

# MEASUREMENT OF THE PERFORMANCE OF AN ECONOMY

## POMIAR WYNIKÓW GOSPODARKI

Eva Jílková<sup>1</sup>, Jolana Skaličková<sup>2</sup>

<sup>1</sup> Czech Republic, Moravian Business College Olomouc  
e-mail: Eva.Jilkova@mvsso.cz

<sup>2</sup> Czech Republic, Moravian Business College Olomouc  
e-mail: jolana.skaliczkova@mvsso.cz

**Abstract.** The success of a national economy and the economic development of a country are mainly assessed based on economic indicators. The Gross Domestic Product (GDP) is the most commonly used indicator at national and regional levels. The informational power of GDP is limited, so alternative ways of measuring economic development and well-being have begun to be used, of which the Human Development Index (HDI) is the best known and the most accessible. The aim of this research is to highlight the areas that are to be considered when assessing economic development and well-being, especially social and environmental factors. One of the objectives is to compare the GDP and the HDI in the V4 countries. There was a gradual, slight increase in HDI without regard to economic cycles and changes in the GDP in the V4 countries between 2007 and 2017.

**Keywords:** gross domestic product, human development index, national economy, well-being

**Streszczenie.** Powodzenie gospodarki krajowej oraz rozwój gospodarczy kraju oceniane są głównie na podstawie wskaźników ekonomicznych. Produkt Krajowy Brutto (PKB) jest najczęściej stosowanym wskaźnikiem na poziomie krajowym i regionalnym. Informacyjna moc PKB jest ograniczona, dlatego stosuje się alternatywne sposoby mierzenia rozwoju gospodarczego i dobrobytu. Do najbardziej znanych i dostępnych alternatywnych mierników rozwoju gospodarczego zalicza się Indeks Rozwoju Ludzkiego (HDI). Celem niniejszych badań jest wyjaśnienie czynników, które należy uwzględnić przy ocenie rozwoju gospodarczego i dobrobytu, w szczególności czynników społecznych i środowiskowych. Jednym z celów jest porównanie PKB i HDI w krajach V4. Bez względu na cykle gospodarcze i zmiany w PKB, między 2007 a 2017 rokiem w krajach V4 nastąpił stopniowy, niewielki wzrost HDI.

**Słowa kluczowe:** produkt krajowy brutto, indeks rozwoju ludzkiego, gospodarka krajowa, dobrobyt

### Introduction and literature review

The performance of both the national economy and the regional economy is assessed by default using the gross domestic product, a standard macroeconomic indicator by which the success rates of countries or regions are calculated. However, the GDP has many shortcomings. Therefore, alternative indicators are needed for the measurement of not only economic performance, but also of welfare and economic development. Even a small increase in the GDP as an indicator of prosperity means real improvement in poor and developing countries, where basic health care, education, food, and functional infrastructure are not sufficiently available. In these states, every increase in the GDP also represents an increase in the life satisfaction of the population. The authors (Diener and Seligman,

2004) have argued, regarding this point, that national economic indicators alone are now “out of sync” with national well-being in the developed nations.

We are also facing a looming environmental crisis, especially associated with global change. Market prices are distorted where there is no charge imposed on carbon emissions, and no account is made of the cost of these emissions in standard national income accounts. Clearly, measures of economic performance reflecting these environmental costs might look markedly different from standard measures (Stiglitz, Sen, Fitoussi, 2009).

Although there is quite a high level of well-being in developed countries, we must also consider the assessment of sustainability, in other words, whether this state of affairs can be maintained over time. The contemporary level of the living standard has to do

with both economic resources, as well as with the non-economic aspects of peoples' lives.

We agree that the average indicators of income, consumption, wealth, and the like are meaningful statistics though not all-embracing in all cases. They do not adequately reflect differences and their distribution. For these reasons, we recommend using other indicators, for example median income.

The Genuine Progress Indicator (GPI) is used at the regional level. An example of its use is the state of Maryland in the USA. The GPI uses three simple underlying principles for its methodology: First, accounting for income inequality, second, the inclusion of non-market benefits from the economy, environment, and society that are not included in the GDP and third, the identification and deduction of costs such as environmental degradation, human health effects, and loss of leisure time.

Martinčík (2008) created magical n-angles for evaluating regions. Specifically, 18-angles are used, whose evaluation parameters are divided into three areas: macroeconomic performance, growth potential and quality of life. Kahoun (2007) used two distinct groups of indicators to assess regional performance: regional macroeconomic performance and regional innovation performance. Economists also use magical n-angles, especially quadrangles, as a tool for the assessment of a national economy. The monitored indicators are economic growth, inflation, unemployment and payment balance with foreign countries. We can imagine constructing the magical n-angle (polygon) which includes vertices such as job/income satisfaction, living standards, educational level, health and ecological aspects, and others.

Ferrara, Nistico (2015) focused their attention on alternative welfare measures in regions. They examined ten different multidimensional determinants of well-being in Italian regions over the period 2004 - 2010: culture and free time, education, employment, the environment, the availability of essential public services, health, material living conditions, personal security, research and innovation, and the strength of social relations. The results clearly show that differences in well-being between regions are not necessarily in line with those based on per capita GDP, suggesting a need to pay more attention to the quality-of-life features of economic progress in public policy goals and design.

There are more indicators at the national level than at the regional level. The characteristics of the selected indicators are important.

Besides the level of performance of the economy, we can also measure living standards and well-being. Currently, politicians recommend shifting the emphasis from measuring economic production to measuring life satisfaction (Stiglitz, Sen, Fitoussi,

2009). There is a growing effort to find alternative ways to measure the overall performance of the economy and social development. More complex indicators are being constructed, multidimensional approaches are being sought and concepts of subjective well-being are being increasingly applied. (Večerník, 2014). The authors (Diener, Seligman, 2004) even make the recommendation that "well-being should become a primary focus of policymakers, and that its rigorous measurement is a primary policy imperative". Understandably, the current measurement of well-being is with smaller or bigger different variances and these indicators are still improving, with different studies assessing different concepts in different ways. Research could be more systematic, for the purpose of providing important information not shown by economic indicators.

Our efforts as authors are focused on the enhancement of the value of economic indicators by supplementing them with indicators of well-being.

The Index of Sustainable Economic Welfare (ISEW) is based on a modification of the standard GDP. This index extends the GDP by, for example, domestic labour services and takes into account the costs of environmental degradation and the depreciation of natural capital. It was developed in 1989, due to criticism of traditional indicators. Bley (2006) focused on the value of the ISEW index per capita and the GDP per capita in Belgium in the period 1970 – 2006. These two indicators evolved differently, with the GDP growing over time, while the ISEW experienced only a slight increase. The ISEW has also fluctuated more. The ISEW was methodologically updated in 1994 and was rebranded in 1998. The result was a new index – the Genuine Progress Indicator (GPI).

The Human Development Index (HDI) is the best known and the most accessible of the indicators. This index was created to emphasize that people and their abilities should be the ultimate criteria for assessing the development of a state, not the GDP and its growth alone. The HDI measures three dimensions: a long and healthy life, knowledge, and a decent standard of living. It was methodologically updated in 2010.

The methodological framework for HDI is still being developed. Qiu, Sung, Davis, Tchernis (2018) have proposed the Bayesian factor analysis model as an alternative to the Human Development Index. Omnari, Alizadeh, Amimi (2019) have proposed a new approach to the calculation of semi-HDI scores. The semi-HDI scores of provinces/regions/countries can be calculated based on the geometric mean of standards for a healthy life, the education of a given population and living standards.

Scientists such as Diener and Seligman (2004), and Kahneman, Krueger, and colleagues (2004), advocate the creation of national well-being accounts to complement national income accounts. The nation of Bhutan, in the meanwhile, has introduced the concept of “gross national happiness” to replace the gross national product as a measure of national progress (Graham, 2005).

Gross National Happiness (GNH) as an indicator is symbolic of the philosophy of the government of Bhutan, where it is an integral component of how Bhutan is governed. This philosophy includes this index, which is used to measure the collective happiness and well-being of the population. Gross National Happiness has been instituted as the goal of the government of Bhutan as set out in the Constitution of Bhutan. The nine domains of GNH are psychological well-being, health, time use, education, cultural resilience and promotion, good governance, community vitality, the environment and living standards. Gupta, Agrawal (2017) analysed the GHN in Bhutan and they said certain discrepancies create ambiguity and limitations around the validity of adoption of the concept in other countries (GNH Centre Bhutan, 2019).

Monni, Spaventa (2013) focused on the fact that all the indicators being used are external indicators and asked whether it is possible to shift the focus of policy from being on a battle between competing paradigms to being on a mechanism for eliciting information on well-being directly from the population.

The aim is to highlight the areas that are to be considered when assessing economic development and well-being, especially social and environmental factors. One of the objectives is to compare the GDP and the HDI in the countries of the Visegrad group.

The relationships between the GDP and the HDI have been examined (see e.g. Bechtel, 2018).

## Material and methods

For the comparison of the Gross Domestic Product and the Human Development Index, the following data is used: the real GDP, which is given in terms of constant prices and refers to the volume level of GDP and the HDI as the geometric mean of three normalized indicators (see formula 1).

All of the data presented are for the period from 2007 to 2017. The length of this period allows us to capture the effects of the global economic crisis in 2009. The main source of data are the human development reports from the United Nations Development Programme and OECD data.

Generally, the following classical methods are used: the examination of input data and indicators, the comparison of characteristics at the national level, and deduction and synthesis for the purposes of the formulation of conclusions.

The HDI is the geometric mean of three normalized indicators:

$$HDI = \sqrt[3]{LEI \cdot EI \cdot II}. \quad (1)$$

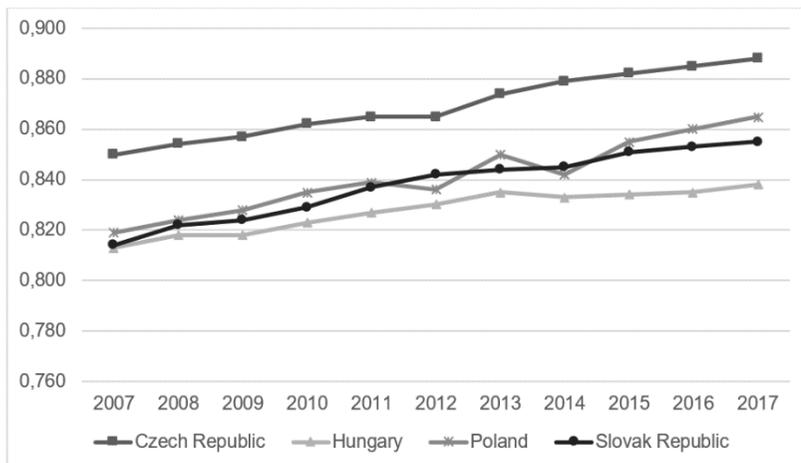
Firstly, the life expectancy index (LEI) is part of the HDI. The LEI moves within an interval (0-1). It is 1 when the life expectancy at birth is 85 years and 0 when the life expectancy at birth is 20 years.

Secondly, the education index (EI) comprises a part of the HDI. It is a mean based on the mean of years of schooling index and the expected years of schooling index.

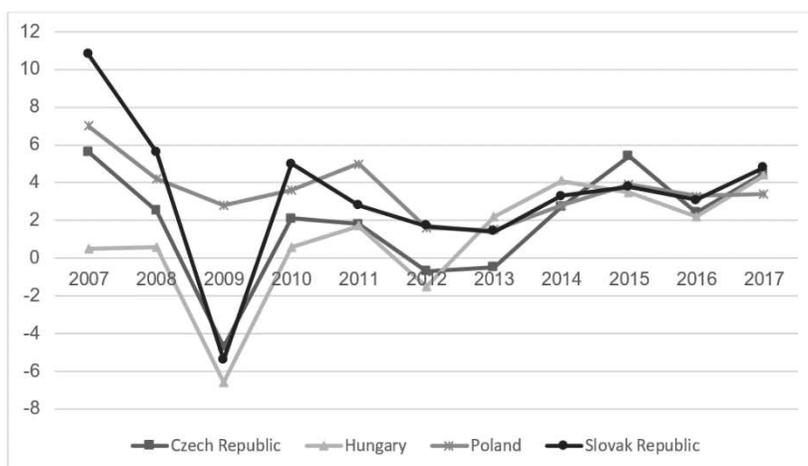
Thirdly, the income index (II) forms a part of the HDI. The II moves within the interval (0-1). It is 1 when the Gross national income (GNI) at purchasing power per capita is 75 dollars and 0 when the GNI per capita is 100 dollars.

Figure 1 illustrates the development of the HDI in the countries of the Visegrad group (V4). The development of the HDI is steady with the value increasing slightly during the reference period in all countries. This development did not reflect the impact of the global economic crisis, which influenced most countries in 2009.

The development of the GDP fluctuates (see Figure 2). A big drop in the GDP was recorded in 2009 (except for Poland). The countries returned to their original positive GDP growth between 2014 and 2017. Poland was not affected by the economic crisis, as its economy is not dependent on exports.



**Figure 1.** Development of HDI in V4 countries  
Source: <http://hdr.undp.org>, 2019, authors.



**Figure 2.** Development of real GDP (%) in V4 countries  
Source: <https://data.oecd.org/gdp/real-gdp-forecast.htm>, 2019, authors.

## Results and discussion

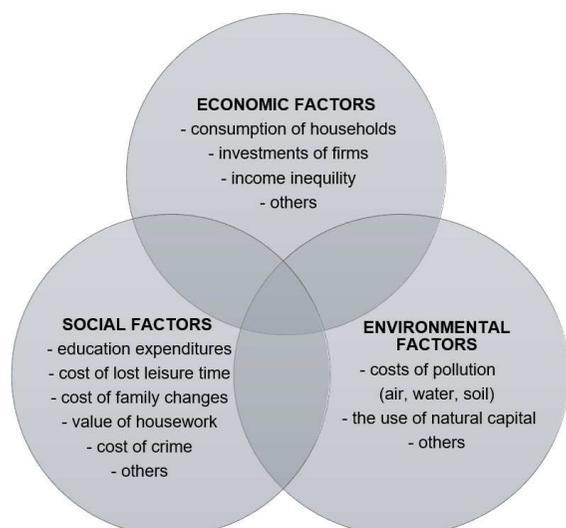
Firstly, we should focus on the factors which are necessary for the evaluation of the economic performance or welfare. The indicator that evaluates the welfare of the state should consider three factorial areas: economic factors, social factors and environmental factors (Figure 3).

We propose to include those economic factors which measure and evaluate the size of national economic production, especially consumption by households and investments by firms. Income inequality cannot be neglected in welfare assessment. Economic indicators form the basis of the evaluation and their shortcomings should be offset by the inclusion of these two additional areas.

Social factors help to promote and develop the use and level of the human potential. Human potential means the prerequisite for the realization of all its socio-economic functions, is an essential

element in the increase in the niveau of human capital, thereby supporting any region's economic strength. Educational expenditures also comprise an important social factor. It is also necessary to consider factors that are not part of the GDP, e.g., the cost of lost leisure time, of family changes, the value of housework or the cost of crime.

Environmental factors are very important. We need to evaluate environmental sustainability. The environment must be protected not only for the current population, but also for future generations. Negative externalities related to environmental pollution need to be considered. Since it is problematic to quantify the magnitude of externalities, the assessment should include the magnitude of the costs that serve to correct them.



**Figure 3.** The factors affecting state welfare measurement  
Source:(capitalize a) authors.

Kocourek, Bednářová, and Laboutková (2013) analysed the areas that are to be considered when assessing economic development and well-being, especially social and, increasingly, global economic integration, and global forms of governance. Globally inter-linked social and environmental developments are often referred to as globalization. They highlight the requirements of life standards and qualities, such as the right to a healthy environment, the importance of integrating social equity into environmental policies, and the critical importance of public participation and official accountability are stressed with increasing frequency and pressure.

A comparison of the ranking of the V4 countries now follows. The object of the comparison are the Gross Domestic Product and the Human Development Index (Table 1).

**Table 1.** Ranking of V4 countries

		<b>Czech Republic</b>	<b>Slovak Republic</b>	<b>Poland</b>	<b>Hungary</b>
2007	GDP	3	1	2	4
	HDI	1	3	2	4
2008	GDP	3	1	2	4
	HDI	1	3	2	4
2009	GDP	2	3	1	4
	HDI	1	3	2	4
2010	GDP	3	1	2	4
	HDI	1	3	2	4
2011	GDP	3	2	1	4
	HDI	1	3	2	4
2012	GDP	3	1	2	4
	HDI	1	2	3	4
2013	GDP	4	3	2	1
	HDI	1	3	2	4
2014	GDP	4	2	3	1
	HDI	1	2	3	4
2015	GDP	1	3	2	4
	HDI	1	3	2	4
2016	GDP	3	2	1	4
	HDI	1	3	2	4
2017	GDP	2	1	4	3
	HDI	1	3	2	4

Source: authors.

Analysing the GDP in the Czech Republic, we can say that the ranking was variable. Mostly, the third rank was typical for the Czech Republic. The Czech Republic achieved a lower GDP compared to other countries in the selected period.

The GDP in the Slovak Republic was high, especially in the first part of the analysed period. The Slovak GDP was in first position five times.

The GDP in Poland was mostly in second position. We can say that the economic situation was good, because the Polish GDP was the highest three times when compared with that of other V4 countries. Poland's best position was in 2009 when other countries were hit by the economic crisis.

The worst situation was in Hungary. Changes occurred only in the years 2013 and 2014, when economic growth was the highest in Hungary.

Focusing on this comparison of the HDI, we can say that the positions of the countries involved were stable. The highest HDI was in the Czech Republic over the entire period of time. The lowest HDI was in Hungary. The second and third positions were exchanged between Poland and the Slovak Republic. Table 2 shows how the rank of V4 countries changed in individual years compared with previous year. The HDI changed less than the GDP. A real GDP reflects changes in the economy, which were much more significant in the period under review. HDI evaluates indicators that are more

stable, e.g., the life expectancy at birth is gradually increasing in individual years. The life expectancy was highest in the Czech Republic in all periods. This value was 78.9 years in the Czech Republic, 77.8 years in Poland, 77 years in the Slovak Republic and 76 years in Hungary in 2017 (see [hdr.undp.org](http://hdr.undp.org), 2019). Big differences are also evident in the educational index (0.892 in the Czech Republic, 0.866 in Poland, 0.831 in the Slovak Republic and 0.816 in Hungary in 2017) and in the gross national income (GNI) at purchasing power per capita (30.58 in the Czech Republic, 29.46 in the Slovak Republic, 26.15 in Poland and 25.39 in Hungary in 2017).

The study (see Haque, Khan, 2019) reports that educational expenditures contribute the most to HDI.

**Table 2.** Change in rank of V4 countries in years

		Czech Republic	Slovak Republic	Poland	Hungary
2008	GDP	→	→	→	→
	HDI	→	→	→	→
2009	GDP	↑	↓	↑	→
	HDI	→	→	→	→
2010	GDP	↓	↑	↓	→
	HDI	→	→	→	→
2011	GDP	→	↓	↑	→
	HDI	→	→	→	→
2012	GDP	→	↑	↓	→
	HDI	→	↑	↓	→
2013	GDP	↓	↓	→	↑
	HDI	→	↓	↑	→
2014	GDP	→	↑	↓	→
	HDI	→	↑	↓	→
2015	GDP	↑	↓	↑	↓
	HDI	→	↓	↑	→
2016	GDP	↓	↑	↑	→
	HDI	→	→	→	→
2017	GDP	↑	↓	↓	→
	HDI	→	→	→	→

Source: authors.

## Conclusions

The aim of the article was to highlight the areas that are to be considered when assessing economic development and well-being, especially social and environmental factors. One of the objectives was to compare the Gross Domestic Product and the Human Development Index in the V4 countries.

In assessing the welfare of the national economy, social and environmental factors must be considered in addition to economic factors. An

example of a social factor is the education expenditure affected by the level of education. The level of education in each country is part of what comprises the Human Development Index.

When comparing the development of the Human Development Index and the Gross Domestic Product, based on the example of the V4 countries, there was a gradual slight increase in HDI regardless of economic cycles. The highest value of HDI has been in the Czech Republic and the lowest in Hungary in all of the selected periods. For further

research, it would be appropriate to examine the development of individual HDI components.

Generally, we can conclude that, for better findings and assessment of people's lives, it is necessary to use a broad-spectrum indicator, which concludes economic (material resources to meet needs, adequate income), ecological (a healthy environment) and social aspects (a democratic and stable society). For welfare or well-being assessment, it is even necessary to consider psychological influences, such as supportive friends and family, health care and medical treatment available in case of need, to have goals related to values and also a philosophy or religion that provides guidance, purpose, and meaning to one's life (Diener, Seligman, 2004).

In further research, scientists should focus on the assessment of well-being and establish a better system of national measurement, to improve their measurements by the supplementation of economic indicators with data from other areas. On the other hand, there are many economists who would not agree with these recommendations and consider well-being and satisfaction to be non-measurable, "soft" data. Nevertheless, well-being surveys can serve as an important complementary tool for public policy. In addition, it is necessary to mention potential biases in the analysis of survey data and difficulties associated with analysing these kinds of data in the absence of controls, which Graham (2005) points out and states that happiness surveys at times yield anomalous results which provide novel insights into human psychology—such as adaptation and coping during economic crises—but do not translate into viable policy recommendations.

The authors suggest recommendations:

1. to use alternative indicators of economic welfare as a complement to standard indicators (GDP),
2. to use a combination of economic, social and environmental factors as part of alternative indicators with the possibility to include psychological influences,
3. to make comparing and ranking of countries based on alternative indicators.

In any case, further research in this area opens up space for finding possible answers to those questions which still need to be examined (and their implications for economic growth, consumption, usage of scarce resources, investment, political behaviour, etc.). Hopefully, researchers will be able to acquire more data of higher quality, which will lead to a higher degree of sophistication in econometric methods and therefore scientists will also be better able to address research questions on well-being in the future.

## References

- Bechtel, G. (2018). The Human Development Index as Isoelastic GDP: Evidence from China and Pakistan. *Economies*. (6), 2018.
- Bleys, B. (2006) The Index of Sustainable Economic Welfare for Belgium Data, Methodology and Preliminary Results. Brussel: Vrije Universiteit Brussel.
- Diener, E., Seligman M.E.P. (2004). Beyond Money Toward an Economy of Well-Being. *Psychological Science in the Public Interest*, Volume 5, No 1.
- Ferrara, A.R., Nistico, R. (2015). Regional well-being indicators and dispersion from a multidimensional perspective: evidence from Italy. *Annals of Regional Science*. (55)2015, 373-420.
- Haque, M.I., Khan, M.R. (2019). Role of oil production and government expenditure in improving human development index: Evidence from Saudi Arabia. *International Journal of Energy Economics and Policy*. (9)2019, 251-256.
- GNH Centre Bhutan (2019). Available from: <http://www.gnhcentrebhutan.org/what-is-gnh/the-9-domains-of-gnh/>.
- Graham, C. (2005) The Economics of Happiness. Insights on globalization from a novel approach. In *World Economics*, vol.6, no 3. p. 41-55.
- Gupta, K., Agrawal, R. (2017) Sustainable development and spirituality: A critical analysis of GNH index. *International Journal of Social Economics*. (44)2017, 1919-1939.
- Kahoun, J. (2007). Regionální rozdíly ekonomické výkonnosti ČR. *Bulletin CES VŠEM*. (10)2007, 5-8.
- Kahneman, D., Krueger, A.B., Schkade, D., Schwarz, N. and Stone, A. (2004). "Toward National Well Being Accounts", *American Economic Review Papers and Proceedings*, Vol. 94, No. 2, May, p. 429-434.
- Kocourek, A., Bednářová, P., Laboutková, Š. (2013). Vazby lidského rozvoje na ekonomickou, sociální a politickou dimenzi globalizace. *E+M Ekonomie a management*. (16)2013, 10-21.
- Martinčík, D. (2008). Ekonomicko-sociální úroveň krajů – komplexní srovnávací analýza. *E+M Ekonomie a management*. (11)2008, 14-24.
- Monni, S., Spaventa, A. (2013). Beyond GDP and HDI: Shifting the focus from paradigms to politics. *Development*. (56)2013, 227–231.
- OECD. Real GDP forecast. 2019. Retrieved from <https://data.oecd.org/gdp/real-gdp-forecast.htm>.
- Omran, H., Alizadeh, A., Amini, M. (2019). A new approach based on BWM and MULTIMOORA methods for calculating semi-human development index: An application for provinces of Iran. *Socio-Economic Planning Sciences*. 2019.
- Qiu, Q, Sung, J., Davis, W, Tchernis, R. (2018). Using spatial factor analysis to measure human development. *Journal of Development Economics*. (132)2018, 130-149.

Stiglitz, J., Sen, A. Fitoussi, J. (2009). Report by the commission on the measurement of economic performance and social progress. Retrieved from <https://ec.europa.eu/eurostat/documents/118025/118123/Fitoussi+Commission+report>

United nations development programme. Human development reports. 2019. Retrieved from <http://hdr.undp.org>

Večerník, J. (2012). Subjective indicators of well-being: approaches, measurements and data. *Politická ekonomie* 2012 (3): 291-309 January 2012. Retrieved from <https://doi.org/10.18267/j.polek.843>.