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DETERMINANTS OF CZECH INHABITANTS' LIVING STANDARDS

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Abstract

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Living standards are influenced by several variables. In the submitted paper, they are divided into eight main groups based on analysing alternative indicators of living standards – public life, place of residence, economic area, educational area, health care, environment, interpersonal relationships and personality. The main source of the data is represented by the results of a questionnaire survey performed in 2013 and 2014 in the Czech Republic, focused on elicitation of inhabitants' opinions about how much 99 individual variables influence their living standards. Using Principal Component Analysis, there were seven factors created out of the assessed variables. They should be reflected by a complex assessment of living standards.

Keywords: standard of living, Czech inhabitants, factors, well-being, quality of life, perception, subjective opinion

INTRODUCTION

The issue of standard of living and its composition has, for many years, been engaged by many researchers (KDO), state authorities, institutions (OECD, UN, World Bank, etc.), etc. Knowledge of the factors that should make up standard of living is significant not only for its measurement and subsequent comparison of a state's level of socio-economic development, but also for priorities of policy makers, understanding of population satisfaction and its behaviour. (Stávková *et al*., 2013; Gotowska, Jakubczak, 2013; Shumakova *et al*., 2014).

Although it is desirable for the above-mentioned entities to know how to measure standard of living, there is neither a consensus on how to measure it Cummins, 1997; Wolff, 2009; Gotowska, Jakubczak, 2013) nor of which factors standard of living should consist. This problem follows especially from the different definitions of the term itself (see e.g. Hicks, 1979; Sen, 1987; Dasgupta, 1990; World Bank, 2004D; Matthews, 2007D; Wise and Geek, 2012D; etc.) and the fact that in science there are also a number of closely-related terms like living conditions or level of living (Gotowska, Jakubczak, 2013, p. 16). Standard of living is also seen from different perspectives – economic, socio-economic or socio-psychological (Knausová, 2005).

On the basis of the many definitions of standard of living, there are a number of suggested approaches how to measure it. Currently, the most common approach is to measure the standard of living by real GDP per capita (Dorwick *et al*., 2003). Wolff (2009) lists three other measures, such as net national product (NNP), total personal income, and total personal disposable income. Although these approaches based on an objective measurement have been adopted by many states, a lot of authors have criticized them (see e.g. Mankiw, 2000; Woodard, 2008; Costanza *et al*., 2009). Based on this criticism, a number of alternative approaches were created, such as Net Economic Welfare (Nordhaus, Tobin, 1972), Genuine Progress Index (Anielski, 2001), Human Development Index (UNDP, 2013), Better Life Index (OECD, 2013), and Actual Individual Consumption based on the Stiglitz-Sen-Gitoussi report (Stávková *et al*., 2013).

Although these alternative approaches combining subjective and objective factors try to measure standard of living with respect to the criticism, no *„unified and universally accepted system of values that characterize people's living standards"* exists which

would be accepted by the above-cited subjects (Shumakova *et al*., 2014, p. 198). These subjects are (also for problems like difficulty in measurement, lack of information, delay of results, etc.) unable to agree especially on factors which the representative approach/indicator should contain. The main question therefore is which factors: have an influence on a population's standard of living, are important, affect both functional and temporal aspects, and should be taken into account when measuring standard of living?

Because of complexity, standard of living cannot be expressed by a single factor (Shumakova *et al*., 2014). Except of measurable objective factors, it should also contain subjective factors which are able to better express personal quality of life (Poláčková, Jindrová, 2011; Křupka *et al*., 2013; Campbell, 1972).

The above-cited approaches contain many economic (e.g. unemployment, investments, inflation, consumption, income), socio-economic (e.g. poverty, social exclusion, life expectations) and environmental factors (e.g. waste generation, gas emissions). According to Pope (1993), a standard of living indicator should consist of GNP per capita, wealth accumulation, the distribution of income and wealth, etc. Rapley (2003) selected frequently used objective and subjective factors (e.g. life expectancy, crime rate, school attendance, relationships with family, sense of community or material possessions). According to Shumakova *et al*. (2014, p. 198), "standard of living should be comprised of 3 main categories: "Population quality", "Level of prosperity", and "Quality of living conditions and social sphere".

The main goal of this paper is to identify factors which are important for measurement of standards of living based on subjective opinion of inhabitants. For the purpose of this paper, eight main groups of factors affecting standard of living were analysed: public life, place of residence, economic, education, health care, environment, interpersonal relationships, and personality.

MATERIALS AND METHODS

The main source of data for the purposes of this paper were the results of the questionnaire survey performed in the Czech Republic. The data was collected using the quota selection based on economic activities. The numbers of respondents (heads of household) is 1 164.

The aim of the survey performed in 2013 and 2014 was to find out which factors are crucial for living standards, as subjectively perceived by the inhabitants. The respondents assessed individual factors using the 1–10 scale (1 – minimum, 10 – maximum) based on how important they considered them in terms of their living standards. In total, 99 factors were assessed, selected based on various indicators of living standards and welfare.

The results were assessed using Principal Component Analysis (PCA). This multidimensional statistical method enables the reduction of the number of variables (called principal components) that describe the variability of all the variables and their mutual relations. This method does not distinguish between dependent and independent variables, and the principal components are based on a linear combination of the original variables. The principle of the analysis is to create Zj variables – called principal components, uncorrelated, and arranged based on their dispersion – from p Xi variables in the following way:

$$Var(Z_1) > Var(Z_2) > \ldots > Var(Zp). \quad (1)$$

During further stages of the analysis the reduction of the variables with a negligible dispersion is performed, and then the analysis works with the variables with strong mutual correlations. First, a table with the data for p variables for n individuals is created. The first principle component is then a linear combination of the variables X_1, X_2, … Xp:

$$Z_1 = a_{11}X_1 + a_{12}X_2 + \ldots + a_1pXp, \quad (2)$$

and it is distinguished by the biggest possible variability among the individuals provided that the aij constants correspond to this equation:

$$a_{211} + a_{212} + \ldots + a_{21}p = 1. \quad (3)$$

On all the other principal components, the given relation and condition (Hendl, 2004) are applied. Using p independent principal components makes it possible to express the original variables out of which only several first variables have significantly big dispersions that are further used. The subsequent correlation between the variable and the principle component is called factor loading, and the sum of all the factor loadings for all the variables for the selected component corresponds to the total dispersion explained by the component. As highlighted by Meloun (2011), the dominant part of the analysis is identifying and explaining the relation of the original signs to the principal components. Pecáková (2008) adds that in order to further use the principal components in following statistical analyses it is necessary to set a unit of the component value, i.e. a component score. The score of the first principle component for unit j is specified by substituting it in an equation with the parameters of the first component of the found value of the original variable for this unit. This process is similar for the other principal components. For the purposes of this paper, the analysis of the principal components was processed in the SPSS Statistics.

RESULTS

To reach the aim of the paper Principal Component Analysis was used which provided for defining the main components of living standards and enabled significant reduction in number of indicators used for identifying and assessing the living standards of inhabitants. The achieved results can be one of the arguments for future alteration of the indicators of assessing inhabitants' living standards which have been used so far.

Respondents' opinion survey realised for such a purpose was unique for the fact that the analysis of various authors' opinions concerned with assessing living standards and factors influencing them had been accomplished before creating the questionnaire. Questions were formulated to comprise all the areas which are a part of living standards. The areas were introduced to respondents in a form of as many factors being part of the particular area as possible, and respondents were asked to express their opinion on importance of a factor for expressing the standard of living and level of satisfaction as they comprehend it subjectively. Representativeness of the group of respondents was assured in 6 criteria – age, gender, number of household members, level of education attained, economic activity, and income level. The 8 areas of living standards formulated by 99 determinants were firstly analysed and then assessed by authors.

Economic Side of Life

It is an area which due to its content corresponds the most with the so far most frequently used factor of living standards – form of GDP per capita. The area includes questions aimed at household income situation, job opportunities, price and quality of goods and services, balance between work and free time, property ownership, and others. According to respondents' opinion, gross income, quality of goods and services, and price of goods and services have the biggest impact on living standards. 52% of respondents are satisfied with the overall economic situation, the remaining 48% is represented mainly by the unemployed and pensioners.

Public Services and Infrastructure in the Place of Residence

The area is defined by questions concerning feeling of security in the place of residence, local municipality activity, accessibility and quality of shops, services, sport and free-time activities, and others. The importance of the area is strongly influenced by the level of infrastructure in the respondents' place of residence. Most of the factors in term of meaning fluctuate on the middle level, the most meaningful one for inhabitants is security, and price and quality of living. Within the whole area, respondents' satisfaction predominates (77.6% of respondents).

Educational Area

In this area, the attention was turned to respondents in a form of questions like education level, accessibility of schools, financing education, importance of public and private universities, and others. The most important factors for respondents are quality of teachers, applicability of taught subjects, and accessibility and quality of public universities. Within the area of education, overall satisfaction predominates (74%). By a group of the unemployed and pensioners, dissatisfaction predominates.

Healthcare Area

Healthcare area aims at accessibility and quality of healthcare institutions, or elderly housing and housing for disabled people, and financial demands of healthcare services, aids and medicine. Individual parts of the area have the strongest influence whatsoever according to respondents, the importance of many of the factors was marked by maximum points which is 10. The most important ones are quality of healthcare institutions, price of healthcare aids and medicine, and their accessibility. There are 57% of generally satisfied respondents in the healthcare area, by the 43% of the unsatisfied, the unemployed and pensioners predominate.

Environment

In the area of environment, respondents assessed how cleanliness of air and watercourses, noise in the place of residence, cleanliness of public buildings, amount of greenery, recycling possibilities, and others influence quality of life. By most of the factors, their importance for living conditions and standard of living was marked by number 8 on the point scale, an area marked as an important one, thus. According to respondents, noise in the place of residence is the most influencing factor, recycling possibilities are the least influencing one. In the area of environment, overall satisfaction predominates by the respondents (73.8%).

Public Life

The area of public life and state affairs includes questions relating to government and individual ministries activities, trust in politics, number of foreigners and minorities in the state, accessibility and quality of transportation services, and others. The average influence of all the factors is on the level 6.12, according to respondents, the most influencing factors are amount of taxes paid, law enforcement, quality of the law; the least influencing ones are non-governmental organisations activities. The area of public life is an area where dissatisfaction predominates, 58% of respondents expressed themselves negatively. The only group of respondents satisfied with the area of public life is a group of the self-employed.

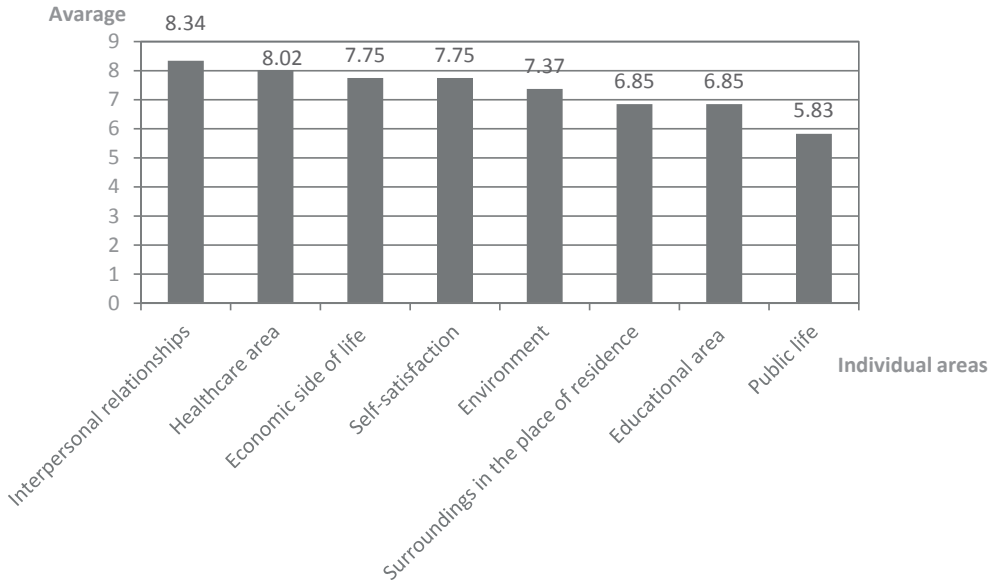
Interpersonal Relationships

Within the area of interpersonal relationships, family relationships, family and close friends health, value arrangement, and others were assessed. The most significant influence is assigned by respondents to family relationships (55% percent expressed themselves), family and friends' health, relationships in the workplace, and value arrangement in society. While assessing satisfaction in the area of interpersonal relationships, satisfaction predominates among respondents (65%). Dissatisfaction predominates by a group of the unemployed.

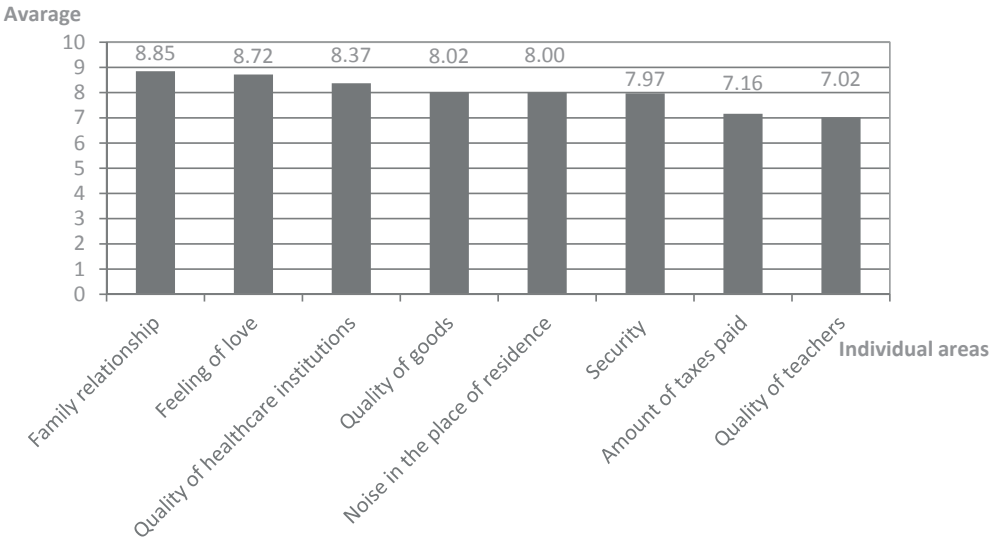
Self-satisfaction

Among the assessed factors, there were talent, feeling of security, and possibility of self-actualisation, image, and others included. Factors connected to respondent's personality are significantly rated highly (7.7 points). None of the factors was rated less than 6. The most important one is feeling of love, security, the least important one is image. Respondents assessed their self-satisfaction highly positively, there were only 17% of the unsatisfied, the most satisfied respondents were from a group of employees.

At the end of the questionnaire, respondents were to summarise the above mentioned areas using assessing scale according to their importance in every-day life, therefore essential for identifying and assessing the living standards. The result is stated in the following Fig. 1 from which it is visible that the area of interpersonal relationships, health, and as lately as the third position, economic side of



1: *Assessing the importance of individual areas*



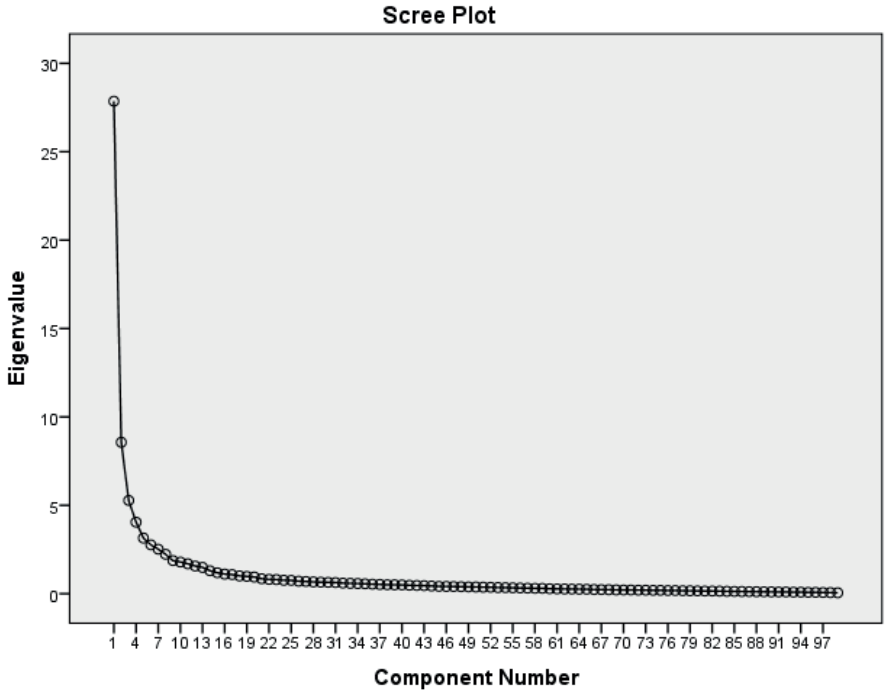
2: *The most important factors in individual areas*

life have the strongest influence on identifying and assessing the living standards. Authors may claim that the same conclusion about the importance of particular factors was reached by a similar opinion survey carried out in 2013 and 2014 by 2,713 households in 5 European countries.

Fig. 2 depicts the most important factor from every section as it was marked by respondents using a point scale.

Applying a method of Principal Component Analysis, the original 99 variables were reduced to 18 factors, explaining 72% of the overall variability of variables. Such a fact is formulated graphically using a scree plot (Fig. 3).

Due to apparent cut-off points in the scree plot progression, only 7 factors were identified and described consecutively, by which it was possible to state defining variables to every factor using factor loading. It was impossible to denote variables of the factor 8, therefore they were affiliated to the already defined factors according to the factual content of the variables. Created factors and their defining variables are stated in Tab. I. It is necessary to draw attention to the share of the remaining 12 undescribed factors creating 20% of the overall variability.



3: *Scree Plot*

I: *Final factors with variables*

Education	accessibility to public education institutions, accessibility to private education institutions, quality of education institutions, applicability of the taught subjects, qualities of teachers, financial costs of education, opportunity for foreign studies, education system, highest level of education reached
Health	accessibility to healthcare institutions, quality of healthcare institutions, healthcare personnel communication, accessibility to elderly housing, quality of elderly housing, financial costs of healthcare services, accessibility to healthcare aids
Environment	air cleanliness, water cleanliness, nature cleanliness, public places cleanliness, accessibility to greenery and forests, opportunity to recycle
Public life	government and ministries activities, trust in politics, corruption, judicial activities, law enforcement, law quality, municipality office activities
Economic side	number of job opportunities, gross income, the amount of social benefits, quality and price of goods, quality and price of services, opportunity to live in state housing, property ownership, legacy
Interpersonal relationships	family relationships, neighborhood relationships, feeling of overall satisfaction, feeling of security, feeling of love, feeling of appraisal and esteem, possibility of self-actualisation
Infrastructure	accessibility to grocery shops, accessibility to other shops, accessibility to services, quality of services, availability of the internet connection, accessibility to transportation services, quality of transportation services, accessibility to free-time activities, sport and culture facilities

DISCUSSION AND CONCLUSION

Opinion survey was carried out in 2014 with a representative set of 1152 respondents. Using 99 factors, respondents expressed themselves to the factors importance for assessing inhabitants' living standards. Via method of Principal Component Analysis, the factors were reduced to 18 of them, explaining 72% of all the variables variability. 7 defined factors were used for the possible logical interpretation and describing factors assessing living standards – education, health, environment, public life, economic side of life, infrastructure, and interpersonal relationships.

The following might be concluded from the results of analysing opinion survey about inhabitants' living standards. First of all, subjectively defined areas and factors created by rotation of factors and variables match in 6 out of 7 areas (health, education, environment, public life, interpersonal relationships and economic side of life). Only the subjectively defined area concerned with self-satisfaction became a part of other factors, mostly the factor expressing mutual interpersonal relationships. Furthermore, factors defined by the method of Principal Component Analysis, or subjectively stated areas of living standard (based on experience, results of foregoing surveys, and deep theoretical knowledge) may be marked as the most suitable ones and sufficient for assessing inhabitants' standard of living. Specifying the content and number of explaining variables (factors) is to be a subject matter for further research. As the opinion expression to the importance of factors for assessing living standards implies, interpersonal relationships and health are the most important ones for respondents, followed by the factor of economic side of life, generally understood as a factor crucial for satisfaction and quality of life. Based on the findings it may be inclined to an opinion that material side of life is not a priority for its quality, thus we contribute to several arguments criticising GDP per capita as a factor of living standards.

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