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Mirela LAZĂR, Cornel LAZĂR

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Human Development in Romania in the Context of the New Methodological Approaches

Mirela LAZĂR¹, Cornel LAZĂR²

Abstract

Specialist's preoccupation concerning the quantification of the human development through synthetic indexes has been materialized during time in a series of composite indexes, whose methodology was permanently reconsidered from the meaning of quantify more correctly and rigorously the contribution of each involved factor. One of the most known synthetic indexes is the Human Development Index (HDI), which starting with 2010 has suffered important methodological changes. The paper present briefly these methodological changes and emphasize their influence both of the HDI level and of countries classification. It's also present the evolution of the HDI in Romania in comparison with other European countries, for the period 1980 – 2010, calculated both in the old and in the new variant. The data emphasize the fact that even the new methodology brings us a better rank, Romania is still situated near to the end of classification between the UE countries.

Keywords: human development; Human Development Index; methodological changes; education index; life expectancy index; income index.

Introduction

The complexity of human development, the multiple differences between countries, regions, the discrepancies between their levels of development have all led to increasing the interest of the specialists in this field. Quantizing the human development, especially from the point of view of long-lasting development, can be accomplished both by means of a system of precise or sectorial indicators, oriented towards different problems, and by some synthetic, unitary indicators,

¹ Lecturer PhD, Faculty of Economic Sciences, Oil and Gas University in Ploiesti, B-dul. Bucuresti, no.39, phone 0740174189, ROMANIA, e-mail: lazar_mce@yahoo.com

² Reader PhD, Faculty of Economic Sciences, Oil and Gas University in Ploiesti, B-dul. Bucuresti, no.39, phone 0744913435, ROMANIA, e-mail: clazar@upg-ploiesti.ro

which should point out the level of long-lasting development by only one expression.

Even the aggregated indicators (Lazăr Mirela, Lazăr Cornel, 2008) cannot provide a complete image on the human development in the same way as a complex system of indicators, they have a real scientific character and they are very often used in the appreciation of the human development, being a useful tool to monitor progress in this domain. They are successfully used for the hierarchical distribution (Boidin Bruno, 2003) of different territorial entities, from the perspective of the sustainable development. One of the most known and used indicator for quantify the human development is The Human Development Index (HDI), an aggregated indicator that measure the average achievement in three basic dimensions of human development – a long and healthy life, knowledge and a decent standard of living (HDR, 2006).

The HDI is considered a better measure of the human development than the income per capita because the income can not be a surrogate for all dimensions of human development and for achieves a reasonable level of human development it's not necessary unlimited income. In the era of globalization, human development has new dimensions and the methodology of quantification must be reconsidered (Lorenzo Garbo, 2009).

Changes in methodology of calculating the Human Development Index

The Human Development Index was first calculated in 1900 in the first Human Development Report, published in PNUD. Throughout the time, HDI has gone through a lot of changes which have aimed both at the already-considered indicators, their maximum and minimum values, and the index calculation formulae.

If we refer to the indicators used to calculate the HDI, their evolution since 1990 up to now has been the following:

Table 1 The indicators of the Human Development Index

Variables	UM	1990	1991-1994	1995-2009	2010
Life expectancy of birth	years	●	●	●	●
Adult literacy rate	%	●	●	●	
Gross enrolment ratio	%			●	
Mean years of schooling	years		●		●
Expected years of schooling	years				●
Gross Domestic Product (GDP) per capita	\$PPP	●	●	●	
Gross national Income (GNI)per capita	\$PPP				●

Data sources: Human Development Reports 1990, 1991, 1995, 2009, 2010

As results from the above-mentioned table, throughout the 20 years since the first Human Development Report was drawn up, the HDI indicators have changed; the only one that has not changed is life expectancy at birth. Irrespective of the indicators which were at the basis of HDI throughout the time, they were chosen in this way in order to measure every time the progress of human development in three dimensions: longevity, the access to education and a decent standard of living.

After the calculation of the first HDI in 1990, in the following four years (1991 - 1994), there is introduced a new variable in the calculation of the index, namely the mean years of schooling, which, together with the adult literacy rate, is used in determining the education index.

Since 1995 the variable of the mean years of schooling is no longer used for measuring education as its calculation formula was very complex and required an enormous volume of data. In most of the cases, the data were estimated and the results were not always acceptable. Instead of this, the variable gross enrolment ratio is introduced, which was kept for the HDI calculation until 2009.

2010 brings about new major changes in the HDI methodology concerning the variables used; the only variable which was not changed was life expectancy at birth. Thus, in exchange for the two variables used until then in order to determine the education index (the adult literacy rate and the gross enrolment ratio), there are introduced two more variables: the mean years of schooling and the expected years of schooling. Also, as far as income is concerned, the Gross National Income per capita is introduced instead of Gross Domestic Product per capita.

The changes that occurred were the result of the continuous concern of the specialists in the field of precise quantising the human development, identifying the most appropriate variables which should reflect the progress or regress of different countries in this field and which should comply with the current global tendencies, especially in the field of education. The introduction of the new variables also considered their availability, as well as the possibility of determining them.

The changes that occurred in the methodology of HDI calculation, as we mentioned earlier, did not aim only at the variables, but also at their minimum and maximum values which are used in the calculation of the indices for the three fields. These values have always been monitored and updated in compliance with the evolution recorded at the global level, being chosen in such a way to lead to values of individual indices between 0 and 1.

After a series of changes made almost annually between 1990 and 1994, from 1995 to 2009 the maximum and minimum values of the variables remained unchanged; they were about to change in 2101 along with the change of the variables.

Table 2 – Evolution of the minimum and maximum values of HDI variables

	UM	1995-2009		2010	
		Minimum	Maximum	Minimum	Maximum
Life expectancy of birth	years	25	85	20	83,2
Adult literacy rate	%	0	100		
Gross enrolment ratio	%	0	100		
Mean years of schooling	years			0	13,2
Expected years of schooling	years			0	20,6
Gross Domestic Product (GDP) per capita	\$PPP	100	40000		
Gross national Income (GNI)per capita	\$PPP			163	108211

Data sources: Human Development Reports 1995, 2009, 2010

For 2010, which brought about the most significant methodological changes, setting the maximum values was based on observing their evolution within a 30-year time period (1980 - 2010). Thus, for life expectancy at birth, the maximum level represents the value recorded in Japan in 2010, for the mean years of schooling, the value recorded in 2000 in the United States, for the expected years of schooling, the value recorded in 2002 in Australia and for income, its level in 1980 in the United Arab Emirates (HDR, 2010).

The minimum values set in 2010 for variables are those close to ‘natural’ zero or the subsistence ones. Income is the exception; its minimum level is the one recorded in 2008 in Zimbabwe.

The methodological HDI changes have affected the calculation formula as well throughout the time.

Determining the Human Development Index implies the calculation of individual indices according to the following general formula:

$$IndexX_i = \frac{actualX_i\ value - min\ inumX_i\ value}{max\ inumX_i\ value - min\ inumX_i\ value}$$

where X_i represents the variables considered in determining HDI.

Among the three indices that were always vital for determining the HDI, irrespective of the variables used, the index for longevity is the only one that remained unchanged; the other two, the education one and the income one were changed by applying some more complex formula.

The education index was calculated until 2009 as an arithmetic weighted mean of the indices of the two variables considered for its calculation, the adult literacy rate having a weight of two thirds, and the other variable (the mean years of schooling or the gross enrolment ratio) representing one third.

The income index has always been a complex calculation formula, approached differently until 1999, between 1999 and 2009 and in 2010.

Thus, until 1999 the incomes were adjusted according to a complex formula in which their medium global level was considered to be the threshold level and any exceeding income was adjusted according to Atkinson formulation for income utility.

Between 1999 and 2009, the calculation methodology for income index is changed, the adjustment being done gradually, by applying the following logarithm:

$$I_{PIB} = \frac{\log PIB_i - \log PIB_{min}}{\log PIB_{max} - \log PIB_{min}}$$

The logarithm was applied in order to diminish the big influence of incomes in determining the HDI level, because a reasonable level of human development does not necessarily imply a high level of incomes. “The link between economic prosperity and human development is neither automatic nor obvious. Two countries with similar income per capita can have very different HDI values” (HDR, 1999).

However, the most drastic changes in determining the HDI are made in the Human Development Report in 2010, which, apart from changing the variables and their maximum and minimum levels, modify also the calculation manner both of the individual indices and the HDI.

Thus, the education index is not determined any more as a weighted arithmetic mean, but as a geometrical mean of the individual indices of the two variables considered (the mean years of schooling and expected years of schooling):

$$\text{Education index} = \frac{\sqrt{\text{Mean years of schooling index} \times \text{Expected years of schooling index}} - 0}{0,951 - 0}$$

where 0.951 represents the maximum level for Combined education index (a value calculated for New Zealand, 2010), and 0 is the minimum level.

The income index is calculated by applying the natural logarithm instead of the logarithm.

$$\text{Income index} = \frac{\ln GNI_i - \ln GNI_{min}}{\ln GNI_{max} - \ln GNI_{min}}$$

Also, the calculation formula of the HDI turns from a simple arithmetic mean of the three indices (for longevity, education and income) into their geometric mean:

$$\text{HDI} = \sqrt[3]{I_{Life} \times I_{Education} \times I_{Income}}$$

The new calculation formula points out “imperfect substitutability across all HDI dimensions” (HDR, 2010), thus dealing with a series of criticism addressed to the old methodology about the linear aggregation which allowed the perfect substitution across dimensions.

There were also changes regarding the way the classification of countries was done. Thus, since 2009 the classification has not comprised 3 big groups of countries any more, but 4:

Table 3 – Classification of countries according to the values of Human Development Index

Groups of countries	before 2009	2009 - 2010
Very high human development	-	0,788 – 1
High human development	0,800 – 1	0,677 – 0,784
Medium human development	0,500 – 0,799	0,488 – 0,669
Low human development	0 – 0,499	0 – 0,470

Data sources: Human Development Reports 2007-2008, 2009, 2010

Tendencies recorded at the global level in the HDI evolution and in the classification of countries

The calculation of Human Development Index began 20 years ago in the first Human Development Report of PNUD and the continuous concern with improving the methodology so that the results should reflect a fair and real situation have brought about a new perspective on human development.

Conceived so that it can show human development in its three dimensions, HDI was recalculated each time there were changes in order to ensure data continuity and to show the recorded tendencies as correctly as possible. HDI was initially calculated for 130 countries and along the way the number reached 182 countries (Human Development Report 2009).

Irrespective of the calculation methodology, there is a series of countries such as Japan, Canada, Norway, Australia, The Netherlands, Sweden, Switzerland, France and the United States, which were constantly in the top 10 of the classification with a high level (or very high, according to the classification in 2009 and 2010). The first position during 20 years was occupied in turn by Japan (three times), Canada (eight times), Island (once) and Norway (eight times).

At the opposite end of the classification, with a low level of development, there were countries such as Niger, Congo, Somalia, Sierra Leone, Mali.

As we mentioned before, the Human Development Report in 2010 brings about the most significant changes regarding the calculation methodology of HDI. The new calculation formula of HDI which uses the geometric mean led to lower values of the index than before, especially in the case of countries with uneven development across dimensions. The impact on the classification was however moderate.

In 2010 HDI was calculated only for 169 countries as compared to 182 in the previous year. Also, in order to study the progress recorded, as it happened every time there were methodological changes, the index is recalculated for the last 40 years for 135 countries under the form of a hybrid index this time (<http://hdr.undp.org/en/data/trends/>), which uses the new calculation formula, but takes into consideration the old indicators. There was a positive conclusion in the sense that, except for three countries (Congo, Zambia and Zimbabwe), all the other countries recorded progress in the field of human development as compared to 1970. The best rising trend was recorded by Oman, China, Nepal and Indonesia.

The evolution of human development in Romania regarding HDI

Even from the beginning, Romania was included in the group of countries for which the Human Development Index was calculated, a synthetic index, used along with other similar indicators in order to assess the human development level, the progress and regress recorded in this direction.

In almost all the cases since HDI began to be calculated, Romania fell into the category of countries with a medium development level, being behind many countries which adhered to European Union later, like our country, but which fell in the group of countries with a high development level (Hungary, Poland, Czech Republic, Estonia, Lithuania, Latvia, Slovenia, Greece, Malta, Cyprus etc.). Bulgaria was ahead of Romania for quite a long period of time; it fell into the group of countries with a medium level of development. Countries such as the Russian Federation, Albania, Serbia, Republic of Moldova, countries which are not EU members, recorded lower values of HDI than Romania.

Starting with the Human Development Report in 2006, the Human Development Index calculated for Romania exceeds the threshold of 0.800, thus falling in the category of countries with a high level of development, keeping however the same hierarchy as the above-mentioned one.

The numerous methodological changes mentioned above led to the recalculation of HDI for the previous periods as well, in order to ensure comparability and recalculation of the index according to the new conditions.

Looking at the recalculated data, considering both the new methodology in the Human Development Report in 2010 and the old methodology in the previous year, the HDI evolution for Romania was the following:

Table 4 The evolution of the Human Development Index in Romania

	1970	1975	1980	1985	1990	1995	2000	2005	2010
Hibrid HDI ¹	0,643	0,677	0,708	0,725	0,723	0,702	0,713	0,755	0,785
New HDI ²	...	...	...	...	0,688	0,674	0,690	0,733	0,767
Old HDI ³	...	...	0,786	0,792	0,786	0,780	0,788	0,824	-

Date sources: ¹ <http://hdr.undp.org/en/data/trends/> ² Human Development Report 2010 ³ Human development Report 2009 for 1990 – 2005 and Human Development Report 2007/2008 for 1980 and 1985 ... Missing data

Looking at the evolution of the three versions, it is obvious that Romania has recorded considerable progress throughout the time as regards human development. The most significant version, which refers to a 40-year period, is that of the hybrid index, which shows an increase of over 20% in the level of the index.

The graphic representation highlights the fact that the versions calculated in 2010, both for the hybrid index and for the new index, show close values, but about 0.1 lower than those calculated according to the old methodology in 2009.

Furthermore, the indices recalculated in 2010 for the previous periods highlight a regress period between 1990 and 2000, unlike those in 2009.

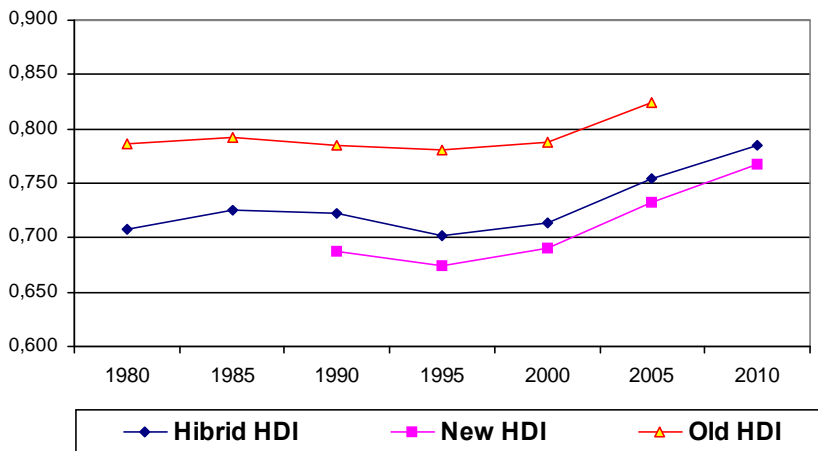


Figure 1 The evolution of the Human Development Index in Romania

Data sources: Human Development Reports 2007-2008, 2009, 2010 and <http://hdr.undp.org/en/data/trends/>

For Romania, the new calculation methodology in 2010 brings a much better position from the point of view of the classification (position 50 as compared to position 63 in the previous year), even if it reduces the level of the index. For the first time, Romania is situated ahead of Bulgaria (position 58) in the classification. Unfortunately, as compared to the other EU member states, the situation does not change, Romania continuing to be behind them.

Conclusions

Although the calculation methodology of the Human Development Index has been through a lot of changes, 2010 changed significantly the calculation manner of HDI, both regarding the variables used and their minimum and maximum values. Furthermore, for the calculation of the index, the calculation formula is also changed in 2010, the geometric mean replacing the arithmetical mean. The new methodology generated low values of the index, especially for the countries with a low level of development. There must be pointed out the fact that, irrespective of the calculation methodology of HDI, countries such as Canada, Norway, Japan, the Netherlands, Sweden etc. have always held positions at the top of the classification. The calculation of a hybrid index of human development every five years for a 40-year period (1970 - 2010) pointed out the fact that most of the countries recorded progress. The way of progress was however different, especially for a series of developing countries which recorded faster progress,

similar to the developed countries, in the field of education and health and less in the case of income.

Calculated according to the new methodology in 2010, HDI in Romania recorded a significant increase, from 0.688 in 1990 to 0.767 in 2010, a level which places our country among the countries with a high level of development, on position 50. Although for the first time Romania comes ahead of Bulgaria (position 58), our country however is situated on the last but one position among the EU member states.

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