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Knowledge for INtegration Governance

The Contribution of Migration to the Demography of Europe between 1991 and 2011 - An overview-

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KING - Knowledge for INtegration Governance

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The KING project's objective is to elaborate a report on the **state of play** of migrant integration in Europe through an interdisciplinary approach and to provide decision- and policy-makers with **evidence-based recommendations** on the design of migrant integration-related policies and on the way they should be articulated between different policy-making levels of governance.

Migrant integration is a truly multi-faceted process. The contribution of the insights offered by different disciplines is thus essential in order better to grasp the various aspects of the presence of migrants in European societies. This is why **multidisciplinarity** is at the core of the KING research project, whose Advisory Board comprises experts of seven different disciplines:

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The project consists in the conduct of preliminary **Desk Research** to be followed by an empirical in-depth analysis of specific key topics identified within the desk research. To carry out these two tasks, each Advisory Board member chose and coordinated a team of two to five researchers, who have been assigned a range of topics to cover.

The present paper belongs to the series of contributions produced by the researchers of the “Demography” team directed by Professor Gian Carlo Blangiardo:

EU Policy	ADVISORY BOARD MEMBER	DESK RESEARCH PAPERS
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The project is coordinated by the **ISMU Foundation**, based in Milan (Italy).

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The contribution of migration to the European demography between 1991 and 2011: an overview

1. INTRODUCTION

Immigration to European countries has drastically increased during the last decades. Around 2008, 15 per cent of the population in the European Union was foreign-born or had at least one foreign-born parent (Lanzieri 2010). This inflow of people has a multi-faceted effect on European populations. Immigrants increase population and thus support population growth. A majority of immigrants is aged 20-30 years upon arrival and hence mitigates to some extent negative effects of population ageing and declining labour force. In addition, since migrants are of a different culture, ethnicity and religion, they contribute to change the social environment in the destination countries. Demographic effects of migration interact with societal effects: a higher proportion of migrants in a population increase its cultural, ethnical and religious diversity. Migrants usually differ from the local population in their fertility level and pattern of family formation and this change its overall demographic characteristics. The relevance of these changes is underlined by Coleman who argues that migration is the main constituting element of the so-called Third Demographic Transition (Coleman 2008).

Before World War II Europe was the main supplier of population to overseas countries, especially U.S.A, Canada and Australia, but after the war immigration started to increase. In the end of the 1940s and the 1950s independence of ex-colonies moved large masses of people towards the main land, they were mainly returning nationals or migrants workers from the colonies. The countries most involved in these flows were UK Belgium the Netherlands and France. These migration flows were followed by the big migration waves – constituted mainly by migrant workers - in the 1960s and the 1970s directed especially towards Germany and Austria (so-called “Gastarbeiter”). In the end of the 1980s East-West European migration arose as a dominant flow on the continent, particularly enforced after the fall of the totalitarian regimes in Central and Eastern Europe. The EU declaration for the right of free movement of people (Directive 2004/38/EC) and free labour markets turned the first decade of the twenty –first century into the period of largest migration flows in the EU. In the recent past, many European countries experienced sudden rises in the flow of immigration and have gradually transformed themselves from sending to receiving countries; as a consequence, migration has become an important component of population change besides the natural increase due to vital events.

Today there are more than seven billion people living on our planet. Of them 232 million are international migrants, i.e., people living temporarily or permanently outside their country of birth. They represent three per cent of the world’s population (UN 2012). Most of the international migrants (59%) live in the high-income countries of the Northern Hemisphere. The migration flows are driven by the past and current demographic trends which see an ever-increasing life expectancy combined with below-replacement levels of fertility. These two trends – largely unrelated - are modifying the shape of the age profile of the population from the well-known and traditional pyramid, with larger younger cohorts at the bottom, to an almost reversed pyramid, where the larger cohorts are among the elderly. The process of ageing is expected to be particularly relevant in the European Countries in the next decades – with the ageing of the baby boom generations - and may be accompanied by a shrinking of the population size with further repercussion on the potential labour force, which may no longer be sufficient to support economic growth.

The demographic solutions envisaged by the countries affected are aimed at increasing fertility levels and/or increasing the flow of immigration. However, any increase in fertility would need at least a couple of decades before becoming 'visible' to the labour market, while the effect of migration can be 'visible' immediately.

This paper aims to answer the following research questions:

- 1) How was the geography of international migration in Europe in the past two decades (1991-2001 and 2001-2011)?
- 2) To what extent did migration flows influence size and composition of population in the destination countries?
- 3) Which contribution did migration give to the population of receiving countries in terms of human capital, labour market, and fiscal policies?

The analysis covers the past two decades, 1991-2001 and 2001-2011 and the 28 EU Members and is developed in the following steps: a) calculation of additional amount of people observed in the inter-temporal periods by comparing the actual observed population and the hypothetical population under the zero migration assumption for each EU member State; b) computation of potential migration contribution to the changing structure of the EU hosting populations in terms of human capital, labour supply, and population ageing; c) cross-country comparisons of gain and loss in the demographic asset of each EU Member State population due to migration.

Using the concept of potential demography (Hersch 1942; 1944; 1948; Blangiardo 2012; Blangiardo and Rimoldi 2012), we compute the demographic asset (DA) for each EU Member State population and compare the results across countries by looking at different demographic indicators. The demographic asset is positive in countries where immigration prevails and negative otherwise. The data are taken from different international data sources as well as from national official statistics. The geographical scope of the analysis is the 28 EU member States.

This study is mostly focused on cross-country comparisons and does not provide very in-depth country specific analysis; in addition, since it is mainly descriptive, it leaves explanatory analyses for later research. Eventually, by examining past and present migration and their effect on European Union population, this paper is functional to the next one which takes a prospective view and examines this impact with regard to the future. In order to construct reasonable population forecasts it is helpful to dispose with analyses about the past and the present.

In the next section we describe the conceptual framework of the analysis, next, we present the data and the methodological approach, and then we discuss the main findings. Finally, the policy implications of the migrations contribution to the European demography are given in the concluding section.

2. CONCEPTS, DATA AND METHODS

2.1. Conceptual framework and definition

The future development of a population at any given time can be evaluated by computing its potential expected life, that is, the sum of the life expectancies of all its members.

This concept of potential demography was firstly developed by Hersch (1942 and 1944), who introduced also the idea of vital centre of a population, defined as the age that equally divides the sum of potential years of life of any given population into two parts. According to Hersch potential demography is an extremely powerful tool for investigating the extent of population ageing and comparing levels of ageing across different populations because it combines into one single index, the generalized mean age, the two components/determinants of population aging, namely age structure and life expectations (Hersch 1948).

On the basis of the potential demography the concept of demographic asset, DA - and the complementary one of the demographic gross domestic product, dGDP, (Blangiardo 2012; Blangiardo e Rimoldi 2013) - can be computed for any given population at any given time. The DA is the number of additional potential years of life that the population can spend in its future. It can grow by the contribution of the new births (and improvements in survival conditions), net of those years consumed (by living) or lost (by dying), plus or minus the number of potential years of life received from or given to other countries population (by migrations). For any given time and country, the dGDP can be considered as the gross additive/positive contribution to the DA through births and net migrations. Hence, the DA and the dGDP can be seen as the stock and the flow measures, respectively, of the time/future years of a certain population.

Using this theoretical/conceptual framework is possible to investigate the contribution of foreign migrants to the demography of Europe by computing the demographic asset of each EU country and comparing the related values across the different EU member States. In performing the comparisons it should be taken into account that in Europe the variation of potential demography is driven more by cross-country differences in the age population structure than by cross-country variation in survival rates.

The concept of an immigrant population in a country is defined according to available definitions and data and its definitions may differ across countries and times. According to the UN definition of 1998, which is also accepted in the EU, an immigrant is “a person who moves to a country other than that of his or her usual residence for a period of at least a year, so that the country of destination effectively becomes his or her new country of usual residence” (UN 1998). This definition replaced a previous one in which the term “residence” was excluded as it was too divergent across countries. Usually the immigrant population is approximated with the foreign or the foreign-born population. Eurostat defines the foreign population as “all persons who have that country as country of usual residence and who are the citizens of another country” and the foreign-born population as “all persons who have that country as country of usual residence and whose place of birth is located in another country”. The former definition includes persons of other nationality born in the country. The latter definition includes naturalized immigrants, i.e., foreigners who have received the citizenship in the country of their usual residence. It also includes nationals born abroad who have moved back to their country of origin. The use of either one of these definitions depends on the focus and purposes of the analysis.

Haug (2002) discusses an interesting criterion for the definition of immigrant population. In Germany, Switzerland and Portugal it is approximated with the foreign population while in Belgium, the Netherlands, and Norway it is defined with reference to the place of birth of a person or his parent or grandparents, which means that in the latter three countries the immigrant population includes foreigners born abroad

and persons born in the country with one or both parents being foreigners (persons with migration background). The choice of definition is linked with the naturalization procedure which is more demanding in Germany, Switzerland and Portugal and more generous in Belgium the Netherlands and Norway. Since naturalization is selective, it influences the integration process. In countries where it is less demanding some naturalized persons may find integration not appealing and thus pertain to their original culture for more than one generation. In such cases it makes sense to consider an enlarged definition of an immigrant population.

2.2. Data and methods

The data are taken from different international data sources as well as from national official statistics. The period considered for studying international migration in the EU and its contribution to the demography of each EU country encompasses the two decades 1991-2001 and 2001-2011.

The geography of international migration in Europe is reconstructed by computing net migration by age and sex in each EU country.

The reconstruction of the net migration profile by age and gender for any given population from time t to time $t+1$ is made using the following relationship:

$$NM_{x/x+1} = [P_{x+1}(t+1)] - [P_x(t) * s_{x/x+1}] \quad (1)$$

where NM stands for net migration and $P_x(t)$, $P_{x+1}(t+1)$ is the resident population by age (and sex) structure at time t , $t+1$, and $s_{x/x+1}$ are the survival rates as taken from the most recent available life tables.

Using the above formula (1) the total years spent by any given population in training, production, and retirement can be computed and the overall demographic asset gained and lost by the same population through the means of international migrations, can be assessed. In other words, reconstructing not only the amount but also the age and sex structure of the migrant population in each of the EU member State it is possible to evaluate the extent to which international migrations have contributed to the past observed equilibrium in both the labour market and the welfare system of the selected EU country. A necessary assumption required by the above mentioned assessment of the demographic asset is that migrants are supposed to remain definitely in the hosting countries after their arrival. It should be kept in mind that the assessment draws on hypothetical conditions that may not always be met.

The comparison between the observed population and the population that could have been observed under the assumption of absence of migration (see research aim (d)) is performed using age pyramids and synthetic socio-economic indicators such as age and dependency ratios, and so on.

The cross-country comparison in the gains of EU member State demographic assets due to migration (see research aim (e)) is developed by comparing the values of the different country socio-economic indicators and by ranking the EU countries according to different levels of achieved gains in terms of human capital, labour supply, and ageing. Cluster of countries with similar patterns are detected.

3. RESULTS

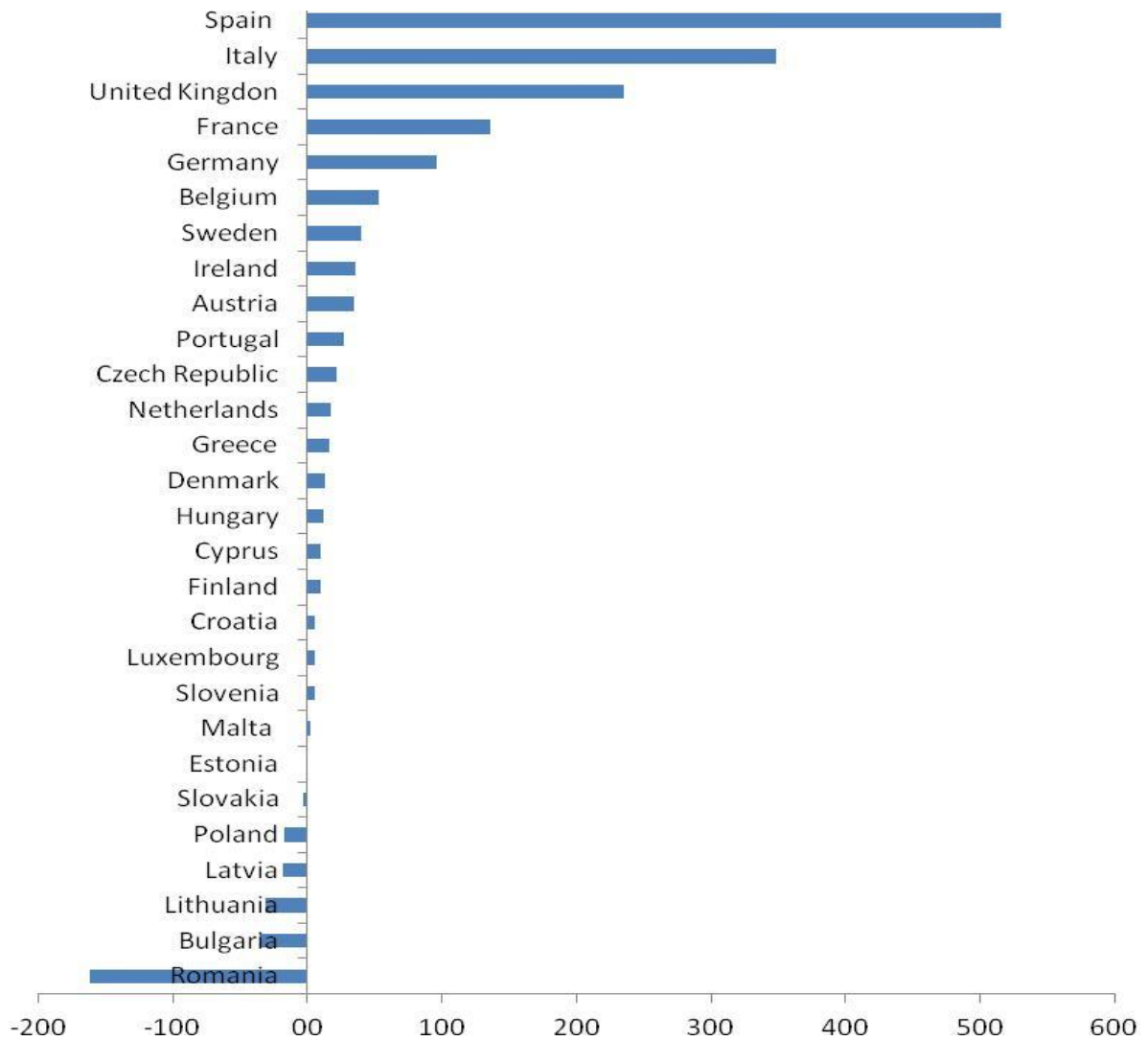
3.1. Net migration flows

The annual contribution of migration to the EU-28 population¹ between 2001 and 2011 was equal, on average, to 1,373 thousand people.² Three different clusters of countries can be detected according to the size of additional migrants recorded in the period 2001-2011. A first cluster encompasses the five EU countries with the largest positive net migration flows, around 100 thousand people or above, namely: Spain, Italy, the United Kingdom, France, and Germany. A second group includes countries (16 overall) in which net migration balance in 2001-2011, although positive was not as big as in the previous group, between one thousand and 50 thousand people, namely: Belgium, Sweden, Ireland, Austria, Portugal, the Netherlands, the Czech Republic, Greece, Denmark, Hungary, Cyprus, Finland, Croatia, Luxembourg, Slovenia and Malta. A third cluster covers countries with a negative migration balance in the decade 2001-2011 which are all belonging to the Eastern Europe, namely: Romania, Bulgaria, Lithuania, Latvia, Poland, Slovakia, and Estonia (Figure 1). Within this latter group Romania was the country with the biggest negative flows (minus 161 thousand people) while Estonia was the country with the smallest negative net migration (minus one thousand people).

The net migration flows will slightly decline in the EU in the next decade (2011-2020) (see also Kaczmarczyk, 201). Declines are foreseen also for some EU member states: Ireland, France, the United Kingdom, Spain, Malta, Cyprus, Austria, Germany, Latvia, Lithuania, Bulgaria and Estonia. In the latter four countries the net migration flows will be still negative in the next future but the loss is expected to be of smaller magnitude. An increase in the net migration flows is predicted in Denmark, Finland, Sweden, the Netherlands, Luxembourg, Belgium, Italy, Portugal, Greece, Czech Republic, Hungary and Slovenia, Poland, Slovakia, and Romania. In the latter three countries the net migration flows, negative in the period 2001-2011, will become positive in the next years. Interestingly, Ireland – and Malta to a lesser extent - will experience a transition from positive to negative net migration balance between 2001 and 2011 and 2011-2021. Moreover, Spain is expected to experience a drastic reduction in its net migration balance in the next decade. One possible explanation for such a reversal trend could lie in the recent economic recession which has brought the unemployment rates well above historical averages in the recent years and made some of the traditional receiving countries less attractive for labour migrants and their dependent family members (Grimm 2012). The European countries most affected by the financial and economic crisis – Ireland, Greece, Portugal and Spain – recorded more emigration than immigration in 2010-12 (Eurostat 2013).

¹ Actually, by comparing resident populations at the beginning and the end of different time intervals, we get the total amount of resident people, not necessarily migrants, added or lost in the interval considered. The assumption that these inter-temporal changes in the population size, either positive or negative, are mainly due to past migrations is a reasonable one. The migration contribution has been computed firstly for each country and year and - within each country and year - for each age group and both genders. Afterwards the average of migration contribution by age and sex obtained for each single year has been used to compute the average net migration over the whole period.

Figure 1 - Average net contribution (thousands of people added/lost annually) in the 28 EU countries. Years 2001-2011



Source: Author's elaboration based on Eurostat data

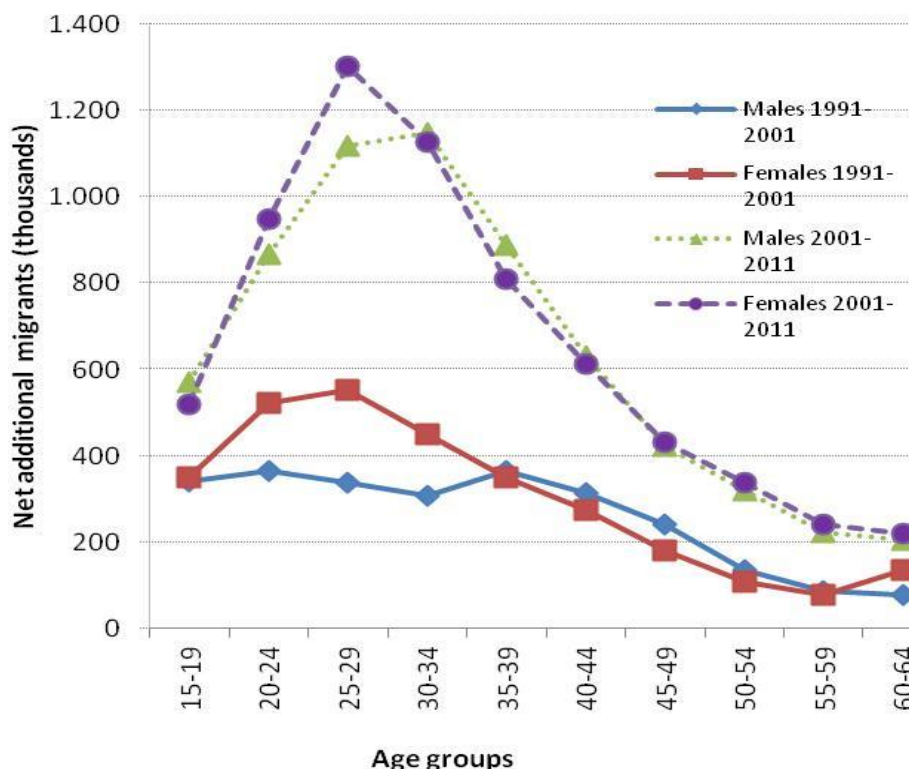
3.2. Contribution of migration to the EU working age population

International migration positively influences, above all, the working age population of receiving countries because migrants move when they are in their working ages (15-64). Most of them, indeed, migrate because they seek for a job abroad. To examine the net contribution of migration to the European workforce in the twenty years between 1991 and 2011, a comparison between the actual (observed) EU population and the hypothetical EU population obtained under the assumptions of zero migration and constant survival rates over time has been made. More specifically, in the decade 1991-2001, the net migration contribution² to the EU working-age population (either positive or negative) is computed by starting with the resident population at the initial observation year, i.e., 1991, and comparing two different populations, theoretical and actual population, at the end of the period, i.e., 2001. The theoretical resident population is derived by applying the survival rates to the 1991 population (which implies the assumption of zero migration in the period), while the actual resident population is just the resident population actually recorded in 2001. The same procedure has been repeated for the computation of the contribution of migration to the working-age population in the subsequent decade, 2001-2011. The results are presented in Figures 2-4 and in Table 1 for the EU as a whole as well as for each EU Member State.

The contribution of migration to the EU working age population (more than) doubled over the period 1991-2011. Overall, there were almost 13 million people added to the EU 28 working-age population (15-64) in the decade 2001-2011 and 5.6 million in the previous decade 1991-2001. There were considerable differences by age classes. A peak of additional people in the age group 25-29 can be observed for the EU-28 as a whole (Figure 2). At these ages there were around 1,304 thousand women and 1,120 thousand men added to the EU population in the decade 2001-2011 (there were slightly a bit more for the male population in the subsequent age group 30-34, i.e., 1,150 thousand people). In the previous ten years the number of EU additional people in the same ages (25-29) due to migration was considerably smaller: around 554 thousand women and 337 thousand men; moreover in this former period, a second peak of migrants is visible in correspondence of the age group 35-39 for males (see Figure 2, and Figure 3, panel A), which is more pronounced than that observed at ages 25-29 (plus 364 thousand men). This result seems to suggest that the workforce added in the 1991-2001 was not only of a smaller size but also had a different age structure, i.e., more mature than that arrived in the most recent years. At each working-age group, the net contribution of migration to the EU workforce was of a bigger magnitude in the most recent decade, 2001-2011, than in the previous one, 1991-2001. The curves of the migrants in 2001-2011, both the female and the male ones, are always above those of the corresponding migrants recorded in 1991-2001. The differences are striking at ages 25-29 after which the curves of the additional females and males in 2001-2011 decline steeply and tend to converge with those of 1991-2001. There are also some gender differences: migrants were more often females than males in the central ages 20 to 34 years in 1991-2001 and in the ages 20 to 29 in 2001-2011, as a consequence, the age profile of female migrants is steeper than that of male migrants in 1991-2001 as well as in 2001-2011.

² See the previous note 1.

Figure 2 - Additional contribution to the EU working-age population - 1991-2011 (thousands of people acquired throughout the decade). Age profiles. EU-28



Source: Author's elaboration based on Eurostat data

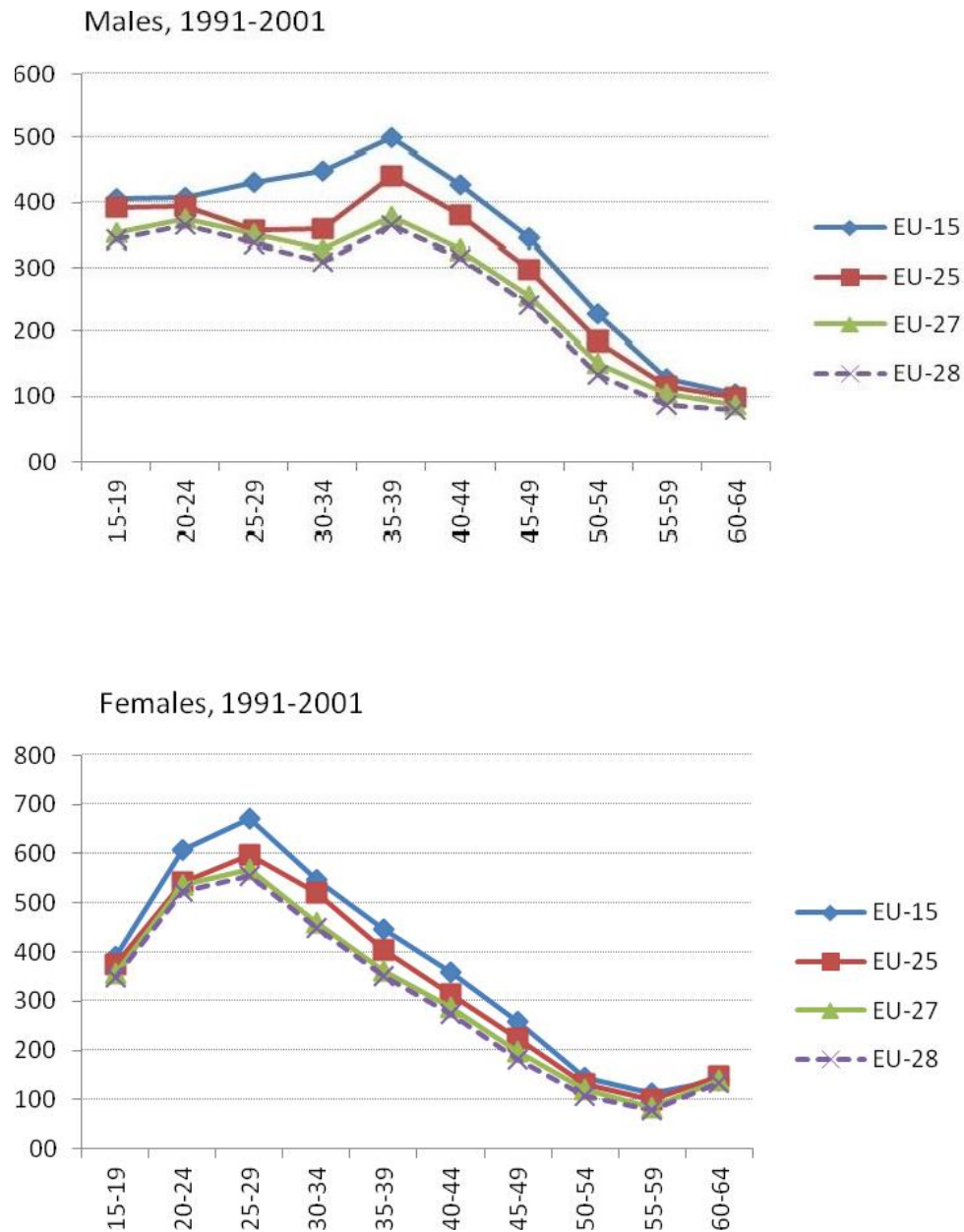
The contribution of migrants to the EU working-age differ by the EU country area considered and, more specifically, depends on whether only the original 15 EU countries are examined or also the 13 additional EU Member States, i.e., EU-28. The largest amounts of additional people in the working-age are recorded in the EU-15 which encompasses several old traditional immigrant countries, such as: France, the United Kingdom and Germany (Figure 3). By contrast, in the EU-28 the migration contribution is the smallest one because there are also emigrating countries, like the Eastern European countries, included in it. Gender differences in the age profile of migration contribution to the working-age population become more visible by looking separately at the different EU geographical areas for men and female and in each of the two past decades considered (Figure 3). Over the period 1991-2001, for example, the contribution of males were more substantial for ages 35-39³, while the contribution of females was the biggest one at younger ages, 25-29 (Figure 3, panel A). In the subsequent ten years (2001-2011), the largest contribution was registered in correspondence of the ages 30-34 and 25-29 for men and women, respectively (Figure 3, panel B). In the three graphs related to the years 1991-2001 (Figure 3, panel A) the EU-15 shows the highest migration levels and the EU-28 the lowest ones while the EU-25 takes an intermediate position. In the three graphs related to the subsequent decade, 2001-2011, (Figure 3, panel B) the differences between the EU-15 and the enlarged EU-25 disappear: the curves of additional people for the EU-15 and EU-28 almost completely overlap at age 40 and above and the differences between the two geographical areas are visible only in the central working-ages, 30-39 years, in the graph of women and men together (bottom of Figure 3). This finding suggests that at the end of the last century the positive migration contribution to the EU population was concerning mainly the original 15 EU countries – most of which did also have a tradition as immigration countries, such as France, Germany, the United Kingdom, and to a lesser extent Italy and Spain – while at the beginning of the 21st century also some additional EU Member States (i. e.,

³ It should be remembered that the age group is related to the final date of each interval considered.

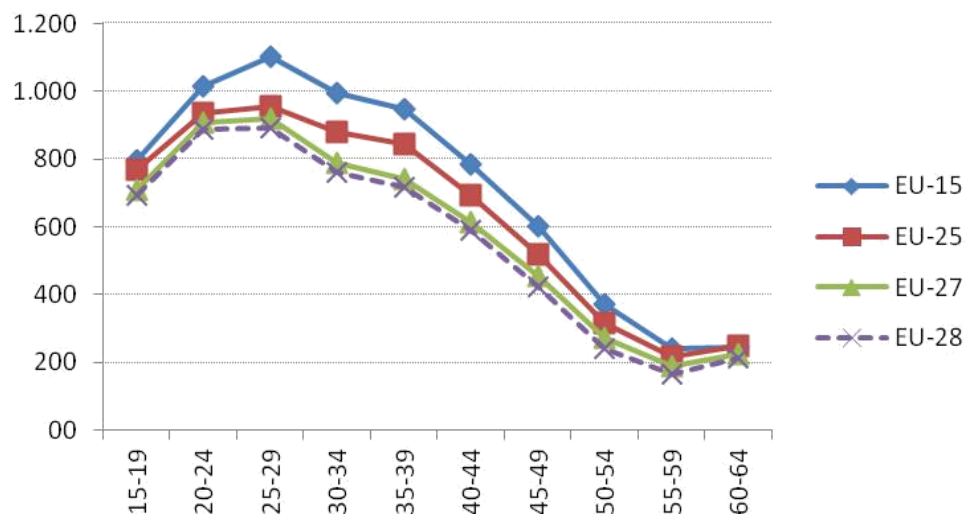
Poland that from negative become positive) could benefit from a net positive contribution to their working-age population.

Figure 3 - Additional contribution to the EU working-age population (thousands of people acquired throughout the decade). Age profiles. Several EU areas.

Panel A -- Years 1991-2001

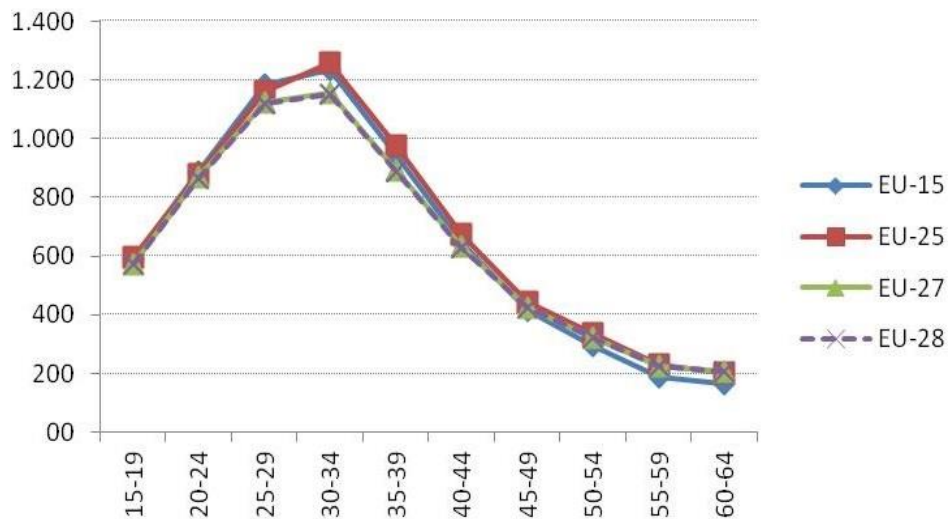


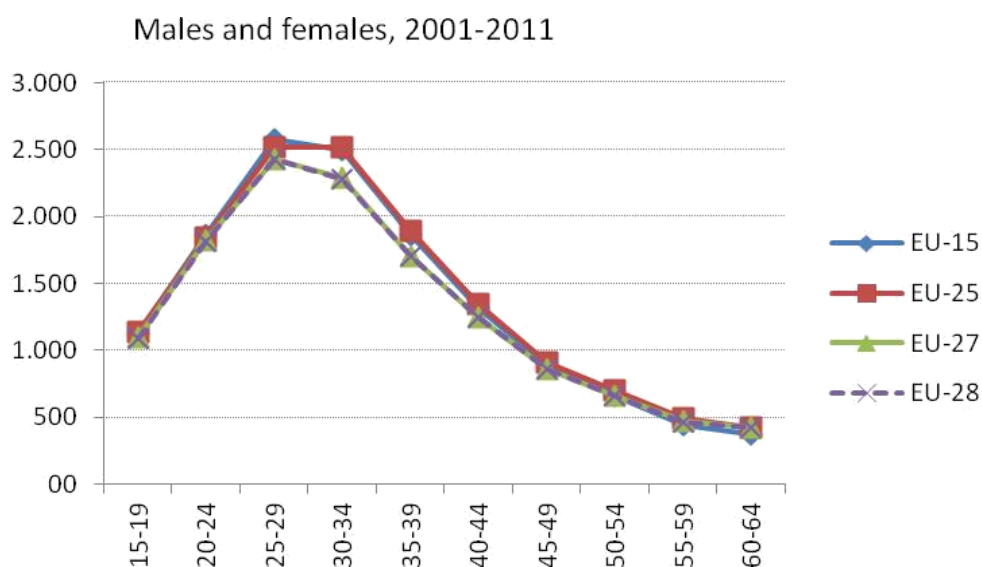
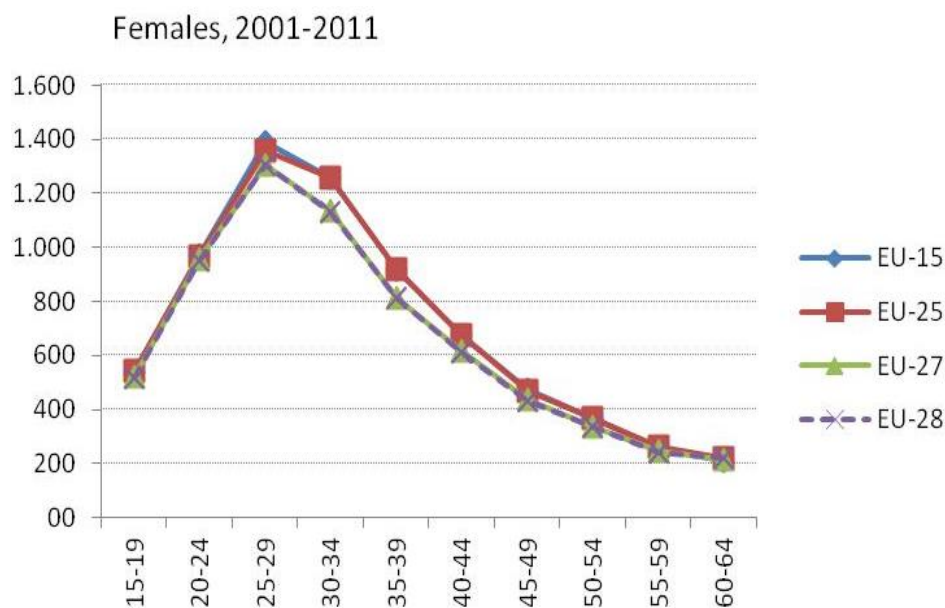
Males and females, 1991-2001



Panel B -- Years 2001-2011

Males, 2001-2011





Source: Author's elaboration based on Eurostat data

There are also remarkable cross-country differences in the contribution of migration to the EU workforce, as shown in Figure 4, in which countries are ordered according to the size of migration contribution recorded in 2001-2011. This ranking largely corresponds to that observed in the previous decade, 1991-2001, but it does not completely match with it (Table 1). The benefits coming from the international migration to the EU labour force were strongly concentrated in a few countries: Spain, Italy, the United Kingdom, France and Germany. Spain benefited from more than 4 million migrants, Italy received more than 3 million and the United Kingdom almost 2 million, while France and Germany registered around one million additional migrants in the working-ages between 2001 and 2011. In the previous decade, Germany was clearly dominating as immigration country benefiting from additional working-age population, covering almost 50% of the whole contribution to the EU working-age population, followed by Spain (plus 1100 thousand people), the United Kingdom (plus around 500 thousand people), and Italy and France (plus

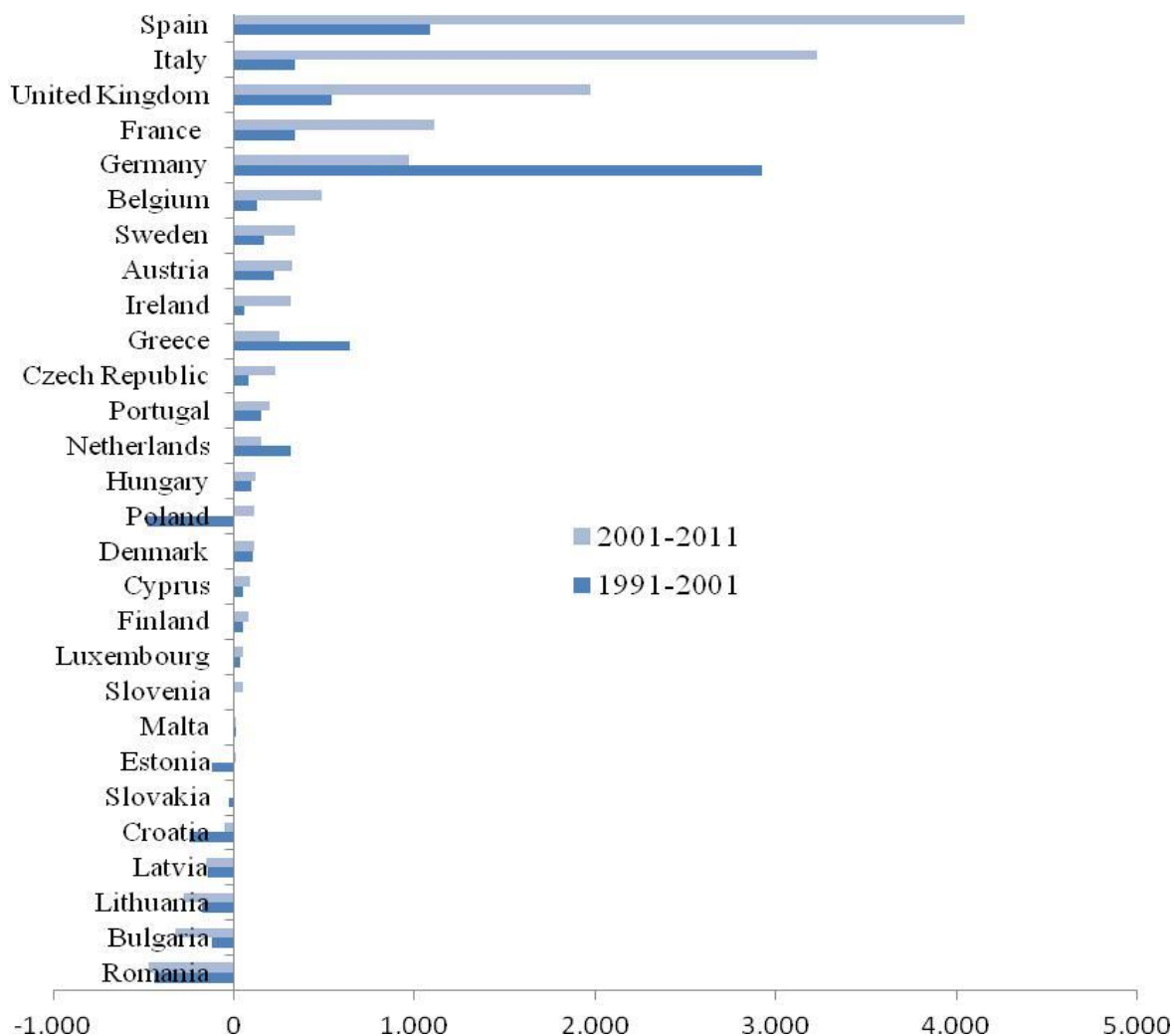
around 300 thousand people). In most of the other EU countries the contribution to the working-age population was still positive but of a much smaller magnitude. Belgium recorded almost 500 thousand additional units in 2001-2011 and Greece 640 thousand in 1991-2001 but in all other cases the figures were between 300 thousand and a few thousand people aged between 15 and 64. Poland experienced a reversal in the sign of additional working age immigrant population during the observation period: the net contribution was negative and equal to 480 thousand people in the decade 1991-2001 and positive (+115 thousand) in the subsequent decade 2001-2011. All the Eastern European countries recorded a negative balance in both the past decades, with the only exception of Hungary which received 98 and 119 thousand new people in 1991-2001 and 2001-2011 respectively. This result is reasonable given that the free circulation of people across the European countries and within the EU encouraged many people in the Eastern Europe countries to move toward the Western European countries where the labour market was more attractive and the conditions and salary levels more favourable than in the East.

Table 1 - Contribution to the EU working-age population (ages 15-64). (thousands of people added/lost throughout the decade). 28 EU countries.

Countries	Years 1991-2001			Years 2001-2011		
	Men	Women	All	Men	Women	Both
Austria	106.8	113.9	220.8	150.4	172.1	322.5
Belgium	58.2	72.3	130.5	240.5	241.8	482.3
Bulgaria	-67.9	-52.0	-119.8	-119.9	-200.4	-320.3
Croatia	-134.8	-109.5	-244.3	-24.2	-25.5	-49.7
Cyprus	17.9	28.8	46.7	39.9	51.2	91.1
Czech Republic	45.1	35.1	80.2	142.8	87.3	230.1
Denmark	51.6	55.2	106.8	48.7	63.2	111.9
Estonia	-69.0	-55.2	-124.1	3.6	1.7	5.2
Finland	28.9	19.0	47.9	46.0	36.0	82.1
France	77.7	256.8	334.5	461.0	646.8	1107.8
Germany	1528.6	1392.5	2921.1	376.0	592.2	968.2
Greece	356.1	284.4	640.5	131.7	117.1	248.8
Hungary	37.0	61.3	98.4	66.7	52.0	118.7
Ireland	29.6	29.1	58.7	145.9	169.1	315.1
Italy	112.2	229.3	341.5	1533.6	1693.7	3227.2
Latvia	-80.7	-63.6	-144.3	-74.2	-78.1	-152.3
Lithuania	-97.6	-80.7	-178.3	-137.5	-143.4	-280.9
Luxembourg	19.3	18.4	37.6	26.1	23.8	49.9
Malta	5.5	5.5	11.0	6.4	5.5	11.9
Netherlands	149.4	166.0	315.4	36.5	113.1	149.6
Poland	-251.6	-229.0	-480.7	106.7	8.1	114.8
Portugal	80.7	71.2	151.8	51.5	145.2	196.7
Romania	-243.9	-193.7	-437.5	-211.3	-260.1	-471.3
Slovakia	-18.7	-7.8	-26.5	9.0	-14.9	-5.9
Slovenia	4.0	-12.0	-7.9	34.6	12.1	46.7
Spain	588.4	501.0	1089.5	2082.3	1962.3	4044.6
Sweden	84.2	85.6	169.8	171.4	168.2	339.6
UK	156.4	381.0	537.4	1052.7	919.2	1971.8
EU-28	2573	3003	5576	6397	6559	12956

Source: Author's elaboration based on Eurostat data

Figure 4 - Contribution of migration to the EU working-age population (ages 15-64) (thousands of people added/lost throughout the decade). 28 EU Member States



Source: Author's elaboration based on Eurostat data

3.3 - The EU demographic asset due to international migration and its potential contribution in term of human capital to be spent into education, work activity, retirement

Migration can influence not only the population size (population growth in Italy has been exclusively due to net migration in the recent years, see for example Marcu 2011) but also the population structure of the EU countries. Changes in population age structure due to migration are beneficial to contrast the EU population ageing process and to mitigate its socioeconomic consequences. This potential contribution of migration is extremely important, given that the economically favourable demographic situation will be changing in the coming decades in European countries due to the fall in the percentage of population of working-age.

In Figure 5, the old age dependency ratios of EU Member State in 1991 and 2011 are reported⁴. In the Figure countries are ranked according to the size of the ratios observed in 2011. There were 26 people of pensionable age for every 100 of working age in the EU-27 as whole in 2011, around five elderly people more for each 100 active people than those registered twenty years before, when the ratio was slightly below 21. Germany and Italy are at the top of the ranking with the oldest population structure: 31 people of pensionable age for every 100 of working age in 2011. These two countries registered also the biggest increase in the number of elderly persons (65 and above) as compared to that of working-age persons (15-64): eight elderly people more in 2011 than in 1991. The other main immigrant countries, France, the United Kingdom, and Spain had around 25 people of pensionable age for every 100 of working-age in 2011 but experienced a different pace of ageing over the past twenty years: the old age dependency ratio was constant in the United Kingdom while in France and Spain there were four more elderly persons to each 100 persons in working-age in 2011 than in 1991. The countries whose population has been ageing most rapidly are Lithuania and Latvia: the old age dependency ratio went from 17 in 1991 to 27 in 2011 in both countries. In some other EU Member States ageing was also faster than in the EU. In Portugal and Greece the old age dependency ratios went from 21 in 1991 to 29 in 2011 (+8). Bulgaria, Finland, Estonia and Malta registered an increase of similar magnitude (+7) in their share of elderly persons as compared to working-age persons, although Malta has a population structure clearly younger than the other three countries. Ireland has the youngest population in the EU and was the only country registering a negative change in its old age depending ratio over the period: the value went from 17 in 1991 to 19 in 2011. Slovakia, Cyprus and Poland have also quite young population structures and show old age dependency ratios still below 20 in 2011.

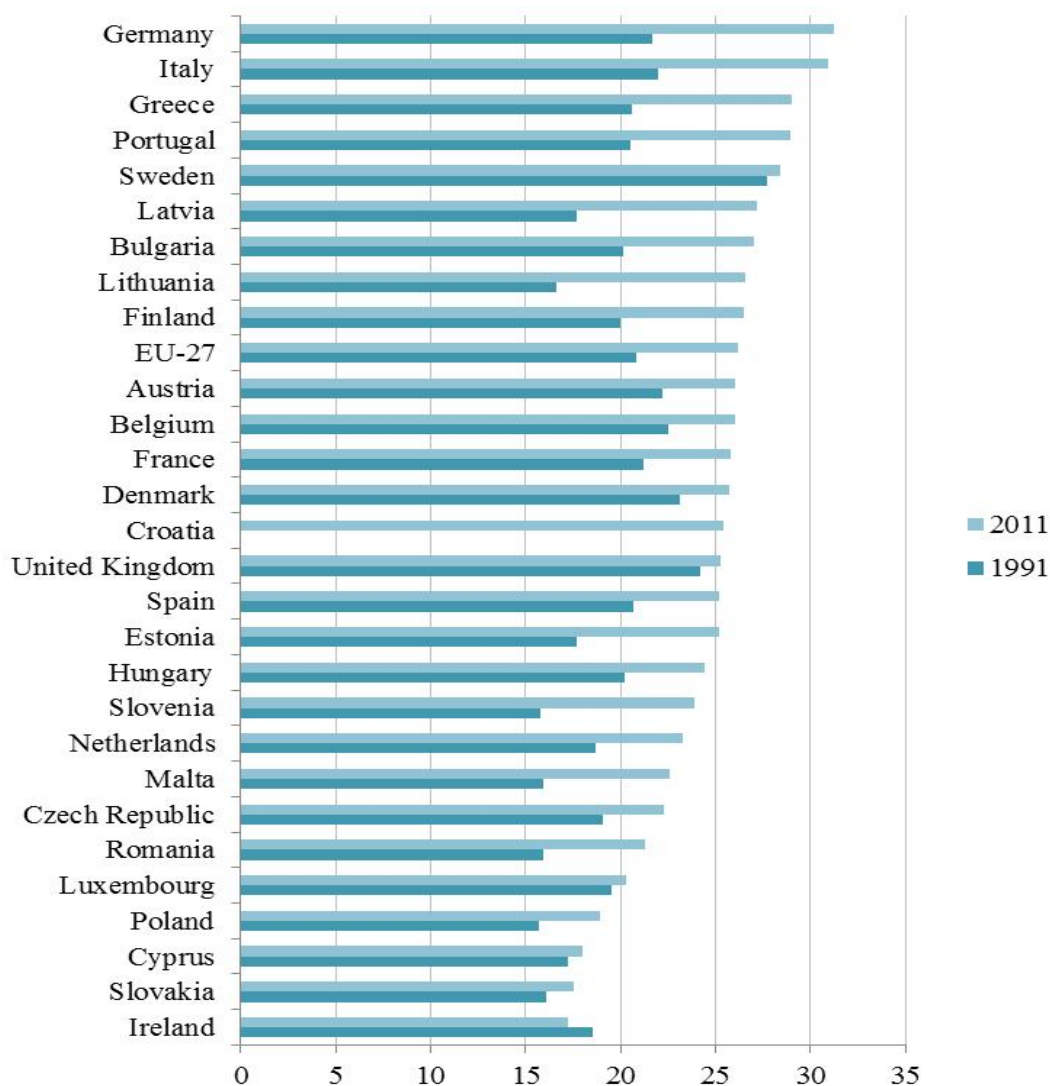
Short-term changes in old-age dependency ratios can be expected to be downwards when immigration prevails and upwards when emigration prevails as the majority of migrants are aged 20-35 years. Over a period of 20 years change will depend on the cumulated effect of immigrants as some of them will get older during this period.

With the aim to assess the impact of migration on population ageing and, more generally, on human capital of sending/receiving countries, life-years acquired or lost by any given EU country population have been computed by applying the life expectancy - for each age and gender - to the net migration population distribution by age and sex corresponding to the average annual contribution 2001-2011 (see section 3.1). Life-years are the years that migrants are expected to live in the destination country under the hypothetical assumption of keeping their permanent residence in the immigration country.

Following this methodological approach, the gains and deficits in total life-years spent in education, work and retirement by any given EU population due to international mobility were computed. In Table 2, results for five EU countries with the large migration flows between 2001 and 2011 are reported.

⁴ The old age dependency ratio is the sum of persons aged 65 and above divided by the sum of persons aged 15-64, in percent.

Figure 5 - Old-age dependency ratios (in percent). 28 EU countries. Years 1991 and 2011.



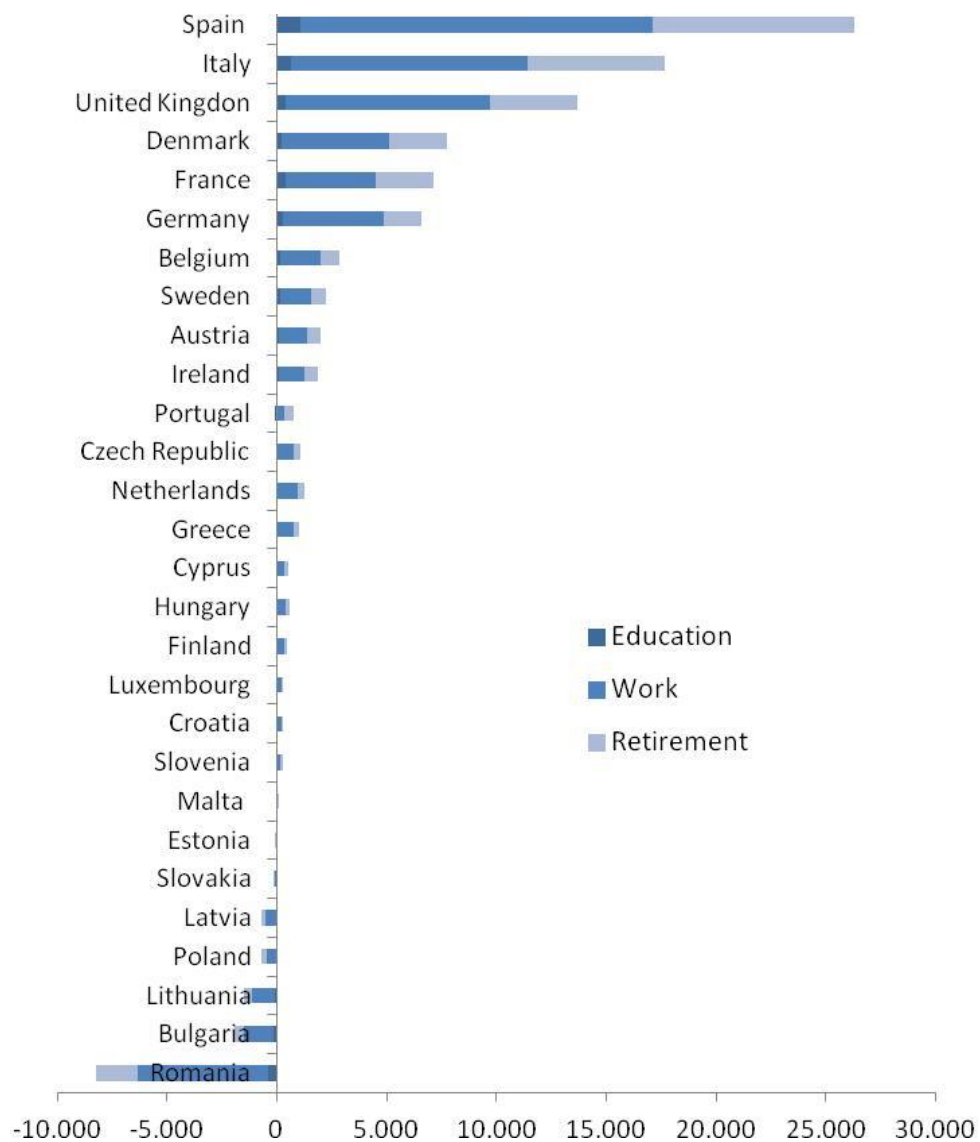
Note: Aggregate data for EU-27 are reported, instead of EU-28, because the old age dependency ratio was not available for Croatia in 2011.

Source: Eurostat data

A look at the net life-years gained by each EU country population in the three main age groups 0-19, 20-64, 65 and above, shows that most of the benefits (or the loss) coming from the international migration to the EU demography concerns the working ages population segment which is considerably enriched (or decreased) by migration flows as can be seen in Figure 6. By contrast, the net life-years spent in education are not so many because the segment of very young population (0 to 19 years) is not as big as that of working age in the international migration. This result points out that migration is mainly a resource for the receiving countries because the migrants have received their education in their origin countries but they spend their acquired knowledge in the destination countries contributing to enlarge the working age population.

However, the number of additional life-years to be spent in retirement ages is also quite high, for many EU countries is more than half of the years to be spent in work. As a consequence, although migration is mainly a resource for the EU labour force, we should also consider the relevant costs in terms of welfare system that should be paid for migrants.

Figure 6 - Design of the additional/missing life-years due to the average net contribution 2001-2011 (thousands of people acquired/lost annually) by the 28 EU Member States



Source: Author's elaboration based on Eurostat

As can be seen (Table 2, Panel A), Spain is the first EU country benefiting from the international migration, followed by Italy, United Kingdom, France and Germany. Spain gained almost 30% of the life-years acquired by the whole EU-28; the same percentages are clearly lower for Italy (22%), the UK (17%), France (9%) and Germany (8%).

Table 2 - Life-years added/lost as a result of the average net contribution. Years 2001-2011

<i>Panel A. Five most important EU immigrating countries</i>						
	Spain	Italy	United Kingdom	France	Germany	EU-28
Education (ages below 20)	1,051	648	411	423	294	3,057
Work (ages 20-64)	16,084	10,790	9,288	4,100	4,559	50,387
Retirement (ages 65 and above)	9,172	6,248	4,000	2,605	1,702	27,935
TOTAL	26,307	17,686	13,699	7,128	6,555	81,379
<i>Panel B. Five most important EU emigrating countries</i>						
	Romania	Bulgaria	Lithuania	Latvia	Poland	EU-28
Education (ages below 20)	-382	-167	-96	-28	-2	3,057
Work (ages 20-64)	-5,932	-1,342	-1,044	-505	-481	50,387
Retirement (ages 65 and above)	-1,939	-429	-360	-197	-230	27,935
TOTAL	-8,253	-1,938	-1,500	-730	-713	81,379

Note: the figures refer to the net life years, i.e. difference between years gained and years lost in the same decade due to migration occurred in the decade 2001-2011.

Source: Author's elaboration based on Eurostat

These five most important immigrating countries covered almost 90% of the total life-years gained by the EU-28 as a whole. Moreover, for each EU country, life-years are gained more in the central life stage deserved to working activities (ages 20-64) than in the other life stages deserved either to investments in education (ages 0-19), or to retirement (ages 65 and above), although the changes in retirement is not marginal. Romania was the EU country losing at most from migrations, with its negative annual balance of 380 thousand life-years of education, almost 6 million life-years of working, and almost two million life-years of retirement, it covered more than half of the total loss in terms of life-years registered in the EU-28 as a whole. Romania is followed by Bulgaria, Lithuania, Latvia and Poland. In these latter four countries the negative contribution of migration in the years 2001-2011 was of a smaller magnitude: Bulgaria and

Lithuania recorded a deficit of over one million life-years of working, while in Latvia and Poland the same deficit was of just half a million life-years (Table 2, Panel B). The negative balance was less pronounced in the education and retirement life-years than in the working life stage for the same reasons mentioned above (i.e., migrants being mainly in the working ages).

4. CONCLUDING DISCUSSION

In this report we aimed to assess the impact of migration to the size and age structure composition of EU population in the past twenty years (1991-2001). The relevance of this research purpose is evident if we think that over recent decades several EU countries have gradually transformed themselves from sending to receiving countries, and that migration has become an important component of population change. The increasing ageing of EU population, due to the rise of the life expectancies and below-replacement fertility levels, may be accompanied in the future by a shrinking of the population size, with repercussions on the potential labour force, which will be no longer sufficient to support economic growth. In such circumstances, increasing the flow of migration is one of the most immediate solutions to the demographic problems (shortage in the labour force and population ageing), the other, i.e., increasing fertility levels, although relevant is less immediate because it needs some decades before being at work. Indeed, the implications of immigration flows in low-fertility population have been stressed since the 1980s (see, among others, Espenshade 1986), when the effects of the decline in fertility after the post-World War II baby boom were becoming clearer and since then has been increasingly present in the scientific literature (see, for example, Coleman 2006).

Our results indicate that migration played an important role in the demographic dynamic of Europe in the past two decades, helping several European countries to continue their population growth or soften their decline. The benefits of migration become even more evident if we focus on its effects on working-age population. In fact, our findings show that while the average net migration balance amounted to around one million and 373 people in the EU-28 in the decade 2001-2011, almost 13 million people were added to the EU-28 working-age population (15-64) due to the migration movements occurred in the same decade. More than one third of this new EU workforce was concentrated in the central ages, 25-34 years, and was almost equally made by female and male migrants.

By translating the additional people coming into EU into life-years to be spent by migrants in the hosting countries (under the assumption that migrants will keep a permanent residence there), we came up with an estimate of more than 50 million net life-years added in the working ages (20-64) and almost 30 million net life-years added in the retirement ages (65+), while the increase in education - slightly more than 3 million life-years - was more moderated. The largest positive net contribution to the demography of Europe concerns the central ages (20-64) which are those deserved to work; hence, migration can be considered a potential resource for the immigrating countries which may stimulate positive repercussions on their economic systems.

The European Union groups together countries with quite different demographic profile and migration history, and therefore the analysis at the aggregate level has been complemented with the analysis at national level which has been performed mainly in a cross-country comparative approach. The cross-country differences show that the largest part of the gains in terms of both net additional people as well as net life-years acquired are concentrated in the five most important immigrating countries, Spain, Italy, the United Kingdom, France and Germany, who received almost 90% of the additional EU workforce (new people of working ages, 15-64) and similarly benefited from almost 90% of the gains in life-years. On the opposite side, the demographic loss (both in terms of additional people as well as life-years) concerns

almost exclusively the Eastern European countries and especially Romania which alone accounted for slightly less than 40% of the negative net migration balance in the working-age population and around 60% of the overall negative life-years balance recorded in the EU-28 as a whole in the years 2001-2011.

The economic implications of such migration contribution to the demography of some EU countries are striking. Because people's economic behavior varies at different stages of life (mainly three: education, work, and retirement), changes in a country's population age structure can have significant effects on its economic performance. More specifically, if most of the population falls within the working ages, the added productivity of this group can produce a "demographic dividend" of economic growth, if policies which take advantage of this are in place. In other words, the combined effect of a large working-age population and health, family, labour, financial and human capital policies can stimulate virtuous cycles of wealth creation (Bloom et al 2003). As argued by Ogawa and colleagues (2010), there are two demographic dividends connected/created by the demographic transition: the first one, corresponding to the growth rate of economic support ratio, is transitory, while the second one, corresponding to the growth rate of productivity, can be potentially more long-lasting but depends upon the policies implemented.

Bloom et al. (2003) explain the important role of demographic change for economic growth by referring to the demographic dividend delivered by the demographic transition via labour supply, savings, and human capital.

This reference could be used to keep in mind that the challenges posed by declining and ageing populations should not be faced by using only suitable demographic options. While these remain a clear resource there could be other relevant policy areas which need active intervention, such as employment, productivity, integration of migrants, as indicated by the European Commission.

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