A Regional Effects Of Population Aging

There are no geniuses in art,
but voices or pens led by human intelligence,
with various degrees of real creation ability.
The rest is nothing but work, work and work again.

Maurice Chevalier
(real name Maurice-Edouard Saint-Léon Chevalier)
(born September 12, 1888, Paris; died January 1, 1972, Marnes-la-Coquette, Paris)
was a French actor (teatre and film) and a cabaret singer.

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Abstract: *TThis paper highlights the effects of population aging; it has a negative impact on economy in general but also on the regional economic development in particular. As it happened in most European countries, Romania has been experiencing economic and social effects expressing the multiple aspects and various elements of a population in a continuous downward aging trend. Aging was more visible starting with 2000, year in which the elder population has exceeded young population; it is a growing phenomenon, as, according to statistics, the share of the elder population (aged over 65) has exceeded the share of young population (between 0 and 14 years). The diminished fertility rate and mortality rate are the determining factors which have accentuated population aging. The most important elements which contribute to a diminished fertility rate in modern society are culture, religion, demographic policy as well as other elements, more specific. A significant effect of the diminished fertility rate is the progressive reduction of capable future generations fit to enter the labour market, in order to increase the contributions to social health and insurance budgets which are necessary for payments for pensioners. It is important to acknowledge that goods which will bring added value in the economy cannot be created without human effort so as to improve the quality of life; otherwise, the diminished number of young people able to work leads inevitably to a lowered long-term development capacity.*

Keywords*:* demographic, population aging, young population
JEL classification: H55, H61, J10, O15

Introduction

A diminished fertility rate entails multiple effects; however, progressively diminishing future generations may have significant effects on the quality of life of the elderly population, especially in developing countries struggling to provide adequate support to this category of population.

Some states propose measures to thwart the effects of aging population; these measures are likely to support young population, namely young families, in the sense of encouraging natality, by providing facilities for the purchase of a home, a car, providing support to young families with more than two children.

According to the national statistical data published by the National Institute of Statistics in Romania, the demographic aging index increased from 104.7 (as of July 1, 2015) to 107.7 elderly people per 100 young people (as of July 1, 2016).

According to the same source (The National Institute of Statistics of Romania), population by domicile on July 1, 2016 decreased by 0.2% compared to July 1, 2015. On July 1, 2016 the population by domicile was 22,215 thousand persons. The urban population and the female population represent the majority (56.3%, respectively 51.2%).

Demographic aging has increased, the population aged 65 and over exceeding the young population aged 0-14 with more than 250,000 people (3. 518 million compared to 3.265 million people), according to national statistics.

As of July 1, 2016, the population by domicile in the urban area was 12.514 million people, decreasing with 0.4% compared to July 1, 2015.

The female population was 11.371 million people on July 1, 2016, which is 0.2% less compared to the same date of the previous year. Demographic aging deepened compared to July 1, 2015; it represents a slight decrease in the share of young people (0-14 years) and an increase of 0.3 percentage points in the share of the elderly population (aged 65 and over).

The average population age was 41 years, 0.2 years higher than on July 1, 2015. The median age was 40.6 years, 0.4 years higher compared to July 1, 2015.

On July 1, 2016, the largest share in the total population was held by the age group 45-49 years (8.8%). The share of this age group was 9.1% for men, and 8.5% for women.

The share of the age group 0-4 years was 4.5%, lower than that of the age group 5-9 years (5.1%) and that of 10-14 years (5.1%).

The latest data are also worrying, especially those concerning births; in 2018, the number of Romanian new-borns was lower than 200,000; it was the year with the fewest births at least since 1960 (the beginning of the time series provided by the National Institute of Statistics in Romania); 188,755 children were born in 2018, compared to 2017, when 205,000 children were born.

The detailed analysis highlights some interesting aspects concerning the decreased number of new-borns such as:

- the mother`s average age at birth was 28.6 years, slightly increased. In the rural area, the mother`s average age at birth was lower, namely 27.0 years, compared to the urban area, where the average age at birth was 29.8 years.
- almost two thirds of the new-borns (119,131 children) had mothers aged between

20 and 34 years and fathers aged between 25 and 39 years.

• the share of live births with mothers aged 30 years and over was 41.1%, continuing the increasing trend of the previous years. This share is higher in the urban area: 49.5%, compared to the rural area, where it was 30.9%.

• out of the total number of live births, 69.5% were born to married parents, and out of these, 46.4% were born in the first two years of marriage

• more than half (55.0%) of the total number of live births registered in Romania have employed mothers and 37.0% have stay-at-home mothers.

• in the families with both parents employed, almost half of the children, respectively 94,093 children (49.85%) were born, and 33,186 children (17.58 %) were born in families with employed father and stay-at-home mother.

• female fertility was between 43.3 live births per 1000 fertile age women in Ilfov county and 26.9 live births per 1000 fertile age women in Brăila county. Low fertility rates (under 30 live births per 1000 fertile age women) were also recorded in Caraș-Severin, Galați, Gorj, Hunedoara, Mehedinți, Olt and Vâlcea counties. Fertility rate in the rural area is higher than in the urban area, with the exception of Ilfov County.

We believe that alteration of the structure by (large) age groups, especially by increasing the share of the population over 60 years and above in total, will generate peer pressure which will lead to political decisions that will have to be taken, in particular regarding the allocation of amounts, which can lead to increased tensions in society.

1. Determined demographic elements of population aging

Slowly but surely the population of Western European countries includes a new age group, over 80 years, with a significant, constantly increasing share.

Significant changes in the structure of population involve structural changes in the society, both at the economic level and at the infrastructure level, regarding care in terms of health and social assistance for the elderly, respectively the population older than 80 years. Globally it is acknowledged that there is little understanding of the consequences of these trends but also that society and economy are not fully prepared to cope with this pressure. In fact, the related infrastructure to provide social assistance for this new age group lacks.

The forecasts show that the age group of 80 years and over in Romania will increase rapidly by 2060. Starting with the second half of 2012, the share of people aged 80 years and over was only 3.4% of the total population, but there is an increasing trend of 4.6% in 2020, 5% in 2030 and 7.9% in 2060 (Table no. 1).

Table no. 1 Population aged 60 years and over, population aged 80 years and over, in total, in the 3 forecast versions, with external migration in 2020, 2030 and 2060

Version	60 years and over			80 years and over			Total		
	Constant	Optimistic	Pessimistic	Constant	Optimistic	Pessimistic	Constant	Optimistic	Pessimistic
					2020				
Total	4,915,804	4,937,273	4,890,518	890,591	897,020	883,041	19,330,610	19,387,052	19,263,824
%	25.4	25.5	25.4	4.6	4.6	4.6	100.0	100.0	100.0
					2030				
Total	4,954,513	5,041,054	4,851,092	894,913	921,412	864375	18,046,984	18,270,252	17,777,572
%	27.5	27.6	27.3	5.0	5.0	4.9	100.0	100.0	100.0
					2060				
Total	4,350,081	4,670,599	4,038,997	1,022,441	1,152,327	907,742	12,946,710	13,966,824	11,926,401
%	33.6	33.4	33.9	7.9	8.3	7.6	100.0	100.0	100.0

Data source: "Projection of the Romanian population at the horizon of 2060", National Institute of Statistics, 2013, pages 29-44

Among the determined demographic elements of population aging, we analyse the development of some statistical data regarding the conjunctural index of fertility, the mortality rate and the increase of life expectancy.

1.1 The conjunctural fertility index

The conjunctural fertility index is very important and shows the intensity of fertility; it is determined by the formula TFR (CFI) = Σfx / 1000

where:

TFR (CFI) - total fertility rate (conjunctural fertility index)

fx - specific fertility rates by age (15 years ..... 49 years).

This index experienced a downward trend in between 1990 and 2012 from 1.8 in 1990 to 1.3 in 2012. It decreased to 1.2 in 2014 and it returned to 1.3 in 2016; the same level was in 2018, as can be seen in Table no. 2. It indicates that it diminished from 1.8 children per woman, to 1.3 children per woman and that it is below the 2.1 generation replacement level over time.

1990 is the year when the value of the conjunctural fertility index was below the generation replacement level over time (2.1 children per woman) and starting from 1996 it ranged from 1.2 to 1.4.

More and more couples decide to have one or at most two children, as they have the opportunity to control the number of births by different methods; this highlights an increased share of rank one and two children. Considering the trend of the total fertility rate, of the share of different ages at its formation and also of the structure concerning children according to birth rank, it means that the couples practice a demographic behaviour of diminution and not one of distribution in time of the number desired children, in the economic and social conditions in Romania.

The effects of population aging caused by a diminished fertility rate can be found on several levels, including the financial elements as well:

- Increased cost of health services;
- Lack of proper infrastructure to support families with children (nurseries, kindergartens);
- Shortcomings in providing a decent living standard for retirees.

Table no. 2 Evolution of conjunctural fertility index between 1990 and 2018

1990	1992	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
1.8	1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3

Source: National Institute of Statistics, Romanian Statistical Yearbook, 2018

1.2 Mortality rate

Population mortality is a complex demographic phenomenon measuring all deaths within a population over a defined period of time. Mortality level includes all the factors that adversely affect the quality of life and which also relate to the changes of socio-economic factors. Due to the decrease of the standard of living and of the health of population, the overall mortality has increased in the last ten years, but values were even higher in the last years. The variation in mortality rates, largely determines the level of natural increase and life expectancy. In its turn, mortality is the most sensitive index influenced by socio-economic and biological factors (environment, lifestyle), as well as by health services.

In 2015, there were 260,997 deaths, corresponding to a gross mortality rate of 11.7 ‰ inhabitants, which represents the highest rate during the studied period.

Dynamics of mortality by sex. There is still male supramortality in 2015 (135,697 deaths - 12.5 ‰) compared to the female supramortality of 125,300 deaths (11.0 ‰), as can be seen in Table no. 3.

Table no. 3 Mortality by sex in Romania between 2006 and 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Male	12.3	12.1	12.3	12.5	12.6	12.1	12.2	12.0	12.2	12.5
Female	10.5	10.3	10.2	10.4	10.6	10.4	19.6	10.4	10.7	11.0
Total	11.4	11.2	11.2	11.4	11.5	11.2	11.4	11.2	11.4	11.7

Source: National Report on the Health Status of the Population of Romania 2016

Dynamics of mortality by environments. Higher mortality in the rural area (138,505 deaths - 14.3 ‰) than in the urban area (122,492 - 9.8 ‰) can be noticed in Table no. 4 below. It may be due to population aging especially in the rural area, the migration of the young population to the urban areas in search of jobs, but also the lower accessibility to medical services, the small number and the poor equipment of the sanitary units.

Table no. 4 Mortality by environments in Romania between 2006 and 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Urban	9.1	8.9	8.9	9.1	9.2	9.0	9.3	9.2	9.5	9.8
Rural	14.5	14.1	14.2	14.5	14.6	14.1	14.2	13.8	14.0	14.3
Total	11.4	11.2	11.2	11.4	11.5	11.2	11.4	11.2	11.4	11.7

Source: National Report on the Health Status of the Population of Romania 2016

1.3 Increased life expectancy

a. Life expectancy at birth shows the number of years a new-born would live provided that the current mortality pattern remains the same. Extended life expectancy is a goal for every developed country. Life expectancy at birth in Romania in 2007 was 73.1 years in total, namely 69.5 years for men and 76.8 years for women; it increased to 75.0 years in 2014, namely 71.4 years for men and 78.7 years for women according to data published by Eurostat at http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_mlexpec&lang=en.

Although steadily increasing over the last 10 years, the level of life expectancy at birth for Romania was 7-8 years lower compared to the advanced European countries in 2014.

b. Life expectancy at age 65 is represented by the number of years of a person aged 65, if the current mortality pattern were maintained. Life expectancy at age 65 is a synthetic indicator which specifically reflects the influence of the living conditions on the number of years a person can still live.

Life expectancy at age 65 in 2007 in Romania was 15.5 years in total, out of which 13.9 years for men and 16.9 years for women; it increased to 16.6 years in 2014, out of which 14.7 years for men and 18.1 years for women according to data published by Eurostat, accessed at http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_mlexpec&lang=en.

Improvement of the living conditions, and especially of the level of the specific medical services offered to this category of population, would implicitly lead to an increase in life expectancy at age 65.

2. Economic and demographic dependence ratio

The effects of aging both on economic and social life, as well as on demographic development, are also shown by the dependency ratio (economic, demographic). At the same time with the increase in the number of pensioners, there is a decrease in the number of the employed population. Within this framework, economic dependence increases. Thus, from 315.1 state social insurance retirees per 1000 employees in 1990, there were 1,125.0 retirees per 1000 employees in 2010, their number being reduced quite a bit to 1,073.1 retirees per 1000 employees in 2013. As for the demographic dependency ratio, in July 2012, there were 21.5 elderly persons per 100 adult persons (15-64 years), 5.7 persons more than in 1990, Table no. 5.

Table no. 5 Dependence ratio of young and elderly that per 100 adults, by design variants, in 2012, 2030, 2060, persons

Version	July 1, 2012	2030			2060		
		Constant	Optimistic	Pessimistic	Constant	Optimistic	Pessimistic
Young and elderly persons per 100 adults	42.9	49.1	50.03	47.9	63.4	67.6	59.8
Female	46.4	54.7	56.0	53.4	71.8	76.5	68.2
Male	39.4	43.7	44.6	42.4	55.3	59.1	51.6
Young persons per 100 adults	21.4	19.8	20.5	19.1	19.8	22.7	17.1
Female	20.8	19.4	20.1	18.7	19.6	22.6	16.9
Male	22.0	20.2	20.8	19.4	19.9	22.8	17.3
Elderly persons per 100 adults	21.5	29.3	29.8	28.8	43.6	44.9	42.7
Female	25.6	35.3	35.9	34.7	52.2	53.9	51.3
Male	17.3	23.5	23.8	23.0	35.4	36.3	34.3

Data source : National Institute of Statistics (2012) and "Projection of the Romanian population at the horizon of 2060 (2030, 2060)", pages 29-44

For all design variants, the number of young people per 100 adult persons will continue to decrease, reaching in the pessimistic version 19.1 persons in 2030 (17.1 persons in 2060), and in the optimistic version 20.5 persons (22.7 persons in the year 2060).

The changes expected to occur in the structure by population age groups will lead to an increase in the number of people considered "dependent", respectively under 15 years and over 65, per 100 adults, with the lowest values in the pessimistic version. In the medium and long term, the ratio between pensioners and employees will remain high, the structure of Romania's population being atypical, with very large generations aged between 23 and 48 (a result of pro-natalist policies in the period up to 1989) and very young, aged from 0 to 22 years (transition generations). Thus, less numerous generations have already begun to enter the labour market and the number of employees will not increase much. The number of the elderly per 100 adults will increase continuously; it is estimated that after 2030 it will start to grow steadily as a result of the massive entry of the many generations born after 1966 in the population aged 65 and over. So if in 2030 this ratio will be around 30.0%, it will reach 44.9% in the optimistic version, 43.6% in the constant version and 42.7% in the pessimistic version in 2060 (Table no. 5).

3. Effects of population aging

In Romania, as in the other countries affected by demographic aging, the direct effects that led to population aging were demographic: the decrease of birth rate and mortality rate together with the influence of flows arising from migration. The main element was the lowering birth rate, which considerably influenced the structure of population by age groups, contributing to the acceleration of demographic aging. Decreased mortality or, in other words, increased average life span played a secondary role. In Romania, the decrease of the birth rate was essentially influenced by the uprooting of the young population from the rural area, which massively relocated to the urban area; it gradually abandoned the traditional demographic peasant procreative behaviour and switched to a new demographic behaviour based on rigorous planning of births. Thus, an increase in demographic aging in rural areas and a gap between the two areas occurred.

3.1 Economic effects

The most important economic effects of the aging process in Romania refer to: economic dependence; demographic dependence; the consumption and adequate satisfaction by the society of the consumption needs for the elderly population; ensuring budgetary expenses related to pensions, aid and other forms of special support.

Consumption and the adequate satisfaction by the society of the consumption needs for the elderly population can be considered as other economic effects, since their achievement depends on the level of the elderly's income and implicitly on their standard of living, with direct implications on the quality of their life.

3.2 Social effects

The social effects entailed by the aging of groups of people represent a field of research because of the multiple situations

in which this category of population is, and which has various particularities. In this framework differential research on homogeneous sub-collectivities is necessary, because the group of the elderly or of the long living persons, for example, generates some implications, whereas the implications among the older males are different than the older females, or the married people, compared to widows/widowers, divorced, single.

Among the social effects of demographic aging, we emphasize: cessation of professional activity which entails social, family and individual effects, feelings of worthlessness and social isolation with social consequences generated by aging, aging of the family and members of the household which entails some social and other consequences.

Conclusions

Romania has undergone significant changes in the population structure in the last decades, mostly due to the economic and demographic transition. Political changes with different visions regarding the important aspects such as the public policies regarding family support, the health system, the pension system were other elements which had a strong influence on the development of demographic phenomena. The last twenty years have been characterized by continuous decrease in the number of population with about 1.9 million inhabitants (21.3 million inhabitants in July 2012, compared to 23.2 million inhabitants in 1990). Changing the couples' demographic behaviour towards reproduction increased mortality, as well as external migration were the factors contributing to the continuous decrease in the country's population. The decrease will continue, so that Romania's population will reach 18.0 million inhabitants by 2030 (3.3 million inhabitants less compared to July 2012), and by 2060, Romania's population will reach 12, 9 million inhabitants (8.4 million inhabitants less compared to July 2012). (the constant variant).

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