

DEMOGRAPHIC AGING OF THE EUROPEAN UNION COUNTRIES

Veronika Fričová, Zdeněk Matěja

Abstract: This paper deals with the issue of demographic aging of the European Union. Its aim is to describe the process of demographic aging, and to evaluate the demographic situation of the European Union at the turn of the third millennium. Today, demographic aging is considered one of the most important challenges of many developed economies. Its range and speed are particularly dependent on the development of average life expectancy, the level of fertility and migration process. The demographic changes rank among the most important future challenges of the European Union as a whole and its member states. Demographic aging impacts the society and its economics, infrastructure and government. Hence, the great scope strategies in the fields of economics, spatial planning, education, transportation, accommodation, and social inclusion having to take into account all the factors provoked by an aging population. It is appropriate to remember that the increasing share of the older population leads an increase in both their contributions to society and their needs from society or consumers' and citizens' requirements and expectations.

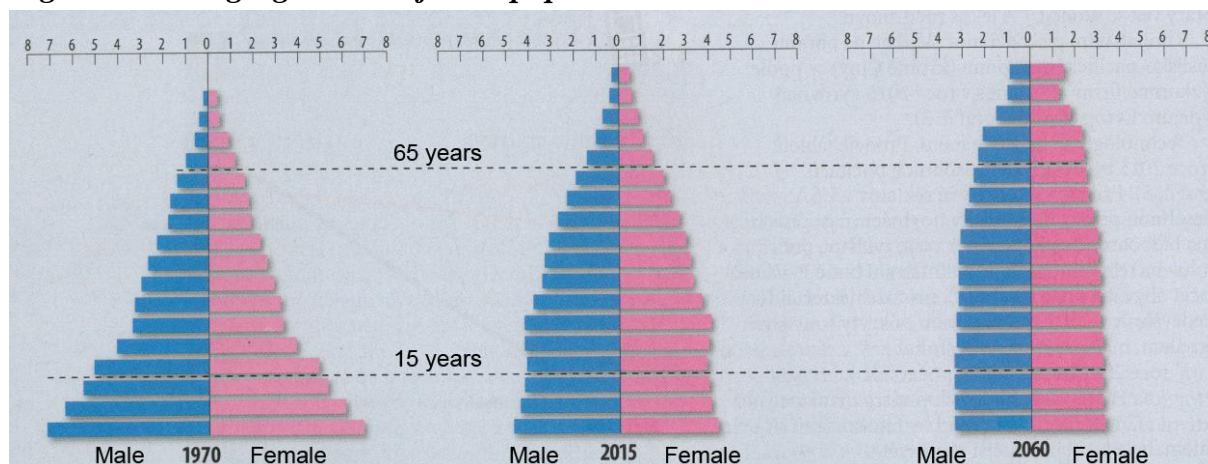
Keywords: Demographic aging, age structure of the population, fertility, life expectancy, European Union.

JEL Classification: J11, R23.

Introduction

The process of demographic aging in developed countries brings many economic, social and political issues. It is manifested by changes in the age structure of the population, characterized mainly by the increasing proportion of retirees (65+) at the expense of the rest of the population. The range and rate of population aging is primarily dependent on the development of average life expectancy, birth rate level and migration.

Fig. 1: World aging as a % of total population



Source: [12]

When looking at the structure of the world population in 1970, 2015 and 2060 (prognosis) in Fig. 1, the process of demographic aging is clearly visible, but the traditional shape of the visualization of the population structure – the age pyramid – is disappearing. Due to declining fertility, a rapid narrowing of the base is occurring on one hand, represented by the pre-productive generation (up to 15 years), and on the other hand, there can be clearly seen an increase in life expectancy and the associated increase in the older population – post-productive generation (65+).

In connection to the declining birth rate in developed countries, new theoretical approaches and opinions began to form at the turn of the third millennium. One of the most important theories dealing with this issue is currently the so-called theory of low fertility, which combines the ideas of four theoretical approaches – rational choice theory, risk aversion theory, post-materialist values theory, and the theory of gender equality. [10]

The uneven temporal and territorial development in different parts of the world is reflected by the current state of demographic aging in the world. The aging population is so far located mainly in the developed parts of the world (Europe, North America, Australia, New Zealand and Japan), but gradually it starting to appear already in some developing countries. Japan, however, has the oldest population in the world, but Europe is the oldest macro-region in the world. [8]

The purpose of this paper is to describe the problems of demographic aging and subsequently evaluate the demographic situation in its context in the European Union countries at the turn of the third millennium.

1 The issue of demographic aging

It is possible to find various definitions for demographic aging, but usually they do not significantly differ. Gavrilov and Heuveline describe the aging process as a general phenomenon for the procedure in the age structure of the population from the youngest to the oldest [7].

In the United Nations' report concerning World Population Aging 1950 - 2050 [14], population aging is described and explained as a process resulting from the fact that older residents form the greater part of the total population.

According to Kalibová, the aging of society is occurring due to changes in the nature of demographic reproduction, thus changing the ratio of the children and senior component in the population. It further states that two types of demographic aging can be characterized. The first is the aging at the bottom of the age pyramid. It is occurring due to reduction in fertility levels, thus slowing the growth of the children component in society. The second type of aging is on top of the age pyramid, caused by the improvement in mortality rates. These types of aging can take place simultaneously or with a small-time interval. [9]

Koschin holds the same view, adding the knowledge that the size of the grandparent generation is increasing along with the decrease in mortality. This phenomenon is referred to as absolute aging. Conversely, the fertility rate is decreasing with relative aging, and the ratio of the children's generation along with it. [11]

Rabušic characterizes demographic aging as a long-term process in which the age structure of the population is gradually changing. People older than 65 years of age are

dominant in society, and their share is increasing simultaneously with a decline in people younger than 15 years of age. According to him, the important thing is also to distinguish between population aging and the aging of an individual. An aging population, in contrast to an individual, can become younger. [13]

It must also be mentioned that the process of demographic aging, among other things, is a consequence of the demographic revolution often also called the demographic transition. This phenomenon is one of the key theories in demographics. Demographic transition, according to De Vaan Kaa, is caused by population aging, ended for decades in most developed countries. Now, however, other changes can be seen in society, which can be referred to as a second demographic transition. [15]

The old age index, dependency indices and the index of economic burden can be used for the measurement of demographic aging. The old age index measures the number of people of post-productive age and pre-productive age in society. The dependency index has two appearances; the first evaluates the dependence of the pre-productive generation, the second dependence of the post-productive generation, always towards the productive age generation. The economic burden index is then the sum of both dependency indices. The values of these indices may also serve to reflect the possible implications of demographic population aging in society and the economy.

2 Demographic aging of European Union

Demographic changes are considered one of the greatest future challenges of the European Union. In the past, a declining population in Europe was mainly due to famines and large infant mortality, at present mainly due to a decline in marriages, changing patterns of family life, the older age of parents, growing affluence, and also problems associated with unemployment. [1]

The low birth rate already lasting several years and accompanied by the steady increase in average life expectancy suggests profound changes in population structure will occur in the European Union in the first half of the 21st century. This means that globally it may have to face a loss of competitiveness and a slowdown in economic growth compared with the parts of the world in which a significant demographic rise is occurring.

The European Commission launched reflections on this issue and proposed a strategy for the five key areas through its communication by means of “The Demographic Future of Europe – Let’s Take Advantage of the Problem” [2]. The key areas are demographic renewal, longer and more active life with higher quality, a more efficient Europe through innovations, the better integration of immigrants, ensuring social security and solidarity among generations.

Demographic renewal is associated with the creation of conditions under which all Europeans could realize their desire to have children. The basic requirement is the possibility of combining work, family and a personal life – because women still have to choose between work and family too often. Europe needs to increase the rate of labor activity of women, young people and older people in order to achieve a better balance between workers and retirees. There is interest in reducing the number of early retirements from the labor market and develop an active aging strategy requiring an investment in education and ensuring high quality working conditions throughout life.

Future economic growth will increasingly depend on the condition of an increased productivity and abilities to innovate, thus investment in education, research and development. It will also depend on how enterprises will be able to exploit new market opportunities associated with the needs of an older population, but also with an increasing number of significantly older people who need social and health care. The better integration of immigrants is also desirable. Immigration will not prevent aging, but along with how the active age population is declining, an increased demand for immigrants can be expected in the labor market. The aging brings increased expenses on social security, health care and long-term care, which places a considerable burden on public finances. For the sustainability of funding it is, however, necessary to also involve private sources (savings or insurance) in addition to healthy public budgets.

Also, the message “An Aging Europe? A fact, for which a person needs to be prepared,” [5] highlights the fact that a sharp increase in the proportion of older people will occur in the European Union in the coming decades and an associated significant decline in the proportion of young people and people of working age. More and more older people will be dependent on an increasingly smaller number of young people. It is expected that a third of the EU population will be at a post-productive age by 2060 and the number from the economically active population will in turn be reduced by about ten percentage points (67% in 2010, 56% in 2060). Lengthening average life expectancy is obviously considered a success, but the aging population poses significant challenges for the economy and social care systems. The impact on public finances can be illustrated by the prognosis that public expenditure used only in the context of older citizens (pension and social security benefits, health and long term care) will increase by about 4 percentage points by 2060 of their share in GDP, from 25% (in 2010) to 29% (in 2060).

3 Analysis of the demographic situation in European Union countries

There were four indicators chosen for the demographic analysis of the European Union in relation to demographic aging – the age structure of the population, the average age of the population, life expectancy and total fertility rate. The analysis was performed for all 28 current Member States of the European Union, Tab. 1 up to Tab. 4, then showing only selected data.

Tab. 1 shows the age structure of the population of individual countries up to 1. 1. 2015 in the division of the pre-productive (0–14 years), productive (15–64 years) and post-productive generation (65+). The pre-productive generation is involved for 16% of the total European Union population, for 65% of the productive generation and for 19% of the post-productive generation of which in effect is a regressive type of population.

Tab. 1: The age structure of the population in selected EU countries up to 1. 1. 2015

COUNTRY/GENERATION	0-14 years		15-64 years		65+ years	
EU	79 369 624	16%	333 099 995	65%	95 981 237	19%
Czech Republic	1 601 045	15%	7 056 824	67%	1 880 406	18%
France	12 356 171	19%	41 846 445	63%	12 212 545	18%
Germany	10 686 723	13%	53 422 103	66%	17 088 711	21%
Great Britain	11 463 255	18%	41 898 460	65%	11 513 450	18%
Greece	1 577 918	15%	7 011 027	65%	2 269 073	21%
Ireland	1 024 787	22%	3 003 481	65%	600 681	13%

Italy	8 383 122	14%	39 193 416	64%	13 219 074	22%
Luxembourg	93 747	17%	389 371	69%	79 840	14%
Poland	5 714 790	15%	26 431 118	70%	5 859 706	15%
Slovakia	830 181	15%	3 834 289	71%	756 879	14%
Sweden	1 682 033	17%	6 152 438	63%	1 912 884	20%

Source: authors' own work based on data [4]

The pre-productive generation has the largest share of the total population in Ireland (22%), France (19%) and the UK (18%) and the least in Germany – only 13%. Slovakia (71%) and Poland (70%) show the highest working-age population and France and Sweden (both 63%) the lowest. Italy (22%), Germany and Greece (both 21%) rank among one of the oldest countries in the European Union based on the proportion of the post-productive generation; on the other hand, the lowest post-productive generation is represented in Ireland (13%), Luxembourg and the Slovak Republic (both 14%). The age structure of the Czech Republic does not significantly deviate from the EU average.

Tab. 2: The average age of the population in selected EU countries

COUNTRY/YEAR	1990	2000	2010	2014	Change 1990 – 2014
EU	:	:	41.0	42.2	:
Bulgaria	36.5	39.1	42.2	43.2	6.7
Cyprus	30.5	33.3	35.6	36.8	6.3
Czech Republic	35.1	37.3	39.6	40.8	5.7
Germany	38.1	39.8	44.2	45.6	7.5
Great Britain	35.8	37.5	39.4	39.9	4.1
Ireland	29.1	32.4	34.0	36.0	6.9
Italy	36.9	40.1	43.3	44.7	7.8
Lithuania	32.4	35.8	40.3	42.4	10
Luxembourg	36.3	37.3	38.9	39.2	2.9
Portugal	33.9	37.5	41.2	43.1	9.2
Slovakia	31.2	33.9	37.0	38.6	7.4
Slovenia	34.0	37.8	41.4	42.5	8.5
Sweden	38.4	39.3	40.7	40.9	2.5

Source: authors' own work based on data [4]

Tab. 2 demonstrates the development of the average age in selected EU countries between 1990 and 2014. An increase in the average age of the population occurred identically between these years in all 28 member states, but significant differences can be found in the rate of growth. The most “grown old” residents of Lithuania (about 10 years), Portugal (9.2) and Slovenia (8.5), the residents of Sweden (2.5), Luxembourg (2.9) and Great Britain (4.1) the least. The highest average age in 2014 is shown by Germany (45.6 years), Italy (44.7) and Bulgaria (43.2), and Ireland (36), Cyprus (36.8) and Slovakia (38.6) aligned at the opposite end of the ranking. The Czech Republic with an average age of 40.8 years, compared to other European Union countries in 2014, belong among those “younger” countries.

Tab. 3 demonstrates life expectancy (calculated for old age of one year) of the population of selected EU countries sorted by gender in 2005 and 2014. Certainly, one positive finding is that life expectancy in all EU countries is constantly increasing without distinction. It is not surprising, that elderly women live longer, the most in Spain (85.4 years in 2014), France (85.3) and Italy (84.8). The lowest life expectancy

is demonstrated by women in Bulgaria (77.6), Romania (78.3) and Latvia (78.7). Men living to the highest age live in Cyprus (80), Italy (79.9) and Spain (79.6), while the first die in Latvia, Lithuania (both 68.4) and Bulgaria (70.7). The life expectancy of women and men in the Czech Republic can be ranked among the lower ones in comparison to other EU countries.

Tab. 3: Life expectancy according to sex in selected EU countries

YEAR	2005			2014			Change 2005 – 2014		
COUNTRY/SEX	Total	Male	Female	Total	Male	Female	Total	Male	Female
EU	77.9	74.8	80.9	80.2	77.4	82.9	2.3	2.6	2
Bulgaria	72.3	68.9	76.0	74.1	70.7	77.6	1.8	1.8	1.6
Cyprus	78.0	75.9	80.2	81.9	80.0	83.8	3.9	4.1	3.6
Czech Republic	75.4	72.2	78.5	78.1	75.0	81.1	2.7	2.8	2.6
France	79.7	76.1	83.1	82.1	78.8	85.3	2.4	2.7	2.2
Italy	80.2	77.4	82.8	82.5	79.9	84.8	2.3	2.5	2
Latvia	70.2	64.4	75.9	73.7	68.4	78.7	3.5	4	2.8
Lithuania	70.7	64.7	76.9	74.0	68.4	79.4	3.3	3.7	2.5
Romania	72.0	68.6	75.5	74.7	71.1	78.3	2.7	2.5	2.8
Spain	79.6	76.4	82.9	82.5	79.6	85.4	2.9	3.2	2.5

Source: authors' own work based on data [4]

The total fertility rate for selected countries of the European Union is shown in Tab. 4. It is clear that not even a single country in the years 2005 to 2014 reached the level of simple reproduction, which is defined by a value of 2.1. France was the closest to approaching this value in 2014 (2.01 children per woman), followed by Ireland (1.94) and Sweden (1.88). The lowest values of the total fertility rate in 2014 were reached by Portugal (1.23), Greece (1.3) and Cyprus (1.31). The Czech Republic with its value of 1.53 ranks approximately in the middle of the EU order. When analyzing the difference in the total fertility rate between 2014 and 2005, the value has increased in 18 countries (mostly in Lithuania, Slovenia, Latvia and the Czech Republic), the same remained in the Netherlands and was reduced the most in 9 countries on the contrary (mostly in Portugal, Cyprus and Luxembourg).

Tab. 4: The total fertility rate in selected EU countries

COUNTRY/YEAR	2005	2014	Change 2005 – 2014
EU	1.51	1.58	0.07
Cyprus	1.48	1.31	-0.16
Czech Republic	1.29	1.53	0.24
France	1.94	2.01	0.07
Greece	1.34	1.30	-0.04
Ireland	1.86	1.94	0.08
Latvia	1.39	1.65	0.26
Lithuania	1.29	1.63	0.33
Luxembourg	1.63	1.50	-0.13
Netherlands	1.71	1.71	0.00
Portugal	1.41	1.23	-0.18
Slovenia	1.26	1.58	0.32
Sweden	1.77	1.88	0.11

Source: authors' own work based on data [4]

Conclusion

Demographic structures and likely future patterns considerably vary across the European Union, both in individual member countries, as well as at the regional level. It is necessary to use a variety of approaches to effectively deal with this issue, taking into consideration many regional specifics, and unconditionally including also the regional level, represented by the relevant regional factors, into a multilevel decision-making process. [3]

Demographic aging has an undeniable impact on society, its economy, infrastructure and administration. It is a necessary for the successful development of society to take into account the factors caused by an aging population and to integrate their solutions into a broad range of strategies in areas such as management, urban planning, education, transport, housing and social inclusion. [6]

With the increasing proportion of representation in the population, the importance of older people and their contribution to society is growing, but also their demands as consumers and for their expectations as citizens. It is advisable to focus on strengthening their productive contribution for society and identifying the consumption patterns of their behavior in relevance to both the private and public sector, as older people are an important growing group of consumers. It is also desirable to involve older people in regional governance and address the issue of possible poverty and social exclusion.

Acknowledgement

The paper was supported by the University of Pardubice, Faculty of Economics and Administration, Project SGS_2016_023 „Economic and social development in private and public sector“.

References

- [1] BACCI, M. L. *Populace v evropské historii*. Praha: Nakladatelství Lidové noviny, 2003. 272 p. ISBN 80-7106-495-5.
- [2] EUROPEAN COMMISSION. *Europe's demographic future*. Luxembourg: Office for Official Publications of the European Communities, 2007. ISBN 92-79-07043-3.
- [3] EUROPEAN POLICIES RESEARCH CENTRE. *Regions for All Ages: The Implications of Demographic Ageing for Regional Policy*. Glasgow: University of Strathclyde, 2006. 113 p.
- [4] EUROSTAT. *Demography and migration. Population*. [cit. 2016-03-21]. Available at WWW: <<http://ec.europa.eu/eurostat/data/database>>.
- [5] EVROPSKÁ KOMISE. *Stárnoucí Evropa? Skutečnost, na kterou je třeba se připravit*. 2012. [cit. 2015-01-10]. Available at WWW: <http://ec.europa.eu/news/economy/120515_cs.htm>.
- [6] FERRY, M., BAKER, R. *Regionální strategie a demografické stárnutí: Age Proofing Toolkit – Příručka ke strategii pro demografické stárnutí*. Brusel: Evropská unie, Výbor regionů, 2006. 29 p.

- [7] GAVRILOV, L. A., HEUVELINE, P. *Aging of Population*. In: Paul Demeny and Geoffrey McNicoll. (Eds.) *The Encyclopedia of Population*. New York. USA. 2003. [cit. 2015-09-24] Available at WWW: <http://longevity-science.org/Population_Aging.htm>.
- [8] KALIBOVÁ, K., PAVLÍK, Z., VODÁKOVÁ, A. (eds.) *Demografie (nejen) pro demografy*. Praha: Sociologické nakladatelství (SLON), 2009. 241 p. ISBN 978-80-7419-012-4.
- [9] KALIBOVÁ, K. *Úvod do demografie*. Praha: Karolinum, 2002. 52 p. ISBN 802-46-0222-9.
- [10] KLUFOVÁ, R., POLÁKOVÁ, Z. *Demografické metody a analýzy: demografie české a slovenské populace*. Praha: Wolters Kluwer ČR, 2010. 306 p. ISBN 978-80-7357-546-5.
- [11] KOSCHIN, F. *Demografie poprvé*. Praha: Oeconomica, 2005. 122 p. ISBN 802-45-0859-1.
- [12] PARKER, J. *Nová podoba světa*. In Franklin, D. (ed.) *Svět 2015*. Praha: Economica, 2014. 114 p. ISBN 978-80-85378-90-0.
- [13] RABUŠIC, L. *Česká společnost stárne*. Brno: Masarykova univerzita, 1995. 192 p. ISBN 80-210-1155-6.
- [14] UNITED NATIONS. *World Population Ageing: 1950 – 2050*. [cit. 2016-03-30]. Available at WWW: <<http://www.un.org/esa/population/publications/worldageing19502050>>.
- [15] VAN DE KAA, D. J. Europe's Second Demographic Transition. In: *Population Bulletin*, 1987, Vol. 42, Iss. 1, pp. 1-57.

Contact Address

Bc. Veronika Fričová

University of Pardubice
Faculty of Economics and Administration
Institute of Regional and Security Sciences
Studentská 95, 532 10 Pardubice
Czech Republic
Email: veronika.fricova@student.upce.cz
Phone number: 466 036 665

Ing. Zdeněk Matěja, Ph.D.

University of Pardubice
Faculty of Economics and Administration
Institute of Regional and Security Sciences
Studentská 95, 532 10 Pardubice
Czech Republic
Email: zdenek.mateja@upce.cz
Phone number: 466 036 665