THE EFFECTS OF AGE-STRUCTURE CHANGES ON THE DEVELOPMENT OF SOCIAL AND ECONOMIC PROCESSES

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Abstract

The changing age structure of the population and the consequent population ageing belong undoubtedly among the most discussed issues of the 21st century. Demographic ageing is most often considered as a negative phenomenon. However, changes in the age structure offer many opportunities that may bring benefits to societies and economies. It creates the chance of the positive utilization of increased workforce that contributes to the increase of GDP and productivity in countries with appropriate policy measures − this phenomenon is considered as the demographic dividend. Submitted paper analyzes the process of population ageing and the impact of social, economic and technological changes on demographic indicators. The paper includes selected demographic and statistical processes and methods.

Key words: population age structure, demographic ageing, demographic dividend, life expectancy.

JEL Code: J110, J140.

Introduction

The development of number, composition of the population and demographic processes such as natality, fertility or mortality is variable in time. From the demographic history demographers have come to interpret the two major time breaks in the population development − the demographic revolution and the second demographic transition, which is typical for major changes − either decrease or increase − in the development of demographic processes.

Demographic revolution (demographic transition) is a process that began at the turn of the 17th and 18th century and is connected with the period of industrialization. From this revolution we consider the distribution of the developed and developing countries. The demographic revolution began in France and England, and gradually expanded to other European countries. During the demographic transition both fertility and mortality decreased. Infant mortality, by which the level of development of a country was characterized, improved significantly.

The beginning and the progress of the demographic revolution was different for each country, but for its end we consider the 20th century, the period after World War II. Changes in the demographic behavior after World War II are known as the second demographic transition. The second demographic transition began in developed countries of Western and Northern Europe in the period 1965-1985, in the post-socialist countries after the change of political regime in the early 90s of the 20th century. The second demographic transformation is most often associated with changes in demographic characteristics of Western society, with changes in the value orientation of the people and an increase of individualism. For this period of population development a decline in fertility and birth rates is typical (often below the level of simple reproduction = 2.1 children). Due to advanced forms of contraception women regulate and plan the number of their children and the age at first birth is increasing, together with the age at first marriage (Pavlík, 2009). The result of demographic revolution is the current population growth, which is manifested in the form of an aging population and increased life expectancy.

1 Age-structure changes in selected European countries

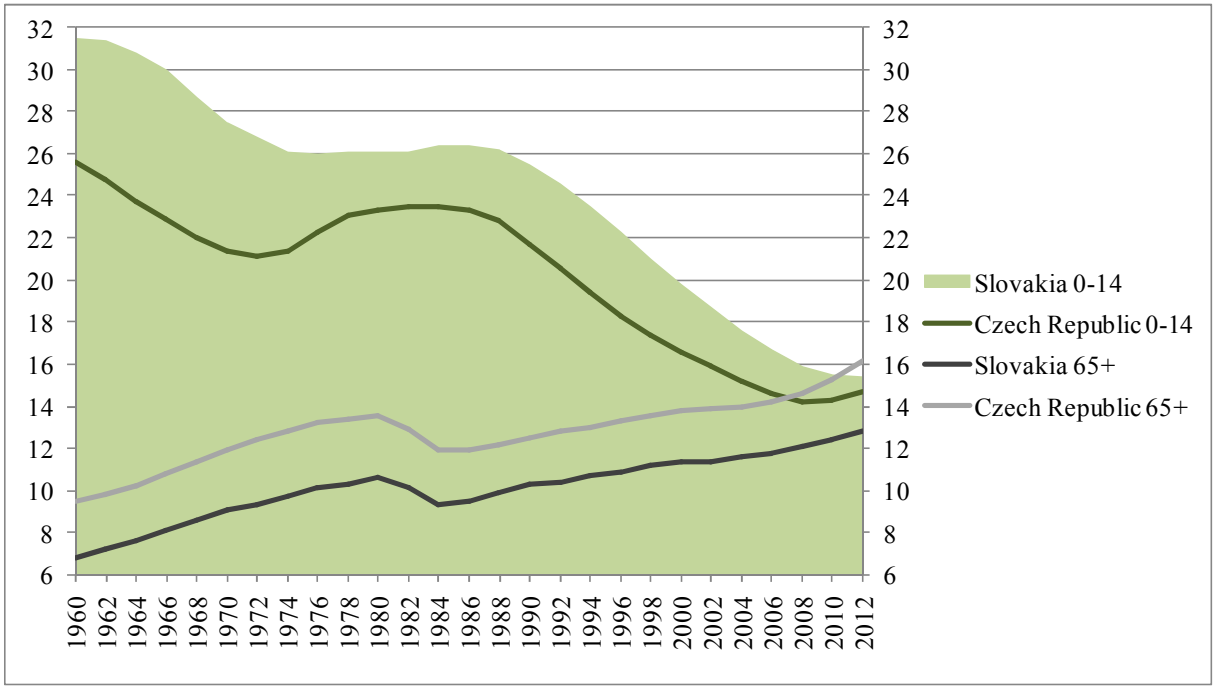
At present, the majority of developed countries deal with the phenomenon of population ageing. This process is accompanied by an increasing rate of elderly persons, especially in economically developed countries. In economically developed countries with low levels of mortality, life expectancy at birth for both sexes increased from around 30 to 45 years in the middle of the 19th century to about 80 years in recent periods (Meslé and Vallin, 2011). The longevity expansion resulted in a considerable growth of the elderly population and led to increasing concern about inequalities in the lifespan (length of life) among populations (Hirouchi, Ouellette, Cheung, Robine; 2013).

1.1 Demographic dividend

Changes in the age structure of the population do not necessarily represent a negative phenomenon. In case that during the period of the demographic revolution birth rate is declining and the dependency ratio of young people is decreasing as well, while the share of productive population is high, there is a chance for economic growth and productivity in the country. The demographic dividend represents an increase of economic growth as a result of higher share of productive people in the total population and occurs when there is a different growth of economically active population and total population.

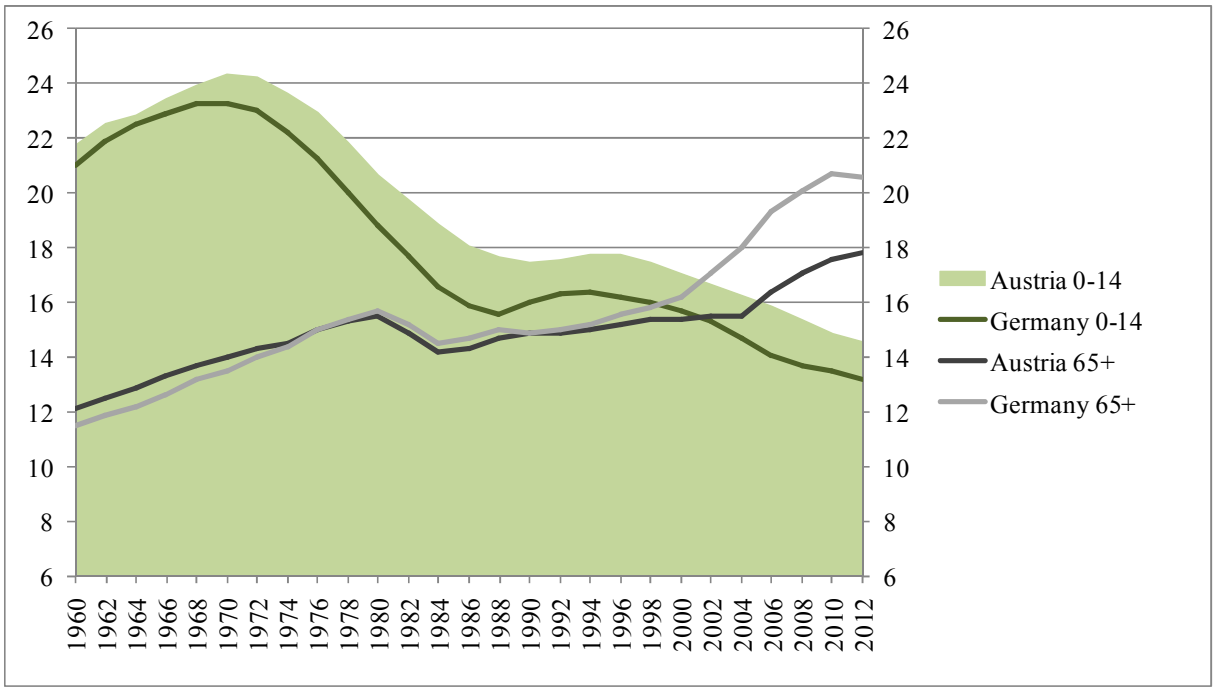
The predominance of the share of productive individuals may then contribute to the increasing GDP per capita (Matejková, 2011). The role of public authorities is to create an adequate number of job opportunities for the high proportion of employed persons in order to positively contribute to the GDP. For the possible onset of the demographic dividend we consider the state where the share of children (0-14 years) falls below 30%, while the proportion of grandparent component (65+) is less than 15% (United Nations, 2006). In the Czech Republic, the proportion of people 65 years and older was below 15% until 2008, but as a result of the population ageing the proportion of older people is increasing. In 2010, the share of people aged 65+ was 15.3% and in 2012 even 16.2%. In Slovakia, the proportion of the elderly people hasn´t reached the value of 15% until now (the proportion of the elderly was 12.8% in 2012). In Western European countries, where the demographic revolution started earlier than in the countries of Eastern and Central Europe, we see that the proportion of seniors reached 15% already in 1976. In 2012, the proportion of persons aged 65+ was 20.6% in Germany and 17 8% in Austria (see figure 1 and figure 2).

Figure 1: The development of the proportion of population aged 0-14 and 65+ between years 1960-2012 in the Czech Republic and Slovakia (%)



Source: Eurostat Database, own construction

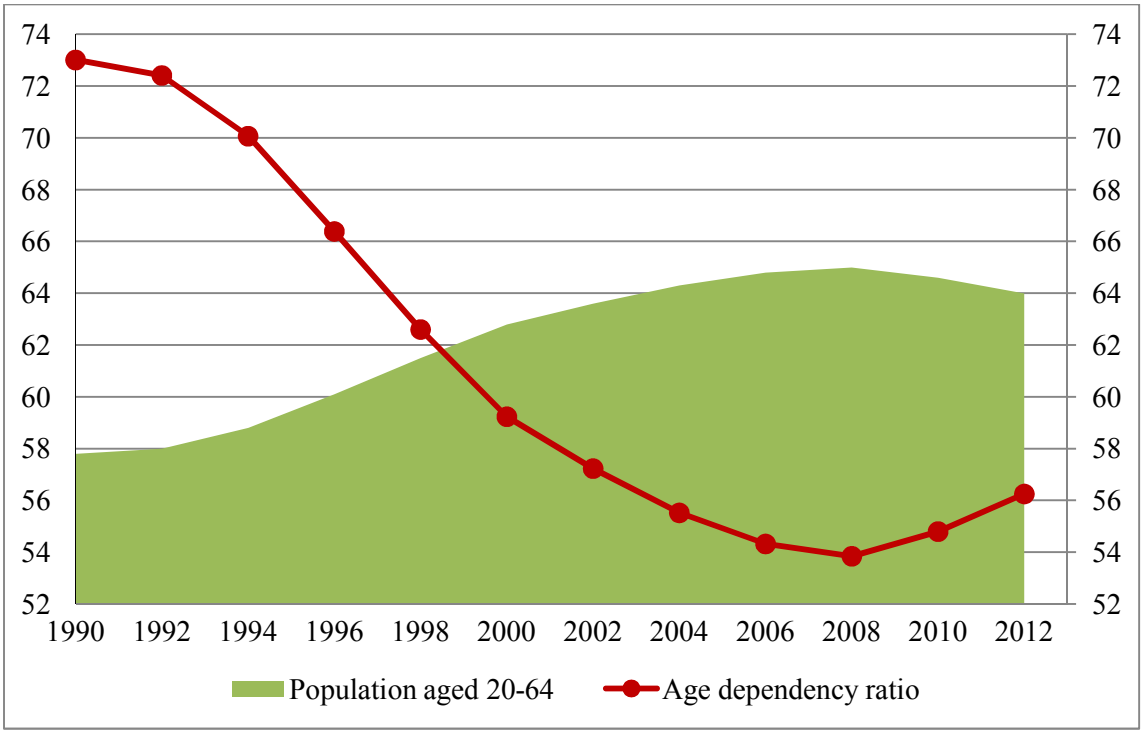
Figure 2: The development of the proportion of population aged 0-14 and 65+ between years 1960-2012 in Germany and Austria (%)



Source: Eurostat Database, own construction

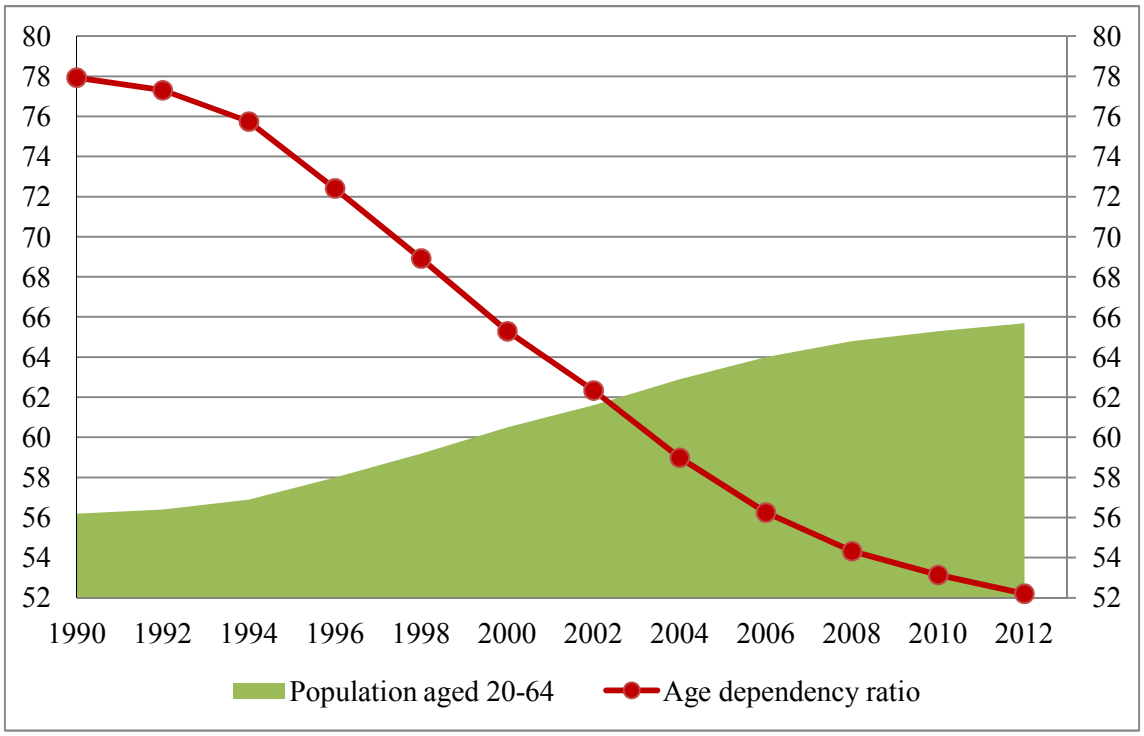
On figures 3, 4, 5 and 6, we see the development of the age dependency ratio (the ratio of people aged 0-19 years and 65 years and older to productive persons aged 20-64). We see the difference between the Western and the Eastern Bloc. In Slovakia and in the Czech Republic the age dependency ratio is decreasing − this is due to the decline in the share of young people aged 0-19, while the number of employed persons is high. Thus, the value of the age dependency ratio is decreasing (see figures 3 and 4). Unfavorable situation may occur in the future, when the significant proportion of economic active people born in the period of "baby boom" reach retirement age. Countries will face a demographic challenge, which must be adapted to labor markets. Proportion of workers will be lower and the proportion of retirees will burden the system. One possible solution will be time jobs, part-time work and maintaining older workforce as long as possible in the labor market. In the Czech Republic the increase of older aged labour force will be caused not only by the irregularities in the age structure, but also by the permanent increase of retirement age. Because of these two reasons the proportion of people in productive age older 50 years will almost double during next two decades. The average age of people in their productive age will be increasing (Fiala, Langhamrová, 2014). From figures 5 and 6 we see that in case of Austria and Germany the age dependency ratio exceeds the proportion of productive people (in Germany the age dependency ratio = 63.4% in 2012 and in Austria = 61.8% in 2012).

Figure 3: The development of the Age dependency ratio compared to the proportion of productive population (20-64) in the Czech Republic between years 1990-2012 (%)



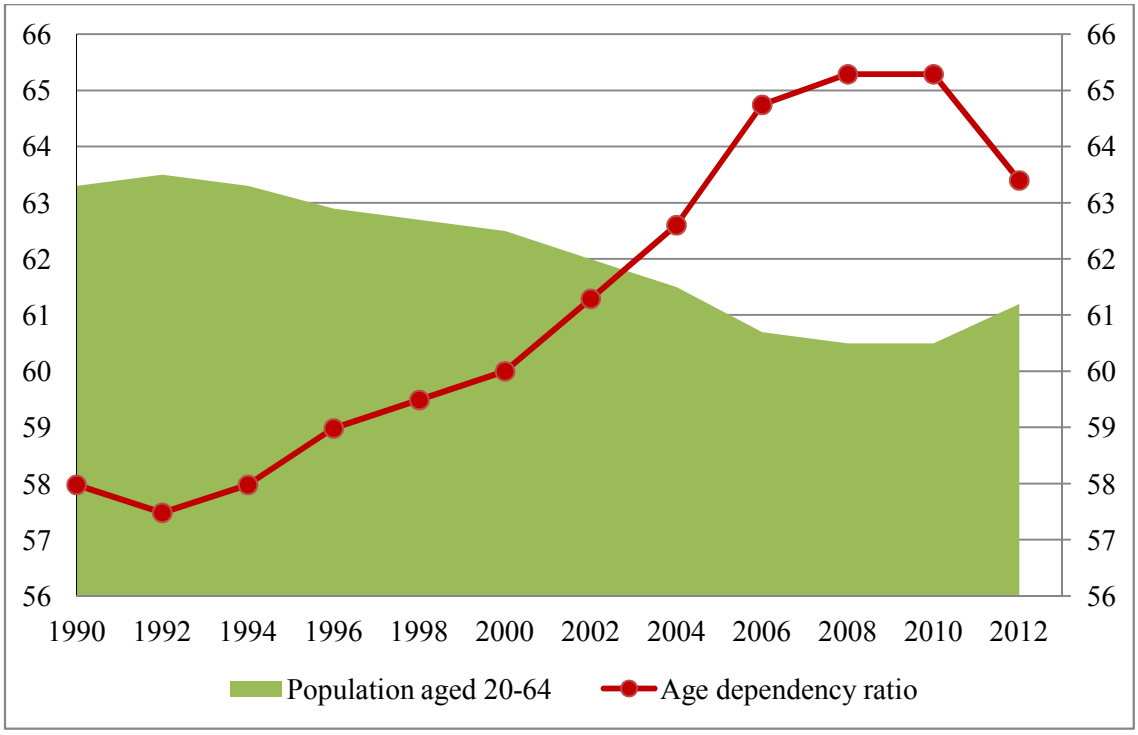
Source: Eurostat Database, own construction

Figure 4: The development of the Age dependency ratio compared to the proportion of productive population (20-64) in Slovakia between years 1990-2012 (%)



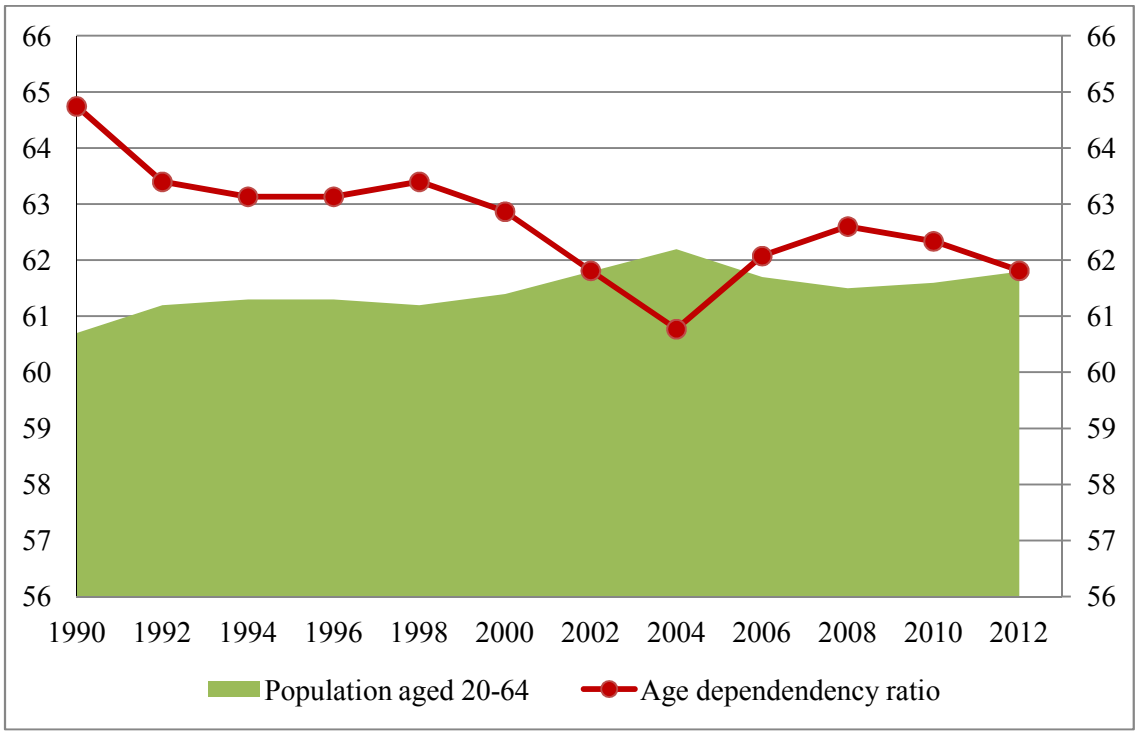
Source: Eurostat Database, own construction

Figure 5: The development of the Age dependency ratio compared to the proportion of productive population (20-64) in Germany between years 1990-2012 (%)



Source: Eurostat Database, own construction

Figure 6: The development of the Age dependency ratio compared to the proportion of productive population in Austria (20-64) between years 1990-2012 (%)

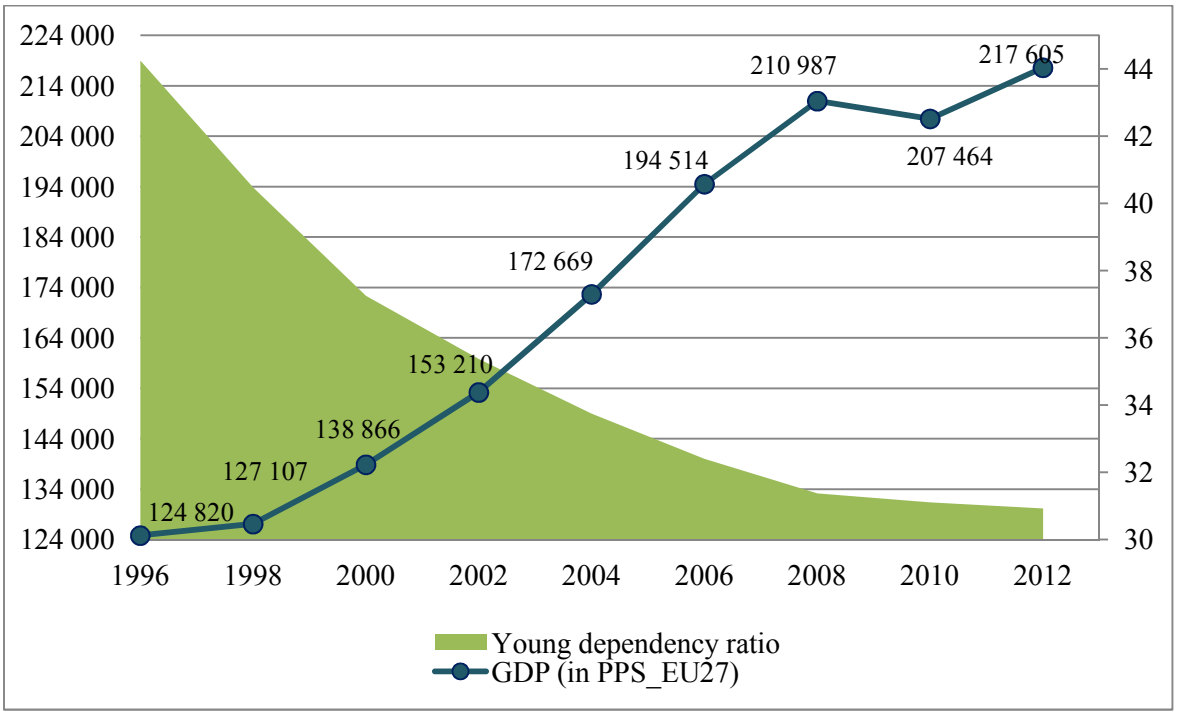


Source: Eurostat Database, own construction

1.2 Correlation between GDP and Young age dependency ratio in the Czech Republic

It is reported that population ageing may bring possible benefits and opportunities for the society in the form of increased rates of GDP. This is due to the increased proportion of economically active persons who produce and contribute to the increase in the level of GDP. This opportunity, to which the state must respond with appropriate measures, such as establishing an appropriate number of job vacancies, is called the demographic dividend. Furthermore, some studies indicate that in case the GDP growth is higher than the population growth, the standard of living conditions of the population improves (Matejková, 2011). On figure 7, we see the correlation between the evolution of GDP (in purchasing power parities) and the young dependency ratio in the Czech Republic from 1996 to 2012. In the period when the share of the pre-productive population is low and the share of the post-productive population grows, there is a space for the demographic dividend as a form of economic growth. It is due to the fact that the pre-productive population does not burden the working-age population in a large extent (Matejková, 2011). The next phase of demographic changes is the population ageing, which besides the lack of labor force also causes decrease in the amount of collected taxes on income (Langhamrová, Fiala, 2010).

Figure 7: The development of the Young dependency ratio and GDP per capita in the Czech Republic between years 1996-2012



Source: Eurostat Database, own construction

Conclusion

In the submitted paper, we highlighted the population ageing and the changes in the age structure of the population in the Czech Republic, Slovakia, Germany and Austria. The Czech Republic and Slovakia are currently undergoing demographic changes and getting closer to countries of Western Europe, but their population development is time shifted with significant technological and social changes only from the beginning of the 90s of the 20th century. In Germany and Austria, these processes have taken place much earlier (for example, the proportion of people aged 65+ in Germany was 14% in the 70s, while in the Czech Republic this value appeared for the first time in 2004). We confirmed the indirect linear relationship between the amount of GDP and the young dependency ratio (r = -0.93).

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References

EUROSTAT. European Commission Database. 2014. http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

FIALA, T., LANGHAMROVÁ, J. 2014. Increase of Labor Force of Older Age – Challenge for the Czech Republic in Next Decade. In: *17th International Conference Enterprise and Competitive Environment 2014.* [online] Brno, 06.03.2014 – 07.03.2014. Amsterdam: Elsevier, 2014, s. 144–153. Procedia Economics and Finance 12. ISSN 2212-5671. URL: http://www.sciencedirect.com/science/article/pii/S221256711400330X

HORIUCHI, S., OULLETTE, N., CHEUNG, S.L.K., ROBINE, J.M. 2013. Modal age at death: lifespan indicator in the era of longevity extension. In Vienna Yearbook of Population Research 2013. Vol. 13, pp. 37-69.

LANGHAMROVÁ, J., FIALA, T. *Ekonomické důsledky stárnutí populace České republiky.* In: Reprodukce lidského kapitálu. Praha. 2010. [online] http://kdem.vse.cz/resources/relik10/PDFucastnici/Fiala_Langhamrova.pdf

MATEJKOVÁ, J. 2011. *Analýza a modelovanie vplyvu ekonomických a sociálnych procesov na vývoj vybraných demografických ukazovateľov v krajinách V4* [online]. Bratislava, 2011. http://www.iam.fmph.uniba.sk/studium/efm/diplomovky/2011/matejkova/diplomovka.pdf. Diplomová práce. Univerzita Komenského v Bratislave.

MESLÉ, F., VALLIN, J. 2011. Historical Trends in Mortality. In *International Handbook of Adult Mortality,* ed. by R. G. Rogers and E. M. Crimmins, 9-47. New York: Springer.

PAVLÍK, Z. et al. *Demografie (nejen) pro demografy*. Praha: SLON, 2009, 241 s. ISBN 978-80-7419-012-4.

Kolektív autorov United Nations. 2006, *World population to 2300*, USA: United Nations 2004, 254 s.

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