

DEFINING TENDENCIES IN MODELLING THE LIVING STANDARD OF THE POPULATION IN NUTS 2 REGIONS OF CENTRAL AND EASTERN EUROPE COUNTRIES

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In the article the tendencies of modelling the living standard of the population in NUTS 2 regions – Poland, Latvia, Lithuania, Estonia, the Czech Republic, Hungary, Romania and Slovakia – are analysed according to results of the integral indicator construction¹. The analysis is made in the context of dynamics of territorial disproportions during the period from 2000 till 2007. The list of explored countries is determined by the presence of Eurostat statistics for the mentioned period for NUTS 2 level regions.

Methods of research used for accomplishing the research objectives: the methods of logical analysis and synthesis, the monographic and analytic method of the studying theoretical and empirical economic sources of the international level; multidimensional statistical methods (factor analysis by the main component method); statistical methods and methods of econometric modelling (the dynamic model with one dependent variable; methods of correlation analysis.

Key words: the living standard integral indicator, economic growth, sector structure of regions economics, NUTS 2 regions.

JEL classification: R11

Introduction

After the WWII there were actualised such aims of the market economy as ensuring society well-being and smoothing the inequality between economically weak and strong regions. Nowadays, formation of well-being still is one of the main tasks in many European countries with social market economy (Sweden, France, Germany, the Great Britain, Denmark, and the Netherlands). In socially oriented economy one of the main development aims is ensuring the adequate living standard for all citizens. Changes in economic and social sphere of such Central Eastern Europe (further in the text – CEE) countries as Latvia, Lithuania, Estonia, Poland, Romania, the Czech Republic, Hungary and Slovakia during the last decade, their integration into the European Union, and also the influence of globalization factors demand the statistical evaluation and the development of a new research methodology. The population of these countries rightfully expects from the entrance into the Europe Union the raise of their living standard.

Discovering the prerogatives of the living standard, which is based on the degree of problematicity of the initial list and the importance of weight coefficient, both allows to plan the strategy of social-economic development at the national level and also the help of the EU in the frames of cohesion policy, considering the peculiarities of each country of NUTS 2 level regions – Latvia, Lithuania, Estonia, Poland, the Czech Republic, Hungary and Slovakia.

In early 1970s Eurostat established the nomenclature of territorial units for statistics (NUTS) as the only consequent system of the EU territories division for the purpose of regional statistics registration. NUTS have got the

legal status on July of 2003². First amendments after the entrance of new members in 2004 were proposed in autumn 2005; they were discussed in 2006 and were accepted in 2007³. Further amendments were accepted in the beginning of 2008 in connection with Bulgaria's and Romania's entrance into the EU⁴. The main aim of regulations is to control inevitable transformation process in administrative structures of the EU in order to minimize problems of application and comparability of regional statistics. In May 26 of 2003 the EU has adopted the rule about the minimal and maximal amount of inhabitants in NUTS territories. In NUTS1 level regions the minimal amount of inhabitants is three millions, maximal – seven millions; in NUTS2 level regions the minimal amount of inhabitants is 800 000, the maximal – three millions, in

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² Regulation (EC) no 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS)

³ Commission Regulation (EC) No 105/2007 of 1 February 2007 amending the annexes to Regulation (EC) No 1059/2003 of the European Parliament and of the Council on the establishment of a common classification of territorial units for statistics (NUTS).

⁴ Regulation (EC) No 176/2008 of the European Parliament and of the Council of 20 February 2008 amending Regulation (EC) No 1059/2003 on the establishment of a common classification of territorial units for statistics (NUTS) by reason of the accession of Bulgaria and Romania to the European Union

NUTS3 level regions the minimal amount of inhabitants is 150000, the maximal – 800 000. At the more detailed level you can find regions and municipalities with the name of local administrative unit (LAU). There are no many empirical researches on the above stated territorial units for statistics, which also motivates the development of the present system applying to NUTS 2 regions.

The period of research is defined by the interest to the period of transfer of post-communistic countries from the planned economy toward the market economy, and the influence of the entrance into the EU on the living standard of inhabitants of NUTS2 level regions countries. Unfortunately there is available statistical information only for NUTS2 regions of such countries as Latvia, Lithuania, Estonia, Poland, Romania, the Czech Republic, Hungary and Slovakia in the period since 2000 till 2007.

The aim of research is to develop the integral indicator of the population living standard estimation and to research with the help of it quantitative and dynamic regional differences in the living standard of population in Central and Eastern Europe.

The research hypothesis: alongside with the general tendency of increase of the living standard of CEE population, there exist significant quantitative and dynamical differences in the living standard of the population in different regions. These differences are conditioned by peculiarities of economic growth and sector structure of regions economics.

Methods of research used for accomplishing the research objectives:

- The methods of logical analysis and synthesis, the monographic and analytic method of the studying theoretical and empirical economic sources of the international level were used for the analysis of notions of the living standard and its criteria, factors and conditions, which influence the living standard, and the existing in the world science methodologies defining the living standard, and

for selection of the most valid methodology defining the living standard prerogatives of the regions population;

- Multidimensional statistical methods (factor analysis by the main component method) were used for the calculation of the living standard for the target regions of CEE with the purpose of the constructing the living standard integral indicator of the population of NUTS 2 regions of CEE countries;

- Statistical methods and methods of econometric modelling (the dynamic model with one dependent variable) were used to define tendencies of the living standard formation of the regions population.

- Methods of correlation analysis were used for the analysis of the correlation between the rate of the GDP growth and the sector structure of economics with the living standard by NUTS 2 regions of CEE countries.

Methodological issues of studying the living standard

The interest towards the notion of the living standard in economic studies was topical during the process of their evolution. All the schools and trends of economic science were more or less involved into the elaboration of the welfare theory. Over the years the system of notions has undergone the evolution from such economical category as “wealth” to “welfare” and, further, to “living standard”. The content of these notions was also changing. The change was determined by the transfer of the emphasis from macro to micro level and the appearance with time of aspects of meso-level as well. In this connection, the notion of the living standard became broader and came to include numerous new components.

Schematically, the evolution of theoretical approaches towards the notion of the living standard can be presented in the context of the evolution of economic theories (figure 1.).

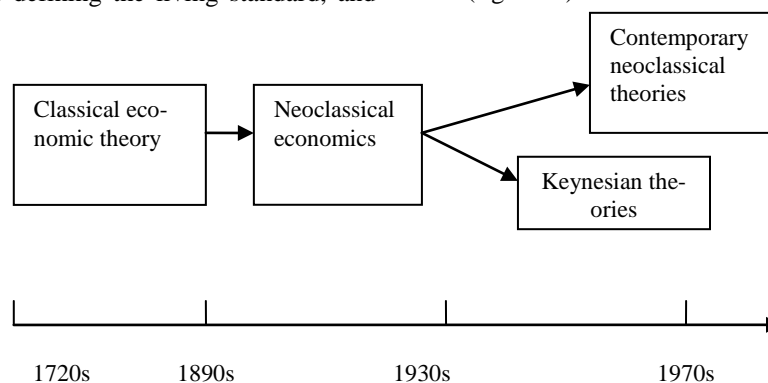


Figure 1. Evolution of economic approaches to the living standard in the 18th-20th centuries

Source: authors' design according to the analysis of welfare theories

The concept of the living standard in classical economic theory

The representatives of the classical school regarded the economic science as the study about wealth and the methods of its aggrandizement. Smith (1904) concerns that the national welfare (i.e. the living standard at a macro level we are interested in) is represented by the production consumed by the population of the given country. The greater is the correlation of the quantity of production consumed and the number of the country population, the higher is the level of country's material wealth.

Ricardo continued Smith (1904) work. However, he corrected some of Smith inaccuracies and considerably precised the labour theory of value. D.Ricardo identified the living standard at the micro-level with the living standard of industrial bourgeoisie.

The third representative of the classic school – Mill (1965) has come to conclusion that morality cannot be based only on the postulate of the personal economic profit of individual and on the belief that the satisfaction of a mercenary interest of a separate individual will almost automatically lead to universal welfare. According to his opinion, the assertion the higher is the living standard of every individual within society, the higher is the living standard at a macro level is valid only under the condition of accordance with social interests: “The modern nations should realize that the nation's welfare should be achieved by the means of justice and self-administration” (Mill, 1965).

Mill (1965) wrote also about the positive influence that is ensured by the benefit system and getting a piece of land as a property, and about the negative influence of charity, because it promotes unemployment. On author's mind, Mill's thoughts about the gender aspect of the salary are very topical. “Women's salaries are usually lower, besides, much lower than men's salaries with the equal achievements. It can be explained by the tradition based on prejudice or by the existing social order, which makes almost every woman man's property” (Mill, 1965). Mill thought that it is necessary to provide women with equal rights as men's, because it positively influences the limit of children's amount in a family and increases inhabitants' wellbeing.

The classics, in their theoretical search, base their assumptions on the principle of economic liberalism, the principle of the free competition. To sum up, the following conclusion can be made – the representatives of the classical school analysed the living standard from the both sides: at a macro level as well at a micro level. The meso level was not even singled out. The notion of the living standard was regarded in a narrow material meaning.

The living standard in neoclassical economic theory

Marshall wrote that the economic science is engaged in the research of the material welfare and its major aim is to research the poverty reason, which leads to degradation of the lower levels of society (Marshall, 1890).

According to Marshall, state wealth elements or “national wealth” include all kinds of state material and social property, and also “gratituous goods”. “However, national wealth includes both individual and collective state inhabitants' property” (Marshall, 1890).

A. Marshall provided the broader interpretation of the social development vector. According to his opinion, the society driving motive cannot be defined only by the aspiration to maximal profit. The economics of wealth (according to Smith) should be reoriented to the economics of the universal welfare. “Any decrease of inequality in the distribution of wealth achieved by the means, which do not damage the free will motives and the character strength and, therefore, cannot considerably slow down the growth of the national wealth, would be an obvious public domain” (Marshall, 1890).

Walras (1969), Menger (1950) and others acknowledged the importance of the living standard at the micro level, which is determined by two series of circumstances: preference of an individual and the presence of conditions for making the rational choice (on conditions that resources are used in the sphere of production and consumer goods are used in the sphere of consumption). In marginal theory a person knows the hierarchy of his/her needs and, having satisfied them, strives for the achievement of a greater welfare.

Pareto formulated the principle, according to which, the maximal living standard at a macro level is achieved on conditions of optimal distribution of resources, when any redistribution of it does not increase the social utility. According to this approach, the increase of the living standard at a macro level is achieved by the means of perfection of the competitive market mechanism. However, other representatives of neoclassical economic theory had proved the imperfection of this approach because of the “market failure”.

Pigou (1932) studied the national income from the point of view of its distribution. According to his belief, the increase of production does not necessarily mean the increase of the living standard at a macro level; market is not able to completely resolve the contradictions between common and private interests within the society.

It is necessary to carry out the fiscal policy, adequate to definite developed common interests. Pigou (1932) approach can be referred to as a view from the society's angle, not that of individual. However, this approach is applied as well to the problems of neoclassical science: an individual function of satisfaction, a private production profit etc. Pigou wanted to harmonize the private and the public aspect, wanted to find the theoretical basis for resolution of the similar conflicts between the private and the public aspect.

Pigou (1932) has shown that the living standard concept at a micro level is broader than its purely economic aspects. Besides the maximal utility of consummation, it includes such things as: the character of labour, environ-

mental conditions, mutual relationships with other people, position within the society, housing conditions, public order and safety. Pigou in the history of economic thought is estimated as philosopher, who has finished the formation of the neoclassical welfare theory.

Neoclassical economic theory as well as classic economic theory proceeds from the principle of economic liberalism and the principle of a free competition; however, the first ideas of governmental regulation start to appear and the problem of "the market failure" is studied. In their researches the representatives of neoclassical economic theory place a greater emphasis on the research of applied pragmatic problems, use quantitative analysis and mathematics more than qualitative analysis (content, cause-effect).

To sum up, it is worth to say that the representatives of neoclassical economic school analysed the living standard both from the positions of the macro and micro level, however, it is worth to note that the interest to the living standard micro-component has increased. The interest to the meso-level was not emphasized at all. The living standard started to be analysed in a broader sense, including not only material aspects but also labour character, environmental conditions, mutual relationships with other people, position within the society, housing conditions, public order and safety, taking into consideration the subjective satisfaction of needs at a micro level.

The living standard in Keynesianism

Keynes (1936) pays attention to the issue of serious necessity of government interference into economics in order to prevent its drawbacks. Society, where Keynes lived, was not able to provide the full employment and to prevent unwarranted and unfair incomes distribution (Keynes, 1936).

According to Keynes (1936), it is necessary for society to create a mass consumer with a high customer demand⁵. This consumer will be interested in the development, not the elimination of capitalism, notably, in the development that is manifested in the permanent increase of the living standard of the majority of society members, and not only of those, who stands at the peak of the property pyramid. There is no other way out as the mass population impoverishment during the periods of crisis can cause the social explosion. The discovery of Keynes lied in the stimulation of getting out of depression due to the growth of the population purchasing power on the condition of use of public funds. He supposed that the growth of consummation rate creates workplaces thus stimulating the economic recovery.

In order to achieve the full employment, the authorities must influence the process of consummation by, besides other issues, means of financial policy and public invest-

ments. It was Keynesianism that formed the basis for the approach from the regional level position expressed in the interest toward the problems of unemployment.

Thus, the primary emphasis in Keynesianism is put on the living standard at the micro level, and the greater attention than to the living standard at a macro level is paid, since the population with the acceptable living standard, that can and is willing to consume more, is one of the factors of successful economic functioning. Proceeding from the reforms introduced, we can make an assumption that the population living standard at a micro level should comply with the tendency of a steady growth. For the first time in Keynesianism the interest in the living standard at a meso-level appears and the serious attention is paid to this issue.

The living standard in modern neoclassical theories

According to Eucken, the living standard depends on the form of economic order as the regulation of economics and the distribution of social product are closely interconnected (Eucken, 1990).

Distribution of social product in central economy is made in a different way comparing to competitive economy (Eucken, 1990). Incomes are distributed by the central institution. Different categories of workers (for example, common consumers employed on hard work, etc.) receive the minimal supply level with food, clothes, dwelling, etc. Distribution of goods in the ruling layer also is made on the account of common supply (Eucken, 1990). There exists an opinion that in the basis of centrally governed planned economy development there is an aim to provide all inhabitant with consumer goods as fully and fair as it is possible. However, Eucken admits that actual aim is to achieve the maximal level of capital investments. In the reality, the amount of consumer goods supply in general, and its distribution among individuals, first of all, depends on plans of investments. Distribution was included into production plans in such a way that, as far as it is possible, it would serve its production. The full employment in the centralized system can be achieved simply as economy is oriented onto constant investing. The difference is covered on the account of money emission. The new money promote the increase of demand for goods; the tendencies of inflation are formed (Eucken, 1990). Similar tendencies create the full employment also in market economy. As the planning institutions strictly control the prices, producers and consumers get some compulsory unspent money. They are waiting for a chance to spend their money when the goods will appear. In the presence of money surplus, producers have no problems to sell everything they have produced. Thus, compulsory savings have decreased the security of workers in the greatest part of countries to the minimal supply level. As we know, the income amount dependence on the market can cause injustice. This is a complicated

⁵ At the same time, he does not oppose the fundamental classic postulates of market economy organization, namely, personal profit and competition, as well as favour of the "invisible hand".

problem, but the dependence on the central ruling institutions trying to realize big investment projects are even more dangerous. Work productivity decrease, supply decline and liberty limitation, and no hope for just distribution of social product – this is the price for central planning economy (Eucken, 1990).

Eucken also criticized “laissez-faire” policy. Bad living circumstances, the absence of liberty, the lack of protection and unfair distribution are social defects caused, as workers and servants of the 19th century thought, by the “capital”. “Laissez-faire” policy did not promote the development of economic order adequate to law-based state because realizing such an economic policy, there can emerge uncontrolled monopoles or partial monopoles (Eucken, 1990). The law-based state can be fully realized only when simultaneously with the state legal order there exists “adequate economic order” (Eucken, 1990). Eucken considered the monopoly and partial monopoly to be inadequate to the law-based state. In order to solve this dilemma, it is necessary to find the compromise between “laissez-faire” policy and planned economy, and this compromise is “the middle way policy” or category of “competitive economic order” (Eucken, 1990).

Erhard plays an important role in practical realization of neoliberal ideas (Erhard, 1957). Erhard asserts that the main aims of social market economy are liberty and justice. He makes it clear that economic liberty is not possible without political freedom, without government guarantees of observance of human rights and freedoms, without social protection and social justice. The increase of the living standard, to which I am striving, is not so much the problem of distribution as the problem of production and, to be more exact, of productivity. The solution lies not in the division but in the multiplication of national production. Those, who pay their attention to the problems of distribution, always come to a misleading desire to distribute more than the national economy is able to produce (Erhard, 1957).

Thus, all the modern tendencies of economic science recognize that, as a result of expansion of individual capabilities at the end of the 20th century, the individual becomes the main source of social reformations, and the living standard at a micro level is promoted as the main approach. The quantity of living standard aspects notably expanded and is marked by the broad approach, at the same time, a great attention is paid to the living standard at a regional level. There functions a mixed economic system, wherein market, by means of supply and demand, defines, which goods, for whom and how much are necessary to be produced, but the government corrects market economy costs by taking the responsibility for national defense, protection of environment, redistribution of incomes in the society interests.

The living standard concept

Numerous researchers distinguish such definitions, similar to our studied category, as “welfare”, “quality of

life”, “mode of life”, “cost of living”, which oftentimes do not differ greatly from each other and are used interchangeably, and the list of markers, which describe them, are congruent in many respects. Nevertheless, one should distinguish these concepts.

Mode of life is a complex system of human vital activity that takes place within a framework of a definite space and time period. This concept does not signify a definite kind of activities or a mechanical sum of different kinds of activities, but the whole system of human activity, activity of a social group, of population of a definite territorial unit and of society as a whole. The living standard is the important component of the system mentioned. The mode of life, as a peculiar result of something collective and, in certain instances, of inter-contradictory influence of numerous factors, may be even opposite within the same level. This explains the fact that superiority in the living standard of any given country does not mean its superiority in the mode of life.

The definition of such Latvian authors as Bela, Tisenkopfs (Dzives kvalitāte..., 2006) describes the living standard as “a broad and capacious concept, which includes both objective markers and subjective contentment and evaluation of to what extent an individual is able to live in accordance with his/her intentions” (Dzives kvalitāte..., 2006) and includes “the general contentment with life, subjective interpretation of a good life, incomes and material welfare, work and employment, family and time management, health, living facilities, the quality of life of children and youth, mass media, initiatives and risk of enterprise, ethnic and regional living standard differences, gender differences, etc.” (Dzives kvalitāte..., 2006). The living standard can be defined as a complex characteristics of the population vital activity conditions, which are expressed in objective markers and subjective evaluation of satisfaction of material, social and cultural needs, and which is connected with the way how people perceive their position according to cultural peculiarities, value system and social standards, existing in society.

The living standard is a narrower category in comparison with the *quality of life*. Various human needs, occurring and realized in the sphere of consummation, are the systemically important basis of the living standard concept.

The monetary evaluation of goods and services, which are used in households in the definite time period and correspond to the definite level of satisfaction of needs, forms the cost of life (Stoimost zizni..., 1991). In other words, *the cost of life* is the monetary evaluation of goods and services, provision with which reflects the living standard. From this definition it follows that the cost of life can alter not only in connection with changes in people consummation structure as the result of changes of their needs, but also under the influence of prices dynamics (Viner, 1925). That is why for measuring the living standard not only nominal (monetary term), but also real

quantities (updated taking into consideration changes of prices, i.e. with the help of index of consumer prices) are used. However, evaluations of the living standard through the cost of life for our research are unsuitable.

The approach to define the concept "living standard" basing on "inhabitants' incomes" is widely spread. In official statistical materials the living standard almost implicitly includes all categories listing incomes, wage, pensions, social benefits and transfers. Real incomes are not suitable as a measure of the living standard, if we speak about social benefits. The evaluation of real incomes ignores state gratuitous services provided for a person.

Literature review let us select two basic groups of defining the concept "living standard". In the first group the discussed concept is understood narrowly and is identified, theoretically, with the level of consummation of only material goods or with the level of real incomes of population. To the second group belong definitions, in which the living standard is understood broadly and consider apart from consummation also health care, education, working and recreation conditions etc. We are in the position of the second group of definitions and interpret the living standard from the broader positions as all human needs do not come only to material things⁶. We also want to emphasize that in above listed definitions the regional aspect of the living standard is not considered at all.

The living standard is an objective social-economic category. Sometimes encountered in the literature interpretation of the living standard as a subjective phenomenon, to our mind, does not correspond the reality. The opinion about that the living standard was formed not under the influence of real consummation, but subjective demands, which households experience in connection with bought goods and services, is not full, and that is why is not right.

The living standard being a part of broader category "way of life" reflects not only satisfaction of people's material and spiritual needs, but also, apart from other, territorial aspects are peculiar to it.

The living standard is an abstract category that is why the concretization of this concept can be made in territorial and social direction. In territorial direction, the living standard of the population of separate countries, regions, cities, etc. is considered. In social direction, we consider the living standard of separate layers of society, different social groups, households, and, finally, separate individuals.

⁶ The most spread is division of needs into two groups: biogenic and sociogenic. All needs, excepting the lowest, vital, are related to social needs. To material needs we relate needs for stuffs and goods, necessary for providing physical existence and development of people. These are foodstuffs, accommodation, clothes etc. To spiritual group – needs for spiritual activity and its products, for spiritual reproduction of people themselves, for cognition, for education, etc.

The living standard is conditioned by economic activity; however, it also influences the further development of economics, conditioning the further demand for material and non-material goods and services, and is directly connected to rational usage of human resources.

The living standard is dynamically developing category: the amount of its constitutive components, their content and correlation are constantly changing.

So, basing on the result of analysis of considered points of view, we will formulate the definition, which further will be operationalized. The living standard is a complex social-economic category reflecting the level of development of material and non-material needs, and also the level of their satisfaction, which let a person be an active member of society, proceeding from the peculiarities of existence of people's territorial communities.

The living standard criteria and factors

In the basis of the living standard concept there can underlie different criteria⁷ (see the table below).

Liberal economics concentrate on the following factors: stable economic development (Balke, Slottje, 1993; Bluestone, Harrison, 2000; Freeman, 2001; Gordon, 1972; Jorgenson, 1998; Blank, 2000), free market (Darity, Myers, 1987; Gilde, 1981; Okun, 1975; Lindbeck, 1995; Bane, Ellwood, 1994; Danziger, Haveman, 1981), factors of productivity of labour and scientific-technical factors, education level, qualification (Bednost i regionalnoje razvitije..., 2007), unemployment (Gallie, Paugam, 2000; Ljungqvist, Sargent, 1998; Williams, 1991).

Table 1. Criteria, which form the living standard concept

| No | Type of criterion | The content of criterion |
|----|-------------------------------------------------|-------------------------------------------------------------|
| 1 | By origin | Objective - subjective |
| 2 | By content | Economic – non-economic |
| 3 | By time and character of duration | Long-term – short-term Permanently – occasionally acting |
| 4 | By estimation methods | Calculated – non-calculated |
| 5 | By way, in which the data for study is received | Primary – secondary |
| 6 | By concretization level | Territorial – social |
| 7 | By relation towards the regions | External – internal |
| 8 | By content | Material – non-material Manageable – poorly manageable |
| 9 | By management | Self-manageable – manageable from outside |

Source: authors' design.

⁷ feature, which is estimated

Structural theory concentrates on the following factors: demographic factors (Wilson, 1996; Alderson, Nielsen, 2002; Gustafsson, 1995), the structure of employment provision (Eggers, Massey, 1992; Kasarda, 1993; Nelson, Schwirian, 1998; Quillian, 2003; Alderson, Nielsen, 2002).

In institutional economics there are mentioned institutional factors that generate difference at the level of state well-being. The existing among states and society groups difference in the level of poverty results from the degree of incomes distribution chosen by the state and also the level of social transfers directed for support of poor ones. Supporters of the prosperous state prove that the increase of social protection is the most important factor decreasing poverty (Blank, 2000; 2001; DeFina, Thanawalda, 2001; Page, Simmons, 2000; Korpi, Palme, 1998; Kenworthy, 1999; Brady, 2005; Moller, Bradley, 2003).

Having considered and analysed criteria of the living standard formation, its worth to say that for the aim of our work the most important are the following criteria:

- by origin - objective,
- by study methods – calculated,
- by way, in which the data for study is received – secondary,
- by content – economic and non-economic (including social, technological),
- by content – material and non-material.

Aspects which form the living standard

The content of the living standard concept depends on different aspects.

Table 2. The division of markers according to spheres of life

| Marker | Spheres of life (aspects) |
|--------------------------------------------------------------------------------------|---------------------------------------|
| The UN Statistical Commission (Draft Guidelines on Social Indicators, 1976) | 1. Population |
| | 2. Study and education services |
| | 3. Income |
| | 4. Income division, riches |
| | 5. Social safety and prosperity |
| | 6. Residence and environment |
| | 7. Public order and safety |
| | 8. Time budget and free time usage |
| | 9. Stratification and public mobility |
| United Nations Research Institute for Social Development (UNRISD) (Drewnowski, 1966) | 1. Subsistence |
| | 2. Residence |
| | 3. Health |
| | 4. Education |
| | 5. Recreation |
| | 6. Social safety |
| | 7. Material accomplishment |
| Drewnowski (Drewnowski, 1974) | 1. Subsistence |
| | 2. Garments |
| | 3. Residence |
| | 4. Health |
| | 5. Education |
| | 6. Recreation |
| | 7. Safety |
| | 8. Social environment |
| | 9. Physical environment |

| Marker | Spheres of life (aspects) |
|---------------------------------------------------------------------------------|-------------------------------------------------|
| Zienkowski (Zienkowski, 1979) | 1. Subsistence |
| | 2. Health |
| | 3. Education |
| | 4. Residence and environment |
| | 5. Recreation and environment connected with it |
| | 6. Culture |
| | 7. Employment and work conditions |
| | 8. Social safety |
| | 9. Public order and safety |
| | 10. Income and property division |
| | 11. Stratification and public mobility |
| | 12. Family and sexual life |
| Michalos (Michalos 1980-1982) | 1. Population structure |
| | 2. Mortality |
| | 3. Morbidity and healthcare |
| | 4. Crime and justice |
| | 5. Politics and organisation |
| | 6. Science and technology |
| | 7. Education |
| | 8. Nature environment and resources |
| | 9. Recreation |
| | 10. Transport and communication |
| | 11. Residence |
| | 12. Economy |
| | 13. Morals and social traditions |
| Social progress indicator (Estes, 1990, pp. 186-188) | 1. Education |
| | 2. Health |
| | 3. Woman's status |
| | 4. Defence |
| | 5. Economy |
| | 6. Demography |
| | 7. Region geographical position |
| | 8. Political participation |
| | 9. Cultural diversity |
| | 10. Government efforts to maintain prosperity |
| International Living Index (ILI) („International Living...) | 1. Cost of life |
| | 2. Culture and recreation |
| | 3. Economic development |
| | 4. Environment |
| | 5. Freedom |
| Life quality integral indicator (Айвазян, 2001, 2003, 2005) | 1. Population quality |
| | 2. Population prosperity level |
| | 3. Quality of social sphere |
| | 4. Ecological niche quality |
| | 5. Nature-climatic conditions |
| The Netherlands Institute for Social Research (Values on a Grey Scale..., 2008) | 1. Life situation |
| | 2. Employment, income and social security |
| | 3. Education |
| | 4. Minorities and integration |
| | 5. Emancipation |
| | 6. Youth and family |
| | 7. Civil society and social participation |
| | 8. Public opinion and cultural change |
| | 9. Public services |
| | 10. Culture and media |
| | 11. Sport |
| | 12. Housing, liveability and safety |
| | 13. Care for people with disabilities |

Source: authors' design by sources indicated in the column „marker” of the present table

Having analysed the content of life components indicators of the UN Statistical Commission (Draft Guidelines on Social Indicators, 1976), United Nations Research Institute for Social Development (Drewnowski, 1966), Zienkowski (Zienkowski, 1979), Drewnowski (Drewnowski, 1974), Michalos (Michalos 1980-1982)), Social Progress Index (Estes, 1990, pp. 186-188), International Living Index (ILI („International Living...), the Netherlands Institute for Social Research (Values on a Grey Scale...,2008), the Living Standard Integral Indica-

tor of S. Aivazian (2001) it was stated that the division of markers occurs in the demographic, economic, social and natural-ecological direction.

Having analysed all available statistical indicators in the Eurostat base at the present moment (October 2009) since 2000 of CEE countries (on which there are Eurostat statistics in the mentioned period: Latvia, Lithuania, Estonia, Poland, Romania, the Czech Republic, Hungary and Slovenia) by NUTS 2 regions and taking into consideration the approach from positions of micro-level (per inhabitant), we have formulated the following hierarchic structure:

Table 3. Hierarchical structure of complex social-economic category of the living standard

| 1st level | 2nd level | 3rd level |
|----------------------------|--------------------------------------|----------------------------------------|
| Name of integral indicator | Name of integral indicator component | Name of component peculiarity |
| The living standard | 1.Demographic | 1.1. Birth-rate |
| | | 1.2. Death-rate |
| | | 1.3. Education level |
| | 2.Economical | 2.1. Incomes |
| | | 2.2. Employment, unemployment |
| | | 2.3. Innovation potential of economics |
| | 3. Social | 3.1. Infrastructure |
| | | 3.2. Security |
| | | 3.3.Free time |

Source: authors' development on the basis of analysis of markers division by life spheres and conditions of the living standard formation.

Quantitative evaluation of the living standard of the population in CEE countries NUTS 2 regions in dynamics

In order to achieve empirical goals of our work, we will consider the category of the living standard in the fol-

lowing strategic approach: the living standard of the population of region is characterized by the income level, the occupation level, the level of security and free time, described by markers of birth rate, mortality rate, education, and also by the level of innovation potential of economics.

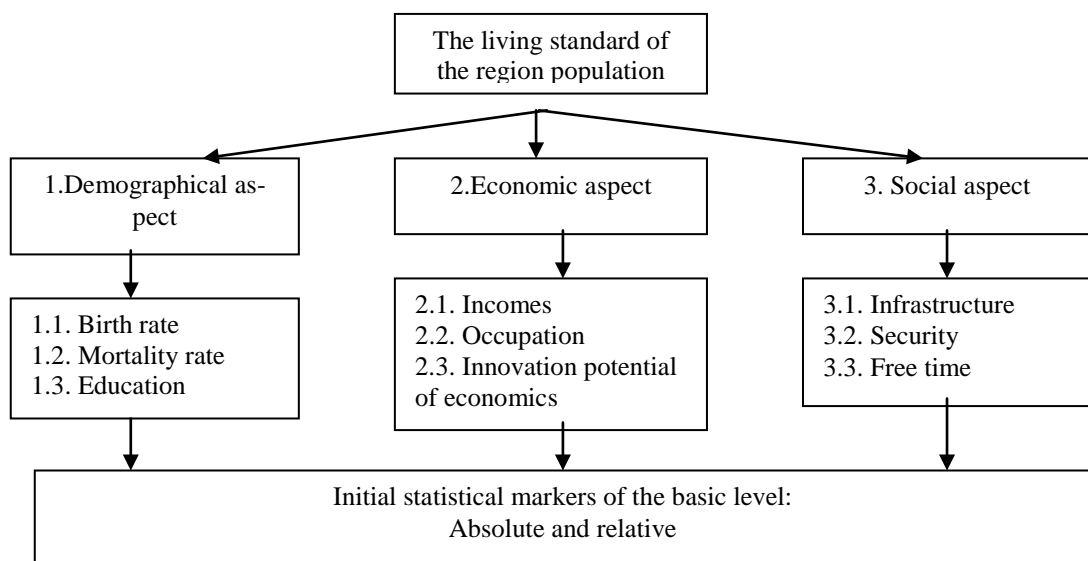


Figure 1. Hierarchical system of statistical markers, individual criteria and integral indicators of the living standard

Source: authors' design

Modelling the information research basis, it is necessary to fill in the common hierarchical system of markers (individual criteria) and integral indicators (see figure 1) with a *concrete content* (available statistical markers), specified for tasks, resolved in the present research, on the basis of the Eurostat data during 2000 - 2008 by NUTS 2 regions of Bulgaria, Estonia, Latvia, Lithuania, the Czech Republic, Poland, Slovakia, Rumania. As the result the following *a priori* selection of elementary statistical indexes was formed. *The unification of initial statistical indexes was made by corresponding kinds of transformation after preparation of the research statistical basis.* The selection of applied transformation depends on the type of analysed index: if the initial index is connected with the analysed integral feature of the living standard by the droningly increasing dependence, then

$$\tilde{x} = \frac{x_i - x_{min}}{x_{max} - x_{min}} \cdot N \quad (1)$$

if the initial index is connected with the analysed integral feature of the living standard by the droningly decreasing dependence, then

$$\tilde{x} = \frac{x_{max} - x_i}{x_{max} - x_{min}} \cdot N \quad (2)$$

where x_{min} and x_{max} — correspondingly, — are minor (the worst) and major (the best) values of the initial index during the studied period, but $N=10$ (Aivazian, 2005).

Further, a relatively small number of individual criteria, which play a determinant role in forming the corresponding integral indicator, was selected from each *a priori* selection. Therefore, the *analysis of the multicollinearity of individual criteria of a priori indicators selection* was made. Then, the most informative individual criteria were selected among the *a priori* selection indicators of each integral characteristic. As the most informative we will consider the selection in which the sum of coeffi-

cients of determination of the dependent variable by the explanatory variables is the maximal (Aivazian, 2005). We will call this brief selection of markers *a posteriori*.

In result there was defined the following *a posteriori* selection of individual criteria:

- demographical: infant mortality till the age of 1 year (number of deaths per 100000 of population), studying in the age of 17 among the 17 years old population (% of 17 years old population);

- economical: household income: disposable income by purchasing power parity (PPP) per inhabitant, occupation in service (proportion of occupied above 15), occupied in science and technologies (% of economically active population); GDP in current market prices by PPP per region inhabitant; unemployment (% of economically active population);

- social: murder and violent death rates (number of cases per 100000 of population), transportations of all kinds (number per person); free time (as a destimulant of the average amount of weekly hours of work on the principal job (full-time working day)).

Having made the factorial analysis of the indicators described above using the method of main components, we have received the first component with explained dispersion in 59% (2000), 57% (2006), in 55% (2007). Consequently, we will make the calculation of the integral marker of the living standard by one first component as a linear convolution of a kind

$$\tilde{y}_i = \sum_{q=1}^p l_q^2 \cdot \tilde{x}_i^{(q)} \quad (3)$$

where $i=1,2,\dots,n$ with scales l_q^2 , satisfying the

condition $\sum_{q=1}^p l_q^2 = 1$ (Aivazian, 2005).

In the result we have constructed the integral indicator by NUTS 2 regions of studied regions (Table 4).

Table 4. Integral Indicator Values of the Living Standard of Regions and Ratings of Regions by the Living Standard for 2000, 2003, 2007

| Country | Codes | NUTS 2 | 2000 | 2003 | 2007 |
|-----------------|-------|--------------------|------|------|------|
| CESKA REPUBLIKA | CZ06 | Jihovýchod | 5.31 | 6.11 | 6.30 |
| | CZ03 | Jihozapad | 5.36 | 6.24 | 6.45 |
| | CZ08 | Moravskoslezsko | 4.87 | 5.62 | 6.11 |
| | CZ01 | Praha | 7.93 | 8.91 | 9.37 |
| | CZ05 | Severovýchod | 5.18 | 5.96 | 6.17 |
| | CZ04 | Severozapad | 4.87 | 5.49 | 5.84 |
| | CZ02 | Stredni Cechy | 5.04 | 5.89 | 6.18 |
| | CZ07 | Stredni Morava | 4.90 | 5.70 | 6.16 |
| EESTI | EE00 | Eesti | 5.02 | 5.50 | 5.97 |
| LATVIJA | LV00 | Latvija | 4.11 | 4.83 | 6.01 |
| LIETUVA | LT00 | Lietuva | 5.24 | 5.54 | 6.78 |
| MAGYARORSZAG | HU10 | Kozep-Magyarorszag | 6.18 | 7.12 | 7.63 |
| | HU21 | Kozep-Dunantul | 4.38 | 4.95 | 5.52 |
| | HU22 | Nyugat-Dunantul | 4.76 | 5.39 | 5.93 |
| | HU23 | Del-Dunantul | 4.42 | 4.85 | 5.44 |

| Country | Codes | NUTS 2 | 2000 | 2003 | 2007 |
|---------------------|-------|---------------------|------|------|------|
| | HU31 | Eszak-Magyarország | 3.87 | 4.40 | 4.85 |
| | HU32 | Eszak-Alföld | 3.70 | 4.56 | 5.17 |
| | HU33 | Del-Alföld | 4.00 | 4.68 | 5.45 |
| POLSKA | PL11 | Lodzkie | 4.49 | 5.06 | 5.61 |
| | PL12 | Mazowieckie | 5.26 | 6.15 | 6.93 |
| | PL43 | Lubuskie | 4.38 | 5.02 | 5.60 |
| | PL41 | Wielkopolskie | 4.52 | 5.42 | 5.80 |
| | PL42 | Zachodniopomorskie | 4.55 | 5.10 | 5.83 |
| | PL61 | Kujawsko-Pomorskie | 4.06 | 4.84 | 5.22 |
| | PL63 | Pomorskie | 4.59 | 5.28 | 5.80 |
| | PL62 | Warmińsko-Mazurskie | 3.76 | 4.75 | 5.15 |
| | PL51 | Dolnośląskie | 4.52 | 5.21 | 5.91 |
| | PL52 | Opolskie | 4.07 | 4.87 | 5.45 |
| | PL21 | Małopolskie | 4.48 | 5.03 | 5.69 |
| | PL22 | Śląskie | 4.32 | 5.42 | 6.07 |
| | PL31 | Lubelskie | 3.98 | 4.56 | 5.28 |
| | PL32 | Podkarpackie | 4.00 | 4.45 | 5.31 |
| | PL34 | Podlaskie | 3.85 | 4.55 | 5.12 |
| | PL33 | Świętokrzyskie | 3.86 | 4.79 | 5.07 |
| ROMANIA | RO21 | Nord-Est | 0.41 | 0.95 | 2.17 |
| | RO22 | Sud-Est | 1.67 | 2.15 | 2.78 |
| | RO41 | Sud-Vest Oltenia | 1.54 | 2.05 | 3.02 |
| | RO42 | Vest | 2.22 | 2.98 | 3.45 |
| | RO32 | Bucuresti - Ilfov | 4.37 | 5.18 | 6.50 |
| | RO31 | Sud - Muntenia | 1.47 | 1.77 | 2.93 |
| | RO12 | Centru | 2.06 | 2.45 | 3.22 |
| | RO11 | Nord-Vest | 1.84 | 2.43 | 3.22 |
| SLOVENSKA REPUBLIKA | SK01 | Bratislavský kraj | 7.11 | 8.01 | 8.66 |
| | SK03 | Stredne Slovensko | 4.12 | 4.86 | 5.10 |
| | SK04 | Vychodne Slovensko | 3.53 | 4.19 | 4.73 |
| | SK02 | Zapadne Slovensko | 4.07 | 5.00 | 5.50 |

Source: authors' calculation

For analysis of the growth rate of the living standard by regions it is convenient to use quintile groups of studied regions (Table 5).

Regions of quintile 1 (2000) in average during 7 years have increased values of the living standard for 41%, of quintile 2 – for 23%, of quintile 3 – for 21%, of quintile 4– for 22%, of quintile 5 – for 19%.

Table 5. Average quintile values of integral indicator of the living standard in the period of 2000-2007

| | 2000 | 2003 | 2007 |
|-----|------|------|------|
| I | 2.0 | 2.6 | 3.4 |
| II | 4.0 | 4.7 | 5.2 |
| III | 4.4 | 5.0 | 5.6 |
| IV | 4.7 | 5.4 | 6.0 |
| V | 5.8 | 6.7 | 7.2 |

Source: authors' calculations

Thus, our hypothesis that the living standard in regions with the lower values increases faster, but in regions with the higher values – more slowly, that means the disproportion gets smooth, is confirmed by the fact described above. We will check this, using statistical tools.

Convergence

In empirical researches mainly two conceptions of convergence are used. They are interrelated, but they condition different effects of socially economical policy: β -convergence (Barro, Sala-i-Martin, 1991, 1992) and σ -convergence (Sala-i-Martin 1996a; Sala-i-Martin 1996b; Islam 2003).

We have constructed the regression of the growth of the living standard since 2000 till 2007 onto its initial level in 2000, in which the dependent variable is the rate of growth, but the independent – the initial level of indicator.

Table 6. Regression model

| | Constant | β | significance |
|---------------------------------------------------------------------------------------------------|----------|---------|--------------|
| $y = a + \beta x$, where $y = \ln(\text{in}2007/\text{in}2000)$, $x = \ln(\text{in}2000)$ | 0.916 | -0.928 | 0.000 |

Source: authors' calculations

Note: "in2007" - value of the living standard in 2007, "in 2000" - value of the living standard in 2000.

From table 5 we can see the equation of the kind: $\ln(\ln 2007/\ln 2000) = 0.916 - 0.928 \ln(\ln 2000)$ and since $\beta = 0.928 < 1$, the hypothesis about β -convergence of regions by the living standard is proved. Thus regions with low values of the living standard increase the living standard faster, but regions with the higher living standard increase it slower.

We will also clarify, if there is σ -convergence of studied regions by the living standard.

The most general markers of variation are: variation swing R and standard deviation σ (see formulas below) (Litvinov, 1999):

$$R = X_{max} - X_{min} \tag{4}$$

$$\sigma = \frac{\sum (x_i - \bar{x})^2 f_i}{\sum f_i} \tag{5}$$

where X_{max} and X_{min} – the highest and the lowest values of the feature;
 \bar{x} – average value of the feature;
 x_i – variants of feature;
 f_i – frequency; $i = 1, 2, \dots, n$ – number of variants.

We will use dependent variation indicators: swing coefficient K_R and variation coefficient V_δ , constructed on the basis of the mentioned above (see formulas below):

$$K_R = \frac{X_{max} - X_{min}}{\bar{x}} \tag{4'}$$

$$V_\delta = \delta / \bar{x} \tag{5'}$$

Table 7. Alteration of amplitude and variation coefficients of integral indicator by CCE countries NUTS 2 in 2000-2007

| Variation indexes | 2000 | 2003 | 2007 |
|-----------------------------------|------|------|------|
| Amplitude coefficient, K_R | 1.8 | 1.63 | 1.31 |
| 2000 = 100% | 100% | 91% | 73% |
| Variation coefficient, V_δ | 0.33 | 0.31 | 0.24 |
| 2000 = 100% | 100% | 94% | 73% |

Source: authors' calculations.

It is seen from the Table 7 that during last 8 years “polarisation” of regions by the living standard has decreased a little, which is directly testified by the decrease of variation coefficient by 27%. Consequently, during the mentioned period the growth of the standard deviation did not surpass the growth of the value of the living standard, which means that the diversity in the living standard was equalized during the time period described above, which confirms σ -convergence of regions by the living standard.

The analysis of correlation of the GDP growth rate and sector structure with the living standard of regions population

To which extent is the living standard of CEE regions population in the period 2000-2007 conditioned by the

previous economic growth? We will answer this question with the help of correlation analysis. We find that there is linear negative coherence between the values of the living standard integral indicator in 2003 and the GDP growth rate in 2000-2003: r (Pearson's)⁸ = -0.367 (significance level 0.05). Thus, in the period 2000-2003 in regions with the higher living standard the previous economic growth rate were slower, similarly, in regions with the lower living standard the previous economic growth rate were faster. However, the linear coherence between the GDP growth rate and the living standard growth rate in the period 2000-2003 is not observed.

Similarly, we ascertain that the linear coherence between the values of the living standard integral indicator in 2007 and the GDP growth rate from 2003 till 2007 is not observed: r (Pearson's) = 0. However, in this period we observe the positive linear coherence between the GDP growth rate and the living standard growth rate (r (Pearson's) = 0.331, significance level 0.01).

Admittedly, regions with the higher living standard initially had higher values of GDP. We will check this with the help of correlation analysis. The coefficient of Pearson's correlation between the living standard values and GDP in current market prices by PPP per capita (% of the average value by the EU) in 2000 is: r (Pearson's) = 0.844 (significance level 0.01), in 2003 r (Pearson's) = 0.852 (significance level 0.01), and in 2007 r (Pearson's) = 0.858 (significance level 0.01).

This means that our hypothesis that the living standard is conditioned by the peculiarities of the economic growth can be confirmed, i.e. in the period 2000-2003 in regions with the higher living standard the slower economic growth proceeded (however, with high enough absolute values), in regions with the lower living standard the economic growth was faster (however, with not very high absolute values).

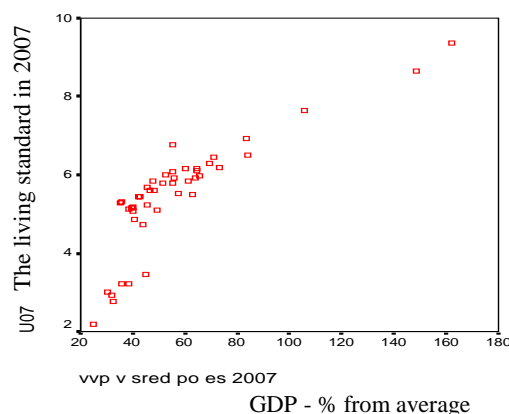


Figure 2. The chart of correlation between the living standard and GDP (% of average value by the EU) in 2007

Source: authors' calculations according to Eurostat data for 2007 and results of constructing the living standard integral indicator.

⁸ Pearson's coefficient of correlation

In the period 2003-2007 the GDP growth rate mediates rather the growth rate of the living standard, but not the value of the living standard itself. Thus, only having achieved definite improvements in the living standard, the GDP growth rate has the positive linear coherence with the growth rate of the living standard.

From the table below we can see the presence of strong negative linear connection of the living standard with the gross value added in agrarian sector. It can be explained in the following way. As economics and scientific-technical progress develop the farming appears to be "pressed" between two tendencies. On the one side, alongside with the supply growth total gain of the sector tends to decrease. On the other side, the prices for goods outrun the prices for agricultural output. In the result, incomes of agricultural production manufacturers decrease. In the long-term perspective farming incomes always remain behind the incomes in other sectors. As the farming is highly competitive branch, due to the market laws parallelly to the

fall of incomes the flow-out of farmers should occur from this branch into other – more profitable branches. However, in practice it does not always occur due to attachment of agrarian inhabitants towards the principles of life and work, it is conditioned by the social conservatism of this part of population. The entrance of new members into the EU in 2004 also became a definite reason for crisis phenomena in agricultural sector. Non-competitive farming of these countries suffers from the pressure of cheaper products from Europe. The EU provides grants, defined proportionally to the percent of population employed in the local farming production, agrarian areas and GDP. But it looks like that grants do not eliminate unprofitable reproduction of agricultural sector, but only fix the cost-based practice.

It is possible that in regions, where the new industrial activity and services concentrate, industrial markers are "washed out" from weak regions, but the effect of diffusion of new technologies in peripheral regions becomes due after some time only as a secondary effect.

Table 8. Pearson's coefficients of correlation between the gross value added in principal (basic) values (% of all gross value) by GDP sectors with values of the living standard integral indicator 2000, 2007

| Year | Gross value added - service | Gross value added – financial mediation* | Gross value added – industry | Gross value added – farming** |
|------|--------------------------------------|------------------------------------------|------------------------------|---------------------------------------|
| 2000 | r=0.579 (significance level 0,01) | r=0.631 (significance level 0,01) | r=0 | r=-0.856 (significance level 0,01) |
| 2007 | r=0.565 (significance level 0,01) | r=0.632 (significance level 0,01) | r=0 | r=-0.711 (significance level 0,01) |

Source: authors' calculations according to Eurostat data 2000-2008.

Note: * - and also real estate, rent and business-activities, ** - and also hunt, forestry, fishery.

Thus, the living standard was created basically on account of financial mediation services.

Conclusions

The evolution of economic theories shows the gradual transfer of emphasis from economic category „wealth” to „wellfare” and, further, to „living standard”. With the transfer of this emphasis the following processes also take place: the increase of the amount of components, complication of the system of above described evolutionizing categories, and also the transfer from macro- to micro- level. During the whole period of evolution, besides the macro- and micro- approaches, we can observe the emergence and further strengthening of attention towards the regional meso-approach with the purpose to reduce disproportions in incomes and unemployment.

The living standard is a complex social-economic category, based on objective statistical data and reflecting material and nonmaterial needs of population, and also conditions and the level of their satisfaction, which let a human be an active member of society, proceeding from peculiarities of existence of territorial people communities.

Analyzing the definition of the living standard the hierarchical structure is defined:

- a) the living standard integral indicator;
- b) its components: demographic, social and economic;
- c) features of components (correspondingly):
 - birth rate, death rate, education,
 - incomes, employment, unemployment, economics innovational potential,
 - infrastructure, security, free time;
- d) primary statistical markers.

The general tendency of alterations in the living standard of the population of NUTS 2 regions CEE countries in the period 2000-2007 during the transfer to market economics is its growth. Regions with lower values of the living standard increase the living standard faster, regions with the higher living standard increase the living standard slower (β -convergence). Polarization of studied regions by the living standard has decreased (σ -convergence).

The main economics factors conditioning the growth of the living standard of CEE population in the period from 2000 till 2007 are economic growth and sector structure of economics. In 2000-2003 in regions with the higher living standard the slower economic growth pre-

ceded, but in regions with the lower living standard the economic growth was faster, because the linear coherence between the living standard integral indicator values in 2003 and the GDP growth rate from 2000 till 2003 is negative and weak (significance level 0.05). However, there is no linear coherence between the GDP growth rate and the living Standard growth rate in the 2000-2003 period. In the period from 2000 till 2007 also there is no linear coherence between the living standard integral indicator values in 2007 and the GDP growth rate from 2003 till 2007. However, in this period the weak linear coherence between the GDP growth rate and the living standard growth rate is not observed (significance level 0.01). Thus, in the period since 2003 till 2007 there occurs the synchronization of the GDP growth rate and the living standard growth rate in all studied regions.

There is strong negative linear connection of the living standard with the gross value added in agrarian sector (significance level 0.01).

There is no linear connection of the living standard with the gross value added in industrial sector.

The living standard basically was created on the account of services, in particular – services of financial mediation – the positive average linear coherence is determined (significance level 0,01). Thus, in the period from 2000 till 2007 in NUTS 2 regions of CEE countries NUTS 2 there occurs degradation of real sector in CEE countries and shift into the side of financial services.

Problems and suggestions for their solution

In the modern scientific literature the interpretation of the concept „living standard” is not well-defined, sometimes is substituted by terms „wellfare”, „quality of life”, „mode of life”, and „cost of life”; that means all these terms are used as synonyms.

Suggestions for solution: Institutions that develop the list of markers, make their statistical analysis and review should define clearly the content of concepts „wellfare”, „quality of life”, „mode of life”, „cost of life” and „living standard”.

The changes in social economic situation are not being flexibly and duly included into the strategy of Latvia National development.

Suggestions for solution: It is possible to use the integral indicator methodology developed in this doctor paper for in time and proactive correction of the national development plan correspondingly to the real social-economic situation.

The monitoring of the living standard of the population of NUTS 2 regions CEE countries on the basis of statistical data with the purpose of fast exposure of problem areas (first of all in Latvia) in order to influence them by tools of social-economic politics, has not been realized.

Suggestions for solution: Organization and realization of monitoring of the living standard of the population of NUTS 2 regions CEE countries on the basis of statistical data, the development of recommendations for conducting social-economic politics at the regional level. The living standard integral indicator can be used as a marker of efficiency criterion for social-economic politics.

Careless attitude towards the disproportions in added value by economic sectors in NUTS 2 regions CEE countries (incl. Latvia) from 2000 till 2007 has lead to the dependence of the living standard on financial services mediation, which can influence the stability of the living standard growth.

Suggestions for solution: At the state and regional level the creators of the economic politics should in time determine the disproportion of values by the sectors of economics and its influence on the living standard with the purpose to determine the stable long-term growth of the living standard in Latvia.

Comments

Coefficient of determination – is squared Pearson’s correlation coefficient between two variables. It expresses the quantity of dispersion, common between two variables. The coefficient takes values from the interval [0;1]. The closer the value is to 1 the closer the model to empirical observations. Explained dispersion – the proportion of data variation, taken into consideration by the model. Variation – quantitative deviation of values of one and the same feature in separate units of the complex. The term “variation” has a Latin origin – variation, which means difference, alteration, diversity.

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