

Relationship between Population Aging and Lithuanian Regional Development Indicators

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Abstract

An aging population is defined in the scientific literature as changes in the structural composition of age of the population, which lead to growth in the population of those who are 60 year old and above. Aging of population is a social and economic problem that needs to be understood and addressed. Aging of population has a significant impact on national economies as well as on individual regions of the country. The old age index has a significant impact on regional employment and unemployment levels and budgets revenue and expenses, among other economic indicators. It is worth stressing that in order to improve a community's quality of life and reduce disparities between regions, it is necessary to continually assess the level of development and regional development opportunities. Evaluation of the regional socio-economic situation should be performed periodically, so that regional policy measures can be directed to the areas in the greatest need.

Keywords: population aging, regional development, social and economic consequences of aging.

Introduction

An aging population is one of the most relevant phenomena that have been causing a lot of problems in the recent years. The aging of a population has had a significant impact on national economies, particularly on the growth of the economic recession: the increasing number of retired older people increases the cost of their maintenance, while the employed people have to indirectly maintain these retired people more and more. There is no doubt that the aging of society has an influence in many different ways, not only on individual countries, but also on each country's different regions.

The problem of the research: the aging of a population and its impact on regional development in Lithuania has not been widely researched. Medaiskis, Gruzevskis and Mikulioniene (2007) analyzed the aging process and its consequences on Lithuania, especially on the labour market in the research "The effects of an aging population on the labour market and enterprises: trends and challenges". This study was carried out without a separate research on each individual region in Lithuania, so it did not compare

which regions have the most rapidly aging societies, and what had the biggest impact. Meanwhile, the aging of society is changing its social power and increasing the demand for health and social services. This trend means that the health insurance and other social security institutions will have higher costs, which in turn creates conditions that require the need to revise and adapt to these new needs for public resources in the areas of the economy (possibility to participate in the labour market, plus income and savings rates), politics (power in political and public organizations), social security (social security), health (meeting the requirements for service development) and human ecology (meeting the needs for housing, the environment, village infrastructure, transport, etc.).

Dicken (2007), Ignasiak-Szulc, Kosiedowski (2007) discussed the meaning of the Cohesion Policy of European Union in the development of countries and regions of Central and Eastern Europe. Padvezko and Ginevicius (2007) analyzed the changes in the evaluation of economic and social development of Lithuanian counties by multiple criteria methods.

The subject of the research: the relationship between the aging population and the development indicators of Lithuanian regions.

The aim of the research: to analyze the relationship between the aging population and the development indicators of Lithuanian regions.

The objectives of the research:

- to define the concept of aging,
- to determine the factors that have contributed to the aging of the population,
- to define the areas influenced by the aging effect,
- to analyze the relationship between the aging population and the development indicators within Lithuania.

The methods of the research: the article has been prepared by structuring and generalizing the content of studies carried out by different authors and scholars, by analysis of documents to codify a synthesis of descriptive statistical methods, time series

analysis, correlation analysis, and the conclusions arising from the generation thereof.

Concept and causes of aging

The aging of population is one of the major processes occurring in Europe. The aging of population has a profound impact on European economies, welfare and development, including prosperity and well-being, so it is necessary to gather and deepen the knowledge about how to promote older people's health and quality of life, and how to avoid the costly consequences of this process, which affect the entire population (The Swedish National Public Health Institute, 2007). Kligyte (2008) adds that the aging population is one of the most important problems of our century, which has a significant impact on our economy and social policy. The author (ibid.) argues that a person can treat his/her aging differently, because it depends on the individual's character and ability to continue an active, fulfilling style of life.

According to Rakauskiene (2006), the current process of aging is becoming a problem. The progress in addressing the process of aging has had medical breakthroughs and is the result of wealth increases, but it is also one of the major public concerns. The search for a balance of social benefits and taxes is one of the priorities in the government's policy.

In this article, only one aspect of this problem will be analyzed: the influence of an aging population on the development of regions in Lithuania. In order to clarify the meaning of this phenomenon, it is necessary to understand the peculiarity of the concept of aging.

In particular, one should distinguish between the two concepts: the old-age population and the aging population level (public). In essence, both cases refer to the same phenomenon, but the first term only refers to a temporal snapshot of the population age structure in the state, while the second term requires at least two points of time comparisons for measurements, it presents the dynamics of the phenomenon (Mikulioniene, 2002).

The aging of society is understood as structural changes in population, the increasing number and percentage of older people in the total population (Cepinskas, Kanisiauskiene, 2009, p. 20). However, Jurgelenas, Juozulynas, Boutiques and Greiciute (2007) say that aging is a complex process consisting of elderly people in their relationship with society and the trend of an increase in life expectancy. According to the authors (ibid.), aging is a social phenomenon, but in this article this phenomenon can be seen as a social, economic, or marketing phenomenon.

From an economics point of view, the aging of the population can be explained as structural po-

pulation changes with the increase in the retirement age and decline in the working-age population. As such, it has a negative impact on the social insurance budget, where the percentage of citizens making payments is decreasing while that percentage receiving allowances is increasing.

Mikulioniene (2002) distinguishes four basic old-age population level indicators:

- the level of old age – ratio of old people to entire population
- the average age of the population
- the age of the population – sex pyramid
- the old age index – ratio of old and young population.

The author (ibid.) emphasizes that in order to find the pace of population aging, it is sufficient to use any of the above-mentioned age-level indicators for measuring at least two different time points or a relatively older population and the population growth over a period of time. An increasing value of the indicator suggests that the present society is facing or will soon face the process of aging. Of course, it is necessary to accurately define the age increase in the number of people regarded as an aging population. Various sources identify the concept of an elderly man in different ways. Kanopiene and Mikulioniene (2006) argue that an old age limit is negotiable, and is selected depending on the purpose of analysis. The most common are:

- The United Nations (UN) recommendation: people 60 year old and above
- World Health Organization (WHO) recommendation: people 65 year old and above.

It is important to note the demographics of a society considered being old, which is one-fifth of elderly people to a quarter (20-25%) of the population.

In conclusion, it should be emphasized that for people who have reached 60 or 65 years, the threshold of falling within the category of "old" is conditional and based largely on economic factors such as those identified with the upper and lower limit of the working age.

No phenomenon happens for no reason, and aging is no exception. Bagdonavicius (2008) considers that the population age structure is related to the basic demographical processes: fertility, mortality, family formation and composition.

A group of authors (Medaiskis, Gruzevskis, Mikulioniene, 2007) have distinguished two basic determinants of aging:

- the expected increase in life expectancy,
- the decline in fertility.

Recently, an increasing number of researchers have drawn attention to another important factor leading to the aging of a population, which is emigration. Emigration accelerates aging. This is especially

important for smaller nations such as Lithuania (younger compatriots dispersed throughout the world, resulting in a substantial change in the relative composition of the population in Lithuania). Of course, immigration has the opposite effect: it slows the aging of a population, since immigrants are generally younger and have more children (Balseviciene, 2008).

Discussing the causes of aging, Mikulioniene (2002) emphasizes that the greatest influence on this phenomenon is seen with a decline in fertility and mortality, while the effects of the other two factors (migration and population age structure) on an aging of population are characterized as relatively modest and short-lived. It is worth highlighting that the author does not mention their effects on life expectancy and aging, but instead speaks of effects on the population structure in the previous century. The author (*ibid.*) argues that the previous age structure affects the formation of the demographic impact caused by the waves of migration.

It is interesting that in Lithuania the aging has mainly been due to a significant decline in the birth rate and an emigration of the younger population (Grabauskas, Gaizauskiene et al., 2007). In accordance with the information provided, it can be said that the main factors affecting the aging of population are mortality, declining birth rates, and emigration. Of course, there has been some influence by scientific and technological achievements in the fields of health and medicine.

Aging effects on the country and its regions

The aging of society is a complex phenomenon that leads to various social and economic impacts on each region, no matter what size it is. Suzmanas from the National Institute of Gerontology says that aging affects every country in every part of the world. Although there are important differences between developed and developing countries, global aging changes the social and economic nature of the planet and provides a serious challenge (Lithuania Gazette, 2009). Mikulioniene (2002) points out that demographers first drew attention to the implications of aging. It is agreed that because of its scale and irreversibility, it changes the demographics of a society and the social structure of production, distribution and consumption systems, and also has an impact on practically all the social groups and layers of social interaction.

According to Cepinskis and Kanisauskaite (2009), aging affects different sectors of society, therefore, this must be taken into account when addressing the need to create old-age policies, setting targets and creating measures for this area:

- Social impacts of the concept of old age and aging, performance status of old people, re-

lationships among generations, households and families including their formation / break-up cycles, income, savings, consumption and distribution, education, village infrastructure, housing requirements, and pension system requirements.

- Economic impact areas of social protection, the labour market and employment, and health care.

Certainly, the impact areas are closely related and influence each other. It should be emphasized that the impacts of the aging process that the authors have identified are not the only ones, and this model could still be complemented by the other ones that authors have mentioned in the impact areas.

Zalimiene (2002, p. 247) argues that with old age and social risk factors giving rise to the need for social protection, social protection policies need to ensure income and compensation for withdrawing from the labour market due to old age, as well as the specific services for personal and social needs (housing, home help, transport facilities, etc.).

Like other EU Member States, Lithuania each year has an increasing proportion of elderly people 60 year old and above (Addicted to news, 2008). All this means that a decreasing proportion of working age people will be able to retire. If the number of people who cease to work exceeds the number of those entering the labour market, a shortage of skilled workers will emerge (the Swedish National Institute of Public Health, 2007). For this reason, many European countries are facing the challenge of financing a pension system for the aging and shrinking labour force.

Other authors (Jurgelenas, Juozulynas, Butikis, Greiciute, 2007) identify one more problematic character of an aging population: an aging society is changing in its social power, with its increasing demand for health and social services. This feature means that the health insurance and other social security institutions will have higher costs because chronic heart disease and cancer remain the leading causes of death, particularly among older people. This will lead to huge costs for health care systems.

Mikulioniene (2002) says that the number of older people forces to review and adapt to the new needs for public resources in areas such as economy (possibility to participate in the labour market, plus income and savings rates), politics (power in political and public organizations), social security (social security), health (meeting the needs for service development), and human ecology (meeting the needs for housing, environment, village infrastructure, transport, etc.).

With this point of view, and according to a group of authors (Medaiskis, Gruzevskis, Mikulionie-

ne, 2007), it may be argued that in an aging society facing labour, consumption and investment savings through structural change, there will be new requirements for the pension system, the need to develop and optimize the social services system, to modernize health care, and for older people to take part in their own spiritual and psychological welfare.

An aging population will increase pension and health care spending, and this will increase public expenditures. In 2006, the European Commission announced that the member states will greatly increase spending on pensions, health care and long-term care, and that this will slow gross domestic product (GDP) growth. If policies remain unchanged, the potential of the European Union's economic growth rate will decrease by half by 2030 (the Lithuanian news, 2009). It should be emphasized that the increase in public spending leads to a higher price level in different regions, and that slowing the country's GDP growth leads to a slowing regional GDP growth.

The guidelines of the National Science Program "Social Challenges to National Security" **funded by the Research Council of Lithuania** (Government of the Republic of Lithuania, 2009) briefly and clearly state that the aging population increases the strain on the social security system and puts new demands on the labour market and labour resources, including personnel management. The older (60 year old and over) population has more impact on the functioning of society, but this factor was underestimated for the work environment and the public.

Summing up the analyses of the scientific literature, it is noted that most authors argue that the aging of society has the greatest influence on the labour market and the regional budget expenditures: with the increasing number of people who need to be paid pensions and other benefits the state budget expenditures are increasing as well. Another area that may be affected by the increasing number of older people is social services, which will need to be expanded. The aging population has a strong influence on the tax system and to the country's economic performance. It should be noted that with the aging of society, one of the main challenges is the need to provide a comprehensive solution to the problems arising.

Methodology of research on the impact of aging society on the economy of regions and social development

There are differences between regions all around the world. It should be emphasized that regional differences determine not only controversial meaning of a concept of a *region*, but also different rates of regional expansion, growth, and development. Regional development is understood as a single aspect of community life development in social, economic, and environmental protection, health service, technology, culture and recreation of a certain area at a certain point. Regional development includes economic and social processes in the political and cultural context (Nauseda, Tamosiunas, 2009).

According to Cibulskiene (2005), the economic situation of each region is determined by such factors: level of economic transformation, industrial and service sector development, geographical location, international economic relations, regional relations with the country's government and its ability to adapt to new conditions and to use them. All these factors led to significant regional differentiation in Lithuania and other countries.

It is important to emphasize that in order to improve the community's quality of life and reduce differences between regions, it is necessary to continually assess the level of regional development and opportunities for expansion. The evaluation of regional socio-economic situation should be performed periodically so that the implements of regional policy could be directed to those areas where they are necessary. The assessment of current situation should be done periodically so as to allow controlling finance that are used for balanced development of regional economic and other areas (Kilijoniene, Simanaviciene, 2005). According to Bivainis and Tamosiunas (2007), balanced regional development is a part of a balanced global development.

Various authors suggest different methods (see Table 1) for the assessment of the development or expansion on the regional level (see Table 1), i.e. different sets of indicators. It should be noted that there are no methods for assessing indicators of regional development and expansion, which would help to compare regions in terms of aging, as well as there is no method (i.e. there is no separate set of indicators) which would allow to assess the impact of this phenomenon on regions.

The comparison of methods for assessment of regional development and expansion

Authors (sources)	Indicators (number, group)	Comment	Aspects of aging ¹
Astrauskas (2004, p. 70)	<ul style="list-style-type: none"> – GDP per capita; – unemployment level; – direct foreign investment per capita; – income per capita; – average monthly wage. 	The main indicators that are used in the European Union countries and that help to identify regional social and economic differences.	<p>Only some indicators of impact of aging are included in these collections:</p> <ul style="list-style-type: none"> – GDP per capita; – unemployment level; – direct foreign investment per capita.
Pareigis and Dorofejeva (2004, p. 63)	<ul style="list-style-type: none"> – Gross domestic product; – unemployment level; – investments; – average monthly wage. 	By comparing these indicators with average indicators the level of regional social and economic development can be determined.	<ul style="list-style-type: none"> – unemployment level; – direct foreign investment per capita.
Bivainis and Tamosiunas (2007, p. 32)	<p>78 indicators:</p> <ul style="list-style-type: none"> – indicators of environmental condition (18 indicators); – indicators of economic development (30 indicators); – indicators of social development (22 indicators); – indicators of regional development (8 indicators). 	It is important to emphasize that the indicators of regional development show how some regional indicators change; however, they do not show regional differences at a particular moment.	<p>There is only one indicator that affects aging: natural increase in population.</p> <p>These indicators of impact of aging are included:</p> <ul style="list-style-type: none"> – GDP per capita; – employment level; – unemployment level; – expenses on social security; – relation of regional GDP per capita with the average of the country; – foreign investments.
Kilijoniene and Simanaviciene (2008, p. 144)	30 indicators are arranged in five groups.	By analyzing the results of the indicators the level of regional development at a particular moment can be assessed, and by analyzing the dynamics of these indicators the opportunities for regional development can be assessed.	<p>The indicators affecting the aging process are included:</p> <ul style="list-style-type: none"> – mortality; – birth rate; – natural increase in population; – migration. <p>In addition, there are many indicators of regional impact:</p> <ul style="list-style-type: none"> – part of regional GDP in the country's GDP; – GDP per capita; – employment level; – unemployment level.
Simanaviciene and Kilijoniene (2004, p. 95)	20 indicators are arranged in four groups.	This collection of indicators is the macroeconomic context for assessment of regional social and economic development.	<ul style="list-style-type: none"> – part of regional GDP in the country's GDP; – GDP per capita; – employment level; – unemployment level.

Source: composed by the authors

By comparing the above-mentioned areas of social and economic development and the development of assessment indicators (see Table 3) it is noted that Astrauskas (2004) and Pareigis with Dorofejeva (2004) data sets differ only by the fact that Pareigis and Dorofejeva (ibid.) in their evaluation methodology do not include income per capita and the use of all the absolute values of indicators, and Astrauskas (ibid.) uses the relative rates of GDP and FDI for the regional development and development assessment, i.e. rates per capita. Both these sets assess the economy of regions according to the main economic indicators. Methodology of Simaviciene and Kilijoniene (2004) for assessment of the social and economic

development is based on the analysis of macroeconomic factors and this analysis includes more indicators that are more accurate in the assessment of the situation in a country (as well as regions).

Bivainis and Tamosiunas (2007) as well as Kilijoniene and Simanaviciene (2008) suggest the largest amount of indicators for regional assessment. Their assessment methodology includes various areas of life and, therefore, helps to assess not only the regional economic development and expansion but also the other areas such as infrastructure, environmental protection, social development, etc.¹

¹ Aspects of aging are distinguished and included in the collection of analyzed indicators

The analysis of time series helped to assess the impact of aging on regional development in Lithuania and descriptive statistical method was used to discuss the indicators that define the aging, namely the level and the rate of senility. The correlation analysis was used in order to evaluate the effect of aging on the regions. This analysis revealed that there is a link between the analyzed phenomenon and regional economic indicators.

Changes in population aging in Lithuania and their links with economic indicators of regional development in Lithuania

A review of the Lithuanian population aging statistics of 2006-2009 shows that in 2006-2009 the population of 60 year olds and above has grown only in the districts of Kaunas and Vilnius, and continued declining in districts of Marijampole, Panevezys,

Siauliai, Taurage and Utena. In the remaining three districts (Alytus, Klaipeda, Telsiai) elderly population seems to have been stable, i.e. by 2008 the population of 60 year olds and above declined and in 2009 the population of this age increased, according to the data of 2009 of the Department of Statistics under the Government of Lithuania. Nevertheless, the level of population aging is better indicated by part of the respective population in the total population.

According to Mikulioniene and Stanaitis (2007), the population of elderly doubled in 100 years; people 60-year-old and above constituted only 9.3% of total Lithuanian population in 1897; while at the beginning of 2007 they accounted for 20.4% of total population in Lithuania. Table 2 provides data on old population in Lithuanian regions, as compared with the total population of these districts in 2006-2009.

Table 2

The level of senility in Lithuanian districts and the entire country in 2006-2009, %

	2006	2007	2008	2009
Alytus district	22.15	22.19	22.31	22.56
Kaunas district	20.64	20.77	20.92	21.11
Klaipeda district	19.16	19.22	19.29	19.45
Marijampole district	21.01	20.90	20.81	20.87
Panevezys district	22.43	22.54	22.66	22.80
Siauliai district	20.55	20.59	20.71	20.89
Taurage district	20.84	20.81	20.85	21.04
Telsiai district	18.86	18.89	18.92	19.09
Utena district	23.78	23.78	23.76	23.92
Vilnius district	19.01	19.06	19.14	19.27
Lithuanian	20.39	20.44	20.52	20.67

Source: composed by the authors with reference to the data of the Department of Statistics under the Lithuanian Government as of 2009

As it can be seen in Table 2, the territorial distribution of older people is not uniform. It should be emphasized that the population of 60 years and older has steadily increased in all districts, except for Marijampole and Utena, where growth was seen only in 2009, and in Taurage district, where the elderly population decreased in 2007 compared with 2006. Alytus, Panevezys and Utena districts in 2009 were the “oldest”, where elderly people comprised 24-22% of the total population. Demographically old societies are those where old people constitute a fifth or a quarter (20-25%) of the population; therefore, it can be noted that seven districts (Alytus, Kaunas, Marijampo-

le, Panevezys, Siauliai, Taurage and Utena) out of ten face this problem. Other three regions (Klaipeda, Telsiai and Vilnius districts) are close to this threshold because older people in these areas constitute more than 19% of the total population.

The old age index (factor) calculated in Lithuania reflects the aging process and shows how many 60-year-old and older people fall on every 100 children. Of course, each region has to ensure that the number of children would be higher than that of the elderly; however, the statistics reveals negative results (see Table 3).

The demographic rate of senility in 2006-2009

	2006	2007	2008	2009
Alytus district	131	137	145	151
Kaunas district	126	131	136	140
Klaipeda district	116	121	125	128
Marijampole district	114	117	121	125
Panevezys district	133	140	147	153
Siauliai district	119	125	131	137
Taurage district	112	116	122	127
Telsiai district	99	103	109	113
Utena district	158	165	172	178
Vilnius district	126	130	133	134
Lithuanian	124	129	134	137

Source: Department of Statistics under the Lithuanian Government as of 2009 b

Since 2006 this indicator has been steadily increasing in all districts, i.e. every year more and more people of 60 year old and above fell on 100 children under 15. It should be noted that the change in all districts is similar and low every year, i.e. ranges between 1 and 8 people. During the analyzed four years in Lithuania number elderly people per 100 children increased by 13 people. Better old age index changes over four years were only in districts of Klaipeda (an increase by 12 people), Marijampole (11) and Vilnius (8). In the period of 2006-2009 Alytus and Utena became the "oldest" districts: in these areas the number of 60 year old and older people per 100 children increased by 20 people. According to Gerviene and Raskinis (2008:26), with increasing number of elderly people and decreasing number of children it is possible to predict that in future labour supply will begin to decrease.

After reviewing the data of all demographic indexes, it is noted that not all societies in different regions can be called old because not in all of them 60 year old and older people constitute 20% or more in the total population. Nevertheless, although not all societies in general are old, the demographic aging of the population takes place in all districts of Lithuania; therefore, it is necessary to analyze the consequ-

ences of this process in all regions of Lithuania. It is important to emphasize that the aging process may affect different regions differently.

As already mentioned, aging of population has significant consequences for each country's and region's economy. One way to assess its impact on the economies of all regions of Lithuania is to do a correlation analysis that helps to assess the relationship between the two phenomena. According to Stumbrys (2006), the method of a correlation analysis does not reveal links between the reasons of the meaning origin, it only quantitatively measures up the strength of those ties. The correlation coefficient shows the relationship tension, and its symbol indicates the nature and direction of the relationship.

After the calculation of the age level and regional economic indicators, it is noted that relationships between these indicators are quite different in Lithuania. For this reason, it is difficult to draw conclusions in which regions the aging of population has the greatest impact. A correlation analysis between the old age index (factor) and the regional economic indicators was done in order to identify the main areas affected by aging of society. The obtained data is presented in Table 4.

Correlation between the old age index (factor) and the regional economic indicators

	Correlation of old age index (factor) to:					
	Unemployed, th.	Unemployment rate, %	Employed, th.	Employment rate, %	GDP, mln. LTL	GDP per capita from the average of the country, %
Alytus district	0.7663	0.7116	0.5219	0.0983	0.4172	0.8541
Kaunas district	0.7607	0.7253	-0.7003	-0.5884	0.5069	0.9969
Klaipeda district	0.7330	0.6804	-0.5845	-0.5299	0.4379	-0.9883
Marijampole district	0.7517	0.8148	-0.4294	-0.8777	0.3520	-0.1817
Panevezys district	0.6951	0.5646	0.0406	0.2544	0.1200	-0.8206
Siauliai district	0.7574	0.7570	-0.4064	-0.4593	0.3556	-0.5461
Taurage district	0.7220	0.8776	-0.8018	-0.8016	0.2665	-0.5514
Telsiai district	0.7605	0.7967	-0.8913	-0.9027	0.3887	0.1658
Utena district	0.6937	0.6718	-0.3988	-0.1803	0.3927	0.7285
Vilnius district	0.6288	0.6789	-0.3245	-0.5344	0.7429	0.3896
Lithuania	0.7001	0.7050	-0.5575	-0.5832	0.5427	-
	Correlation of old age index (factor) to:					
	FDI, mln. LTL	FDI per capita, LTL	Income, th. LTL	Income from taxes, th. LTL	Total expenses, LTL	Expenses on soc. security, %
Alytus district	-0.1791	-0.0138	0.9660	0.9998	0.9601	-0.7666
Kaunas district	0.6260	0.6428	0.8855	0.9950	0.8713	-0.7994
Klaipeda district	0.9192	0.9212	0.9005	0.9927	0.8669	-0.8434
Marijampole district	0.6919	0.7163	0.9752	1.0000	0.9700	-0.7414
Panevezys district	-0.4991	-0.4034	0.9565	0.9963	0.9495	-0.9040
Siauliai district	0.9616	0.9688	0.9660	0.9968	0.9635	-0.7872
Taurage district	0.8837	0.8912	0.9707	0.9998	0.9679	-0.7574
Telsiai district	-0.4265	-0.4165	0.9791	1.0000	0.9718	-0.7761
Utena district	0.8147	0.8433	0.9696	0.9975	0.9727	-0.7634
Vilnius district	0.9836	0.9838	0.8585	0.9857	0.8508	-0.7664
Lithuania	0.8490	0.8613	0.9280	0.9964	0.9190	-0.7968

Source: composed by the authors

As it can be seen in Table 4, the relation between the number of unemployed and the unemployment rate with the old age index is quite similar, i.e. both indicators are linked directly to the age factor, which ranges from medium to very strong. After analyzing the relationship between age factor and the employment rate, it can be noted that similar tendencies are seen in all districts, except in Alytus and Panevezys where these indexes are the opposite. But it is important to state that the relation varies in a great range: from very low to very strong connection. The aging society (according to the old age index) has a small direct impact on creating regional GDP. These indicators are linked to a low or medium (depending on district) connection, a strong connection between these indicators is observed only in Vilnius district. Accord-

ing to the results, it is noted that quite different correlation coefficient values are obtained when analyzing the relationship between the old age index and GDP per capita with regard to the average of the country. The relationship between these indicators differs in separate regions of Lithuania not only by the level of tension but also by the direction of the connection. After analyzing the relationship between age index and both FDI indicators, it is noted that the reversed and weak link is in Alytus district, the reversed and medium is in districts of Panevezys and Telsiai, and the correlation between analyzed indicators is direct in the rest of the districts, where strength ranges from medium to very strong.

It is important to note that the connection among all the indicators related to the regional bud-

get and old age index is strong or very strong. Expenses on social security differ more than any other indicator because the rate of this indicator and the age are related oppositely, and other indicators are related directly. To sum up the results on the correlation coefficient indicators of this group, it can be noted that an aging population (by age index) has a similar impact on the economy in all regions.

In summary, it is noted that the aging of society is closely related to many economic indicators of regions that were analyzed. According to old age level there appears high differentiation between regions, therefore it is difficult to determine which indicators are most affected by the aging of the population. Nevertheless, the relation of the old age factor to other indicators showed that aging of society has little effect on the regional GDP, GDP per capita, and the number of the employed and the greatest impact is on the income and expenses of districts as well as unemployment and employment levels.

Conclusions

1. The aging of society is the changes in the structure of inhabitants which determine the increase in the number of 60 year old and older people. The aging of society is both social and economic problem and it is necessary to understand and solve it. Misunderstanding or wrong understanding of the problem may be one of the reasons why a nation (and regions) suffers negative consequences.
2. The aging of society is determined by many factors. A birth-rate and mortality, growing number of elder people and their part in a total population, emigration, the growing relation between old people and children under 15 are the main factors.
3. The aging of society mostly affects the expenses of a regional budget because it increases expenses on social security: pensions, health care, etc. The review of scientific literature revealed that the aging of society has a rather high impact on labour market (employment and unemployment), GDP and other economic indicators such as direct foreign investments.
4. After evaluating the impact of aging of society on the economy of different regions in Lithuania according to two aging indicators (senility level and factor), it was noticed that the relation of senility level to the indicators of economy of regions is quite different, and senility factor in the regions is quite similar. The senility index (factor) has quite a high impact on all levels of regional employment and unemployment as well as on budget incomes and expenses; a low impact is on the generated value of GDP, GDP per capita, and the number of employed. This leads to conclusion that demographic aging of population has the greatest impact on labour market and regional budget. It is important to note that the process of aging is inversely related to the number of employed, the level of employment and expenses on social security. The relation with other analyzed indicators is direct.

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Visuomenės senėjimo ryšys su Lietuvos regionų plėtros rodikliais

Santrauka

Visuomenės senėjimas – tai vienas aktualiausių reiškinių, keliantis nemažai problemų pastaraisiais metais. Didėjantis pagyvenusių žmonių skaičius daro nemažą įtaką šalių ekonomikai, ypač dėl ekonomikos recesijos: augantis senyvo amžiaus žmonių skaičius didina valstybių išlaidas jiems išlaikyti, dirbantys asmenys netiesiogiai turi išlaikyti vis daugiau į užtarnautą poilsį išėjusių žmonių. Neabejojama, kad visuomenės senėjimas skirtingai veikia ne tik atskiras valstybes, bet ir kiekvienos šalies atskirus regionus.

Tyrimo problemą gali formuluoti taip: mažai ištirtas visuomenės senėjimo procesas Lietuvos regionuose ir šio proceso įtaka kiekvienam regionui. Medaiskis, Gruževskis ir Mikulionienė 2007 m. atliktame tyrime „Visuomenės senėjimo padariniai darbo rinkai ir įmonėms: tendencijos ir iššūkiai“ analizavo visuomenės senėjimo procesą ir pasekmes visai Lietuvai, ypač darbo rinkai. Šis tyrimas atliktas netiriant atskirai kiekvieno Lietuvos regiono, todėl neleidžia palyginti, kuriuose regionuose visuomenės senėjimas vyksta sparčiausiai ir sukelia didžiausias pasekmes. Tuo tarpu, senstant visuomenei, keičiasi jos socialinė galia,

didėja sveikatos ir socialinių paslaugų poreikis. Šis požymis reiškia, kad valstybių ligonių kasos ir kitos socialinio draudimo įstaigos turės didesnių išlaidų, o tai lems būtinumą peržiūrėti ir naujiems poreikiams pritaikyti visuomenės išteklius ekonomikos (galimybės dalyvauti darbo rinkoje, pajamų ir santaupų lygis), politikos (galia politinėse ir visuomeninėse organizacijose), socialinio saugumo (socialinės garantijos), sveikatos apsaugos (poreikius atitinkančių paslaugų plėtra) ir žmogaus ekologijos (poreikius atitinkantys būstai, aplinka, gyvenvietės infrastruktūra, susisiekimas ir pan.) sferose.

Tyrimo objektas – visuomenės senėjimo įtaka Lietuvos regionų plėtrai.

Tyrimo tikslas – išanalizuoti visuomenės senėjimo įtaką Lietuvos regionams.

Šiam tikslui pasiekti išsikelti tokie **uždaviniai**:

- 1) apibrėžti visuomenės senėjimo sampratą;
- 2) nustatyti veiksnius, sukeliančius visuomenės senėjimą;
- 3) nustatyti visuomenės senėjimo įtakos regionams sritis;

- 4) išanalizuoti senstančios visuomenės įtaką Lietuvos regionų plėtrai.

Tyrimo metodai. Atliekant visuomenės senėjimo poveikio regionų plėtrai tyrimą buvo taikyti mokslinės literatūros ir teisinių dokumentų analizės, sisteminės analizės, sintezės, aprašomosios statistikos metodai, laiko eilučių ir koreliacinė analizė.

Apibendrinant įvairių autorių nuomonę, visuomenės senėjimas gali būti apibūdinamas kaip gyventojų struktūros pokyčiai, kurie lemia 60 m. ir vyresnių gyventojų daugėjimą. Visuomenės senėjimas – tiek socialinė, tiek ekonominė problema, kurią būtina suprasti ir spręsti. Nesupratimas ar blogas problemos supratimas gali būti viena priežasčių, kodėl valstybė (ir regionai) patiria neigiamų pasekmių.

Visuomenės senėjimą lemia daugelis veiksnių. Pagrindiniai yra šie: gimstamumas ir mirtingumas, didėjantis senyvo amžiaus žmonių skaičius ir jų dalis bendrame gyventojų skaičiuje, emigracija, senyvo amžiaus ir vaikų iki 15 m. santykio didėjimas. Senstanti visuomenė labiausiai veikia regionų biudžeto išlaidas, nes didina išlaidas socialinei apsaugai: pensijoms, sveikatos apsaugai ir pan. Mokslinės literatūros apžvalga atskleidė, kad nemažą įtaką visuomenės senėjimas turi darbo rinkai (užimtumui ir nedarbui), BVP ir regionų plėtros rodikliams.

Visame pasaulyje vyrauja netolygumai tarp atskirų regionų. Akcentuotina, kad regionų skirtumai lemia ne tik nevienareikšmę sąvokos *regionas* prasmę, bet taip pat skirtingus regionų plėtros, augimo ir vystymosi tempus. Regionų išsivystymas suprantamas kaip vientisas bendruomenės gyvenimo socialinio, ekonominio, aplinkosaugos, sveikatos apsaugos, technologijos, kultūros ir rekreacijos aspektų išvystymas tam tikroje teritorijoje tam tikru momentu.

Verta pabrėžti, kad siekiant pagerinti bendruomenės gyvenimo kokybę ir sumažinti skirtumus tarp regionų,

būtina nuolat vertinti regionų išsivystymo lygį bei plėtros galimybes. Regionų socialinės-ekonominės padėties vertinimas turėtų būti atliekamas periodiškai, kad regioninės politikos priemonės būtų galima nukreipti į tuos regionus, kuriems jų labiausiai reikia. Periodiškai atliekamas esamos situacijos vertinimas leidžia kontroliuoti lėšas, kurios skiriamos regionų ekonominei ir kitų sričių darniai plėtrai

Regionų išsivystymo lygiui ar plėtrai įvertinti įvairūs autoriai pateikia skirtingas metodikas, t. y. skirtingus rodiklių rinkinius. Reikia paminėti, kad nė vienoje regionų plėtrą ir išsivystymą vertinančių metodikų nėra išskiriami rodikliai / rodiklių grupė, pagal kurią būtų galima palyginti regionus visuomenės senėjimo aspektu, taip pat nėra sudarytos metodikos (t. y. nėra sukurto atskiro rodiklių rinkinio), kurią pasitelkus būtų galima įvertinti šio reiškinio poveikį regionams.

Įvertinus visuomenės senėjimo įtaką Lietuvos regionų ekonomikai pagal du senėjimo rodiklius – senatvės lygį ir senatvės koeficientą, pastebėta, kad senatvės lygio ryšys su regionų ekonomikos rodikliais gana skirtingas, o senatvės koeficiento – pagal apskritis ganėtinai panašus. Senatvės indeksas (koeficientas) turi nemažą įtaką visų regionų užimtumo ir nedarbo lygiams, biudžetų pajamoms ir išlaidoms, mažas ryšys yra tarp regionų sukuriamos BVP vertės, BVP, tenkančio vienam gyventojui, bei užimtųjų skaičiaus. Todėl daroma išvada, kad demografinis gyventojų senėjimas praktiškai didžiausią poveikį turi darbo rinkai ir apskričių biudžetams. Svarbu pabrėžti, kad senėjimo procesas atvirkščiai susijęs su užimtųjų skaičiumi, užimtumo lygiu bei išlaidomis socialinei apsaugai, o su kitais analizuojamais rodikliais ryšys yra tiesioginis.

Pagrindiniai žodžiai: visuomenės senėjimas, regionų plėtra, socialinės ir ekonominės visuomenės senėjimo pasekmės.

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