

Effect of Migration on Population Size and Age Composition in Europe

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Abstract

This paper presents the impact of cumulated net migration on population size and age composition in 21 member countries of the European Union. The impact depends significantly on the definition of the population consisting of immigrants and their descendants. We apply two methods: one based on the survival of birth cohorts to around 2007 closed to migration, and one based on a projection of the population observed between 1960 and 2007, again closed to migration. The populations in 2007 are compared with the observed population, and the difference forms the migration surplus – population size attributed to accumulated net migration. We find that populations in Spain, France, Austria and Germany have grown considerably, while those of Portugal and Bulgaria have declined as a result of migration. Change in population size is moderate in several countries mainly from Central Europe. The methods are used to compare changes in population size over time. Southern European countries along with Ireland are found to have experienced a decline in population size as a result of net migration until recently, while during the last decade they have gained population, i.e. they turned from emigration to immigration countries.

The appendices provide detailed information which can be used for deeper country-specific and comparative analyses.

European Demographic Research Papers are working papers that deal with all-European issues or with issues that are important to a large number of countries. All contributions have received limited review.

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Country codes

Country code		Country code	
Austria	AT	Italy	IT
Belgium	BE	Latvia	LV
Bulgaria	BG	Lithuania	LT
Czech Republic	CZ	Netherlands	NL
Denmark	DK	Poland	PL
Estonia	EE	Portugal	PT
Finland	FI	Slovakia	SK
France	FR	Spain	ES
Germany	DE	Sweden	SE
Hungary	HU	United Kingdom	UK
Ireland	IE	England and Wales	E&W

1 MIGRANTS IN EUROPE - INTRODUCTION

Immigration to European countries has drastically increased during the last decades. Around 2008, 15 percent of the population of the European Union were foreign-born or had at least one foreign-born parent. This proportion is projected to increase to 30 percent towards 2061 (Lanzieri 2010). This inflow of people has a multi-faceted effect on European populations. Immigrants increase populations 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. Beyond these and other demographic effects migrants contribute to a changing social environment. Migrants are usually of a different culture, ethnicity and religion. When they become naturalized citizens they do not need to reject their original lifestyle, religion and habits: the topic of assimilation in contemporary times is not as crucial as it has been a couple of decades ago. Demographic effects of migration interact with societal effects: a higher proportion of migrants in a population increase its cultural, ethnical and religious diversity leaving homogeneity in the past. Migrants usually differ from the local population in their fertility level and patterns of family formation and thus change its overall demographic characteristics. The significance of these changes is underlined by Coleman (2006) who sees them constituting the third demographic transition (also Coleman 2008).

The present paper discusses the demographic impact of migration on European populations. Similar studies usually analyse this impact with regard to the future based on population forecasts which include simulations of future migration flows. A conspicuous example is research on replacement migration which denotes this level of migration that can compensate for lacking births needed for zero population growth. However, in order to construct reasonable forecasts it is helpful to dispose with analyses about past and present migration and their effect on populations. The paper aims to contribute to this purpose.

Before World War II Europe was the main supplier of population to overseas countries and particularly to the U.S.A., Canada and Australia. After the war immigration began to prevail. In the end of the 1940s and the 1950s independence of ex-colonies moved large masses of people towards the main land. They consisted of returning nationals as well as of migrant workers from the colonies. Most affected were the UK, Belgium, Netherlands and France, the latter particularly in the end of the 1950s and the beginning of the 1960s. These first waves were followed by the “Gastarbeiter” waves which dominated during the 1960s and the 1970s. Germany and to a lesser extent Austria were the main recipient countries. The initial waves of guest workers consisted mainly of men who were joined by their wives a few years later: family reunification arose as a derivative reason for migration. The end of the 1980s marked the start of a new era of migration on the continent, particularly enforced after the fall of the totalitarian regimes in Central and Eastern Europe. East-west migration arose as a dominant migration flow on the continent. The enlargement of the EU contributed additionally for significant moves among the EU countries. 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. More details about migration in Europe during the second half of the twentieth century are provided in the collection of articles in Council of Europe (2002); see also Pfliegerl (2006), Hansen (2003), Salt (1996), Fassman and Münz (1992), Salt and Almeida (2006).

Migration in the ex-socialist countries before 1990 did not belong to these patterns. The “Iron curtain” prevented it, except for forced emigration during or after turbulent times such as the uprising in Hungary 1956, the “Prague Spring” in 1968, or the emigration of ethnic Turks from Bulgaria in the second half of the 1980s. During the last two decades migration into these countries was considerably lower than to Western Europe and populations of some countries like Bulgaria and Romania have experienced significant emigration that speeds up population decline.

The main research question in this paper is: how did all these migration flows during a period of 5-6 decades influence contemporary population size and age composition? We describe the population change in 21 EU countries where data were available. We apply two methods: in the first step birth cohorts and past populations are projected to around 2007 as being closed to migration and in a second step t compared with the observed population. The difference defines a migration surplus which informs about the migration effect that has cumulated during the last 5-6 decades. The migration surplus is positive where immigration prevails and negative otherwise. The purpose of the study is to present descriptive comparative information across countries and leaves explanatory analyses for later research. The study does not provide rigorous country-specific analyses which can be conducted using the numerous data published in this paper or in its on-line version.¹

2 CONCEPTS, DATA AND METHODS

2.1 Concepts

Analyses of the effect of migration on population size and age composition require a rigorous definition of the two populations of interest, namely the population which consists of immigrants and the population that excludes them. This section proposes a brief review of some definitions. We use the terms “aliens” to denote the immigrant population which can have different definitions, and “natives” to denote the rest of the population within a country. Poulain et al. (2006) provide a detailed discussion on concepts and statistical practices in the EU countries across time and countries; see also Raymer and Willekens (2008).

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

¹ Available on the VID web-site as of September 2010.

also accepted in the EU, an (long-term) 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 (12 months), so that the country of destination effectively becomes his or her new country of usual residence.” (United Nations 1998). This definition replaced a previous one adopted in 1976 where 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 former as “all persons who have that country as country of usual residence and who are the citizens of another country” and the latter as “all persons who have that country as the country of usual residence and whose place of birth is located in another country”. The former includes persons of other nationality born in the country. The latter 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 scope of aliens defined with the foreign-born population can be enlarged to include their children which are referred to as the second generation: persons with both (or at least one, depending on country) parent born abroad. A third-generation can be added as well. The population which consists of these groups is referred to as the population with migration background.

Haug (2002, p. 12) in his summary of country case-studies 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 of his parents or grandparents, i.e. 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). Haug notes that the choice of definition is linked with the naturalization procedure. It is more demanding in the former three countries, and more generous in the

latter three and particularly in the Netherlands. Since naturalization is selective it defines the integration process. When it is less demanding, some naturalized persons may find integration not appealing and thus pertain to their original culture for more than one generation. Therefore it makes sense to consider an enlarged definition of an immigrant population.

2.2 Data and methods

We use data from the Human Mortality Database (HMD). Where data were not available they were complemented from the Eurostat database. We use sex-specific live birth counts, single age- and sex-specific data for population and for cohort and period mortality rates, as well as single age-specific fertility rates by age of mother. Population data refer towards January 1 each year. Table 1 informs about data availability by countries. Data for EU countries not included in the table were not available in the HMD or from Eurostat.

Table 1 Data availability, initial and last year.

Country	Fertility rate		Cohort mortality rate		Period mortality rate		Live births	
	Initial**	last	initial	last	initial	last	initial	last
AT	1960	2008	1947	1978	1947	2008	1947	2008
BE	1960	2006	1947	1977	1947	2006	1947	2008
BG	1960	2008	1947	1977	1947	2007	1947	2008
CZ	1960	2008	1950	1978	1950	2008	1947	2008
DK	1960	2008	1947	1977	1947	2007	1947	2008
EE	1960	2008	1959	1977	1959	2007	1947	2008
FI	1960	2008	1947	1978	1947	2007	1947	2008
FR	1960	2008	1947	1977	1947	2007	1947	2008
DE*	1960	2008	1947	1978	1960	2008	1947	2008
HU	1960	2008	1950	1976	1950	2006	1947	2008
IE	1986	2008	1950	1976	1950	2006	1947	2008
IT	1960	2007	1947	1976	1947	2006	1947	2008
LV	2002	2008	1959	1977	1959	2007	1959	2008

Table continued on the next page

Table 1 continued

Country	Fertility rate		Cohort mortality rate		Period mortality rate		Live births	
	initial	last	initial	last	initial	last	initial	last
LT	1960	2008	1959	1977	1959	2007	1959	2008
NL	1960	2008	1947	1976	1947	2006	1947	2008
PL	1970	2008	1958	1976	1958	2006	1947	2008
PT	1960	2008	1947	1977	1947	2007	1947	2008
SK	1960	2008	1950	1978	1950	2008	1947	2008
ES	1971	2008	1947	1976	1947	2006	1947	2008
SE	1968	2008	1947	1977	1947	2007	1947	2008
UK	1973	2006	1947	1976	1947	2006	1947	2008

* United Germany is considered. Mortality rates from 1960 to 1989 were estimated from the rates for FRG and GDR.

** This initial year indicates also the initial year of the population projections discussed in method 2.

We apply two main methods of analyses. The first one is based on a projection of observed births as of 1947 to 2007 and the second one on projection of the population observed in 1960 to 2007. In both methods the initial or the horizon year of the projection may differ according to data availability.

Method 1: Projection of births

We describe the model using an initial year 1947 and a final year 2007. Table I.A in Appendix I displays the country-specific initial and final years used for model 1. Births registered in 1947 are survived till 2007 applying a cohort life table with deaths as a single decrement. It is estimated using cohort mortality rates till 1978; after that year the cohort life table is continued using period mortality rates. The error introduced from using period instead of cohort mortality rates as of 1979 is very small and does not have a significant influence on the reported results. The births from 1947 survived to 1.1.2007 constitute a population aged 59 years. It is compared with the actual population aged 59 years towards 1.1.2007, and the

difference informs about the impact of net migration on the 1947 cohort accumulated all throughout the period 1947-2007. The same procedure is applied for births in 1948, 1949, etc. Finally births in 2006 are only projected to survive till the end of the year which is 1.1.2007, so they compare with the actual population aged 0-1 towards 1.1.2007. Births through 1947-2006 survived to 2007 constitute a population aged 0 to 59. The comparison with the actual population towards 1.1.2007 informs therefore about the cumulative effect of net migration below age 60. The initial year depends on the availability of cohort death rates; for example it is 1950 for the Czech Republic and the maximum age achieved towards 2007 is 56. The horizon year of survival depends on the available period mortality rates, and it is 1.1.2008 where the last data are for 2007 and 1.1.2007 where the last data are for 2006.

The application of a cohort life table closed to migration is straightforward and needs no detailed description. Two hints are worth noting. The radix of the life table can be equated to the number of births, and the number of persons aged x to $x+1$ years presented by L in life-table notation, is the actual number of survived births to that age. For example the number of male (live) births in Austria in 1960 was 64,795 and $L=63,474$ were estimated to survive to 1.1.1961. the method is actually a projection based on survival of cohorts and no fertility.

Natives are defined in this projection as live births survived through time. A birth cohort can be considered as consisting of nationals when migrants are defined as the foreign-born population. Aliens in this method are the foreign-born persons only. Their ancestors who were born in the country will figure in the birth cohorts and hence are included in the natives.

The difference between survived births and actual population informs about the cumulative effect of net migration. Since natives may leave the country this surplus is not a proxy for the accumulated foreign population and their descendants; it is a proxy for the foreign-born population decreased with the size of emigrated natives. The following

balance equation illustrates the method and the resulting constituent populations, all considered towards 1.1.2007:

$$(1) \quad \text{Actual population} = \begin{array}{l} \text{Survived births} \\ - \text{Emigrants among surviving births} \\ + \text{Foreign-born persons} \end{array}$$

The migration surplus is defined as the population of foreign-born person net of native-born emigrants.

This method can be used to compare a cohort as of the time of its birth till 2007 with the observed population in the same age group as of the cohort through a sequence of years. We present comparisons of the survived 1960 cohort with the actual population aged sequentially 0-1 on 1.1.1961, 1-2 on 1.1.1962, etc. This comparison informs about the accumulation of net migration over time.

This method is based on the assumption that mortality does not differ among nationals and foreigners. The validity of this assumption is not immediately clear. On one side, immigrants particularly from developing countries arrive from populations with higher mortality than the hosting population. On the other side, mortality of the foreign population is sometimes registered as lower than that of the nationals and this observation has different explanations. One is based on the “healthy migrant” effect: immigrants are robust and healthier people. Alternatively it happens that when immigrants get sick and particularly before dying they may wish to return home; consequently their deaths will not be registered in the receiving country.

Method 2: Projection of a population

In this method a population observed on 1.1.1960 is projected to 1.1.2007 using observed mortality and fertility rates and keeping it close to in- and out-migration. The horizon year is one and the same for all

populations and the initial year is defined by the available data on fertility rates (Table 1). The method was not applied to Latvia as the fertility rates were available only as of 2002. The projected population is compared with the actual one, and the difference is attributed to accumulated net migration over the period 1960-2007. This method was first applied by Le Bras (1991) for several European countries starting with 1945. Coleman et al. (2002) applied it for a study of the UK population.

The native population in this method is identical with the 1.1.1960 population. The proportion of the foreign population around 1960 is usually available and it was very low in all countries except for those who accepted immigrants from ex-colonies. In Austria the foreign population was 1.4 percent in 1961; in Germany it was 1 percent. The age distribution of this foreign population was not available to us except for Austria. Estimates for Austria based on defining natives as the 1960 population without foreigners showed that the proportion of foreigners increase a little as their fertility is higher, and their exclusion from the 1960 population did not influence other results (see next section).

Foreigners who stay in the country for long are expected to get integrated to the local population, and this expectation holds also for their descendants. This consideration is a basis for the inclusion of foreigners to the natives in the 1960 population. In addition, identifying natives with the total 1960 population makes possible to study the effect of migration as of 1960, disregarding migration before that year.

The projection relies on the assumption that mortality of natives and aliens does not differ. This assumption was discussed above. A similar assumption about fertility may be infeasible as the fertility of aliens can be considerably higher than that of the natives. Table 2 informs about these differences in selected immigration countries and years where data were available.

Table 2 Total fertility rate of the total population, nationals and foreigners.

	Year	Total population	Nationals	Foreigners
AT	1986	1.47	1.41	2.56
	2008	1.41	1.31	2.01
BE	1985	1.49	1.48	1.82
	1995	1.56	1.49	2.13
E&W	1986	1.8	1.7	2.4
FR	1985	1.82	1.75	3.05
	1999	1.79	1.72	2.8
	2004	1.9	1.8	3.29
DE	1985	1.28	1.25	1.67
	1990	1.45	1.37	2.18
	2006	1.34	1.29	1.66
DK	1999-2003	1.75	1.69	2.43
	2004-2008	1.83	1.82	1.9
NE	1985	1.51	1.48	2.43
	1997	1.56	1.49	2.19
	2008	1.77	1.78	1.87
SE	1986	1.79	1.76	2.24
	2008	1.91	1.85	2.55
ES	1998	1.16	1.12	2.42
	2006	1.38	1.3	1.7
	2008	1.41	1.33	2.12

Source: Sobotka (2010, Table 2) for the years beyond 1986 for immigrants of foreign nationality, and OECD (1991, Table III.3) for 1985 and 1986 for foreigners.

The data in the table, although scanty, can be used to draw hypotheses for the fertility of the aliens during the period from 1960 to 2007. Where information for 1985 or 1986 is available, we assume that the ratio of the total fertility rate (TFR) of aliens to TFR of natives has been constant back till 1960. After 1985 the ratio changes linearly to the year when it is available again; where necessary this linearity was extrapolated till 2007. In Spain the 1998 ratio was assumed constant back to 1960 and after 1998 the linear decline to its 2006 applied, extrapolated with one more year to 2007.

In Italy the ratio for 2008 is 1.59; it was back extrapolated to 1960 to 1.8. The data for England and Wales were applied for the U.K. and the Republic of Ireland. Simulations indicated that changes in the values of the ratio do not change significantly the final results. Additionally we adopted the assumption that the fertility schedules for natives and aliens are equal, which hardly holds but is not expected to have an influence on the final results. Further use is made of the balance equation for births to women at a specific age:

$$N.f_n + A.f_a = T.f_t$$

N denotes native women, A - aliens, T - women in the total population in the corresponding age group, and f denotes the age-specific fertility rate for the corresponding population; all refer to a specific age. T is the observed, and N is the projected population; $A=T-N$. Simple arithmetic shows that the age-specific fertility rate of the natives is given by:

$$f_n = f_t / (N/T + (1 - N/T).r)$$

r is the ratio discussed above. This fertility rate was used in the projection of the natives.

The effect of migration on population growth is frequently estimated using a simple balance equation: add births and subtract deaths from the initial population, and compare with the actual population. The difference which forms a migration surplus is attributed to immigration. This method assumes that all births and all deaths are ascribed to the natives, which is not true. Our method has a similar logic but is more rigorous. Equation (1) can be restated in this method as:

- (2) Actual population on 1.1.2007 = 1960 population projected to
 1.1.2007
 - Emigrants from this population
 or their descendants
 + Immigrants and their descendants

The migration surplus is defined as the immigrants and their descendants who reside in the country net of emigrants from the 1960 population or their descendants. Immigrants can be either foreigners or foreign-born persons.

In this paper method 2 is applied with the initial year 1960. This year can be changed to fit a selected research topic. For example, the migration boom during the last two decades can be analysed with this method with an initial year between 1985 and 1990 and final year with last available data.

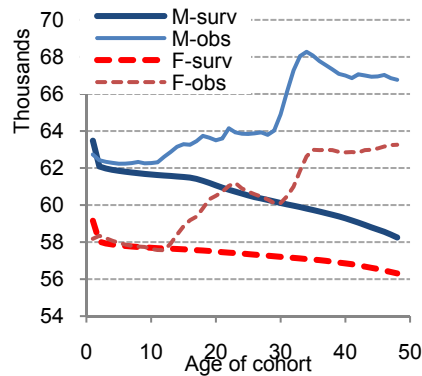
3 RESULTS: ILLUSTRATION WITH AUSTRIA

Method 1: Natives defined as survivors of birth cohorts

First we discuss the survival of birth cohort 1960. Figure 1 presents the projected survival path of males and of females, both being typical survival curves. There is a sharp drop at age 0 which is a consequence of infant mortality still high in 1960, and a subsequent gradual decline. The horizontal axis is scaled in ages but it can be scaled in years too. For example, age 40 denotes the population aged 40-41 on 1.1.2001. The projection is till age 47-48 on 1.1.2008.

The figure depicts also the observed population, aged exactly as the projected birth cohort. The difference between the observed population and the natives illustrates the migration surplus.

Figure 1 Survival of the 1960 birth cohort to 2008 and observed population at the corresponding ages, Austria, males and females.



During the first 10-12 years the migration surplus is very small. After that age it swiftly increases as a result of the increase in immigration to Austria during the 1970s. During the 1980s (ages 20-30) the surplus does not increase; actually females experienced some return migration. The 1990s bring a next swift increase in the observed population. Ultimately the observed cohort outgrows survived births with nearly 16 thousand persons, or approximately 15 percent.

Table 3 presents the survivors towards 1.1.2008 of all birth cohorts from 1949 to 2008, in 5-year age groups (column 2: projected births). The last row shows that the observed population is with 771 thousand larger than the projected. This is the net effect of immigration, where immigrants include foreign-born persons and their descendants. That is, immigration of foreign-born persons has contributed to a population growth with 12 percent, net of emigration of natives.

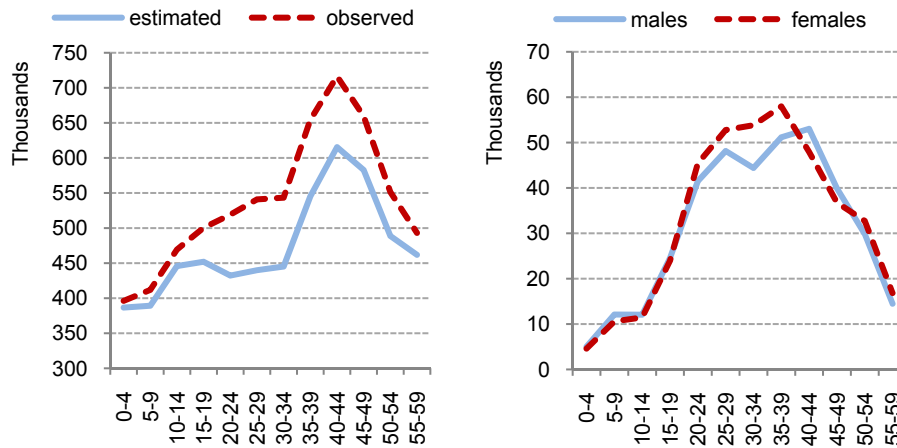
Table 3 Population estimated with survived births, observed population towards 1.1.2008, and migration surplus, thousands, and surplus in percent to the observed population, by age groups, Austria.

Age	Population		Surplus			Surplus in percent
	Estimated	Observed	Males	Females	Total	
0-4	387	396	5	5	10	2
5-9	389	412	12	11	23	6
10-14	446	469	12	11	24	5
15-19	452	500	25	24	48	10
20-24	432	519	41	45	87	17
25-29	440	541	48	53	101	19
30-34	445	543	44	54	98	18
35-39	545	654	51	58	109	17
40-44	615	716	53	48	101	14
45-49	583	659	40	37	77	12
50-54	489	551	30	33	63	11
55-59	462	493	14	17	31	6
Total 0-59	5,685	6,456	376	395	771	12

The surplus is broken down by sex in the next two columns: it is larger for the females with nearly 20,000 persons. The last column shows in terms of percents how the observed population outgrows the projected one in separate age groups. The largest surplus is observed for ages 25-34 where the observed population is with 18-19 points larger than the projected.

Figure 2 illustrates the numbers in Table 2. The left panel gives the age composition of the populations till age 55-59. The observed population is higher than the projected one for all ages which depicts the surplus in column “total” in Table 2. The right panel displays the migration surplus by sex. The surplus of females is larger at ages 20-39.

Figure 2 Projected births and observed population by age groups (left panel), and difference by sex (right panel), Austria 2008.



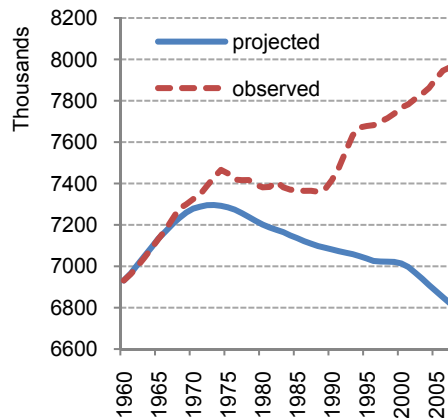
Method 2: Projection of the 1960 population

This method rests on a projection of the population observed in 1960 which is assumed to represent only natives. During the course of the projection from 1960 to 2007 the aliens accumulate as a result of immigration, naturalization and their descendants.

The age span is 0-79 completed years of age. The last age group is not open-ended. We do not consider population older than 80 because statistics at these advanced ages are inexact and comparisons may be misleading (see the Protocol of the Human Mortality Database, HMD available on-line). For the same reason caution is required for the interpretation of other old ages.

Figure 3 is similar to Figure 1 except that the projection path of the whole population is depicted. It is compared with the observed population in the same age span. While in Figure 1 the horizontal axis was scaled on age, in Figure 3 it is scaled in years as an age scale is irrelevant.

Figure 3 1960 population projected to 2007, and the observed population during the period 1960-2007, Austria, age span 0-79.



The path of the observed population is much like that of the observed single-age population of females or males on Figure 1. The migration surplus (the difference between the two populations) started to increase drastically since around 1990. The projected population marks an increase till the first half of the 1970 and begins to decline thereafter. Were the 1960 population kept close to any migration, it would start declining as early as from the beginning of the 1970s.

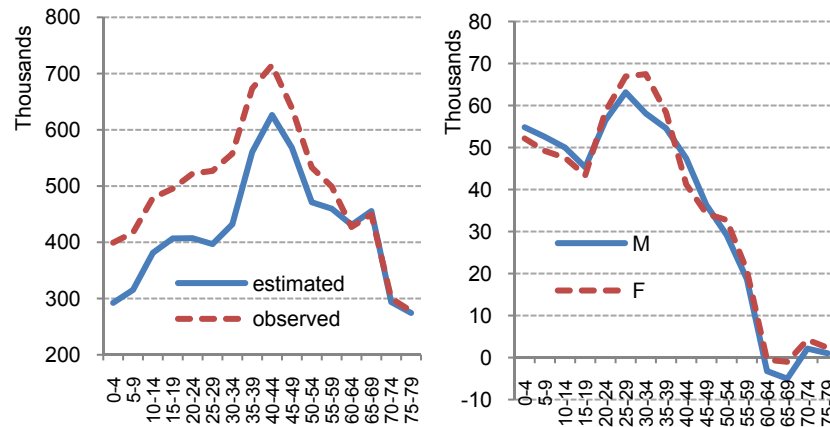
Table 4, similar to Table 3, displays projected results and comparisons with the observed population, pictured on Figure 4. Were there no immigration or emigration from 1960 till 2007 the Austrian population would drop down to 6,773 thousand from the initial 6,931 thousand in 1960 – a decline with 150 thousand persons. The difference between the observed and the projected population on 1.1.2007 is 1,139 thousand persons, or 14percent of the observed population. This is the migration surplus. It is formed by stocks of immigrants and their descendants, net of emigrants. It is a measure of population growth due to migration under the assumptions of this method.

Differences by age between the observed and the projected population are very large for the youngest ages 0-4 and 5-9, as well as for young adults aged 20-34. The contribution of migration gradually declines beyond age 35 and comes around zero beyond age 60. The negative difference of 1 percent at ages 60-69 is too small for reasonable interpretations. Pensioners at this age are known to prefer living in Southern countries such as Italy or Spain: the data for Austria do not indicate the existence of this pattern or movers just do not register the change in their residence.

Table 4 Projected 1960 and observed population towards 1.1.2007, Austria, surplus between observed and projected, and surplus in percent to the observed, by age groups, thousands.

Age	Projected	Observed	Surplus			Surplus in percent
			Males	Females	Total	
0-4	292	399	55	52	107	27
5-9	315	417	53	49	102	24
10-14	381	479	50	48	98	20
15-19	407	496	45	43	89	18
20-24	407	522	56	59	115	22
25-29	397	527	63	67	130	25
30-34	432	558	58	67	126	23
35-39	561	673	55	58	113	17
40-44	626	715	47	41	89	12
45-49	568	639	36	34	71	11
50-54	471	533	29	33	62	12
55-59	460	499	19	21	39	8
60-64	431	427	-3	-1	-4	-1
65-69	456	450	-5	-1	-6	-1
70-74	294	300	2	4	6	2
75-79	274	278	1	2	3	1
Total	6,773	7,912	561	578	1,139	14

Figure 4 Projected 1960 and observed population by age groups (left panel), and surplus by sex (right panel), Austria 2008.



The Austrian data make possible to check the impact of the assumption that the whole population observed in 1960 consists of natives. The 1961 Population Census provides data for the foreign population by single years of age. The foreign population at that year was 1.4percent of the total, or about 100,000 persons. The natives were computed as the 1961 total population minus the foreigners, and then projected under the model described in method 2 till 1.1.2007. This population was with 120,000 persons lower that the one projected with the assumption that the total population consists of natives. No other particular differences were noticed that would influence the results considered in this paper.

4 ESTIMATION OF CUMULATED EMIGRANTS

Where data about the foreign-born population are available it is possible to use equation (1) and estimate the number of cumulated emigrants among the native-born population. According to the Microcensus in Austria there were 1,075.1 thousand foreign-born persons towards 1.1.2008, and additional 351,6 thousand persons who were born in Austria and whose both

parents were foreign-born. In the age span 0-59 these numbers are 895.2 and 324.2 thousand. (The latter two numbers were received by using the proportions observed in 2009.)

The projections give a surplus in this age span equal to 771 thousand (Table 3). Hence the number of cumulated emigrants from the native-born in Austria as of 1947 is derived from equation (1) equal to 124.2 thousand (in the age span 0-59 completed years of age).

The number of foreign-born persons aged 0-54 in the Netherlands was recorded equal to 1,289.6 thousand. The difference between the observed population and the projected births as of 1947 is 923.5 thousand, so the cumulative number of emigrants is 366.1 thousand. The “turn-over” of migrants was apparently larger in the Netherlands than in Austria.

The estimated number of cumulated emigrants will not include those who return before the horizon year of the projection. Hence it is not the same number as the sum of emigrants by year.

The application of equation (2) requires the separation of natives from aliens in the initial year 1960 and a projection of natives only. Additionally first-generation and second-generation data with reference to foreign-born persons will be necessary, assuming that a third generation will be very small in volume over a period of 47 years. In Austria the migration surplus was estimated equal to 1,260.5 thousand and the persons of a migration origin (Personen mit Migrationshintergrund) 1,426.7 thousand. The difference of 166.2 thousand is the number of persons who have left the natives from 1960 during the period 1960-2007, and their descendants: all assumed to be included in the projected 1960 population under the assumption of no migration. Austria is an explicitly pronounced immigration country where immigration heavily dominates over emigration.

5 POPULATION GROWTH

The Appendix provides information for all countries included in the analysis similar to the one used for Austria in section 3. This paper does not

focus on country-specific analyses; instead it provides some descriptive international comparisons.

Table 5 gives a summary of the effect of migration on population growth as estimated in the selected methods. This effect is presented by the surplus in percent to the total population. Population growth is usually presented per year; in method 1 this is impossible by virtue of its construction, and in method 2 it is over a period of 47 years. However since migration is far from being uniform over time we do not discuss a yearly contribution of migration.

Table 5 Migration surplus, in thousands and in percent to the observed population, two methods of estimation.

Country	Age span	Method 1		Age span	Method 2	
		Surplus, thousands	Surplus in % to obs. population		Surplus, thousands	Surplus in % to obs. population
AT	0-59	771	12	0-79	1,139	14
BE	0-59	679	8	0-79	1,204	12
BG	0-59	-719	-12	0-79	-1,010	-14
CZ	0-59	219	3	0-79	-19	0
DK	0-59	245	6	0-79	346	7
FI	0-59	41	1	0-79	-243	-5
FR	0-59	4,611	9	0-79	10,047	17
PT	0-59	-627	-7	0-79	-2,144	-21
SE	0-59	764	11	0-79	1,226	14
DE	0-49	5,853	12	0-79	12,352	16
HU	0-54	21	0	0-79	46	0
IE	0-54	85	3	0-79	158	4
IT	0-54	1,898	5	0-79	1,867	3
SK	0-54	-61	-1	0-79	-182	-3
ES	0-54	3,717	17	0-79	5,590	19
UK	0-54	1,282	3	0-79	2,671	5
NL	0-54	924	8	0-79	1,412	9
EE	0-44	-48	-6	0-79	106	8
LV	0-44	-26	-2			
LT	0-44	-76	-4	0-79	-42	-1
PL	0-44	-619	-3	0-79	-1,731	-5

In method 1 the surplus is defined as the foreign-born population net of native-born emigrants. The table gives numbers for different age-groups which does not influence the comparisons; were the last age group 49, the surplus in percent would change at most by 1 percent upwards. Spain is the country with the highest benefit: its population has grown with 16 percent, followed by Austria, Germany and Sweden. Bulgaria marks the lowest net surplus of -12 percent, followed by Portugal. A small relative surplus is observed in several countries from Central and Eastern Europe, along with Finland, Ireland, Italy, and the U.K.

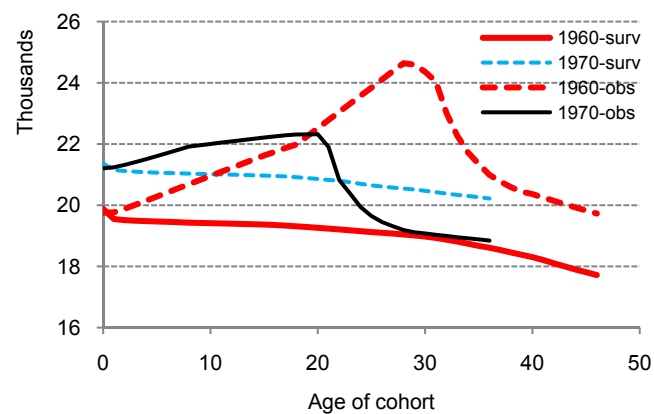
In method 2 the age span of the studied populations is 0-79 across all countries. The populations of Spain and France have increased by 19 percent and 17 percent as a result of migration. A significant increase is noted also in Germany, Austria, and Sweden. The big loser according to this method is Portugal with -21 percent, followed by Bulgaria with -14 percent.

The two methods are conceptually different: the first one is based on the place of birth while the second one is based on residence in 1960. Since the aliens are defined differently in the two methods it is likely to expect that the migration surplus and hence population growth may differ. This is observed for some countries. In Finland and Portugal the negative impact on population growth is more pronounced in method 2 while Estonia has a negative surplus of -6 percent according to method 1, and a positive surplus of 8 percent according to method 2.

How can this difference in model outcomes for Estonia be explained? After World War II and till the early 1990s the Estonian population hosted an increasing number of immigrants mainly from Russia and also from the Ukraine and Belorussia, all in the boundaries of the USSR. After the collapse of the USSR foreigners started leaving the country. These changes are vividly depicted in Figure 6 below. Towards 2007 the immigrants and their descendants still contributed to a larger population with 8 percent relative to the initial one from 1960 projected to 2007, although their contribution in 1991 was 16 percent.

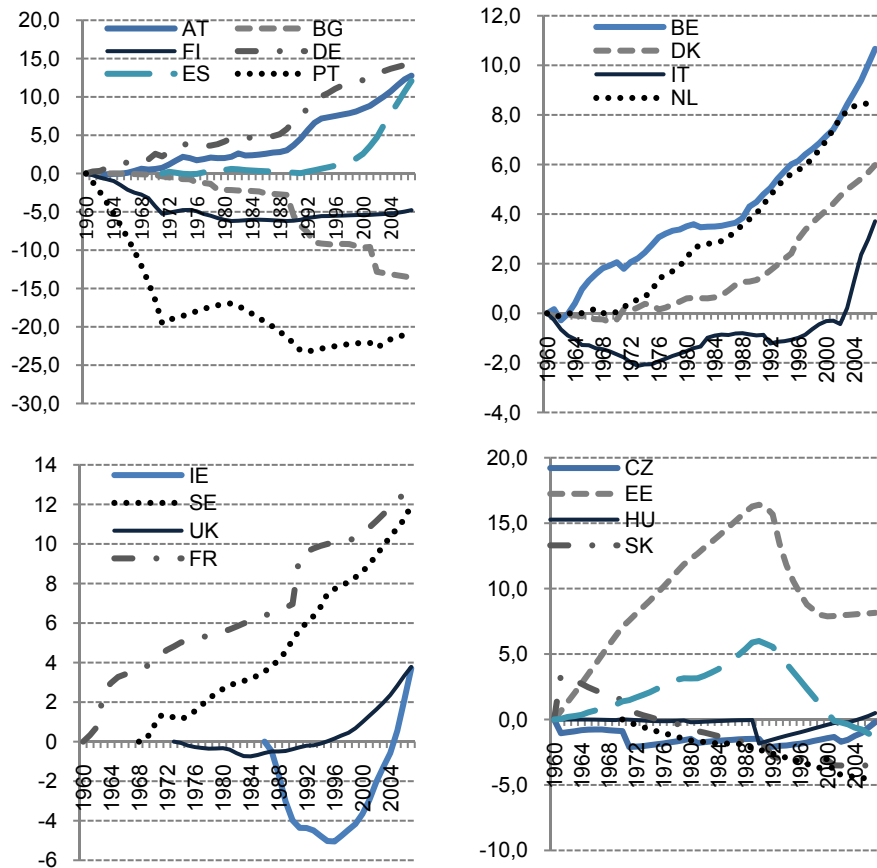
Figure 5 shows the application of method 1 for two cohorts: 1960 and 1970, both sexes. The 1960 cohort of actual population is larger than the birth cohort all throughout the period from 1960 to 2007, when the birth cohort is 46 years of age. The 1970 observed cohort however is larger than the surviving birth cohort only till age 21, i.e. till 1991. Then it declines speedily and gets smaller than surviving births. This pattern is observed for all cohorts born after the mid-1960s and it contributes to the negative surplus estimated with method 1. Immigrants who arrived in Estonia after 1960 have accumulated towards 1991 across all ages to a very large proportion which remained positive after the subsequent emigration, which was not observed for cohorts born after around 1965.

Figure 5 Surviving 1960 and 1970 birth cohorts and observed cohorts, Estonia.



Method 2 can be applied to describe population growth through time (Figure 6).

Figure 6 Population growth due to migration, from 1960 or last available till 2007, age span 0-79, in percent.



The migration surplus was moderate in Austria, Germany and Denmark till the mid- 1980s and speeded up afterwards. In Spain it was around zero till the beginning of the 1990s and speeded later. In Italy, it was negative till the beginning of the 2000s. A steady increase was observed in Belgium, the Netherlands, France and Sweden. Estonia and Latvia have a similar pattern of change discussed above. A significant negative growth was

observed in Bulgaria particularly as of the end of the 1980s when large groups of ethnic Turks started leaving the country, and in Portugal because of its continuous emigration to other European countries. The surplus in the Czech Republic, Slovakia, Poland and Hungary is close to zero, although there is a tendency of a further decline particularly outlined in Poland and Slovakia.

It is important to note that the population growth has turned its direction for several countries. In Portugal it was declining till the beginning of the 1990s and then it started to raise. Portugal turned from an emigration country till the 1990s to an immigration country. This switch is observed also for Italy and Ireland.

Figures I.1 and II.3 in the Appendix show the contribution of the surplus to population growth for each country.

The contribution of migration since 1960 to the growth of population size can be summarized in four groups:

- Countries with a continuous population growth: AT, DE, DK, ES, FR, NL, SE
- Countries with a continuous population decline: BG, PL, SK
- Countries with a population decline followed by population growth: IE, IT, PT, and decline moderately expressed in FI and UK
- Countries with a population growth followed by decline: EE, LT

CZ and HU do not experience significant population change.

6 CHANGES IN AGE COMPOSITIONS

Method 1

Figure 7 shows age schedules of the migration surplus in percent, last available year. The surplus in Austria and Germany is with a similar age profile. Several other countries have the same profile, although their schedules are lower. In these countries migration has enforced population

growth mainly in the age span 20-45. In France and Sweden the schedules marks an increase with age, as a result of long-lasting dominant immigration. Negative migration has produced negative schedules with dominance in the age span 15-40 in Poland and Lithuania, and 15-50 n Bulgaria, while in Poland and Slovakia it decreases as of age 20.

Thus in overall there are four patterns across countries:

- Positive surplus at ages 20-40: AT, BE, DE, DK, ES, NL, UK, IT (negative at age 50-54), CZ with small surplus
- Positive surplus continuously increasing with age: FR, SE
- Negative surplus: BG, FI, LV, PL, SK, LT (positive at age 40-44), PT (after age 40)
- Positive surplus till a certain age, negative after that age: EE, HU, IE,

Figure 6 Migration surplus by age groups, in percent to the observed population.

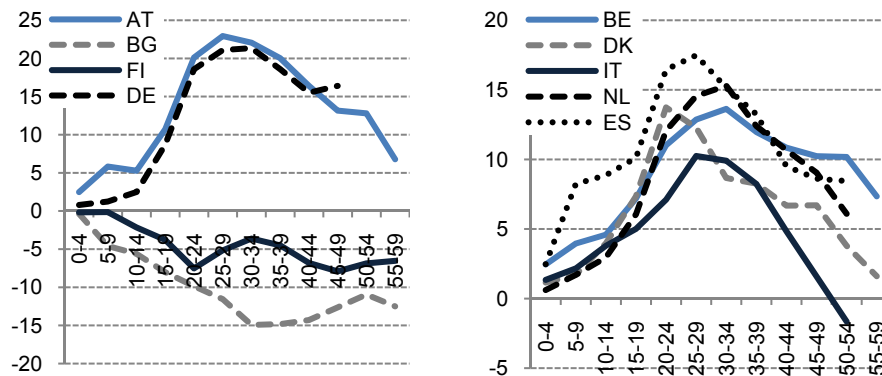
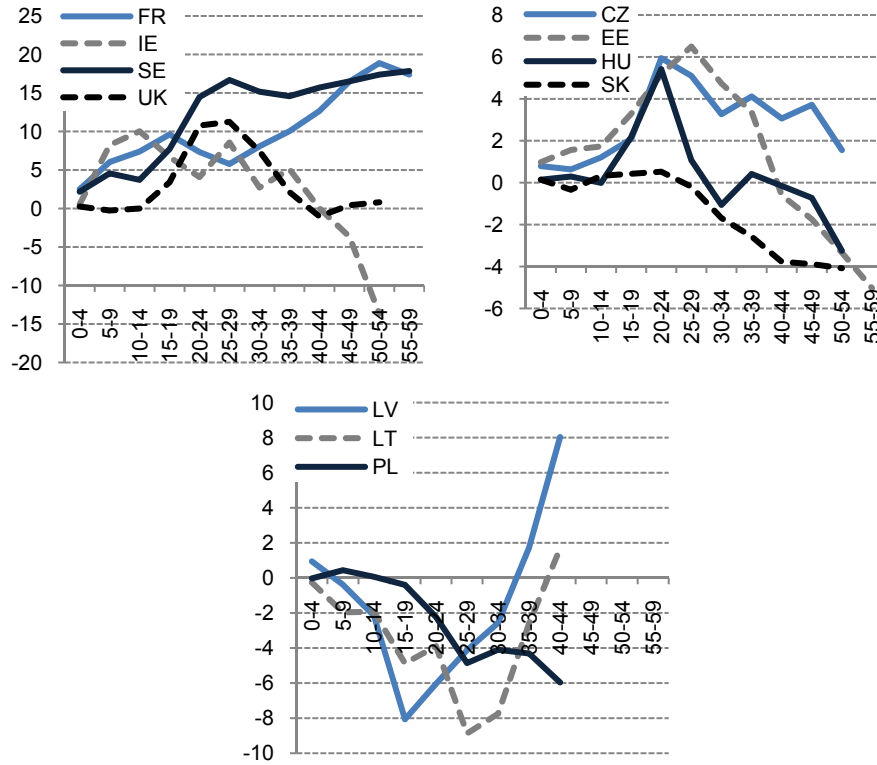


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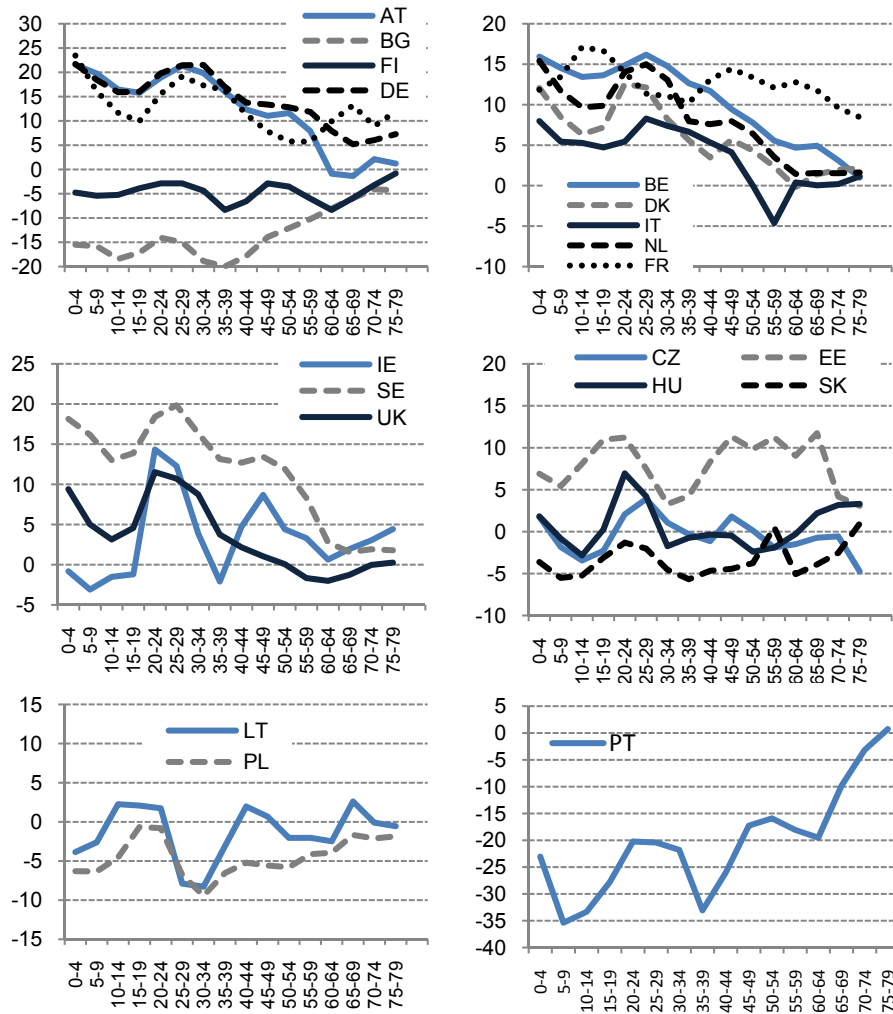
Figure 6 (continued)



Method 2

Figure 7 displays the migration surplus by age groups. A positive surplus at ages 20-40 is exhibited in this method in a similar pattern as in the former method. Unlike in method 1, the age schedules in method 2 show a relative increase at ages 0-4. This observation is in agreement with a standard yearly age schedule of immigration or of emigration (see for example Raymer and Rogers 2008). Where the surplus is negative its schedule is a mirror inverse of the one prevailing in a positive surplus as is seen in the schedule for Poland and Lithuania. These two patterns are prevailing across European countries.

Figure 7 Migration surplus by age groups, in percent (difference between projected and observed population in 2007, in percent to the observed population).



The positive surplus at ages 20-40 is exhibited in this method in a similar pattern as in the former method. Unlike in method 1, the age schedules in method 2 show a relative increase at ages 0-4. This observation is in agreement with a standard yearly age schedule of immigration or of

emigration (see for example Raymer and Rogers 2008). Where the surplus is negative its schedule is a mirror inverse of the one prevailing in a positive surplus as is seen in the schedule for Poland and Lithuania. These two patterns are prevailing across European countries.

7 DEPENDENCY RATIOS

Dependency ratios were computed from the data in Table II in Appendix II, displayed in Table 6 below. The old-age dependency ratio is defined as the sum of persons aged 65-79 divided by the sum of persons aged 15-64, in percent. The young-age dependency ratio is the ratio of persons aged 0-14 to 15-64, and the total dependency ratio is the sum of both. The table gives the ratios for the observed population and the difference between the ratios of the observed and the projected population.

Table 6 Dependency ratios in observed populations and difference between observed and projected populations towards 1.1.2007, age span 0-79, in percent.

Country	Initial year of proj.	Old-age		Young-age		Total	
		Observed	Diff	Observed	Diff	Observed	Diff
AT	1960	18.4	-2.8	23.2	1.5	41.6	-1.3
BE	1960	19	-1.7	25.8	1	44.8	-0.7
BG	1960	19.9	1.7	19.4	-0.3	39.3	1.4
CZ	1960	15.7	-0.3	20.2	-0.3	35.9	-0.6
DE	1960	22.9	-2.6	21	0.8	43.9	-1.8
DK	1960	17	-0.7	28.2	0.9	45.1	0.1
EE	1960	20	-0.4	21.9	-0.4	41.9	-0.8
FI	1960	18.5	0.3	25.7	0	44.2	0.2
FR	1960	17.7	-0.6	28.4	0.4	46.1	-0.2
HU	1960	17.9	0.4	22.1	-0.2	40	0.2
IE	1986	11.9	-0.3	29.7	-2.2	41.6	-2.5
IT	1960	22.2	-0.8	21.3	0.5	43.5	-0.3
LT	1960	18.2	0.4	23.2	0.2	41.4	0.6
NL	1960	16	-1.3	26.8	1	42.8	-0.2
PL	1961	14.9	0.4	22.3	-0.2	37.2	0.2

Table continued on the next page

Table 6 (continued)

Country	Initial year	Old age		Young age		Total	
	of proj.	Observed	Diff.	Observed	Diff.	Observed	Diff.
PT	1960	19.6	2.9	23	-1.5	42.5	1.2
SK	1960	13	0.2	22.4	-0.3	35.4	-0.2
ES	1971	17.6	-0.2	21.1	-0.1	38.7	-0.3
SE	1968	18.2	-2.4	25.9	0.8	44.1	-1.6
UK	1973	17.4	-0.8	26.6	0.5	44	-0.3

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 projection period of 47 years changes will depend on the cumulated effect of immigrants as some of them will get old during this period. When immigration has been high during the 1960s and 1970s and low afterwards, the old-age dependency might first decrease and later increase. Higher fertility of immigrants is also of significance for this longer period. This paper restricts to displaying the estimated ratios and will not go into detailed country-specific analyses.

In Germany migration has led to a decline of the old-age dependency ratio with 2.6 points and in Austria with 2.8 points. The decline with more than 2 points is observed additionally only in Sweden. In France, a pronounced immigration country the decline is only 0.6 points. This unexpected result is likely to be explained with the timing of migration: when it has been high mainly during the first years of the projection period, cumulated migrants have gradually aged and have moved to the population aged above 65. Where emigration dominated it has contributed to an increase in the old-age dependency ratio (in Portugal with nearly 3 points).

The youth dependency ratio is usually with a reverse sign to that of the old-age one, with exceptions I Ireland where fertility declined drastically over the period and in several countries where migration is low.

Does migration mitigate population ageing? Its contribution is above 1% in few countries in the EU, and its evaluation requires more detailed research. Past migration flows which are considered here have been with divergent intensity in time and hence have a sporadic effect. When policies support uniform migration flows along time their effect on population age composition will be more permanent and predictable.

8 SUMMARY

Immigration accumulated through time increases population size and growth; emigration has the inverse impact. Both also change the age composition of a population. While these statements are trivial, an estimation of the magnitude of these changes is not as apparent as it depends on how the population of migration origin is defined. We used two methods of estimation to measure the impact of migration on population growth and age composition. The first method is based on defining immigrants as foreign-born persons. The corresponding model is based on a survival of a sequence of birth cohorts which form the native population. In the second method the natives are defined as the population observed in 1960 (or later, depending on data availability). This population is projected to 2007 assumed closed to migration, using observed mortality rates and fertility adjusted to the natives. The second method informs about the contribution of cumulated net migration during a period of 47 years. In both methods the estimated population is compared with the observed population, and the difference forms the migration surplus. Population growth is measured by relating the migration surplus to the observed population.

The two methods give significantly different results. Their application can be recommended with respect to the research topic of interest. For example the method based on survival of births can be useful for a study of the impact of migration on the size of baby-boom cohorts. The second method is useful for the study of the impact of migration over a specific time period. We considered the period 1960-2007 and showed the significance of the migration boom during the last 1-2 decades. A period

starting in 1985 can be applied for a detailed study of the effect of migration specifically during these two decades.

Population growth measured with either method marks enormous amplitude among the 21 EU countries included in this study. According to the second method the population of Spain experienced the highest growth with 19 percent with a starting year 1971, i.e. for a period of 36 years. A high growth was observed also for Austria, France, Germany and Sweden. A high negative growth was estimated for Portugal, -21 percent, and in Bulgaria, -14 percent for a period of 47 years from 1960 to 2007. Growth is negative also in a couple of other countries but at a much lower level. However, Portugal's population experiences positive net migration during the last 1-2 decades and the negative net migration accumulated during the "guest-worker" years gradually declines. Bulgaria is the only pronounced emigration country.

Other countries from Central Europe (the Czech Republic, Slovakia, Latvia and Hungary) experience a low net migration impact. The same is observed in Poland although negative (-5 percent). Estonia's population had a specific migration history which at present leads to the decline of the impact of net migration cumulated during the times of the USSR. These low levels suggest that some of these countries may become more attractive in the forthcoming years and hence turn into immigration countries.

Western European countries are traditional immigration countries. Southern European countries experienced a switch from previously experiencing dominant emigration to a dominance of immigration at present. The same holds for Ireland.

The impact of migration on the age composition of the population is diverse. A general pattern in the immigration countries is that the larger part of the migration surplus is observed at ages 20-40 as well as at ages 0-10. The age schedule of the surplus resembles that of a migration flow observed during one year, except that the schedule of the surplus is stretched over a larger span of ages. A pattern in emigration countries is less evident.

The Appendices present a large amount of country-specific data, a lot of which has remained unused in the short descriptive review presented in this paper. A rigorous explanatory analysis is yet to come.

Acknowledgement

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APPENDIX I Method 1 (Survival of birth cohorts)

Table I.A Initial and end year of estimations

	Initial birth cohort	Birth survived to January 1st
Austria	1947	2008
Belgium	1947	2007
Bulgaria	1947	2007
Czech Republic	1950	2008
Denmark	1947	2007
Estonia	1959	2007
Finland	1947	2008
France	1947	2007
Germany	1947	2008
Hungary	1950	2006
Ireland	1950	2006
Italy	1947	2006
Latvia	1959	2007
Lithuania	1959	2007
Netherlands	1947	2006
Poland	1958	2006
Portugal	1947	2007
Slovakia	1950	2008
Spain	1947	2006
Sweden	1947	2007
United Kingdom	1947	2006

Table I Population estimated with survived births, observed population, and differences between the two populations; initial and end-year in table II.A.

Table I.1 Austria

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	387000	396000	5000	5000	10000	2
5-9	389000	412000	12000	11000	23000	6
10-14	446000	469000	12000	11000	24000	5
15-19	452000	500000	25000	24000	48000	11
20-24	432000	519000	41000	45000	87000	20
25-29	440000	541000	48000	53000	101000	23
30-34	445000	543000	44000	54000	98000	22
35-39	545000	654000	51000	58000	109000	20
40-44	615000	716000	53000	48000	101000	16
45-49	583000	659000	40000	37000	77000	13
50-54	489000	551000	30000	33000	63000	13
55-59	462000	493000	14000	17000	31000	7
Total 0-59	5685000	6456000	376000	395000	771000	19

Table I.2 Belgium

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	576000	590000	7000	7000	14000	2
5-9	569000	592000	11000	11000	23000	4
10-14	589000	616000	14000	13000	27000	5
15-19	600000	643000	21000	22000	43000	7
20-24	574000	637000	26000	37000	63000	11
25-29	601000	678000	33000	44000	77000	13
30-34	608000	691000	39000	44000	83000	14
35-39	681000	763000	40000	42000	82000	12
40-44	737000	817000	40000	40000	80000	11
45-49	720000	793000	36000	38000	74000	10
50-54	661000	728000	34000	34000	67000	10
55-59	627000	673000	25000	21000	46000	7
Total 0-59	7543000	8222000	324000	354000	679000	8

Table I.3 Bulgaria

Age	Population		Difference			Difference
	estimated	observed	males	females	total	in %
0-4	345000	343000	-1000	-1000	-1000	0
5-9	337000	322000	-8000	-8000	-16000	-5
10-14	389000	367000	-11000	-11000	-22000	-6
15-19	535000	492000	-22000	-21000	-43000	-8
20-24	591000	533000	-29000	-29000	-58000	-10
25-29	640000	566000	-37000	-37000	-74000	-12
30-34	676000	575000	-51000	-50000	-101000	-15
35-39	642000	547000	-49000	-46000	-95000	-15
40-44	595000	510000	-45000	-40000	-85000	-14
45-49	612000	535000	-41000	-36000	-77000	-13
50-54	614000	547000	-36000	-32000	-67000	-11
55-59	632000	553000	-40000	-39000	-79000	-13
Total 0-59	6608000	5890000	-370000	-349000	-719000	-12

Table I.4 Czech Republic

Age	Population		Difference			Difference
	estimated	observed	males	females	total	in %
0-4	512000	516000	2000	2000	4000	1
5-9	452000	455000	2000	1000	3000	1
10-14	500000	506000	3000	3000	6000	1
15-19	633000	646000	7000	6000	13000	2
20-24	661000	700000	23000	16000	39000	6
25-29	769000	808000	23000	16000	39000	5
30-34	904000	933000	18000	11000	30000	3
35-39	714000	743000	19000	10000	29000	4
40-44	692000	713000	14000	7000	21000	3
45-49	619000	642000	13000	10000	23000	4
50-54	740000	751000	5000	7000	12000	2
Total 0-59	7195000	7414000	129000	90000	219000	3

Table I.5 Denmark

Age	Population		Difference			Difference in %
	estimated	observed	males	females	total	
0-4	321000	325000	2000	2000	4000	1
5-9	331000	336000	3000	3000	6000	2
10-14	340000	353000	7000	7000	13000	4
15-19	301000	323000	11000	11000	22000	7
20-24	260000	296000	17000	18000	36000	14
25-29	288000	324000	15000	20000	35000	12
30-34	347000	377000	12000	18000	30000	9
35-39	360000	390000	14000	16000	30000	8
40-44	397000	424000	14000	13000	27000	7
45-49	351000	374000	12000	11000	24000	7
50-54	349000	362000	6000	7000	13000	4
55-59	360000	365000	3000	3000	6000	2
Total 0-59	4005000	4250000	116000	129000	245000	6

Table I.6 Estonia

Age	Population		Difference			Difference in %
	estimated	observed	males	females	total	
0-4	69000	69000	0	0	0	1
5-9	62000	61000	0	0	-1000	2
10-14	73000	70000	-2000	-1000	-3000	2
15-19	114000	103000	-6000	-5000	-11000	3
20-24	116000	105000	-6000	-5000	-11000	5
25-29	106000	96000	-5000	-5000	-10000	6
30-34	102000	92000	-5000	-4000	-9000	5
35-39	96000	91000	-3000	-2000	-5000	3
40-44	88000	90000	0	3000	2000	-1
Total 0-44	825000	776000	-27000	-21000	-48000	-6

Table I.7 Finland

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	289000	292000	1000	1000	3000	0
5-9	282000	286000	2000	2000	4000	0
10-14	311000	317000	3000	3000	5000	-2
15-19	321000	332000	5000	5000	11000	-4
20-24	311000	327000	9000	7000	16000	-8
25-29	314000	335000	11000	9000	20000	-5
30-34	309000	324000	9000	6000	15000	-4
35-39	313000	324000	7000	4000	11000	-5
40-44	376000	374000	0	-3000	-2000	-7
45-49	381000	374000	-2000	-5000	-7000	-8
50-54	401000	387000	-5000	-9000	-13000	-7
55-59	425000	404000	-6000	-15000	-21000	-7
Total 0-59	4034000	4075000	35000	6000	41000	1

Table I.8 France

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	3847000	3943000	47000	49000	96000	2
5-9	3734000	3959000	117000	109000	225000	6
10-14	3602000	3868000	134000	132000	266000	7
15-19	3782000	4146000	180000	184000	364000	10
20-24	3791000	4069000	107000	171000	278000	7
25-29	3759000	3976000	56000	161000	217000	6
30-34	3873000	4186000	106000	206000	313000	8
35-39	4062000	4470000	158000	249000	408000	10
40-44	4049000	4561000	209000	303000	513000	13
45-49	3777000	4399000	271000	351000	622000	16
50-54	3587000	4264000	304000	373000	677000	19
55-59	3632000	4263000	314000	318000	632000	17
Total 0-59	45495000	50106000	2004000	2607000	4611000	9

Table I.9 Germany

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	3442000	3469000	14000	13000	27000	1
5-9	3756000	3802000	22000	24000	47000	1
10-14	3913000	4010000	49000	48000	97000	2
15-19	4271000	4643000	190000	182000	372000	9
20-24	4095000	4856000	374000	387000	761000	19
25-29	4110000	4977000	421000	446000	867000	21
30-34	3876000	4703000	409000	418000	827000	21
35-39	5093000	6040000	495000	452000	947000	19
40-44	6214000	7177000	529000	434000	963000	15
45-49	5763000	6708000	509000	436000	945000	16
Total 0-49	44531000	50384000	3012000	2841000	5853000	12

Table I.10 Hungary

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	478000	478000	0	0	1000	0
5-9	489000	491000	0	2000	1000	0
10-14	584000	584000	0	0	0	0
15-19	614000	627000	7000	7000	13000	2
20-24	641000	675000	17000	18000	35000	5
25-29	809000	817000	6000	3000	9000	1
30-34	797000	788000	-6000	-3000	-8000	-1
35-39	699000	702000	-1000	4000	3000	0
40-44	605000	604000	-5000	4000	-1000	0
45-49	700000	695000	-9000	4000	-5000	-1
50-54	820000	793000	-19000	-7000	-27000	-3
Total 0-54	7235000	7256000	-11000	31000	21000	0

Table I.11 Ireland

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	301000	303000	0	1000	2000	1
5-9	264000	286000	11000	11000	22000	8
10-14	248000	273000	12000	13000	25000	10
15-19	276000	295000	9000	10000	18000	7
20-24	331000	344000	4000	10000	13000	4
25-29	344000	374000	14000	16000	29000	9
30-34	329000	338000	4000	5000	9000	3
35-39	298000	313000	7000	8000	15000	5
40-44	295000	295000	-2000	2000	0	0
45-49	281000	270000	-6000	-4000	-10000	-4
50-54	284000	245000	-19000	-19000	-39000	-14
Total 0-54	3251000	3336000	33000	52000	85000	3

Table I.12 Italy

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	2709000	2746000	17000	19000	36000	1
5-9	2664000	2722000	29000	29000	58000	2
10-14	2713000	2816000	49000	54000	103000	4
15-19	2771000	2909000	71000	68000	139000	5
20-24	2953000	3163000	98000	112000	210000	7
25-29	3445000	3798000	162000	191000	353000	10
30-34	4192000	4607000	190000	225000	415000	10
35-39	4441000	4807000	173000	193000	366000	8
40-44	4494000	4712000	90000	128000	217000	5
45-49	4035000	4100000	2000	62000	64000	2
50-54	3795000	3732000	-70000	8000	-63000	-2
Total 0-54	38213000	40112000	810000	1088000	1898000	5

Table I.13 Latvia

Age	Population		Difference			Difference
	estimated	observed	males	females	total	in %
0-4	104000	105000	0	1000	1000	1
5-9	95000	95000	0	0	0	0
10-14	121000	119000	-1000	-1000	-3000	-2
15-19	191000	175000	-8000	-7000	-15000	-8
20-24	195000	183000	-6000	-6000	-12000	-6
25-29	167000	160000	-3000	-4000	-7000	-4
30-34	164000	160000	-2000	-2000	-4000	-3
35-39	156000	158000	1000	2000	3000	2
40-44	149000	161000	5000	7000	12000	8
Total 0-44	1342000	1316000	-15000	-10000	-26000	-2

Table I.14 Lithuania

Age	Population		Difference			Difference
	estimated	observed	males	females	total	in %
0-4	152000	151000	0	0	0	0
5-9	175000	171000	-2000	-2000	-3000	-2
10-14	220000	215000	-2000	-2000	-4000	-2
15-19	279000	266000	-7000	-6000	-14000	-5
20-24	278000	267000	-6000	-5000	-11000	-4
25-29	249000	227000	-10000	-12000	-22000	-9
30-34	248000	229000	-10000	-9000	-19000	-8
35-39	255000	248000	-5000	-2000	-7000	-3
40-44	254000	258000	1000	3000	4000	2
Total 0-44	2109000	2033000	-41000	-35000	-76000	-4

Table I.15 Netherlands

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	982000	988000	2000	4000	6000	1
5-9	982000	999000	8000	9000	17000	2
10-14	969000	998000	15000	14000	29000	3
15-19	934000	991000	29000	27000	57000	6
20-24	861000	965000	48000	56000	104000	12
25-29	866000	992000	55000	71000	126000	15
30-34	976000	1125000	66000	83000	149000	15
35-39	1164000	1308000	69000	75000	144000	12
40-44	1188000	1315000	61000	65000	127000	11
45-49	1117000	1218000	46000	55000	101000	9
50-54	1055000	1120000	28000	36000	64000	6
Total 0-54	11094000	12018000	428000	495000	924000	8

Table I.16 Poland

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	1781000	1781000	-1000	0	0	0
5-9	1974000	1983000	1000	7000	9000	0
10-14	2424000	2426000	-2000	4000	2000	0
15-19	2881000	2869000	-10000	-2000	-11000	0
20-24	3392000	3316000	-48000	-28000	-76000	-2
25-29	3267000	3108000	-91000	-68000	-159000	-5
30-34	2872000	2755000	-69000	-49000	-118000	-4
35-39	2489000	2382000	-56000	-51000	-107000	-4
40-44	2654000	2496000	-84000	-74000	-158000	-6
Total 0-44	23734000	23115000	-360000	-260000	-619000	-3

Table I.17 Portugal

Age	Population		Difference			Difference
	estimated	observed	males	females	total	in %
0-4	549000	548000	-1000	0	-1000	0
5-9	571000	546000	-15000	-10000	-25000	-4
10-14	549000	544000	-5000	0	-5000	-1
15-19	585000	586000	-1000	2000	1000	0
20-24	675000	679000	-1000	5000	4000	1
25-29	783000	793000	-1000	10000	10000	1
30-34	827000	848000	6000	15000	21000	3
35-39	853000	790000	-36000	-27000	-63000	-7
40-44	929000	787000	-80000	-63000	-142000	-15
45-49	929000	785000	-79000	-64000	-144000	-15
50-54	922000	781000	-78000	-63000	-141000	-15
55-59	909000	768000	-77000	-65000	-141000	-16
Total 0-59	9081000	8454000	-368000	-260000	-627000	-7

Table I.18 Slovakia

Age	Population		Difference			Difference
	estimated	observed	males	females	total	in %
0-4	266000	267000	0	0	0	0
5-9	268000	267000	0	0	-1000	0
10-14	316000	317000	0	1000	1000	0
15-19	389000	391000	1000	1000	2000	0
20-24	433000	436000	1000	1000	2000	1
25-29	466000	465000	1000	-2000	-1000	0
30-34	467000	460000	-3000	-5000	-8000	-2
35-39	387000	377000	-5000	-5000	-10000	-3
40-44	390000	375000	-9000	-6000	-15000	-4
45-49	395000	379000	-9000	-6000	-15000	-4
50-54	399000	382000	-10000	-7000	-16000	-4
Total 0-54	4176000	4116000	-32000	-28000	-61000	-1

Table I.19 Spain

Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	2179000	2234000	27000	28000	55000	3
5-9	1862000	2029000	82000	86000	167000	9
10-14	1894000	2078000	90000	94000	184000	10
15-19	2066000	2299000	112000	120000	232000	43
20-24	2415000	2891000	226000	249000	476000	54
25-29	3055000	3702000	336000	312000	647000	38
30-34	3247000	3826000	319000	260000	580000	18
35-39	3154000	3636000	260000	222000	482000	15
40-44	3098000	3424000	166000	160000	326000	11
45-49	3070000	3360000	144000	145000	289000	9
50-54	3018000	3296000	137000	142000	278000	9
Total 0-54	29059000	32776000	1898000	1818000	3717000	11

Table I.20 Sweden

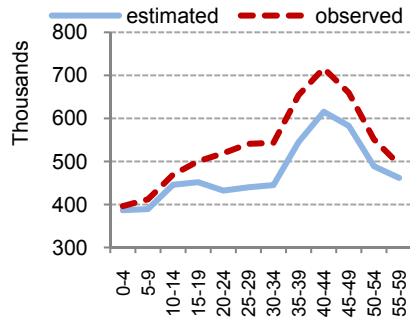
Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	502000	513000	5000	6000	11000	2
5-9	448000	468000	10000	10000	20000	5
10-14	549000	569000	10000	10000	20000	4
15-19	575000	620000	23000	22000	44000	8
20-24	473000	542000	34000	34000	68000	14
25-29	469000	548000	39000	39000	78000	17
30-34	523000	602000	39000	41000	79000	15
35-39	551000	631000	39000	41000	80000	15
40-44	567000	656000	46000	43000	89000	16
45-49	547000	638000	47000	44000	90000	17
50-54	526000	618000	47000	45000	91000	17
55-59	508000	598000	46000	45000	91000	18
Total 0-59	6238000	7002000	386000	378000	764000	11

Table I.21 United Kingdom

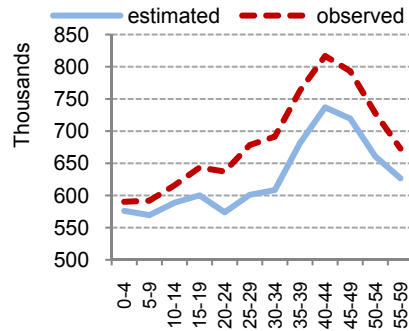
Age	Population		Difference		total	Difference in %
	estimated	observed	males	females		
0-4	3454000	3463000	3000	6000	9000	0
5-9	3531000	3522000	-8000	-1000	-9000	0
10-14	3785000	3785000	4000	-4000	0	0
15-19	3846000	3976000	77000	54000	131000	3
20-24	3590000	3977000	187000	199000	387000	11
25-29	3424000	3809000	153000	232000	385000	11
30-34	3822000	4107000	87000	198000	285000	7
35-39	4524000	4620000	-11000	107000	97000	2
40-44	4681000	4633000	-91000	43000	-48000	-1
45-49	4078000	4095000	-43000	60000	17000	0
50-54	3646000	3675000	-24000	54000	29000	1
Total 0-54	42380000	43663000	334000	948000	1282000	3

Figure I.1 Population estimated from survived births and observed population on January 1st, initial and end year in table I.A.

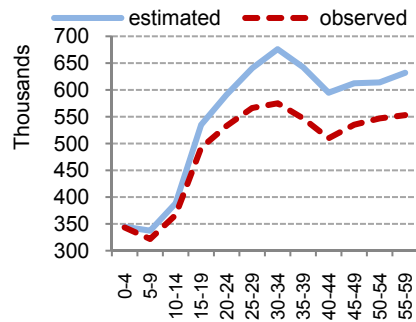
Austria



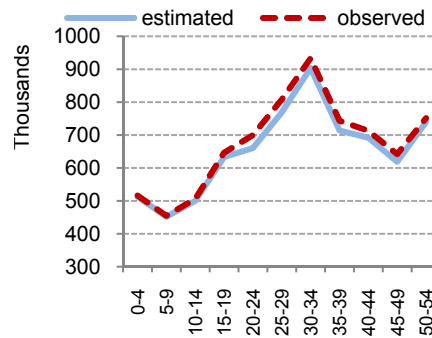
Belgium



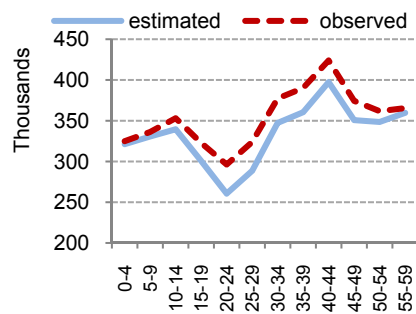
Bulgaria



Czech Republic



Denmark



Estonia

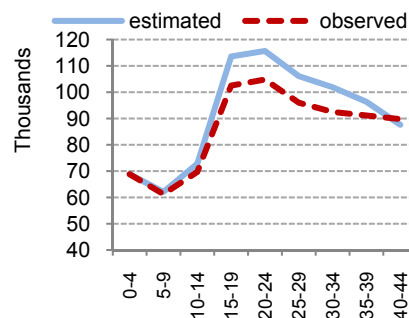
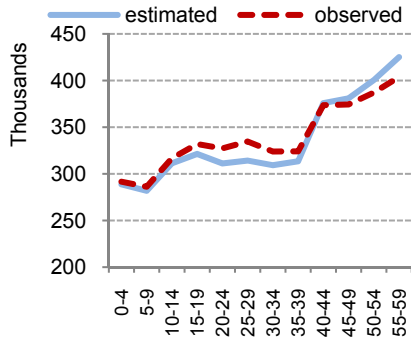


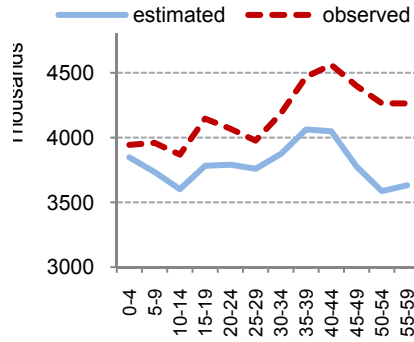
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Figure I.1 (continued)

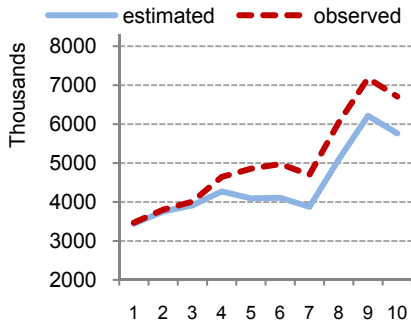
Finland



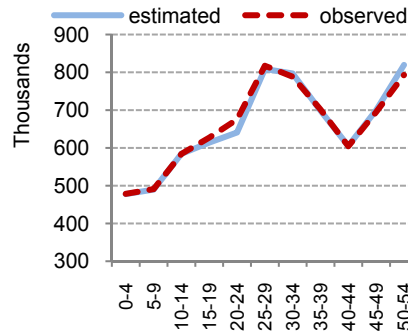
France



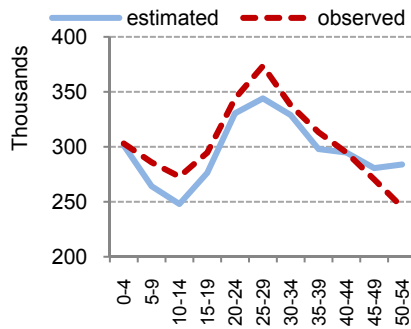
Germany



Hungary



Ireland



Italy

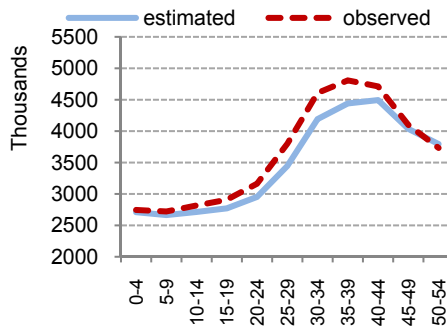
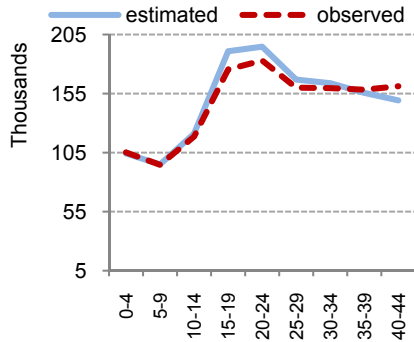


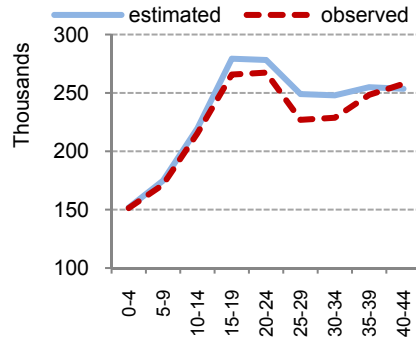
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Figure I.1 (continued)

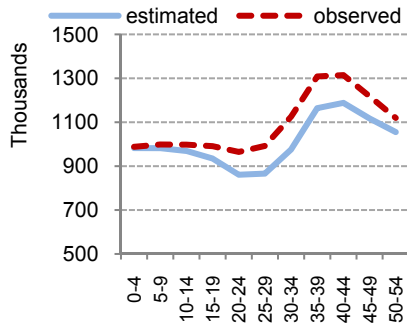
Latvia



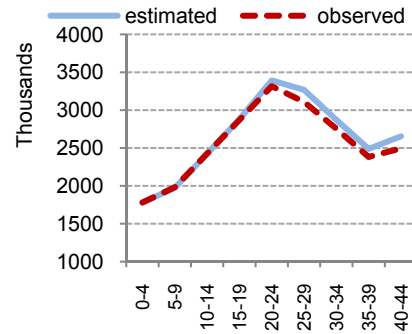
Lithuania



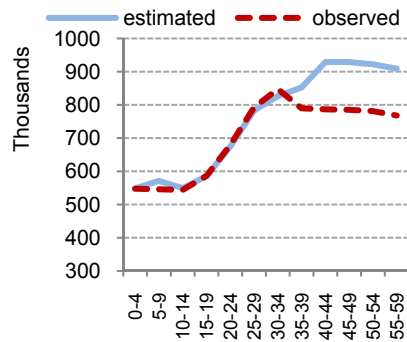
Netherlands



Poland



Portugal



Slovakia

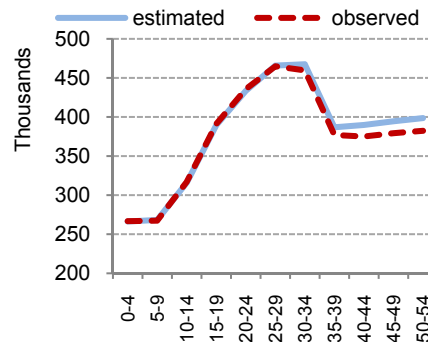
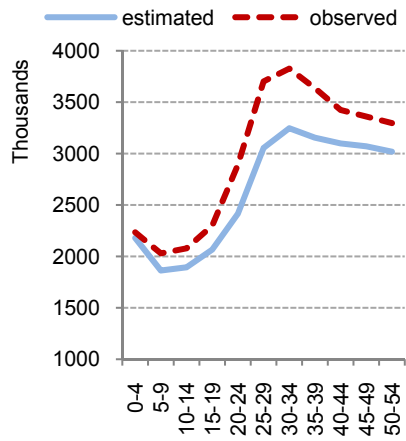


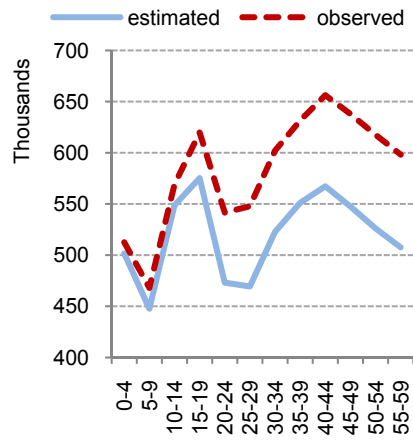
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Figure I.1 (continued)

Spain



Sweden



United Kingdom

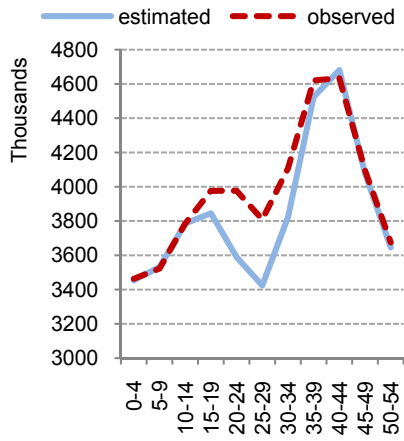
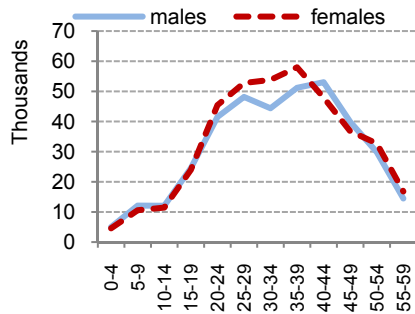
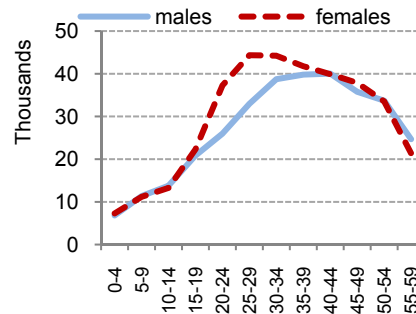


Figure I.2 Differences between the observed population and survived births on January 1st, initial and end year in table I.A.

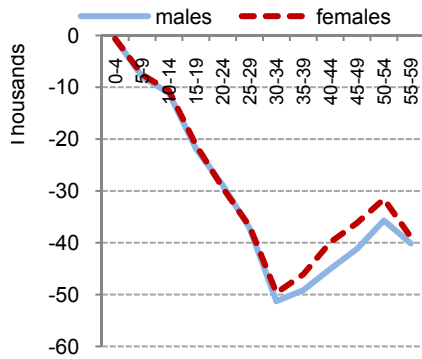
Austria



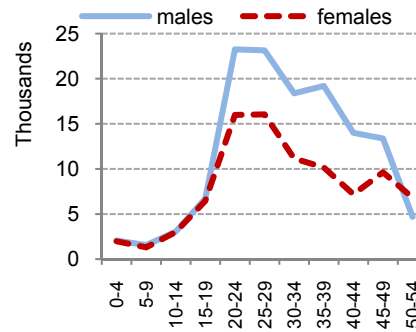
Belgium



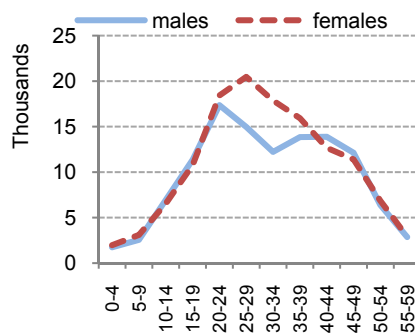
Bulgaria



Czech Republic



Denmark



Estonia

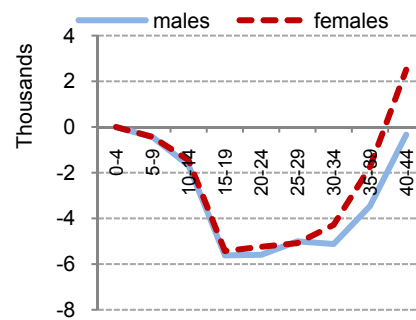
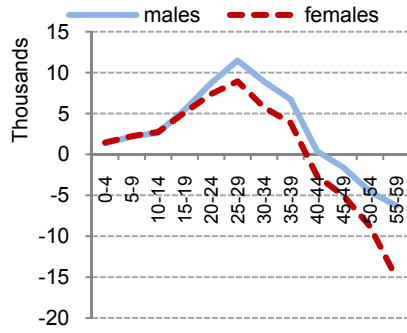


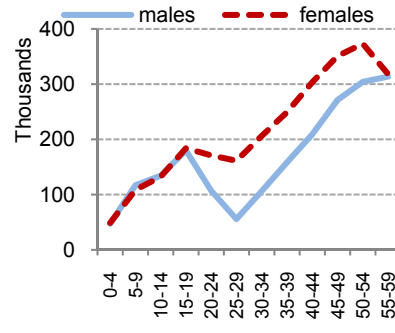
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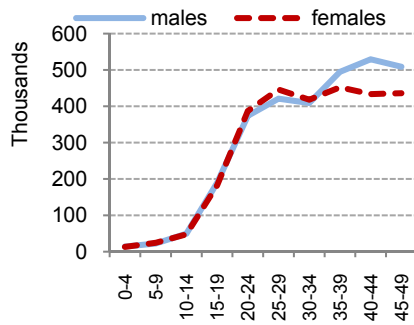
Finland



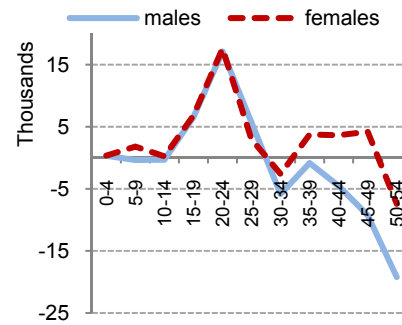
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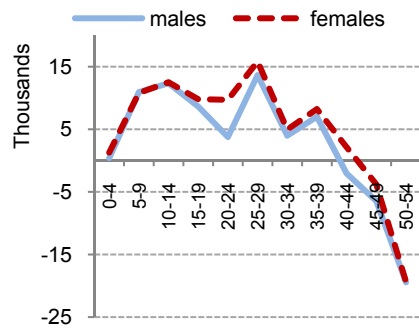
Germany



Hungary



Ireland



Italy

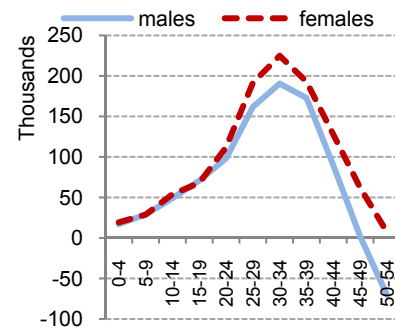
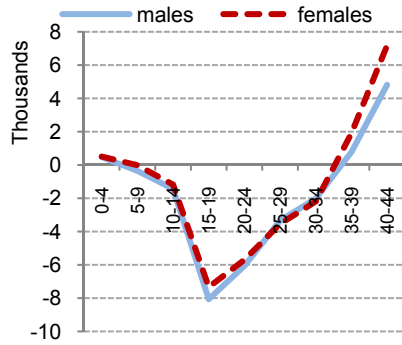


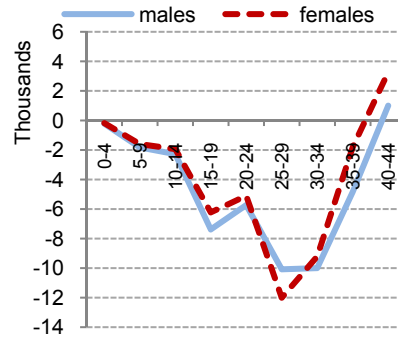
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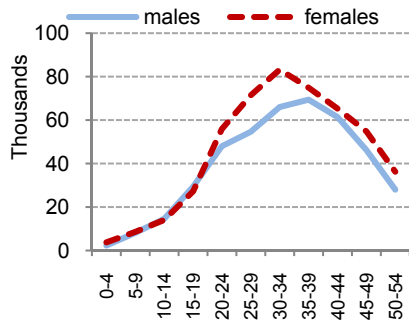
Latvia



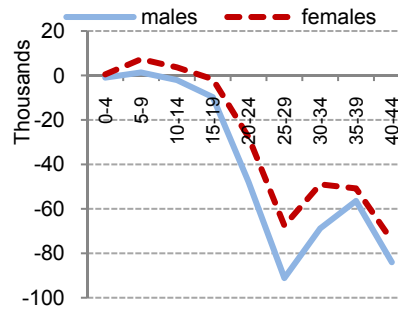
Lithuania



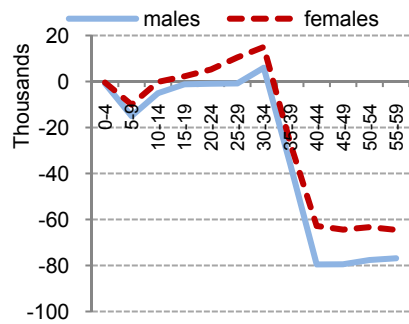
Netherlands



Poland



Portugal



Slovakia

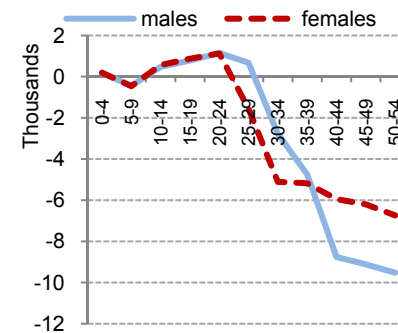
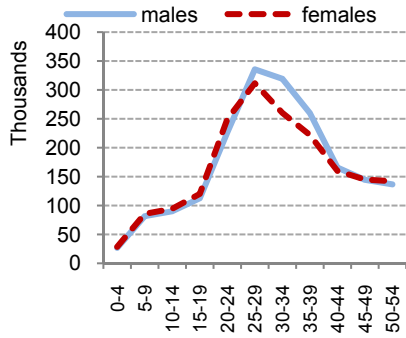


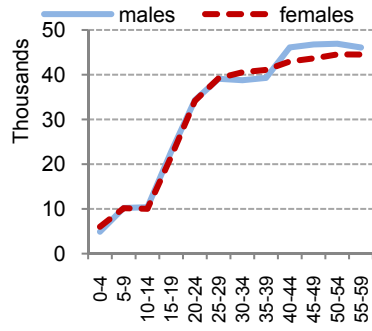
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Figure I.2 (continued)

Spain



Sweden



United Kingdom

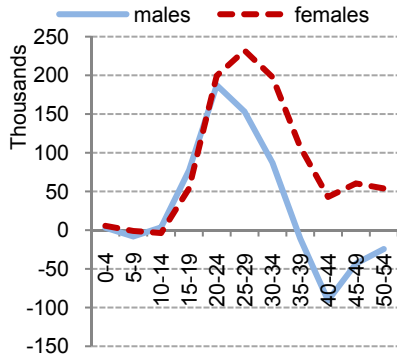


Figure I.3 Survival of the 1960 birth cohort through age and observed population at the corresponding age (horizontal axes measure age of cohort).

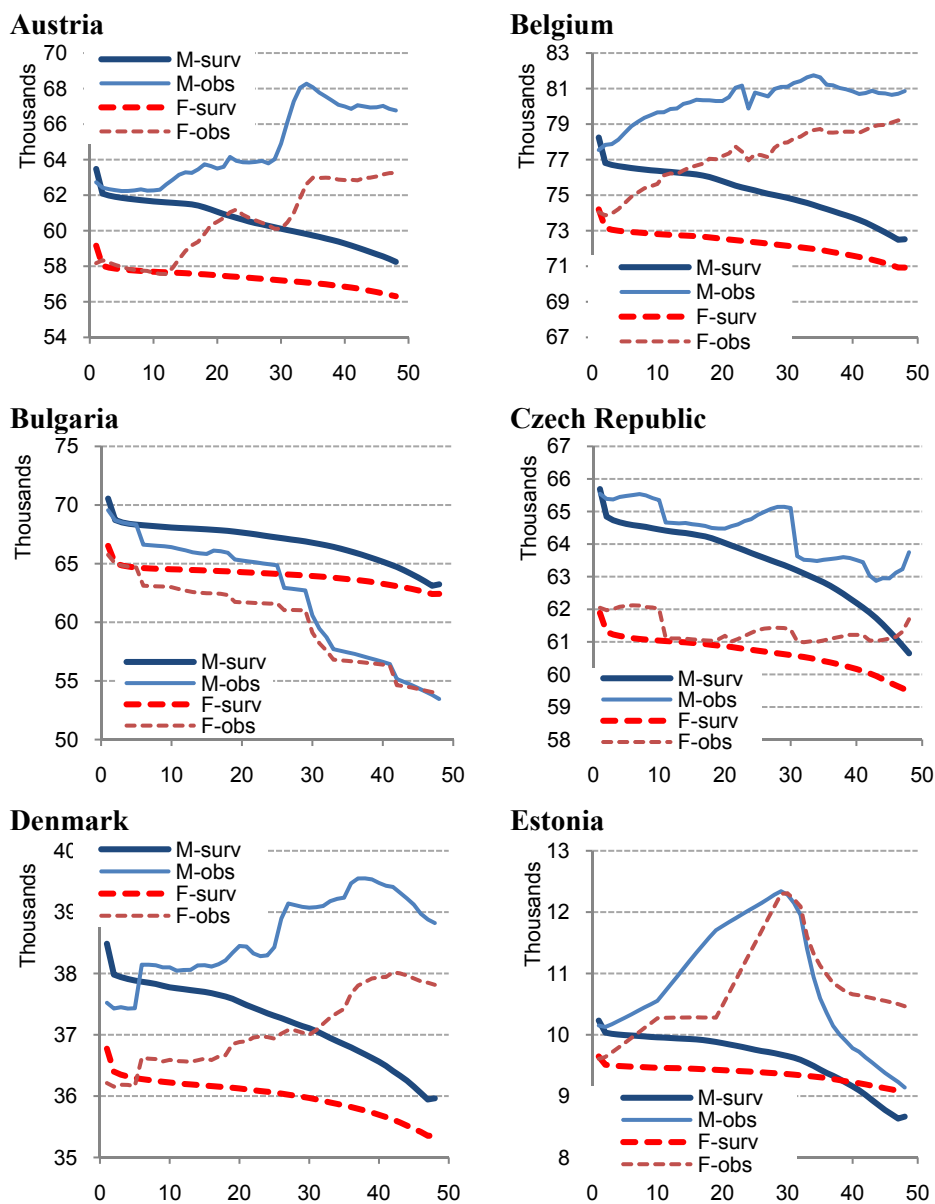


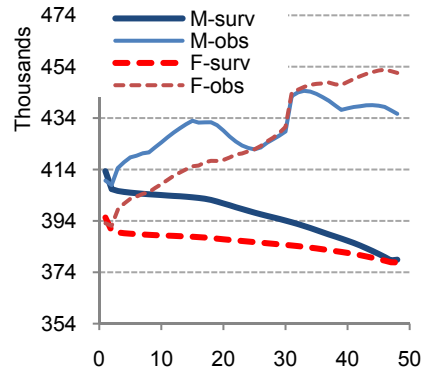
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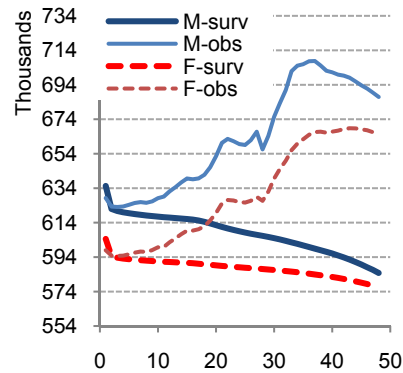
Finland



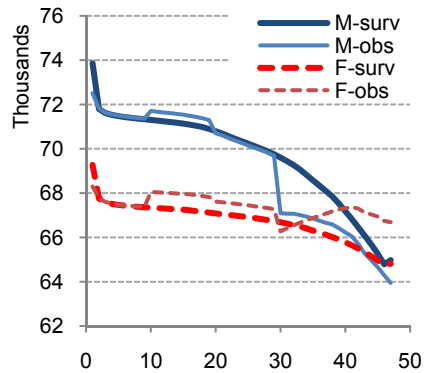
France



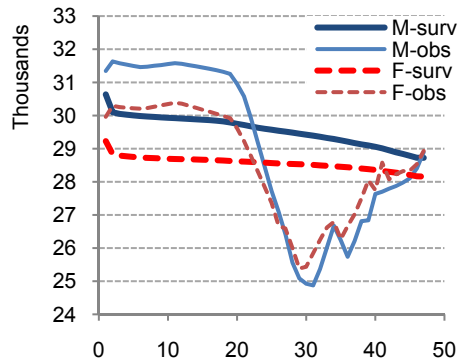
Germany



Hungary



Ireland



Italy

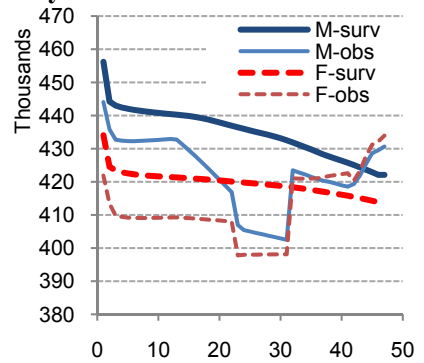
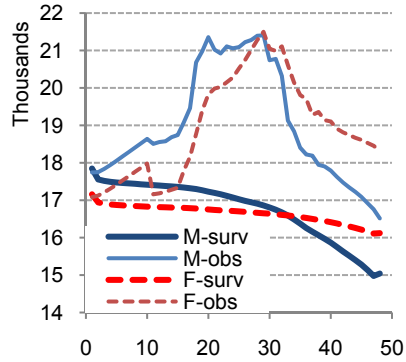


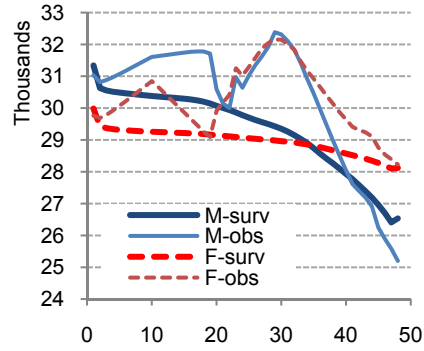
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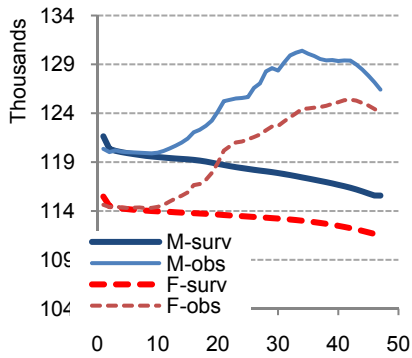
Latvia



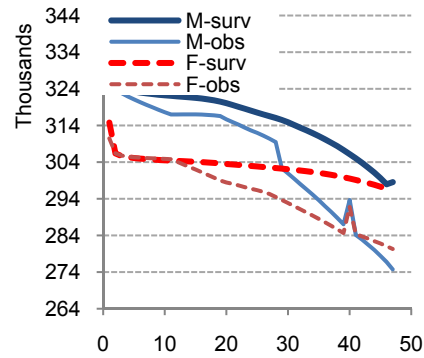
Lithuania



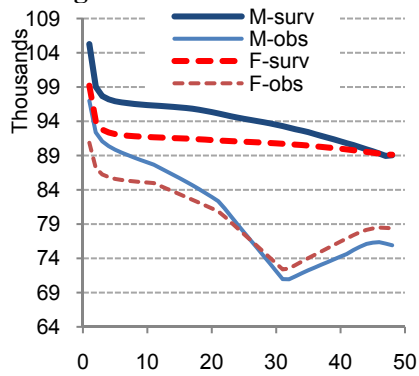
Netherlands



Poland



Portugal



Slovakia

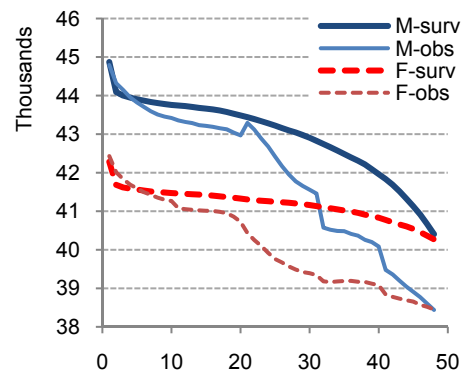
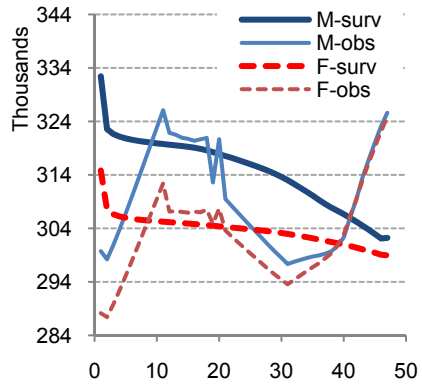


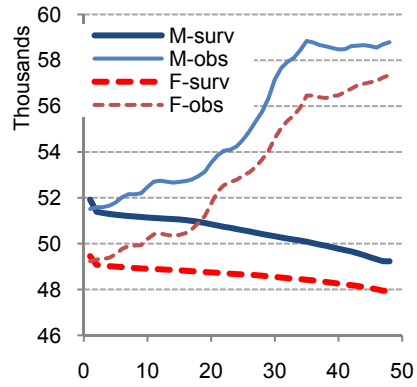
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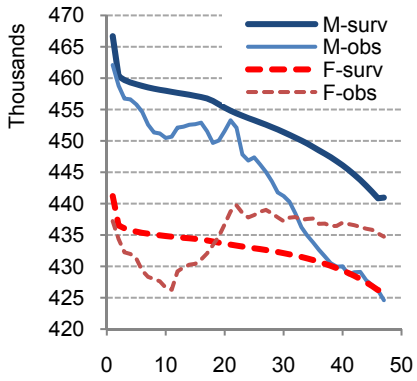
Spain



Sweden



United Kingdom



APPENDIX II Method 2 Population projection closed to migration

Table II.A Country specific years of projection (due to data availability).

	Initial year of projection	End year of projection
Austria	1960	2007
Belgium	1960	2007
Bulgaria	1960	2007
Czech Republic	1960	2007
Denmark	1960	2007
Estonia	1960	2007
Finland	1960	2007
France	1960	2007
Germany	1960	2007
Hungary	1960	2007
Ireland	1986	2007
Italy	1960	2007
Latvia	2002	2007
Lithuania	1960	2007
Netherlands	1960	2007
Poland	1961	2007
Portugal	1960	2007
Slovakia	1960	2007
Spain	1971	2007
Sweden	1968	2007
United Kingdom	1973	2007

Table II Projected and observed population, January 1st 2007, absolute differences and relative to observed population.

Table II.1 Austria

Age	Population		Difference			Difference in %
	projected	observed	males	females	total	
0-4	272000	263000	-5000	-5000	-10000	-4
5-9	290000	275000	-8000	-7000	-15000	-6
10-14	350000	333000	-9000	-8000	-17000	-5
15-19	412000	399000	-6000	-6000	-12000	-3
20-24	449000	443000	-3000	-3000	-6000	-1
25-29	477000	468000	-4000	-5000	-9000	-2
30-34	467000	447000	-9000	-11000	-20000	-5
35-39	386000	365000	-11000	-10000	-21000	-6
40-44	397000	380000	-11000	-7000	-18000	-5
45-49	408000	391000	-9000	-8000	-17000	-4
50-54	420000	404000	-9000	-6000	-15000	-4
55-59	342000	343000	1000	1000	2000	1
60-64	255000	243000	-6000	-6000	-12000	-5
65-69	208000	201000	-4000	-4000	-8000	-4
70-74	171000	167000	-2000	-2000	-4000	-3
75-79	135000	136000	1000	1000	1000	1
Total	5439000	5258000	-94000	-86000	-181000	13

Table II.2 Belgium

Age	Population		Difference			Difference in %
	projected	observed	males	females	total	
0-4	469000	590000	62000	60000	121000	16
5-9	485000	592000	54000	53000	107000	15
10-14	516000	616000	51000	49000	100000	13
15-19	542000	643000	51000	51000	102000	14
20-24	532000	637000	47000	58000	105000	15
25-29	558000	678000	55000	65000	120000	16
30-34	582000	691000	52000	57000	109000	15
35-39	660000	763000	51000	52000	103000	13
40-44	717000	817000	50000	50000	99000	12
45-49	718000	793000	37000	38000	75000	9
50-54	671000	728000	29000	28000	57000	8

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Table II.2 (continued)

Age	Population		Differences			Difference
	projected	observed	males	female	total	In %
55-59	635000	673000	22000	15000	37000	6
60-64	527000	553000	15000	11000	26000	5
65-69	449000	472000	12000	11000	23000	5
70-74	441000	455000	7000	7000	14000	3
75-79	396000	400000	1000	3000	4000	1
Total	8898000	10101000	596000	608000	1202000	13

Table II.3 Bulgaria

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	397000	343000	-27000	-26000	-53000	-15
5-9	373000	322000	-26000	-25000	-51000	-16
10-14	434000	367000	-35000	-33000	-68000	-18
15-19	576000	492000	-43000	-41000	-84000	-17
20-24	608000	533000	-37000	-37000	-75000	-14
25-29	651000	566000	-43000	-42000	-85000	-15
30-34	683000	575000	-55000	-53000	-108000	-19
35-39	656000	547000	-56000	-53000	-109000	-20
40-44	601000	510000	-48000	-43000	-91000	-18
45-49	609000	535000	-40000	-35000	-74000	-14
50-54	613000	547000	-35000	-32000	-66000	-12
55-59	609000	553000	-29000	-28000	-56000	-10
60-64	502000	465000	-18000	-20000	-37000	-8
65-69	410000	387000	-10000	-13000	-23000	-6
70-74	399000	384000	-4000	-12000	-16000	-4
75-79	300000	287000	-4000	-8000	-12000	-4
Total	8421000	7413000	-510000	-501000	-1008000	13

Table II.4 Czech Republic

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	485000	494000	4000	4000	9000	2
5-9	458000	450000	-4000	-4000	-8000	-2
10-14	554000	536000	-10000	-9000	-18000	-3
15-19	666000	651000	-8000	-7000	-15000	-2
20-24	681000	695000	9000	5000	14000	2
25-29	797000	829000	18000	14000	32000	4
30-34	893000	903000	7000	2000	10000	1
35-39	711000	709000	2000	-4000	-2000	0
40-44	710000	702000	-2000	-6000	-8000	-1
45-49	641000	653000	7000	5000	12000	2
50-54	763000	764000	-1000	2000	1000	0
55-59	794000	779000	-9000	-6000	-15000	-2
60-64	651000	641000	-4000	-6000	-10000	-1
65-69	454000	451000	-2000	-2000	-3000	-1
70-74	373000	371000	-1000	-1000	-2000	-1
75-79	341000	325000	-7000	-9000	-15000	-5
Total	9972000	9953000	-1000	-22000	-18000	13

Table II.5 Denmark

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	272000	325000	27000	26000	53000	12
5-9	299000	336000	19000	19000	37000	8
10-14	327000	353000	13000	13000	26000	6
15-19	298000	323000	13000	12000	25000	7
20-24	257000	296000	19000	20000	39000	13
25-29	283000	324000	18000	23000	41000	12
30-34	345000	377000	13000	19000	32000	8
35-39	368000	390000	10000	12000	22000	6
40-44	409000	424000	8000	7000	15000	3
45-49	353000	374000	11000	10000	21000	6
50-54	346000	362000	8000	8000	16000	4
55-59	357000	365000	5000	4000	9000	2

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Table II.5 (continued)

Age	Population		Difference		Difference	
	projected	observed	males	females	total	in %
60-64	363000	362000	1000	-1000	-1000	0
65-69	251000	255000	1000	2000	4000	1
70-74	195000	199000	2000	2000	4000	2
75-79	154000	157000	2000	2000	3000	2
Total	4877000	5222000	170000	178000	346000	13

Table II.6 Estonia

Age	Population		Difference		Difference	
	projected	observed	males	females	total	in %
0-4	64000	69000	2000	2000	5000	7
5-9	58000	61000	2000	2000	3000	5
10-14	64000	70000	3000	3000	6000	8
15-19	91000	103000	6000	5000	11000	11
20-24	93000	105000	6000	6000	12000	11
25-29	89000	96000	4000	3000	7000	8
30-34	89000	92000	1000	2000	3000	3
35-39	87000	91000	1000	3000	4000	4
40-44	82000	90000	2000	5000	7000	8
45-49	86000	97000	4000	7000	11000	11
50-54	83000	92000	3000	6000	9000	10
55-59	76000	85000	3000	7000	10000	11
60-64	57000	63000	2000	4000	6000	9
65-69	66000	75000	3000	6000	9000	12
70-74	56000	59000	1000	1000	2000	4
75-79	48000	50000	1000	0	2000	3
Total	1189000	1298000	44000	62000	107000	13

Table II.7 Finland

Age	Population		Difference			Difference in %
	projected	observed	males	females	total	
0-4	302000	288000	-7000	-7000	-14000	-5
5-9	305000	289000	-8000	-8000	-16000	-5
10-14	341000	324000	-9000	-8000	-17000	-5
15-19	338000	325000	-6000	-6000	-13000	-4
20-24	342000	332000	-4000	-5000	-10000	-3
25-29	340000	331000	-4000	-5000	-9000	-3
30-34	329000	316000	-6000	-8000	-14000	-4
35-39	364000	336000	-13000	-15000	-28000	-8
40-44	401000	376000	-11000	-14000	-25000	-7
45-49	386000	375000	-4000	-7000	-11000	-3
50-54	406000	392000	-4000	-9000	-14000	-4
55-59	435000	410000	-8000	-17000	-25000	-6
60-64	339000	313000	-9000	-17000	-26000	-8
65-69	274000	259000	-6000	-10000	-15000	-6
70-74	213000	206000	-3000	-4000	-7000	-3
75-79	184000	183000	0	-2000	-1000	-1
Total	5299000	5055000	-102000	-142000	-245000	13

Table II.8 France

Age	Population		Difference			Difference in %
	projected	observed	males	females	total	
0-4	2976000	3943000	493000	474000	968000	12
5-9	3018000	3959000	484000	458000	941000	13
10-14	2860000	3868000	514000	494000	1008000	17
15-19	3172000	4146000	492000	482000	975000	17
20-24	3274000	4069000	371000	423000	794000	14
25-29	3346000	3976000	266000	364000	630000	11
30-34	3572000	4186000	260000	354000	614000	11
35-39	3889000	4470000	246000	335000	581000	10
40-44	3880000	4561000	294000	387000	681000	13
45-49	3763000	4399000	279000	357000	636000	14
50-54	3694000	4264000	252000	318000	570000	13
55-59	3748000	4263000	256000	260000	515000	12
60-64	2723000	3122000	203000	196000	399000	13

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Table II.8 (continued)

Age	Population		Difference		total	Difference in %
	projected	observed	males	females		
65-69	2250000	2550000	134000	166000	300000	12
70-74	2292000	2536000	91000	153000	244000	10
75-79	2065000	2257000	66000	126000	191000	8
Total	50522000	60569000	4701000	5347000	10047000	13

Table II.9 Germany

Age	Population		Difference		total	Difference in %
	projected	observed	males	females		
0-4	2551000	3504000	489000	465000	954000	22
5-9	3012000	3901000	455000	434000	889000	18
10-14	3176000	4036000	441000	419000	861000	16
15-19	3828000	4762000	479000	456000	935000	16
20-24	3788000	4848000	522000	538000	1061000	20
25-29	3789000	4919000	554000	576000	1130000	21
30-34	3694000	4791000	549000	547000	1096000	22
35-39	5272000	6397000	592000	534000	1126000	17
40-44	6206000	7212000	556000	451000	1006000	14
45-49	5658000	6532000	466000	407000	874000	13
50-54	4971000	5701000	365000	365000	730000	13
55-59	4502000	5107000	306000	299000	605000	12
60-64	3963000	4304000	194000	147000	341000	8
65-69	5177000	5459000	166000	117000	283000	5
70-74	3732000	3972000	131000	110000	240000	6
75-79	2841000	3063000	115000	107000	223000	7
Total	66160000	78508000	6380000	5972000	12354000	13

Table II.10 Hungary

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	473000	482000	5000	4000	9000	2
5-9	488000	484000	-3000	-1000	-4000	-1
10-14	580000	564000	-9000	-7000	-16000	-3
15-19	622000	624000	1000	1000	2000	0
20-24	616000	662000	22000	24000	46000	7
25-29	755000	788000	18000	15000	33000	4
30-34	838000	823000	-8000	-6000	-14000	-2
35-39	722000	717000	-4000	-1000	-5000	-1
40-44	609000	607000	-5000	3000	-2000	0
45-49	660000	657000	-7000	4000	-3000	0
50-54	821000	801000	-15000	-5000	-19000	-2
55-59	699000	686000	-9000	-4000	-13000	-2
60-64	567000	565000	-2000	0	-2000	0
65-69	477000	487000	5000	6000	11000	2
70-74	402000	415000	6000	7000	13000	3
75-79	328000	340000	5000	6000	11000	3
Total	9657000	9702000	0	46000	47000	13

Table II.11 Ireland

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	310000	310000	0	0	-1000	-1
5-9	303000	294000	-5000	-4000	-9000	-3
10-14	279000	275000	-3000	-2000	-4000	-2
15-19	291000	287000	-2000	-1000	-3000	-1
20-24	298000	348000	14000	36000	50000	14
25-29	349000	398000	23000	26000	49000	12
30-34	342000	355000	6000	8000	14000	4
35-39	336000	329000	-2000	-4000	-7000	-2
40-44	290000	304000	7000	8000	14000	5
45-49	254000	278000	14000	10000	24000	9
50-54	240000	251000	7000	5000	11000	4
55-59	219000	226000	5000	2000	7000	3
60-64	187000	188000	2000	-1000	1000	1

Table continued on the next page

Table II.11 (continued)

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
65-69	140000	143000	3000	0	3000	2
70-74	115000	119000	2000	2000	4000	3
75-79	88000	92000	2000	2000	4000	4
Total	4041000	4197000	73000	87000	157000	13

Table II.12 Italy

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	2698000	2776000	39000	39000	78000	8
5-9	2637000	2747000	56000	53000	110000	5
10-14	2679000	2799000	58000	62000	120000	5
15-19	2812000	2941000	66000	63000	130000	5
20-24	2942000	3110000	74000	93000	168000	5
25-29	3372000	3676000	134000	171000	305000	8
30-34	4199000	4533000	147000	188000	335000	7
35-39	4481000	4801000	147000	173000	320000	7
40-44	4567000	4825000	112000	146000	258000	5
45-49	4039000	4213000	59000	115000	174000	4
50-54	3798000	3799000	-38000	38000	0	0
55-59	4004000	3827000	-134000	-43000	-177000	-5
60-64	3279000	3292000	-5000	18000	13000	0
65-69	3330000	3331000	10000	-8000	1000	0
70-74	2855000	2860000	28000	-22000	6000	0
75-79	2434000	2462000	32000	-4000	28000	1
Total	54126000	55992000	785000	1082000	1869000	13

Table II.13 Lithuania

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	157000	151000	-3000	-3000	-6000	-4
5-9	176000	171000	-2000	-2000	-4000	-3
10-14	211000	215000	2000	2000	5000	2
15-19	260000	266000	2000	3000	6000	2
20-24	263000	267000	2000	3000	5000	2
25-29	245000	227000	-8000	-10000	-18000	-8
30-34	248000	229000	-10000	-9000	-19000	-8
35-39	256000	248000	-5000	-2000	-8000	-3
40-44	253000	258000	1000	4000	5000	2
45-49	261000	262000	-1000	3000	2000	1
50-54	214000	210000	-3000	-1000	-4000	-2
55-59	191000	187000	-3000	-1000	-4000	-2
60-64	169000	165000	-3000	-1000	-4000	-2
65-69	159000	164000	3000	1000	4000	3
70-74	144000	144000	1000	-2000	0	0
75-79	116000	115000	1000	-1000	-1000	-1
Total	3323000	3279000	-26000	-16000	-41000	13

Table II.14 Netherlands

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	801000	967000	84000	82000	166000	15
5-9	875000	1006000	66000	65000	131000	12
10-14	879000	986000	54000	52000	107000	10
15-19	889000	998000	56000	53000	109000	10
20-24	821000	966000	70000	76000	145000	14
25-29	833000	989000	70000	86000	156000	15
30-34	925000	1068000	62000	81000	143000	13
35-39	1192000	1295000	47000	57000	104000	8
40-44	1210000	1310000	47000	53000	100000	8
45-49	1137000	1236000	45000	53000	98000	8
50-54	1060000	1132000	32000	41000	73000	6
55-59	1072000	1111000	19000	20000	39000	4
60-64	911000	925000	9000	4000	13000	1

Table continued on the next page

Table II.14 (continued)

Age	Population		Differences			Difference
	projected	observed	males	females	totals	in %
65-69	696000	707000	7000	4000	11000	2
70-74	576000	585000	3000	6000	9000	2
75-79	467000	475000	2000	5000	8000	2
Total	14344000	15756000	673000	738000	1412000	13

Table II.15 Poland

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	1903000	1790000	-56000	-57000	-113000	-6
5-9	2038000	1917000	-65000	-56000	-121000	-6
10-14	2421000	2316000	-59000	-46000	-105000	-5
15-19	2807000	2788000	-14000	-4000	-19000	-1
20-24	3312000	3286000	-30000	3000	-26000	-1
25-29	3329000	3118000	-121000	-90000	-211000	-7
30-34	3117000	2849000	-149000	-119000	-269000	-9
35-39	2574000	2416000	-83000	-75000	-158000	-7
40-44	2558000	2431000	-62000	-64000	-127000	-5
45-49	3057000	2896000	-82000	-79000	-162000	-6
50-54	3186000	3012000	-89000	-86000	-175000	-6
55-59	2712000	2604000	-54000	-54000	-108000	-4
60-64	1649000	1587000	-30000	-32000	-62000	-4
65-69	1529000	1504000	-2000	-23000	-25000	-2
70-74	1418000	1388000	-9000	-20000	-29000	-2
75-79	1158000	1137000	-6000	-15000	-21000	-2
Total	38768000	37039000	-911000	-817000	-1731000	13

Table II.16 Portugal

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	674000	548000	-65000	-61000	-126000	-23
5-9	739000	546000	-102000	-91000	-193000	-35
10-14	726000	544000	-96000	-86000	-181000	-33
15-19	749000	586000	-86000	-77000	-163000	-28
20-24	817000	679000	-74000	-64000	-137000	-20
25-29	955000	793000	-89000	-73000	-162000	-20
30-34	1032000	848000	-98000	-86000	-185000	-22
35-39	1051000	790000	-136000	-125000	-261000	-33
40-44	992000	787000	-111000	-94000	-205000	-26
45-49	877000	748000	-69000	-60000	-129000	-17
50-54	794000	685000	-60000	-49000	-109000	-16
55-59	765000	648000	-63000	-54000	-117000	-18
60-64	681000	570000	-55000	-56000	-111000	-20
65-69	567000	516000	-15000	-36000	-51000	-10
70-74	507000	492000	1000	-17000	-15000	-3
75-79	385000	388000	8000	-5000	3000	1
Total	12311000	10168000	-1110000	-1034000	-2142000	13

Table II.17 Slovakia

Age	Population		Difference			Difference
	projected	observed	males	females	total	in %
0-4	272000	263000	-5000	-5000	-10000	-4
5-9	290000	275000	-8000	-7000	-15000	-6
10-14	350000	333000	-9000	-8000	-17000	-5
15-19	412000	399000	-6000	-6000	-12000	-3
20-24	449000	443000	-3000	-3000	-6000	-1
25-29	477000	468000	-4000	-5000	-9000	-2
30-34	467000	447000	-9000	-11000	-20000	-5
35-39	386000	365000	-11000	-10000	-21000	-6
40-44	397000	380000	-11000	-7000	-18000	-5
45-49	408000	391000	-9000	-8000	-17000	-4
50-54	420000	404000	-9000	-6000	-15000	-4
55-59	342000	343000	1000	1000	2000	1
60-64	255000	243000	-6000	-6000	-12000	-5

(Table continued on the next page)

Table II.17 (continued)

Age	Population		Difference		total	Difference in %
	projected	observed	males	females		
65-69	208000	201000	-4000	-4000	-8000	-4
70-74	171000	167000	-2000	-2000	-4000	-3
75-79	135000	136000	1000	1000	1000	1
Total	5439000	5258000	-94000	-86000	-181000	13

Table II.18 Spain

Age	Population		Difference		total	Difference in %
	projected	observed	males	females		
0-4	1752000	2289000	274000	263000	537000	13
5-9	1759000	2096000	166000	171000	337000	12
10-14	1832000	2074000	113000	128000	242000	10
15-19	1740000	2286000	430000	116000	546000	9
20-24	1767000	2825000	839000	219000	1059000	15
25-29	2103000	3680000	1247000	330000	1577000	18
30-34	3256000	3936000	373000	308000	680000	16
35-39	3116000	3721000	317000	288000	605000	16
40-44	3123000	3520000	192000	205000	397000	11
45-49	2928000	3176000	104000	144000	248000	8
50-54	2565000	2722000	66000	91000	157000	6
55-59	2352000	2494000	38000	104000	142000	6
60-64	2027000	2248000	96000	125000	222000	10
65-69	1609000	1851000	100000	142000	242000	13
70-74	1754000	1921000	50000	117000	167000	9
75-79	1439000	1627000	38000	150000	189000	12
Total	35122000	42466000	4443000	2901000	7347000	13

Table II.19 Sweden

Age	Population		Difference			Difference in %
	projected	observed	males	females	total	
0-4	353000	513000	82000	78000	160000	18
5-9	344000	468000	64000	60000	124000	16
10-14	458000	569000	56000	55000	111000	13
15-19	521000	620000	51000	48000	99000	14
20-24	432000	542000	55000	54000	109000	18
25-29	431000	548000	58000	59000	117000	20
30-34	498000	602000	51000	52000	104000	16
35-39	547000	631000	42000	43000	85000	13
40-44	573000	656000	43000	40000	83000	13
45-49	506000	584000	39000	39000	78000	13
50-54	512000	581000	34000	36000	69000	12
55-59	562000	613000	26000	25000	51000	8
60-64	588000	605000	8000	9000	17000	3
65-69	426000	433000	1000	6000	7000	2
70-74	342000	349000	1000	6000	7000	2
75-79	304000	310000	1000	5000	6000	2
Total	7397000	8624000	612000	615000	1227000	13

Table II.20 United Kingdom

Age	Population		Difference			Difference in %
	projected	observed	males	females	total	
0-4	2949000	3544000	304000	291000	595000	9
5-9	3175000	3457000	141000	141000	282000	5
10-14	3578000	3728000	75000	74000	149000	3
15-19	3793000	4006000	116000	97000	213000	5
20-24	3591000	4082000	242000	249000	491000	12
25-29	3480000	3911000	180000	251000	431000	11
30-34	3617000	3967000	129000	220000	349000	9
35-39	4395000	4566000	23000	148000	171000	4
40-44	4586000	4689000	-16000	118000	102000	2
45-49	4157000	4200000	-36000	80000	44000	1
50-54	3704000	3706000	-39000	41000	2000	0
55-59	3893000	3829000	-49000	-15000	-64000	-2
60-64	3429000	3362000	-50000	-18000	-68000	-2

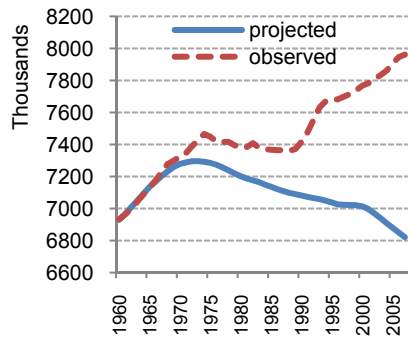
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Table II.20 (continued)

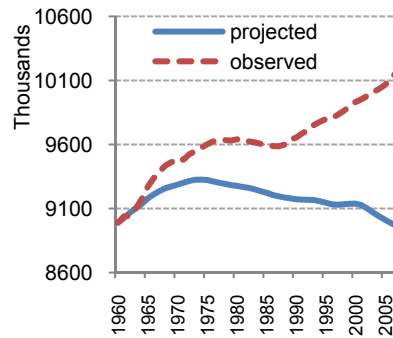
Age	Population		Difference		total	Difference in %
	projected	observed	males	females		
65-69	2728000	2694000	-29000	-5000	-34000	-1
70-74	2350000	2349000	-8000	8000	-1000	0
75-79	1960000	1966000	0	5000	5000	0
Total	55385000	58056000	983000	1685000	2667000	13

Figure II.1 Projected and observed population change from the initial year indicated in table II.A to January 1, 2007.

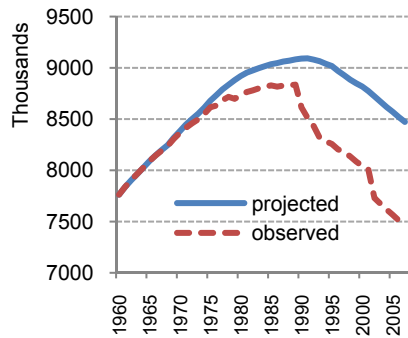
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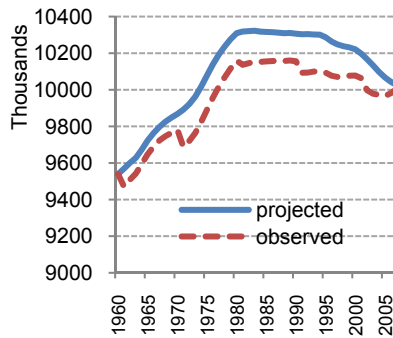
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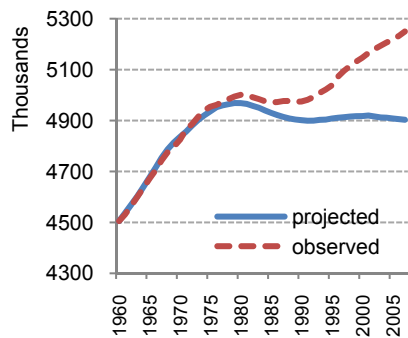
Bulgaria



Czech Republic



Denmark



Estonia

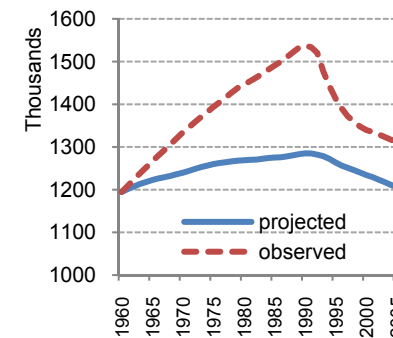
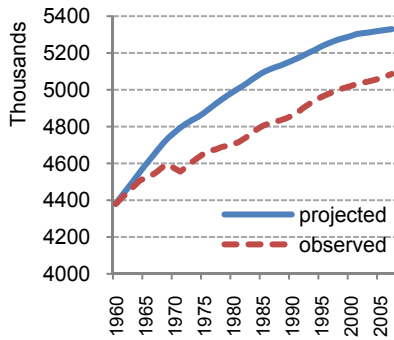


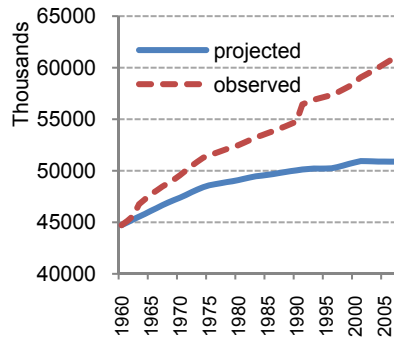
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Figure II.1 (continued)

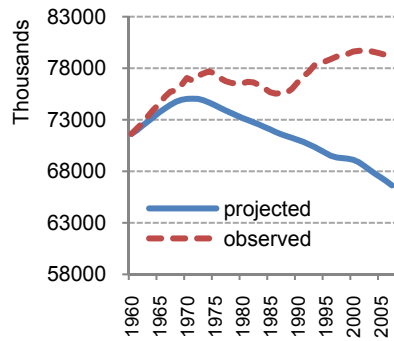
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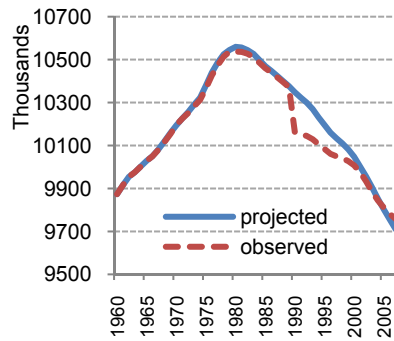
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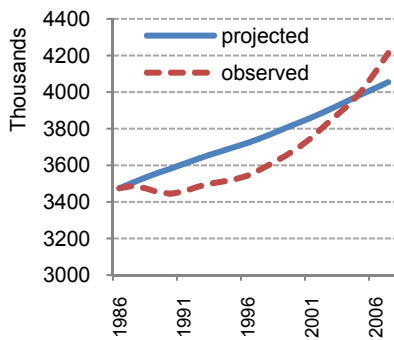
Germany



Hungary



Ireland



Italy

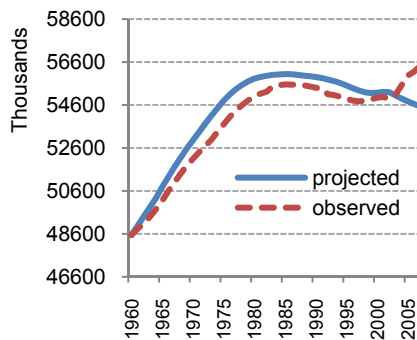
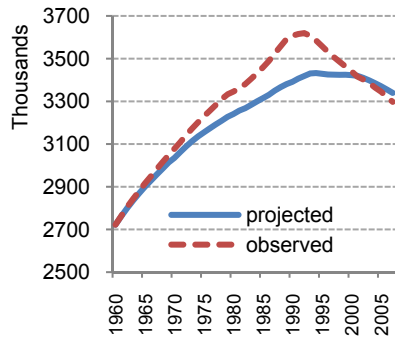


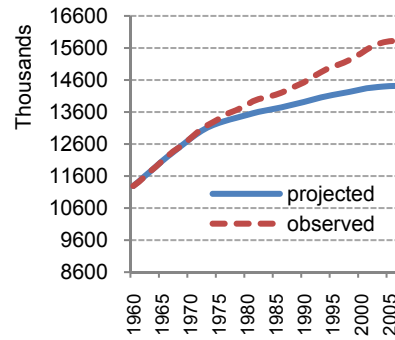
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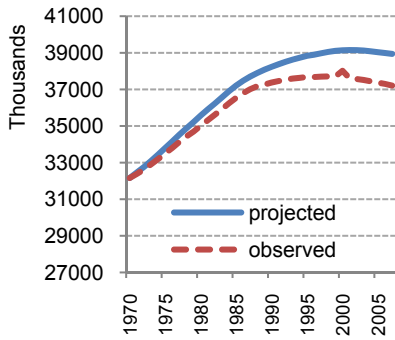
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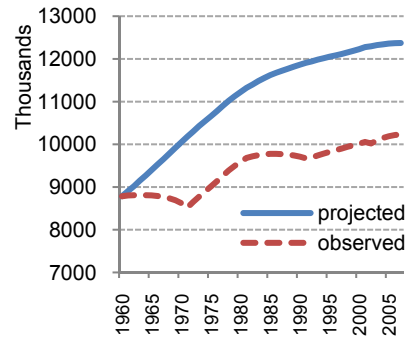
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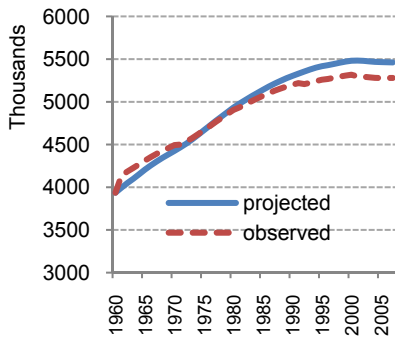
Poland



Portugal



Slovakia



Spain

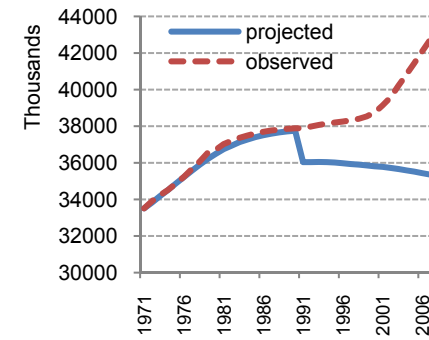
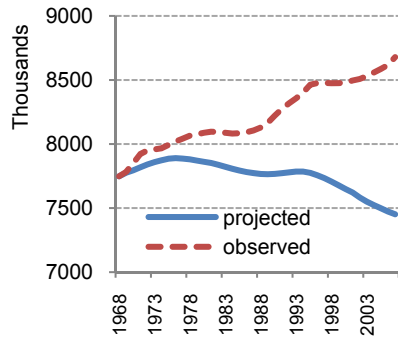


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Figure II.1 (continued)

Sweden



United Kingdom

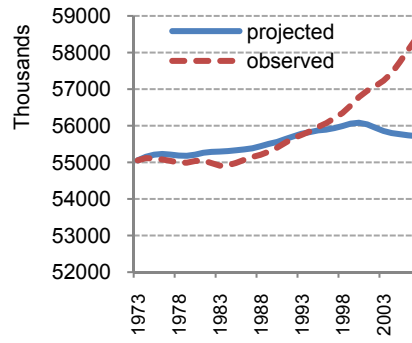
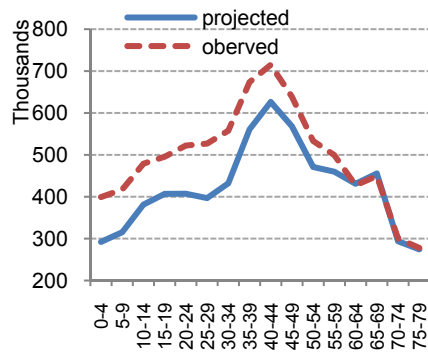
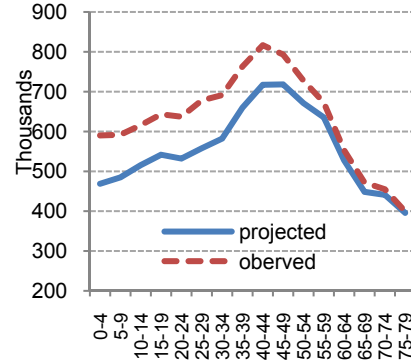


Figure II.2 Projected and observed population on January 1st 2007, by age group.

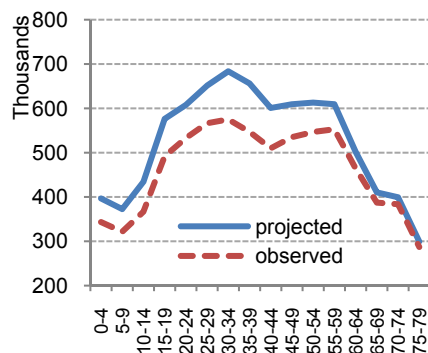
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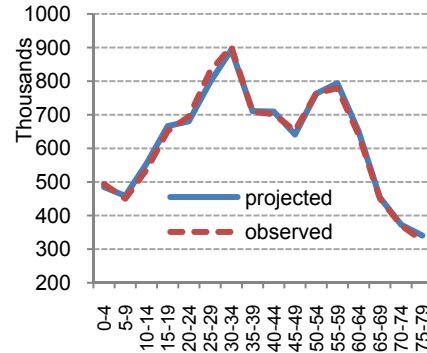
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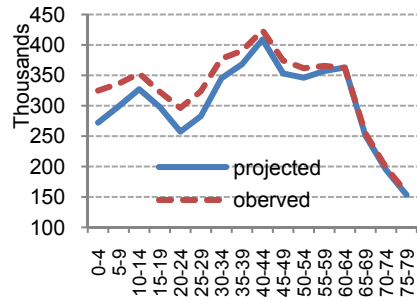
Bulgaria



Czech Republic



Denmark



Estonia

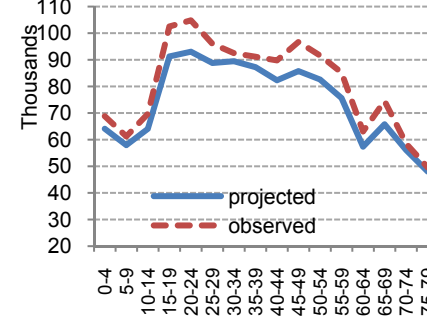
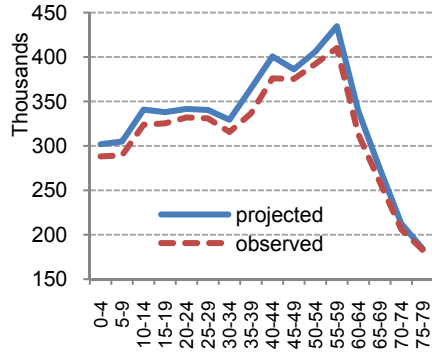


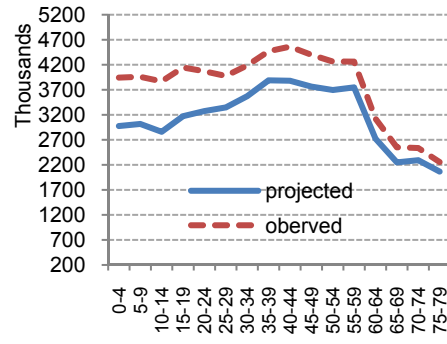
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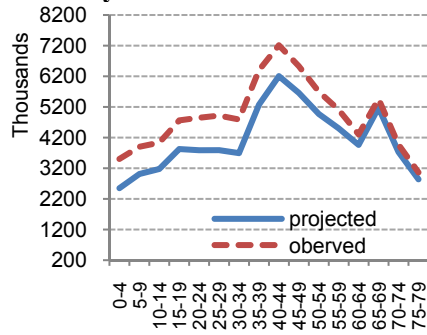
Finland



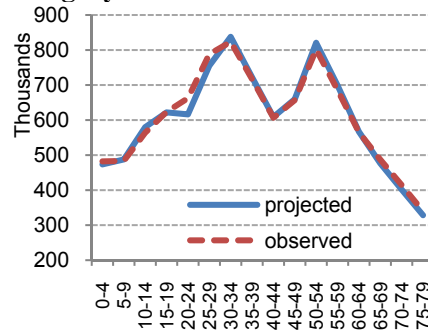
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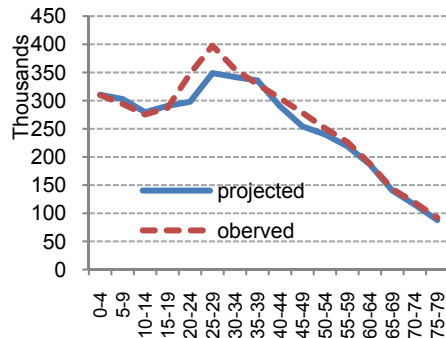
Germany



Hungary



Ireland



Italy

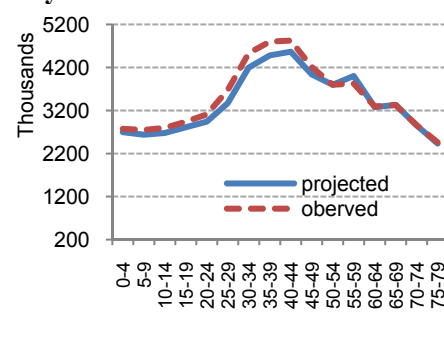
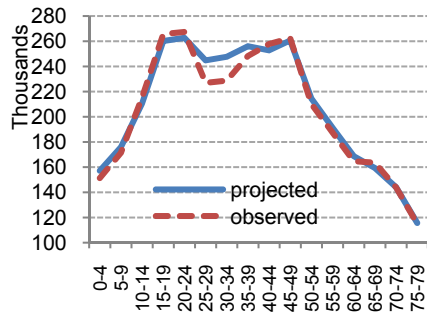


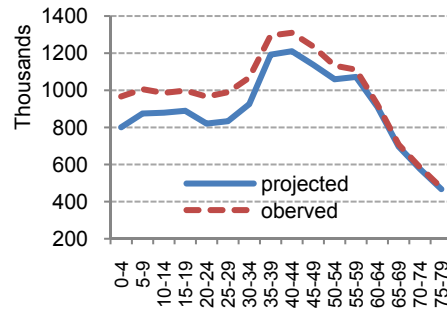
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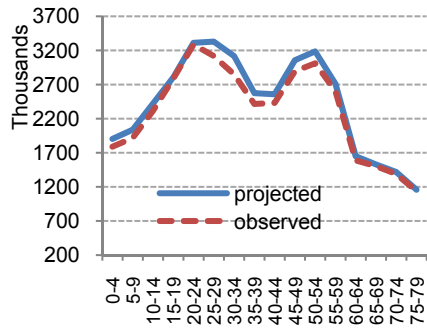
Lithuania



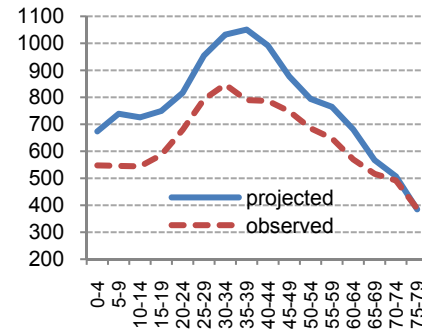
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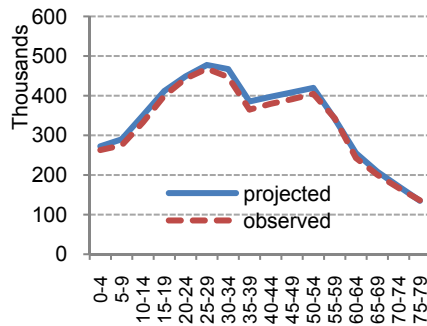
Poland



Portugal



Slovakia



Spain

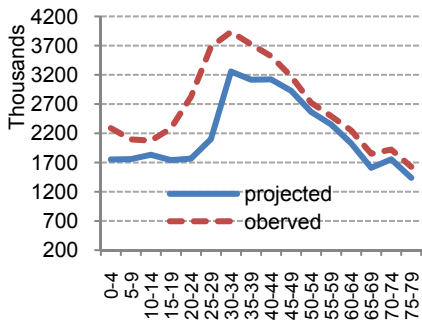
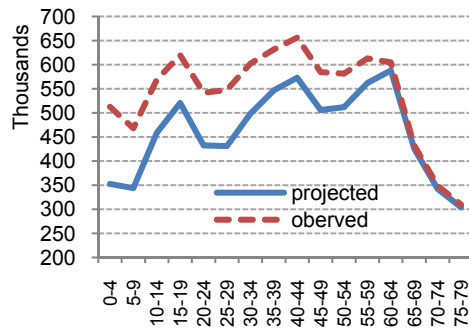


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Figure II.2 (continued)

Sweden



United Kingdom

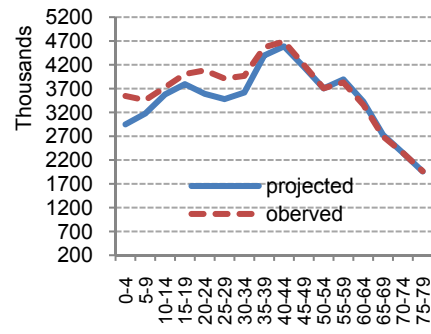
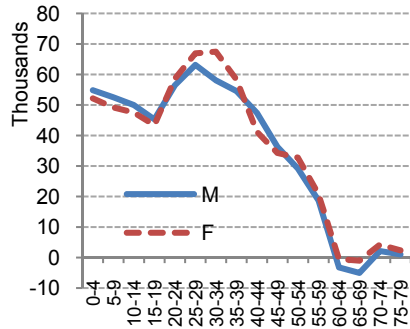
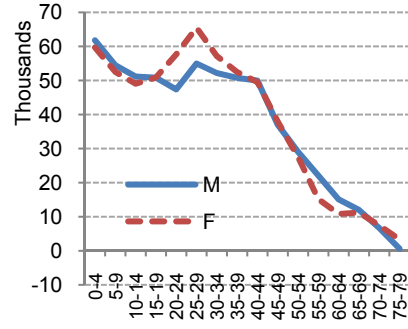


Figure II.3 Difference between projected and observed populations, by age group.

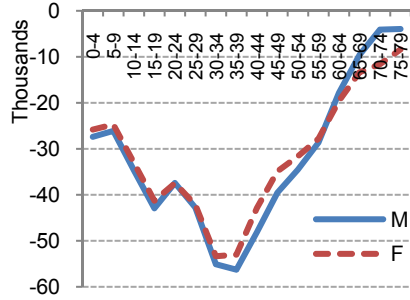
Austria



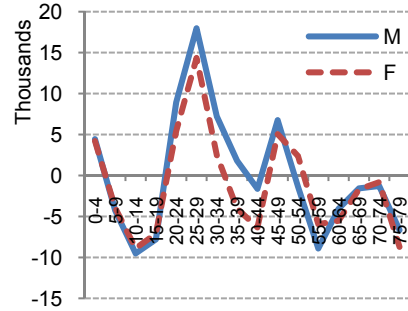
Belgium



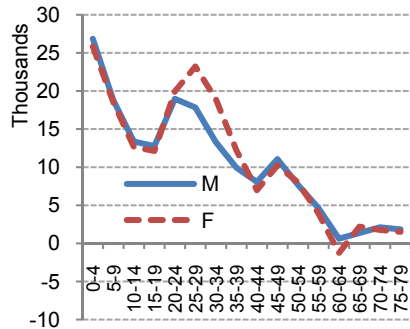
Bulgaria



Czech Republic



Denmark



Estonia

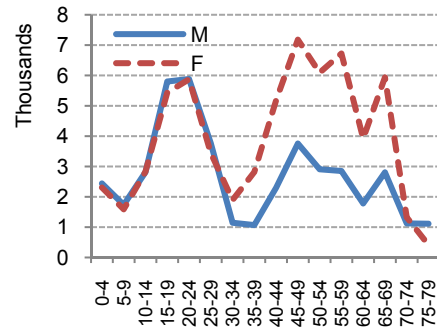
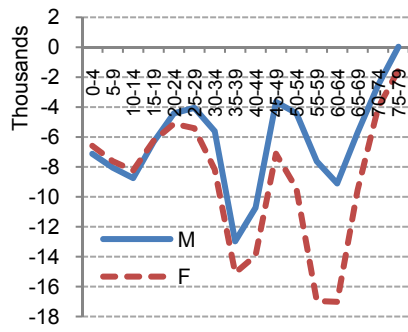


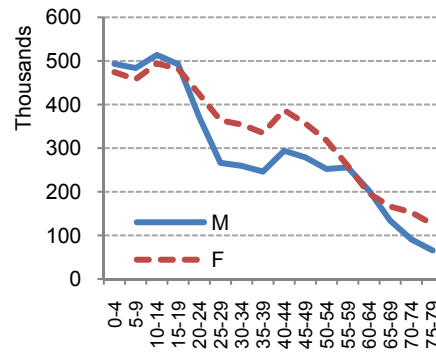
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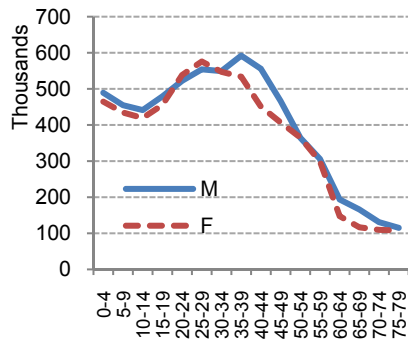
Finland



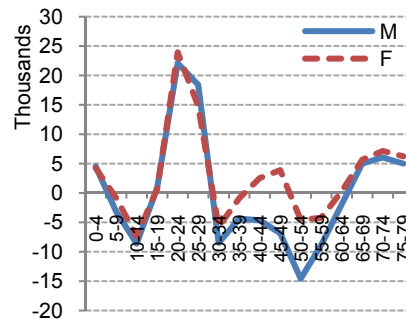
France



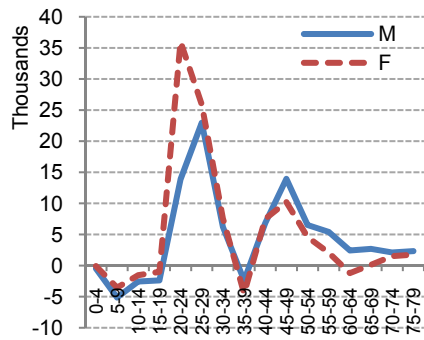
Germany



Hungary



Ireland



Italy

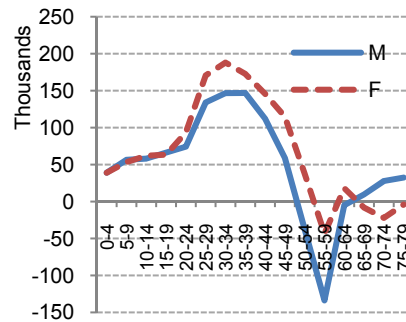
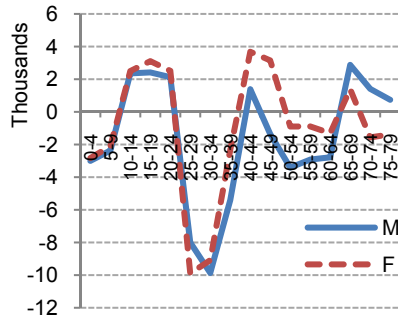


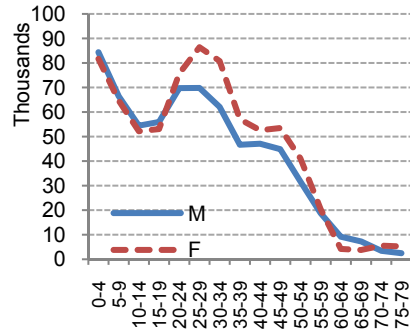
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Figure II.3 (continued)

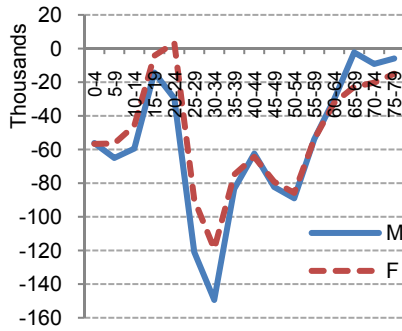
Lithuania



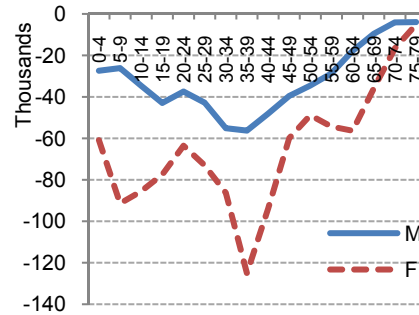
Netherlands



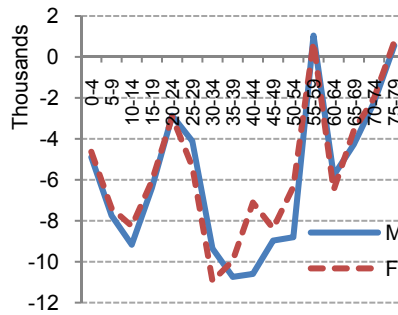
Poland



Portugal



Slovakia



Spain

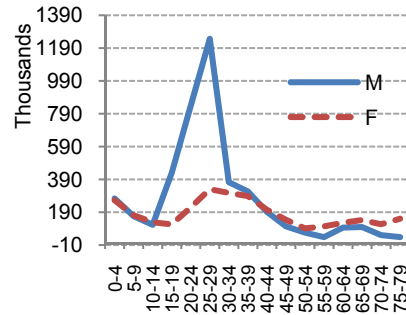
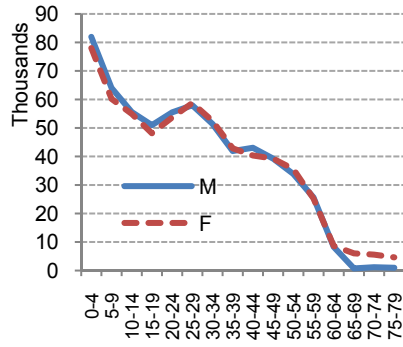


Figure II.3 continued on the next page

Figure II.3 (continued)

Sweden



United Kingdom

