POPULATION AGING. A DEMOGRAPHIC VULNERABILITY FOR THE SOCIETAL SECURITY OF THE EUROPEAN UNION[1]

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Abstract. *For centuries, important geopolitical, social-economic or scientific factors have contributed to the progress of European societies. An important effect of this progress was the improvement of the perspectives and the demographic context. The positive evolution of important demographic indicators, including population growth, urbanization, decreased mortality (including infant mortality), increased life expectancy, population mobility, etc. have contributed to Europe's success worldwide. Europe proved to be an important demographic source that allowed for the golden era of colonialism when the Christian-European civilization spread across the globe. However, the trends have changed in the meantime. If during the period of sharp increase in the birth rate in the years after the Second World War, the European population reached up to 22.8% of the world's population, Europe subsequently experienced a reduction down to zero of the population growth. Today, the European population represents only 9.6% of the world's population. In the current geopolitical and economic context, this tendency of population decline is an important demographic vulnerability of the European space, and particularly of the European Union. Not only the quantitative dynamics of the population is in decline. Its structure reflects more and more vulnerabilities that impose new public policies, including in the field of social protection, of social services. The increase of life expectancy in the last decades has not been corroborated with the maintenance or increase of the birth rate, so we are witnessing an increasingly visible phenomenon of population aging. These imbalances create strong pressures on the pension systems of EU member states. In this context, some states have chosen to progressively open their doors to the foreign workforce. The increasingly massive migration is a demographic phenomenon entailing several problems that require a delicate approach through the rethinking of public policies. Immigrant integration has proven to be toilsome and costly. Moreover, this increasingly raises issues related not only to societal security but also to national security. Methodologically, without analyzing the full range of demographic vulnerabilities that the European Union is facing, we intend to monitor the main demographic indicators that refer to the age group structure of the population of the 28 EU Member States. This paper aims to capture the phenomenon of population aging in Europe, with its various regional peculiarities. To carry out this analysis we propose to use the data provided by Eurostat for the last 10 years.*

Keywords: *The European Union, population aging, demographic vulnerability, societal security*

Conceptual and methodological contextualization

[1] This paper was made by completing a revised edition of the study *Population aging. A demographic vulnerability of the European Union* (Mircea Brie, 2019).

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From a historical perspective, we can see that Europe, compared to other geographical areas, has been noted for its more balanced evolution of the population structures. For centuries, important geopolitical, social-economic or scientific factors have contributed to the progress of European societies. An important effect of this progress was the improvement of the perspectives and demographic context. The positive evolution of important demographic indicators, including population growth, urbanization, decreased mortality (including infant mortality), increased life expectancy, population mobility, etc. have contributed to Europe's success worldwide. Europe proved to be an important demographic source that allowed for the golden era of colonialism when the Christian-European civilization spread across the globe. Eurocentrism, from this perspective, is not just a philosophical current or a worldview from a European perspective, but a reality given by the demographic force of the European continent.

This demographic reality, associated with technological and economic progress, has allowed the great European states to be in a dominant position compared to the rest of the world. However, the trends have changed in the meantime. At the beginning of the 20th century, the population of Europe was close to 20% of the world population[2]. If in the period of sharp increase in the birth rate during the years after World War II the European population reached up to 22.8% of the world's population[3], Europe then experienced a reduction down to zero in population growth. In the last decades, the natural growth has been negative, and the maintenance of the number of the European population has been due to the massive immigration from the western states. Contemporary Europe has lost, compared to other geographical areas. Today, the European population represents only 9.6% of the world's population[4]. Comparatively, throughout this period, Africa went from 9% in 1950, to 17.1% at present, and has the potential of exceeding 25% in 2050[5]. Quantitatively, the European population has grown from almost 550 million inhabitants to a little over 743 million to date. At the same time, Africa has grown from 228 million to over 1.3 billion inhabitants.

In the current geopolitical and economic context, this *tendency of population decline* is an important demographic vulnerability of the European space, and particularly of the European Union. The internal market, European affairs, but also the social services are affected by this evolution of the population.

Not only the quantitative dynamics of the population is in decline. Its structure reflects more and more vulnerabilities that impose new public policies, including in the field of social protection, of social services. The increase of life expectancy in the last decades has not been corroborated with the maintenance or increase of the birth rate, so we are witnessing an increasingly visible *phenomenon of population aging*. These imbalances create strong pressures on the pension schemes of EU member states. Conceptually and methodologically, we consider that the threshold of aging is 65 (the EU operates with this age), despite the fact that in many UN publications and reports there are

[2] R. Cameron, *Concise Economic History of the World*, New York, O.U.P., 1993, p. 193.

[3] *Worldometers*, United Nations, Department of Economic and Social Affairs, Population Division. *World Population Prospects: The 2017 Revision*, http://www.worldometers.info/world-population/europe-population/, accessed on 15.10.2018.

[4] *Ibidem*, http://www.worldometers.info/world-population/population-by-region/, accessed on 15.10.2018.

[5] *Ibidem.*

two thresholds: 60 and 65 years old. The age of 65 is more relevant from the perspective of social policies, as well (most European states have set the retirement age around 65).

The decline in the birth rate within the EU does not even provide the hope of rebalancing the demographic deficit and reordering the age pyramid.

In this context, some states have chosen to progressively open their doors to the foreign workforce. The increasingly massive *migration* is a demographic phenomenon that brings with it many problems that require a delicate approach through the rethinking of public policies. Immigrant integration has proven to be toilsome and costly. Moreover, this increasingly raises issues related not only to societal security but also to national security. Then, the Open-Door Policy in the west has depleted Central and Eastern European countries which have recently joined the EU of young people and the labor force. During this period, countries such as Romania or Poland, but also the other former communist states, strongly feel the effects of emigration as a hindrance to their development.

Methodologically, without analyzing the full range of demographic vulnerabilities that the European Union is facing, we intend to monitor the main demographic indicators that refer to the age group structure of the population of the 28 EU Member States. *The aim* of this paper is to capture the phenomenon of population aging in Europe, with its various regional peculiarities, and of the derived effects that constitute a vulnerability for the societal security of the EU. In order to carry out this analysis, we intend to use the data provided by Eurostat for a period of 10 years, starting from 2007 up to 2017. As the phenomenon of population aging has different causes and different degrees of expression in the western states compared to the eastern ones, we intend to highlight the trends recorded from this regional perspective throughout this analysis.

Aging of the EU population. Demographic analysis

The age-related change in the population structure is one that can be observed globally. This change always has the same meaning: population aging. According to a UN report on the analysis of changes in the age structure of the population in the years 1950-2050, the current period is one characterized by a sharp increase in the aging rate. Thus, even in countries where the birth rate continues to be high (above the reproduction rate), the share of the elderly population is increasing. Such a tendency, as long as it is associated with the increase of life expectancy, cannot be considered as a negative one. With few exceptions, however, most states are experiencing a decline in the share of other age groups, especially in the youth population. Naturally, in this case, the medium and long-term demographic premises lead to social/economic and societal vulnerabilities. "It is estimated that Europe has already reached a critical stage: after a century of natural demographic growth, the prospect for this century is, on the contrary, a natural decline and excessive aging of the population. Many of the Eastern European countries are already experiencing the demographic decline and many Western countries will experience it in the near future"[6].

Even if differences in intensity may be noticed between different European regions, the trend is the same: population decline and aging. In some countries which recently joined the European Union, there is still a balanced population structure, but according to the forecasts, the aging of the population here will be even more pronounced

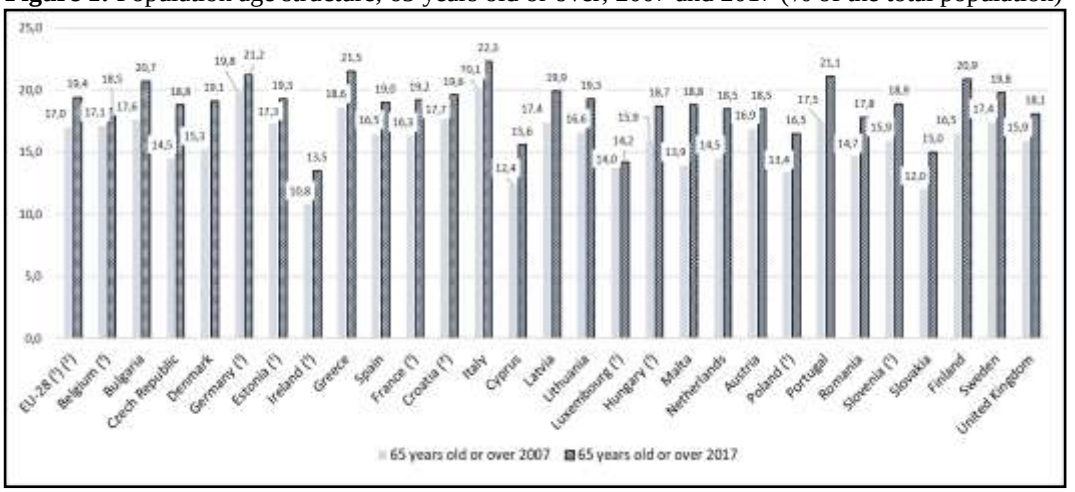
[6] Ana Bălaşa, *Îmbătrânirea populaţiei: provocări şi răspunsuri ale Europei*, in *Calitatea Vieţii*, XVI, nr. 3–4, 2005, p. 275.

in the coming decades. This phenomenon is largely determined by the association of an additional factor to the two already mentioned above: the massive migration, especially of the youth population of fertile age. Thus, migration contributes even more to declining birth rates. The much faster improvement of socio-economic indicators, in general of those related to the quality of life, contributes to a rapid increase in longevity. Therefore, there is an accumulation of factors that have the effect of a more obvious process of an increase in the aging rate of the population in these Central and Eastern European states.

Throughout the European Union as a whole, the aging tendency of the population is maintained as the average. The share of the elderly population is increasing. Thus, as Figure 1 shows, the share of population aged at least 65 increased from 17% in 2007 to 19.4% in 2017. An increase of 2.4% in just 10 years is quite large. However, we can easily note the more pronounced trends in some European states (See Figure 2).

In countries such as Germany, Italy (22.3% - the highest level in the EU), Greece, Portugal, but also Bulgaria, the share of the population over 65 has exceeded 20%. By analyzing Figure 1, we find two realities: 1. "Old Europe" seems to have experienced this aging trend much earlier; 2. "New Europe" is following the same trend at a much faster pace. In conjunction with the migration mentioned before, the population aging here tends, in a not too distant future, to exceed in share the one in the western and northern states.

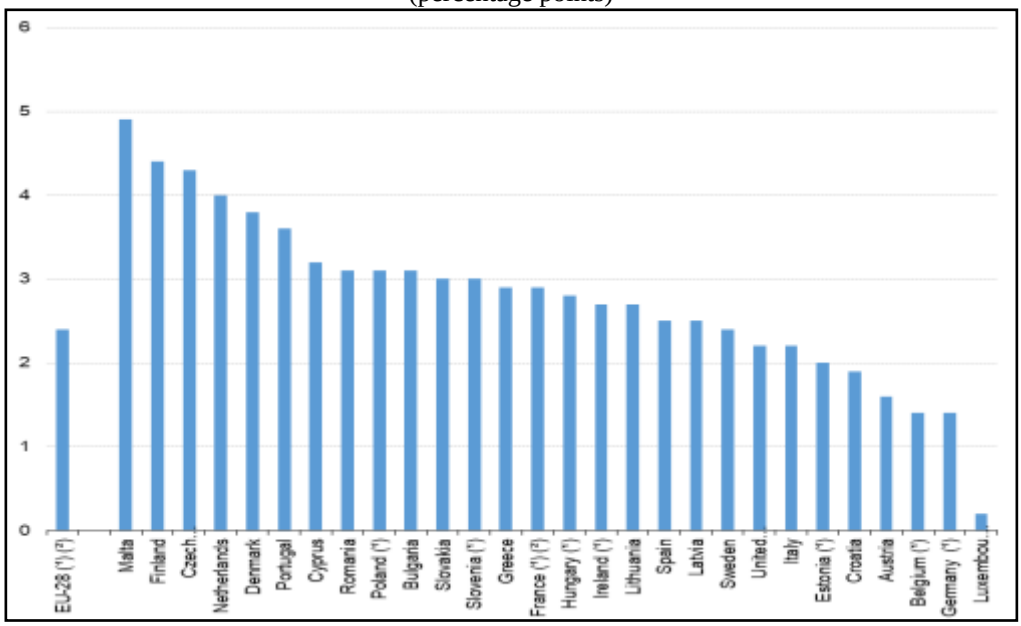
Figure 1: Population age structure, 65 years old or over, 2007 and 2017 (% of the total population)



(1) Break in time series in various years between 2007 and 2017
(2) The population of unknown age is redistributed for calculating the age structure.
Source: Eurostat, https://ec.europa.eu/eurostat/data/database, accessed in 15.05.2019

The more pronounced tendency of aging of some countries' populations is shown in Figure 2. Thus, compared to a 2.4% increase in the share of the population over 65 years old throughout the European Union in just 10 years, growth rates of over 4% can be noted in Malta (4.9%), Finland (4.4%) and the Czech Republic (4.3%). The only state where the growth rate of the elderly population is below 1% is Luxembourg (0.2%).

Figure 2: Increase in the share of the population aged 65 years or over between 2007 and 2017 (percentage points)

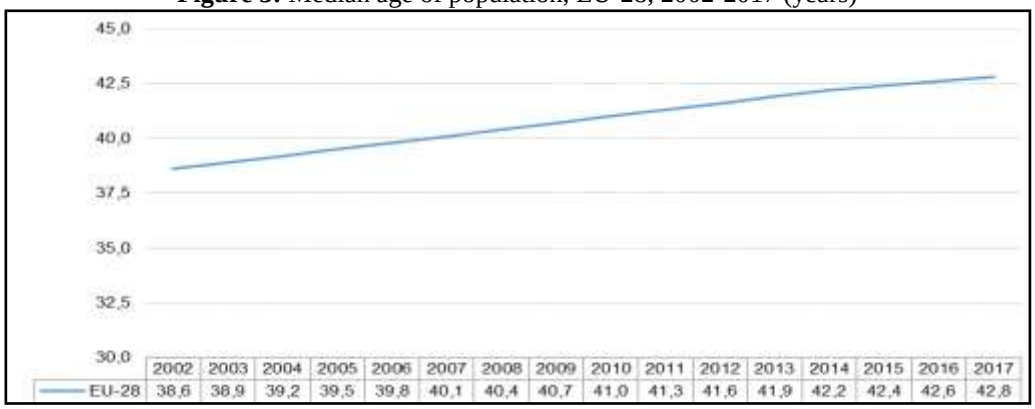


(1) Break in time series in various years between 2007 and 2017.
(2) Provisional.
Source: Eurostat, https://ec.europa.eu/eurostat/data/database, accessed in 15.05.2019

The increase in the share of the aging population is associated with the need to reorganize public policies related to social protection, the reformation of the labor market and last, but not least, the development of a new institutional and legal framework in the social-demographic field.

The increase in the share of the population aged 65 and over is accompanied by an obvious increase during the 10 years under review. Thus, in just 10 years, between 2007 and 2017, the median age of European citizens increased by 2.7 years, from 40.1 years old (2007) to 42.8 years old (2017) (See Figure 3).

Figure 3: Median age of population, EU-28, 2002-2017 (years)

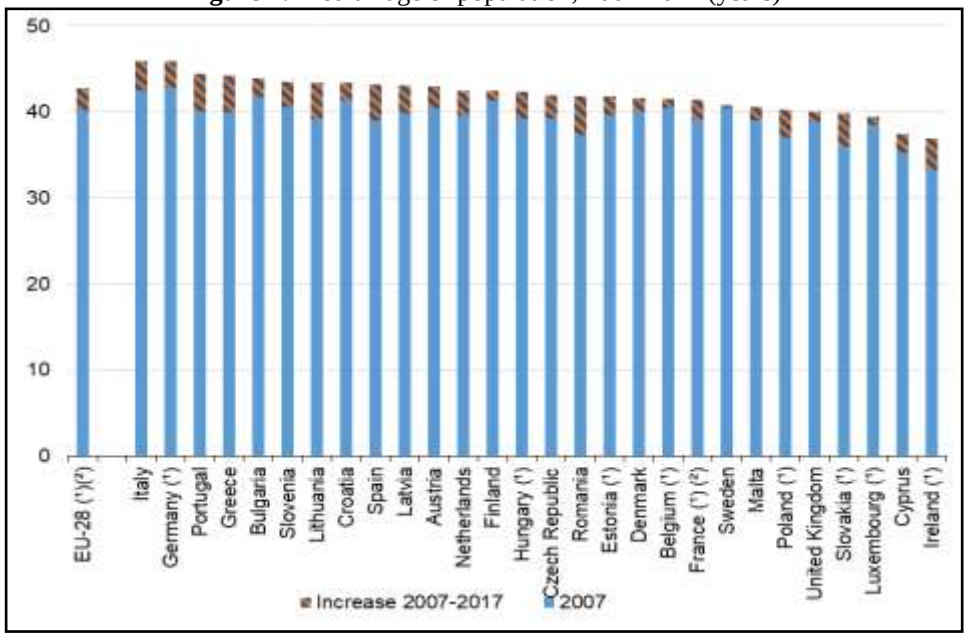


Note: 2010, 2011, 2012, 2014,2015, 2016 and 2017: break in series. 2017: provisional.
Source: Eurostat, https://ec.europa.eu/eurostat/data/database, accessed in 15.05.2019

This evolution is not consistent throughout the European Union. In some states, the trend is more obvious, while in others it is slower. In this latter case, we are discussing states that either mitigated this trend through various policies, or previously experienced an increase in the age of the population.

Among the states with a sharp increase in the median age of the population between 2007 and 2017, we mention Romania (4.5 years), Portugal (4.4 years), Greece (4.3 years), Lithuania (4.2 years) or Latvia (4.2 years). If in some states this process is due to natural demographic trends, in Central and Eastern Europe the process is intensified by the massive migration of the youth population. In countries such as Romania (41.8 years old), even if there is a marked increase in the median age, the median age still remains below the EU average one (42.8 years old). In countries such as Italy (45.9 years old) or Germany (45.9 years old), despite the obvious aging of the population, the process of increase in the median age is still high (an increase of 3.5 years in Italy and 3.1 years in Germany for the period under review). The only states with an increase of less than one year in the period 2007-2017 are Sweden (0.3 years) and Luxembourg (0.9 years).

Figure 4: Median age of population, 2007-2017 (years)



(1) Break in time series in various years between 2007 and 2017.
(2) Provisional.
Source: Eurostat, https://ec.europa.eu/eurostat/data/database, accessed in 15.05.2019

An analysis of the degree of dependency of the population (youth and elderly) reveals to a large extent the demographic vulnerability of many of the European states. In the table below we identify several groups of states whose trends are different from the EU average (24% youth population and 53.9% elderly population).

Table 1: Population age structure indicators, 1 January 2017 (%)

	Young-age dependency ratio	Old-age dependency ratio	Total age dependency ratio	Share of population aged 80 or over
EU-28 (1)	*24.0*	*29.9*	*53.9*	*5.5*
Belgium	26.3	28.6	54.9	5.5
Bulgaria	21.6	31.8	53.4	4.8
Czech Republic	23.7	28.6	52.4	4.0
Denmark	26.0	29.7	55.7	4.3
Germany	20.5	32.4	52.9	6.0
Estonia	25.2	30.0	55.2	5.3
Ireland	32.2	20.7	52.9	3.2
Greece	22.6	33.6	56.2	6.7
Spain	22.8	28.7	51.6	6.2
France	29.3	30.7	60.0	5.9
Croatia	22.1	29.8	51.8	5.0
Italy	21.0	34.8	55.8	6.8
Cyprus	23.9	22.8	46.8	3.4
Latvia	24.1	30.8	54.9	5.2
Lithuania	22.5	29.3	51.8	5.5
Luxembourg (1)	23.4	20.5	43.9	3.9
Hungary	21.7	27.9	49.7	4.3
Malta	21.1	28.1	49.1	4.1
Netherlands	25.0	28.4	53.3	4.5
Austria	21.5	27.6	49.1	4.9
Poland	22.1	24.2	46.3	4.2
Portugal	21.6	32.5	54.1	6.1
Romania	23.4	26.7	50.1	4.4
Slovenia	22.6	28.6	51.1	5.1
Slovakia	22.2	21.5	43.8	3.2
Finland	25.8	33.2	59.1	5.2
Sweden	28.1	31.6	59.7	5.1
United Kingdom	27.8	28.2	56.0	4.9

(1) Break in time series

Source: Eurostat, https://ec.europa.eu/eurostat/data/database, accessed in 15.05.2019

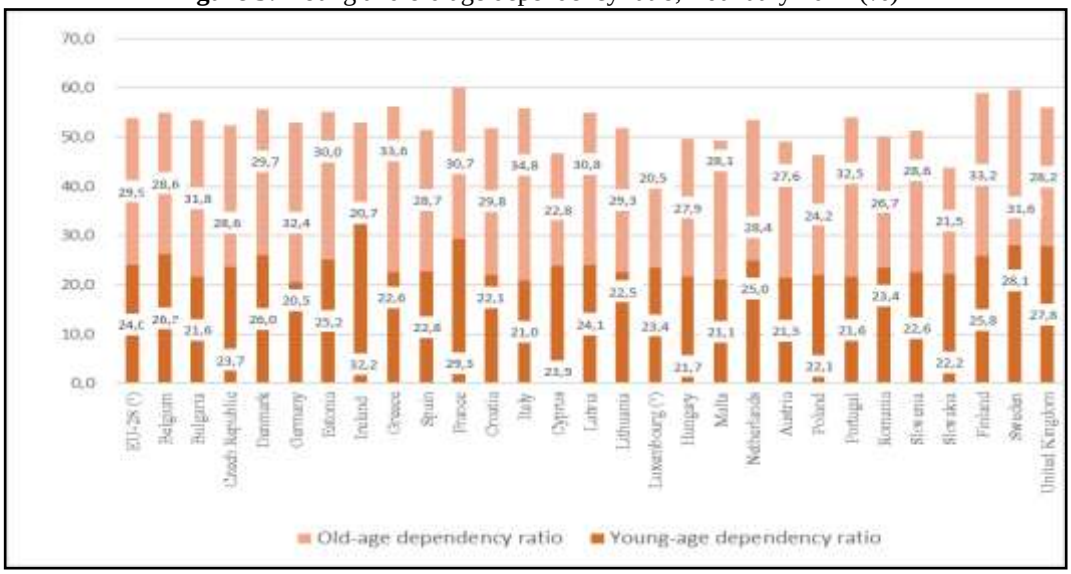
In our analysis, we identify 5 categories of states with a higher share than the EU average of the population dependency ratio (in total or by age group categories) (See Table 1):

1. states with a high rate of dependent population due to population aging. The states with a high rate of dependent population due to the elderly are: Greece - 56.2% (33.6% elderly population), Italy - 55.8% (33.8% elderly population) and Portugal - 54.1% (32.5% elderly population);
2. states with a high rate of dependent population due to the aging of the population but also corroborated with a high rate of the youth population - in this case, the trends can be positive in the medium and long term by a reduction in the percentage of the aging population. In this category of states with a high rate of the dependent population, the following can be mentioned:

Estonia - 55.2% (30% elderly and 25.2% youth); France - 60% (30.7% elderly and 29.3% youth); Latvia - 54.9% (30.8% elderly and 24.1% youth); Finland 59.1% (33.2% elderly and 25.8% youth) and Sweden - 59.7% (31.6% elderly and 28.1% youth)

3. states that have succeeded through various mechanisms and policies (e.g. birth rate, positive migratory balance) to maintain a high rate of the youth population. States with a high rate of dependent population due to young people are Belgium – 54.9% (26.3% youth population), Denmark – 55.7% (26% youth population) and the United Kingdom – 56% (27.8% youth population);
4. states with a high rate of dependent population due to the aging of the population, without exceeding (yet) the total average rate of the dependent population. This category includes states such as Bulgaria – 31.8% elderly population.
5. states with a high rate of dependent population due to the (still) high share of the youth population, without exceeding the total average rate of the dependent population. This category includes states such as Netherlands - 25% youth population. In this case, if the trends of growth or conservation of the percentages of the youth population are maintained, in the next period we will be able to detect a slight process of reversing the trend of population aging.

Figure 5: Young and old age dependency ratio, 1 January 2017 (%)



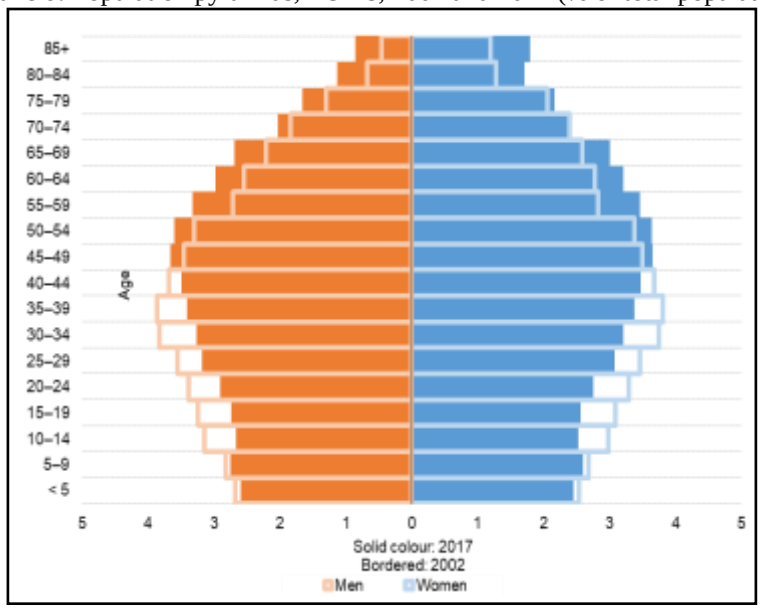
(1) Break in time series

Source: Eurostat, https://ec.europa.eu/eurostat/data/database, accessed in 15.05.2019

The age pyramid of the population of the states of the European Union in the period 2002-2017 is presented as a fundamental conclusion of this process that has not even remotely reached the turning point of reversing the trend. Thus, a simple visualization of the two pyramids of the population captures the high share of the elderly population which EU " has earned", particularly through the increased life expectancy and by the fact large cohorts of the population born in periods with a much higher birth rate

than the curent one live past the age of 45. Moreover, another conclusion is given by the reduction of the share of the youth population, a phenomenon due mainly to, as I mentioned above, the birth rate decline.

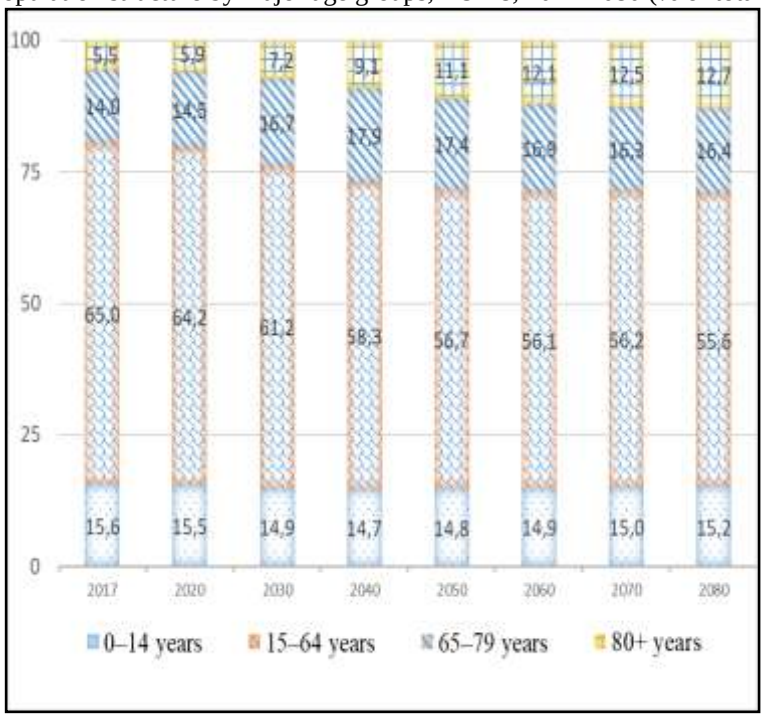
Figure 6: Population pyramids, EU-28, 2002 and 2017 (% of total population)



Note: Break in series. 2017: estimated, provisional.
Source: Eurostat, https://ec.europa.eu/eurostat/data/database, accessed in 15.05.2019

The demographic forecasts, calculated based on Eurostat data for the not too distant future maintain the same trend of population aging. By 2080, if the demographic indicators taken into account will not be sharply and radically reversed compared to the observed trends, the share of the aging population will have increased considerably. Thus, according to the projection presented in Figure 7 below, from a share of 5.5% of the age group over 80 years old (2017) the trend will reach 5.9% in 2020, 7.2% in 2030, 9.1% in 2040, 11.1% in 2050, 12.1% in 2060, 12.5% in 2070 and 12.7% in 2080. The increase in the share of this age group is therefore expected to be sharp between 2020-2060. After this period, the growth rate will become more moderate. The other age groups follow the same pattern. The 65-79 age group is also experiencing an increase of the share from 14% in 2017 to a maximum of 17.9% in 2040, so that after this period a reduction of the share to 16.4% will be seen in 2080. This reduction, expressed strictly in terms of percentage (not in terms of quantity) is explained, in our view, not by a reduction in the share of the elderly population but, on the contrary, by an increase in the critical mass of reference provided by a sharp increase of the population over 80 years old. The increase of the share of the aging population (a phenomenon clearly heightened by the constant increase of life expectancy), can only be understood in the light of the steady birth rate decline. This process, which began in the second half of the 20th century, could not be stopped as a general trend, and was therefore the reason why the mass of the "young" population started to decrease as compared to the total population.

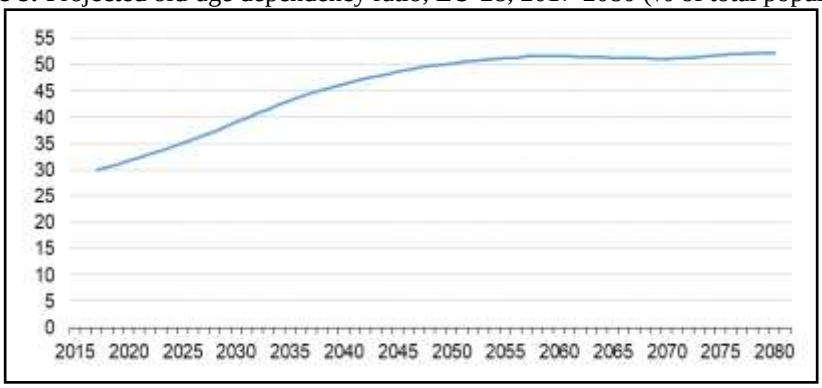
Figure 7: Population structure by major age groups, EU-28, 2017-2080 (% of total population)



Note: 2017: break in series, provisional. 2020–2080: projections (EUROPOP2015).
Source: Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=proj_15ndbims&lang=en, accessed in 15.05.2019

The active population, aged between 15 and 65, is steadily decreasing throughout this period. From 65% in 2017 to 55.6% in 2080. A 10% reduction in the share of the population available to be employed in the EU economy leads to an even greater vulnerability of the economy/labor market. An encouraging fact is the reversing trend of the evolution of the share of the population aged between 0 and 14. The downward trend is reversed around 2040.

Figure 8: Projected old-age dependency ratio, EU-28, 2017-2080 (% of total population)



Note: 2017: break in series, provisional. 2018–2080: projections (EUROPOP2015).
Source: Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=proj_15ndbims&lang=en, accesed in 15.05.2019

From the standpoint of the active population, in relation to the dependent population (youth and elderly), this period coming up in the short and medium future is a critical one. The upward trend in the dependent population is evident and sharp until 2060. After this year, there is a relative stabilization, with a reduction in growth rate of this share. This reality triggers a constant pressure on social policies and social insurance, questioning the whole architecture of the social system of the European Union. New social policies, in conjunction with preventive and associated demographic policies, will have to be taken into account by national governments, obviously supported by Brussels.

Effects on societal balance

We mention that the security and societal balance, within the meaning of the concept that we are using throughout this analysis, refers to the balance within society, between different community forms constituted on various criteria, including identity (ethno-national, linguistic, religious, cultural, etc.).

Among the demographic trends that make the space of the European Union vulnerable, one factor that is centrally present is the population decline. The process is not a recent one, and its causes can be seen in the behavior of the European population in the post-war period. Among the effects of this demographic reality we can identify the narrowing of the EU internal market, the unsettling of the social system and the deterioration of the business environment. From a demographic perspective, the population decline is not a unique phenomenon. It is determined, in this case, by the declining birth rates. Furthermore, the population decline is also shown in the context of the continuous increase of the life expectancy of Europe's population. The corroboration of these two indicators leads, as expected, to the aging of Europe's population.

The phenomenon of population aging has even more complex effects than the population decline alone. An aging population calls for speedy public policy adjustments. Under the effect of these demographic realities, European states are constrained to undergo reform. The social insurance systems must be adjusted. Some states are preparing the reform of the public pension systems by raising the retirement age (others have already done so). Then, the authorities are forced to increasingly encourage alternative private pension systems, precisely to reduce future social pressures generated by a need for the financial adjustment of public systems.

The population decline, associated with the population aging, has a direct effect on the labor market, which is narrowing and no longer responding to the growing demand for labor from European companies that want to be globally competitive. To compensate for this imbalance in the labor market, companies, with the help of governments, have engaged in a process of recruiting labor from outside the EU. Actually, for European companies, this hasn't been a difficult thing to accomplish. The level of immigration has been major, given the success that has been achieved in Western Europe for decades. Moreover, in areas of geopolitical proximity, there have been no improvements of the macro-economic indicators, of the living conditions indicators or of those arising from the social-political climate. Europe has basically been stormed by immigrants for decades.

Immigration was therefore a solution born out of a need, but also a problem that had to be solved. Immigrants had to be integrated, helped to enter the labor market, thus responding to Europe's need for labor force. But the apparent equation of the redeeming solution that would please everyone was much more complicated.

Immigration has also brought with it the need to transform European societies and model them to the new realities. Growing communities of immigrants could no longer be

considered groups of individuals; they increasingly represented communities. These communities, founded on the basis of various forms of identity solidarity, demand rights and privileges. Apparently all this cannot be an imbalance, a vulnerability, as long as it does not disturb anyone. Against the successive crises that European states have had to face, the societies of many states have had to face new challenges. Restructuring many businesses has led to unemployment and uncertainty. The societal vulnerability was born also by associating the pessimistic social-economic landscape with the increasingly massive immigration generated by the humanitarian crises at the borders of the EU (in the last decade, Europe's neighboring territories have been the scene of numerous conflicts in the north of Africa, in the Near East and even in Ukraine).

Numerous forms of cleavage could be identified between the newcomers and the old citizens (regardless of their origin). European societies had to further prepare themselves to identify the means and resources to contribute to the societal balance. The authorities of many states have responded positively by seeking solutions, while others have simply refused to do so. This is why in many states the issue of anti-migration has become a central topic of populism. Associated with xenophobia and nationalism, this type of discourse has given rise to uncertainty and fear.

Increasing immigration, as it can be easily understood, will not be enough to solve the demographic deficit and the deterioration of the optimal ratio of age groups. Moreover, migration provides a demographic plus in the short and medium term. In time, immigrants develop the same demographic model based on a low birth rate.

The role of the European institutions in this context can and should be much stronger and clearer. It is time for a coherent demographic policy to be discussed in Brussels that will benefit all Europeans, citizens and European states. However, a common demographic policy is far from being implemented as long as the east has almost always been seen as a demographic reservoir for the west. Central and south-eastern European states, with lower levels of development and pay, have had to accept the departure of a large part of the highly skilled young workforce. This has further widened the development gap, limiting the prospects for real convergence.

Conclusions

The demographic realities within the states of the European Union reveal population decline and aging as general trends, despite certain discrepancies in intensity between different European regions. In some countries which recently joined the European Union, there is still a balanced population structure, but according to the forecasts, the aging of the population here will be even more pronounced in the coming decades. This phenomenon is largely determined by the association of an additional factor to the two already mentioned above: the massive migration, especially of the youth population of fertile age. Thus, migration contributes even more to declining birth rates. The much faster improvement of socio-economic indicators, in general of those related to the quality of life, contributes to a rapid increase in longevity. Therefore, there is an accumulation of factors that have the effect of a more obvious process of an increase in the aging rate of the population in these Central and Eastern European states.

The aging of the European population can, therefore, be associated with both a steady and consistent increase in life expectancy and a worsening of the ratio of the share of the youth and working-age population. Thus, in terms of percentage, the population over the age of 65, including over 80, is continually growing. This reality calls for increased attention from national states and European institutions. They must find

sustainable solutions as quickly as possible to ensure the demographic balance and sustainability of the current European social system.

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