

STATISTICAL TRENDS AND ECONOMIC AND DEMOGRAPHIC CONSEQUENCES OF EXTERNAL MIGRATION IN ROMANIA

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ABSTRACT. External migration is a socio-demographic phenomenon strongly shaped by the economic and political evolution of a country. Within certain limits, migration serves as a mechanism to alleviate social frustrations, such as dissatisfaction with low incomes, unstable employment, and limited opportunities for professional and social advancement. International migration affects all nations, acting as countries of origin, transit, or destination. In 2023, approximately 200000 Romanians temporarily migrated to economically developed countries to address financial, professional, and familial needs. Of these emigrants, about 85% were aged 15–64, representing an economically active demographic also contributing to the population’s fertility rate. This study examines the impact of net average salaries on external migration and how migration influences Romania’s ageing population and workforce from 2007 to 2023. Using statistical-descriptive methods and linear regression models, it explores the relationships between the net average salary, the ageing of the active population, and the external migration rate. The findings highlight both positive and negative economic, demographic, and political effects, including labor shortages in Romania and reduced labor costs in destination countries.

1. INTRODUCTION

External migration refers to the movement of people across national borders, either permanently or temporarily, and encompasses both emigration (leaving one’s country) and immigration (entering another country). In Romania, external migration has significant socio-economic [1] and demographic implications, particularly due to the steady decline in the active population and the simultaneous acceleration of population ageing [2]. These trends pose serious challenges to Romania’s labor market, economy, and social systems.

Historically, migration has been influenced by economic, political, and social disparities, as well as interdependencies between countries of origin and destination. Following Romania’s accession to the European Union in 2007, migration flows intensified, with over 5,7 million Romanians choosing to live and work abroad, placing the country 17th globally in terms of emigrant numbers. The ratio of Romanian emigrants to foreign immigrants settling in Romania is approximately 6 to 1, according to data from the World Organization for Migration (cited by CES Bucharest).

Demographer Vladimir Trebici aptly described migration as a social event driven by economic and social determinants, with far-reaching consequences for demographics, economics, and society [3]. Migration often leads to a loss of young, economically active individuals, exacerbating Romania’s ageing population and fertility decline. While economic factors like low wages and poor working conditions are primary drivers of migration,

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other influences such as education, cultural expectations, and geopolitical instability also play crucial roles.

At the international level, organizations like the International Organization for Migration (IOM) and initiatives such as the 2015 European Agenda for Migration highlight the global significance of migration management [4]. These efforts aim to address root causes of migration, enforce policies on illegal migration, and develop strategies for legal migration while considering demographic challenges like ageing populations and declining fertility rates. Despite these initiatives, disagreements persist. For example, some EU states, including Poland and Hungary, have opposed the UN Migration Pact, citing concerns over national sovereignty [5].

For Romania, migration trends have been shaped by both domestic and international factors. While economic growth in recent years has created new opportunities, geopolitical instability in neighboring regions and persistent disparities in living standards have fueled continued emigration. Meanwhile, Romania faces a growing labor shortage, threatening its economic stability. As developed EU countries remain attractive destinations for migrants, Romania must address this challenge through targeted economic and social policies that improve living and working conditions to retain its workforce.

2. REVIEW OF SPECIALIZED LITERATURE

The dynamics or general movement of the population presents two essential processes: the natural movement described by the very demographic events (birth, mortality, nuptiality, and so on, divorce) and the migratory movement that is part of the process of population mobility (change of residential, professional, social status of people).

According to scientific approaches of population migration studies, both the economic causes of migration and the migration policy of states are addressed and analyzed [6], [7]. Migration policy [8] of a state must primarily aim at resolving the social, political, legal and financial problems arising from migration processes [9], and, as well as regulating migration processes and combating illegal migration [10]. Migration policy [11] is the component of the national long-term development strategy, based on the principle of a complex approach to regulating a wide range of relationships that would ensure the dynamic development of both the beneficiary countries of the workforce and the donor countries [12].

An important aspect of migration policy [13] is that it refers to taking the necessary measures to ensure that part of the diaspora [14] returns home at some point, but also to ensure integration. The return of the diaspora represents for the country a gain both in terms of workforce, as for the fact that they return with more knowledge and a certain civic spirit for the sustainable development of a country like Romania [15], as well, facing a massive migration of the active workforce and an acute shortage of skilled workers in certain areas, such as construction, HORECA, installations, etc. Another aspect of migration policy is the integration of migrants into society and active life [16].

The economic approach to population migration research allows for a reflection on this complex phenomenon, the determination of common laws, as well as specific characteristics and the development of regulatory and management measures [17]. Determining the legitimacy of migration processes over the last two centuries has been the subject of research by representatives of various economic schools [18].

The mobility of the workforce is thus determined by the characteristics of contemporary industry, and this mobility, which involves a change of occupation, profession and field of activity, obviously does not take place without territorial movements, he said, population migration [19]. The economic factors that determine the mobility of the population

are conditioned by the need [20] for capital movement, the production process and the productive forces. The mobility of capital from one branch to another, from one region to another, determines the mobility of the active population [21].

At the end of the 20th century, migration intensified as a result of several factors, such as globalization and the evolution of the means of transport and communication [22].

The 21st century brings a new wave of migrants to Western Europe. It has become the responsibility of the entire European Union [23], [24] to find viable solutions, because the exodus from the Mediterranean basin is not only a problem for the countries of the region. As is known, there are different reasons for migration: wars, conflicts, poverty, discrimination, violence and persecution, family, climate change and many more.

Migration can be classified according to several criteria, depending on the factors of influence [25-27], as follows: depending on the type of border that migrants cross, depending on the type of, time period, purpose of the journey, degree of freedom of the migration decision, legality of the journey [28], [29]. This classification mode is illustrated in Figure 1 [30].

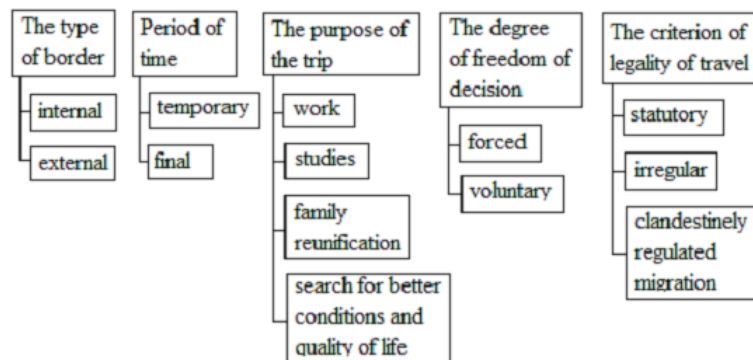


FIGURE 1. Criteria for classifying types of migration

The demographic approach has a key role to play in the analysis of migration processes [31]. Within this approach, the importance of sustainable effects of population growth and the role of population quality as a determinant of socio-economic development are highlighted [32]. In the current conditions, there has been a massive increase in population, of which 80% live in developing countries. Recently, there has been a decrease in population reproduction and demographic ageing indicators in European countries. This is one of the factors in labor migration, especially from developing countries into a demographic crisis.

Currently, migration is a phenomenon that takes more and more forms and produces various effects with a strong impact on society [33]. The factors that lead to the intensification and diversification of the migration phenomenon have become more and more varied, being determined by political, social, environmental, and other factors, the economic and technological changes that have taken place in recent decades around the world. Therefore, a more effective management of migration, aimed at increasing its positive impact and mitigating its negative effects, requires highlighting the factors that are driving the intensification of the migratory phenomenon [34].

External migration (emigration) is analyzed according to the temporal criterion resulting in temporary emigration and definitive emigration. In this paper we will statistically

analyses the external migration dimension after Romania's accession to the EU (2007-2023), focusing on its consequences: the reduction of the workforce and the ageing of the population.

3. METHODOLOGY SPECIFICATIONS FOR THE STUDY OF MIGRATION

The migration phenomenon is treated at level "macro" through quantitative (statistical) methods and at level "micro" through qualitative (sociological) methods such as focus group, interview or meeting, case study. The study of migration is a distinct chapter in all textbooks and treaties on demography and the sociology of the population. Demographers are mainly focused on the technical (statistical) aspects involved in the analysis of this phenomenon, which are part of the larger chapter of spatial or geographical mobility of the population. Sociologists concerned about population studies are particularly interested in "migration flows" [35]. However, it is difficult to place a line that strictly demarcates the sociological and statistical-demographic approaches. In the analysis of the migration phenomenon, a number of statistical indicators are used, as follows:

- gross migration ($Mb = I + E$), which cumulates immigration and emigration;
- migratory increase ($Sm = I - E$), which has negative values, even worrying in the case of Romania;
- the migration rate ($Mr = M/P \cdot 1000$), where M is the number of migrants, P is the population at risk of migration;
- emigration and immigration rates $Re = (E/P) \cdot 1000$ and $Ri = (I/P) \cdot 1000$;
- the attraction index of the migration $Ia = (Po \cdot Pd)/D$, a formula in which Po represents the population of the locality of origin, and Pd represents the population of the destination locality, as follows, and D is the distance between the two towns.

According to the methodology of the National Institute of Statistics (INS), definitive emigration means the movement of Romanian citizens with the change of domicile in Romania and the establishment of domicile on the territory of another state.

Temporary emigration means moving Romanian citizens abroad for a period of at least 12 months. The international migratory movement produces significant effects especially on the population's herd (volume) and its age structure. Measurement of this effect can be achieved by calculating the external migratory balance, both in absolute or relative form and normalized. The external migratory balance in absolute form is calculated by the formula $Sdme = (Sc - Pc) + (Ss - Ps) = Sdmec + Sdmes$, where Sc = number of repatriations, Pc = number of emigrations, Ss = number of immigrations, Ps = number of departures from the country of foreign citizens, Sdmec = external migration balance due to the citizens of the respective country, Sdmes = external migration balance due to foreign citizens. In relative form, the external Sdme migratory balance shall be determined by reference to the population of the country at the time of reference: $Pop/Sdmer = (Sdmec + Sdmes)/Pop \cdot 100$. In normalised form, the external Sdmen migratory balance shall be calculated as the ratio between the sum of net flows and the total of input and output flows: $Sdmen = [(Sc - Pc) + (Ss - Ps)] / [(Sc + Pc) + (Ss + Ps)]$ or according to the share of the external migration movement (gc) of the respective citizens of the respective country $Mmec = Sc + Pc$ and the total external migration movement $Mmet = Ss + Ps$, respectively, according to the literature [36].

4. STATISTICAL ANALYSIS OF EXTERNAL MIGRATION IN 2007-2023

Together with the negative natural increase, the migration phenomenon is an important cause of the constant decrease of the Romanian population.

The migration of Romanian workforce abroad has been widespread in the last 20 years and involves the population of all regions of the country, all age and gender categories, and, all ethnic groups in the country. Romanians go to work not only in Latin-speaking countries of the European Union, such as Italy, Spain and France, but also in countries such as the UK, Germany, the US or Canada, he said, exceeding Latin world and attachment to linguistic affinities in the choice of country for labor migration.

The evolution of the migration process in Romania in the period 2008-2023, based on the statistical data obtained from <https://ec.europa.eu/eurostat/data/database> and <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, can be graphically rendered using Figure 2:

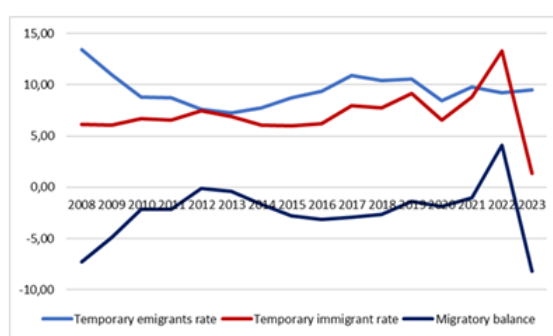


FIGURE 2. The evolution of the temporary emigrants rate (‰), the temporary immigrants rate (‰) and the migration balance in Romania during 2008-2023

In the first year after Romania’s accession to the European Union, there was a peak of departures abroad, with 544074 persons (an emigration rate of 25,7 ‰) have chosen to temporarily emigrate to countries such as Italy and Spain.

As can be seen from Figure 2, since 2008 there has been a downward trend of temporary emigrants, in 2012 the lowest migration balance was recorded, the difference between immigrants and migrants is only 2920 people. Then, since 2014 there is a steady growth of those who leave the country. The number of migrants in Romania decreased in the year of the 2020 pandemic by 21,45% compared to 2019, reaching 21031 people in 2020 compared to 26775 people in the previous year. The number of immigrants, who registered a value of 32250 people in 2020, compared to 64479 in 2019, was also decreasing by almost 50% in 2020 due to the COVID-19 pandemic.

In Romania in 2023, the number of immigrants exceeded the number of emigrants by 82 thousand people. According to the latest data issued by the National Institute of Statistics, on January 1, 2024, in Romania, the resident population was 19064409 people, up 9861 from January 1, 2023. The immigration phenomenon is the main reason for the country’s population growth in 2023. Thus, the balance of international migration in 2023 was positive, the number of immigrants exceeding the number of emigrants by 82 thousand people.

Thus, starting from a net monthly nominal salary of 1042 lei in 2007, it reached 4412 lei in 2023, which means an increase of 323% from the moment of joining the European Union. Even if there were these salary increases, Romanian employees still have the lowest salaries in the European Union, the gap being significant. But the wage increases did not correspond to the evolution of the standard of living of the population. High inflation,

rising utility spending have reduced purchasing power. But not only wage gain has an influence on migration, but the entire economic and social climate that is characterized by a sharp instability.

On immigration, about 30% of the total number of temporary immigrants is represented by pupils and students due to the growing number of scholarships granted to students and research outside the country (INSSE, 2023). (Table 1)

Table 1. Age structure of Romanian temporary emigrants for 2007-2023

Year	Age group 0-19 years	Age group 20-29 years	Age group 30-39 years	Age group 40-49 years	Age group 50-59 years	Age group 60 years and over
2007	99257	189145	135248	79130	33928	7365
2008	55240	105266	75270	44039	18882	4099
2009	48448	84704	54038	36349	18181	4906
2010	38947	68432	41966	28836	15039	4765
2011	39807	67251	41584	27036	14630	5243
2012	34672	56916	33446	25377	14399	5376
2013	33248	52156	30569	24265	14787	6730
2014	28787	55923	42004	26034	14249	5874
2015	30340	79811	45730	23203	10316	5318
2016	35531	75781	45819	32963	11374	6110
2017	46195	85995	48974	32479	17059	11491
2018	47190	71872	52068	34129	16975	9427
2019	45529	75404	50894	32469	19224	10216
2020	27795	53884	44237	31433	18851	10618
2021	29919	60818	54152	38571	21444	11957
2022	28154	53296	47408	36055	22626	14772
2023	38545	51895	47153	34981	24572	11210

If we look at the age structure of the emigrants over the 17 years, we note that the most important share is represented by people in the age group 20-29 years and in the group 30-39 years. High migration among young people will have the effects of major problems in the labor market and pension system in the coming years. Also, the phenomenon of demographic ageing is increasing due to changes in the structure by age group of the population.

Regarding the main destinations of Romanian emigrants for the period 2008-2022, it is noted that in the year after the accession to the European Union most Romanians preferred Italy (163290 people) and Spain (61027 people). With the worsening economic and social conditions in Italy and Spain, there is a substantial increase of Romanians emigrating to the UK (from 2430 people in 2008 to 55474 people in 2016). (Figure 3)

Since 2019, Romanians have seen a substantial increase in Romanians emigrating to Germany (from 28000 people in 2016 to 56000 people in 2018). It is noted from the graph shown in Figure 3 that in 2022 the favorite country of Romanian emigrants is Germany. Germany is the largest economy in Europe and offers numerous opportunities when it comes to finding a job, in very diverse fields, both for those with experience and German speakers, as well as for those without professional training or who do not master the language.

In the case of final migrants, there is a substantial increase over the 17 years following their accession to the European Union. For example, in 2023, the number of permanent emigrants was 48612 people, compared to 2007 when the number was 8830 people. Also,

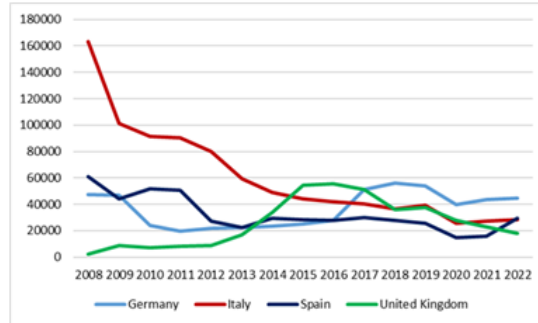


FIGURE 3. Evolution of the number of persons in Romania who have changed their habitual residence abroad in the period 2008 – 2022

the rate of definitive immigration had an upward evolution, determined by the acquisition of Romanian citizenship by the persons from the Republic of Moldova, as well, especially after the legislative changes in 2014 (application of the EU Regulation no. 259/2014 on the liberalization of the visa regime for the citizens of the Republic of Moldova). (Figure 4)

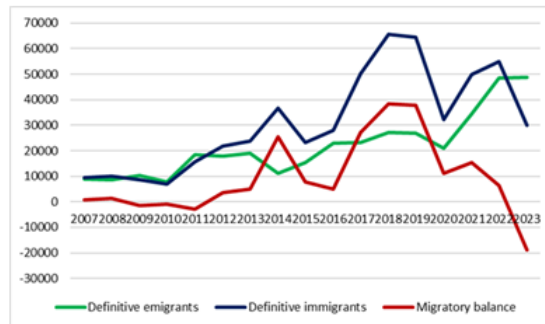


FIGURE 4. Evolution of emigration, immigration and migration balance

Temporary migration decreased steadily between 2008 and 2012, reflecting a reduction in seasonal opportunities in destination countries, probably as a result of the global financial crisis. After 2012, temporary migration increased, culminating in 2023, indicating an improvement in external economic opportunities and more labor migration.

Final migration tends to steady growth of definitive emigrants which shows a worrying phenomenon – the population not only works temporarily abroad, but chooses to settle there permanently.

The chart shows a negative migration balance for a large part of the period under review, exacerbating demographic and economic losses. Since 2023, the migratory balance is becoming positive, with a higher number of immigrants than emigrants, suggesting the start of a process of balancing flows.

4.1. Net average nominal salary as an external migration factor

By means of the simple linear regression model, we will analyze whether the dependent variable rate of definitive emigration (%) may be in a direct dependence relation to the

net average nominal salary (lei). The data used are recorded annually for the period 2007-2023 and are taken from the TEMPO-Online base of the National Institute of Statistics.

In the simple regression model [37], the evolution of the dependent variable is defined according to an independent variable. In general, the statistical model of simple linear regression is determined by the relation (1):

$$y = a + bx \quad (1)$$

where: y is the dependent variable, x independent variable and a , b are the regression coefficients.

The estimation of model parameters is carried out using the method of least squares (MLS). With the help of the SPSS statistical software, for the two variables, the results were obtained on point estimates of the parameters of the regression model (2), according to table 2.

Table 2. Values of regression model coefficients (2)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	-0,202	0,137		-1,471	0,162
	Monthly average nominal salary	0,001	0,001	0,924	9,380	< 0,001

a. Dependent Variable: Definitive emigrant rate

The estimated equation of the simple linear regression model is as follows:

$$emigration_rate = -0,202 + 0,001 \cdot average_monthly_nominal_net \quad (2)$$

An increase in the net average nominal salary by 100 lei will lead to an increase in the rate of final emigration by 0,1 ‰.

The Student test for the two parameters indicates a Sig t value equal to 0,001. Thus, it is rejected the hypothesis that between the two variables there would be no linear type link, with a probability of 95%.

Table 3. Correlation values and determinations ratio - model (2)

Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
2	0,924 ^a	0,854	0,845	0,22568	0,854	87,979	1	15	0,000	1,573

a. Predictors: (Constant), Average nominal salary

b. Dependent Variable: Definitive emigrant rate

The estimated value of the correlation ratio ($R=0,924$) indicates a strong link between the dependent variable rate of definitive emigration and the independent variable average monthly net nominal gain. The value of the determination ratio (R-squared) shows that 85,4% of the change in the rate of definitive emigration is explained by the variation of the net average nominal salary.

The modelling results are shown in Table 4:

Table 4. Model testing (2)

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	4,481	1	4,481	87,979	<0,001 ^b
	Residual	0,764	15	0,051		
	Total	5,245	16			

a. Dependent Variable: Definitive emigrant rate

b. Predictors: (Constant), Average nominal salary

From Table 4, it is noted that the probability Sig. associated with the value of the Fischer test in table ANOVA is less than or equal to 0,05 (Sig = 0,001), this means that the proposed model is statistically significant in order to explain the dependence between variables. Therefore, it can be guaranteed with a probability of 95% that the independent variable explains the variation of the dependent variable.

4.2. External migration as a factor of population ageing

Ageing is a global phenomenon. According to UN data, the proportion of the third-aged population will increase in the long term even in regions where birth rates are higher than the reproduction rate. The ageing phenomenon is particularly present in Europe and Japan. It is estimated that Europe has already reached a critical stage: after a century of natural demographic growth, the outlook for this century is, on the contrary, a natural decline and an excessive ageing of the population. A large part of the countries of Eastern Europe are already aware of the demographic decline and many Western countries will know it in the near future [38].

Demographic ageing is influenced by the following factors: declining birth rates, increasing life expectancy, external migration. Young people no longer want to have children for various career reasons, time spent at work, insufficient income, changing social values, other worldviews and life. Then demographic ageing is also influenced by the increase in life expectancy, which is a consequence of social progress in various areas: medicine, quality of life, social protection. In '50s Romania, life expectancy was 56,3 years. Today, we are talking about a life expectancy of over 70 years, somewhat higher in women. Through the temporary and/or definitive emigration, especially of the active population segment (aged 16-64 years), it is obvious that the share of the active civilian population in the total population decreases, especially in favor of the segment represented by the elderly population, increasing the phenomenon of demographic ageing.

The demographic ageing index represents the number of elderly people (65 years and over) returning to 100 young people (under 15 years).

Figure 5 shows that the index of demographic ageing has an increasing trend with the accession of Romania to the European Union. Also, starting with 2015, the elderly population over 65 years exceeded the young population (0-14 years).

The demographic ageing process has increased compared to 1 July 2023, by increasing the share of the elderly population by 0,4 percentage points (65 years and over) and by a slight decrease, by 0,3 percentage points, the share of young people (0-14 years).

The demographic ageing index increased from 124,9 (on 1 July 2023) to 130,2 elderly people per 100 young people (on 1 July 2024).

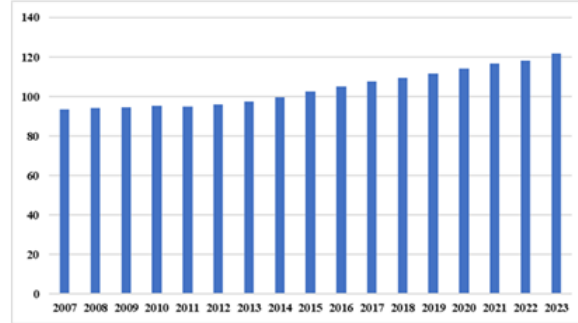


FIGURE 5. Demographic ageing index

The demographic dependency ratio represents the ratio between the number of people aged "dependent" (people under 15 years and over 64 years) and the working population (15 – 64 years) expressed at 100 people.

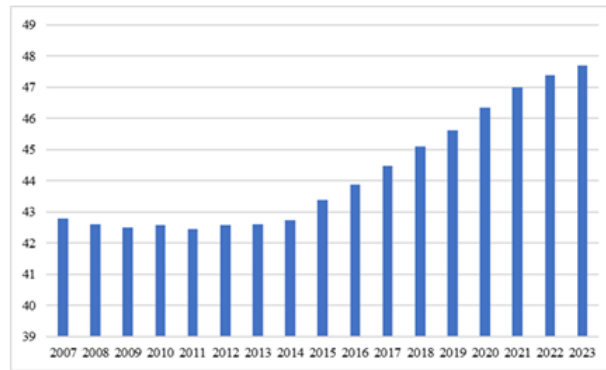


FIGURE 6. Demographic dependency ratio in Romania

The demographic dependency ratio for Romania is 48 young and old people per 100 adult persons, on July 1, 2023. The growth rate is faster after 2014, reflected by the increase in the share of the elderly population and the decrease in the share of the adult population (15-64 years) as a result of high migration in this segment of the population, as seen in Figure 6.

Through simple linear regression we have analyzed whether an increase in the rate of definitive emigration influences the index of demographic ageing.

Table 5. Values of regression model coefficients (3)

Model		Coefficients ^a			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
3	(Constant)	89,634	2,154		41,615	0,000
	Definitive emigrant rate	15,014	1,914	0,897	7,845	0,000

a. Dependent Variable: Demographic ageing index

The estimated equation of the simple linear regression model (3) is as follows:

$$demographic_ageing_index = 89,634 + 15,014 \cdot permanent_emigration_rate \quad (3)$$

A 1 ‰ increase in the definitive emigration rate leads to a 15,01% increase in the demographic ageing index.

Table 6. Correlation values and determinations ratio - model (3)

Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
3	0,897 ^a	0,804	0,791	4,38301	0,804	61,544	1	15	0,000	1,036

a. Predictors: (Constant), Definitive emigrant rate

b. Dependent Variable: Demographic ageing index

The estimated value of the correlation ratio (R=0,897) indicates a relatively strong link between the dependent variable the demographic aging index and the independent variable the rate of definitive emigration. (Table 6)

The value of the determination ratio (R-squared) shows that 80,4% of the variation in the demographic ageing index is explained by the variation in the rate of definitive emigration.

Table 7. Model testing (3)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	1182,315	1	1182,315	61,544	<0,001 ^b
	Residual	288,161	15	19,211		
	Total	1470,477	16			

a. Dependent Variable: Demographic ageing index

b. Predictors: (Constant), Definitive emigrant rate

The probability of Sig. associated with the value of the Fischer test in the ANOVA table is less than or equal to 0,05 (Sig = 0,001), this means that the proposed model is statistically significant in order to explain the dependence between variables. (Table 7)

4.3. Consequences of external labor migration

External migration primarily affects the population and population structure of a country. Then, it affects the labor resources represented by the segment of the population that has all the physical and intellectual capacities by virtue of which it carries out useful work in one of the activities of the national economy.

From a statistical-demographic point of view, the labor resources include: 1) The working-age population able to work (active population) to be determined by the decrease in the working-age population of persons with permanent incapacity for work and elderly pensioners work that does not work and 2) persons under and above working age in activity.

The employed population represents all persons who are engaged in economic activities, that is, those who actually work, either as employees or as self-employed workers, either in other forms of remunerated work or in their own households. This is an important component in the analysis of the labor market and the economy of a state.

Another method of calculating the civilian active population is the summation of the employed population and the unemployed, according to the formula $P_a = P_o + S$. Then, from the summation of the active population and other categories of active population that learn (students from post-secondary schools, students, etc.) and persons who do not work and are not on the record of public authorities as jobseekers result in working-age population aged between 15-64 years, according to the formula $P_{vm} = P_a + \text{other categories}$.

The active population (workable people aged 15-64) is the most affected by the phenomenon of external migration. According to INS, in 2023, a number of 208356 temporarily emigrated from Romania, of which 179305 are active persons (aged 15-64 years), representing 86,05% of the total temporary emigrants.

Table 8. Evolution of the civil active population in Romania in 2007-2023

Anul	Populația activă civilă (mii persoane)	Anul	Populația activă civilă (mii persoane)
2007	9093,7	2016	8735,8
2008	9150,4	2017	8717,9
2009	9120,1	2018	8696,4
2010	8998,3	2019	8750,5
2011	8826,5	2020	8736,9
2012	9063,4	2021	7835,6
2013	9042,9	2022	8051,2
2014	8910	2023	7973,2
2015	8776,8		

In the case of Romania, there is a trend of a steady decrease in the active population, from a total of 9093,7 thousand people in 2007 to 7973,2 thousand people in 2023, due to both negative natural growth and external migration.

If we analyze the influence of the definitive emigration rate on the active population, for the period 2007-2023, we get the following equation (4):

$$\text{economically_active_population} = 9356,777 - 636,154 \cdot \text{permanent_emigration_rate} \quad (4)$$

according to table 9:

Table 9. Values of regression model coefficients (4)

Model		Coefficients ^a			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
4	(Constant)	9356,777	89,586		104,445	0,000
	Definitive emigrant rate	-636,154	79,600	-0,900	-7,992	0,000

a. Dependent Variable: Active population

An increase of 1 ‰ of the definitive emigration rate leads to a decrease of 636 thousand people active on the labor market.

Table 10. Correlation values and determinations ratio - model (4)

Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
4	0,900 ^a	0,810	0,797	182,29968	0,810	63,870	1	15	0,000	1,959

a. Predictors: (Constant), Definitive emigrant rate

b. Dependent Variable: Active population

The estimated value of the correlation ratio (R=0,900) indicates a relatively strong link between the dependent variable "the civil active population" and the independent variable "the definitive emigration rate".

The value of the determination ratio (R-squared) shows that 81% of the civil active population variation is explained by the variation in the rate of definitive emigration.

Table 11. Model testing (4)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
4	Regression	2122602,552	1	2122602,552	63,870	<0,001 ^b
	Residual	498497,617	15	33233,174		
	Total	2621100,169	16			

a. Dependent Variable: Active population

b. Predictors: (Constant), Definitive emigrant rate

The probability of Sig. associated with the value of the Fischer test in the ANOVA table is less than or equal to 0,05 (Sig = 0,001), this means that the proposed model is statistically significant in order to explain the dependence between variables.

Among the limits of the linear regression method, we mention the cause-effect relationship between the variables that is supposed to remain linear throughout the analyzed period. In practice, socio-economic variables do not have an unchanged evolution over time, which determines the estimation of erroneous results. Also, the reduced number of records for the analyzed variables can determine the obtaining of conclusions that do not reflect the reality.

Romanian emigrants are 86,05% people aged 15-64 years, that is a consistent segment of the working population, at risk of fertility.

Migration can influence the age pyramid, especially if a country attracts or loses a significant number of young people or elderly people.

This is a pyramid of migration that compares the temporary and permanent migration of 2008 and 2023, divided by age groups. This graphical representation highlights the fact that age groups between 20 and 39 have the highest values for both types of migration, this indicates a more intensive migration among the active population. Regarding the temporary migration 2008 vs. 2023, notable differences are observed in certain age groups, such as people between 25 and 34 years old, which seem to be much more active in temporary migration in 2023. Figure 7 shows that permanent migration 2008 vs. 2023 has a relatively constant level, but with certain increases or decreases in some categories. Age groups 0-14 years and 65+ years have lower values, indicating lower mobility of children and the elderly. The increase in temporary migration in 2023 may be linked to greater job opportunities in other countries, economic changes, as well as legislative changes or more favorable conditions for seasonal workers. The elderly population generally remains

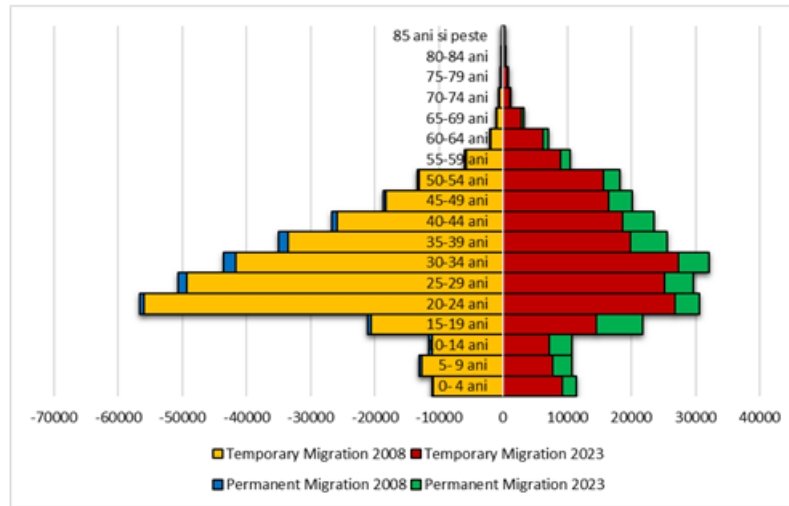


FIGURE 7. Pyramid of External Migration: 2008 vs. 2023

stable, but the large proportion of young people migrating temporarily or permanently may have effects on the demographic structure of the country of origin.

External migration contributes significantly to the increase of the fertility rate in the destination countries, to the rejuvenation of the population and, last but not least, it constitutes a reservoir of active, well-trained workforce, for the labor market in countries where migrants are resident.

5. CONCLUSION

After Romania's accession to the European Union in 2007, external migration increased significantly due to easier access to EU labor markets. Popular destinations for Romanian emigrants include Italy, Spain, Germany, and the UK. This phenomenon has had profound demographic, economic, and social effects, requiring analysis from multiple perspectives.

Demographic Impacts:

The migration of the active population (especially individuals aged 20–39) has contributed to a decline in Romania's population, particularly among young and economically active groups, accelerating population ageing. Emigrants also influence fertility rates, increasing the fertility rate in destination countries while reducing it in Romania. Between 2007 and 2023, temporary migration initially declined until 2012 but has since steadily increased, with definitive migration consistently rising, reaching 48,612 emigrants in 2023. The demographic ageing index rose from 124,9 in 2023 to 130,2 in 2024, reflecting the ageing population and shrinking active labor force.

Economic and Social Impacts:

Linear regression analysis revealed a strong relationship ($R = 0,897$; $R^2 = 80,4\%$) between economic factors, such as net average salary, and emigration rates. However, the paradoxical increase in emigration alongside rising salaries suggests other factors, such as living costs and perceived economic instability, play a significant role in migration decisions. The emigration of the economically active population has led to labor shortages in Romania, threatening the sustainability of the pension system and overall economic growth.

Policy Implications:

The findings highlight the urgent need for targeted economic and social policies to address the root causes of emigration. Measures to improve job stability, increase living standards, and create opportunities for professional advancement are critical to retaining the active population. Without such interventions, the long-term impacts—such as a declining workforce and a rising ageing index—will pose significant challenges to Romania’s economic sustainability. In order to reduce the flow of external migration, this social phenomenon can be redressed by creating public policies to attract and retain skilled labor, by improving the economic and social conditions in Romania, including through investments in infrastructure, education and health, and through the development of programs to support the diaspora and facilitate the return of migrants.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interests regarding the publication of this paper.

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