
ANALYSIS OF THE EVOLUTION OF THE POPULATION – SOURCE THAT FEEDS THE LABOR FORCE

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Abstract

In the study to be presented in this article, the authors set out to highlight the way in which the population of Romania evolves and the way in which, year after year, the population supplies the workforce needed in the national economy. The authors also started from the fact that the population and housing census was recently completed, resulting in still non-definitive data, but sufficiently important to be able to analyze the current stage of the evolution of the natural movement of the population in our country but, above all, the perspective of the evolution during next. In the analysis of the evolution of the population starting from the natural daily, monthly, annual or any period of time an analyst wants to take into account, a downward trend of the resident population is found. We specify that at the statistical level the population is registered according to two criteria:

- The resident population, which means those people who have declared their residence, for at least one year, in Romania. The resident population is important because it pays taxes and fees for Romania. Also, in conducting statistical surveys or even in elections, it is the population that enters the electoral quorum that the central electoral institution can certainly rely on.*
- The second category is the population by domicile, starting from the fact that a lot of Romanian emigrants still maintain their domicile in Romania because most emigrants from the last decades have also maintained their Romanian citizenship, they have also maintained some properties in the country and are to an important extent also contributors to bringing into the country important sums, in the*

form of remittances, for personal interest, or for relatives or even, many of them, for commercial interest.

In the analysis of the demographic phenomenon, the population, we took into account the structural analysis by gender, by age, by geographical area and we started from the fact that this evolution is the one that can give a verdict on the local source of labor that can be it feeds every commercial company or, at the macro-economic level, the national economy. Of course, there should be a correlation between the labor force requirement structured geographically or in terms of professions, qualifications, but this is more difficult to achieve. However, it is, as will be seen in the article, the main source of these labor needs. As a paradox, Romania, which at the moment registers approximately 4 million Romanian citizens working abroad, needs labor and, mainly, around 200,000 people annually receive acceptance to work in the economy from Romania. In this analysis we used the index system, other statistical methods such as comparability, dynamic series, structural series or some econometric methods, through which we tried to highlight the existence and maintenance of some correlations at the level of the national economy.

Key words: *demography, resident population, population by residence, labor force, developments, statistical variables.*

JEL classification: *E20, E30*

Introduction

In this article we started from the results recorded in the population and housing census, which ended in a new formula, which gave much better results and we hope that they will also confirm when the final indicators are obtained.

We started the study from the natural movement of the population in the year 2023, highlighting the birth rate, mortality in the first place, putting here in parallel the effect of the two indicators that in the stillbirth indicator, show that at the present moment, when the structure of the population by age groups is directed towards the top of the age pyramid, i.e. highlighting an aging population, also expresses why the stillbirth causes the permanent reduction of the population in our country.

I also referred to other indicators, such as divorce rate, marriage rate, infant mortality, mortality by age groups, etc., precisely to reveal the fact that in the current conditions, when the fertility of female persons at the reproductive age has decreased, it leads to a more refreshing ease of future generations.

There are studies and references, which we do not want to refer to in

order not to give a different tone to our article, and in terms of medication, the effect of some pandemics, incurable diseases and others, which also have a negative effect on stillbirths.

The labor force is recruited from the coming generations, depending on the existing jobs in the economy both at state-owned commercial companies, but especially in the private sector. Certainly, labor force quotas are released year by year, based on the completion of high school, professional qualification studies or the last stage, the higher, university studies.

We know that due to the way in which people without jobs are treated, those who are well trained and with some possibilities, from the high school period they are oriented to study abroad, and after studies the percentage of those who come to the country is very low.

Here, in the government strategy, in addition to the need to grant a series of advantages, for the establishment of commercial companies by young graduates and their involvement in leading areas of the economy, we can somehow stop the number of those who emigrate after completing their studies, in the countries where they carried out these studies or in other countries bringing financial and material advantages for these people.

The labor force is not prepared at the moment, neither by the education system nor by other forms, to satisfy the demand of the labor market for certain specializations, certain professions, certain activities that can become promising and individual profit or profit in the wider interest of society.

A study carried out on specializations shows us that a significant number of IT professionals, with good training and qualification in the country or even abroad, cannot find jobs. This is how it happens that at the fairs where the unoccupied places in the economy are taken out for employment, this desired is not fulfilled. This is because the requirements for job vacancies are totally different from the aspirations of those interested in filling vacancies. Because of this, after each activity of this kind, there remain a lot of vacancies, put out for employment, still free.

It is a very sensitive area because of Clark-Douglas's three factors of production, labor is an important element, perhaps equal in importance to capital subscribed, paid in and employed. In a more careful interpretation, we can put the equal sign between labor, often called human capital, and the social capital we are discussing.

A national way must be found to stimulate the training of graduates in schools with a professional profile, which leads to the prospect of obtaining those specialists that the national economy needs, through commercial companies.

We note from the structuring of the annual budgets that often, if not

very often, the issue of financing education as a whole is discussed. This and closely related to research, innovation and innovation, the latter benefiting from about 0.5% of GDP.

The analyzed theme also has other connotations in the sense that, from here, the perspective of analyzing the standard of living, the material conditions of the population of our country is spilled over, in a context in which there is not much to say that is good.

I ended this article stating that the budgetary sector has been permanently characterized by continuous decreases in the number of employees as the main way to balance revenues with expenses. The decrease in the number of employees registered in the local public administration units is also found in the secondary activities carried out by them, such as cultural, sports, recreational, landscaping and services, agriculture, water distribution, sanitation, waste management, decontamination activities, construction, transports, storage, production and supply of electricity and many others, which contribute to balancing the state budget through reductions that will have their say in a future period.

Literature review

A significant number of researchers have addressed the topic of population evolution in their studies. Thus, Anghelache, Anghel and Iacob (2020) analyzed a series of aspects related to the natural movement of the population in the context of the coronavirus pandemic. Anghelache, Barbu, Anghel and Căpușneanu (2018) highlighted the main indicators used in the population analysis. Chéron, Hairault and Langot (2013) focused on the study of available jobs throughout the life cycle. Klein and Ventura (2009) analyzed the correlation between labor mobility and productivity. Kroft, Lange, and Notowidigdo (2013) directed their research to the study of employer behavior. Maestas, Mullen and Powell (2016) studied the impact of population aging on the labor force and, by implication, on productivity. Nekoei and Weber (2017) tried to identify how job quality is improved by extending unemployment benefits. Oster, E. and others (2013) analyzed the relationship between limited life expectancy, human capital and health investments.

Data, Results and Discussion

Analyzing the data made available by the National Institute of Statistics, we find that in June 2023 the number of births and the number of registered deaths decreased both compared to June 2022 and compared to the previous month (May 2023). In June 2023, the number of marriages and the number of registered divorces decreased compared to June 2022, but

increased compared to May 2023.

In June 2023, the birth of 12,320 children was recorded, with 922 fewer children than in May 2023.

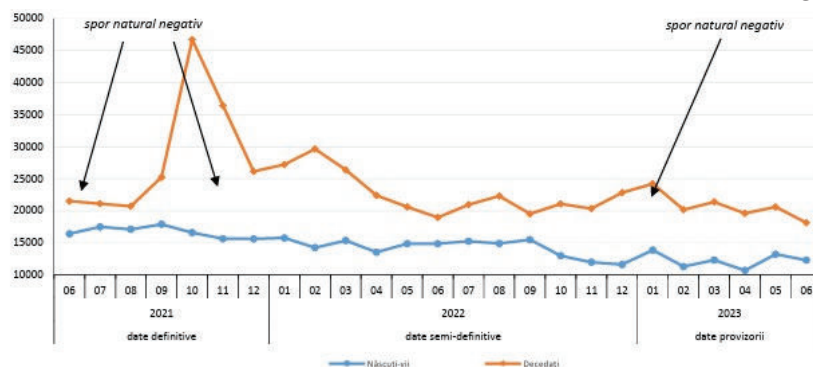
The number of deaths recorded in June 2023 was 18153 (9554 males and 8599 females), with 2464 deaths (1261 males and 1203 females) less than in May 2023. The number of deaths of children under 1 year of age recorded in June 2023 was 70 children, down 17 from May 2023.

The natural increase remained negative (-5833) in June 2023, the number of deceased persons being 1.5 times higher than that of live births.

The monthly evolution of the number of deaths and births in the period June 2021–June 2023 highlights a significant increase in the number of deaths in October 2021 when, in the context of the COVID19 pandemic, the highest value of the entire period was recorded. A significant number of deaths was also recorded in February 2022, with the following period registering an oscillating evolution without reaching the values of the previous months. At the same time, the number of births was the highest in the July-September period, both in 2021 and in 2022, given the increased number of deaths, the natural increase remaining negative. In the first five months of 2023, the values of births and deaths had the same evolution, in June registering decreases in both phenomena compared to the previous month.

Evolution of the number of live births and deaths, in the period June 2021 – June 2023

Chart 1



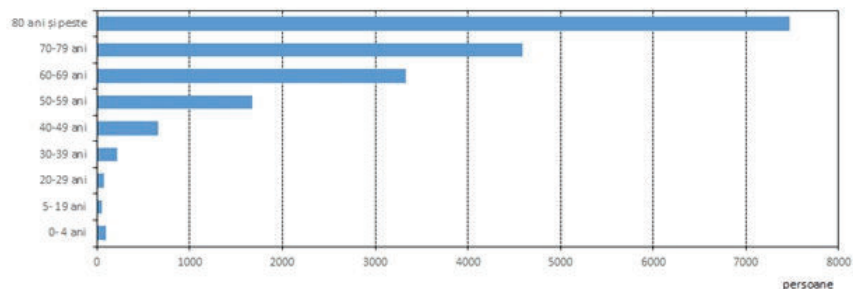
Source: National Institute of Statistics, data processed by the authors.

In June 2023, 41.1% (7466 deaths) of the total number of deaths occurred in people aged 80 and over, 25.3% (4593 deaths) in people aged 70-79 and 18.4% , representing 3334 deaths, in people aged 60-69 years. At the

opposite pole, the fewest deaths were recorded in the age groups 0-4 years (94 deaths), 5-19 years (54 deaths) and 20-29 years (72 deaths).

Deaths recorded in June 2023, by age group

Chart 2



Source: National Institute of Statistics, data processed by the authors.

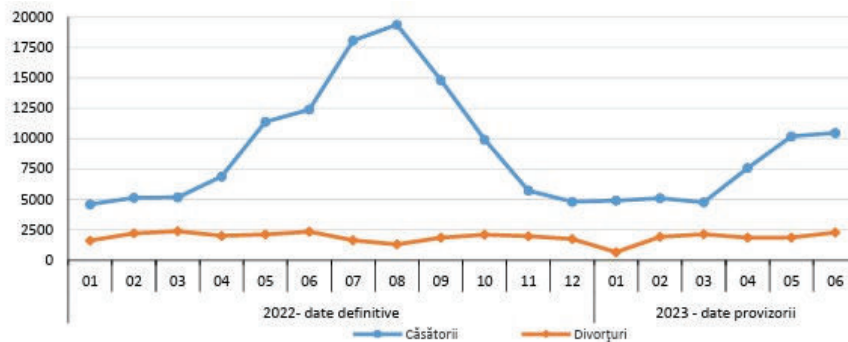
According to the main cause of death, most people who died in June 2023 had the following causes: diseases of the circulatory system (9711 people, representing 53.5%), tumours (3734 people, representing 20.6%) and diseases of the respiratory system (1408 people, representing 7.8%).

In June 2023, 10,470 marriages were registered at civil status offices, 285 more than in May 2023.

The number of divorces pronounced by final court decisions and according to Law no. 202/2010 was 2278 in June 2023, 418 more than in May 2023.

Evolution of the number of marriages and divorces, in the period January 2022 – June 2023

Chart 3



Source: National Institute of Statistics, data processed by the authors.

The number of live births recorded in June 2023 was lower by 2581 compared to the same month in 2022.

The natural increase was negative both in June 2023 (-5833 people) and in June 2022 (-4073 people).

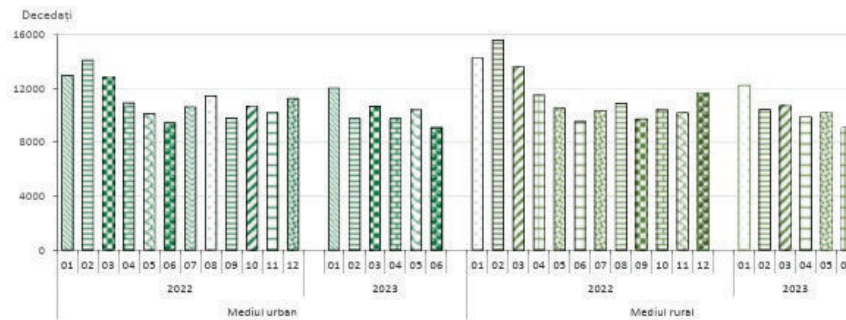
The number of people who died in June 2023 was 821 less compared to June 2022. After the first three main causes of death, in June 2023 compared to June 2022, there were 491 fewer deaths caused by diseases of the circulatory system, with 8 fewer deaths caused by tumours and 54 fewer deaths caused by diseases of the respiratory system.

The number of children under one year of age who died was 21 lower in June 2023 than in June 2022.

In June 2023, the death of 9,074 people (4,776 men and 4,298 women) was recorded in urban areas, and the death of 9,079 people (4,778 men and 4,301 women) in rural areas. Compared to the same month in 2022, the number of people who died decreased by 360 people (218 men and 142 women) in urban areas and by 461 people (194 men and 267 women) in rural areas.

Evolution of the number of deceased by residence environment, between January 2022 and June 2023

Chart 4



Source: National Institute of Statistics, data processed by the authors.

The number of marriages was, in June 2023, 1925 lower than the one recorded in the same month of the previous year.

Through final court decisions and according to Law no. 202/2010 in June 2023 there were 68 fewer divorces than in June 2022.

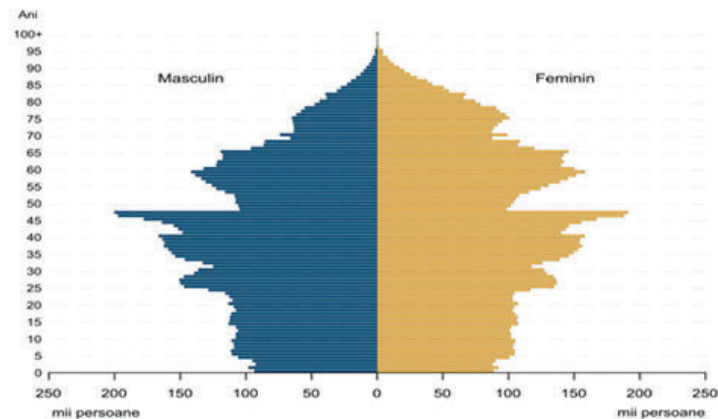
The employed population includes all persons - both employees and self-employed - who exercise a productive activity within the production limits of the European System of Accounts.

On June 30, 2023, the resident population was 19,861 thousand people, down by 85.9 thousand people compared to January 1, 2014. The main cause of this decrease is the negative natural increase (-5833 people). The urban population and the female population are in the majority (53.7% and 51.0%, respectively). The phenomenon of demographic aging has intensified, the gap between the elderly population aged 65 and over and the young population aged 0-14 growing to over 300 thousand people. The demographic dependency index increased from 48.1 to 48.7 young and elderly persons per 100 adults.

The balance of long-term temporary international migration was negative (-31300 people). On June 1, 2022, the urban resident population was 10,437 thousand people, down 0.3% compared to January 1, 2022. The female population on January 1, 2022 was 10,039 thousand people, down 0.31% compared to January 2022.

Resident population by sex and age, on June 1, 2023

Chart 5



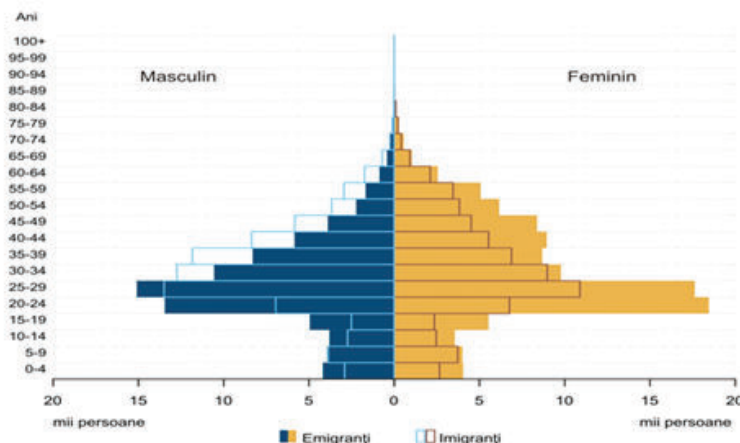
Source: National Institute of Statistics, data processed by the authors.

The demographic aging process has deepened compared to January 1, 2022 noting the decrease in the number of young people (0-14 years) and the increase in the number of elderly people (65 years and over). The demographic aging index has increased. The share of the population aged 0-14 in the total population remained constant, but the share of the population aged 65 and over in the total population increased. Thus, the demographic dependency index increased from 47.1 (on January 1, 2021) to 48.9 young and elderly people per 100 adults (on June 1, 2022).

Romania continues to be a country of emigration. The balance of international migration in 2022 was negative, the number of emigrants exceeding the number of immigrants by 43 thousand people. During 2022, as in 2021, women emigrated in a higher proportion than men. Among immigrants, men were the majority (54.7%).

International long-term temporary migration by gender and age group, in 2022

Chart 6



Source: National Institute of Statistics, data processed by the authors.

This number differs significantly from the number of employees currently employed. It includes the total number of employees determined according to the accounts, which take into account both the data sources used to determine employment, such as the Household Employment Survey (AMIGO); Labor Cost Survey (S3); The annual structural survey in enterprises (ASA), as well as administrative data sources (information from the Ministry of Foreign Affairs, the Ministry of Labour, Family and Equal Opportunities, the Ministry of the Interior and Administrative Reform, etc.); financial and accounting statements of financial companies.

I specify that the number of employees also includes those who work in the unobserved economy, established according to the calculation methodology.

Another category is represented by independent workers (on their own account), these being the people who are the sole owners or co-owners of entities without legal personality, in which they work. This category can also include: unpaid family workers and home workers who produce for the market, workers who exercise, both individually and collectively, production activities exclusively for final consumption or capital formation on their own account.

The employed population according to the SEC methodology is the only indicator that indicates the human potential of the employed workforce that can be used to determine the social productivity of labor as a ratio between GDP and the employed population.

The evolution of labor productivity is, within this series, quite fluctuating, from high positive levels to constant reductions. Until 2019, labor productivity had an upward trend. Starting with the year 2020, with the start of the covid 19 pandemic, productivity, work decreased, having an oscillating evolution in 2022-2023.

Real productivity per hour shows, in principle, the same evolution as real productivity per employed person.

In the analysis of the employed population, the percentage evolution of the employed structure is noted in terms of the large categories of employees and individual entrepreneurs. In this context, according to the European System of Accounts, 1995 edition, employees have a share of about 70.9% of the employed population.

By branches of activity, the largest share is held by agriculture with 27.0%, followed by industry with 22.8% and transport with 21%. The employed population indicator in Romania compared to other countries shows a worrying negative discrepancy and where I think the attention of decision-makers should be focused.

The information related to the “budgetary sector” must be carefully analyzed, because the data refer to statistics from economic activities (aggregated by homogeneous activity), according to CAEN Rev.2. by: public administration, education, respectively health and social assistance (including the private sector for education - about 2%, respectively about 4.5% for health and social assistance), exclusive of the armed forces and assimilated personnel (MApN, SRI, MAI, etc.).

These statistics do not take into account the form of financing, their purpose being to provide information on economic activities, according to CAEN Rev.2.

The budgetary sector was characterized in the period 2010-2015 by continuous decreases in the number of employees. The most pronounced decreases were recorded in 2010 and 2011. In the period 2016-2019, employees in the budget sector had reduced associations, starting with the year 2019 and then the period 2020-2009; 2022-2023, the number of employees in the budget sector decreased, as a result of fiscal measures imposed by the crises facing the national economy.

Likewise, decreases in the number of employees registered in the local public administration units are also found in the secondary activities carried out by them, such as: cultural, sports and recreational activities, landscaping and services for buildings, agriculture, water distribution, sanitation, waste management, decontamination activities, construction, transport and storage, production and supply of electricity and thermal energy, gas, hot water and air conditioning, rental and sub-rental of real estate, etc.

Conclusions

From the data we had at our disposal and presented in the article, we sought to highlight why the evolution of a country's population is important as a source of supply, at least quantitatively, of the labor force necessary for the national economy.

It is found that there is a major imbalance between the requirements of the labor market and the supply of labor, this time starting from the qualitative criterion, i.e. specializations, seniority, the perspective of improvement, retraining and by finding new ways of workforce training.

It is found that there is a paradox, in the sense that Romania has a level of about 4 million people who work abroad annually, on a contractual or non-contractual basis, it doesn't even matter anymore, and the need for labor force with certain qualifications of commercial companies from Romania.

This happens because there is no mechanism to know the jobs available or becoming available, by specialization, by region, so that action can be taken at the level of training future contingents of specialists on these structures.

The labor force is an essential element in increasing labor productivity, therefore in production and, at the same time, increasing incomes with which to increase the annual results of the level of the national economy through the calculation of the Gross Domestic Product.

The Gross Domestic Product is also growing in other ways. For example, inflation is harmful to the standard of living of Romanians, but it is useful for economic growth because the production of the inflated value is distributed, taxed, charged and those amounts go to the state budget. That is why many researchers say that there is an acceptable, even desirable, level of 1-2% of inflation and even unemployment. They start from the fact that an unemployment rate of 1-2% is affordable and stimulating for retraining the labor force in the spirit and interest of the national economy.

A final conclusion is that the population of Romania, clearly, will decrease in every period in the future, due to the reduced fertility of the female sample, which can ensure births. Against this background, the aging process of Romania's population is manifested, the stillbirth indicator increases and, in this way, digitization will surely be a phenomenon that will make work easier, but a very well-structured population will be needed in time to ensure the evolution of the economy national.

References

1. Anghelache, C., Anghel, M.G., Iacob, Ș.V. (2020). *Analysis of the natural movement of the population under the spectrum of the health crisis*. Theoretical and Applied Economics, XXVII (2020), 4(625), Winter, 177-186
2. Anghelache, C., Barbu, C.M., Anghel, M.G., Căpușneanu, S. (2018). *Study of population by domicile and residence. Natural movement and imbalances*. Theoretical and Applied Economics, XXV (2018), 4 (617), Winter, 25-38
3. Chéron, A., Hairault, J.O., Langot, F. (2013). *Life-Cycle Equilibrium Unemployment*. Journal of Labor Economics, 31 (4), 843-882.
4. Klein, P. and Ventura, G. (2009). *Productivity differences and the dynamic effects of labor movements*. Journal of Monetary Economics, 56 (8), 1059–1073
5. Kroft, K., Lange, F. and Notowidigdo, M. (2013). *Duration Dependence and Labor Market Conditions: Evidence from a Field Experiment*. Quarterly Journal of Economics, 128 (3), 1123–1167
6. Maestas, N., Mullen, K., Powell, D. (2016). *The effect of population ageing on economic growth, the labor force and productivity*. National Bureau Of Economic Research, Cambridge, Working Paper no. 22452
7. Nekoei, A., Weber, A. (2017). Does Extending Unemployment Benefits Improve Job Quality?. American Economic Review, 107, 527–561
8. Oster, E., Shoulson, I. and Dorsey, E., (2013). Limited Life Expectancy, Human Capital and Health Investments. American Economic Review, 103 (5), pp.1977–2002