# The quality of life in Poland and Germany

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#### Abstract

Due to the fact that Poland aspires to be an economically developed country, it appears to be important to compare the quality of life of Polish citizens with the quality of life of citizens in a fully developed country like Germany. The aim of the paper is to investigate whether the quality of life evaluation scheme in Poland is similar to the scheme in Germany. Statistical data from the European Quality of Life Survey is used to achieve this aim. The subjective self-evaluation of happiness is compare to the objective quality of lifebased on the capability approach. The aggregate measure of quality of life is constructed on the basis of the Total, Fuzzy and Relative approach. The factors of quality of life which are the most divergent from subjective perception of happiness are indicated. Finally, in order to measure the diversity of these assessments the mobility index, applicable to the study of structural changes, is used.

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## **1** Introduction

The aim of the paper is to investigate whether the quality of life (well-being) evaluation scheme in Poland is similar to the scheme in Germany. Due to the fact that Poland aspires to be an economically developed country, it appears to be important to compare the quality of life of Polish citizens with the quality of life of citizens in a fully developed country like Germany.

Defining the quality of life, we will take into account hedonistic as well as objectivistic approaches to personal well-being. The hedonistic approach focuses on personal happiness or life satisfaction, and is a subjective well-being theory (S), while the objectivistic approach belongs to the objective list theories according to which "certain things are good or bad for us, whether or not we want to have the good things, or to avoid the bad things" (Parfit, 1984).

The objective quality of life refers to Amartya Sen's and Martha Nussbaum's capability approach. According to Sen (2005), a person's capability is defined in terms of the set of valuable "doings" or "beings" i.e. what a person is able to do or to be. For instance, it is important not only that somebody possesses a bike (commodity), even though he/she is

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actually biking (functioning) and taking pleasure from that (satisfaction or happiness), but that taking into account their personal characteristics (e.g. health) and natural and social environments (e.g. income) he/she is able to exercise this activity (capability).

While Sen is reluctant to point out any specific list of human capability set, Nussbaum claims that creating such a list is not only possible, but also very important, and useful. Referring to Aristotelian tradition, she proposes a list of ten dimensions of central human capabilities, such as: (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. For instance, the life dimension consists of such capabilities as: being able to live to the end of a human life or not dying prematurely. Nussbaum claims that the list is objective and universal because the human capabilities are "central requirements for the life with dignity" (Nussbaum, 2003; Alkire, 2002). Because the list justification is based on moral values this is an openly normative approach.

We will attempt to operationalise Nussbaum's list, linking each dimensions of human capability to specific indicators(variables) from the European Quality of Life Survey (EQLS). On the basis of the Total, Fuzzy and Relative approach (TFR), which has been successfully applied to the research on poverty by Polish and foreign researchers, we will be able to calculate the index of objective quality of life. While there are some research projects applying TFR to measure personal well-being based on human capability sets (Tomer, 2002; Martinetti, 2000; Kapuria, 2016), the novel approach presented in this paper consists in making a comparison between the evaluation of subjective and objective quality of life, and indicating the divergence between these two approaches by using the mobility index.

We believe that this kind of research can be relevant for creating social policy. On the one hand, if people's self-evaluation state of happiness significantly exceeds their objective basis of life quality it can be a sign for the policymakers that some citizens adapt to poor living conditions. On the other hand, if people maintain a low level of happiness, despite living in good objective conditions, it could mean that they develop cost-inefficient tastes or preferences. In both cases a precise measure of these differences delivered bythe mobility index can be important.

### 2 Procedure

The source of statistical data was the EQLS gathered between 2003 and 2012. The data file contained 484 variables collected for 34 countries in three waves. The data for Poland and

Germany collected in the third wave (2012) were used in this paper. It was a microdata consisting of 2,262 observation units (individuals) for Poland and 3,055 for Germany. After checking the data for completeness and eliminating missing data, the number of observation units was reduced by almost a half. Thus, we decided to complement the missing data. In order to do this, we chose the indicators which had the least deficiencies and were relevant for the present research purposes. Finally, the data contained 2,226 observation units for Poland and 2,990 for Germany and accounted for 34 indicators (variables) without missing data. There is one additional variable from the EQLS which refers to subjective evaluation of happiness (S). This base variable concerns the following question: "Taking all things together on a scale of 1 to 10, how happy would you say you are?". The respondents had to determine their level of happiness on the ten-point scale.

The indicators were grouped into six dimensions of the central human capability: (1) life, (2) health, (3) education, (4) feelings/emotions, (5) social relationships, and (6) income (Table 1). The choice of the central human capability dimensions and the selection of an appropriate set of indicators was related to the availability of statistical data. Due to a shortage of data we had to single out only six dimensions instead of 10 as originally indicated by Nussbaum. We believe that our list of central human capability is objective in a sense that - despite personal tastes or preferences- it is something objectively good to live in a clean and comfortable environment (without excessive noise, crime, shortage of space etc.), being in good health, well educated, emotionally stable, having good relationships with other people, and not having to worry about income shortage.

In order to obtain one, aggregated evaluation of the respondents' quality of life (Q) based on the indicated capability list, we referred to TFR proposed by Zadeh (1965). His approach is typically applied to evaluate people's degree of poverty risk. Without going into the mathematical details of fuzzy sets theory, it is worth noting that the theory was successfully applied to form a membership function of poverty in both monetary and non-monetary approaches. Among those who used this strategy to poverty analysis were Cerioli and Zani (1990), Cheli (1995), Betti et al. (2005), and in Poland: Panek (2011), Ulman and Šoltés (2015).

The main assumption of this approach is to assess a person's degree of poverty risk by means of a function which takes values from a range of [0;1]. In comparison, the classic approach to identify the poor takes only two values: 1 (when someone is poor) or 0 (when someone is not poor) without paying attention to the degree of poverty risk.

Dimensions of						
central human	Set of indicators					
capability						
Life	Problems with neighbourhood – noise					
	Problems with neighbourhood – air quality					
	Problems with neighbourhood – quality of drinking water					
	Problems with neighbourhood – crime, violence or vandalism					
	Problems with neighbourhood – traffic congestion					
	Problems with accommodation – shortage of space					
	Problems with accommodation – lack of indoor flushing toilet					
	Problems with accommodation – lack of bath or shower					
	In my daily life, I seldom have time to do the things I really enjoy					
	I feel that the value of what I do is not recognised by others					
	Own hobbies, interests					
	My daily life has been filled with things that interest me					
Health	General self-evaluation of health					
	Chronic (long-standing) physical or mental health problem, illness or					
	disability					
	Distance to doctors office/hospital/medical centre					
	Waiting time to see doctor on day of appointment					
Education	Satisfaction from education					
	The highest level of education					
Feelings/ Emotions	Some people look down on me because of my job situation or income					
	I feel close to people in the area where I live					
	I have felt lonely					
	I have felt downhearted and depressed					
	I am optimistic about the future					
	Life has become so complicated today that I almost can't find my way					
Social relationships	Face-to-face contact with friends or neighbours					
	Contact with family members					
	Other social contact (not family)					

Table 1. The set of indicators.

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political action

The membership function of poverty is based on poverty symptoms, distinguishing a monetary part (based on incomes or expenses) and a non-monetary part (various factors which can point to poverty risk). Due to the fact that the poverty can be treated as low level of quality of life, we can apply this approach to research on levels and diversities of quality of life (referring to persons, families or households). Thus, we make a membership function of quality of life instead of poverty.

The following formula allows for transforming variables (dichotomous, ordinal, interval, ratio) into variables that take values from 0 to 1 (Panek, 2011):

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

where:

 $c_{hj,i}$  – is a rank of variant of the j-variable (indicator of quality of life) from *h*-dimension of quality of life for *i*-household (individual),

F(1) – is a value of the cumulative distribution function of ranks of the *j*-variable from *h*-dimension of quality of life for rank equal 1 (variant of *j*-variable indicating the highest level of quality of life). Following this, the membership value equal to 1 means a complete achievement with respect to a given indicator of the quality of life, whereas a value equal to 0 denotes the total failure. Intermediate values between these two extremes describes a degree of quality of life.

Applying formula (1), the value of  $e_{hj,i}$  was calculated for each indicator. Then, all these values were aggregated by using the arithmetic mean. Therefore, we received the assessment of quality of life degree within six dimensions for each indicator according to the formula:

$$\lambda_{h,i} = \frac{1}{k_h} \sum_{j=1}^{k_h} e_{hj,i}.$$
 (2)

In the next step, the aggregation of evaluations of quality of life(Q) is performed by calculation of the arithmetic or weighted mean of  $\lambda_{h,i}$ :

$$\lambda_i = \left(\frac{1}{m} \sum_{h=1}^m w_h \,\lambda_{h,i}\right)^{\alpha}.\tag{3}$$

Because we wanted to compare our calculation to subjective evaluations of happiness (S), which was our base variable, we decided to calibrate the function (3) in such a way that the mean of the function (3) was equal to the mean of the base variable  $(S)^3$ . To achieve this goal, the  $\alpha$  parameter had to be adjusted and its estimated value, which ensured equality of the means was 0.431 for Poland and 0.452 for Germany. The same values of  $\alpha$  parameter can be used for calibrating function (2)<sup>4</sup>.

Two approaches were applied in respect of the  $\alpha$  parameter. Firstly, it was assumed that the calibration parameter  $\alpha$  was calculated on the base of overall evaluation of quality of life (the mean of six dimensions of quality of life) and then was used to calibrate the membership function for each quality of life dimension. Secondly, different calibration parameters  $\alpha$  were estimated for each quality of life dimension and then applied to calculate the overall quality of life evaluation as a weighted average of the partial assessment. The coefficients of variation of the partial quality of life evaluations were used to determine the aforementioned weights.

To compare the base variable (S) to calculated values of quality of life (Q), the values of the function (2) or (3) were grouped into 10 categories. We assumed that interval of the function variability would be divided into 10 intervals of equal length. Finally, based on the particular interval of the value of the function (2), (3) the numbers from 1 to 10 were assigned to each observation unit (individuals).

In order to indicate the gap between S and Q we used the Bartholomew's mobility index (*B*), which in the present context can be defined as

$$B = \frac{1}{m-1} \sum_{i=1}^{m} \sum_{j=1}^{m} w_i p_{ij} |i-j|, \qquad (4)$$

where:

m – is a number of categories,

 $w_i$  – is a fraction of people belonging to the*i*-th category of base variable (S)

 $p_{ij}$  – is a probability of each element mobility that is calculated by the following formula:

$$p_{ij} = \frac{n_{ij}}{\sum_{j=1}^{m} n_{ij}}, \text{ for } i, j = 1, 2, ..., m,$$
(5)

where:

 $<sup>^{3}</sup>$  The variable (S) represents the level of happiness on a scale from 1 to 10, while function (3) takes values from 0 to 1 so the average of variable (S) was divided by 10 to compare with the average of values of function (3).

<sup>&</sup>lt;sup>4</sup> It is also possible to calibrate the membership function for every dimension separately and then yield the total measure of quality of life using the weighted mean, where weights are based on coefficients of variation.

 $n_{ij}$  – is a number of people belonging to *i*-th category of base variable (S) and the *j*-th category of the objective quality of life evaluation (Q).

The value of mobility index is based on a matrix of transition probabilities between particular categories of a variables S and Q. The higher the value of this index, the greater is the gap between S and Q taken as a measure of life quality.

### **3** Results

The comparison of subjectively determined levels of happiness with calculated levels of quality of life is shown in Fig. 1 and 2. The structure of assessment both in subjective (S) and objective (Q) quality of life measure is very similar in Poland and Germany. The respondents more often assess their life satisfaction by indicating higher levels (above 5) – this applies both to the assessment of the happiness level and the aggregate measure of quality of life. It is worth noting that the structure of the quality of life level is more concentrated than it is for the assessment of happiness.

In general, comparing the life satisfaction in Poland and Germany, it can be observed that German respondents assess their happiness slightly better than Polish respondents. A similar conclusion can be drawn using objective measure of quality of life (Q). These outcomes are accompanied by a lack of values in the lower levels of the objective quality of life evaluation.

Looking at the aggregated levels of quality of life for Poland and Germany we can see that in each of those countries less people feel happy or satisfied (S) on the levels seven, eight, and nine than appears to be justified by objective evaluation of their life quality (Q). Also, in both countries significantly more people feel very happy (level ten) than they should be, taking into account objective measure of quality of life (Q).

While the respondents generally assess their happiness (S) at a lower level than it results from the calculated quality of life (Q), the evaluation of quality of life in respect to social relationships (fifth dimension) differs from this pattern both in Poland and Germany. The difference seems to be greater for Poland.

The gap between S and Q which is measured by Bartholomew's mobility index (*B*) is similar for Poland and Germany (Tables 2 and 3).



**Fig. 1.**The structure of assessment of the happiness levels and aggregated quality of life levels for Poland and Germany.



**Fig. 2.** The structure of assessment of the happiness levels and aggregated quality of life levels for Poland and Germany in respect to social relationships.

Index	Total	Life	Health	Education	Feelings	Relationships	Income
S>Q	0.0436	0.0199	0.0437	0,0854	0.0586	0.2299	0.1046
S <q< th=""><th>0.1028</th><th>0.1967</th><th>0.1727</th><th>0.1001</th><th>0.0905</th><th>0.0339</th><th>0.1178</th></q<>	0.1028	0.1967	0.1727	0.1001	0.0905	0.0339	0.1178
Total	0.1465	0.2167	0.2163	0.1855	0.1491	0.2637	0.2223

Table 2. Mobility index for Poland.

 Table 3. Mobility index for Germany.

 Index	Total	Life	Health	Education	Feelings	Relationships	Income
 S>Q	0.0408	0.0130	0.0419	0.1148	0.0264	0.2241	0.1224
S <q< th=""><th>0.1024</th><th>0.2003</th><th>0.1616</th><th>0.0882</th><th>0.1317</th><th>0.0377</th><th>0.1012</th></q<>	0.1024	0.2003	0.1616	0.0882	0.1317	0.0377	0.1012
Total	0.1432	0.2133	0.2035	0.2030	0.1581	0.2618	0.2235

The highest level of differentiation is in the case of the fifth dimension (social relationships), while the smallest is for the fourth dimension (feelings/emotions). Looking at the data we can see also the direction of this diversity. There are two possibilities: the first, when the subjective assessment of happiness is greater than the quality of life evaluation (S>Q), and the second, when the happiness assessment is lower than the quality of life evaluation (S<Q).In general, the calculations show that for both countries the objective evaluation of quality of life is higher than subjective declarations of happiness (S<Q) (ca. 0.1), in comparison to the cases when objective calculation of quality of life turned out to be lower than subjective assessments of happiness (S>Q) (ca. 0.04). The mobility index also indicates that the highest move from the objective evaluation of quality of life to subjective assessment of happiness was observed in the relationships dimension (ca. 0.26). In this case, more people should be considered as having lower levels of the quality of life than they subjectively declared, which is illustrated graphically in Fig. 2.Besides the social relationships dimension, we observe a greater differentiation of assessments towards higher evaluation of objective quality of life than the self-evaluation of happiness for Polish respondents. It means that many people have are latively low level of happiness despite quite good objective conditions regarding central human capabilities. We can also observe that the German respondents tend to assess happiness higher than it is shown by the quality of life calculation in respect to education and income. It means that the differentiation between the assessments of happiness and the evaluations of quality of life generated by income is more directed towards a higher assessment of happiness. On the one hand, it seems that even when having low income people can achieve a high level of happiness. On the other hand, the reverse direction is relatively less important; it means that high level of quality of life resulting from high incomes is associated with a lower level of happiness.

### Conclusion

Two different measures of quality of life were applied in our research: subjective selfevaluation of happiness (S) and objective assessment (Q) based on the list of central human capability. The comparison of these measures for Poland and Germany revealed very similar schema of the quality of live evaluation in both countries. Due to the calculation of the mobility index, we were also able to notice possibly similar problems regarding the social relationships dimension in both countries. In Poland, as well as in Germany, more people have lower level of quality of life in respect to the social dimension than their declared state of happiness. Despite the fact that Poland is still a less developed country in comparison to Germany, it appears to be that the schemas of the quality of life in both countries are analogous.

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#### References

Alkire, S. (2002). Dimensions of Human Development. World Development, 30(2), 181-205.

- Betti, G., Cheli, B., Lemmi, A. & Verma, V. (2006). On the Construction of Fuzzy Measures for the Analysis of Poverty and Social Exclusion. *Statistica & Applicazioni*, 4(1), 77-97.
- Cerioli, A. & Zani, S. (1990). A Fuzzy Approach To The Measurement Of Poverty. *Income* and Wealth Distribution, Inequality and Poverty Studies in Contemporary Economics, 272-284.
- Cheli, B. (1995). Totally, Fuzzy and Relative Measures of Poverty in Dynamic Context. *Metron*, 53(3-4), 183-205.
- Kapuria, P. (2016). A Human Well-Being Perspective to the Measurement of Quality of Life: Findings From the City of Delhi. *Applied Research in Quality of Life*, *11*(1), 125-145.
- Martinetti, E. (2000). A Multidimensional Assessment of Well-being Based on Sen's Functioning Approach. *Rivista Internazionale di Scienze Sociali*, 108(2), 207-239.
- Nussbaum, M. (2003). Capabilities As Fundamental Entitlements: Sen And Social Justice. *Feminist Economics*, 9(2-3), 33-59.
- Panek, T. (2011). *Ubóstwo, wykluczenie społeczne i nierówności. Teoria i praktyka pomiaru.* Warszawa: Oficyna Wydawnicza SGH.
- Parfit, D. (1984). Reasons and Persons. Oxford University Press.

Sen, A. (2005). Commodities and Cappabilities. Oxford University Press.

- Tomer, J. F. (2002). Human Well-Being: A New Approach Based on Overall and Ordinary Functionings. *Review of Social Economy*,60(1), 23-45.
- Ulman, P. & Šoltés, E. (2015). The Monetary and Non-Monetary Aspects of Poverty in Poland and Slovakia. *Entrepreneurial Business and Economics Review*, *3*(1), 61-73.

Zadeh, L. A. (1965). Fuzzy Sets. Information and Control, 8, 338-353.