

VERICA JANESKA¹

ALEKSANDRA LOZANOSKA²

ELIZABETA DJAMBASKA³

DEMOGRAPHIC CONSEQUENCES OF THE EMIGRATION FROM THE REPUBLIC OF MACEDONIA

Abstract

The growing trend of the emigration abroad from the Republic of Macedonia is confirmed by different data sources. The total number of Macedonian citizens all over the world amounts approximately 630 thousands persons (2013) and the emigration rate reached around 30%. The aim of the analyses in this paper is to identify the demographic consequences of the intensified emigration abroad in the last two decades due to the manifested changes of migration contingent features. It is observed on the example of three receiving countries (Germany, Italy and Switzerland), which share in the total number of Macedonian citizens all over the world amounts more than one quarter.

Considering the very high emigration rate, large permanent emigration and significant changes in the migration contingent structure, the analyses in

¹ Professor, Ph.D., Ss. Cyril and Methodius University in Skopje, Institute of Economics – Skopje, Republic of Macedonia, e-mail: verica@ek-inst.ukim.edu.mk

² Assistant professor/Scientific researcher, Ph.D., Ss. Cyril and Methodius University in Skopje, Institute of Economics – Skopje, Republic of Macedonia, e-mail: sandra@ek-inst.ukim.edu.mk

³ Assistant professor/Scientific researcher, Ph.D., Ss. Cyril and Methodius University in Skopje, Institute of Economics – Skopje, Republic of Macedonia, e-mail: beti@ek-inst.ukim.edu.mk

the paper show that Macedonia is facing serious demographic consequences with long-term implications. Emigration abroad has significant consequences on the total population growth in the country, natural population increase and the process of population ageing.

In order to identify the determinants of the natural population increase of the migration contingent, the CCR-LM model is applied for the period 2008-2014. The results are showing that the share of Macedonian live births in Germany, Italy and Switzerland in the total number of live births in the country, is mostly correlated with the increase of the share of total Macedonian migrants in these countries in the total population of the country, as well as with the share of Macedonian women in Germany, Switzerland and Italy in the total women population in Macedonia.

Keywords: Republic of Macedonia, emigration, demographic consequences, natural population increase, correlation

JEL classification: J110, C1

Introduction

The intensified emigration abroad, especially in the last two decades, the big migration potential (particularly the intellectual emigration) and the small scope of return migration, are undeniably imposing the fact that the emigration abroad became one of the dominant factors determining the population development in Republic of Macedonia.

The aim of the analyses in this paper is to identify the demographic consequences of the intensified emigration abroad and manifested changes of the migration contingent features. Indisputable fact is that the migration is difficult to analyze: the process is complex, the data poor, and the theory unsatisfactory, and beside that its many factors include unpredictable policy change⁴. In this respect the Republic of Macedonia is faced with serious problem because there are no relevant data from the domestic statistics for the scope, demographic and socio-economic features of the population that have left the country, while the foreign data sources are limited and very often incomplete.

⁴ *David Coleman*, "The demographic effects of international migration in Europe", *Oxford Review of Economic Policy* (2008) 24 (3): 452-476.

Having in mind this, the demographic consequences of the emigration of Macedonian citizens abroad are identified on the case of three receiving countries that have relatively great share in the migration contingent and for which there are relevant data from foreign data sources. These are Germany, Switzerland and Italy, the three receiving countries whose participation in the total number of Macedonian citizens all over the world amounts more than one quarter, and more than three quarters in the European receiving countries. So, they could be considered as good example for identifying the demographic consequences of the Macedonian emigration abroad.

In order to identify the determinants of the natural population increase of the migration contingent, quantification of the impact of six relevant factors is made. For that purpose, the Correlated Component Regression (CCR) analysis is applied on the example of the abovementioned receiving countries (Germany, Italy, Switzerland) with high share in the migration contingent and in the live births abroad, for the period 2008-2014.

1. CHANGES AND CURRENT SITUATION OF THE EMIGRATION ABROAD

The current territory of the Republic of Macedonia is a traditionally emigration area in which the migratory movements abroad are dating from the beginning, and the contemporary economic emigration from the mid-sixties of the last century. Although the most popular destinations are well known, the total number of Macedonian citizens abroad remains unknown. Because of the long history of emigration abroad (in some families is repeated for several generations) today there aren't relevant data on the "old" migration and their descendants (second and third generation), as well as for those who have returned to the country. Moreover, in the recent decades, only a small part of the Macedonian citizens have officially registered their stay abroad, which is making the available national statistics for the people who are temporarily or permanently leaving the country incomplete.

The data from the population censuses show that in the period 1971-1994, the number of Macedonian citizens abroad was increased by three times (from 56,449 to 173,611 persons). In the structure of the total migration contingent high increase was noted in the share of the family members which in 1994 was almost equal to that of the migrant workers. This means that

in the early nineties of the last century the emigration abroad had acquired permanent character.

The scope of citizens who are leaving the country and who are registered with the regular statistical survey of the migration from the State Statistical Office of the Republic of Macedonia, is very small and shows only the number of persons who have officially registered their stay abroad.⁵ According to these data, in the period 1994-2014, 12,219 Macedonian citizens have left the country, out of which 3,476 persons or 28.4% in the period 2009-2014.⁶

In such circumstances, the changes and the current situation of the scope of emigration from Macedonia and the structure of the migration contingent can be seen only on the basis of foreign data sources from the international organizations/institutions and national statistics of the receiving countries. Available data from the different foreign sources more or less are differ and confirm that studying the international migration is hampered by the lack of comprehensive and consistent data series for the consideration of all aspects of the migration process. However, the analyses of the total emigration from Macedonia and of the migration contingent in the countries that are considered in this paper, gives relevant findings on the trends of these movements, as well as of the changes in their scope and structural features.

The World Bank statistics for the bilateral estimation of the migration stock in the receiving countries, according to the migrant's country of origin, shows that the total number of the Macedonian citizens (migration stock) worldwide, covered with these data in the period 1960-2013 is with variable dynamics and confirms the previous statement of the migration data inconsistency. Regardless of that, they indicate a rising trend of the emigration from Macedonia and in 2013 their number amounts more than 600 thousand Macedonian citizens, which represents 30.3% of the total population in the country (Table 1). The great change in the total number of migrants in 2013 compared to 2010, according to the analyses by countries, shows that it is a result of the incomplete coverage of the Macedonian citizens in certain overseas countries and in the Balkan countries of reception in previous years

⁵ This research is based on the reports about the immigrated – emigrated person obtained from the regional offices of the Ministry of Interior. It is conducted under the Law on State Statistics («Official Gazette», no. 54/1997 and 22/2007), the Law on Registration of Residence of Citizens and the Law on Movement and Stay of Foreigners («Official Gazette», no. 36/1992, 12/1993, 43/2000 and 66/2007).

⁶ State Statistical Office of the Republic of Macedonia (www.stat.gov.mk)

(1990, 2000 and 2010). But, it does not exclude the fact that after 2010, increase of the emigration abroad was recorded.

Table 1

Total Number of Macedonian Citizens in Receiving Countries all over the World, World Bank Bilateral Estimates of Migrant Stocks

Year	1960	1970	1980	1990	2000	2010	2013
Number	111,617	145,109	468,654	223,563	342,243	447,138	626,312

Source: World Bank (2016): *Bilateral Migration Matrix* in:
<http://go.worldbank.org/JITC7NYTT0> (last access 26.02.2016)

The large number of the Macedonian citizens abroad is also confirmed by the national statistics of the receiving countries. They show that in a considerable number of the receiving countries worldwide, in the last decade, their number was significantly increased. This was confirmed by the data from the population censuses in 2011. According to the available data of the receiving countries in 2011/2012 the total number of Macedonian citizens abroad is around 560 thousand persons or about 27% of the country's population in 2012.

The growing trend of the emigration abroad from the Republic of Macedonia is also confirmed by the Eurostat data. Despite the manifested oscillations, they show that in the European receiving countries, the number of Macedonian citizens has increased from 135 thousand in 2000 to 260 thousand in 2013, i.e. to 240 thousand persons in 2014. The largest increase is noticed in the receiving countries of the European Union, especially in 2011, after the stagnation during the economic and financial crisis (2008-2010). These trends correspond with the changes in the migration policies of the receiving countries.

In terms of the geographical distribution of the Macedonian citizens abroad, based on all available data, it can be concluded that in the last two decades, Australia, Italy, Germany, USA and Switzerland have remained the five receiving countries with the largest number of immigrants from the Republic of Macedonia. Regarding the European countries, the most important destination are: Germany, Italy, Switzerland, Austria, Slovenia and Belgium (Eurostat data), i.e. Sweden (Census of population 2011).⁷ In the last

⁷ European Commission, & GVG, *Social Impact of Emigration and Rural-Urban Migration in Central and Eastern Europe* (VT/2010/001) – Synthesis Report, June 2012, p. 58.

decade, the largest increase was registered in Germany, Belgium, Switzerland and Slovenia, where the number of Macedonian immigrants has increased for about 71 thousand persons (period 2003-2014). At the same time, Germany, Italy and Switzerland have remained the European receiving countries with the highest number of Macedonian citizens, whereas their total number amounts 152,195 (2003) and 212,741 persons (2014).⁸

Taking into account the abovementioned data sources it can be concluded that the emigration rate in the country today ranges from 27% to 30%. This means that out of the country there is very large proportion of the population. The foreign data sources confirm that in the last decade the permanent emigration remains relatively large. At the same time, significant growth is noticed in the temporary migration (for employment abroad, family reasons, study or for other reasons), which is constantly transformed into permanent emigration. As for returning flows of the Macedonian citizens who are residing abroad, all data sources show that they were and remain relatively small.

Regarding the scope, the emigration abroad also is characterized with the changes in the demographic and socio-economic features of the migrants. In the migrants' structure the share of the youth remains dominant, and large increase is noticeable in the share of women and family members. Beside this, the number of children born abroad is continuously increasing. In terms of very high emigration rate, large permanent emigration and significant changes in the migration contingent structure, Macedonia is facing serious demographic consequences with long-term implications.

Due to a lack of complete data, the analysis in this paper is focused on identifying the demographic consequences on the example of the migration contingent in the three receiving countries - Germany, Italy and Switzerland for two reasons. First, the participation of the Macedonian citizens in these three countries in the total migration contingent worldwide is 38.4% (World Bank, 2013), i.e. 88.6% of the total number of migrants in the European receiving countries (Eurostat, 2014). Second, for the migrants in these countries there are data for the changes in their scope and demographic structure. Therefore, based on the analysis of the three receiving countries, relevant conclusions on the demographic consequences about the emigration abroad from the Republic of Macedonia can be drawn.

⁸ Eurostat; Population by sex, age and citizenship (migr_pop1ctz); (<http://epp.eurostat.ec.europa.eu>)

2. FEATURES OF THE EMIGRATION IN GERMANY, ITALY AND SWITZERLAND

2.1. Changes in the migration contingent

The emigration from the Republic of Macedonia in Germany, Italy and Switzerland has a long tradition. It can be seen from the available data of the previous Population censuses in Macedonia, from the databases of the international institutions and from the national statistics of these receiving countries.

With the Population census 1994 in Germany, Italy and Switzerland were recorded 61645 persons or 35% of the total number of Macedonian citizens abroad. Regarding the receiving countries in the period 1971-1994, Germany and Switzerland stood out with relatively high common share in the total number of Macedonian citizens abroad (45.5% in 1971 to 34.9% in 1981 and 33.5% in 1994) and a very large increase in the share of the family members (Table 2). The number of migrants in Italy, however, in the period 1981-1994, had registered a very large increase, especially among the employees abroad. The changes in the migratory contingent of the Macedonian citizens in these three countries of reception up to 1994 imply a growth on the basis of family reunification and the gradual creation of the migratory networks, which had determined the changes in the next two decades.

Table 2

Census data for Macedonian Citizens in Germany, Italy and Switzerland

	Number			Share (in %)		Share (in %)	
	1971	1981	1994	1981	1994	1981	1994
TOTAL	56,449	100,922	173,611	100.0	100.0	100.0	100.0
Employed abroad	54,433	57,964	87,715	57.4	50.5	100.0	100.0
Family members	2,016	42,958	85,896	42.6	49.5	100.0	100.0
GERMANY*	24,851	28,896	34,393	100.0	100.0	28.6	19.8
Employed abroad	24,851	18,661	17,567	64.6	51.1	32.2	20.0
Family members	...	10,235	16,826	35.4	48.9	23.8	19.6
ITALY	...	228	3,477	100.0	100.0	0.2	2.0
Employed abroad	...	142	2,742	62.3	78.9	0.2	3.1
Family members	...	86	735	37.7	21.1	0.2	0.9
SWITZERLAND*	857	6,285	23,775	100.0	100.0	6.2	13.7
Employed abroad	857	5,476	12,193	87.1	51.3	9.4	13.9
Family members	...	809	11,582	12.9	48.7	1.9	13.5

* There are no data for family members

Source: State Statistical Office of the Republic of Macedonia, Census of Population, Households and Dwellings in the Republic of Macedonia, 1981; Census of Population, Households, Dwellings and Agricultural holdings in the Republic of Macedonia, 1994

As for the databases of the international institutions, according to data completeness the World Bank stands out. They show that in the period 1960-2013, the number of the Macedonian citizens in Germany, Italy and Switzerland, although with some fluctuations, noticed very large absolute and relative increase. In 2013 the total number of Macedonian citizens in these three countries amounts around 240,000 persons that is 38.4% of the migratory contingent (Table 3).

The OECD data, although differ from those of the World Bank, are confirming that the total number of the Macedonian citizens in Germany, Italy and Switzerland in the recent years is very large. According to these data it is 201,439 persons (2010), 193,545 (2011) and 193,030 persons (2012), that is about 10% of the total population in the Republic of Macedonia.⁹

The data of the National Statistical Offices of Germany, Italy and Switzerland, even though they are giving different data on the number of immigrants from Macedonia, still, basically confirm the conclusion that this number is very high and that the structure of the migration contingent is changing towards increase of the family members participation. For example, according to these data, in 2011 the number of the Macedonian citizens in these three countries was around 220,000 persons.¹⁰

Table 3

World Bank data for Macedonian Citizens in Germany, Italy and Switzerland, 1960-2013

Destination country	1960	1970	1980	1990	2000	2010	2013
Germany	4,689	22,794	32,954	28,788	54,994	99,646	114,083
Italy	4,320	7,417	6,904	16,850	44,657	101,539	68,714
Switzerland	1,455	3,920	11,355	23,592	58,224	46,581	57,907
TOTAL - three countries	10,464	34,131	51,213	69,230	157,875	247,766	240,704
Total number of macedonian citizens in receiving countries all over the world	111,617	145,109	468,654	223,563	342,243	447,138	626,312
Share (in %) of the migrants in three countries in the migration contingent	9.4	23.5	10.9	31.0	46.1	55.4	38.4

Source: World Bank (2016): *Bilateral Migration Matrix* in: <http://go.worldbank.org/JITC7NYTT0> (last access 26.02.2016).

⁹ Source: OECD, International Migration Statistics, (<https://stats.oecd.org/Index.aspx?DataSetCode=MIG>)

¹⁰ Source: Federal Statistical Office of Germany (<https://www.destatis.de/EN/Homepage.html>); The Italian National Institute of Statistics (<http://en.istat.it/>); The Federal Statistical Office of Switzerland (<http://www.bfs.admin.ch/bfs/portal/en/index.html>)

Eurostat gives the most comprehensive data on the migration contingent in the three analyzed receiving countries in the last decade. It shows that regardless of the manifested changes, the share of the Macedonian citizens in Germany, Italy and Switzerland in the total number of migrants in the European receiving countries, in the period 1997-2014 was and remains dominant. In 2014 in these three countries around 212 thousand persons were residing (Table 4).

Based on all available data one can conclude that the emigration from the Republic of Macedonia in Germany, Italy and Switzerland in the last two decades, has noted continuous and rapid growth, primarily under the influence of the established migration networks, and that the migration contingent have reached very large scope. In such circumstances, the emigration in these countries has a growing impact on the demographic changes in the country.

Table 4
Eurostat data for Macedonian Citizens in Germany, Italy and Switzerland, 1997-2014

Destination country	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Germany	38,774	42,550	46,167	49,420	51,841	55,986	58,250	61,019	61,105	62,093	66,219	66,433	66,196	66,651	70,140	71,517	77,200	71,684
Italy	11,596	13,456	16,647	21,110	:	:	34,019	51,208	58,460	63,245	74,162	78,090	65,809	69,208	71,315	73,972	76,608	78,424
Switzerland*	45,146	48,604	51,142	54,042	56,092	58,549	59,926	60,676	61,008	60,898	60,362	60,184	59,909	60,043	60,116	60,741	61,668	62,633
TOTAL - three countries	95,516	104,610	113,956	124,572	107,933	114,535	152,195	172,903	180,573	186,236	200,743	204,707	191,914	195,902	201,571	206,230	215,476	212,741
Total number of macedonian citizens in European receiving countries	99,725	110,258	121,804	134,948	137,464	140,275	179,925	198,379	251,273	214,210	230,309	241,886	231,408	218,189	227,970	252,989	262,897	240,137
Share (in %) of the migrants in three countries	95.8	94.9	93.6	92.3	78.5	81.7	84.6	87.2	71.9	86.9	87.2	84.6	82.9	89.8	88.4	81.5	82.0	88.6

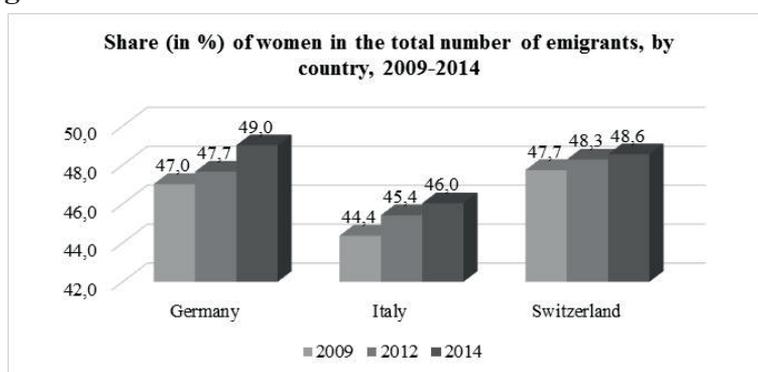
Source: Eurostat; Population by sex, age and citizenship (migr_pop_letz); (<http://epp.eurostat.ec.europa.eu>)

2.2. Demographic structure of the migrants

The increase of the number of Macedonian citizens in Germany, Italy and Switzerland is accompanied by significant changes in the demographic structure of the migrants. The only comparable data for the structure of migration contingent in these countries according to gender and age are those of Eurostat, for the period 2009-2014.

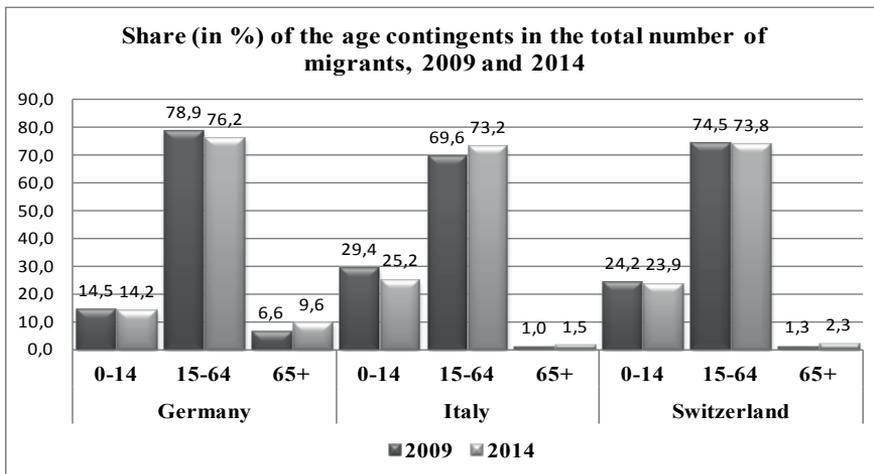
The structure by gender suggests that women's share in the overall migration contingent in these three countries in the period after 2009 has shown a steady increase (Figure 1). In 2014 it amounts: 49% (Germany), 46% (Italy) and 48.6% (Switzerland). Such participation of women implies a continuous process of family reunification of the Macedonian citizens in these three receiving countries.

Figure 1



Source: Eurostat: Population by sex, age and citizenship (migr_pop1ctz), <http://epp.eurostat.ec.europa.eu>

The structure of the Macedonian citizens abroad by age, viewed through the share of the large age groups, in the three analyzed receiving countries, is more or less different (Figure 2). Thus, in Germany the share of children (0-14 years) and of the working age population in the period 2009-2014 has slightly decreased, while the share of those aged 65+ has increased from 6.6% to 9.6%. Similar changes are characteristic for Switzerland, where the share of children is significantly higher, but of the older population (65+) is four times lower than in Germany. In Italy, however, the participation of children has decreased, while of the working age population and of the older population (65+) have increased.

Figure 2

Source: Eurostat: Population by sex, age and citizenship (migr_pop1ctz), <http://epp.eurostat.ec.europa.eu>

The changes in the scope and demographic structure of the migrants shows that after 1990, the contingent of Macedonian citizens in Germany, Italy and Switzerland noticed an increase on two grounds - the new emigration, mostly on the basis of family reunification, and the inflow of the second and third generation. Subsequently, the temporary has been continuously transformed into permanent emigration.

3. DEMOGRAPHIC CONSEQUENCES OF THE EMIGRATION ABROAD

The large increase of the emigration abroad and the significant changes in its structural features, assume numerous consequences and implications, which are manifested on the demographic and socio-economic development of the Republic of Macedonia. The impact of the emigration on the demographic development is direct and indirect and has a long-term effect. In this context, the demographic consequences of the emigration of the Macedonian citizens in Germany, Italy and Switzerland is observed through its impact on the total population growth, natural population increase and the population aging in the country.

Table 5
Basic functional contingents in Germany, Italy and
Switzerland and their share in the contingents in the
Republic of Macedonia, 2009, 2011 and 2014

	2009	2011	2014
Absolute numbers			
Total number of migrants in Germany, Italy and Switzerland	191,914	201,571	212,741
Children (0-14)	43,440	44,314	44,881
Working-age population (15-64)	142,654	150,092	158,279
Female (15-49)	54,159	57,467	61,816
Female (20-34)	28,683	29,760	30,827
Population aged 65+	5,820	7,165	9,434
Share (in %) in the total population/contingents in count			
Total number of migrants in Germany, Italy and Switzerland	191,914	201,571	212,741
Children (0-14)	12.0	12.5	12.9
Working-age population (15-64)	9.8	10.3	10.8
Female (15-49)	10.2	10.9	11.9
Female (20-34)	12.2	12.6	13.2
Population aged 65+	2.4	2.9	3.6

Source: State Statistical Office of the Republic of Macedonia, Natural Population Change, Statistical review: Population and Social Statistics no.: 2.4.10.08 (661); 2.4.11.10 (693); 2.4.12.07 (722), 2.4.13.12 (755) and 2.4.14.09 (787). (www.stat.gov.mk); Eurostat; Population by sex, age and citizenship (migr_pop1ctz);

a) *Total population increase*

According to Eurostat data, the total number of Macedonian citizens in Germany, Italy and Switzerland has increased from 95,516 (1997) to 212,741 person (2014). This means that only on the basis of emigration in these three countries in this period, the population in Macedonia decreased for about 117 thousand people or for more than 5%. Therefore, it can be concluded that in the last two decades the emigration in the analyzed countries had great direct impact on the population growth.

Considering the predominant participation of the youth in the migration contingent, this impact is even more severe in certain age groups. Based on Eurostat data, it can be concluded that in these three receiving countries in 2014 reside 44,880 children (0-14 years) or 12.9% of children in the Republic of Macedonia (Table 5). The number of young people (15-29) in Germany, Italy and Switzerland, also recorded continuous growth and in 2014 amounts 54,945 persons, which is 12.3% of the number of young people in the country. Therefore, the common share of children and young people reaches almost 100 thousand persons, representing 47% of the migratory contingent in these three countries in 2014. These indicators confirm that there is a large scope of young people abroad, which undoubtedly has a direct and indirect impact on the demographic changes in the country.

In the period 2009-2014 continuous growth has been also recorded the working age population contingent. This number in the three countries of observation, reached about 158 thousand persons, representing 10.8% of the working age population in the country in 2014. Young people up to 29 years have dominant share in this contingent.

Regarding the indirect effects of the emigration, it is important to indicate the size of the fertile female population (aged 15-49) and the women on optimal reproductive (aged 20-34) in the migratory contingent of the Macedonian citizens in Germany, Italy and Switzerland. Their number is constantly growing, and their share in the same age groups in the country in 2014 have reached 11.9% and 13.2% respectively.

Longevity of the emigration and the prolonged residence abroad, determined the growth of the Macedonian citizens aged 65+ in the analyzed countries of reception. In the period 2009-2014, this segment of the migratory contingent has increased by 62% and their share in the total population in the Republic of Macedonia aged 65+ have increased from 2.4% to 3.6%.

These and the aforementioned indicators are confirming that in Germany, Italy and Switzerland a significant proportion of children, young

working age population and the population of fertile age is residing, which implies more pronounced long-term demographic consequences of the emigration abroad.

b) Natural population increase

In the last two decades the emigration abroad become an integral part of the population development in the country due to the large permanent emigration of the young population and of the growing number of children born abroad. The State Statistical Office data on the number of live born abroad, is showing that it is increasing year by year, and has a pronounced influence on the changes in the natural population increase in the country. In the period 2008-2014 this number was 27,886 children, which represents 17.0% of the total live births in the country (163,997) in the same period.¹¹

The available data on the number of live births abroad shows that in the analyzed period, three-quarters of them belongs to Germany, Italy and Switzerland. Their common share in the total live births in the Republic of Macedonia, in the period 2009-2014, is continuously increasing and in last two years amounts more than 13% (Table 6).

Table 6

**Live births of the macedonian citizens abroad - total,
in Germany, Italy and Switzerland, 2009-2014**

Year	Total live births abroad		Live births abroad			Three countries - total		
	Number	Share (in %) of total live births in the country	Germany	Italy	Switzerland	Number	Share (in %) of total live births abroad	Share (in %) of total live births in the country
2008	3,728	16.2	393	1,174	1,311	2,878	77.2	12.5
2009	3,510	14.8	366	1,075	1,191	2,632	75.0	11.1
2010	3,642	15.0	306	1,233	1,276	2,815	77.3	11.6
2011	4,012	17.6	365	1,311	1,353	3,029	75.5	13.3
2012	4,221	17.9	369	1,395	1,402	3,166	75.0	13.4
2013	4,373	18.9	424	1,367	1,403	3,194	73.0	13.8
2014	4,400	18.6	518	1,286	1,410	3,214	73.0	13.6
Total	27,886	17.0	2,741	8,841	9,346	20,928	75.0	12.8

Source: State Statistical Office of the Republic of Macedonia, Natural Population Change, Statistical review: Population and Social Statistics no.: 2.4.10.08 (661); 2.4.11.10 (693); 2.4.12.07 (722), 2.4.13.12 (755) and 2.4.14.09 (787). (www.stat.gov.mk)

¹¹ Source: State Statistical Office of the Republic of Macedonia, Natural Population Change, Statistical review: Population and Social Statistics no.: 2.4.10.08 (661); 2.4.11.10 (693); 2.4.12.07 (722), 2.4.13.12 (755) and 2.4.14.09 (787), (www.stat.gov.mk)

In absolute scope, the number of live births is very high in Italy and Switzerland. In this context, the data of the Federal Office for Migration of Switzerland are interesting, according to which in 2013, 17,953 persons or 28.7% of the Macedonian citizens with permanent residence (62,515 persons) were born in Switzerland.¹²

The increasing and high number of live births in Germany, Italy and Switzerland, clearly are presenting the demographic consequences of emigration in these receiving countries on the natural population increase in the country. Therefore, in order to perceive the determination of the increase in the number of Macedonian live births in these countries in the period 2008-2014, for the purpose of this paper, quantification of the impact of six relevant factors is made.

For that purpose, the Correlated Component Regression (CCR)¹³ analysis is applied, which allows simultaneous adjustment for the effect of each indicator on the other, and hence shows the independent and unique contribution of each indicator. This statistical model is the best selection for the linear regression when all independent variables are positively and strongly correlated with the dependent variable. They are all predictors of the analyzed dependent variable. The CCR is the newest model that was introduced in the past several years that overcame the problem of lack of large time series data and the presence of high multicollinearity among the variables.

The CCR.LN model is applied for estimation of the statistical relevance of several demographic indicators on the share of the live born children abroad. The relationship assessment is made using the data from State Statistical Office of the Republic of Macedonia, and EUROSTAT considering the period 2009-2014. The CCR analysis was performed using XLSTAT 2016, to identify the optimal demographic factor associated with the share of the live-births abroad.

¹² Source: <https://www.bfm.admin.ch/dam/data/bfm/publiservice/statistik/auslaenderstatistik/2013/ts-2013e>

¹³ Correlated Component Regression – CCR is revolutionary new approach of the Predictive Modeling, developed by Jay Magidson several years ago, and it's totally different from the conventional methods. (<https://www.xlstat.com/en/solutions/features/correlated-component-regression-ccr>), last approached: 19.2.2016

The variables in the model are:

Y – Share of live births in Germany, Switzerland and Italy in the total live births in the Republic of Macedonia

X₁ – Share of total number of Macedonian migrants in Germany, Switzerland and Italy in the total population of the Republic of Macedonia

X₂ – Share of Macedonian women in Germany, Switzerland and Italy in the total number of women in the Republic of Macedonia

X₃ – Share of Macedonian women in the total number of Macedonian migrants in Germany, Switzerland and Italy

X₄ – Share of Macedonian women on fertile age (15-49) in Germany, Switzerland and Italy in the total number of women on fertile age in the Republic of Macedonia

X₅ – Share of Macedonian women on the optimal reproductive age (20-34) in Germany, Switzerland and Italy in the total number of the women on optimal reproductive age in the Republic of Macedonia

X₆ – Share of Macedonian men on fertile age (15-64) in Germany, Switzerland and Italy in the total number of men on fertile age in the Republic of Macedonia

The correlation matrix confirm that all independent variables are highly correlated one with other and with the dependent variable. The correlation index is in range from 0,824 – 0,916) that is very close to value of perfect correlation 1. The highest correlation index of 0,916 with the dependent variable has the share of total number of Macedonian migrants in the observed countries (Germany, Switzerland and Italy) in the total population of the Republic of Macedonia. Very high correlation index (0,910) has and the share of Macedonian women in Germany, Switzerland and Italy in the total women population in the Republic of Macedonia. It is nearly the same correlation index (0,907) for the share of the women that are on optimal reproductive age in the selected countries in the total number of the women on optimal reproductive age in the Republic of Macedonia. Also, the share of the women on fertile age in Germany, Switzerland and Italy in the total number of women on fertile age in the Republic of Macedonia has high correlation index and it is 0,902 (Table 7).

Table 7

Correlation matrix

Variables	X1	X2	X3	X4	X5	X6	Y
X1	1.000	0.996	0.909	0.987	0.996	0.970	0.916
X2	0.996	1.000	0.943	0.997	0.996	0.946	0.910
X3	0.909	0.943	1.000	0.965	0.927	0.788	0.824
X4	0.987	0.997	0.965	1.000	0.991	0.921	0.902
X5	0.996	0.996	0.927	0.991	1.000	0.949	0.907
X6	0.970	0.946	0.788	0.921	0.949	1.000	0.883
Y	0.916	0.910	0.824	0.902	0.907	0.883	1.000

Source: CCR-LN calculations with XLStat 2016

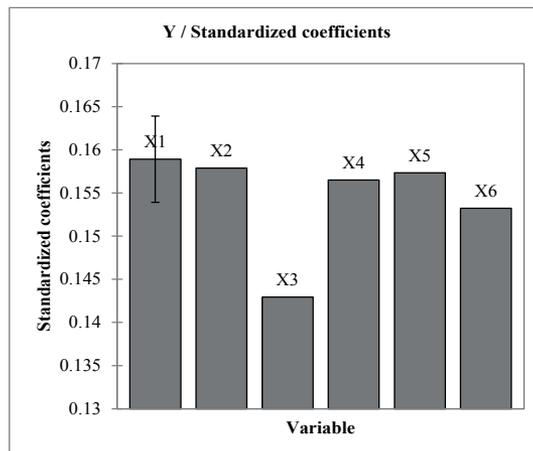
Coefficient of the determination in the model is $R_2 = 0,826$ and after cross-validation is $R_2 = 0,660$. This confirms that estimation model is reliable and around 66% of the variations in the Macedonian live births abroad for the analyzed period can be explained by the variations in the selected independent variables.

The model has the following appearance:

$$Y = -23.19 + 0.43X_1 + 0.37X_2 + 0.31X_3 + 0.27X_4 + 0.42X_5 + 0.49X_6$$

The figure 3 present the conditionality of the independent variables with the dependent variable after the cross-validation with the standardized coefficients. This confirms the previous conclusion of highly correlated variables and positive effects of all selected variables on the live births abroad.

Figure 3 The relationship of the dependent variable and standardized coefficients of the independent variables



Source: CCR-LN calculations with XL Stat 2016

The applied model confirms that the changes in the abovementioned independent variables have positive impact on the natural population increase in the country. The significant rise of the numerical values of the selected demographic indicators in the analyzed period is the reason for increase of the live births abroad.

c) Population ageing

In terms of several decades' continuous emigration abroad increase, there is significant direct and indirect impact of these migratory movements on the acceleration of the demographic ageing process in the Republic of Macedonia. In the period 2009-2014 the population remained in the stadium of demographic old age, while the average age of the population increased from 36 to 38 years. On the population aging process based on emigration, particularly great impact has the age structure of the migration contingent in Germany, Italy and Switzerland. This is confirmed by the indicators for the proportion of the age groups 0-19 and 20-39 years in the migratory contingent, which in 2014 amounted 28.0% and 39.5%, respectively. These population indicators in the Republic of Macedonia are 23.3% and 30.7%. According to the participation of the persons aged 0-40 years in 2014, the Macedonian citizens abroad are in the third stage - demographic maturity, while the population in the Republic of Macedonia is in the fifth stage - demographic old age.¹⁴

In the context of population ageing process, particular attention deserves the indicators of age dependency ratio - total, of the young and of the old persons. According to the population estimates in the Republic of Macedonia these indicators in 2014 amounts: total age dependency ratio 41.8%, the youth dependency ratio 23.8%, and the elderly dependency ratio 18.0%. For the migration contingent in the three analyzed countries these indicators are: 34.3%, 28.4% and 6.0%. The differences are evident and confirm the impact of emigration on the demographic aging in the country.

The intensive population aging in the Republic of Macedonia implies growing problems in different domains. One of them is greater burden of the pension system based on paid contributions, especially in terms of lower age limit for retirement and increased pressure on the public finances.

¹⁴ Dimitrieva, E., Janeska, V., (2001), Population and labour force aging in the Republic of Macedonia, University "Ss. Cyril and Methodius" in Skopje, Institute of Economics – Skopje, p. 26

Conclusion

Based on the analyses made in this paper several conclusions can be made. The migration statistics of the Republic of Macedonia is relatively poor, because there are no relevant data for the scope, demographic and socio-economic features of the population that have left the country. On the other hand, the foreign data sources are limited and very often incomplete. For that reasons it is very difficult to make complete analyses of the emigration abroad.

Considering the available data sources (State Statistical Office of the Republic of Macedonia, the World Bank, OECD and Eurostat) it can be concluded that the emigration rate in the country is very high and ranges from 27% to 30%. Also, the permanent emigration remains relatively large, while the temporary migration for employment abroad, the migration for family reasons, for study or for other reasons is noticing a significant growth and mostly is transforming into permanent emigration. The established migration networks in the last two decades, are one of the main reasons for the continuous and rapid growth of the emigration from the Republic of Macedonia in the three analyzed countries. The intensified emigration and the large scope of the migration contingent has a growing impact on the demographic changes in the country.

The relevant data from foreign sources are showing that Germany, Italy and Switzerland have relatively great share of the Macedonian migration contingent. Their share in the total number of Macedonian citizens all over the world amounts more than one quarter, and more than three quarters in the European receiving countries. For that reason, they could be taken as a good example for identifying the demographic consequences of the emigration abroad.

The demographic structure of the migration contingent in Germany, Italy and Switzerland is characterized with significant changes. In that context, the analyses of the gender structure show stable increase of the share of the women. The age structure of the Macedonian citizens abroad, observed through the participation of the large age groups, in the three analyzed countries, is more or less different. However, it is characterized with nearly similar changes. The share of children (0-14) was decreasing in all countries, the participation of the working age population (15-64) only in Germany and Switzerland, while the share of the old population 65+ is increasing in all three countries. These changes are indicating a continuous process of family

reunification of the Macedonian citizens and intensified inflow of the second and third generation.

The demographic consequences of the emigration of the Macedonian citizens in Germany, Italy and Switzerland is observed through its impact on the total population increase, natural population increase and the process of demographic ageing in the country. The analyses is showing that in these three countries lives a significant proportion of children, young working age population and the population of fertile age, which implicates negative influence on the total population increase in the Republic of Macedonia.

Regarding the consequences to the natural population increase, the analysis is showing that the common share of the live births abroad in the total live births in the country, in the period 2009-2014, is continuously increasing and in 2014 accounts for 13.6%. For the purpose of identifying the factors which influence the natural population increase of the migration contingent in Germany, Switzerland and Italy, the correlated component regression (CCR-LM) is used. This model overcame the problem of lack of large time series data and the presence of high multicollinearity among the variables. The results from the calculations are implying that the share of the Macedonian live births in these three countries of the total number of live births in the country, is significantly correlated with the increase of the share of total number of migrants in the in the total population of the Republic of Macedonia, as well as with the participation of women in these countries in the total women population in the Republic of Macedonia.

The demographic consequences on the demographic ageing process in the country are also very concerning. In situation, when the emigration of the young population is significantly intensified, the ageing process in the Republic of Macedonia is accelerating. With respect to that and with increasing old age dependency ratio, very soon, the country will face difficulties in the pension system and with increased pressure on the public finances.

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