Durable Goods Possession and the Determinants of Subjective Well-being of Households. Evidence from Central European Countries

Marta DZIECHCIARZ-DUDA
Department of Econometrics and Operational Research
Wroclaw University of Economics and Business[1], Poland
marta.dziechciarz@ue.wroc.pl

Article's history:

Received 24th of August, 2021; *Received in revised form* 13th of September, 2021; *Accepted* 4th of October, 2021; *Published* 25th of October, 2021.

Suggested Citation:

Dziechciarz-Duda, M 2021. Durable Goods Possession and the Determinants of Subjective Well-being of Households. Evidence from Central European Countries, *Journal of Applied Economic Sciences*, Volume XVI, Fall, 3(73): 350– 360.

Abstract:

The purpose of this study is to indicate determinants of households' subjective well-being perception. The determinants of subjective well-being include material, financial and immaterial factors, which all are elements of quality of life. An additional source of the subjective well-being perception is the differences between countries in how households assess their current life circumstances.

The empirical goal of this study is to model the influence of comparative factors on subjective well-being perception. The evidence comes from the selected European countries, namely Germany and Poland. In absolute values, numbers describing the material wealth in Germany are much higher than Polish equivalents. Surprisingly, the households' subjective well-being perception in both countries is on an almost identical level. The research hypothesis concerning this phenomenon is that the speed in overall improvement of the households' material well-being in wealthy countries, like Germany, is lower than in developing countries, like Poland. The pace of material situation improvement is one of the determinants of overall satisfaction, including subjective well-being perception. The analysis for selected material goods showed the influence potency of crucial impact factors describing a household. The analytical econometric tool used is the ordered multinomial logit model.

Keywords: household's subjective well-being; durable goods; multinomial ordered logit; Central European Countries.

JEL Classification: I31; I32; C51; C52.

Introduction

The problem addressed in this study consists of an attempt to examine the factors that influence self-perception of satisfaction and emotions constituting subjective well-being perception in households. For research purposes, in the present study, the author defined a household as the analytical unit. The author assumed that determinants of subjectively perceived well-being include immaterial and material factors, including financial assets. In the earlier study, the author discussed the observation that households' endowment with durable goods is a disproportionately important factor in assessing the subjective perception of households' well-being or at least in an evaluation of well-being level made by the head of the family (Dziechciarz-Duda 2020). The author managed to identify the source that influences the self-judgment of the household's situation (satisfaction). The main finding is that there is no unique, universal source of subjective well-being.

The hypothesis for the present study is that one of the crucial factors influencing self-perception of subjective well-being in households is the overall economic situation in the country of interest. The evidence comes from the selected European countries, Germany and Poland. In absolute values, material wealth in Germany is much higher than in Poland. The fact that the household's subjective well-being perception in both countries is on an almost identical level is thus surprising. The research hypothesis is that the pace of material situation improvement determines overall satisfaction, including subjective well-being perception.

1. Research Background

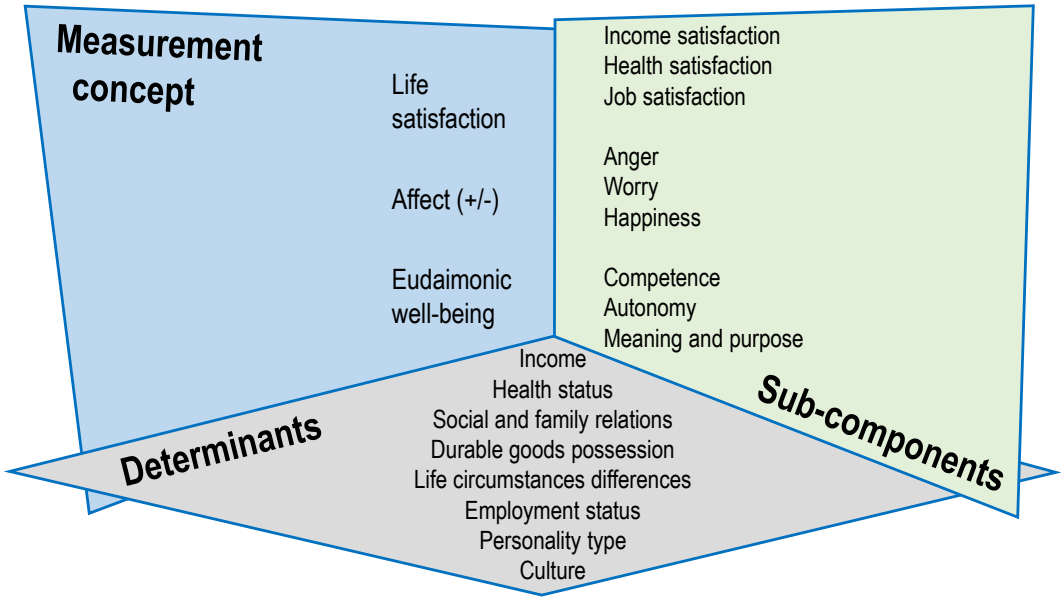
Well-being perception of an individual primarily describes the subjective personal experiences associated with eudaimonia or living a life of virtue in the pursuit of human excellence. Some of these feelings include self-actualisation and emotional expressiveness (Whitehead 2017, Krems *et al.* 2017). Diener *et al* (2018) developed the concept of Subjective Well-being using the description of high-level satisfaction in life, along with the experience

[1] Komandorska 118/120, 53-345 Wroclaw, Poland.

of high-level emotions (Pavot 2018, Diener 1984). On the other hand, the determinants of subjective well-being include material factors, along with financial assets.

Evaluating well-being is a challenging process. In Figure 1, there are lists of well-being determinants with subcomponents used when the selected aspect of subjective well-being is measured.

Figure 1. Dimensions of subjective well-being



Source: own elaboration based on (Guidelines 2013).

Since the mid-twentieth century, researchers, authors of various studies have primarily focused on analysing poverty and measuring the relation between financial incomes or expenditures and well-being (Decerf *et al.* 2021). The range of focus varies from absolute poverty (Atkinson 2019, Allen 2017) through relative poverty (Hirvonen *et al.*.2020) to the holistic approach (Dang *et al.* 2021, Michalos 2014).

In a more general approach, the economic factors influence well-being and quality of life (Strielkowski *et al.*2014). Some researchers expanded their studies on well-being to material assets: financial wealth, relative income and possession of durable goods (Perez-Truglia 2020, Ravallion 2020). An interesting summary of the theory and practice of the economics of poverty in research is provided by Shymanska (2021).

The search for adequate measures of well-being, especially those going beyond GDP, was elaborated and discussed by researchers grouped around Stiglitz *et al*. (2018). Durable goods involved in the process of creation of well-being satisfaction change their influence over time. Once considered a luxury, some durable goods become later widespread in society, part of everyday life for many families. Those once luxury goods now satisfy the lower-level needs. Examples include washing machines, refrigerators and vacuum cleaners. These products are widespread and play an increasingly important role in everyday life due to evolving lifestyles (Dziechciarz *et al.* 2010). The Item Response Theory is one of the techniques used in this context (Nima *et al.* 2020).

Easterlin (2013) in the seventies of the last century, formulated the observation that economic growth does not always go together with increasing life satisfaction. He noted that subjective well-being perception, which he calls happiness, varies along with income at a specific, fixed point in time. There has been much discussion over that phenomenon. As a result, it is known as the Easterlin Paradox (Li and Shi 2019, Easterlin 2013). The phenomenon exists both between and within nations. Paradoxically, happiness does not trend upwards over time, together with increasing revenue. In other words, there is a contradiction between the point-of-time mechanism and time series findings.

The related concept is known as the Cantril life ladder developed by Cantril (1965). In their opinion polls, the OECD, Gallup, Our WorldIn Data, Well Being International and others use the concept of the Cantril ladder to measure Well-being (How's Life 2020, Helliwell et al. 2020, Ortiz-Ospina 2017, Guidelines 2013).

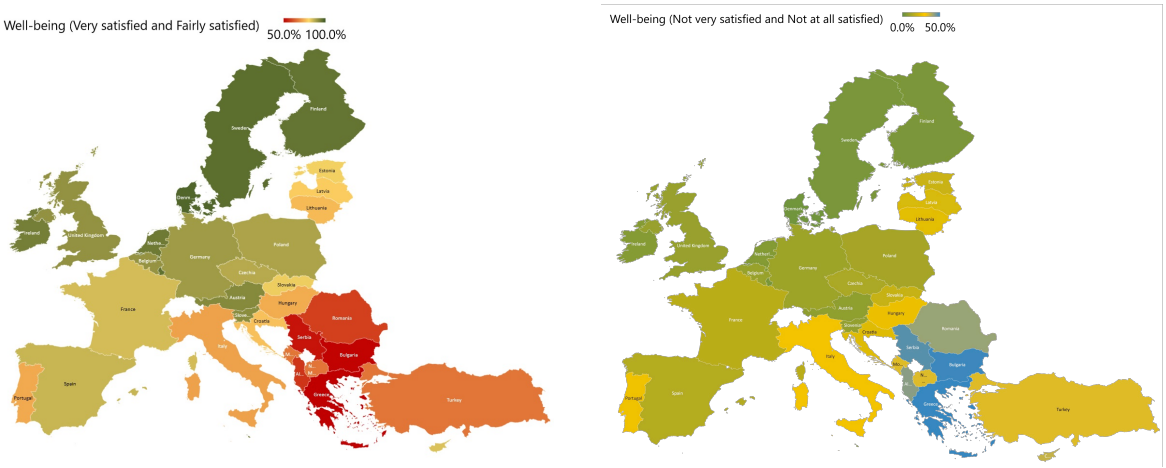
The hypothesis for the present study is that one of the crucial factors influencing self-perception of subjective well-being in households is the overall economic situation in the country of interest. People's well-being improves in many respects. Progress is unequal in individual countries. Generally, OECD countries do better on average. Feature greater equality between population groups. OECD countries in which the well-being perception was on a

low level during the last decades of the twentieth century experienced more significant gains in this respect than those starting from the higher level. Not all dimensions of subjective well-being matched fundamental advances in the country's economic situation. The evidence for the current study comes from the selected European countries, namely Germany and Poland. Those two countries differ substantially in actual values of the economic descriptors. In absolute values, the numbers describing the material wealth in Germany is much higher than Polish equivalents. Surprisingly, the household's subjective well-being perception in both countries is on similar level. The research hypothesis is that this phenomenon consists of the fact that the pace of material situation improvement determines overall satisfaction, including subjective well-being perception.

Endowment with durable goods proved to be a good indicator for subjective perception of household well-being (Amendola and Vecchi 2014). The new impulse came from A. Banerjee, E. Duflo, and M. Kremer, who received the 2019 Nobel Prize in Economics (Shymanska 2020). Endowment with durable goods serves as a proxy for the assessment of household well-being. A disproportionately important role for families substantiates decisions to use durables in households. For assessing the subjective perception of household well-being – in other words, for evaluating well-being level by the head of the household – endowment with durable products has been chosen for analysis (Dziechciarz and Dziechciarz-Duda 2017). For international comparisons, measuring cross-country material well-being and inequality using consumer durables possession is not straightforward (Grimes and Hyland 2020). The international comparisons of overall satisfaction with personal life perception reveal unexpected phenomena described as the Mean Cantril Ladder score (Guidelines 2013, 205).

As mentioned, in Europe, there are pairs of countries where a household's subjective well-being perception in both countries is on an almost identical level. One of such pairs is Germany and Poland, very similar nations in terms of the rate of population that positively and negatively assess their lives (Figure 2a, 2b). In 2019, the cumulative positive variants ratio value (on the whole[1]: 4 – Very satisfied and 3 – Fairly happy with the life that one leads) for Germany was 89.6% of respondents and for Poland 88.3%. There exists some difference in the share of those very satisfied. In Germany, the percentage of those respondents who indicate they are very satisfied with their life on the whole amounts to more than 32%. For Poland, this ratio is less than 21%. On the opposite side, those not at all satisfied and not very satisfied represent 10.41% for Germany and 11.68% for Poland (Table 2).

Figure 2. Assessment of the respondent's life they lead on the whole: very satisfied and fairly satisfied frequencies: (a) and not very satisfied or not at all satisfied frequencies: (b)



(a) (b)

Source: own elaboration (Eurobarometer 91.5 2019).

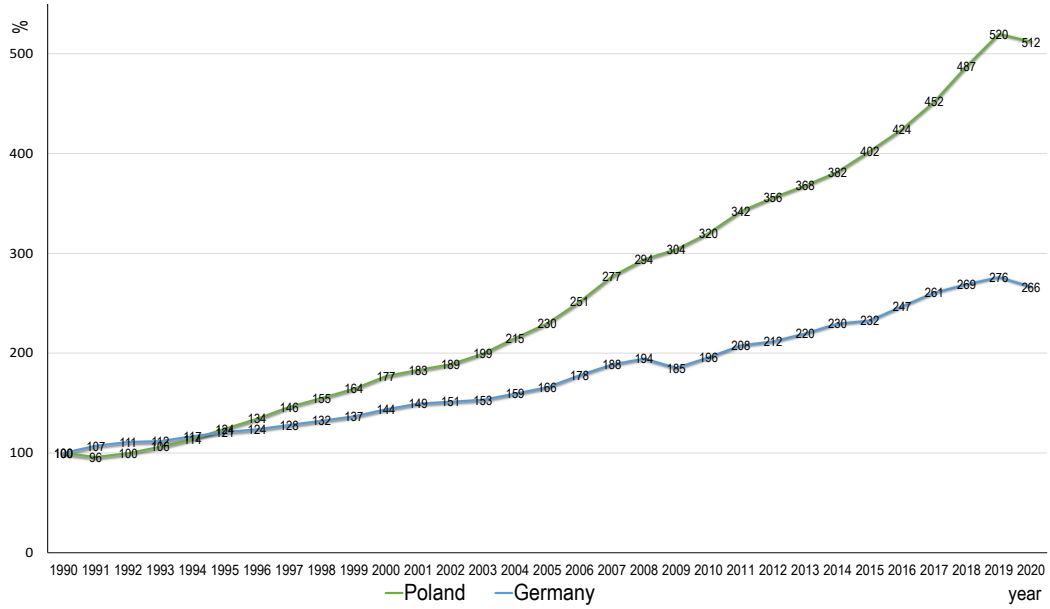
For the social policy design and decisive recommendation formulation, it is interesting to identify the possible reasons. Although apparent differences, the well-being perception is equal in two nations, these positively and negatively assessing cohorts. The hypothesis for the present study is that one of the essential factors influencing self-perception of subjective well-being in households is not the overall economic situation in the country of interest. The decisive influence on the assessment has the dynamics of change (improvement). In the search for confirmation, the selected European countries, *i.e.* Germany and Poland, were chosen. In absolute values, the numbers describing material wealth in Germany are much higher than Polish equivalents, while the household's

[1]The questionnaire statement formulation is as follows: "*On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead*".

subjective well-being perception in both countries is on an almost identical level. The wealth in both countries is dramatically different, *e.g.* in 2020, the per capita income in PPP (international dollars) in Germany equals 54,551, in Poland equals 34,165 (WEO 2021). Following the research hypothesis stating that the pace of material situation improvement determines overall satisfaction, including subjective well-being perception, the gross domestic product per capita growth ratio measured in current prices with the purchasing power parity; international dollars was compared.

In Figure 3, the illustration of the growth ratio differences is provided. The comparison of the growth rates of gross domestic product per capita, measured in current prices, calculated as purchasing power parity in international dollars (1990 = 100%), leads to the observation that after the thirty years of development, the value of the indicator is twice higher for Poland than for Germany. The respective value for Germany in 2019 is 276%; for 2020, it accounts for 266%. The Polish equivalents are almost twice so high; 520% for 2019 and 542% for 2020.

Figure 3. Gross domestic product per capita, current prices, Purchasing power parity; international dollars (1990 = 100%)



Source: own elaboration (WEO 2021).

2. Methodology

2.1. Data

Standard Eurobarometer survey data was used in the conducted analysis (Eurobarometer 91.5 2019) carried out in 2019 on territories of EU member states and candidate countries[1]. The Eurobarometer survey is a cyclic, cross-national and cross-temporal opinion poll program. The survey includes various topics, e.g. political situation and the economy (perception of the current situation and expectations for the future). The respondents were adult citizens of the European Union – aged 15 years and over (Table 1 contains sample characteristics of respondents).

Table 1. Sample frequencies [in %]

Head of Household characteristics		Poland	Germany West	Germany East	Total (whole sample)
GENDER	Man	36.50	54.40	50.88	46.53
	Woman	63.50	45.60	49.12	53.47
AGE [years]	15-24	7.50	10.53	5.31	9.95
	25-39	25.20	20.19	20.58	22.08
	40-54	24.80	18.45	15.71	25.06
	55 years and older	42.50	50.82	58.41	42.91
TYPE OF COMMUNITY	Rural area or village	43.80	26.60	15.04	33.08
	Small/middle town	28.80	47.39	42.26	36.91
	Large town	27.40	26.02	42.70	30.01
	One	17.70	32.37	37.17	19.77

[1] The sample includes European Union Member States and other nationals, referred to as candidate countries (Turkey, North Macedonia, Montenegro, Serbia, Albania, and the Turkish Cypriot Community).

Head of Household characteristics		Poland	Germany West	Germany East	Total (whole sample)
HOUSEHOLD COMPOSITION [no of persons]	Two	37.30	40.00	40.71	33.50
	Three	18.60	12.56	10.18	17.62
	Four or more	26.40	15.07	11.95	29.10
OCCUPATION OF RESPONDENT	Self-employed	6.60	5.51	8.85	8.29
	Employed	46.10	41.16	35.18	44.47
	Not working	47.30	53.33	55.97	47.24

Source: own calculations based on data (Eurobarometer 91.5 2019).

2.2. Research Methods

The analytical tool used for modelling was the multinomial logit model. The works of Greene (2018), Train (2009), Winkelmann (2005), Bhat (1995), contain a detailed description of the procedures, applicability and inference rules. Depending on the nature of alternatives in the choice set, models under consideration could be divided into two distinctive groups: the ordered choice models and the unordered choice models. A comprehensive discussion of those types of models could be found in Hensher *et al.* (2015), Cramer (2011), Greeneand Hensher (2010), Brooks *et al.* (2007), Halcoussis (2005), Louviere *et al.* (2000). Suppose the dependent variable has more than two possible discrete outcomes. In that case, multinomial logit models are appropriate to determine the dependence between the exploratory variable and a set of explanatory variables (regressors).

The multinomial ordered logit models can be employed when the categories of the dependent variable follow specific order (Winkelmann 2005). Multinomial unordered logit models are used in the situation's models where the dependent variable with more than two possible discrete outcomes does not have an ordered structure. General references on the ordered and unordered choice model topics include Greene (2018, 801-823), Hensher et al. (2015), Greene and Hensher (2010), Train (2009), Louviere et al. (2000).

Since the dependent variable in the study measures opinions (rank respondent's well-being), the outcomes have an ordered character. To model discrete choices of respondents – the multinomial, ordered logit model was used. Precisely, the multinomial ordered logit model specification was used to model the probability that the *i*-th respondent chooses the *j*-th alternative.

Alternatives are preferred in the order of index *j*, with alternative *J* the most preferred and alternative 1 the least preferred. The dependent variable has ordered outcomes (Ruud 2000, 770):

$$y_{n1}^* < y_{n2}^* < \cdots < y_{nJ-1}^* < y_{nJ}^* \tag{1}$$

The probability of this rank order is:

$$Pr\{y_{n,j-1}^* \leq y_{nj}^*, j = 2, \cdots, J | x_n\} = Pr\{\varepsilon_{n,j-1} - \varepsilon_{n,j} \leq (x_{nj} - x_{n,j-1})'\delta_0, \quad J > 2 | x_n\}. \tag{2}$$

The probability of selecting individual categories in this model equals the probability that a particular variant is most preferred among a set of alternatives that omits all variants ranked higher (Ruud 2000, 770). The relationship between each pair of alternatives is the same. Hence, the coefficients that describe the relationship between all response variable categories are the same (proportional odds assumption).

Parameters of the multinomial logit model are estimated by the maximum likelihood method. The odds ratio is used to assess the impact of an exogenous variable on the probability of being in the most preferred alternative.

2.3. Model and Variables

The dependent variable in the models is the respondent's life assessment on the whole, which can be interpreted as self-reported subjective well-being. The dependent variable is discrete, with ordered variants, categories 1, 2 ..., *J; J = 4*. Thus, the dependent variable is appropriate for the multinomial ordered logit model. The first category, the least numerous class (*j* = 1), has the lowest rating (1 – Not *satisfied*). Second – *Not very satisfied,* third – *Fairly satisfied.* The fourth category is the highest rating (4 – *Very satisfied*). Table 2 shows frequencies for Germany and Poland.

Table 2. Assessment of the respondent's life that lead on the whole (4 – Very satisfied; 3 – Fairly satisfied, 2 – Not very satisfied, 1 – Not at all satisfied). Frequencies for Germany and Poland

Head of Household characteristics		Germany [N]	Frequency [%]	Poland [N]	Frequency [%]
1	Not at all satisfied	25	1.63	10	1.02
2	Not very satisfied	135	8.78	105	10.66
3	Fairly satisfied	882	57.35	665	67.51
4	Very satisfied	496	32.25	205	20.81

Source: own calculations based on data (Eurobarometer 91.5 2019).

Some European counties have a very high ratio of people that are very satisfied with their life, e.g. Denmark (72%), The Netherlands (56%), Sweden (49%), the United Kingdom (45%), Ireland (42%), Luxembourg (38%), Austria (38%) and Finland (38%). The lower rating of well-being is in Greece. Negative assessment made by the respondent's life that lead on the whole ratio is more than 50%, not very satisfied are 34% and not at all satisfied are almost 17%.

Independent variables in the models describe both the household and its head and possession of some durable goods. In the analysed group of households, the most frequent goods are smartphones, cars and laptops. In Poland, these goods are slightly less common. In Germany, the ratio of households that own apartments or houses paid is much lower than in other surveyed countries (see Table 3).

Table 3. Durable goods frequency in households [in %]

Durable goods	Germany [N=1544]	Poland [N=1544]	General
Smartphone	72.73	65.96	74.9
Car	70.14	63.36	70.2
Laptop	60.17	61.87	57.9
DVD player	53.89	28.48	40.6
Music cd player	47.73	18.92	35.8
Desk computer	40.61	22.26	35.8
Tablet	35.75	26.81	41.3
Apartment/house paid	31.54	53.06	53.2
Apartment/house paying	13.15	11.13	20.7
Television	92.16	92.12	97.5
Internet connection	72.73	65.96	74.9

Source: own calculations based on data (Eurobarometer 91.5 2019).

Variables measuring durable goods ownership were included in the model as independent variables. Table 4 contains results of χ^2 tests of independence between durable goods possession and dependent variable (life satisfaction). For the χ^2 significance tests, the null hypothesis that there is no association between durable goods possession and life satisfaction variable can be rejected in most cases.

Table 4. Significance test (χ^2) between variables: durable goods ownership and assessment of the respondent's life that lead on the whole

Listed durable goods and life satisfaction	Poland [N=1054]			Germany [N=1538]		
	χ^2	*df*	*p-value*	χ^2	*df*	*p-value*
Smartphone	62.733	3	0.000	22.411	3	0.000
Car	48.196	3	0.000	60.545	3	0.000
Laptop	34.515	3	0.000	28.796	3	0.000
DVD player	4.950	3	0.176	20.141	3	0.000
Music cd player	7.269	3	0.064	27.833	3	0.000
Desk computer	3.738	3	0.291	23.489	3	0.000
Tablet	14.310	3	0.003	43.472	3	0.000
Apartment/house paid	2.076	3	0.557	17.907	3	0.000
Apartment/house paying	23.908	3	0.000	25.042	3	0.000
Television	14.602	3	0.002	2.592	3	0.459
Internet connection	46.300	3	0.000	25.915	3	0.000
Smartphone	13.884	3	0.003	50.580	3	0.000

Note: For a *p*-value lower than 0.05, the null hypothesis that there is no association between the two variables can be rejected
Source: own calculations based on data (Eurobarometer 91.5 2019).

Characteristics used as independent variables describe the size of the household (number of persons in a family over 15 years of age) and number of children (aged below 10 and 10 to 14). Some characteristics of the

respondents define age and exact age of education (see Table 6). Variable *AGE* measured the age of the household head as nominal variable 1 to 4 categories (dummy): under 24 years old, 25-39 years, 40-54 years, 55 years and above.

Table 5. Descriptive statistics of sample characteristics of Germany and Poland

Characteristics	Poland [N = 1078]					Germany[N = 1544]				
	Mean	Median	St. Dev.	Min	Max	Mean	Median	St. Dev.	Min	Max
HOUSEHOLD: AGED 15+	1.88	2.0	0.97	1.0	19.0	2.29	2.0	1.11	1.0	15.0
HOUSEHOLD: AGED <10	0.19	0.0	0.55	0.0	4.0	0.35	0.0	0.75	0.0	8.0
HOUSEHOLD: AGED 10-14	0.10	0.0	0.36	0.0	3.0	0.15	0.0	0.49	0.0	8.0
HOUSEHOLD: SIZE A+B+C	2.17	2.0	1.32	1.0	19.0	2.79	2.0	1.60	1.0	18.0
AGE EXACT	53.56	56.0	19.52	15.0	97.0	48.77	48.0	17.26	15.0	93.0
AGE EDUCATION	19.81	18.0	6.71	0.0	89.0	20.10	19.0	6.11	0.0	83.0

Source: own calculations based on data (Eurobarometer 91.5 2019).

For the modeling as an independent variable was also used characteristics describing the type of the place of residence (dummies: *TYPE OF COMMUNITY:* rural area or village and urban areas subdivided by resident size units as small/middle town and large town); *GENDER* (1 – man, 0 – woman) and the working class of society (dummies: *SOCIAL CLASS*, 1 – the working class of society, 2 – the lower middle class of society, 3 – the middle class of society, 4 – the upper middle class of society, 5 – the higher class of society, 6 – other). Some variables that describe respondents were measured as a subjective assessment of their life. They were coded as dummies, e.g. perceiving of job situation and financial situation (1 – very good, 2 – rather good, 3 – rather bad, 4 – very bad) and expectations in terms of job situation and life in general (1 – better, 2 – worse, 3 – the same).

3. Results

Table 7 and Table 8 contain estimations of the multinomial ordered logit model for Poland and Germany, respectively. The percentage of correctly predicted cases (*count* R^2) for Poland is 68.5%. For Germany, the model correctly predicted 65.5% cases (*count* R^2). All the following inferences are under *ceteris paribus* condition.

The positive sign of the coefficient next to the independent variable indicates that assessment made by the respondent's life that leads on the whole increases with the increasing value of the independent variable.

Table 6. Multinomial Ordered Logit. Poland [N = 985]

Variable	Coefficient	Std. Error	z	p-value	Odds Ratio
GENDER_1	-0.68	0.15	-4.50	0.00	0.51
TYPE OF COMMUNITY_2	-0.40	0.16	-2.52	0.01	0.67
HOUSEHOLD COMPOSITION: AGED <10	0.35	0.11	3.18	0.00	1.42
HOUSEHOLD COMPOSITION: AGED 10-14	-0.45	0.14	-3.17	0.00	0.64
AGE: 25-39 YEARS	-1.45	0.44	-3.28	0.00	0.23
AGE: 40-54 YEARS	-1.40	0.44	-3.18	0.00	0.25
AGE: 55 YEARS AND OLDER	-1.16	0.44	-2.62	0.01	0.31
SITUATION: JOB PERSONAL_1	0.90	0.22	4.13	0.00	2.47
SITUATION: FINANCIAL HH_3	-1.46	0.20	-7.19	0.00	0.23
SITUATION: FINANCIAL HH_4	-2.21	0.43	-5.18	0.00	0.11
SOCIAL CLASS_4	-0.63	0.38	-1.65	0.10	0.53
SOCIAL CLASS_5	-0.86	0.47	-1.83	0.07	0.42
EXPECTATIONS: LIFE IN GENERAL_1	0.86	0.19	4.48	0.00	2.36
EXPECTATIONS: PER JOB_1	-0.46	0.21	-2.20	0.03	0.63
LAPTOP	-0.35	0.19	-1.87	0.06	0.70
SMARTPHONE	0.59	0.20	2.97	0.00	1.80
CAR	0.61	0.18	3.39	0.00	1.84
APARTMENT/HOUSE PAID	0.30	0.16	1.81	0.07	1.34
APARTMENT/HOUSE PAYING	0.94	0.25	3.81	0.00	2.56
cut1	-6.17	0.58	-10.58	0.00	
cut2	-3.38	0.49	-6.90	0.00	
cut3	0.80	0.47	1.69	0.09	

Note: Likelihood ratio test: χ^2 (19)= 448.32 [0.0000]
Source: own calculations based on data (Eurobarometer 91.5 2019).

For interpretation of the coefficient can be used odds ratio, which is generally explained (interpreted) as the change in the odds of *y* being greater than *j* associated with a one-unit change in the independent variable (that is

the exponent of the coefficient). Concerning the model for Poland (Table 7), the odds of a high WELL-BEING rating versus lower ratings of the dependent variable are 0.49% lower for men than for female respondents. The other variables are held constant. The odds ratio for *the HOUSEHOLD COMPOSITION: AGED <10 variable is 1.42, and for the HOUSEHOLD COMPOSITION, the AGED 10-14* variable is 0.64. This result means that respondents who have younger children (less than ten years old) raise the probability of being in a higher set of alternatives of well-being (versus all lower ones) by about 42%. In comparison, people with children 10 to 14 years old have a 36% lower chance for better assessment of their lives.

In most cases, if respondents possess selected durable goods (except laptops), they have a higher probability of better evaluating their lives (holding other explanatory variables constant). In particular, individuals who possess more valuable goods, such as cars or apartments, assess better their well-being. For example, the respondents who own a car show around 84% greater chance (odds ratio) of better evaluating their well-being.

Respondents (from Poland) who positively describe their lives, especially concerning job situation (variable SITUATION: JOB PERSONAL_1, meaning very good), have about 2.5 times greater chance of having better than worst well-being assessment. Regarding the model for Germany (Table 8), the odds of high *WELL-BEING* versus lower ratings of the dependent variable are 2.5 times greater for respondents who positively describe theirs job situation (variable *SITUATION: JOB PERSONAL_1*), the same as for Poland.

For Germany (Table 8), a one-unit increase in *AGE EDUCATION* would result in 1% unit increase in the ordered log-odds of being in a higher assessment of life as a whole versus lower are one percent higher category. All other variables in the model are held constant.

If respondents possess chosen durable goods, they have a higher probability of evaluating their lives better (holding other explanatory variables constant). In all cases, individuals who possess computing devices, cars, and houses (flat) have a 20% to 35% more chance of better assessing well-being.

Table 7. Multinomial Ordered Logit. Germany [N = 1538]

Variable	Coefficient	Std. Error	z	p-value	Odds Ratio
AGE EDUCATION	0.01	0.00	2.09	0.04	1.01
QUALITY OF LIFE WAS BETTER_1	-0.83	0.20	-4.15	0.00	0.43
QUALITY OF LIFE WAS BETTER_2	-0.77	0.17	-4.64	0.00	0.46
QUALITY OF LIFE WAS BETTER_3	-0.37	0.13	-2.77	0.01	0.69
EXPECTATIONS: LIFE IN GENERAL_1	1.05	0.26	4.10	0.00	2.85
EXPECTATIONS: LIFE IN GENERAL_3	1.13	0.20	5.58	0.00	3.11
EXPECTATIONS: FINANCIAL SITUATION HH_1	0.37	0.20	1.90	0.06	1.45
EXPECTATIONS: PERS JOB_1	-0.32	0.20	-1.65	0.10	0.72
SITUATION: JOB PERSONAL_1	0.90	0.15	5.87	0.00	2.45
SITUATION: FINANCIAL HH_1	2.55	0.23	11.08	0.00	12.75
SITUATION: FINANCIAL HH_2	1.42	0.17	8.48	0.00	4.13
LAPTOP	0.20	0.12	1.63	0.10	1.22
TABLET	0.29	0.12	2.37	0.02	1.34
CAR	0.24	0.14	1.74	0.08	1.27
APARTMENT/HOUSE PAID	0.23	0.13	1.78	0.08	1.26
APARTMENT/HOUSE PAYING	0.30	0.18	1.71	0.09	1.35
cut1	-2.14	0.32	-6.76	0.00	
cut2	0.05	0.27	0.19	0.85	
cut3	3.81	0.30	12.75	0.00	

Note: Likelihood ratio test: χ^2 (15) = 834.257 [0.0000]
Source: own calculations based on data (Eurobarometer 91.5 2019).

Conclusion

The author identified the list of most significant factors influencing subjective well-being perception through the case study of two selected countries, Germany and Poland. The author used econometric techniques for the quantitative analysis of the phenomenon of interest. The multinomial logit models served as the analytical tool. The specification of multinomial ordered logit models was chosen to model the combination of data from strong (metric) and weak (nonmetric) measurement scales.

The author performed extensive and comprehensive studies of subject literature. In the review, the family well-being concept development proved of interest. The broad discussion of well-being typology and sources identification concludes that the measurement of diversity in possession of durable goods is an adequate tool to measure and analyze the sources of well-being differentiation.

In the empirical case study, the author found that concentration only on quantifiable (material) determinants in the international context is insufficient. It was the reason that additional – immaterial factors were included in the analysis and modelling. Further factors considering comparative analysis were necessary. As a result of the inquiry, the author presented the identified factors causing differences in households' subjective well-being perceptions statements. As the result of the analysis of models for both studied countries, the theoretical suggestions of well-being determinants (Figure 1) proved to be significant. The most influential factors were those describing social and family relations and job satisfaction. Also, the variables defining material wealth, durable goods possession and income (financial) satisfaction are among the most important.

This author's contribution to the subject includes real-life empirical application and an attempt to solve a new theoretical problem. The research arose from the need to analyze a contemporary, practical issue, namely: the need to measure the perception of subjective well-being in households. New and improved measurement and analysis instruments are provided in the present article. Proposed tools allow for a better assessment of the influence of socio-economic and other vital factors on the subjective perception of a household situation. The empirical results of the analysis confirmed the existence of objective elements that temper households' attitudes towards socio-economic and material wealth factors as a source of subjective well-being. An attempt to quantify the direction and the strength of influence of individual descriptors resulted in the possibility to consider the estimates of model coefficients as indicator values, which may be used to support social policy formulation and as a tool for quantification of formulated recommendations.

Funding

The research and publication were partly financed in the framework of the research project entitled *Households' Equipment with Durable Goods in Statistical Analysis and Econometric Modelling of Material Well-being*. Project no. 2018/29/B/HS4/01420 financed by the National Science Centre.

References

[1] Allen, R. 2017. Absolute poverty. When necessity displaces desire, *American Economic Review*, 107(12): 3690-3721. DOI: 10.1257/aer.20161080.

[2] Amendola, N., Vecchi, G. 2014. *Durable goods and poverty measurement*, World Bank Policy Research Working Paper, WPS 7105, Washington. Available at: http://hdl.handle.net/10986/20612

[3] Atkinson, A. 2019. *Measuring Poverty Around the World*, Princeton University Press, Princeton, ISBN: 978-0691191225, 464 p.

[4] Bhat, C. 1995. A heteroscedastic extreme value model of intercity mode choice, *Transportation Research*, 29: 471-483. DOI: https://doi.org/10.1016/0191-2615(95)00015-6

[5] Brooks, R., Harris, M., Spencer, C. 2007. *An inflated ordered Probit model of monetary policy: Evidence from MPC Voting Data*, Monash University, Melbourne. Available at: https://www.researchgate.net/publication/24116022_An_Inflated_Ordered_Probit_Model_of_Monetary_Policy_Evidence_from_MPC_Voting_Data

[6] Cantril, H. 1965. *The Pattern of Human Concerns,* Rutgers University Press, New Brunswick, 427 p.

[7] Cramer, J. 2011. *Logit Models from Economics and Other Fields*, Cambridge University Press, Cambridge. ISBN: 978-0521188036.

[8] Dang, H., Kilic, T., Carletto, C., Abanokova, K. 2021. *Poverty imputation in contexts without consumption data. A revisit with further refinements,* World Bank Policy Research Working Paper, WPS 9838, Washington. Available at: http://documents.worldbank.org/curated/en/914731636124765122/Poverty-Imputation-in-Contexts-without-Consumption-Data-A-Revisit-with-Further-Refinements

[9] Decerf, B., Ferrando, M., Quinn, N. 2021. *Fair and welfare-consistent global income poverty measurement. theory and application*, World Bank Policy Research Working Paper, WPS 9844, Washington. Available at: http://documents.worldbank.org/curated/en/407061636400299012/Fair-and-Welfare-Consistent-Global-Income-Poverty-Measurement-Theory-and-Application

[10] Diener, E. 1984. Subjective well-being, *Psychological Bulletin*, 95(3): 542-575. DOI: https://doi.org/10.1007/978-90-481-2350-6_2

[11] Diener, E., Lucas, R., Oishi, S. 2018. Advances and open questions in the science of subjective well-being, *Collabra: Psychology*, 4(1): 15. DOI: https://doi.org/10.1525/collabra.115

[12] Dziechciarz, J., Dziechciarz Duda, M. 2017. Non-metric data in household durable goods analysis. Selected aspects, *Folia Oeconomica*, 4(330): 111-128. DOI: https://doi.org/10.18778/0208-6018.330.08

[13] Dziechciarz, J., Dziechciarz-Duda, M., Przybysz, K. 2010. *Household possession of consumer durables on background of some poverty lines*, in: Locarek-Junge, H., Weihs, C. (eds.), *Classification as a Tool for Research* Springer, Berlin: 735-742.

[14] Dziechciarz–Duda, M. 2020. Modelling the influence of durable goods possession on subjective wellbeing of households. *Journal of Applied Economic Sciences*, XV, 4(70): 801-812.

[15] Easterlin, R. 2013. *Happiness and economic growth. The evidence*, IZA Discussion Paper, 7187: 1-32. Available at: https://ftp.iza.org/dp7187.pdf

[16] *Greene*, W. 2018. *Econometric Analysis*. 8th Edition Pearson, Boston. ISBN: 9780134461366.

[17] Greene, W., Hensher, D. 2010. *Modeling Ordered Choices. A Primer*, Cambridge University Press, Cambridge. ISBN: 9780511845062.

[18] Grimes, A., Hyland, S. 2020. Measuring cross-country material wellbeing and inequality using consumer durables. *Scottish Journal of Political Economy*, 67: 248-271. DOI: https://doi.org/10.1111/sjpe.12237

[19] Halcoussis, D. 2005. *Understanding Econometrics*, South-Western, Cincinnati. ISBN: 978-0324233858.

[20] Helliwell, J., Layard, R., Sachs, J., De Neve, J. (eds.). 2020. *World Happiness Report 2020*. Sustainable Development Solutions Network, New York. http://worldhappiness.report

[21] Hensher, D., Rose, J., Greene, W. 2015. *Applied Choice analysis: A Primer*. Cambridge University Press, Cambridge. ISBN: 978-1316136232

[22] Hirvonen. K., Bai, Y., Headey, D., Masters, W. 2020. Affordability of the EAT-lancet reference diet. A global analysis, *Lancet*, 8(1): 59-66. DOI: https://doi.org/10.1016/S2214-109X(19)30447-4

[23] Krems, J., Kenrick, D., Neel, R. 2017. Individual perceptions of self-actualisation: What functional motives are linked to fulfilling one's full potential? *Personality and Social Psychology Bulletin*, 43(9): 1337-1352.

[24] Li, L., Shi, L. 2019. Economic growth and subjective well-being. Analysing the formative mechanism of eastern paradox, *The Journal of Chinese Sociology*, 6(1): 1-19. DOI: https://doi.org/10.1186/s40711-018-0090-9

[25] Louviere, J., Hensher, D., Swait, J., Adamowicz, W. 2000. *Stated Choice Methods Analysis and Applications,* Cambridge University Press, Cambridge. ISBN: 978-0511753831.

[26] Michalos, A. (ed.), 2014. *Encyclopedia of Quality of Life and Well-being Research*, Springer, Dordrecht. DOI: https://doi.org/10.1007/978-94-007-0753-5

[27] Nima, A., Cloninger. K., Persson, B., Sikström, S., Garcia, D. 2020. Validation of subjective well-being measures using item response theory, *Frontiers in Psychology*, 10: 1-33. DOI: https://doi.org/10.3389/fpsyg.2019.03036

[28] Ortiz-Ospina, E., and Roser, M. 2017. *Happiness and life satisfaction*. Available: https://ourworldindata.org/happiness-and-life-satisfaction

[29] Pavot, W. 2018. *The cornerstone of research on subjective well-being: Valid assessment methodology,* in: E. Diener, Oishi, S., Tay, L. (eds.), *Handbook of Well-being*. DEF Publishers, Salt Lake City. Available at: https://www.nobascholar.com/chapters/15/download.pdf

[30] Perez-Truglia, R. 2020. The effects of income transparency on well-being: Evidence from a natural experiment, *American Economic Review*, 110(4):1019-1054.

[31] Ravallion, M. 2020. On measuring global poverty, *Annual Review of Economics*, 12: 167-188.

[32] Ruud, P. 2000. *An Introduction to Classical Econometric Theory*, Oxford University Press, Oxford. ISBN: 978-0195111644.

[33] Shymanska, O. 2021. Radical rethinking of the economics of poverty in research by A. Banerjee, E. Duflo, M. Kremer (2019 Nobel Prize in Economic Sciences). *Herald of Economics*, 1(95): 213-225, https://doi.org/10.35774/visnyk2020.01.213

[34] Stiglitz, J., Fitoussi, J., Durand, M. 2018. *For good measure. Advancing research on well-being metrics beyond GDP*, OECD, Paris. DOI: https://doi.org/10.1787/9789264307278-en

[35] Strielkowski, W., Hejlová, D., Kisileva, L. 2014. Economic factors influencing well-being and the quality of life, *Journal of Applied Economic Sciences*, Volume IX, 29: 488-494.

[36] Train, K. 2009. *Discrete choice methods with simulation*, Cambridge, Cambridge University Press, Cambridge. ISBN: 9780521766555.

[37] Whitehead, P. 2017. Goldstein's self-actualization: A biosemiotic view, *The Humanistic Psychologist*, 45(1): 71-83.

[38] Winkelmann, R. 2005. Subjective well-being and the family: Results from an ordered probit model with multiple random effects, *Empirical Economics*, 30(3): 749-761. DOI: https://doi.org/10.1007/s00181-005-0255-7

*** *Guidelines on Measuring Subjective Well-being 2013*. OECD. DOI: http://dx.doi.org/10.1787/9789264191655-en

*** *How's Life 2020? Measuring Well-being, 2020*. OECD, Paris. Available at: https://www.oecd-ilibrary.org/sites/9870c393-en/1/3/1/index.html?itemId=/content/publication/9870c393en&_csp_=fab41822851fa020ad60bb57bb82180a

*** World Economic Outlook Database (WEO), 2021. Available at: https://www.imf.org/en/Publications/WEO/weo-database/2021/October