

RELATION BETWEEN GDP AND LIFE SATISFACTION IN THE EUROPEAN UNION

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Abstract. *In the paper, relation between GDP and subjective well-being, expressed as personal life satisfaction is analysed. On the basis of the European Union data from 2000 to 2009, the so-called Easterlin's paradox, which claims that life satisfaction stays flat in face of the increasing wealth of nations, is tested. The test is carried out using aggregated country level data on life satisfaction from a Standard Eurobarometer survey and GDP per capita data. Both the cross-country correlation and the within-country trends' regression analyses show that the GDP level is positively related to the level of life satisfaction. Although the relation is particularly strongly expressed in Eastern European countries, it also stays positive in many more prosperous EU countries. Nevertheless, further studies on factors influencing the shape of relation are necessary to explain exceptions from the relation. The authors also suggest a possible necessity to find more sensitive indicators of life satisfaction to measure it more accurately in the future.*

Key words: *life satisfaction, Easterlin's paradox, GDP, subjective well-being*

Introduction

Individual utility, or subjective well-being, has been an object of economic studies for a long time. The relatively recent trend is to relate subjective well-being measured as happiness or life satisfaction to economic factors and to explain differences and changes using economic variables. As noted by Hayo and Seifert (2003), there are at least three reasons for scientists to engage into happiness studies: 1) because it's (increasing of wealth-being) a key target of any economic policy; 2) because happiness determines support for market economy and democracy; 3) because it is important to understand the relationship between subjective and objective indicators of well-being. Studies of happiness could be divided into two broad categories: analysis of relation between subjective well-being indicators and macroeconomic data (such as GDP, unemployment, inflation, etc.) and analysis of individual characteristics influencing the subjective well-being. An extensive review of various factors associated with subjective well-being as well as its measures has been presented by Dolan et al. (2008).

Many of the recent macroeconomic studies on happiness start with a discussion of the so-called Easterlin's (1974) paradox, which rests on the analysis of USA happiness

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data and shortly could be described as follows: since World War II, happiness responses in USA are flat in the face of considerable increases in average income. A similar pattern was observed in France, the UK, Germany and Japan by different studies (Easterlin, 1995; Blanchflower, Oswald, 2004). On the other hand, there are studies that show a positive relation between happiness data and economic factors. Heady et al. (2004) analyse five country household panel data and argue that wealth and consumption expenditure are positively related to happiness. These conflicting findings have led to a heated discussion on whether the macroeconomic factors are indeed insignificant in increasing life satisfaction. The standard conclusion that average income does not matter was advocated by Easterlin (2005) as an opposition to Hagerty's and Veenhoven's (Hagerty, Veenhoven, 2003; Veenhoven, Hagerty, 2005) views associating positive happiness trends with income growth. Easterlin's views are supported by Bjornskov et al. (2008) in their study of life satisfaction data from 1973 to 2002 in 15 EU countries. They find that GDP growth *per se* does not induce positive trends in life satisfaction in 15 European countries; however, the accelerating growth of GDP does (Bjornskov et al., 2008, 328). They also conclude that nations adapt to steady improvements by raising their expectations and that individuals may tend to compare their situation to the situation in neighbouring countries (Bjornskov et al., 2008, 329). Yet other scientists analysing the same data end up with slightly different conclusions arguing that GDP affects country's happiness: "People's happiness answers *en masse* are strongly correlated with movements in current and lagged GDP per capita" (Di Tella et al., 2003: 823). However, it should be noted that the aforementioned studies have arrived to different conclusions on the same data using them differently: Bjornskov et al. analysed them on the country level and Di Tella et al. projected macroeconomic data onto the individual level (Di Tella et al., 2003, 815). Trying to explain the disappearing impact of growing GDP on life satisfaction, the idea of satiation point was introduced. It says, as expressed by Layard: "once a country has over \$15,000 per head, its level of happiness appears to be independent of its income per head" (Layard, 2003: 17). The proposition of the satiation point is also supported by Clark et al. (2008), Frey and Stutzer (2002: 90). The debate on Easterlin's paradox was heated up even further by Stevenson and Wolfers (2008) who analysed multiple rich data sets including the USA, the EU and developing countries spanning in some cases to several decades. They argued that they found a clear positive link between average well-being and GDP per capita across countries. They also claim that data do not show any evidence of existing a point of satiation. The link between growing wealth and life satisfaction is positive in both rich and poor countries (Stevenson, Wolfers, 2008: 23).

Easterlin's reaction defending the validity of his paradox is a study that includes 37 countries: 17 developed, 9 developing and 11 transition (Easterlin, Angelescu, 2009). Easterlin maintains his idea that evidence does not show any relation between GDP

and live satisfaction. His argumentation flows into two points: 1) others often confuse cross-country analysis, which shows a correlation between income and well-being, with within-country analysis which shows no evidence of a positive relation between income and well-being; 2) Stevenson and Wolfers confuse data from long-time series with data from relatively short-time series. Easterlin claims that if short-time series of transition countries were not included into analysis, it would render different results (Easterlin, Angelescu, 2009: 11). However, Easterlin and Angelescu do not avoid some possible confusion and misinterpretation by providing a regression analysis relating growth rates but not absolute figures of both GDP per capita and life satisfaction variables (Easterlin, Angelescu, 2009: 8–9). Regression of GDP per capita and life satisfaction as such within each country for the same time period could give different results.

There is not much research done on happiness and macroeconomic indicators in Eastern Europe or New Member States of the EU. Hayo and Seifert (2003) analysed subjective well-being data in several Eastern European countries in the period 1991–1995. Analysing data on country level, they found a very modest correlation between GDP and subjective well-being in 1991–1994 data and a strong correlation in 1995 data. The argument is that “in early stages of transformation, macro information, such as GDP per capita, may not be a very precise measure of subjective living conditions, while more recent data appear to be of better quality” (Hayo, Seifert, 2003: 346). Nevertheless, their conclusion tends to be in support of positive effects of GDP level on subjective well-being. Hayo (2007) analyses New Democracy Barometer survey data on happiness in eight Eastern European countries in 1991 and looks at the impact of GDP on it. He concludes that “preliminary evidence concerning the explanation of these cross-country differences in average happiness suggests that variations in national unemployment rates, the human development index and the degree of political freedom may be more important than variations in GDP per capita” (Hayo, 2007: 218). But he also admits that to answer the question convincingly a larger data set is needed. Recently, an extensive study on the relationship between life satisfaction and GDP in Eastern Europe has been published by Easterlin (2009). Analysing data from the World Value Survey, he argues that life satisfaction reached the level of early nineties only in 2005, while GDP is averaging more than 25 percent above its 90s level. He claims that it is due to the increased dissatisfaction with job, health and family life, but does not take into account that the high life satisfaction in early 90s could have a very specific regional explanation, i.e. political transition from a totalitarian to a democratic system, which could have significantly risen the levels of “normal” life satisfaction. Several other studies were devoted to a single country analysis in the region (Blanchflower, Oswald, 2001; Graham, Pettinato, 2002; Eggers et al., 2006; Andren, Martinsson, 2006; Frijters et al., 2006).

The question on whether GDP and life satisfaction are related and what is the shape of this relation, if any, remains open. So is the question about the relation between in-

come level and life satisfaction in transition countries, namely Eastern members of the European Union. The objective of this paper is to analyse the correlation between GDP per capita and life satisfaction on a country level in the European Union. The analysis will cover the newest data from 2000–2009 standard Eurobarometer studies that were not analysed in the previous studies. Both the cross-country (to establish a relation between GDP per capita and life satisfaction level) and within-country (to look at the trends on the country level) analysis will be executed using correlation measures. The study will provide an extensive analysis of relation between GDP and subjective well-being in Central and Eastern members of the EU, which has not been performed to the moment. We will also show that usage of a slightly more sensitive life satisfaction indicator renders more accurate results.

Data

As already noted, different studies use several possible indicators of subjective well-being depending on the availability of data. An extensive overview of all possible indicators of well-being is provided by Dolan et al. (2008). It is obvious that most of the available data are on measurement of either life satisfaction (although using different scales, from Likert-type to 1–10 point scales) or happiness. Some of the studies also employ a measure of economic well-being. As noted by Hayo and Seifert (2003: 346), economic well-being is highly correlated to life satisfaction. Also other studies show that happiness and life satisfaction indicators are correlated (Di Tella et al., 2003, 811). It means that whatever indicator is taken to represent subjective well-being, their trends in a longer time period remain the same. The data on life satisfaction in EU will be used in this study, as it is the most extensive data source available for a long period on all the EU countries.

Data on life satisfaction were taken from semi-annual Standard Eurobarometer surveys conducted in all EU countries and from Candidate Countries Eurobarometer surveys conducted prior to 2004¹. A Eurobarometer survey provides a unified measure of life satisfaction in the sense of questioning and the methodology employed to sampling and interviewing respondents. The standard life satisfaction question asked in the Eurobarometer is: “On the whole, how satisfied are you with the life you lead?” The answers are given on the Likert scale of four possible answers where 4 means very satisfied, 3 – fairly satisfied, 2 – not very satisfied, and 1 – not satisfied at all.

The aggregated country level data were used in a subsequent analysis. The life satisfaction variable is expressed as a percentage of respondents who say they are either

¹ Eurobarometer reports may be found at http://ec.europa.eu/public_opinion/index_en.htm. Eurobarometer data files may be downloaded from German Social Science Infrastructure Service <http://www.gesis.org/redirect/alte-institute/>

“very satisfied” or “fairly satisfied” with their life. In some cases, to obtain a bigger variation, only the percentage of respondents answering “very satisfied” was included into the analysis. In both cases, the aggregated country level data give a measure expressed in true metric variable² enabling to use the OLS regression analysis and the product moment correlation (Pearson) coefficients. Depending on the type of available data, most previous studies use some type of regression analysis (OLS, probit, ordinal) or a correlation (Pearson, Spearman, Kendall) analysis to detect a relation between the variables (Easterlin, 2009; Easterlin, Angelescu, 2009; Stewenson, Wolfers, 2008; Hayo, Seifert, 2003; Di Tella et al., 2003; Bjornskov et al., 2008; Hayo, 2007).

Data on GDP were obtained from the Eurostat³. The data are expressed as GDP per capita in PPS (Purchasing Power Standards). Expressing GDP in PPS eliminates differences in price levels among the countries. A Standard Eurobarometer survey is carried out twice a year—in spring and autumn. The data used in the analysis were from autumn periods as they probably better reflect and correlate to the annual GDP data⁴.

Relation of life satisfaction and GDP in cross-country analysis

We will test two hypotheses based on cross-country analysis of life satisfaction data. The first hypothesis to be tested is the following:

H1 – there is no significant positive relation between a country’s GDP per capita level and its percentage of population saying they are very satisfied or fairly satisfied with their lives.

We will also test the hypothesis whether there is a satiation point in GDP after which the correlation between income and satisfaction does no longer exist or is weaker than in countries below this point. The hypothesis is as follows:

H2 – there is no significant positive relation between country’s GDP per capita level and country’s percentage of population saying they are very satisfied or fairly satisfied with their lives in the group of countries that have GDP per capita above 20000 EUR⁵.

In testing both hypotheses, we employed the product moment (Pearson) correlation coefficient. We used 2008 data as the newest and rather reliable source⁶, but the analysis

² Life satisfaction is expressed as a country’s percentage of people indicating they are “very satisfied” or “fairly satisfied” with their lives. The variable theoretically may vary from 0 to 100.

³ Source: <http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=1&init=1&pcode=te c00001&language=en>

⁴ As an annual GDP reflects a country’s annual wealth, the autumn wave of the survey better than the spring one reflects an aggregated annual opinion of respondents. Changes in GDP (or expectations of changes) are both presented in the media and related to the real economic situation. Thus, their annual effect is better to be measured late in the year.

⁵ Layard (2003: 17) suggests that the satiation point of GDP is 15, 000 USD per capita, Frey and Stutzer (2002: 416) suggest even a lower limit: 10, 000 USD GDP per capita. 20, 000 EUR is a much higher limit that allows us to make an even stricter test of their propositions.

⁶ The GDP data for 2009 are still not final and might be recalculated.

of other years (from 2000 to 2009) rendered essentially the same results. To test the second hypothesis, we will analyse two groups of countries separately: Eastern European EU members as a relatively poor⁷ countries and Western European EU members as relatively rich⁸ countries.

Figure 1 shows a strong positive relation between a country's GDP per capita and life satisfaction indicator. Bulgaria, whose GDP per capita is only 10400 EUR or 41 percent from EU average, is the last on satisfaction with 38 percent of satisfied population. Denmark, whose GDP per capita is 3 times higher than in Bulgaria and makes 120 percent of the EU average, is the most satisfied nation in the EU with 98 percent of population saying they are satisfied. Pearson's correlation coefficient ($r = 0.558$, sig. level = 0.004, $N = 25$) also confirms a visually obvious relation between life satisfaction and GDP per capita data. It means that the hypothesis H1 (there is no correlation between GDP and subjective well-being in EU countries) should be rejected.

But what about the more prosperous countries? Maybe, after reaching some point of GDP per capita, the life satisfaction is no longer related to a country's income level, and richer countries are not happier than poorer ones. To test this supposition, we used the same data on a smaller number of countries, i.e. old members of the EU: all of

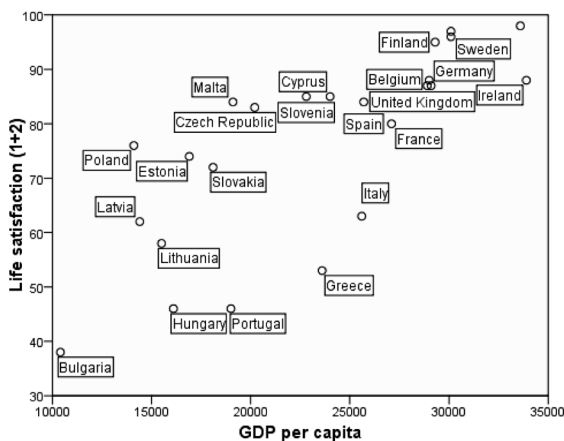


FIG. 1. GDP per capita and life satisfaction in the EU

Source: Eurobarometer and Eurostat. Life satisfaction is taken as a country's percentage of respondents saying they are "very satisfied" or "fairly satisfied" with the life they lead. The number of cases is 25 as Luxemburg is omitted from the diagram due to its outstanding GDP per capita figure, and Romania is omitted due to absence of GDP data in 2008.

them, except Portugal, have GDP per capita higher than 20000 EUR or 95 percent of EU average (see Fig. 2). We also tested the relation even further in the group of countries whose GDP per capita is higher than 25000 EUR (see Fig. 3). In both cases, the relation between a country's income and life satisfaction was positive and quite significant: in the first case, the Pearson coefficient was 0.874 (sig. level = 0.003 $n = 13^9$) and in the second case it was 0.587 (sig. level = 0.075, $n = 10$). These results allow us to reject the H2 hypothesis on the point of satiation proposed by Layard (2003), Clark

⁷ Average 2008 GDP per capita is 17400 EUR.

⁸ Average 2008 GDP per capita is 28000 EUR, excluding Luxemburg.

⁹ Luxemburg is not included for its outstanding GDP, and Austria is not included for the absence of GDP data.

et al. (2008), at least for the EU countries. Although this hypothesis will be tested further by using within-country data on time trends, we can state that, even after the country exceeds a certain level of wealth, the positive relation between life satisfaction and GDP remains. These results are in contradiction with the findings from the World Value Survey as presented by Inglehart (2000) and also raise a question about the validity of his explanation using the concepts of materialist and post-materialist values which says that materialist values do not influence subjective well-being in wealthy societies. It appears that even if the values of rich and poor societies may be different, the relation between wealth and life satisfaction remains strong. With some exceptions, the richer the country the happier its population not depending on prevailing values in its society.

A positive relation between GDP per capita and life satisfaction is observed in the new member states of the EU from Eastern Europe as well (see Fig. 4). The most prosperous new EU member Slovenia is also the most satisfied country among the nine new member states from Eastern Europe. Pearson's correlation coefficient shows a significant positive relation between income and satisfaction ($r = 0.779$; sig. level = 0.013, $n = 9$).

Thus, the relation holds true in all cases – for the whole European Union, its older and wealthier members and its new and poorer members. It should be noted that the

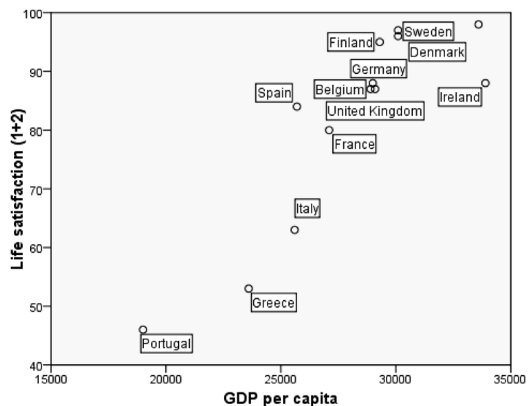


FIG. 2. GDP per capita and life satisfaction in the old EU members

Source: Eurobarometer and Eurostat. Life satisfaction is taken as a country's percentage of respondents saying they are "very satisfied" or "fairly satisfied" with the life they lead. Number of cases is 13 (see footnote for explanations).

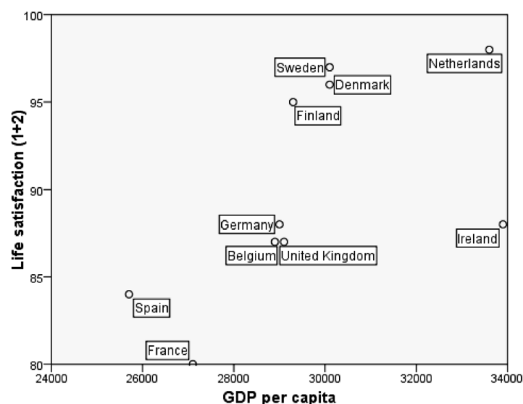


FIG. 3. GDP per capita and life satisfaction in the most wealthy EU countries

Source: Eurobarometer and Eurostat. Life satisfaction is taken as a country's percentage of respondents saying they are "very satisfied" or "fairly satisfied" with the life they lead. Number of cases is 10 (see footnote for explanations).

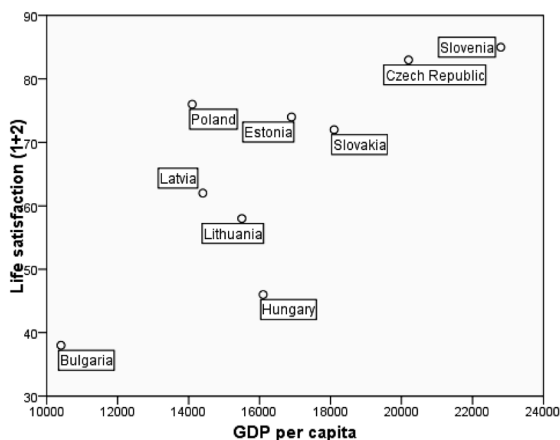


FIG. 4. GDP per capita and life satisfaction in Eastern European EU members

Source: Eurobarometer and Eurostat. Life satisfaction is taken as a country's percentage of respondents saying they are "very satisfied" or "fairly satisfied" with the life they lead. Number of cases is 9 (2008 GDP data on Romania are not available).

observed correlation between GDP per capita and the percentage of people satisfied with their lives is even stronger in richer countries of the European Union. The effect of wealth on subjective well-being seems even bigger than in relatively not so wealthy countries, which is also in contrast to findings of many other studies.

Analysis of within-country trends

Nevertheless, an analysis of cross-country data is not sufficient to prove the effect of growing income on the growth of life satisfaction.

As noted by Easterlin and Angelescu (2009), it is necessary to analyse within-country trend data in order to prove that the growth of one of the indicators is associated with the growth of another indicator. If the relation still exists, we would be able to assert that both income differences and income growth are relevant for increasing the subjective well-being of population. Hence, we formulate the following hypothesis:

H3 – there is no significant positive relation between life satisfaction and GDP per capita in each separately taken EU country in the period 2000–2009.

To test the hypothesis, we will look at OLS regression analysis including all 27 countries of the EU. We will use data for a period from 2000 to 2009 and will analyse the aggregate figures of population percentage saying they are satisfied and GDP per capita figures in each separate country. Several illustrations of trends in life satisfaction and GDP are presented in Fig. 5. Out of six cases, three show a positive relation between GDP level and life satisfaction. In two cases, we do not see any significant relation, and in case of Hungary we observe a negative relation: the growing wealth leads to a decreasing life satisfaction in this country.

The results for all 27 countries are summarised in Tables 1 and 2. The tables show results of OLS regression analysis with life satisfaction as a dependent and GDP per capita as an independent variable. The countries where no significant relation between life satisfaction and GDP was found are not presented in the tables¹⁰. For all Eastern Eu-

¹⁰ They include Ireland, Greece, Spain, Cyprus, Luxemburg, Malta, Portugal, UK, Slovenia.

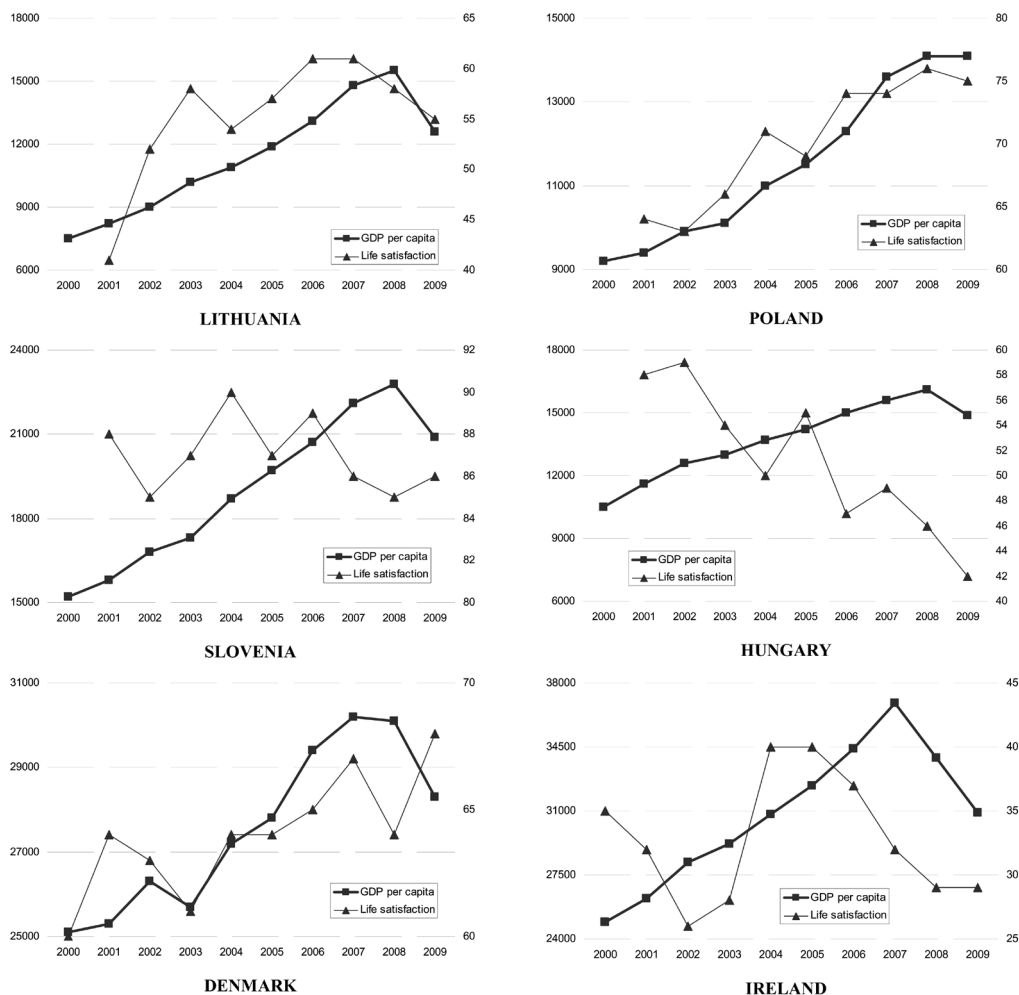


FIG. 5. Trends in GDP per capita and life satisfaction, 2000–2009

Source: Eurobarometer and Eurostat. Life satisfaction is taken as a country's percentage of respondents saying they are "very satisfied" or "fairly satisfied" with the life they lead in Lithuania, Poland, Slovenia, and Hungary. Only answers "very satisfied" were used in case of Denmark and Ireland.

ropean countries, the aggregate data on life satisfaction with the answer categories "very satisfied" and "fairly satisfied" were used. In case of the old EU member countries, data with both "very satisfied" and "fairly satisfied" answers show no correlation with GDP per capita data. Therefore, a more sensitive indicator, i.e. only the percentage of population that answered the question using the "very satisfied" item is used.

Out of 27 EU countries, 15 show a positive relation between GDP per capita and life satisfaction level within the period 2000–2009. Out of these 15 countries, 8 are new (and consequently poorer) and 7 are old (and relatively richer) members of the EU. Three

countries (Italy, Austria and Hungary) show a negative relation between income and satisfaction, i.e. growth in GDP led to a decreasing level of satisfaction in these countries. Nine countries show no significant relation whichever life satisfaction indicator is used.

TABLE 1. Relation between GDP per capita and life satisfaction in the old EU members

	Belgium	Denmark	Germany	France	Italy	Netherlands	Austria	Finland	Sweden
Standardised beta coefficient for GDP	0.65	0.702	0.784	0.57	-0.6	0.776	-0.83	0.726	0.71
p	0.042	0.024	0.007	0.085	0.034	0.008	0.006	0.018	0.022
r ²	0.423	0.493	0.614	0.325	0.45	0.6	0.69	0.527	0.5

Source: Eurobarometer and Eurostat. Only answers "very satisfied" are included into analysis.

TABLE 2. Relation between GDP per capita and life satisfaction in Eastern European EU members

	Bulgaria	Czech Republic	Estonia	Latvia	Lithuania	Hungary	Poland	Romania	Slovakia
Standardised beta coefficient for GDP	0.715	0.82	0.919	0.8	0.758	-0.82	0.942	0.693	0.937
p	0.03	0.007	0.000	0.01	0.018	0.007	0.000	0.056	0.000
r ²	0.511	0.673	0.845	0.639	0.574	0.668	0.888	0.481	0.878

Source: Eurobarometer and Eurostat. Both "very satisfied" and "fairly satisfied" answers are included into analysis.

These results enable us to reject hypothesis H3 and claim that there is a significant positive relation between life satisfaction and GDP level. However, it should be noted that there is no unconditional relation between changes in GDP level and changes in subjective well-being. Although the majority of countries show a strong positive correlation between these two variables, there are some exceptions. The positive relation holds true in all Eastern European countries with the exception of Hungary. The situation is different in other parts of the EU. Further studies are needed to explain the factors influencing the differences among the EU countries. One thing can be noted to lead these studies. The countries that show no relation between subjective well-being and GDP growth or show a negative relation tend to be predominantly Catholic countries (with the exception of the UK, Greece and Cyprus). Whether this has anything to do with the GDP – life sat-

isfaction junction needs to be studied further. However, it does look that growing GDP is a necessary but insufficient condition for growing life satisfaction.

Obviously, the existence of relation is not dependent on the level of GDP. It means that theory of satiation point does not pass the test and hypothesis H2 could be rejected once again. More wealth does not remove the effect of income on life satisfaction. On the contrary, more prosperous countries show almost the same strength (the mean correlation coefficient is 0.7) of relation between the growth of GDP and life satisfaction as do poorer countries (the mean correlation coefficient is 0.82). As already mentioned, these findings also raise the question whether material well-being values are indeed losing their importance in wealthier societies. The impact of post-materialist values is probably not so straightforward as it is believed to be.

However, it should also be noted that more sensitive measures of life satisfaction are necessary to detect a relation with GDP growth in wealthier countries. The smaller part of countries within this group shows a positive relation between the two indicators. Also, the part of life satisfaction variation shared with the variation of GDP is smaller. Therefore, it can be concluded that the type of relation changes from straightforward and almost unconditional in Eastern European countries to more sophisticated, influenced by more factors in wealthier societies.

Discussion and conclusions

Findings of our study suggest that Easterlin's paradox may be not valid, at least in some countries and/or for a certain period of time. They also suggest that there might be other variables that influence the shape of life satisfaction curve. Nevertheless, it clearly indicates that a sharp denial of any relation between life satisfaction and income growth, advocated by Easterlin, is not correct.

An analysis of the EU data supports findings of Stevenson and Wolfers (2008) showing that a positive relation between GDP per capita and life satisfaction exists on both the cross-country and within-country levels. The observed relation is not dependent on the level of a country's wealth. The growth of GDP affects the growth of subjective well-being in both relatively wealthy and relatively poor groups of the EU members.

Analysis of the 2000–2009 within-country data trends shows that the relation between the two variables is not unconditional. There are exceptions with no relation at all or even a negative relation. Further studies on the economic, demographic, cultural and social factors influencing life satisfaction and the shape of relation with macro-economic indicators are needed.

Although the study covers a relatively long timespan (2000–2009) which includes periods of economic growth and recession, even longer data series are needed to prove (or reject) the relation between macroeconomic indicators and subjective well-being. The study also raises the question whether existing measures of life satisfaction are sen-

sitive enough to grasp further changes. Increasing wealth and satisfaction levels require usage of more precise measurement tools than those used at the present moment. Probably, in order to accurately measure changes in the perceived well-being, more fine-tuned indicators are necessary.

Nevertheless, the current study corroborates the theory of the importance of economic growth. It confirms that, at least in many cases, growth does influence overall life satisfaction and this in turn leads to positive views on democracy, market economy and government policies. Therefore, the growth of wealth is an important condition to achieving a sustainable development of democratic societies.

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