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Measurement of objective life quality in the context of economically developed countries' quantification

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Abstract

In the last decades, the economic performance in the countries is very often compared to social development of a society. In this field, there exists a long-term disharmony between a rate of economic growth that is measured by the outputs and a rate of GDP growth and life quality and life conditions of citizens that are measured by different indices. There exist many factors that influence the objective life quality. The fundamental life conditions that may be compared are for instance availability of health care services and education, average wages, quality of natural environment, etc. The use of some indicators is often connected with methodological issues, such as in case of a corruption rate, setting of a legal system, functioning of democratic principles in a country, etc. In the social science, there prevails an opinion that a level of GDP is not automatically reflected into daily lives of people or that a rise of GDP is not linearly connected with a rise of a living standard and a better life of individuals. This article reflects on these aspects. The theoretical part presents a description of the most well-know indices that are used to evaluate life quality at the macro-regional level. The analytical part focuses on quantification of life quality by means of a composite index of a human development (Human Development Index), which is annually published in Human Development Report within the United Nations Development Programme(UNDP) since 1990. There was evaluated a development of values of the HDI index in Slovakia over the last ten years and compared with a development in the countries of the EU on the basis of available data. The conclusion of the paper is devoted to a specification of methodological issues that are related to the HDI index application. These issues are partially eliminated by a complementary use of other indices to assess an objective life quality, which are recommended by the OSN initiatives that will conclude a complex of solved issues in the article.

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Keywords: economic growth, objective life quality, measurement of life quality, life quality quantification, human development index, composite indices of life quality.

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1. Introduction

1.1. Context of quality of life

Quality of life is a composite, multi-level, multi-dimensional concept, for which there is no uniform definition (Ira and Andráško, 2007). Quality of life issues have embraced many disciplines, from theology, psychology, medicine, economics, up to geography, so it is important to determine the area of the quality of life concerned, and also a suitable choice of specific indicators (Murgaš, 2009; Vajda, Vravec, 2011; Antošová et al. 2014). Džuka (2004) distinguishes three dimensions: the objective quality of life which evaluates the objective conditions of life of people who are not the subject of psychological research; subjective quality of life based on the judgment and evaluation of the conditions of life; subjective well-being including expressed emotional system and assessment of the conditions of our lives(Džuka, 2004). Quality of life is a broader concept than economic production and living conditions. It includes a number of factors that affect our assessment of life, beyond its material page. According to the report from professors J.E. Stiglitz, A. Sen and J.P. Fittoussi, there are three approaches to measuring quality of life. The first approach takes into account the subjective evaluation of well-being. It is closely connected to psychological research. The second approach has its basis on the use of individual abilities. It considers human life in terms of various deeds and beings and individual freedom to choose between these abilities. This could include the lifestyle of the individual, which protects against premature death or literacy, which is necessary for active participation in political life. The third approach, developed in the context of the economic tradition, is based on fair allocation (Stiglitz et al., 2009).

1.2. Measurement of objective life quality and economic development of countries

The economic performance of countries in the recent decades is often compared to the social development of the company. In this area there is a long-term mismatch between the pace of economic growth measured by outputs (e.g. GDP) and the quality of life and living conditions, measured by various indices (Kabátin Proceedings, 2011; Gavurová et al. 2014; Szabo et al. 2013; Zachar et al. 2011).Objective assessment of quality of life mostly includes specific quantifiable living conditions and living standards achieved by individuals. There are lots of factors that affect objective quality of life. The basic living conditions, which can be compared, for example, include the availability of services, health care and education, the average wage, the quality of the natural environment, etc. (Gavurová, Hyránek, 2013; Glova, Gavurová, 2013).The measurement of some of the indicators is very difficult, for example, in the case of corruption, setting the legal system, the functioning of democratic principles in the country, etc. (e.g. Glova, 2013; Pavliková, Siničáková, 2012). The standard of living is often found as a measure of material wealth or poverty, through selected quantitative indicators relating to the population as a whole or an individual (Heřmanová, 2012; Vajda, 2009).GDP is widespread indicator of economic performance of the economy and also falls within the normal vocabulary of politicians and journalists. Sometimes there is a misconception that GDP shows the general development of society, or even the quality of life (Stewart, 2005; Bánociová, Pavlíková, 2014).Today in social science is generally accepted that GNP itself is not automatically translated into people's everyday lives and GDP growth is not linearly associated with the growth of living standards and a better life subjects. What is needed is better and more appropriate interpretation of statistical data and indicators (Stiglitz et al., 2009; Benkovičová in Proceedings, 2011; Gavurová, 2012).Objective indicators are established to identify the situation and developments in the economic, demographic, social, environmental and other phenomena. These indicators often serve as an input for the design of the overall aggregate index. Aggregate index is a dimensionless number that has many advantages, such as clarity, ability to easily comparison, aggregation of different variables. One of its disadvantages is frequently distorted results (even with deliberate design index), or the

exclusion of important variables. Significant is also the issue of relevance and choice of individual weights, which is often subjective and heavily influenced by the investigator's opinion (Heřmanová, 2012).Choice of objective aspects included in the evaluation of quality of life depends on the purpose of its evaluation. There is the question whether the aim is to assess changes in conditions inside the country or compare the conditions between countries at different levels of development. Some aspects can be used to assess the state of a person (e.g. health), other values of freedom that people have in achieving the goals that have value to them (e.g. policy choice). In general, the objective of these indicators emphasizes aspects that the organization of the society has an impact on the lives of people and those effects are not all captured in conventional indicators of economic resources (Stiglitz et al., 2009).Warner, J.B.(2006) in his publication, which deals with the social indicators of quality of life, appointed the basic characteristics which should dispose these indicators. There are intentions for which the use, importance, validity and accuracy, relevance, ability to flexibly respond to changes, the ability to predict, clarity, availability of data needed to construct the index up to date and time, stability and reliability, result orientation, level measurement, connectivity, clarity and representativeness (Warner, J.B., 2006).

1.3. A brief overview of quality of life indices

In this section we present an overview of the best known indices used to evaluate the quality of life for the macro-regional level. Table 1 provides an overview, including the basic characteristics and a brief description of indices published by the UNDP.

Table1. The overview of selected indices of macro-regional level published by the UNDP

Name of the index / year	Characteristics
1. Human Development Index (HDI), 1990	It is a summary indicator of average human development in three key dimensions: • education - expected years of schooling and mean years of schooling, • health - life expectancy at birth, • income - GNI per capita (PPP$).
2. Inequality-adjusted Human Development Index (IHDI), 2010	It adapts the HDI for inequality in each dimension across the population. It is calculated as a geometric mean of inequality-adjusted dimension indices.
3. Multidimensional Poverty Index (MPI), 2010	It takes into account overlapping deprivations suffered by people across the same three domains as the HDI at the same time. It displays the number of people who are multi-dimensionally poor and shows the number of deprivations with which poor households usually cope.
4. Gender Inequality Index (GII)	It measures the human development costs of gender inequality. It reflects gender-based disadvantage in three dimensions: • reproductive health –degree of maternal mortality and adolescent fertility, • empowerment –ratio of parliamentary seats held separately by each gender and attainment at secondary and higher education by each gender, • economic activity–degree of labour market participation separately by each gender.
5. Gender Development Index (GDI), 1995	HDI is modified by measuring the gender gap in human development in three essential domains: health, education and usage of economic resources. Absolute deviation from gender parity in HDI ranks the countries by means of theGDI.

SOURCE: own processing based on Malik, K. et al., 2014

2. A quantification of life quality by means of Human development index

2.1. Methodology

The HDI deals with the level of development by measuring the indicators of health, education and income. The health domain is measured by life expectancy at birth. The education domain consists of two parts: expected years of schooling and mean years of schooling. The income domain is represented by GNI per capita (PPP$). 187 countries were ranked by this index in 2013.The HDI mainly uses data from different international databases, e.g. the United Nations Population Division, etc. HDI values and ranks in 2013 report are not comparable to those in past reports because of many revisions done to the component indicators by the mandated agencies. Evaluation of progress in HDI values is enabled through recalculated values from1980 to 2012(Malik, K. et al., 2014).

2.2. Indicator trends in the V4 countries

Slovakia belongs by means of the HDI rank to the very high human development category. In 2013, it was placed as 37 out of 187 countries and territories with the index value of 0.830. Slovakia's HDI value elevated from 0.747 to 0.830. It means an average annual increase of about 0.5 percent and general increase of 11 percent. Table 2 shows Slovakia's development in each of the HDI aggregate indicators.

Table 2.Development in the value of Slovakia's HDI component indices, according to consistent time series data, from 1990 to 2013

	Life expectancy at birth	Expected Years of Schooling	Mean years of schooling	GNI per capita in PPP terms	HDI value
1990	71,2	11,8	10,6	17168	0,747
1995	72,1	12	11,2	-	-
2000	73,3	13,1	11,2	16106	0,776
2005	74,3	13,9	11,6	18856	0,803
2010	75,2	14,7	11,6	23773	0,826
2011	75,4	14,7	11,6	24623	0,827
2012	75,6	14,7	11,6	25130	0,829
2013	75,4	15	11,6	25336	0,830

SOURCE: own processing based on the data from Malik, K. et al., 2014

From 1990 to 2013, life expectancy at birth in Slovakia was raised by 4.2 years, mean years of schooling was raised by 1.0 years and expected years of schooling was raised by 3.2 years. Slovakia's GNI per capita was raised by 48 percent. We can show the contribution of each component index to Slovakia's HDI since 1990 at the Figure 1. The indicators, which are expressed in different units, are transformed by minimum and maximum values into indexes between 0 and 1. It is highly possible that transformation function is concave because each aggregate index is a proxy for capabilities in the congruent domain. We can say that each additional unit of income has a smaller effect on larger capabilities. The natural logarithm of the minimum and maximum actual values is used for income indicator.(Anand and Sen, 2000).

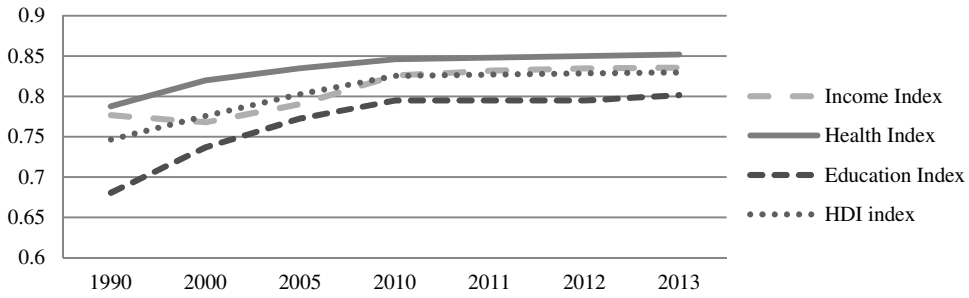

Fig. 1.Developmentin the value of Slovakia's HDI component indices from 1990 to 2013
SOURCE: own processing based on the data from Malik, K. et al., 2014

As we can see from the figure, there is a gradual increase in the value of all composite indices. Table 3 compares the values of HDI and contribution of each of its component index between V4 countries.

Table 3. The value of HDI and its component indices in V4 countries in 2013

Country/rankings	Income Index	Health Index	Education Index	HDI
Czech Republic (28.)	0,831	0,888	0,866	0,861
Poland (35.)	0,811	0,868	0,825	0,834
Slovakia (37.)	0,836	0,852	0,802	0,830
Hungary (43.)	0,809	0,840	0,805	0,818

SOURCE: own processing based on the data from Malik, K. et al., 2014

Slovakia's HDI value (0.830) in 2013 is over the average for countries in Europe and Central Asia (0.738) and under the average for countries in the very high human development group (0.890). Countries from Europe which are similar to Slovakia in 2013 HDI rank and population size are Czech Republic (ranked 28) and Hungary (ranked 43).

We can evaluate long-term development in relation to other countries by considering HDI value and geographical location. From 1990 to 2013, in Slovakia and other V4 countries, there was different level of progress in relation to development of their HDI values (see Fig. 2).

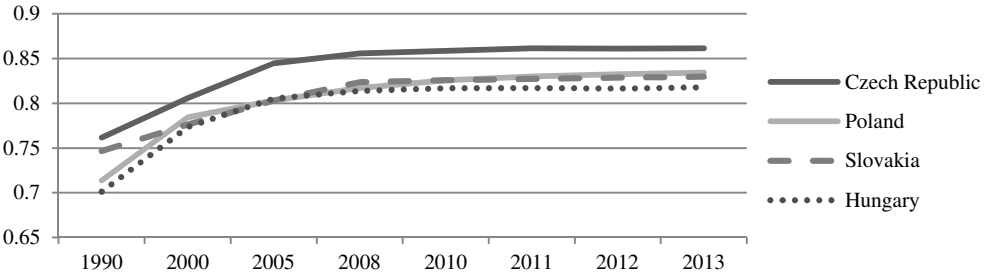

Fig. 2.Development in the value of HDI in V4 countries, from 1990 to 2013
SOURCE: own processing based on the data from Malik, K. et al., 2014

Table 3 below shows the value of each complementary index in V4 countries published by the UNDP in 2013.

Table 4. The value of HDI, IHDI, GII and GDI and rankings in V4 countries in 2013

	HDI	IHDI	GII	GDI
Czech Republic	0,861 (28.)	0,813	0,087 (13.)	0,969 (49.)
Poland	0,834 (35.)	0,751	0,139 (26.)	1,010 (14.)
Slovakia	0,830 (37.)	0,778	0,164 (32.)	1,000 (1.)
Hungary	0,818 (43.)	0,757	0,247 (45.)	0,998 (4.)

SOURCE: own processing

The difference between the value of HDI and IHDI shows the deprivation in potential human development due to inequality. It is expressed as a percentage. When we reduce the value of Slovakia's HDI for inequality in 2013 (0.830), it decreases (0.778). There is a loss of 6.3 percent in the distribution of component indices. Czech Republic, Poland and Hungary suffered the loss of 5.6 percent, 9.9 and 7.4 percent respectively. Among the countries with very high values of HDI the average loss is about 12.3 percent and for Europe and Central Asia it is 13.3 percent. GII value (0.164) ranks Slovakia at 32 out of 187 countries in 2013. In the concrete, women held 18.7 percent of parliamentary seats and 99.1 percent of adult women have reached a secondary or higher level of education when comparing to 99.5 percent of men. The adolescent fertility rate in Slovakia is 15.9 births per 1000 live births and about 6 women die from pregnancy related causes for every 100,000 live births. Female participation in the labour market is about 51percentcomparing to 68.7 for men. Other V4 countries are placed at 13, 26 and 45position by means of this index. The GDI points out gender gaps in human development are acute. Gender gaps in HDI values among V4 countries are from 0 percent to 0.2 percent. Slovakia has achieved gender parity. Gender gap in Slovakia HDI value is the smallest. It takes Slovakia on the first place, then Hungary (4.) and Poland (14.). The Czech Republic is ranked the worst from these countries (49.).

3. Discussion / Alternative indices of human well-being

We can say that HDI does not considerate all aspects of human development. So the UNDP has developed other indices to point out the main issues of human development, e.g. inequality, gender disparity and human poverty. In addition, there exist many complementary indices, which focus on different areas of quality of life.

A new and very innovative is concept of Gross National Happiness (GNH) developed in Bhutan government in the 1970s. It is a holistic approach and suggests that human development should be sustainable and should take into account some non-economic aspects of well-being. GNH is based on 4 elements: good governance, cultural preservation, environmental conservation and sustainable socio-economic development. These elements are classified into 9 domains, e.g. time use, cultural diversity and others. The survey was taken in Bhutan districts in 2010. It could be interesting to make a similar survey in European countries (Ura, K. et al., 2012).

Another approach has been introduced in the World Happiness Report (WHR) which rates countries by means of the happiness index. Sustainable Development Solutions Network (SDSN) is publishing this index annually. Index of happiness consists of six key variables, namely years of healthy life expectancy, GDP per capita, freedom to make life choices, social support, generosity and corruption. Assessments of happiness are made by how people evaluate lives as a whole and their emotions. Three types of accessible measures (positive effect, negative affect and holistic assessment of life) form the primary indicators of subjective well-being. Researchers recognize that life evaluations are more committed to life circumstances than emotions and they adjust more narrowly with other indicators of human development, e.g. HDI (Helliwell, J. F. et al., 2013).

Happy planet index (HPI) is the indicator, which combines the ecological efficiency with human development. It is published annually by the New Economics Foundation (NEF) from 2006. HPI consists of

two parts: well-being and a carbon footprint. Well-being is expressed by means of life satisfaction combined with life expectancy at birth. Carbon footprint measures the amount of natural resources required by each country to operate its economy. Combination of well-being and footprint together provides a picture of relative carbon efficiency among the Europe (Abdallah, S. et al., 2012).

Next table points on the differences in ranking V4 countries by means of Human Development Index (HDI), Happiness Index (HI) and Happy Planet Index (HPI).

Table 5. The position of V4 countries in HDI, HI and HPI ranking in the world

	HDI	HI	HPI
Czech Republic	28.	39.	71.
Poland	35.	51.	89.
Slovakia	37.	46.	92.
Hungary	43.	110.	104.

SOURCE: own processing

In the World Happiness Report, the V4 countries took following positions: Czech Republic (39.), Slovakia (46.), Poland (51.) and Hungary (110.). When comparing to the ranking by HDI, the results are different. This reflects the fact, that subjective wellbeing is sometimes much more different from objective life conditions in the country. Using Happy Planet Index placed the countries on the following positions among the EU resp. world: Poland (19./71.), Slovakia (23./89.), Czech Republic (24./92.) and Hungary(26./104). This index in contrast to well-known indices of human development (e.g. GDP or HDI), takes sustainability into account.

4. Conclusions

The aim of the paper was to provide a current view on the issue of measuring quality of life and some aspects and problems connected with it. The main contribution of the paper is a quantification of life quality by means of the HDI and evaluation of trends in HDI values in Slovakia over the last 13 years comparing to other V4 countries.

We have found that V4 countries are ranked by HDI in the very high human development category, but this fact can be sometimes misleading when taking into account subjective well-being of the inhabitants and sustainability of the development. We can see this when comparing to the ranking by other complementary indices (HI and HPI) in which these countries are on the considerably worse positions.

Currently important is not only construction of new indices for measuring quality of life, but also the proper understanding and specification, with emphasis on correct interpretation of the indices. There are various initiatives to establish rules and a uniform methodology when creating indices. It is a good question for many experts, whether a multidimensional index of quality of life is a relevant and relatively precise overview of such a complicated concept. High number and variety of indices, as well as considerable research in this field indicates the need and timeliness of the issue.

A new vision of progress calls for new indicators, something that countries like Bhutan with measuring of Gross National Happiness have recognized. At this time, there is important the new concept of sustainable well-being, which means achieving good lives for present generations and respecting environmental limits to allow future generations to do the same. Countries with the highest rates of economic growth indicators should be asked question, whether their growth is sustainable and not injurious towards the public and the environment.

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