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QUALITY OF LIFE PARADOX. WELL-BEING RANKING OF THE SELECTED EUROPEAN COUNTRIES BASED ON HYBRID WELL-BEING APPROACH

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ABSTRACT. The paper aims to measure individual and social hybrid well-being, which takes into account the Quality of Life Paradox and compares the results of the selected European countries by creating a country ranking. The paradox refers to an existing disparity between the real quality of life experienced by people and their subjective state of being happy. The hybrid well-being approach is a philosophically inspired attempt to overcome the weaknesses of both subjective and objective well-being theories. Based on a multidimensional concept of well-being, which follows Sen and Nussbaum's capability approach, we have applied the fuzzy sets theory to data from the European Quality of Life Survey to calculate the objective well-being of people living in the selected European countries. Then we have measured fittingness of their objective to subjective well-being by the Fitting Index (FI). Finally, we have constructed the countries' ranking of well-being and compared it to other rankings based on happiness, functionings achievement, and GDP *per capita*. The analysis shows that the country ranking based on hybrid well-being differs from the one created on the basis of GDP *per capita,* and it is not perfectly correlated with other rankings. Therefore, this means that the hybrid well-being based ranking may contain additional information as compared to other rankings. The paper also indicates that citizens of wealthier countries, living in relatively high-quality circumstances, do not have a lower level of subjective well-being (happiness) more often than their counterparts from the Eastern European countries.

JEL Classification: I31, I39, D63

Keywords: hybrid well-being, capability approach, quality of life, happiness

Introduction

The gap between happiness and GDP *per capita* has been well-known since the mid-1970s and Richard Easterlin's seminal research on happiness (Easterlin, 1974). Since then, the so-called Easterlin Paradox has been documented by many economists (Di Tella, MacCulloch, 2008; Easterlin, Angelescu, 2009; Graham, 2011; Sachs, 2018), and remains a subject of continuous scrutiny (Stevenson, Wolfers, 2008; Kahneman, Deaton, 2010; Angeles, 2011; Jebb, Tay et al., 2018). What if a similar gap also exists between subjective well-being (happiness) and objective quality of life? What if there are situations where bad living conditions go together with a high level of subjective well-being or good living conditions go with a low level of subjective well-being? We suggest referring to such situations as the Quality of Life Paradox. We are also convinced that this paradox constitutes an increasingly pressing problem in the contemporary world, not only in developing countries but also (or perhaps especially) in wealthy ones. If we detect that some people in our society feel very happy but at the same time live in extremely poor conditions or just the opposite — live in luxury but feel sad and unhappy, we realise that there are some serious problems in society which should be addressed by policymakers. For this reason, seeking a measure of the fittingness of happiness to quality of life is worth the effort. We think that the hybrid version of well-being, as proposed by Kwarciński and Ulman (2018), may be a good approximation of this fittingness.

This paper aims to measure individual and social hybrid well-being, which takes into account the Quality of Life Paradox. In order to achieve this goal, we will first conceptualise hybrid well-being referring to literature in economics and philosophy, then apply the fuzzy set theory to operationalize the concept and give it empirical contents. We would like to show how far the empirical measure of hybrid well-being yields a well-being ranking different from those provided by happiness, functionings achievement, and standard income-based measures. We would also like to confirm or disprove the intuitive view that citizens of wealthier countries, living in relatively high-quality circumstances, more frequently have a lower level of subjective well-being (happiness) than their less wealthy counterparts from the Eastern European countries. Overall life satisfaction in the selected European countries will be evaluated with respect to hybrid well-being as well as other measures of well-being, and next, their well-being rankings will be created and compared.

The paper's aim is modest in the sense that it is focused entirely on empirical identification of the fittingness of subjective and objective well-being, and it does not attempt to explain happiness in terms of quality of life. Hybrid well-being (HWB) takes into account the subjective and objective aspects of well-being and asserts that to contribute to overall well-being, a subjective state of a person (their feelings) should fit their objective state. At the personal level, a positive attitude, such as pleasure or desire, has to be directed at an objective good. For instance, if one takes pleasure from reading poetry and poetry has its independent (objective) value, then a positive attitude matches a positive value of good and creates the fittingness. According to Hurka (2019), this fittingness is an objective property; therefore, we can measure it, creating the Fitting Index (hereafter FI).

There are plenty of concepts and measures of both objective and subjective well-being. The most prevalent objective concept of well-being refers to the material welfare of a person or society and is usually measured by GDP *per capita*. However, at least since the *Report by the Commission on the Measurement of Economic Performance and Social Progress* was published by Joseph Stiglitz, Amartya Sen, and Jean-Paul Fitoussi (2009) growing beyond GDP movement has gained in strength. A central postulate of the movement is to broaden the concept of well-being by including other than material welfare dimensions of well-being and inventing more adequate measures of the concept (Decancq, Schokkaert, 2016). For instance, an increasing number of publications regarding various possible applications of Sen's capability

approach can be seen as an effort directed to obtain a more valid theoretical basis of objective well-being (Dang 2014, De Rosa, 2018). The rapid development of the objective well-being concept is also accompanied by an increased sophistication in understanding of the subjective state of human well-being. Ed Dainer (1984) pointed out three separate but interrelated concepts of the subjective well-being (SWB): eudaimonistic concept (evaluation of one's life according to some external normative criteria, e.g., virtue), life satisfaction (focus on what leads people to evaluate their own life in positive terms), and emotional experience (positive and negative affects in person's life). The latter two are crucial for empirical investigations. Sometimes the subjective well-being is also defined as the comfort of living (Mishchuk, Grishnova, 2015). The current stage of development of SWB research is summarised in Diener, Oishi, and Tay (2018). Both objective and subjective approaches to well-being have some strengths and weaknesses (Moss 2013). However, there are constant efforts to achieve some synergy (Gasper, 2005; Comim, 2005; Pugno, 2015), for instance, by integrating the subjective and objective aspects of well-being into one holistic concept (D'Silva, Samah, 2018) which could be coherent and appropriate for the application in various social contexts. Bringing out a hybrid approach to well-being jointly with the FI index can also be seen as a move in that direction.

In our study the subjective well-being has been measured by self-reporting, i.e., how happy a person feels regarding their life as a whole, and the objective well-being rests on Amartya Sen and Marta Nussbaum's capability approach. We are aware that a capability approach can be operationalised in many different ways. Some scholars focus on capabilities measured by designing statistical indicators (Dowding et al., 2009), using an econometric model (Krishnakumar, 2007), or a random scale model (Andreassen, Di Tommaso, 2018), while others pay attention to individual functionings and propose an index of well-being as a functionings achievement (Balestrino, Sciclone, 2001; Alkire, 2015). We follow the path indicated by Enrica Martinetti (2000) and her multidimensional assessment of well-being based on a functioning approach, to which she applies the fuzzy sets theory to create an overall index of well-being. Our work can be seen partially as a continuation, and partially as an advancement and extension of her proposal.

However, the hybrid approach differs from multidimensional one in the following important ways: firstly, while many multidimensional well-being concepts treat happiness as one of the dimensions of well-being (Sen, 2009; Alkire, 2015), the hybrid approach conceptualizes happiness as the subjective well-being measured independently from objective aspects of well-being. Multidimensionality refers only to these objective aspects, which consist of a person's quality of life. Secondly, our approach places the subjective and objective well-being on the same scale, which enables comparing both measures and creating the FI. To prove the usefulness of a hybrid approach in the detection of the subjective-objective well-being fittingness, highly developed European countries were selected for comparisons. Our sample consisted of countries belonging to the Visegrád Group (Poland, Hungary, the Czech Republic, the Slovak Republic), the Weimar Triangle (Poland, France, Germany), and Bulgaria. There were seven countries in total. The World Bank classifies all of them except for Bulgaria as high-income countries. Bulgaria was chosen for comparison since it is the most impoverished country in the EU in terms of GDP *per capita*. However, according to the World Bank it belongs to the upper-middle-income group of countries.

The structure of the article is as follows. Section 2 presents a theoretical background of the hybrid well-being concept. Section 3 overviews an approach to the measurement of hybrid well-being based on fuzzy sets theory and the FI. Section 4 shows an example of an empirical application of the FI by creating a ranking of the selected European countries based on it. Section 5 compares this ranking to other rankings of well-being based on happiness, functionings achievement, and GDP *per capita*. The final section presents conclusions.

1. Hybrid well-being: between subjectivity and objectivity

The hybrid version of well-being (HWB) is a philosophically inspired attempt to overcome the weaknesses of both subjective and objective approaches to well-being (Kwarciński, Ulman, 2018). In particular, it aims to avoid a problem concerning the agent's autonomy protection, which is hard to tackle using objective list theories, and a personal adaptation problem, which is challenging for the defenders of subjective approaches to well-being, such as hedonism and preference fulfillment theories (Robeyns, 2017: 130-133).

While the subjective well-being (SWB) is based on self-evaluation of personal state of satisfaction or happiness regarding someone's life taken as a whole and is measured by answering the survey question "Taking all things together on a scale of 1 to 10, how happy would you say you are?"[1], the objective aspects of HWB refer to Sen and Nussbaum's capability approach.

According to Sen (2005; 2009), a personal capability is defined as a set of valuable "doing" or "being," that a particular person is able to do or to be. Nussbaum defends the claim that there are some fundamental human capabilities related to life, health, relationships, etc. All of them secure personal autonomy and dignity, which is why they are universally relevant.[2] This leads her to propose a list of central human capabilities comprising ten dimensions: (1) life, (2) bodily health, (3) bodily integrity, (4) senses, imagination and thought, (5) emotions, (6) practical reason, (7) affiliation, (8) other species, (9) play, (10) control over one's political and material environment (Nussbaum 2003: 41, 42). In this paper, we try to operationalise Nussbaum's list, linking each dimension to a specific variable or variables from the European Quality of Life Survey (EQLS). Variables selection was based on two criteria: relevance to the research purpose and completeness of respondents' replies. In line with the fuzzy sets theory, we calculate an index of the objective well-being based on the membership function (μ). Then the index is rated on a scale of 1 to 10, similarly to SWB. Thus, two measures of well-being, subjective self-evaluation (SWB), and objective calculation (μ), become comparable. The former is called S (subjectivity), while the latter is called Q (quality of life). It is worth mentioning that to use a survey to operationalise Nussbaum's approach, we have to focus on personal functionings rather than capabilities due to the fact that surveys usually contain information regarding actual and not potential doings or beings.

Having subjective (S) and objective (Q) measures of well-being gives us a chance to calculate a hybrid version of well-being, which is able to depict the Quality of Life Paradox. We assume that the hybrid well-being index (HWB) always gives priority to the lowest value of S or Q. Giving priority to Q when it takes a lower value enables us to be sensitive to the adaptation problem while favouring S when it becomes lower is a way to respond to the problem of personal autonomy. In other words, if someone feels very happy (S is high) while their quality of life is reduced (Q is low), we suggest that their well-being is in fact at the level Q. But if someone feels really dissatisfied (S is low) while their quality of life is excellent (Q is high), we think that their personal experience should have priority. In such a case, nobody should be able to force another person to choose the goods which he or she does not want.

Hybrid well-being is measured by the FI, which captures a change between S and Q. The value of the FI depends on the probability of transition within the compared levels of well-being assessment as well as the magnitude of these transitions (differences in well-being evaluations). As Fig. 1 shows, the value of the FI depends on how many people feel less happy (red arrows) or happier (blue arrows) than indicated by their objective circumstances, and how significant is this disparity (how long are both arrows). The FI is a correct measure of HWB

[1] The question comes from the European Quality of Life Survey 2003-2016.
[2] Of course, the list's content is still debatable, and there are also discussions regarding weights assigned to particular categories of well-being. Nonetheless, the list approach has gained some popularity among empirical researchers (Alkire 2002).

because it reflects two situations: the first when someone has a low quality of life but feels happy (S>Q), and the second when low happiness is accompanied by a relatively high quality of life (S<Q). The lower the FI, the more accurate personal self-evaluation of happiness with relation to the objective assessment, and the highest well-being. Thus, we have to tend to minimise HWB measured as the FI.

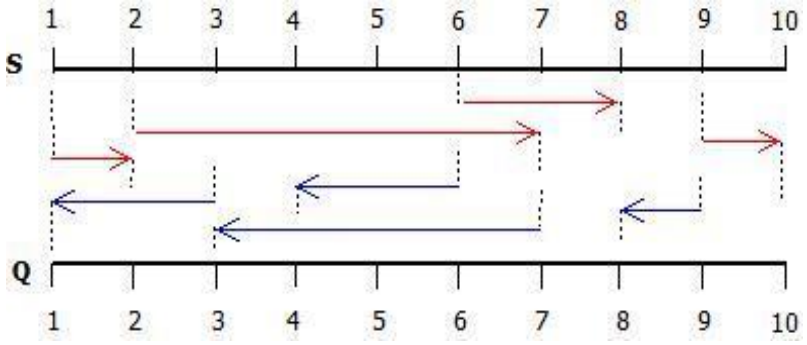

Figure 1. How does the Fitting Index work?
Source: own analysis.

2. Measuring hybrid well-being by the Fitting Index

To obtain a single, aggregated assessment of respondents' objective well-being (Q), we referred to the multidimensional approach. This approach was applied by Kolm (1977), Atkinson and Bourguignon (1982), Tsui (1995), Aristei and Bracalente (2011) among others, to assess the economic status including non-income information about the surveyed units (individuals, households, and countries) in the context of inequality and social welfare. In some cases, researchers combined different indicators to obtain a multidimensional index of the standard of living, economic status, or poverty. These phenomena were analyzed at the macro (Anand, Sen 1997) as well as micro-level (Smeedeing et al., 1993). In the last three decades, the multidimensional approach based on Zadeh's (1965) fuzzy set theory has primarily been used in research into poverty. Among those who used the fuzzy sets theory were Cerioli, Zani (1990), Cheli (1995), Betti, Cheli, Lemmi, Verma (2005), and in Poland Panek (2011), Ulman, Šoltés (2015).

In contrast to the classic approach to the identification of the poor when the membership function takes only two values, namely 1 (when someone is poor) or 0 (when someone is not poor), the fuzzy sets approach assesses a person's degree of poverty risk by means of a function which takes values from a range of [0;1]. Recently, the multidimensional approach based on fuzzy sets theory has also been used to examine the quality of life (Betti et al., 2016; Betti, 2016; Dudek, Szczesny, 2017) and the labour market (Belhadj, 2014; De Battisti et al., 2015). The membership function to the poverty sphere is based on poverty symptoms or indicators, distinguishing a monetary part (based on incomes or expenses) and a non-monetary part (various factors which can point to a poverty risk). Due to the fact that poverty can be treated as a low level of well-being, we can apply this approach to research levels and diversities of well-being (referring to persons, families, or households). Thus, we have substituted a membership function to the poverty sphere with the well-being sphere.

The first step to obtain an aggregated measure of well-being is to standardise individual variables (well-being indicators). The following formula of standardisation has been applied:

$$e_{hj,i} = \frac{F(c_{hj,i})-F(1)}{1-F(1)},\ h = 1,2, \ldots, m;\ j = 1,2,\ldots, k_h;\ i = 1,2, \ldots, n, \quad (1)$$

where:

$c_{hj,i}$ – is a rank of a variant of the *j*-variable (factor of poverty/well-being) from the *h*-dimension of poverty/well-being for *i*-household (individual),

F(1) – is the value of the cumulative distribution function of ranks of the *j*-variable from the *h*- dimension of poverty/well-being for a rank equal to 1 (a variant of the *j*-variable indicating the lowest level of well-being/the highest level of poverty risk).

The values of this measure are obtained for each variable (indicator) and are normalised into a range of [0;1]. The higher the value of (1), the higher the well-being level indicated by a given variable. In the next step, the aggregation of assessments of membership (for each individual) to well-being (lower level of poverty) is performed by calculating the weighted mean for each of the dimensions, then the arithmetic mean is calculated for an overall assessment of well-being. In order to obtain the aggregated and the normalised value of the well-being assessment for each dimension, the following formula is used:

$$e_{h,i} = \frac{\sum_{j=1}^{k_h} w_{hj} * e_{hj,i}}{\sum_{j=1}^{k_h} w_{hj}}, \quad (2)$$

where:

$e_{h,i}$ – is aggregated assessment of well-being for *i*-individual (person) in the *h*-dimension,

w_{hj} – is a weight for the *j-variable in the h*-dimension,

k_h – is the number of variables in the *h*-dimension.

The system of weights is given by the formula (Betti, Verma 1999):

$$w_{hj} = w_{hj}^a \cdot w_{hj}^b,\ h = 1, 2, \ldots, m;\ j = 1, 2, \ldots, k_h, \quad (3)$$

where:

w_{hj}^a – is a measure of the information level of the *j*-variable in the *h*-dimension,

w_{hj}^b – is a measure of discrimination capacity of the *j*-variable in the *h*-dimension.

Such a system of weights attributes more importance to those well-being symptoms, which are less correlated with other variables. This is fulfilled by applying the following formula (Panek, 2010):

$$w_{hj}^a = \left[\frac{1}{1+\sum_{j'=1}^{k_h}\left|r_{e_{hj,hj'}}\right| \left|r_{e_{hj,hj'}} < r_{e_{hj}}^*\right.}\right]\left[\frac{1}{\sum_{j'=1}^{k_h}\left|r_{e_{hj,hj'}}\right| \left|r_{e_{hj,hj'}} \geq r_{e_{hj}}^*\right.}\right],$$

$$j,j' = 1, 2, \ldots, k_h;\ h = 1, 2, \ldots, m, \quad (4)$$

where:

$r_{e_{hj,hj'}}$ – is a correlation coefficient of well-being level of the *j*-variable and the *j'*-variable in the *h*-dimension,

$r_{e_{hj}}^*$ – is a threshold value of a correlation coefficient of well-being level regarding the *j*-variable in the *h*-dimension, which can be calculated as follows:

$$r_{e_{hj}}^* = \min_j \max_{j'} \left|r_{e_{hj,hj'}}\right|,\ j,j' = 1, 2, \ldots, k_h;\ j \neq j'. \quad (5)$$

The weights w_{hj}^a are calculated for each symptom (variable) separately in all dimensions.

A measure of discrimination capacity of variables is established by:

$$w_{hj}^{b} = \frac{S(e_{hj})}{\overline{e_{hj}}},\ h = 1, 2, ..., m;\ j = 1, 2, ..., k_h, \quad (6)$$

where:

$S(e_{hj})$ – is the standard deviation of well-being of the *j*-variable in the *h*-dimension,

$\underline{e_{hj}}$ – is the mean of the well-being of the *j*-variable in the *h*-dimension.

Then, we calculate an overall aggregate evaluation of the objective well-being for each person as the arithmetic mean:

$$e_i = \frac{\sum_{h=1}^{m} e_{h,i}}{m}, \quad (7)$$

where *m* is the number of dimensions.

Finally, the calculation of the membership function to the well-being sphere (lower level of poverty risk) for *i*-person is made according to the following formula:

$$\mu_i = e_i^{\alpha}, \quad (8)$$

where:

α – is a calibration parameter that allows for equalisation of the mean of the function (8) to the mean of the base variable (S). The same parameter α is applied to each dimension.

The values of μ_i function fall into a range [0;1]. The higher the value of the function, the higher personal well-being.

To summarise, applying the formula (1) the value of $e_{hj,i}$ is calculated for each variable. Then, all these values are aggregated by taking the weighted mean for each *h*-dimension of well-being and after applying the formula (7) for all dimensions together. Finally, based on the aggregated values, the membership function to the well-being sphere (8) is calculated for each of five dimensions, and in total. At this stage, we reach the goal of calculating an objective, functionings achievement-based well-being index (Q), which is comparable to the subjective (happiness based) evaluation of personal well-being (S).

To compare the base variable (S) to the objective well-being (Q), we group the values of the function (8) into ten levels. We assume that the interval of the function variability would be divided into ten equal classes (deciles). Finally, based on the particular class of the value of the function (8), the numbers from 1 to 10 are assigned to each observation unit (individuals).

To indicate a change between S and Q, we use the Fitting Index (*FI*)[3], which is defined as

$$FI = \frac{1}{s-1}\sum_{i=1}^{s}\sum_{i=1}^{s} w_i p_{ij} |i - j|, \quad (9)$$

where:

s – is the number of levels,

w_i – is the fraction of people belonging to the *i*-th level of the base variable (S),

p_{ij} – is the probability of the mobility of each element, which is calculated by the following formula:

$$p_{ij} = \frac{n_{ij}}{\sum_{j=1}^{s} n_{ij}} \text{ for } i,j = 1, 2, ... s, \quad (10)$$

[3] The FI is a variant of the Bartholomew index used by social researchers to study the mobility of socio-economic phenomena.

where:

n_{ij} – is the number of people belonging to the *i*-th level of the base variable (S) and the *j*-th level of the objective well-being assessment (Q).

As shown in the previous section, the value of the FI depends on the probability of transition within the compared levels of well-being assessment as well as the size of these transitions (differences in well-being evaluations). In particular, there are four possible variants. First of all, if low FI is accompanied by low S or Q, it means that people live in poor objective conditions, and their happiness level suites them. This is a very bad situation. Secondly, if low FI goes hand in hand with high S or Q, it means that people have a good quality of life, and they are happy about that. There is nothing to worry about in such a situation. The third, high FI can go together with low Q or high S. This is a potentially worrying state of affairs because it can suggest a possible adaptation problem. According to the last option, high FI can be accompanied by high Q or low S, and this is also a worrying situation because it suggests that even though people live in good objective conditions, they still feel unhappy. In general, the higher the FI, the more people feel better (worse) than they should, taking into account objective factors or changes between levels of well-being considered as more significant, which means that they differ more than by one level.

3. Hybrid well-being based ranking of the selected European countries

The source of our statistical data is the EQLS gathered between 2003-2016. The data file contains 667 variables collected for 36 countries in four waves. In this paper, we focus on data for Poland and other countries belonging to the Visegrád Group, the Weimar Triangle, and Bulgaria collected in the fourth wave (2016). Depending on the country, there are between 1009 and 1631 observation units (individuals). After checking the data for completeness and eliminating missing data, the number of observation units was significantly reduced. The largest number of missing data referred to the variable describing equivalent income. Because the income variable is essential for an objective assessment of well-being, we decided to complement the missing data instead of removing this variable from the analysis or reducing the data set. For this purpose, a procedure based on the *k*-nearest neighbours algorithm implemented in a Statistica package was used. Finally, the data contained between 975 and 1619 observation units and accounts for 25 variables without missing data. The number of observations for each country was weighted, reflecting the relative size of their populations. The weights were taken from the EQLS data set.

The variables were grouped into five dimensions, which are the dimensions of central human functionings: (1) life, (2) health, (3) education, (4) relationships, and (5) income. These variables are the indicators of objective well-being, whereas general happiness is the subjective indicator of well-being. This complies with an objective-subjective distinction concerning indicators. The objective indicators are focused on a measure of a situation while the subjective indicators are used as an evaluation of a situation (Boelhouwer, Noll, 2014: 4436). For instance, feeling happy is an evaluation of the overall personal situation, while the lack of a bath or shower or the distance to the doctor's office are the measures of this situation.

The selection of indicators depends on the theoretical framework, mainly Nussbaum's proposal of the objective list, as well as the availability of data. Due to a shortage of data, we narrowed down Nussbaum's list to five dimensions of the objective well-being instead of the original ten. All indicators of well-being included in particular dimensions were collected by self-reporting. However, the independent registration method (Boelhouwer, Noll 2014: 4436) was not used in the EQLS.

Based on the set of indicators included in the central human functionings (see Table 3), we calculated the membership function (μ) for each of the five dimensions and in total regarding

all considered countries. The membership degree to the well-being sphere calculated as the arithmetic mean of (1) for each variable of each country is shown in Table 4. Then the total outcome of μ for each country was divided into ten levels (see Table 5). This constitutes the objective well-being (Q), which is comparable to the subjective self-evaluation of happiness (S). Taking into account the Q evaluation, we should move the majority of respondents to the eighth and ninth levels of well-being. This means that usually, people are neither so unhappy nor so perfectly happy as they tend to claim. As Figure 2 shows, a similar pattern exists in all considered countries.

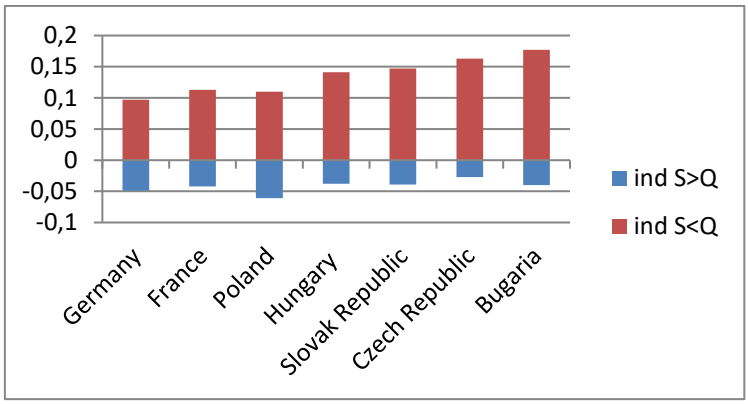

Figure 2. The Fitting Index for the selected European countries
Source: *own analysis of EQLS data*

To construct a country ranking based on the HWB, we first have to create transition matrices for each country, which show the relationships between S and Q for each dimension and in total. An example of such a matrix is in Table 7, where we can see the data for Poland in total. This matrix shows, for instance, that while more than 240 respondents declared that their subjective well-being (S) is at level 5, according to objective evaluation (Q), only 55 people belong to this category[4]. Next, we can calculate the FI, which measures the probability of transitions between levels of S and Q as well as the magnitude of these transitions (Table 8 shows the outcomes for each country). Finally, we can create a country ranking based on the FI as a measure of hybrid well-being (see Table 1). The lower the value of the FI, the higher hybrid well-being, thus according to this measure the order of the countries is as follows: Germany (0.146), France (0.154), Poland (0.171), Hungary (0.180), the Slovak Republic (0.186), the Czech Republic (0.190), and Bulgaria (0.217).

Table 1. The FI based ranking of the selected European countries

Countries	FI based ranking
Germany	1
France	2
Poland	3
Hungary	4
Slovak Republic	5
Czech Republic	6
Bulgaria	7

Source: *own analysis of EQLS data*

[4] We have to remember that the number of respondents in each country is weighted in such a way that the population proportions between countries are represented. This is the reason why Table 7 contains fractional values.

There is more information behind this ranking. In all countries, the largest number of transitions are from a higher quality of life to a lower happiness level, which means that more people living in objectively good conditions feel less happy than they should (see Figure 1). The lowest movement is noticed in the Czech Republic regarding the transition from higher S to lower Q, and in Germany taking into account the transition from lower S to higher Q. This means that in the Czech Republic, when people feel happy, they usually have an adequate quality of life in comparison to other countries, while in Germany, the same is true when people feel unhappy.

It can be seen that in the post-socialist countries, the level of disparity of S and Q is clearly higher than in the case of the two Western European countries surveyed. Therefore, the question of the reasons for such differentiation could be asked. Why do citizens of post-socialist countries more frequently assess their well-being (S) worse than it results from objective measurement (Q)? Is it influenced by cultural factors, or somewhat related to the socio-economic development of a given society? If the latter option is at play, will the diversity mentioned above disappear with the achievement of an ever-higher level of development? It seems that such a scenario is possible. As shown by widely available data in Europe, there is still considerable variation in living standards to the detriment of former socialist countries.

With current open access to information and no borders (Schengen area), these societies may perceive their poverty in relation to Western Europe. This perception may be due to worse objective living conditions (listed in Table 3) in comparison to the countries of Western Europe. It is worth noting that the estimation of objective living conditions (Q) of members of individual societies was made within each of them. Thus, the same living conditions, e.g., within a Bulgarian society assessed as good, might be evaluated differently, e.g., in German society. It may give rise to a lower subjective assessment of well-being in Bulgarian than it results from an objective assessment carried out within this society. Therefore, it can be hypothesized that along with the increase in the level of socio-economic development of Central European countries and the disappearance of differences, the FI indicator will also become similar in the examined countries. Against this background, Poland becomes a link between the countries of Central and Western Europe - as Figure 2 shows, it is precisely between the two mentioned groups of countries.

Concerning the dimension comparisons, for all of these countries except Germany, the highest FI is in the health dimension (see Table 8). In this respect, more people feel worse than they should, taking into account objective factors or changes from their lower levels of happiness to higher levels of quality of life are more significant (differ more than by one level). In Germany, the highest FI is in the education dimension, but this time more people feel better than they should, or there are more significant changes from their higher levels of happiness to lower levels of quality of life. All countries have the lowest FI in the social relationships dimension, which means that in this aspect, the discrepancy between personal happiness and quality of life is relatively small.

4. Comparing the well-being rankings: hybrid well-being, happiness, functionings achievement, GDP *per capita*

As the formation of the HWB requires the comparison of subjective and objective well-being, we can also use measures of these two approaches to create independent country rankings. We can supplement our analysis by adding the traditional well-being measure as a GDP *per capita* and then compare all the rankings to one based on the FI[5].

[5] Similar to Balestrino and Sciclone's (2001: 17) well-being rankings comparison of the Italian regions.

If we sum up the percentage of people claiming they are happy at least at level eight (from 8 to 10 levels), we will notice that only in two countries out of seven, the Czech Republic (37%) and Bulgaria (38%), less than half of the population feel happy at least at level eight. The happiest persons are in Poland (59%), only slightly less happy in Germany (58%), the same position is occupied by Hungary and France (54% respectively), then comes the Slovak Republic (52%) (see Figure 2). This ranking will change if we take into account functionings achievement well-being, measured by the total average membership degrees (μ) of each country (see Table 6). In this respect, the highest position is occupied by France (0.760) while the lowest by Bulgaria (0.715). In the middle of the ranking are the Czech Republic (0.749), Hungary (0.746), Germany (0.745), and the Slovak Republic (0.74). Poland (0.732) is located closer to Bulgaria than to France. Regarding GDP *per capita*, the wealthiest people are in Germany and France, while the poorest in Bulgaria (see Table 9). All well-being rankings are summarised in the following Table 2.

Table 2. Well-being rankings of the selected European countries

Countries	FI based ranking	Happiness (S) based ranking	Functionings achievement well-being ($\boldsymbol{\mu}$) based ranking	GDP *per capita* based ranking
Germany	1	2	4	1
France	2	3	1	2
Poland	3	1	6	6
Hungary	4	3	3	5
Slovak Republic	5	5	5	4
Czech Republic	6	7	2	3
Bulgaria	7	6	7	7

Source: *own analysis of EQLS data*

As we can see, no single country occupies the first position for each ranking, and only Germany reaches the first place according to two rankings, i.e., the FI based ranking and GDP *per capita* based ranking. Poland is at the top of the happiness-based ranking but at the bottom in both functionings achievement well-being and GDP *per capita* based rankings. The worst position in almost all rankings was occupied by Bulgaria.

We can check how much new information is delivered by the FI based ranking by looking at its correlations with other well-being rankings (see Table 10). The highest positive correlation is between the FI based ranking and happiness-based ranking (0.829), which means that on average, countries with happy people tend to have a relatively low gap between happiness and quality of life. It is also true regarding countries with high GDP *per capita* because the FI based ranking is quite well correlated with the GDP *per capita* based ranking (0.643). What is interesting, although the GDP *per capita* based ranking is positively correlated with the functionings achievement-based ranking (0.714), the latter is relatively poorly correlated with the FI based ranking (0.357). Two countries are responsible for this result – first, Poland and then Germany. Both countries have a high position in the FI and happiness-based ranking with a relatively low position in functionings achievement-based ranking. As mentioned before, it is worth remembering that functionings achievement is measured in a relative manner - in relation to other members of a given society. Therefore, for instance, the relative assessment of functionings achievement within a German society may turn out to be lower than, e.g., in the Czech Republic or Hungary. The question then arises whether functionings should not be assessed in all societies treated together. However, there are good

reasons for measuring functionings achievement within a given society. Even though the indicators in Table 3 relate to objective living conditions, they are assigned a subjective assessment. For instance, problems of pollution of the living environment, or the functioning of the health care system may be perceived differently in individual societies, e.g., what is normal in one, may not be acceptable in others. Therefore, it is challenging to discuss comparability even in the case of seemingly objective factors of human functioning in culturally different societies. Similar to measuring poverty based on the relative income line of poverty (determined separately for each country due to incomparability of living conditions in individual countries), the assessment of the functionings achievement was made within a given country, which indicates, first of all, the quality of life in a given society. In the case of Germany, it is worth noting that the relatively low position in the functionings based ranking was influenced by the low value of functionings achievement in the field of education, which may depend on system solutions in this country.

What is more, it should be noted that the differences in levels of measurement of functionings achievement between individual countries are rather small, and the ranking based on them does not fully reflect these differences. However, Poland is a particular case, for which rankings based on objectified information (functionings achievement and GDP *per capita*) place it in low positions, while subjectively perceived well-being (happiness) is relatively high. The question arises whether this is due to the optimism of Poles and the fact that they realistically assess their happiness in relation to objectified well-being, which at the same time is not at the highest level.

Conclusion

The analysis has confirmed that there is a real disparity between the subjective evaluation of well-being (understood as happiness) and the objective quality of life in the selected European countries. Thus, the quality of life paradox exists, and the FI can empirically identify it. The research has also shown that the country ranking based on the FI differs from the one created on the basis of GDP *per capita*, and it is not perfectly correlated with other rankings. This means that the FI based ranking may contain some additional information. For instance, through the FI, we can notice that it is not true that citizens of wealthier countries, living in relatively high-quality circumstances, show a lower level of the subjective well-being (happiness) more frequently than their less wealthy counterparts from the Eastern European countries. Conversely, the citizens of post-socialist countries more frequently assess their subjective well-being as worse than it results from the objective quality of life measurement. Furthermore, it appears that the differences in the quality of life between the countries are not so significant as we would expect. Next, it has been observed that in all the countries the largest number of changes takes place from a higher quality of life to a lower happiness level. It means that in all the countries, more people living in objectively good conditions feel less happy than they should.

It is worth noting that we take a normative stance to refer to the HWB approach. The quality of life paradox occurs between how people feel (their happiness levels) and what their objective living conditions are, which they have reasons to value. Even if the list of objective valuable goods created by Nussbaum appears to be self-evident, it nonetheless requires philosophical justification. Therefore, identification and interpretation of quality of life paradox have to involve both empirical analyses as well as philosophical investigations.

Concerning future research, the applied method can be extended to the other developed and developing countries; the FI can be disaggregated to show which categories of people (e.g., men or women, young or old, employees or the unemployed) usually move from a higher

quality of life to a lower happiness level or vice versa. What is more, a statistical approach explaining the detected patterns can be developed.

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Appendix

Table 3. The indicators included in the central human functionings

Dimensions of central human functionings	No.	Set of indicators	Measurement
Life (μ1)	1.1	Problems with accommodation – a shortage of space	dichotomous variable
	1.2	Problems with accommodation – lack of indoor flushing toilet	dichotomous variable
	1.3	Problems with accommodation – lack of bath or shower	dichotomous variable
	1.4	Own hobbies, interests	3 point scale
	1.5	Problems with the neighbourhood – noise	3 point scale
	1.6	Problems with the neighbourhood – air quality	3 point scale
	1.7	Problems with the neighbourhood – traffic congestion	3 point scale
	1.8	Crowding index	numbers of rooms per person
Health and health care (μ2)	2.1	Chronic (long-standing) physical or mental health problem, illness or disability	dichotomous variable
	2.2	Distance to doctor's office/hospital/medical centre	3 point scale
	2.3	Waiting time to see a doctor on the day of the appointment	3 point scale
Education (μ3)	3	The highest level of education	ISCED levels of education
Social relationships (μ4)	4.1	Participate in social activities of a club, society, or an association	5 point scale
	4.2	Take part in sports or physical exercise	5 point scale
	4.3	Attended a meeting of a trade union, a political party or political action group	dichotomous variable
	4.4	Attended a protest or demonstration	dichotomous variable
	4.5	Signed a petition, including an e-mail or online petition	dichotomous variable
	4.6	Contacted a politician or public official	dichotomous variable
	4.7	Contact with family members	3 point scale
	4.8	Face-to-face contact with friends or neighbours	5 point scale
	4.9	Other social contact (not family)	3 point scale
Income (μ5)	5.1	Make ends meet	6 point scale
	5.2	Household income	OECD equivalised income in PPP

Source: *own analysis based on Nussbaum's list of central human capability*

Table 4. Membership degrees to the well-being sphere calculated as an arithmetic mean of (1) for each variable for the selected European countries

Variables	Poland	Czech Republic	Hungary	Slovak Republic	Germany	France	Bulgaria
e 1.1	0.835	0.923	0.905	0.950	0.878	0.803	0.893
e 1.2	0.956	0.998	0.959	0.988	0.997	0.990	0.885
e 1.3	0.951	0.992	0.959	0.993	0.998	0.988	0.943
e 1.4	0.684	0.739	0.718	0.708	0.762	0.778	0.717
e 1.5	0.799	0.661	0.844	0.772	0.693	0.805	0.666
e 1.6	0.780	0.655	0.848	0.783	0.747	0.891	0.659
e 1.7	0.749	0.728	0.799	0.768	0.673	0.791	0.623
e 1.8	0.433	0.574	0.499	0.568	0.651	0.661	0.514
e 2.1	0.665	0.769	0.663	0.724	0.621	0.767	0.717
e 2.2	0.785	0.711	0.831	0.728	0.866	0.842	0.776
e 2.3	0.744	0.634	0.671	0.664	0.657	0.708	0.649
e 3	0.552	0.537	0.666	0.598	0.387	0.524	0.729
e 4.1	0.160	0.265	0.155	0.230	0.450	0.293	0.106
e 4.2	0.305	0.410	0.216	0.304	0.578	0.457	0.155
e 4.3	0.017	0.032	0.022	0.038	0.088	0.089	0.050
e 4.4	0.029	0.026	0.018	0.022	0.045	0.115	0.014
e 4.5	0.053	0.122	0.052	0.129	0.224	0.261	0.069
e 4.6	0.059	0.023	0.037	0.022	0.122	0.080	0.029
e 4.7	0.661	0.605	0.650	0.716	0.650	0.530	0.678
e 4.8	0.699	0.577	0.632	0.636	0.695	0.600	0.810
e 4.9	0.751	0.779	0.763	0.761	0.775	0.787	0.753
e 5.1	0.597	0.612	0.508	0.496	0.749	0.580	0.470
e 5.2	0.437	0.511	0.435	0.493	0.634	0.561	0.333

Source: own analysis of EQLS data.

Table 5. Objective well-being (Q) as a functionings' membership degrees (μ) for the selected European countries

μ classes	Poland	Czech Republic	Hungary	Slovak Republic	Germany	France	Bulgaria
0.000-0.100	-	-	-	-	-	-	-
0.101-0.200	-	-	-	-	-	-	-
0.201-0.300	-	-	-	-	-	-	-
0.301-0.400	0.07	-	-	0.20	-	0.05	0.85
0.401-0.500	2.46	1.31	1.15	1.62	0.66	1.59	2.18
0.501-0.600	5.71	4.34	6.05	6.46	6.09	4.19	13.15
0.601-0.700	19.36	19.64	21.84	16.12	23.32	15.89	24.56
0.701-0.800	38.33	43.65	36.02	34.83	43.70	41.54	35.21
0.801-0.900	32.90	29.96	32.88	38.07	24.16	33.02	22.69
0.901-1.000	1.17	1.09	2.06	2.70	2.08	3.72	1.36
Total	100	100	100	100	100	100	100

Source: *own analysis of EQLS data*

Table 6. Functionings achievement well-being as an average membership degrees for the selected European countries

Dimensions	Poland	Czech Republic	Hungary	Slovak Republic	Germany	France	Bulgaria
μ1	0.792	0.825	0.822	0.824	0.841	0.856	0.798
μ2	0.771	0.798	0.763	0.775	0.749	0.826	0.777
μ3	0.699	0.694	0.792	0.724	0.550	0.656	0.673
μ4	0.693	0.691	0.681	0.700	0.734	0.700	0.700
μ5	0.643	0.684	0.606	0.622	0.783	0.684	0.526
Total	0.732	0.749	0.746	0.744	0.745	0.760	0.715

Source: *own analysis of EQLS data*

Table 7. Transition matrix for Poland in total

Levels of happiness (S)	Levels of objective well-being (Q)										
	1	2	3	4	5	6	7	8	9	10	Total
1 – very unhappy	0.0	0.0	0.0	1.5	10.6	3.0	8.4	8.5	0.0	0.0	31.9
2	0.0	0.0	0.0	0.0	4.2	3.8	9.0	14.8	0.0	0.0	31.8
3	0.0	0.0	0.0	0.0	4.6	8.9	9.3	12.6	5.3	0.0	40.7
4	0.0	0.0	0.0	0.0	5.7	6.0	15.4	35.0	9.9	0.0	71.9
5	0.0	0.0	0.0	0.0	15.1	21.7	98.5	90.8	17.9	0.0	243.9
6	0.0	0.0	0.0	0.0	5.9	20.0	51.9	42.1	56.2	3.2	179.3
7	0.0	0.0	0.0	0.0	7.5	25.9	51.1	115.4	114.2	4.0	318.0
8	0.0	0.0	0.0	0.0	1.7	10.2	92.3	240.6	208.6	2.1	555.5
9	0.0	0.0	0.0	0.0	0.0	11.9	36.3	111.1	109.3	11.0	279.7
10 – very happy	0.0	0.0	0.0	0.0	0.0	16.9	62.4	189.5	216.9	5.9	491.6
Total	0.0	0.0	0.0	1.5	55.2	128.2	434.6	860.3	738.4	26.2	2244.3

Source: *own analysis of EQLS data*

Table 8. Fitting index (*FI*) for the selected European countries

Poland						
Fitting index	Total	1 Life	2 Health	3 Education	4 Social Relation-ships	5 Income
ind S>Q	0.061	0.064	0.068	0.101	0.106	0.125
ind S<Q	0.110	0.153	0.174	0.107	0.093	0.079
ind Total	0.171	0.217	0.242	0.208	0.199	0.204
Hungary						
Fitting index	Total	1 Life	2 Health	3 Education	4 Social Relation-ships	5 Income
ind S>Q	0.038	0.036	0.060	0.050	0.089	0.125
ind S<Q	0.141	0.206	0.203	0.180	0.107	0.081
ind Total	0.180	0.242	0.262	0.230	0.195	0.207
Czech Republic						
Fitting index	Total	1 Life	2 Health	3 Education	4 Social Relation-ships	5 Income
ind S>Q	0.027	0.023	0.053	0.081	0.051	0.062
ind S<Q	0.163	0.224	0.239	0.130	0.120	0.138
ind Total	0.190	0.247	0.293	0.211	0.170	0.199

Slovak Republic						
Fitting index	Total	1 Life	2 Health	3 Education	4 Social Relation-ships	5 Income
ind S>Q	0.039	0.025	0.065	0.088	0.065	0.118
ind S<Q	0.147	0.193	0.222	0.165	0.116	0.095
ind Total	0.186	0.218	0.287	0.253	0.181	0.213

Germany						
Fitting index	Total	1 Life	2 Health	3 Education	4 Social Relation-ships	5 Income
ind S>Q	0.049	0.028	0.089	0.231	0.068	0.049
ind S<Q	0.097	0.181	0.151	0.048	0.102	0.142
ind Total	0.146	0.209	0.239	0.279	0.170	0.191

France						
Fitting index	Total	1 Life	2 Health	3 Education	4 Social Relation-ships	5 Income
ind S>Q	0.042	0.030	0.058	0.143	0.084	0.096
ind S<Q	0.113	0.194	0.199	0.096	0.086	0.093
ind Total	0.154	0.224	0.257	0.238	0.169	0.190

Bulgaria						
Fitting index	Total	1 Life	2 Health	3 Education	4 Social Relation-ships	5 Income
ind S>Q	0.040	0.038	0.045	0.080	0.049	0.150
ind S<Q	0.177	0.244	0.266	0.177	0.177	0.082
ind Total	0.217	0.282	0.311	0.257	0.226	0.232

Source: *own analysis of EQLS data*

Table 9. GDP *per capita* for the selected European countries

GEO/TIME	2013	2014	2015	2016	2013-2016
Czech Republic	22 400	23 800	25 300	25 600	24 275
Hungary	18 000	18 800	19 800	19 700	19 075
Poland	17 900	18 600	19 800	19 900	19 050
Slovak Republic	20 500	21 300	22 300	22 400	21 625
Germany (until 1990 former territory of the FRG)	33 200	34 700	36 100	36 000	35 000
France	29 000	29 600	30 600	30 400	29 900
Bulgaria	12 200	12 900	13 700	14 200	13 250

Source: *Eurostat*

Table 10. Well-being rankings correlation

Spearman's correlation coefficient				
Well-being measure	FI based ranking	Happiness (S) based ranking	Functioninges achievement well-being (μ) based ranking	GDP *per capita* based ranking
FI based ranking	1			
Happiness (S) based ranking	0.829	1		
Functioninges achievement well-being (μ) based ranking	0.357	-0.108	1	
GDP *per capita* based ranking	0.643	0.126	0.714	1
Tau -Kendall correlation coefficient				
Well-being measure	FI based ranking	Happiness (S) based ranking	Functioninges achievement well-being (μ) based ranking	GDP *per capita* based ranking
FI based ranking	1			
Happiness (S) based ranking	0.619	1		
Functioninges achievement well-being (μ) based ranking	0.143	0.048	1	
GDP *per capita* based ranking	0.429	0.143	0.619	1

Source: *own analysis*

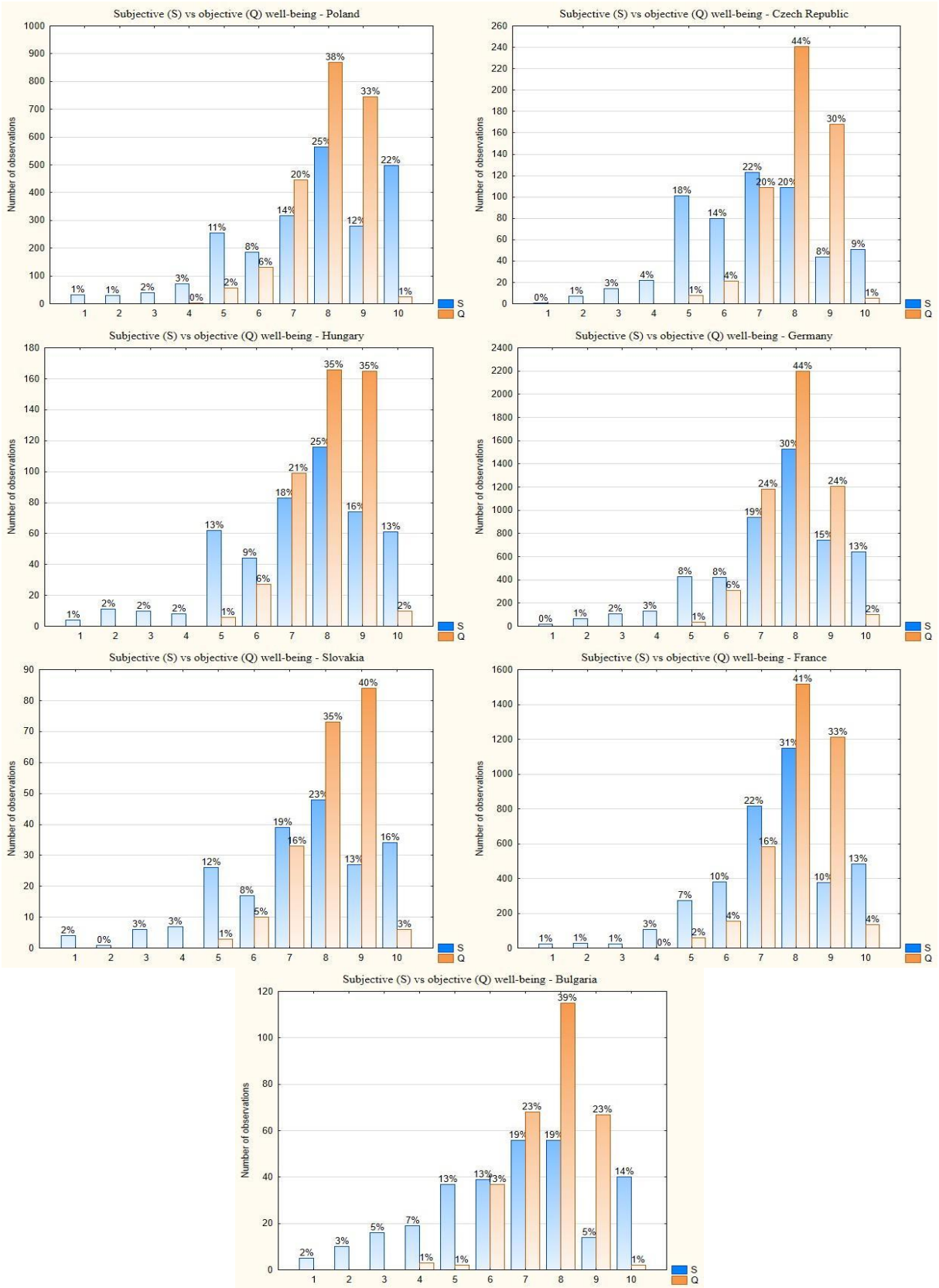

Figure 3. Subjective (S) vs objective (Q) well-being for the selected European countries
Source: *own analysis of EQLS data*