is not captured in the official data. The maximum is set at \$75,000 per capita. Kahneman and Deaton [2010] have shown that there is virtually no gain in human development and well-being from annual income beyond \$75,000. Assuming annual growth rate of 5 percent, only three countries are projected to exceed the \$75,000 ceiling in the next five years. Because each dimension index is a proxy for capabilities in the corresponding dimension, the transformation function from income to capabilities is likely to be concave [Anand, Sen 2000] – that is, each additional dollar of income has a smaller effect on expanding capabilities. Thus for income, the natural logarithm of the actual, minimum and maximum values is used. Income Index (II) results from the formula:

$$\text{II} = \frac{\ln(\text{GNI}) - \ln(100)}{\ln(75000) - \ln(100)}.$$

Finally, the HDI is the geometric mean of the previous three normalized indexes:

$$\text{HDI} = \sqrt[3]{\text{LEI} \cdot \text{EI} \cdot \text{II}}.$$

Several methodological problems will be briefly commented in the next three subsections of this paper. They refer to the category of Gross National Income, missing values problem, and countries grouping. All of them will be explained and commented using some basic materials delivered by the United Nations Development Programme [UNDP 2015].

4.1. Method used to express income

Basically, the income data are based upon the World Bank assessments. The World Bank's 2014 World Development Indicators database contains estimates of GNI per capita in 2011 Purchasing Power Parity (PPP) terms for many countries. For countries missing this indicator (entirely or partly), the Human Development Report calculates it by converting GNI from current to constant terms using two steps [UNDP 2015]. First, the value of nominal GNI per capita is converted into PPP terms for the base year (2011). Second, a time series of GNI per capita in 2011 PPP terms is constructed

by applying the real growth rates to the GNI per capita in PPP terms for the base year.

In the calculation the real growth rate is taken into consideration [UNDP 2015]. The real growth rate is implied by the ratio of the nominal growth of current GNI per capita in local currency terms to the GDP deflator. To obtain the income value for 2013, GDP growth rates (based on growth in constant terms) based on the International Monetary Fund (IMF) projections are applied to the most recent GNI values in constant PPP terms.

The IMF methodology determines all further projections. The IMF-projected growth rates are calculated based on local currency terms and constant prices rather than in PPP terms. This avoids mixing the effects of the PPP conversion with those of real growth of the economy. Official PPP conversion rates are produced by the International Comparison Program, whose surveys periodically collect thousands of prices of matched goods and services in many countries. The last round of this exercise refers to 2011 and covers 180 countries.

4.2. Estimating missing value

Obviously, collecting every year a homogenous data set for all countries is not possible. For a small number of countries missing some indicators, the Human Development Report estimates the missing values using cross-country regression models. The details of the models used are available at the internet page of UNDP presenting Technical Notes of its Human Development Report [UNDP 2015].

In particular, in the last report expected years of schooling were estimated for several countries including: Cote d'Ivoire, Haiti, Liberia, the Federated States of Micronesia, Papua New Guinea, Sierra Leone, South Africa, Sudan and Turkmenistan. Actually, mean years of schooling were estimated for Antigua and Barbuda, Cape Verde, Dominica, Equatorial Guinea, Eritrea, Grenada, Kiribati, Madagascar, Palau, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Solomon Islands.

4.3. Grouping countries

The 2014 Human Development Report introduces a system of fixed cut-off points for the four categories of human development achievements [UNDP 2015]. These points make grouping of countries and their most general evaluation possible. The cut-off points (*COP*) are obtained as the *HDI* values calculated using the quartiles of the distributions of component indicators.

The resulting HDI values are averaged over the 10-year interval (2004-2013): $COP_q = HDI (LE_q, MYS_q, EYS_q, GNIpc_q) \times q = 1,2,3$. For instance, defined threshold values LE_3 , LE_2 , and LE_1 denote three quartiles of the distribution of life expectancy across countries. Finally, the resulting HDI cut-off points for the country grouping in the last Human Development Report are as follows:

- Very High Human Development (COP_3) = 0.800,

- High Human Development (COP_2) = 0.700,
- Medium Human Development (COP_1) = 0.550.

However, the main objective of setting threshold values is countries grouping that allows for classifying them and attribute to one of four general group of countries: Very High Human Development, High Human Development, Medium Human Developed, and Low Human Development (these are countries which are below the level of COP_1 , which is 0.550).

Therefore, this general interpretation of HDI allows for a simplified grouping and development assessment of all nations:

- around 30% of all countries qualifies for High or Very High Human Development,
- around 51% of all countries qualifies for Medium Human Development,
- around 19% of all countries qualifies for Low Human Development.

This classification creates a firm background for the most common typology, which is not officially certified by the United Nations, but extremely popular in the media, indicating in a global community two polarized and opposed groups of countries: “developed countries” and “developing countries”.

5. Ranking of HDI

Human Development Report is annually published by the United Nations Development Programme and presents widely commented and cited HDI ranking of almost all countries of the world. The list of countries is impressive and takes into account the vast majority of UN members including Hong Kong, and Palestinians territories. Only few countries are excluded due to lack of data (e.g. North Korea and Fiji).

The latest ranking of HDI indicators was based on data available for years of 2012-2013 and was published in 2014 [UNDP 2015]. The highest HDI was attained by Norway and the top five countries were as follows:

- Norway – 0.944,
- Australia – 0.933,
- Switzerland – 0.917,
- Netherlands – 0.915,
- USA – 0.914.

It is not surprising that IMF classifies all these countries as “advanced economies” [International Monetary Fund 2015]. However, neither of the three leading countries accounts for the top three results in GDP per capita [The World Bank 2015], which clearly indicates that economic growth is not always the ultimate source of human development level. However, and in general, OECD countries are the permanent leaders of all HDI rankings.

On the bottom of the UNDP ranking list there are countries with the lowest HDI and such a negative result was calculated for a group of African countries:

- Niger – 0.337,
- Democratic Republic of the Congo – 0.338,
- Central African Republic – 0.341,
- Chad – 0.372,
- Sierra Leone – 0.374.

Niger, the Democratic Republic of the Congo and the Central African Republic are classified as Sub-Saharan Africa region countries and included in the list of Least Developed Countries by UN [UN 2015]. However, in this case, both the Central African Republic and the Democratic Republic of the Congo have the lowest GNI per capita in PPP terms converted to international dollars [The World Bank 2015], in the world with the values of 600\$ and 740\$, respectively. This illustrates that economic development level can be the decisive factor of human development for some countries.

It is perfectly clear that the three dimensions incorporated in HDI can be a geometric mean dominated by one factor somehow compensating poor performance of the two remaining factors. Poland and Qatar share almost the same place in the recent rankings of HDI but this is happening because Education Index for Poland compensates Poland's lower Life Expectancy and lower GNI which is almost six times smaller than GNI of Qatar. Therefore, it is necessary to assess HDI at different dimensions in order to identify radical deviations from the general ranking. In the next paragraphs several examples illustrate this aspect of HDI measurement for particular countries which experience poor correlation for their health, education or income indices.

Firstly, HDI final value in comparison with Life Expectancy Index (LEI). It can be identified that there are several countries which are classified in the Low Human Development category but have LEI values similar to the countries which are in the High Human Development category. For instance, the country of Solomon Islands has the similar LEI value to Russian Federation, with the values of 0.733 and 0.738, respectively. However, the Solomon Islands is included in the list of Low Human Development countries with the value of 0.491 while Russian Federation is classified as High Human Development country with the value of 0.778. This example clearly indicates that better health level does not necessarily lead to the higher Human Development Level in the country.

Secondly, HDI value confronted with Education Index (EI). In this case it can be found that there are several countries which are classified in the High Human Development category but have EI values similar to the countries which are in the Medium and Low Level Human Development category. For instance, Kuwait has the same mean years of schooling of adults as Zimbabwe with the years of 7.2. However, Kuwait is included in the list of High Human Development countries with the value of 0.814 and Zimbabwe is classified as Low Human Development country with the value of 0.492. This example clearly indicates that a country can attain quite a high HDI value despite experiencing poor education level in the society.

Table 1. HDI classification by indicators, groups and regions

Classification	HDI 2013	LE 2013	MYS 2012	EYS 2012	GNI per capita 2013 (2011 PPP \$)
HDI Groups					
Very High Human Development	0.890	80.2	11.7	16.3	40 046
High Human Development	0.735	74.5	8.1	13.4	13 231
Medium Human Development	0.614	67.9	5.5	11.7	5 960
Low Human Development	0.493	59.4	4.2	9.0	2 904
Regions					
Latin America and the Carribean	0.740	74.9	7.9	13.7	13 767
Europe and Central Asia	0.738	71.3	9.6	13.6	12 415
East Asia and the Pacific	0.703	74.0	7.4	12.5	10 499
Arab States	0.682	70.2	6.3	11.8	15 817
South Asia	0.588	67.2	4.7	11.2	5 195
Sub-Saharan Africa	0.502	56.8	4.8	9.7	3 152

Source: author's own elaboration based on [UNDP 2015].

Thirdly, HDI value in comparison with Income Index (II). Also with regard to GNI there are several countries which are classified in the Low Human Development category but have II values similar to the countries which are in the High Human Development category. For instance, Angola has the similar II value to Georgia with the values of 0.626 and 0.639, respectively. However, Angola is included in the list of Low Human Development countries with the value of 0.526 and Georgia is classified as High Human Development country with the value of 0.744. This example shows that higher income level does not necessarily lead to the High Human Development level of the country.

This type of inconsistency characteristic for a composite synthetic indicator is due to its calculation method. HDI takes geometric mean of three indexes and in this way gives equal weights to all variables, regardless of the absolute value of a separate component variable. Therefore, a country which has at least one index of

the highest value in the world can still achieve high HDI value in spite of having poor value of two remaining indexes.

In addition to a country analysis based on separated indexes forming the synthetic indicator, HDI results can be inspected in a way based on division into groups of countries and regions. This method of analysis would rely on data presented in Table 1. In the case of group classification of countries each superior group has higher value for all individual indexes when compared to the succeeding category. However, interesting inconsistency appears between HDI assessments in the case of classification based on regions. Particularly, despite the fact that region “Latin America and the Caribbean” has the highest HDI value, region “Europe and Central Asia” has the highest mean years of schooling as well as region “Arab States” has the highest GNI per capita.

Unfortunately, according to the classification system of UNDP, EU or OECD countries do not form a separate region appropriate for this analysis. Thus, in the next part of this paper an analysis of the HDI for EU countries will be performed.

6. Assessment of HDI trends for the EU countries and Poland

HDI for the EU entity and for selected EU countries, based on data provided by UNDP [UNDP 2015], was calculated to disclose several patterns for EU countries in the period of last 33 years.

First, indicators disclose a clear North-West vs. South-East diversity in Europe. Generally, old EU member countries like Germany, the United Kingdom and France show better performance described by HDI than countries like Poland, Estonia and Croatia. In addition to that, many Eastern European countries are outperformed by their North-Western European counterparts on two dimensions of human development. This conclusion can be withdrawn from the detailed data tables of UNDP for education and GNI.

On the other hand, though, this pattern does not hold when comparing North-Western European regions with Southern European regions. Southern European regions outperform many North-Western European regions when it comes to the health dimension represented by Life Expectancy. The main bottleneck to human development for Southern European regions seems to be the knowledge and education dimension (especially southern Italy and large parts of Greece) and the income dimension (especially South-East Spain and Southern Italy).

After a general evaluation of overall trends and patterns for EU and selected countries, a brief analysis will concern HDI for Poland. Poland’s HDI value for 2013 was 0.834 – in the Very High Human Development category – positioning our country at 35 out of 187 countries and territories. Between 1980 and 2013, Poland’s HDI value increased from 0.687 to 0.834, which means an increase of 21% or an average annual increase of about 0.6% [UNDP 2015].

Despite overall increase in HDI value, there are significant differences among trends of each of HDI dimension for Poland. Therefore, each dimension should be analyzed separately to identify a key reason behind the evolution of each trend. Firstly, Life Expectancy Index was the best performing index among others and increased by 11% between 1980 and 2013, with an average annual increase of about 0.3%. The main reason for increase in Life Expectancy Index was due to more healthy natural and working environment, food, and because of improved medical care services. In conclusion, a quite significant increase in life expectancy at birth by 5.5 years was reported for an abovementioned period.

Secondly, Education Index was the worst performing dimension between 1980 and 2000. However, due to robust progress in education, Poland's Education Index reached and passed Income Index at the end of the 1990s. The main reason for an outstanding improvement in Education Index was due to 44% increase in mean years of schooling (of adults) from 7.7 to 11.1 years and 23% increase in expected years of schooling (of children) from 12 to 14.8 years, between 1980 and 2000. Consequently, Education Index for Poland rose by 40% between 1980 and 2013, with an average annual increase of about 1%.

Finally, Income Index for Poland is currently the worst performing index among three considered dimensions. However, Poland's GNI per capita in PPP was \$21,487 for 2013, which increased by about 105% between 1980 and 2013, with average annual growth of 2.2%. As a result, Income Index grew by 15% between 1980 and 2013, which was well below than the growth of Education Index, but still higher than the rise for Life Expectancy Index. This evaluation compares pure dynamics of indexes without a broader view of world economy and its stagnation. Certainly, Poland is doing very well and has a positive growth rate for GDP and GNI. However, this performance is not as much significant for the value of HDI as the most recent increases of Life Expectancy and Education Indexes.

7. Conclusions

The UNDP's iconic HDI is just 25 years old today. Of all the world's indices, the HDI is surely the most ingenious. It ranks countries by the quality of life they give to their people. Its brilliance lies in its simplicity. According to the index philosophy, three parameters govern human development and quality of life: health, education, and wealth. The HDI's simplicity has ensured its endurance.

Because HDI allows for a very transparent ranking, it is also an aspiration index and it sets straightforward targets for nations. Its influence should not be underestimated because it has forced nations to look beyond national income as a crude measure of success – a vital step as our global society attempts to live within planetary boundaries. Its effect has seen governments and international organizations set up projects and policies to attempt to increase their HDI rank. Indeed, the foreword of the 2010 report stated: “The human development approach

has profoundly affected an entire generation of policy-makers and development specialists around the world” [UNDP 2015].

There are some positive and useful characteristics associated with the use of HDI. A classification based on HDI assessment used to distinguish whether the country is developed or developing. HDI helps to measure the impact of economic policies on the quality of life in its broad sense.

However, HDI was not designed to monitor sustainable development and has several failings [Kovacevic 2010]. These are important omissions given that there is overwhelming evidence that human development is not sustainable. The short-list of omissions and obstacles can be as follows:

- HDI does not include any explicit ecological considerations except human health,
- HDI does not include any specific social considerations except schooling,
- HDI still promotes economic growth rather than sustainable development.

Moreover, there are significant examples of a very misleading interpretation of HDI for very different countries. Some countries report progress in HDI but they are not democratic and poor. A paradox like Cuba is symbolic. Cuba ranked around position number 50 had life expectancy of 70.1 years (higher than the USA, rank 4) but GNI of \$5,416, 3.5 times lower than Equatorial Guinea ranked at position number 136.

Scientists propose modifications and supplementary indicators to support the traditional HDI [Becker et. al. 2005]. The UNDP experts attempt to add some social aspects widely considered as contributing to sustainable development in a positive way [Alkire, Foster 2010]. New approaches to HDI include social inequality, poverty [Dotter, Klasen 2014], and gender problem [Gaye et. al. 2010]. There is a visible emphasis on sustaining human progress by reducing vulnerability and building resilience of the social system. The UNDP data base is an open access resource and provides data, methodology and results of the following new indicators [UNDP 2015]:

- Inequality-adjusted Human Development Index (IHDI),
- Multidimensional Poverty Index (MPI),
- Gender Inequality Index (GII),
- Gender Development Index (GDI).

In conclusion, the last 2014 Human Development Report was focused on HDI but also prepared to be a large data base and much more complete evaluation of human development improvements. New measures enumerated above show the new way but are not sufficient, especially because of the environmental gap in the method. The HDI advantages should not be forgotten and HDI drawbacks can be cured by a more advanced indicators addressing the most important but still neglected characteristics of human development.

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