

UDC 314.116:314.15]:303.724 (40672EU)

MIGRATION AND ITS IMPACT ON THE DEMOGRAPHIC TRANSITION IN THE COUNTRIES OF THE EUROPEAN UNION

Marija Trpkova-Nestorovska

Ss. Cyril and Methodius University in Skopje, Faculty of Economics-Skopje
E-mail: marija.trpkova-nestorovska@eccf.ukim.edu.mk

Borce Trenovski

Ss. Cyril and Methodius University in Skopje, Faculty of Economics-Skopje
E-mail: borce@eccf.ukim.edu.mk

Biljana Tashevska

Ss. Cyril and Methodius University in Skopje, Faculty of Economics-Skopje
E-mail: biljana@eccf.ukim.edu.mk

Abstract

Demographic transition is defined as shift from high birth and death rates and increasing population to very low birth and death rates and decreasing population, as a country progresses from a pre-industrial to an industrialized economic system and significant increase in the urbanization. It is consisted of five stages.

The analysis provides revised information about the stages of demographic transition for each of the twenty eight EU countries, and also examines whether the transition model is still compatible with the current demographic situation. The countries are classified in five groups according to their demographic similarity. Panel regression models are used to test the statistical significance of the demographic trends from the demographic transition model. While confirming the demographic transition model or describing the variations from the theory, the analysis should give guidance for further population development and its implications on the economy and the society.

Also, there is an insight given on the impact of the migration on demographic transition and European population, since immigrants tend to have a massive impact on population in Europe in the past decades. While some countries benefit from constant influx of immigrants, others face severe consequences in form of ageing population, fertility decline, weaker economy and labor shortage.

Keywords: *electronic banking, profitability, electronic financial services*

JEL classification: *J11, J13, J15, C23*

1. Introduction:

Demographic transition is defined as a transition from one model of reproduction to another model of reproduction, where reproduction model is represented by the relationship between the birth rates and the death rates of a population. The model goes through different stages, it begins with high birth and death rates, low natural increase and low population, and slowly, in a period of two hundred years it changes to model with low birth and death rates, low or stagnant natural increase and eventually fall in population. This model is based on data from Western European countries.

The purpose of this paper is to give a fresh insight of the present situation regarding the demographic transition in the European countries. The analysis provides information about the stages of demographic transition for each of the 28 countries, and also examine whether the transition model is still compatible with the current situation. It is assumed that most of the countries are in the stages of late transition or post-transition where the population is stagnant or decreasing. Decreasing population with low birth rates means also ageing population, with severe implications on the economy (deficit of workers in different sectors, lower economic growth and burden on the health and pension systems). The paper should confirm the demographic model or describe the variations from the theory and give guidance for further population development, which directly influences the economic growth.

Demographic transition

Demographic transition model was initiated by Thomson (1929). It refers to populations of the developed countries of Western Europe, for period of nearly two hundred years. Regarding the population growth, he grouped all countries of the world in to three groups: Group A-countries with declining birth rate, low death rates, low rates of natural increase and decreasing population; Group B-birth rates are high, death rates are declining more rapidly, so natural increase is rising and Group C-high birth and death rates and population growth. The basis of the demographic transition theory is that the countries will develop from Group C to Group B and finally to Group A, or starting with high birth and death rates and low population (pre-transitional stage), primary there will be decline in death rates, following with the decline in birth rates and growth in population (demographic transition) so finally there are low birth and death rates and population stagnation or decrease (post-transitional stage), due to the process of immense industrialization and urbanization.

Figure
Stages of Demographic transition

Note: The author Max Roser licensed this visualization under a CC BY-SA license.

Source: Roser and Ortiz-Ospina (2018)

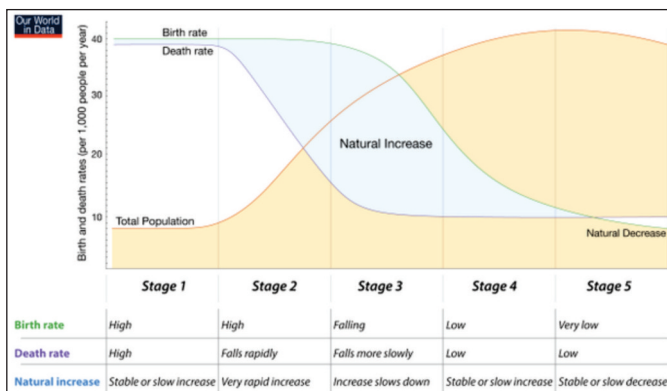


Figure 1 represents the model of demographic transition and its five stages. The first stage has high birth and death rates, with very low natural increase and low population. High mortality rate is due to the low sanitation and health conditions, lack of food and clean water. This is described as pre-industrial society.

In the second stage the death rate starts to decline, due to the improved health conditions and access to food. The birth rate, on the other hand, remains high, because families are not aware yet of the lower mor-

tality, and they remain to produce more children, so normally, natural increase is high. Population is beginning to have a dramatic rise, due to the imbalance between the birth and the death rates.

The third stage is characterized by the process of industrialization and urbanization, where people start to move to bigger cities where industries need workers. The production moves from manual to machine production, thus more products become available, like food and clothes. People earn wages, improve their living standards, and the mortality rate continues to decrease. Population increases rapidly. In this stage, the birth rate starts to decrease, since people become aware of the decrease in mortality. Also, women start to get more educated and families tend to invest in their children education. Natural increase is high.

In the fourth stage death rates are very low and stagnant, while the birth rates continue to decrease. The natural increase is declining, while the population rises reaching its peak. In this stage the governments in some countries start to realize the potential threat of the declining population to their economies. Also, there is a possibility of a great pressure and burden on the pension and health system, due to the rising population born in stage two, that is ageing, and decreasing young population and work force.

The last, fifth stage, represents lower birth rates than death rates, which points out to natural decrease and further decline in population. In this stage the population ageing and the pressure on the health and pension systems is even more pronounced, sometimes even threatening their financial sustainability.

The model described is the idealized picture of demographic transition. Not every country can find itself in one of the transition stages. The idea of this analysis is to reveal the current demographic situation in each of the 28 European Union countries, and detect to which extent the model applies to each country. Also, economic and other effects of the demographic transition are to be discussed.

Literature review

Demographic transition and its implications has been subject in many research. For example, the role of the demographic transition in the process of urbanization was analyzed by Dyson (2011). He describes the urbanization as the inevitable outcome of the demographic transition. Reher (2011) speaks about economic and social implication of the demographic transition. He refers especially to migrations and says that if present trends continue, within a fairly short time most of the countries exporting labor will begin to suffer labor shortages of their own, as cohorts of decreasing size reach working age. It is a sad irony of history that while for these countries the demographic transition (fertility decline) began 60–80 or even more years after it did in many of the historic transitions, the period of labor shortage will begin only 20–30 years later. The gap between the earlier and the more recent transitions is indeed being narrowed, but only at the expense of a reduction in the time available to the newcomers for economic growth and social consolidation. The author managed to predict the current situation in Europe, as presented further in this analysis.

Population ageing was considered as an inevitable consequence of the demographic transition from relatively high fertility to the low fertility which all European countries have now experienced (Mirkin and Weiberger, 2001; Frątczak 2002; Reher 2004).

Długosz and Zbigniew (2006) summarized that population ageing leads to socio-economic consequences such as the rising cost of public pensions and increased demand for health and social care (Golini 2001; Bongaarts 2004). Higher dependency ratio affects the budget position of the government and the level of public savings. It increases consumption relative to output, and lowers the national saving rate, thereby slowing down capital formation. Furthermore, the decline in the share of population in the working age implies a fall in labor supply (Kence and Sayan 2001).

Empirical analysis

The analysis includes data for birth rates, death rates and total population, for 28 European countries, for the period 1960-2016. Data source is the World Development Indicators from the World Bank. Crude birth rate

indicates the number of live births occurring during the year, per 1,000 population estimated at midyear. Crude death rate indicates the number of deaths occurring during the year, per 1,000 population estimated at midyear (subtracting the crude death rate from the crude birth rate provides the rate of natural increase, which is equal to the rate of population change in the absence of migration). Total population is based on the de facto definition of population, which counts all residents regardless of their legal status or citizenship. The values shown are midyear estimates. Population, birth rate and death rate per country are presented in figures 2-6. Population in millions is presented on the left vertical axis and birth and death rates are presented on the right vertical axis.

The movements of the variables reveals certain similarities between countries. Depending on whether the birth rate, the death rate and population are increasing or decreasing, and if the natural decrease is positive or negative, five groups of countries were formed. The groups start with Group 1 that has countries with the most unfavorable demographic situation to Group 5 where countries have most promising demographic trends. The groups are presented in table 1.

To confirm these findings with statistical analysis, a panel regression model was used for each group, described in the following equation:

where y is the dependent variable (population), α is the intercept term, β is a vector of parameters to be estimated on the explanatory variables, and x is a vector of observations on the explanatory variables (birth rate and death rate), i and it stands for cross-sectional unit (number of countries), while t and it stands for time period (Brooks, 2014).

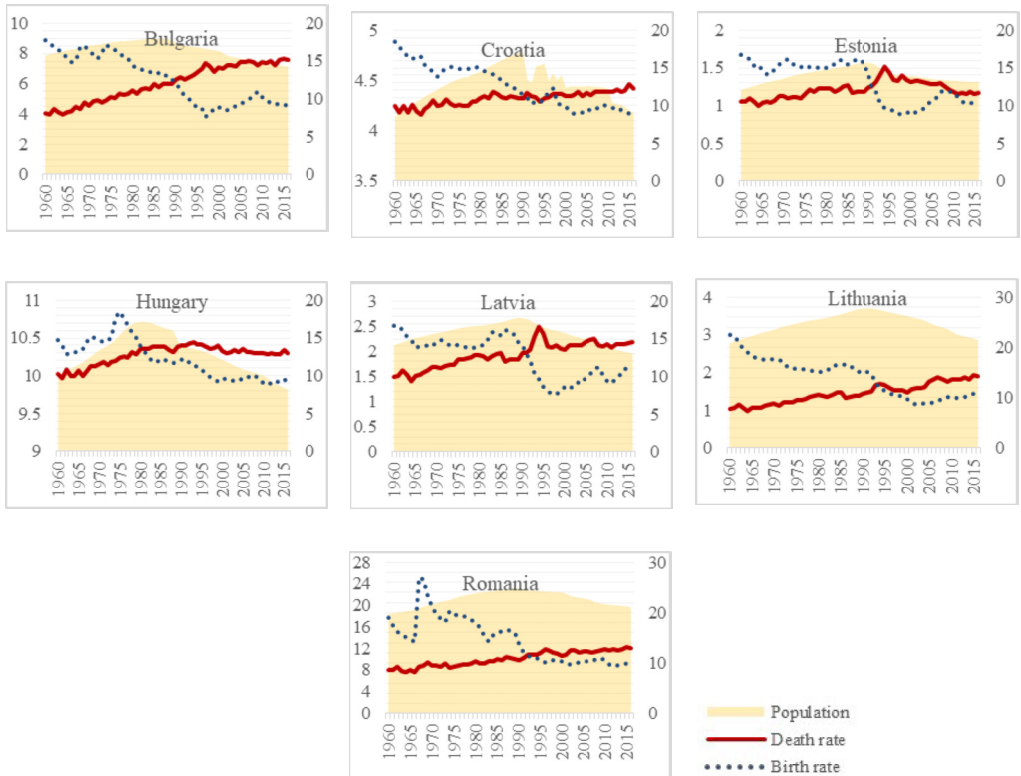
Table 1 Classification of countries

Variable	Group 1 Bulgaria, Croatia, Estonia, Hungary Latvia, Lithuania, Romania	Group 2 Greece, Finland, Italy, Poland, Slovak Rep. Slovenia, Spain	Group 3 Austria, Czech Rep. Germany, Portugal, UK	Group 4 Belgium, Denmark Malta Netherlands Sweden	Group 5 Cyprus, France Ireland Luxembourg
Death rate (current status)	Increasing	Increasing/Stagnant	Decreasing	Decreasing/Stagnant	Decreasing/Stagnant
Birth rate (current status)	Decreasing	Decreasing/Stagnant	Decreasing	Fluctuates	Decreasing
Natural increase (current status)	Negative	Stagnant	Negative	Positive	Positive and constant
Population (current status)	Decreasing	Fluctuates	Increasing	Increasing	Increasing
Stage of DT (current status)	Stage 5	Stage 5	Stage 5	Stage 4	Stage 3 to Stage 4

Source: classification by authors.

Group 1 is consisted of Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania and Romania. Starting from 1960 to the eighties and nineties, there are relatively good demographic trends, the birth rate is decreasing, as is population, while the death rate is increasing. Even with the decreasing birth rate the natural increase is high.

Figure 2 Group 1



Source: World Development Indicators, World Bank; authors' presentation

At beginning these movements correspond to stage four of the demographic transition. After this periods there are dramatic changes in these trends. The death rate continues to increase, birth rate accelerates its decline, and there is serious natural decrease and fall in population. These countries are in the Stage 5 of the demographic transition, with declining population and severe demographic ageing. Panel regression with fixed effects was performed (p - value for Hausman test equals 0,0002). The results from panel regression are following (p - values in brackets):

$$\Delta(\log(\text{population}))_{7,57} = 0,008879 + 0,001293\text{birth rate}_{7,57} - 0,002174\text{death rate}_{7,57}$$

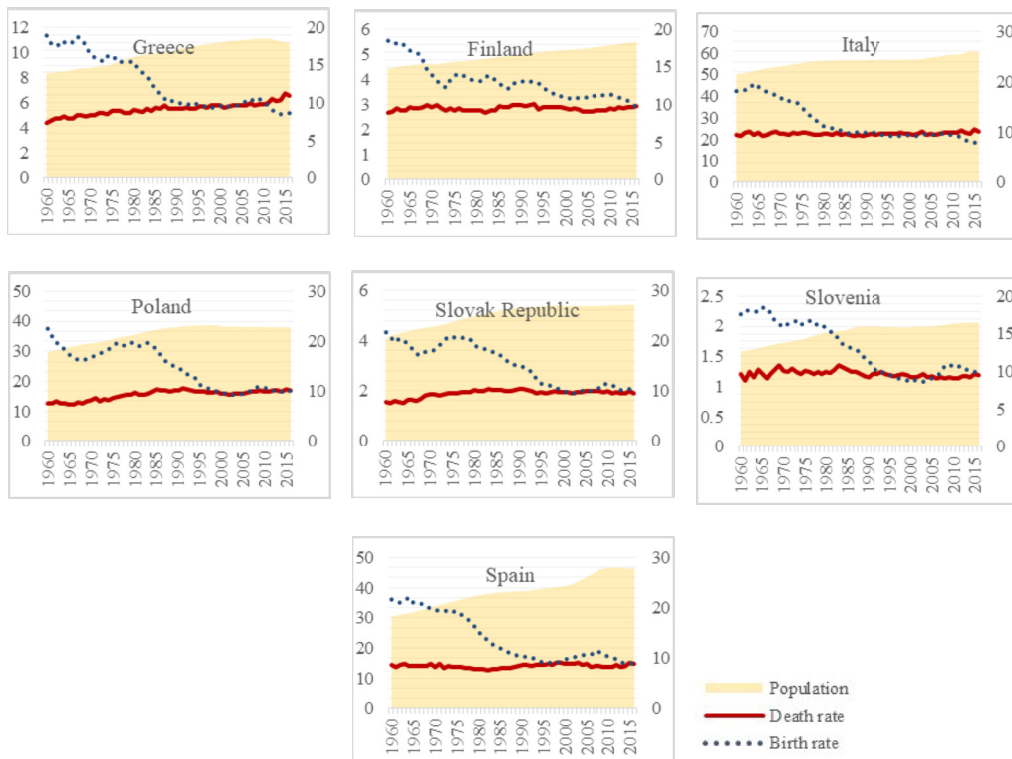
(0,0915)
(0,0000)
(0,0000)

The results confirm that the birth rate and the death rate have statistically significant influence on the population. The positive sign of the estimated parameter for the birth rate indicates positive relationship between the birth rate and the population, or as can be seen from figure 2, they are both declining. There is an inverse relationship between the death rate and the population, because the death rate is increasing and the population is decreasing.

Group 2 includes Greece, Finland, Italy, Poland, Slovak Republic, Slovenia and Spain. In the first two to three decades, the birth rate decreases slowly, the death rate has small rise so the trend is almost stagnant, producing substantial natural increase and rise in population, all of these are traits to stage four of the demographic transition.

After this period trends change having slight increase or stagnant death rate, decreasing or stagnant birth rate, zero natural increase and population that fluctuates (it grows until some period in 2000's or 2010's and then starts to decrease), which signifies the stage five of demographic transition.

Figure 3 Group 2



Source: World Development Indicators, World Bank; authors' presentation

To confirm these findings, another panel regression with random effects was performed (Hausman test p -value 0,6631):

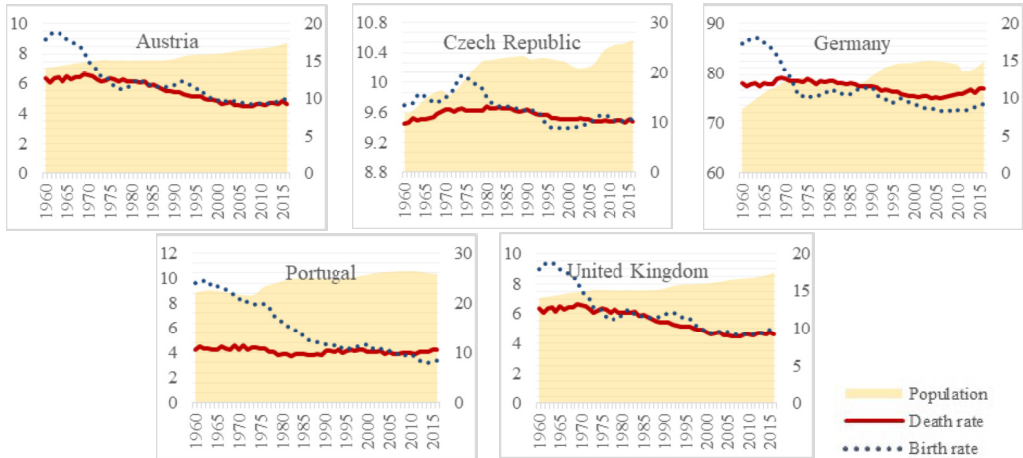
$$\log(\text{population})_{7,57} = 16,19404 - 0,016989\text{birth rate}_{7,57} + 0,0036113\text{death rate}_{7,57}$$

(0,0000)
(0,0000)
(0,0000)

The regression results indicate that there is statistically significant relationship between population and birth rate, that is inverse, and also significant relationship between population and death rate, that is positive. While population is increasing, the birth rate decreases, while the death rate also increases at a small pace.

Group 3 accounts for Austria, Czech Republic, Germany, Portugal and United Kingdom. In the first three decades these countries seem to be at the end of the stage four of demographic transition, with decreasing birth rate, stagnat or decreasing death rate, low natural increase and rise in population. After these three decades, the changes imply continuing decrease in birth rate, decrease in death rate, natural decrease and yet rise in population. Everything signifies stage five of the demographic transition, except the growth of the population. The countries and their trends are presented in Figure 3.

Figure 4 Group 3



Source: World Development Indicators, World Bank; authors' presentation

To test whether the relationship between birth rate, death rate and population is significant, a panel regression with random effects is estimated (Hausman test p -value 0,8656). The results are presented in the following equation:

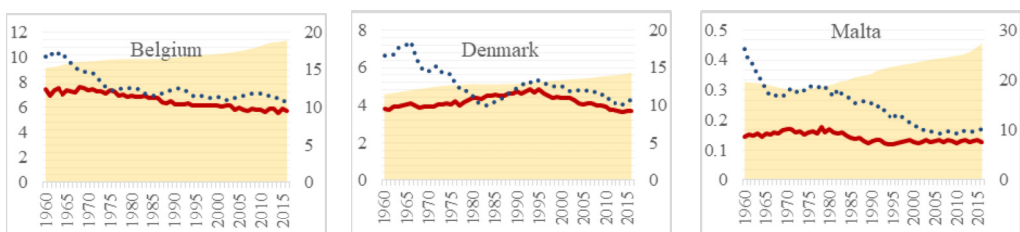
$$\log(\text{population})_{7,57} = 17,12134 - 0,008816\text{birth rate}_{7,57} - 0,015948\text{death rate}_{7,57}$$

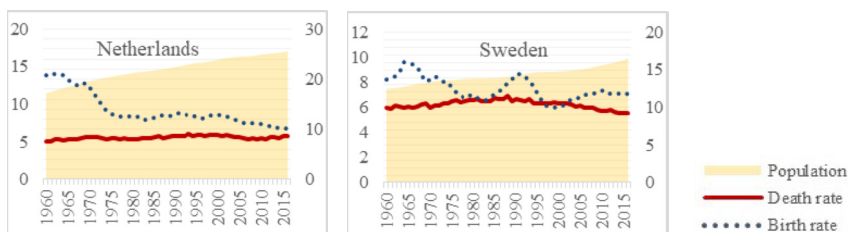
(0,0000)
(0,0000)
(0,0000)

The relationships prove to be statistically significant. The population and the birth rate have inverse relationship, which can be confirmed from their trends (decrease in the birth rate and increase in the population). The same relationship can be established between the death rate and the population, where the death rate is continuously decreasing, while the population is increasing.

Group 4 includes Belgium, Denmark, Malta, Netherlands and Sweden. These countries have trends that do not change dramatically through the decades. The population continuously grows, the birth rate mostly declines, but also fluctuates, while the death rate is stagnant or slightly decreases. Even with the fluctuations of the birth rate, these countries continue to maintain natural increase for the observed period. The countries and their demographic trends are presented in Figure 5.

Figure 5 Group 4





Source: World Development Indicators, World Bank; authors' presentation

To confirm these findings panel regression with fixed effects was estimated (Hausman test *p* - value 0,0000). The results are presented in the following equation:

$$\Delta(\log(\text{population}))_{7,57} = 0,02713 + 0,000335\text{birth rate}_{7,57} - 0,002713\text{death rate}_{7,57}$$

(0,0000)
(0,0011)
(0,0000)

There is a positive and statistically significant relationship between population and birth rate. Even though at some periods the birth rate decreases, while population continuously increases, fluctuations and growth of the birth rate seem to determine the positive relationship in the estimated equation. There is negative and statistically significant relationship between population and the death rate, so when the population shows growth, the death rate is declining. With slight exceptions, the natural increase maintains through the decades. The trends of these countries correspond to stage four of the demographic transition. These countries have better demographic situation than previous groups of countries. Yet, there is a possibility of zero or natural decrease in the following decades, signifying entrance in stage five, if some precautionary measures are not applied.

Group 5 is the last group including Cyprus, France, Ireland and Luxembourg. These countries have the best demographic trends comparing to other analyzed countries. Here, the population is constantly increasing, the death rate and the birth rate are decreasing, yet the birth rate is significantly beyond the death rate, providing continuous and substantial natural increase. These trends correspond to the late stage 3 or early stage 4 of the demographic transition.

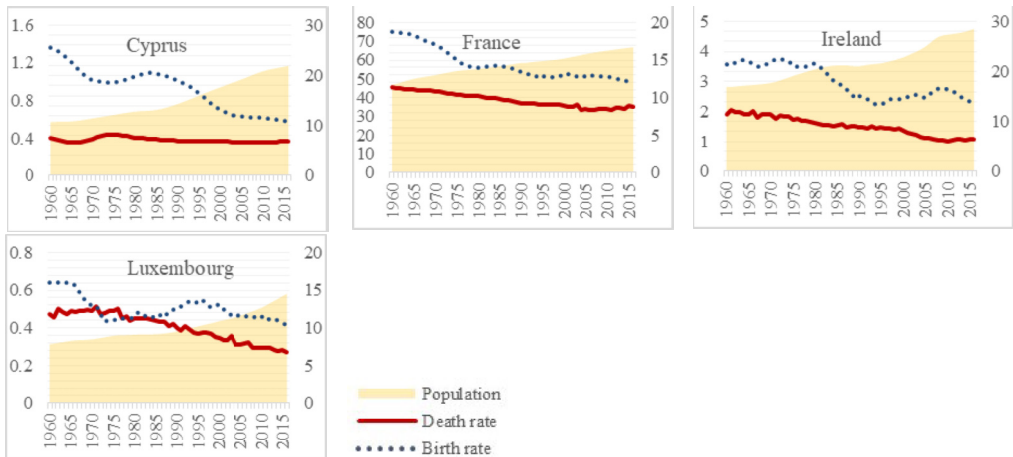
Panel regression with random effects was estimated (Hausman test to confirm the statistical significance of the presented relationships. The equation is following:

$$\log(\text{population})_{7,57} = 15,86716 - 0,034242\text{birth rate}_{7,57} - 0,053454\text{death rate}_{7,57}$$

(0,0000)
(0,0000)
(0,0000)

There is an inverse and statistically significant relationship between population and the birth rate. With population constantly increasing, the birth rate is constantly decreasing. The same relationship can be described between population and the death rate.

Figure 6 Group 5



Source: World Development Indicators, World Bank; authors' presentation

Discussion of the results

The aim of this research was to identify the stages of demographic transition for the countries from the European Union. According to the main demographic trends of demographic transition, the birth rate, the death rate and the population, the countries were classified in five groups because of their demographic similarity. The order of classification is not accidental. The first group includes countries with most concerning demographic situation, while the fifth group has the most favorable demographic situation compared to other groups. Chronologically, the first group is in the latest stage of demographic transition, while the fifth group is almost two stages behind group one.

As was presented, Group 1 has serious demographic problems concerning its population. With substantive natural decrease that continues to grow from year to year, and with declining population, these countries are facing severe demographic ageing, with serious social and economic consequences that come with it. Bulgaria is ranked fourth in the world for its rate of population ageing (Pitheckoff, 2017). There is a National Demographic Strategy of the Republic of Bulgaria 2006-2020 (European Commission, 2018) which addresses the issue of demographic ageing by a set of measures in order to improve the current situation by rising the birth rate, prevent emigration, to elaborate an immigration policy etc. Murgić et al. (2009) state that Croatia is considered a very old country regarding its population, with one of the highest percentage concerning aging in Europe. This raises challenges for national health and economy system, as for reforms of the pension system. Any delay in these crucial reforms slows the economic development. The situation is only worsened by emigration. Pavlič (2018) states that according to CIA data, Croatia is among seven European countries with negative net migration rates. Its statistics are worse than those of Bosnia and Herzegovina and Macedonia, which have negative migration rate, as well as Serbia with zero migration rate.

Pavlič (2018) wrote that Croatia will not be able to compensate for the shortage of workers by importing them from abroad since it cannot compete with developed countries and their higher wages and better labor markets. As long as the legal system and the situation in society are not changed, it will be difficult to keep young Croats in the country and attract foreigners. Low salaries and attitude towards workers must change. According to social scientist Drago Čengić, people today have more information than before when they make a decision on possible economic migration. This situation implies for all countries in Group 1 and it is the main problem that needs to be addressed by their governments.

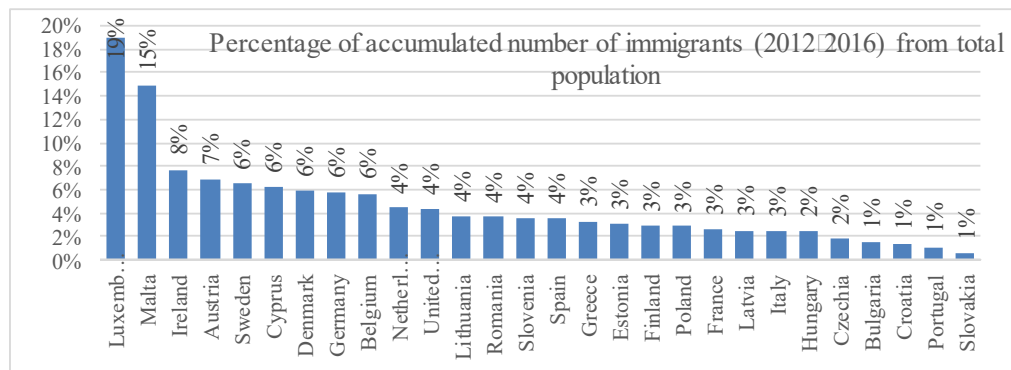
Estonian Public Broadcasting (2015) refers to Estonia, Latvia and Lithuania as the most vulnerable countries in the world to an unprecedented pace of ageing population that is forecast to slow economic growth over the next 20 years. The three Baltic states will face greater challenges in providing for their older populations because their ageing statistics are rising rapidly and their per capita GDPs are much lower than the EU average, which will not only constrain growth in the long term but adds to fiscal pressures. Baltic States governments have attempted to implement a range of pension reforms to offset the fiscal pressures of this ageing trend, but according to the European Commission, much more needs to be done in order to put social security funds on a sustainable footing. Data from Eurostat indicates that the percentage of the total population that is elderly in the three states is set to increase to between 25 percent and 29 percent in 2060, from around 18 percent in 2013. This is expected to place a fiscal burden on the Baltic region. These three countries share a number of credit strengths, including very high institutional strength, resilient government balance sheets and a robust recovery from the global financial crisis. These strengths are balanced by volatile economic growth, heightened geopolitical concerns and their demographic challenges.

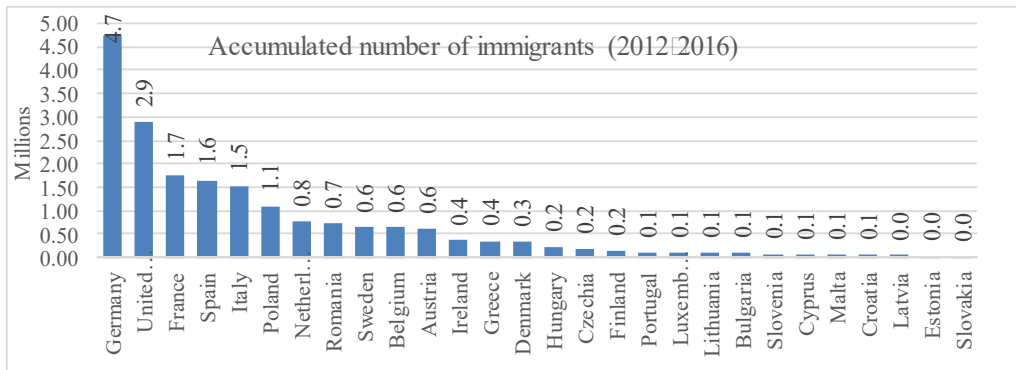
Konrad Adenauer Foundation (2013) states that in 2011 the Estonian population decline of 5,5 percent was significantly lower than the 13 percent decline in Latvia or the 8,5 percent in Lithuania; amongst other explanations, this might be due to the specific nature of Estonian emigration: It is rather based on the pendulum phenomenon – mainly to Finland – whereas Latvians and Lithuanians leave for more distant locations in a more permanent manner. According to demography experts the decline in population is related to emigration.

Population ageing in Hungary is analyzed by Háblicsek (2004), where the common issues about pension system reforms are discussed and also Roma and other immigrant subpopulations are mentioned as they modify the tempo of ageing in Hungary. Asandului (2012) confirms the demographic ageing process in Romania with its economic and social consequences, with effects on the fiscal budget, the labor market as on the economic growth.

These countries show serious demographic ageing. Birth rate is declining and it is unlikely that some government measures could increase this rate. On the other hand there is migration which could substitute the loss of fertility, yet as presented in Figure 7, these countries have very low percentage of immigrants (in the past four years from 2012-2015 Lithuania has 3,78% immigrants as percentage of total population, Romania 3,69%, Estonia 3,11%, Latvia 2,54%, Hungary 2,44%, Bulgaria 1,48% and Croatia 1,33% - for comparison Slovakia has the lowest percentage-0,56% while Luxembourg has the highest 19%).

Figure 7 Immigration in countries from European Union





Source: Eurostat; authors' presentation

Countries in Group 2 differ from countries in other groups because of their death rate. While in Group 3, 4 and 5 death rate is decreasing or it is stagnant, in Group 2 death rate is increasing or it is stagnant for some period. In Group 1 the death rate is also increasing, but the difference from this group is the population. In Group 1 it is decreasing, while in Group 2 it fluctuates. It is only a matter of years when these countries will have the similar situation as countries in Group 1. For this analysis, the authors decided to classify them in a separate group.

Population in Greece was increasing until 2012 where trend of declining population has begun. Study which analyzes the demographic future of Europe, notes that in the period 2011-2016 Greece lost almost 3% of its population, due to the birth of fewer children and emigration attributed to the economic crisis. The country now has one of the most ageing populations in Europe (Kokkinidis (2017)). The reason for population decline is the birth rate. The financial crisis had serious impact on the Greek economy, which is still recovering, with general government gross debt of 176% of gross domestic product in 2017 (Eurostat, 2018). After a decade of belt tightening, the country is facing a new crisis, low birth rates (Flood, 2017). Even with the influx of 356.472 immigrants from 2012-2016, or 3,31% of Greek population (Figure 7), the country is not able to increase its population. In this study the authors decided to classify Greece in Group 2. If the trend of declining population continues, in few years classification in Group 1 would be appropriate.

Finland has the slowest population growth in the Nordic countries, according to its Ministry of Social Affairs and Health. Also, Finland has the lowest net migration rate (from 2012 to 2016, 158.377 immigrants or 2,88% of its population has entered the country (Figure 7)). The main reasons for population growth were due largely to immigration. According to web portal Uutiset immigration boosts Finnish population to 5,5 million.

Italian population was showing increase until 2015 where a decline has started. According to the web portal The Local Italy's population growth rate is almost at zero mainly due to a dwindling birth rate. Italy has one of the oldest populations in the world and births among immigrant families also continued to fall, although they still made up close to 15 percent of the overall birth rate. High rate of immigration (from 2012 to 2016, 1.516.758 immigrants or 2,5% of its population has entered the country (Figure 7)) is just about filling the gaps: the foreign-born population increased taking the number of foreigners resident in Italy up to 8,2 % of all residents, and yet emigration in Italy is also increasing. Status of Italy is similar to status of Greece, after number of years, or a decade this country would be classified in Group 1.

Despite the economic success story of the past decade where this country has doubled its gross domestic product and it was the only EU member state to avoid a recession after the financial crisis and its growth of the decade should be better than the euro zone countries, population in Poland is showing a slow decrease from 2002. The country has been exporting labor at a brisk rate since joining the EU in 2004, and faces the threat of decades of falling worker numbers amid urgent calls for it to lower barriers to new migrants entering the country. Immigrants from neighboring countries (Ukraine) provide the most predictable stream of newcomers and yet are not offsetting the drain (The Irish Times, 2015). From 2012 to 2016 Poland has received

1.086.581 immigrants or 2,86% of its population. Unlike other European countries that have expanded their working-age population and offset negative demographics with immigration, the EU's sixth-largest economy has kept its entrances broadly closed, preferring to encourage short-term labor rather than permanent migration. Marcin Piatkowski, chief economist at the World Bank in Warsaw says that Poland's immigration policy is "reactive, not proactive", and that "It is focused on defending Poland from immigrants, rather than attracting them . . . It is not in line with the aspirations and challenges Poland has and will face . . . We need people to come here, pay taxes, pay our pensions, become citizens and contribute to the growth in the country," (The Irish Times, 2015).

Slovak Republic has good demographic situation compared to the other countries of this group. There is a positive natural increase and the population is showing constant increase. Yet, the number of people in post-productive age is increasing, signifying ageing of population. According to the web portal Spectator Slovakia's population would drop 14 percent if immigration were unregulated. Slovakia has the lowest number of immigrants out of all EU. Only 30.608 immigrants or 0,56% of its population were recorded for period 2012-2016 (Figure 7).

Slovenia also has good demographic trends. Its population is constantly increasing, and it has positive natural increase. According to the Statistical Office of Republic of Slovenia, population of Slovenia is projected to increase until around 2025 and then slowly decrease. In the future more residents are expected to immigrate to Slovenia than emigrate from it. Total fertility rate is projected to mostly gradually increase and despite assumed greater fertility, the population of Slovenia is expected to age. Slovenia has received 74.782 immigrants or 3,62% of its population in period 2012-2016 (Figure 7). People who immigrated to Slovenia are mostly citizens from former Yugoslavia.

In the past four years Spain is showing fluctuation in its population. Spain's population rose for the second straight year in 2017, after having fallen between 2012 and 2015 in the midst of an economic downturn, as an increase in foreigners offset a fall in the number of Spaniards. Natural increase was positive until 2015 when the birth rate and the death rate were almost equal. Immigration in Spain was 3,54% from total population from 2012 to 2016 or 1.647.139 immigrants. According to agency Reuters Spain's population grows due to immigration. The figures come as Europe grapples with a rising influx of migrants, mostly from North Africa and war-torn countries such as Syria, after Mediterranean arrivals spiked in 2015.

Countries from Group 3 have interesting demographic situation, they have zero or negative natural increase, and yet the population grows. The reason for this increase can be found in the immigration. A headline in Austrian medium The Local says that growing immigration will "keep Austria young". Statistics Austria reports that the work force would drop considerably in the long term. Austrian birth rate is also rising in 2016. According to Figure 7 Austria has received 605.517 immigrants from 2012 to 2016, or about 6,93% of its population. The situation is similar in Czech Republic. Radio Praha reports that the migrants are the biggest factor for rise in Czech population - from 2012-2016, 188.043 immigrants (1,78% of the its population). In 2016 the birth rate was higher than the death rate and it was also the highest birth rate in six years, so both immigration and births are reasons for population growth.

According to the web portal The Local Germany managed to increase its population by immigration, despite the negative natural increase. Without positive net migration, the German population would have been shrinking for years. From 2012-2016, 4.743.481 immigrants entered Germany, which is 5,76% of its population (Figure 7). In 2016 most of the immigrants were Romanians, followed by Syrians and Poles. According to web portal Financial Times, Germany leads way as EU population rises. Germany and Sweden are posting impressive growth rates following an influx of refugees. Germany remains the continent's most populated state. Growing populations are good news for Europe's western economy, many of which countries are suffering from ageing demographics. Also, for first time in years, in 2016 Germany marked increase in the birth rate.

Portugal, unfortunately, does not have such a promising situation as Germany or Austria. In the last few years the population has started to decrease, and there is a trend of negative natural increase. From 2012-2016, 111.497 immigrants entered the country, which is about 1,08% of the total population, yet is the lowest percentage in EU (after Slovakia) (See Figure 7), which apparently is not sufficient for increasing popu-

lation. Financial Times states that the combination of Portugal's plummeting birth rate, a deep recession and a wave of emigration is turning the country into a society of one-child families. Probably this would be the same fate for other countries of this group, if there were no sufficient immigration. Portugal government tries to work on measures to increase the birth rate, since low fertility threatens Portugal with "definite impoverishment" leaving the country "unsustainable" in terms of economic growth, social security and the welfare state" (Financial Times, 2015).

According the The Migration Observatory web portal more than half (55%) of the increase in the UK population between 1991 and 2016 was due to the direct contribution of net migration. Migration impacts on both factors—it affects the number of women of childbearing age and, if migrant women have different fertility patterns, the total fertility rate of the population as a whole. The UK population is projected to rise both because of positive natural change and because of positive net migration. From 2012-2017, 2.876.522 immigrants entered UK, or 4,39% of its population. Yet, there is a threat for population growth in the years to come. According to the web portal Quartz UK population growth rate Britain recorded the lowest population growth rate since mid-2004, with the "largest single driver" being the drop in migration. The nation's official data agency also identified Brexit as one of the main reasons for migration falling off a cliff. Since the Brexit vote, Britain has become a far less attractive place for immigrants. A steep decline in EU migration was noted where the annual number of EU citizens coming to the UK for work reasons has fallen by about a third since the referendum. Fall in net migration was the main reason that the rate of growth of population is the slowest for period of 13 years.

Group 4 is consisted of countries with good demographic situation. While the death rate and the birth rate are decreasing, the natural increase remains positive, and the population is constantly increasing. Web portal Focus on Belgium reports the Belgian population grew in 2016, and this increase is primarily due to two demographic factors: first, a positive ratio of births to deaths was recorded in 2016, which represents $\frac{1}{4}$ of the recorded population growth, and second, immigration was stronger than emigration, which accounted for $\frac{3}{4}$ of the year's growth. Eurostat reports that when it comes to how fast a country's population is growing, Belgium is one of Europe's frontrunners and it is only beaten by Luxembourg, Sweden and Malta. The increase can mostly be explained by the arrival of new immigrants 643.041 immigrants or 5,67% of total population for period 2012-2016 (Figure 7)). However, the number of births in the country is also well above the number of deaths.

The situation is almost identical in Denmark, as in Belgium, with a higher number of immigrants, 335.984, or 5,87% of population for period 2012-2016, that sustain the population growth. Also, the birth rate contributes to this growth.

Netherlands also has the same trends. According to the Central Bireau for Statistics, the relatively high population growth is due to migration. On 1 January 2017, the population in the Netherlands stood at almost 17.1 million, i.e. 110 thousand more than on 1 January 2016. Migration contributed most to the population growth. Net migration was + 88 thousand. Natural population growth was + 22 thousand. Syrian refugees contribute most to population growth, while people with German, Indonesian or Dutch background fell down in number.

Same situation can be recorded for Sweden. The Local reports Sweden is growing faster than ever and high immigration has sent population figures soaring. Sweden has received 643.115 immigrants or 6,93% of its population for period 2012-2016. The crisis in Syria has the biggest effect on population numbers. Except for immigration, the birth rate also continues to rise and contributes to the population increase.

Malta is a country with increase in its population, mostly due to immigration. This country has the second largest percentage of immigration (as percent of its total population), 14,84%, or 67.594 immigrants from 2012-2016 (first is Luxembourg with 19%) (Figure 7). Despite the immigration, positive natural increase and increasing birth rate are contributing to the population growth. Web portal Times of Malta (2018) reports that increase in Malta population is more than 15 times that of EU, with almost 16.000 more living in Malta in 2017 compared to 2016. This resulted with average economic growth of 6,4%, outstripping the EU average. Yet, there are consequences: the country will lack in necessary space and infrastructure for the increased economic growth, the current number of foreign workers (around 43,000) had surpassed the size of the

entire public sector and Malta maybe facing “sociocultural ruin” if the influx of foreign workers is not carefully managed as part of a long-term economic plan.

Countries in Group 4 are most similar, making this group most cohesive in its demographic development.

The last is Group 5 and according to its demographic trends, these countries have the most promising demographic development in the EU. This Group is similar to Group 4, with difference in the natural increase, which is much higher in Group 5. According to Eurostat, Ireland – with a natural change of its population of +6,6 per mille – remained in 2017 the EU member state where births most outnumbered deaths, ahead of Cyprus at +3.8 per mille, Luxembourg at +3.2 per mille, France at +2.5 per mille, Sweden at +2.3 per mille and the United Kingdom at +2.2 per mille. The top four countries are part of this Group.

According to Eurostat, Cyprus recorded 10,7 live births and 7,0 deaths in 2017, which constitute a 3,8 per mille positive natural change in population, second in the EU only to Ireland. Also, immigration play important role in population growth as in period 2012-2016, 72.411 immigrants or 6,48% of the population entered in Cyprus.

France has growing population, and according to the web portal South EU Summit France’s birth rate continues to fall for the third year in a row, but an influx of immigrants are increasing the country’s overall population and strengthening its long-term economy. The principle reason for population increase is immigration, rather than an increase in French births (in period 2012-2016, 1.748.902 immigrants or 2,62% of the population entered France). Though Germany is currently Europe’s largest country by population, demographic trends indicate that France will overtake its neighbor before 2060. While Berlin will experience changes due to a loss in population and ageing, its current monetary policies will continue to provide a modicum of prosperity in the future (Worldview.Stratfor, 2015). Apparently, people will be France’s advantage over Germany.

Ireland has growing population and positive natural increase. Population growth in Ireland was more than five times the EU average in 2017 according to the web portal Irish Examiner. Excluding the impact of immigration, Ireland had the highest rate of natural increase (an excess of births over deaths) in its population in the EU last year, at a time when many other countries experienced a decline. Immigration to Ireland was 366.359 immigrants or 7,7% of total population from 2012-2016 (Figure 7).

Luxembourg’s population is growing and the migration is the main cause of the demographic growth, says web portal Luxembourg Public. The birth rate is remaining stable, yet migration remains the main cause of the demographic growth in Luxembourg (from 2012 to 2016 110.599 immigrants or 19% of its population (highest percentage in European Union) have entered the country).

Conclusion

The theory of demographic transition proved to be a valid theory of demographic development in many countries for many years. Having information about the demographic trends in Europe today, one would expect a country to be in stage four or stage five of the demographic transition. Yet, as presented, the trends show deviations from the predicted trends in the demographic transition model and this is because this theory makes and “oversight” and does not include a very important movement-migration. It is migration today that is changing the last stage of demographic transition, and also it is changing the whole demographic picture of Europe. Migrations today are greater than ever before in Europe, in their intensity, longevity and size.

There are diverse demographic trends in EU countries regarding demographic transition today. Some countries are following the predicted stages and do not show significant variations from the model. Countries in Group 1 are a perfect example for trends typical for stage five of the demographic transition, with negative natural increase and decreasing population. Countries from Group 2, Group 3 and Group 4 show match with the models’ stage four only in the first decades. Later, when the natural increase is zero, the population should decline, while it shows growth, mostly because of the immigration, and thus varies from typical stage five. Countries from Group 5 have a constant natural increase, especially in the last decades. If analyzed, this trend corresponds to stage three of demographic transition, stage historically characterized by industri-

alization and urbanization. These countries are way beyond these processes, so this positive and constant natural increase is mainly due to the immigration, reduced mortality and slow decline in the birth rate.

It can be concluded that when regarding some of the countries in Europe (like countries from Groups 2,3 and 4), migrations are changing the demographic transition, creating a new stage for some countries, stage where the population is rising, while the birth rate and the death rate are slowly declining or are stagnant, creating zero natural increase. Countries from Group 5 have never entered and they even may not enter late stage four or stage five, again because of the constant influx of immigrants and steady birth rate.

So, today, the European Union has two blocks of countries. One are countries with growing population that are attracting large number of immigrants, such as those from Groups 2, 3 and 4 (Western and some Southern European countries) and the other block are countries with decreasing population due to high emigration, low birth rates and increasing death rates, such as countries from Group 1 (East European countries). While immigrations and birth rates are key to population growth, emigrations and high death rates are reasons for demographic ageing and population decline. Thus as presented countries like Luxembourg, Cyprus, Malta, Spain, Austria, Sweden, Ireland, Belgium, Germany and Italy owe their population increase to migration. Declining population due to migration can be found in Lithuania, Latvia, Romania, Estonia, Croatia, Bulgaria, Poland, Slovakia, Slovenia and Portugal. Yet, is not always migrations that increase the population, there is also natural increase like in Ireland, Cyprus, Luxembourg, France, Malta, Netherlands, UK, Finland, Sweden and Belgium.

Did Europe really needed immigrants? Yes. The population equation is pretty simple, births increase it, and deaths decreased it, and if people decide not to have as much as children as needed for a country to reproduce its work force, immigration is the solution. And it is the solution to a greater economic, demographic and social problem - demographic ageing. Ageing population can be devastating in long term. The work force is reduced, and so is the total output, while on the other hand greater demands are laid on the health and pension system. Later, a decline in the living standard is only a matter of time. So what are the benefits from increased population by immigrants? First, it is the increase in labor force and productive capacity, labor shortages in different parts of the public and private sector cease to exist or are significantly reduced, tax revenues will increase, with increased population density economies of scale and efficiency will occur, effect of the ageing population will start to lessen, the economy will be stronger with increase of the real gross domestic product.

It is clear that immigrants are having immense impact on European population. Despite the negative natural increase in the European Union, the population increased due to net migration according to Eurostat. Yet, not all countries follow this trend. The highest population growth in 2018 is in Malta, Luxembourg, Sweden, Ireland and Cyprus, while the highest population fall in 2018 is in Lithuania, Croatia, Latvia, Bulgaria and Romania. The divide is largely caused by migration. Countries that have been receiving immigrants in the past decades are now having steady population growth. Poland, Slovakia and Slovenia had restrictive immigration policies that have reduced the growth of their population. Yet countries in Eastern Europe that are not attractive to immigrants are suffering from demographic ageing.

While Western Europe has provided itself with enough people (with births or/and immigration) to keep its economy strong, the problem in Eastern Europe remains and continues to put further pressure on the economy, the health and pension system, on the private and public production and consumption and on the country's functioning in general. The top ten countries with the fastest shrinking populations are all in Eastern Europe (with a few in Central and Northern Europe), according to UN projections. Emigration is one of the main reasons behind the decline. Eastern Europeans migrated to Western Europe, enticed by the prospect of higher earnings and better welfare systems. With the population declining via emigration, the countries remain with ageing population and decline in the birth rates. The measures that some of the governments took to reverse these negative trends had poor results (Romei, 2016), so the problem remains, with all its gravity, while there yet has been no efficient strategy to defuse the shocks of the emigration, reduced fertility and ageing population.

References:

- Asandului, Laura. "Population ageing in Romania: facts and analysis." The 6th International Days of Statistics and Economics, Prague (2012).
- Bongaarts, John. "Population aging and the rising cost of public pensions." *Population and Development Review* 30, no. 1 (2004): 1-23.
- Brooks, C. (2014): *Introductory Econometric for Finance*. Cambridge University Press, Cambridge.
- Central Biro for Statistics (2015). Relatively high population growth due to migration. cbs.nl. <https://news.err.ee/116893/estonia-among-most-vulnerable-countries-to-effects-of-ageing-population-agency-says> (accessed 27th of November, 2018).
- Długosz, Zbigniew, and Sławomir Kurek. (2006). "Demographic ageing in European union countries." *Europa* xxi: 185.
- Dyson, Tim. "The role of the demographic transition in the process of urbanization." *Population and development review* 37 (2011): 34-54.
- Estonian Public Broadcasting (2015). "Estonia among most vulnerable countries to effects of ageing population, agency says". *News.err.ee*. <https://news.err.ee/116893/estonia-among-most-vulnerable-countries-to-effects-of-ageing-population-agency-says> (accessed 27th of November, 2018).
- European Commission (2018). *National Demographic Strategy of the Republic of Bulgaria (2006-2020)*. ec.europa.eu. file:///C:/Users/Marija/Desktop/docl_7519_526832330.pdf, Accessed 27th of November, 2018.
- European Demographic Data Sheet (2018). populationeurope.org, Accessed 02nd of December, 2018.
- Eurostat (2018). *Immigration by age group, sex and country of birth (online database)*. ec.europa.eu/Eurostat. <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do> (accessed 28th of November, 2018)
- Frątczak, Ewa. "The aging process of the Polish population." *Demographic Studies* 2, no. 142 (2002): 3-28.
- Financial Times (2017). Germany leads way as EU population rises to 512m. [ft.com. https://www.ft.com/content/417cab49-36e6-32e6-94a6-25040123bb85](https://www.ft.com/content/417cab49-36e6-32e6-94a6-25040123bb85) (accessed 28th of November, 2018).
- Financial Times (2015). Portugal faces 'perfect demographic storm'. [ft.com. https://www.ft.com/content/657b9066-2df5-11e5-91ac-a5e17d9b4cff](https://www.ft.com/content/657b9066-2df5-11e5-91ac-a5e17d9b4cff) (accessed 28th of November, 2018).
- Flood, Rebecca (2017). Shock birth rates shows Greeks may be dying out over IMPOSED AUSTERITY. [express.co.uk. https://www.express.co.uk/news/world/798318/Greece-birth-rate-dying-economy-austerity-EU-debt-population-crisis](https://www.express.co.uk/news/world/798318/Greece-birth-rate-dying-economy-austerity-EU-debt-population-crisis) (accessed 29th of November, 2018).
- Focus on Belgium (2017). Did you know that the belgian population is constantly on the rise? [focusonbelgium.be. https://focusonbelgium.be/en/facts/did-you-know-belgian-population-constantly-rise](https://focusonbelgium.be/en/facts/did-you-know-belgian-population-constantly-rise) (accessed 29th of November, 2018).
- Golini, Antonio. "Demographic trends and population policies." *Futures* 33, no. 1 (2001): 27-41.
- Habclicsek, László. "Demographics of population ageing in Hungary." (2004).
- Irish Examiner (2018). Ireland's population growth five times EU average. [irishexaminer.com. https://www.irishexaminer.com/ireland/irelands-population-growth-five-times-eu-average-472747.html](https://www.irishexaminer.com/ireland/irelands-population-growth-five-times-eu-average-472747.html) (accessed 29th of November, 2018).
- Kenc, Turalay, and Serdar Sayan. "Demographic shock transmission from large to small countries: an overlapping generations CGE analysis." *Journal of Policy Modeling* 23, no. 6 (2001): 677-702.
- Kokkinidis, Tasos (2017). The Dwindling Greeks: Alarming Study on Population in 2050. [greece.greekreporter.com. https://greece.greekreporter.com/2017/08/13/the-dwindling-greeks-alarming-study-on-population-in-2050/](https://greece.greekreporter.com/2017/08/13/the-dwindling-greeks-alarming-study-on-population-in-2050/) (accessed 29th of November, 2018).
- Konrad Adenauer Foundation (2013). *Demographic Trends in Estonia*. [Kas.de. https://www.kas.de/c/document_library/get_file?uuid=28b94892-9ac5-c53f-76ea-6e7b470c2e87&groupId=252038](https://www.kas.de/c/document_library/get_file?uuid=28b94892-9ac5-c53f-76ea-6e7b470c2e87&groupId=252038) (accessed 27th of November, 2018).

- Luxembourg Public (2016). Luxembourg's population is growing. <http://luxembourg.public.lu>. <http://luxembourg.public.lu/en/actualites/2016/03/22-population-luxembourg/index.html> (accessed 29th of November, 2018).
- Ministry of Social Affairs and Health (2015). Finland has the slowest population growth in the Nordic countries. stm.fi. https://stm.fi/en/artikkeli/-asset_publisher/suomen-vaesto-kasvaa-hitaimmin-pohjoismaista (accessed 29th of November, 2018).
- Mirkin, Barry, and Mary Beth Weinberger. "The demography of population ageing." *publicado en Population Bulletin of the United Nations* 42, no. 43 (2001): 37-53.
- Murgić, Jure, Tomislav Jukić, Spomenka Tomek-Roksandić, Mate Ljubičić, and Zvonko Kusić. "The ageing of Croatian population." *Collegium antropologicum* 33, no. 2 (2009): 701-705.
- Mohdin, Aamna (2018). As migration tumbles, the UK population growth rate drops to its lowest level since 2004. *Total-croatia-news.com*. <https://www.total-croatia-news.com/politics/28233-cia-croatia-s-emigration-statistics-among-worst-in-europe> (accessed 27th of November, 2018)
- Mohdin, Aamna (2018). The EU countries that desperately need migrants to avoid shrinkage—and those that don't. qz.com. <https://qz.com/1325640/the-european-countries-that-desperately-need-migrants-to-avoid-demographic-decline-and-those-that-dont/> (accessed 02nd of December, 2018)
- Pavlić, Vedran (2018). CIA: Croatia's Emigration Statistics among Worst in Europe. qz.com. <https://qz.com/1317914/uk-immigration-slowdown-hits-britains-population-growth-rate/> (accessed 28th of November, 2018).
- Pitheckoff, Natalie. "Aging in the Republic of Bulgaria." *The Gerontologist* 57, no. 5 (2017): 809-815.
- Radio Praha (2017). Migrants biggest factor in rise in Czech population. radio.cz. <https://www.radio.cz/en/section/news/migrants-biggest-factor-in-rise-in-czech-population> (accessed 28th of November, 2018).
- Reher, David S (2004). "The demographic transition revisited as a global process." *Population, space and place* 10, no. 1: 19-41.
- Reher, David S (2011). "Economic and social implications of the demographic transition." *Population and development review* 37: 11-33.
- Reuters (2018). Spain's population grows for second straight year due to immigration. reuters.com. <https://www.reuters.com/article/us-spain-economy-population/spains-population-grows-for-second-straight-year-due-to-immigration-idUSKBN1JL136> (accessed 29th of November, 2018).
- Romei, Valentina (2016). Eastern Europe has the largest population loss in modern history. ft.com. <https://www.ft.com/content/70813826-0c64-33d3-8a0c-72059ae1b5e3> (accessed 02nd of December, 2018).
- Roser, Max and Ortiz-Ospina, Esteban (2018): "World Population Growth". Published online at OurWorldInData.org. Retrieved from: '<https://ourworldindata.org/world-population-growth>' (accessed 29th of November, 2018).
- South EU Summit (2018). Migration Creates Net-Positive Population Growth for France. southeusummit.com. <https://www.southeusummit.com/europe/france/migration-creates-net-positive-population-growth-france/> (accessed 29th of November, 2018).
- Spectator (2014). Slovakia's population would drop 14 percent if immigration were unregulated, a poll says. spectator.sme.sk. <https://spectator.sme.sk/c/20050668/slovakias-population-would-drop-14-percent-if-immigration-were-unregulated-a-poll-says.html> (accessed 29th of November, 2018).
- Statistical Office of Republic Slovenia (2015). Projections 2015: in 2080 population down, the share of the elderly up. stat.si. <https://www.stat.si/StatWeb/en/News/Index/6584> (accessed 29th of November, 2018).
- Times of Malta (2018). Increase in Malta population more than 15 times that of the EU. timesofmalta.com. <https://www.timesofmalta.com/articles/view/20180710/local/increase-in-malta-population-more-than-15-times-that-of-the-eu.684039> (accessed 29th of November, 2018).
- The Irish Times (2015). Poland's people emigrate as its population flatlines - time for new policies? irishtimes.com. <https://www.irishtimes.com/business/economy/poland-s-people-emigrate-as-its-population-flatlines-time-for-new-policies-1.2067048> (accessed 29th of November, 2018).
- The Local (2018). Italy 'almost at zero' population growth. thelocal.it. <https://www.thelocal.it/20150616/italy-almost->

at-zero-population-growth (accessed 29th of November, 2018).

- The Local (2018). German population has grown by two million since 2015 due to immigration. thelocal.de. <https://www.thelocal.de/20180313/german-population-has-grown-by-two-million-since-2015-due-to-immigration> (accessed 28th of November, 2018).
- The Local (2016). Growing immigration will 'keep Austria young. thelocal.at. <https://www.thelocal.at/20161123/growing-immigration-will-keep-austria-young> (accessed 28th of November, 2018).
- The Local (2015). Immigration behind record population growth. thelocal.se. <https://www.thelocal.se/20150219/immigration-behind-record-population-growth-in-sweden> (accessed 29th of November, 2018).
- The Migration Observatory (2018). The Impact of Migration on UK Population Growth. migrationobservatory.ox.ac.uk. <https://migrationobservatory.ox.ac.uk/resources/briefings/the-impact-of-migration-on-uk-population-growth/> (accessed 28th of November, 2018).
- Thompson, Warren S. (1929): "Population." American Journal of Sociology 34, no. 6 959-75.
- Uutiset (2017). Immigration boosts Finnish population to 5.5 million. yle.fi. https://yle.fi/uutiset/osasto/news/immigration_boosts_finnish_population_to_55_million/9795849 (accessed 29th of November, 2018).
- World Bank (2018). World Development Indicators (online database) available from: <http://databank.worldbank.org/data/reports.aspx?source=World-Development-Indicators> (accessed 27th of November, 2018).
- Worldview.Stratfor (2016). People: France's Advantage over Germany. worldview.stratfor.com. <https://worldview.stratfor.com/article/france-germany-population-demographics-europe-eu-power> (accessed 29th of November, 2018).