

Population Projections for non EU / non EFTA Countries in Europe

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Abstract

In this study we develop population projections for the non EU/non EFTA countries in Europe. The natural population dynamics recently observed in these countries are moving in a similar direction as in the rest of Europe, even though there is significant, country-specific heterogeneity regarding the intensity and timing of these changes. Contrary to other European countries, the majority of these countries will see a favourable period in terms of the characteristics of their population age profiles in the near future. With a low share of young and elderly populations on the one hand, and a prominent working-age population on the other hand, this demographic window could trigger socio-economic development. Yet this situation will only prevail during a short period, until the dependency ratio once more increases as the ageing process advances, which also seems to be an item on the future demographic agenda of these countries.

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 only limited review.

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1 INTRODUCTION

Demographic changes observed across European countries during the recent decades went in the same direction. Nevertheless, there is still cross-country heterogeneity in the intensity of these demographic changes and in the consequences they produce. Fertility decline and postponement are general phenomena, though with significant country-level specificities. The base of the population pyramid shrinks all across Europe, yet the European countries find themselves at different stages of the ageing process. Finally, gains in life expectancy at birth are also registered regularly, even though there are differences in levels both between men and women and between countries. In particular mortality decline is often hampered by changes in the socio-economic context and health care systems. This applies to many formerly socialist countries, where life expectancy at birth declined during the last decade.

In the present study, we develop population projections for the European non EU/non EFTA countries taken into account in demographic publications by the Council of Europe. Based on these projections, we try to gain further insight into the future demographic developments in Europe, with a special focus on the changes in population age profiles. Our population projections cover the following countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, the Former Yugoslav Republic of Macedonia, Moldova, Romania, Russia, Serbia & Montenegro, Turkey and the Ukraine.

2 POPULATION PROJECTIONS: METHOD AND ASSUMPTIONS

We use the standard cohort-component model to project the population by age and sex for each of the countries covered by the study. The data for the 2004 base-year population, fertility and mortality are derived from the UN. The base-year population, as well as the fertility and mortality age schedules are estimated for single years of age using age

interpolation. The shape of the age-specific fertility curve is kept constant throughout the projection period.

The basic projection assumptions are summarised in Table 1. We use the tempo-adjusted Total Fertility Rate (TFR) as target TFR for 2030.¹ From this year onwards, the TFR is kept constant. Life expectancy at birth is assumed to increase by two years per decade (Lutz et al. 1997 and 2001; Sanderson and Scherbov 2004), an assumption supported by Oeppen and Vaupel (2002). The Brass relational model is used to adjust life expectancy values. With regard to migration assumptions, we want to mention that migration is one of the most unpredictable demographic phenomena, not least because of its socio-political nature. Due to the high uncertainty of migration flow forecasts and the lack of appropriate and reliable time-series data on both net migration flows and net migration age profiles, we assume zero net migration for all the countries covered by the study, though we are aware that this assumption is unrealistic. The projected population can, nonetheless, give some valuable insights into the future population development resulting from natural population dynamics.

¹ The tempo-adjusted TFR is calculated on the basis of the Bongaarts-Feeney formula (Bongaarts and Feeney 1998), which uses fertility data by birth order. For countries for which no such data are available, the adjusted TFR is estimated on the basis of a regression relating the observed change in the mean age of childbearing to the size of the tempo effect. For more details on the calculation method see: www.populationeurope.org

Table 1 Base year total population, fertility and mortality assumptions.

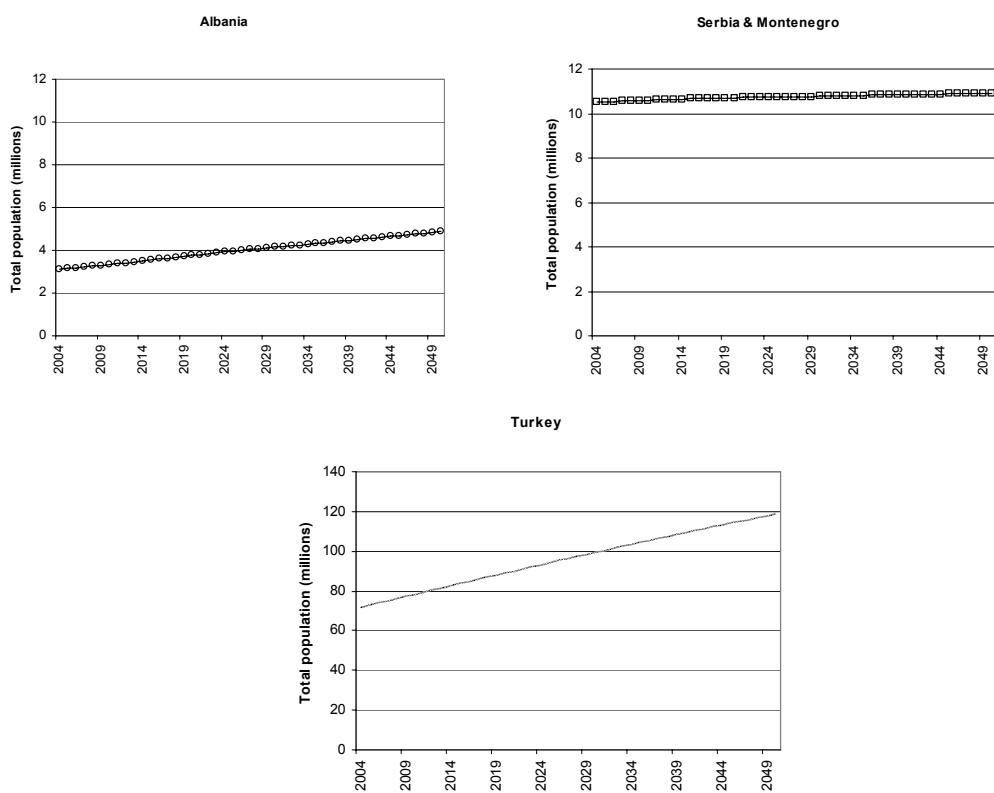
	Total population (millions), 2004	TFR, 2004	Female e0, 2004	Male e0, 2004	Adj. TFR, 2030	Female e0 (years), 2030	Male e0 (years), 2030
Albania	3.1	2.29	77.0	71.2	2.36	82.2	76.4
Armenia	3.0	1.34	75.1	68.4	1.46	80.3	73.6
Azerbaijan	8.4	1.84	70.8	63.5	1.69	76.0	68.7
Belarus	9.8	1.25	74.2	62.7	1.44	79.4	67.9
Bosnia-Herz.	3.9	1.33	77.0	71.6	1.58	82.2	76.8
Bulgaria	7.8	1.25	75.8	69.1	1.53	81.0	74.3
Croatia	4.5	1.36	78.6	71.6	1.64	83.8	76.8
Georgia	4.5	1.50	74.6	66.8	1.81	79.8	72.0
Moldova	4.2	1.25	71.4	64.1	1.65	76.6	69.3
Romania	21.8	1.28	75.2	68.1	1.58	80.4	73.3
Russian Fed.	143.9	1.34	72.5	59.4	1.53	77.7	64.6
Serbia & Montenegro	10.5	1.68	76.0	71.3	2.08	81.2	76.5
TFYR Macedonia	2.0	1.56	76.5	71.6	2.03	81.7	76.8
Turkey	72.2	2.46	71.2	66.6	2.44	76.4	71.8
Ukraine	47.0	1.13	72.9	60.5	1.36	78.1	65.7

3 RESULTS

If we consider the population projections up to the end of the projection horizon, i.e. the year 2050, the decline of the total population size is well-spread but not yet a general phenomenon across Europe. As far as natural dynamics are concerned, population inertia will prevent a population decline in some countries in the next fifty years. Among the non EU/non EFTA countries, in particular Albania, Serbia & Montenegro and Turkey will experience a continuous increase in the size of their total populations (Figure 1). In Albania, natural population dynamics will increase the total population from 3.1 million in 2004 to 4.1 and 4.9 in 2030 and 2050 respectively. For Serbia & Montenegro, the figures are 10.8 million

inhabitants in 2030 and 10.9 million in 2050, thus showing that the process of a positive natural population change will slow down. Turkey displays a similar trend: its total population size will grow to 99.7 million people in 2030 and 119.1 million in 2050.

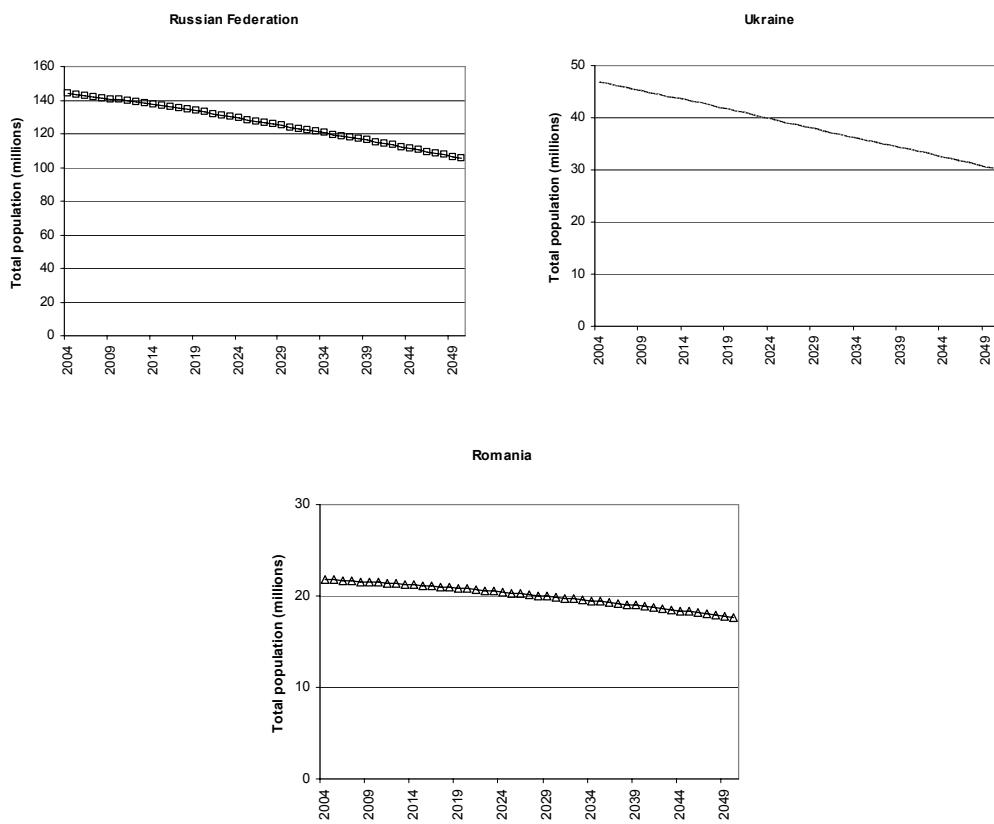
Figure 1 Total population (millions): Albania, Serbia & Montenegro, Turkey; period 2004-2050.



Other European countries already experienced a decline in their population size or will do so within the projected period. Among the top three countries in terms of total population size, the Russian population will decrease further to 123.9 and 105.4 million inhabitants in 2030 and 2050

respectively; the figures for the total population in the Ukraine are 37.7 million people in 2030 and 30.4 million in 2050; in Romania, the total population will decline from 21.8 million people in 2004 to 19.9 in 2030 and 17.6 in 2050 (Figure 2). It is clear that all these figures might be influenced by migration dynamics, which is an important component in future demographic developments and might accelerate or slow down the observed trends.

Figure 2 Total population (millions): Russian Federation, Ukraine, Romania; period 2004-2050.



In order to gain better insight into how the current age-structure characteristics of the population determine future population growth, we calculated the population momentum for all countries covered by this study. Table 2 shows that a momentum larger than one is found in countries with a young age structure, such as Albania, Azerbaijan and Turkey. If we assume fertility at replacement level, these countries will continue to grow up to a total population size that is around 35 percent higher than their current one, while some others such as Georgia, Moldova and Serbia & Montenegro will not experience significant changes in their total population size. In other countries, such as Bulgaria, the Ukraine and the Russian Federation, the marked population decline will continue and reduce the size of the present population by around 15 percent.

Table 2 Population momentum.

Albania	1.37
Armenia	1.20
Azerbaijan	1.35
Belarus	0.89
Bosnia-Herzegovina	0.95
Bulgaria	0.82
Croatia	0.89
Georgia	1.04
Republic of Moldova	1.05
Romania	0.93
Russian Federation	0.87
Serbia & Montenegro	0.99
TFYR Macedonia	1.08
Turkey	1.37
Ukraine	0.84

Compared to the average EU level, the indicator for the population median age is relatively low in these countries. In 2004 Turkey, Azerbaijan and Albania registered the lowest median ages, below 30, while the Ukraine,

Croatia and Bulgaria had the highest median ages (around 40 years) (Table 3). In 2030, the country ranking will change slightly and Bosnia-Herzegovina will be one of the top three countries with the highest median age, i.e., 45+. In comparison, the median age for the EU-25 countries will most likely grow from 39.3 years in 2004 to 46.9 in 2030 (Scherbov and Mamolo 2006), an increase comparable to that found in the countries with the highest median ages.

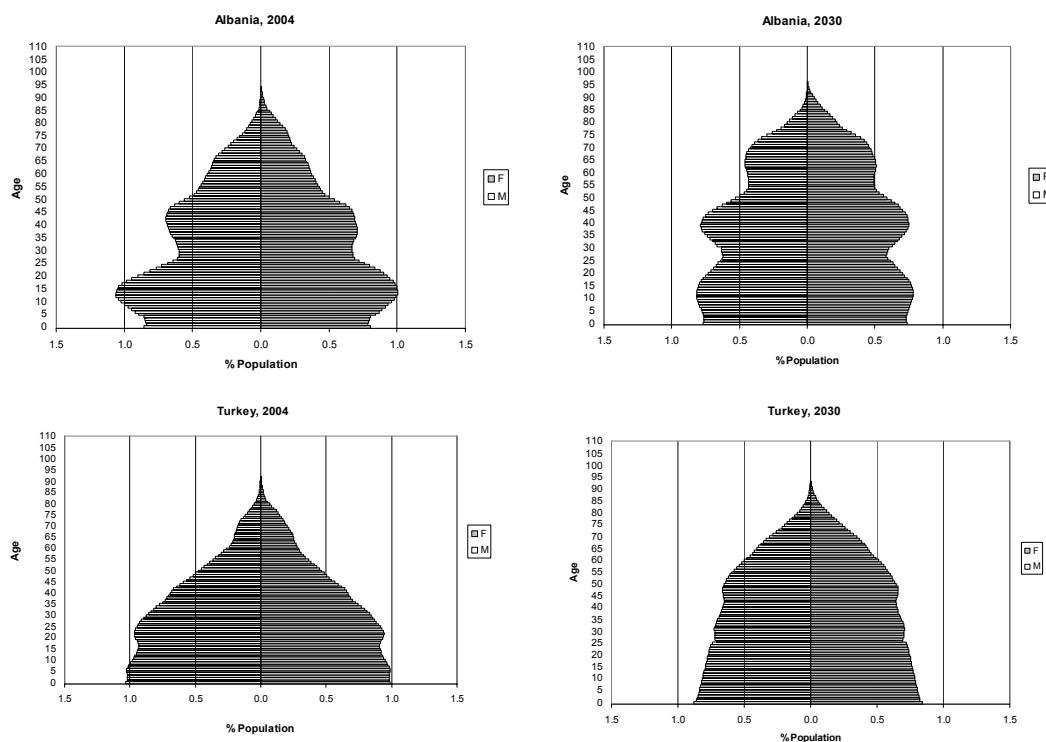
Table 3 Population median age. Country ranking; years 2004 and 2030.

Country ranking		2004		2030
1.	Turkey	26.0	Turkey	32.2
2.	Azerbaijan	27.0	Albania	34.7
3.	Albania	28.0	Azerbaijan	38.7
4.	Armenia	31.4	Serbia & Montenegro	42.0
5.	Moldova	32.6	TFYR Macedonia	42.1
6.	TFYR Macedonia	33.9	Armenia	42.2
7.	Georgia	35.3	Georgia	42.3
8.	Serbia & Montenegro	36.3	Moldova	42.7
9.	Romania	36.3	Russian Federation	44.3
10.	Russian Federation	37.2	Belarus	45.0
11.	Bosnia-Herzegovina	37.6	Ukraine	45.6
12.	Belarus	37.6	Romania	45.9
13.	Ukraine	38.8	Bosnia-Herzegovina	46.5
14.	Croatia	40.4	Croatia	46.9
15.	Bulgaria	40.4	Bulgaria	48.0

This suggests that the population age structure of the countries covered by this study still prevents some of them from ageing quickly and profoundly. However, this is also partly due to the low life expectancy in some of these countries. In Russia or the Ukraine, 50 percent of the male population die before they reach age 60.

Regarding the population age pyramid for the two countries with the youngest age profile, namely Albania and Turkey, it can be noted that both of them show a large pyramid basis in 2004, although the youngest age groups are already noticeably shrinking in Albania. However, according to the fertility and mortality assumptions, by 2030, the proportion of people at younger ages will, nevertheless, have decreased in favour of the adult and older groups in both populations (Figure 3).

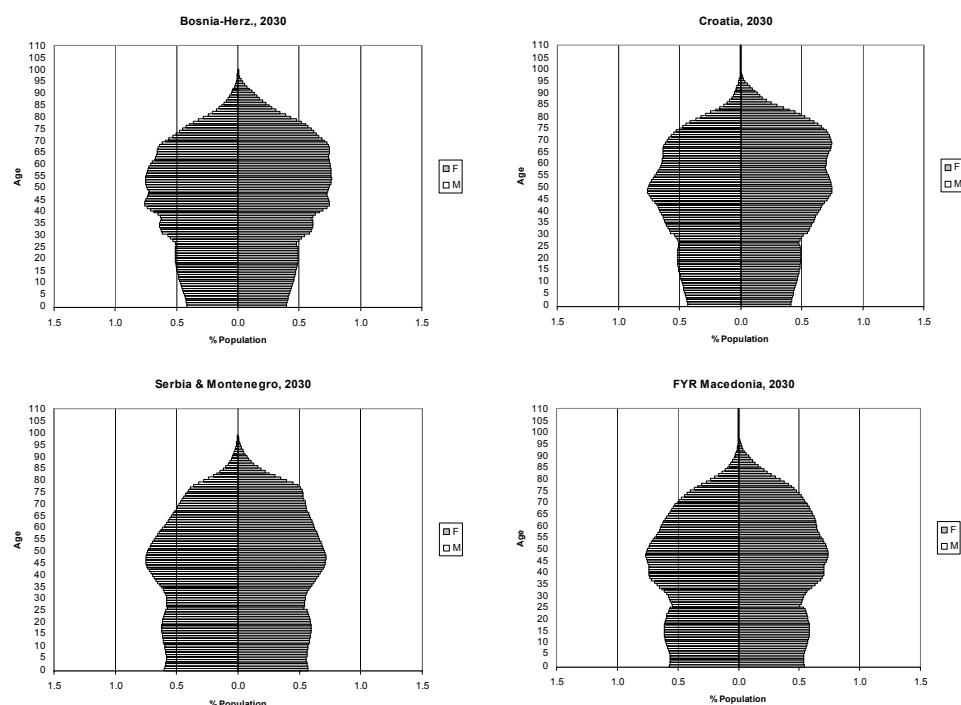
Figure 3 Population age pyramid (%): Albania and Turkey; years 2004 and 2030.



The population pyramid in the four former Yugoslav republics covered by this study show that the decrease in the number of births has

affected these countries for some years and has reduced the younger age groups. In the next 25 years, the natural population dynamics will thus produce an older population (Figure 4) and the age profile will be similar to that observed in many Member States of the EU.

Figure 4 Population age pyramid (%): Bosnia-Herzegovina, Croatia, Serbia & Montenegro, FYR Macedonia; year 2030.



The reduction of births also affected the former USSR republics' age profile in the past 15 years. Azerbaijan, Belarus, the Russian Federation and the Ukraine all have noticeably shrinking cohorts aged less than 15 years, and already in 2030 we can see how larger cohorts move upwards in the population pyramid (Figure 5).

Figure 5 Population age pyramid (%): Azerbaijan, Belarus, Russian Federation, the Ukraine; years 2004 and 2030.

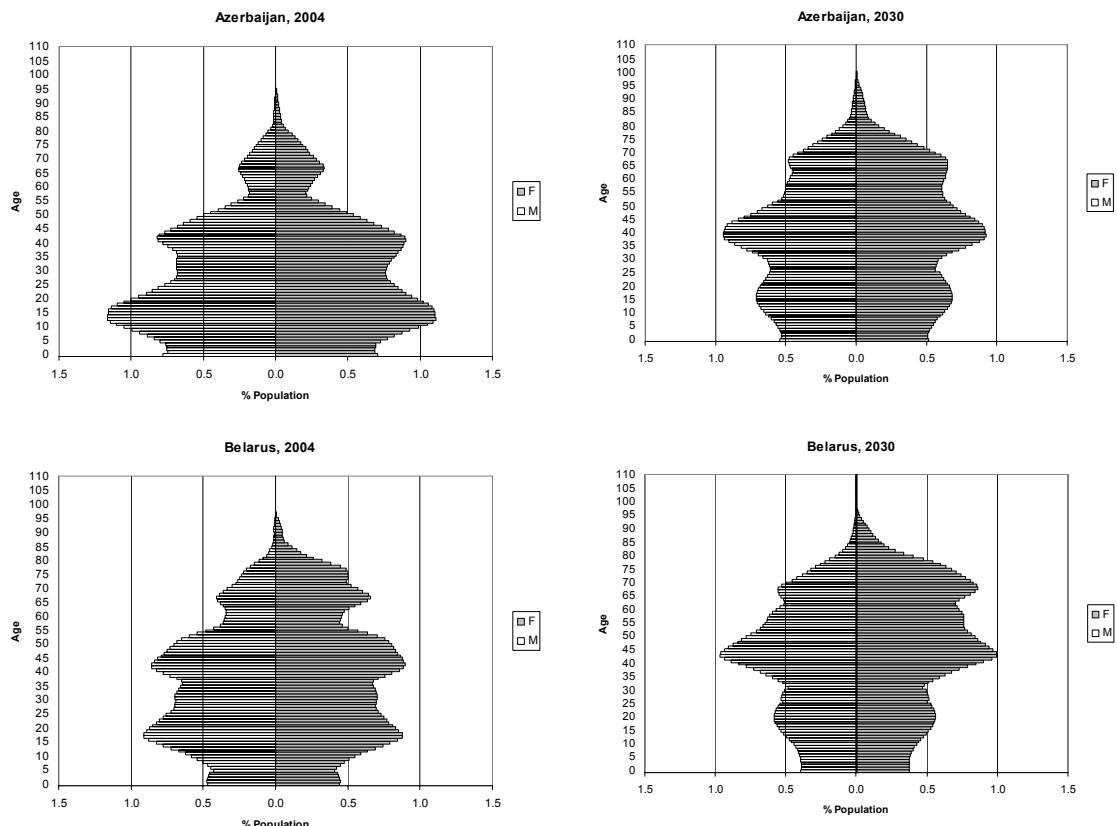
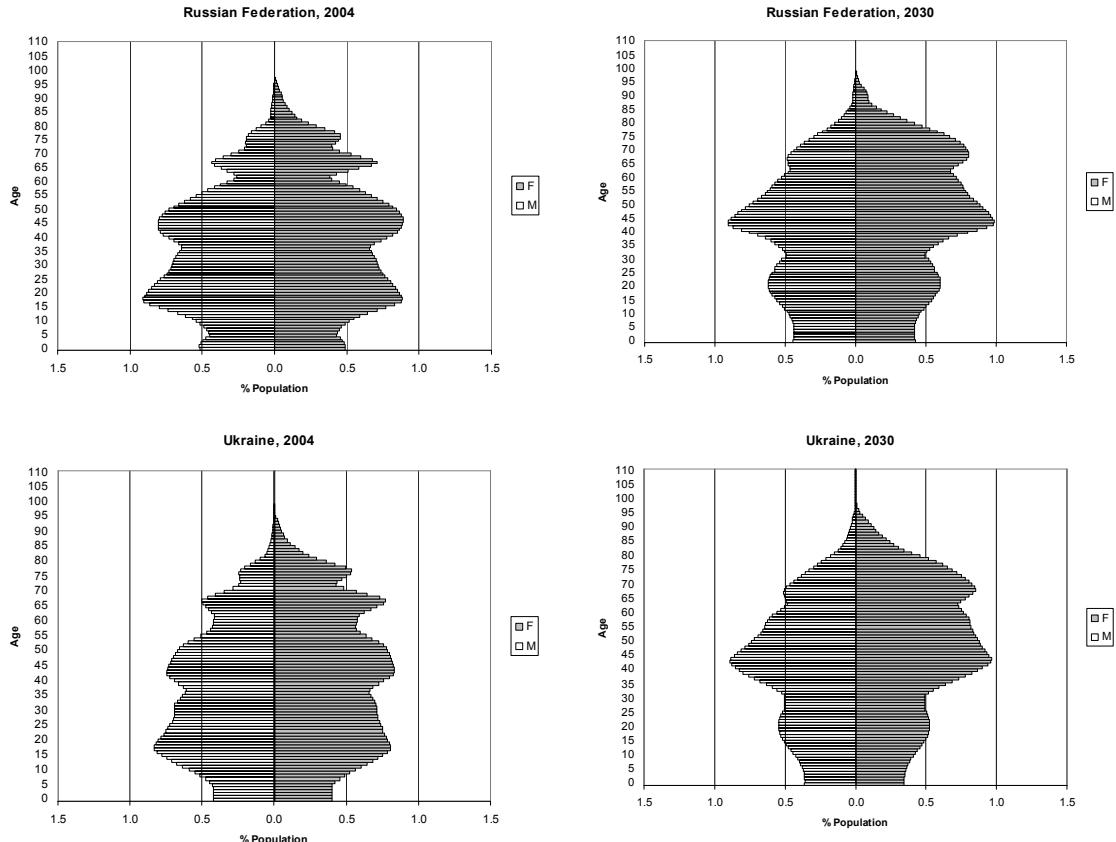


Figure 5 continued



Differences in the age composition of the population can also be summarised by taking a look at some other indicators of age structure.

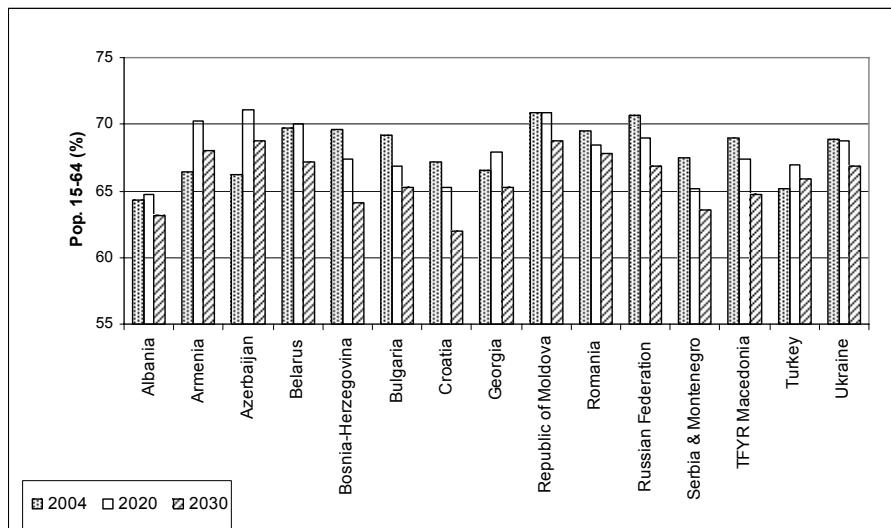
It has already been noted that Turkey and Albania have the youngest populations among the European non EU/non EFTA countries. In 2004, the share of people aged below 15 was 27.6 and 29.5 percent in Albania and Turkey respectively. By 2030, the same indicator decreases by around 16 percent in these two countries. In the majority of the other countries, the proportion of the population aged below 15 ranged between 15 and 20

percent in 2004. In 2030, the young population will have a share of 11 to 15 percent in most of these countries.

During the next ten years, the proportion of the working-age population will increase in all the countries we analysed, but it will decrease afterwards, suggesting that, in the long run, the ageing process might become a significant social burden also in these countries (Figure 6). However, in 2030, none of them will have a share of working-age population around the level of 61.3 percent, which will most likely be typical in the EU-25 by that date (Scherbov and Mamolo 2006). It might well be the case that some of these countries can still exploit the window of opportunity characterised by a prominent proportion of the population at working age and a shrinking share of people below 15. As mentioned above, the proportion of people below age 15 will clearly drop below 30 percent in the near future in all of the countries included in our study. Such a situation, combined with a still rather low and slowly growing proportion of elderly people² lowers the total dependency rate, which might favour socio-economic development. It is clear that such a favourable situation will merely persist for a short period, because the window of opportunity closes as soon as the process of population ageing once more inflates the dependency rate. As we can learn from examples taken from the past, it is advisable to introduce efficient socio-economic policies and to invest into the health and education systems in order to better exploit the opportunities offered by such a demographic window.

² In Albania, the proportion of people above 65 increases from 8.1 percent in 2004 to 10.5 in 2020; in Azerbaijan it rises from 6.9 percent in 2004 to 8.0 in 2020; in Turkey the share of the elderly increases from 5.4 to 7.1 percent during the same period.

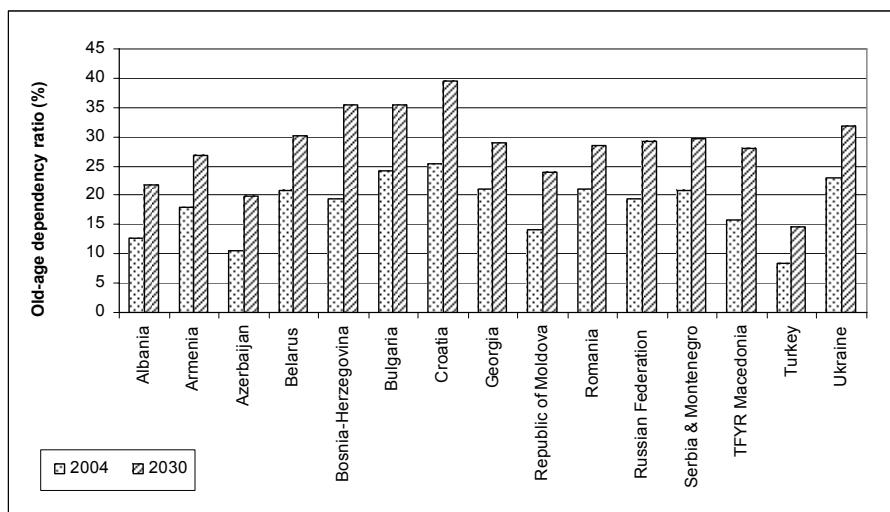
Figure 6 Working-age population (%); years 2004, 2020, 2030.



With regard to the old-age dependency ratio for these countries (Figure 7), the indicator increases during the projected period up to 2050, but there are clear and significant cross-country differences. In 2004, Croatia and Bulgaria registered the highest values of the indicator. In both countries, there is approximately one person aged 65 and above for every four persons of working age. As expected, the most favourable figure is found in Turkey with less than one person aged 65+ for every ten working-age persons. In 2030, in Croatia there will be approximately two persons older than 65 for every five people of working age. The figures for Bulgaria and Bosnia-Herzegovina are in the 35-percent range. In comparison, in the EU-25 context, Germany and Italy show the highest levels of the indicator suggesting that, in 2030, there will be 4.5 persons aged 65 and above for every ten persons of working age. Taking the EU-25 as a whole, the most likely scenario for 2030 indicates that there will be around 10 people of working age supporting four persons above the age of 65 (Scherbov and Mamolo 2006). Different population dynamics, both regarding intensity and timing, prevented the ageing process in these countries to be as pronounced

as in the EU. This is partly due to later fertility declines, but also significantly attributable to the persisting, low life expectancy at birth observed in many of the countries analysed in this study.

Figure 7 Old-age dependency ratio (%); years 2004, 2030.



Even though the ageing process is in an initial stage in many of these countries, it is interesting to take a look at the development of the proportion of elderly people, both those above 65 and aged 80 and above. In all the countries we analysed, both indicators will increase during the projection time horizon. By 2030, most of the countries in the Balkan region will have the highest share of people aged 80 and above. In 2030, almost 6 percent of the people will be above the age of 80 and 24 percent will be aged 65 and above in Croatia (Figures 8 and 9). In Bulgaria and Bosnia-Herzegovina, one person out of 20 will be older than 80 in 2030, and the proportion of those aged above 65 will be around 23 percent. In comparison, according to the Eurostat population projections for EU countries (which include migration dynamics), the maximum share of people aged 80+ will be around 8

percent (with the exception of Italy with a value of around 9 percent) in 2030. In this year, the proportion of persons aged 65 and above will be around 27.5 percent in the countries with the highest levels, namely Germany and Italy. On the other hand, the lowest levels for people aged 80 and above are around 5 percent, while persons aged 65 and above will be around one out of five in some countries in the best case. Thus there does not seem to be a clear division between non EU/non EFTA countries and the EU-25 Member States, since some of them show similar characteristics for some indicators of the population age structure.

Figure 8 Population aged 65+ (%); years 2004 and 2030.

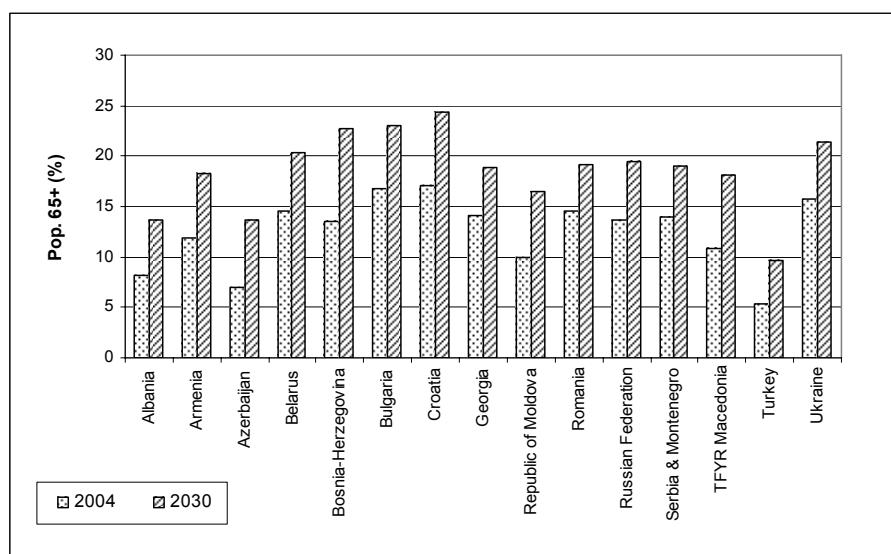
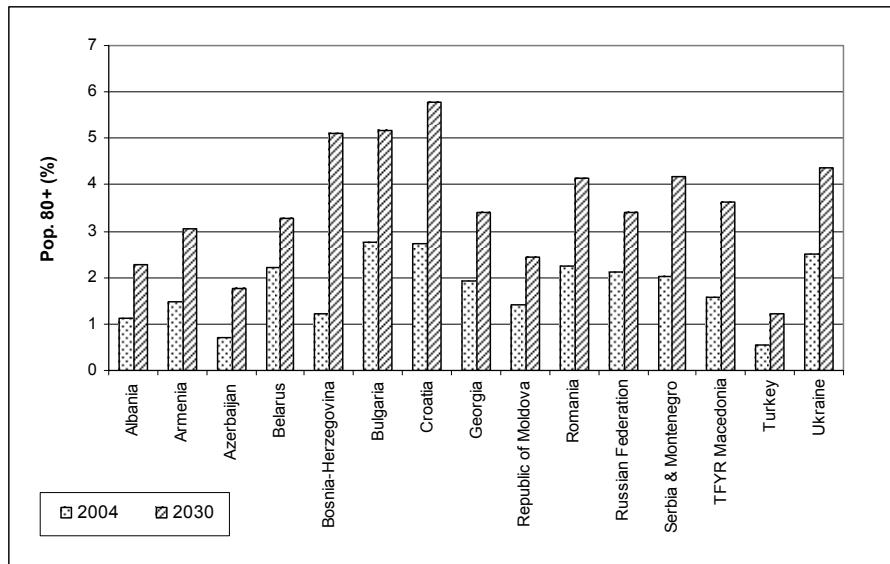


Figure 9 Population aged 80+ (%); years 2004 and 2030.



4 CONCLUDING REMARKS

The population projections for the non EU/non EFTA countries have shown that natural population dynamics are at a turning point also in these European countries, even though there are clear-cut, country-specific characteristics. In particular Balkan countries such as Croatia, Bosnia-Herzegovina and Bulgaria already experience population ageing. They happen to be closest to the EU Member States regarding the development of the population-age profile. However, in many of the non EU/non EFTA countries, population ageing is still marginal. On the one hand, this is due to a still noticeable young population age profile; on the other hand, rather poor gains and a slow recovery of life expectancy at birth, foreseen for the near future for some of these countries, prevent cohorts from reaching older ages.

Finally, it seems that the countries we studied do not diverge from the rest of Europe in terms of natural population dynamics. They probably

only lag behind in the process of population ageing. Nevertheless, contrary to the rest of Europe, the development of the population's age structure in the near future still contains a large potential for socio-economic progress, which these countries should exploit before the demographic window of opportunity once more closes.

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APPENDIX A

Table A.1 Total population (millions); years 2004, 2020, 2030, 2050.

	2004	2020	2030	2050
Albania	3.1	3.8	4.1	4.9
Armenia	3.0	3.2	3.1	2.9
Azerbaijan	8.4	9.5	9.9	9.9
Belarus	9.8	9.1	8.5	7.2
Bosnia-Herzegovina	3.9	3.8	3.7	3.3
Bulgaria	7.8	7.1	6.6	5.6
Croatia	4.5	4.3	4.1	3.7
Georgia	4.5	4.6	4.5	4.3
Republic of Moldova	4.2	4.2	4.1	3.7
Romania	21.8	20.8	19.9	17.6
Russian Federation	143.9	132.8	123.9	105.4
Serbia & Montenegro	10.5	10.7	10.8	10.9
TFYR Macedonia	2.0	2.1	2.2	2.2
Turkey	72.2	89.3	99.7	119.1
Ukraine	47.0	41.4	37.7	30.4

Table A.2 Population median age; years 2004, 2020, 2030, 2050.

	2004	2020	2030	2050
Albania	28.0	31.7	34.7	36.6
Armenia	31.4	36.5	42.2	50.7
Azerbaijan	27.0	33.4	38.7	44.5
Belarus	37.6	40.8	45.0	50.2
Bosnia- Herzegovina	37.6	43.3	46.5	51.6
Bulgaria	40.4	44.3	48.0	53.1
Croatia	40.4	44.0	46.9	50.7
Georgia	35.3	38.6	42.3	45.9
Republic of Moldova	32.6	37.9	42.7	47.2
Romania	36.3	42.1	45.9	51.0
Russian Federation	37.2	40.4	44.3	47.0
Serbia & Montenegro	36.3	39.6	42.0	42.8
TFYR Macedonia	33.9	38.9	42.1	44.3
Turkey	26.0	30.2	32.2	34.7
Ukraine	38.8	42.0	45.6	51.9

Table A.3 Population aged 0-15 (%); years 2004, 2020, 2030, 2050.

	2004	2020	2030	2050
Albania	27.6	24.7	23.2	21.8
Armenia	21.7	17.2	13.7	11.7
Azerbaijan	26.8	20.9	17.6	14.9
Belarus	15.8	14.8	12.5	11.8
Bosnia-Herzegovina	16.9	14.1	13.2	12.1
Bulgaria	14.1	13.0	11.7	11.2
Croatia	15.8	14.2	13.6	12.9
Georgia	19.5	17.3	15.9	15.2
Republic of Moldova	19.1	16.6	14.7	13.9
Romania	15.9	14.5	13.0	12.2
Russian Federation	15.7	15.8	13.6	13.3
Serbia & Montenegro	18.6	18.1	17.5	17.7
TFYR Macedonia	20.1	18.0	17.1	16.9
Turkey	29.5	26.0	24.5	23.0
Ukraine	15.4	13.7	11.9	10.9

Table A.4 Population aged 15-64 (%); years 2004, 2020, 2030, 2050.

	2004	2020	2030	2050
Albania	64.3	64.8	63.1	61.5
Armenia	66.4	70.3	68.0	62.6
Azerbaijan	66.2	71.1	68.7	64.3
Belarus	69.7	70.0	67.1	60.6
Bosnia-Herzegovina	69.6	67.4	64.1	56.9
Bulgaria	69.2	66.8	65.2	56.5
Croatia	67.2	65.2	62.0	56.3
Georgia	66.5	68.0	65.2	60.7
Republic of Moldova	70.9	70.9	68.8	62.2
Romania	69.5	68.4	67.8	57.6
Russian Federation	70.7	69.0	66.9	61.1
Serbia & Montenegro	67.4	65.2	63.6	58.5
TFYR Macedonia	69.0	67.4	64.8	58.3
Turkey	65.1	66.9	65.9	62.0
Ukraine	68.8	68.8	66.8	60.4

Table A.5 Population aged 65+ (%); years 2004, 2020, 2030, 2050.

	2004	2020	2030	2050
Albania	8.1	10.5	13.7	16.8
Armenia	11.9	12.5	18.3	25.7
Azerbaijan	6.9	8.0	13.7	20.8
Belarus	14.6	15.2	20.3	27.6
Bosnia-Herzegovina	13.5	18.5	22.7	30.9
Bulgaria	16.8	20.2	23.1	32.4
Croatia	17.0	20.5	24.4	30.8
Georgia	14.1	14.7	18.9	24.2
Republic of Moldova	10.0	12.5	16.5	23.8
Romania	14.6	17.0	19.2	30.2
Russian Federation	13.6	15.2	19.5	25.6
Serbia & Montenegro	14.0	16.7	18.9	23.9
TFYR Macedonia	10.9	14.6	18.2	24.8
Turkey	5.4	7.1	9.7	15.0
Ukraine	15.8	17.5	21.3	28.7

Table A.6 Population aged 80+ (%); years 2004, 2020, 2030, 2050.

	2004	2020	2030	2050
Albania	1.1	1.8	2.3	4.5
Armenia	1.5	3.6	3.0	7.5
Azerbaijan	0.7	2.0	1.8	5.9
Belarus	2.2	3.5	3.3	7.1
Bosnia-Herzegovina	1.2	4.5	5.1	9.7
Bulgaria	2.7	4.0	5.2	8.3
Croatia	2.7	5.1	5.8	10.0
Georgia	1.9	3.6	3.4	6.6
Republic of Moldova	1.4	2.1	2.4	4.7
Romania	2.2	3.7	4.1	7.7
Russian Federation	2.1	3.4	3.4	6.2
Serbia & Montenegro	2.0	3.7	4.2	6.7
TFYR Macedonia	1.6	2.8	3.6	6.9
Turkey	0.5	1.0	1.2	2.8
Ukraine	2.5	4.4	4.4	7.5

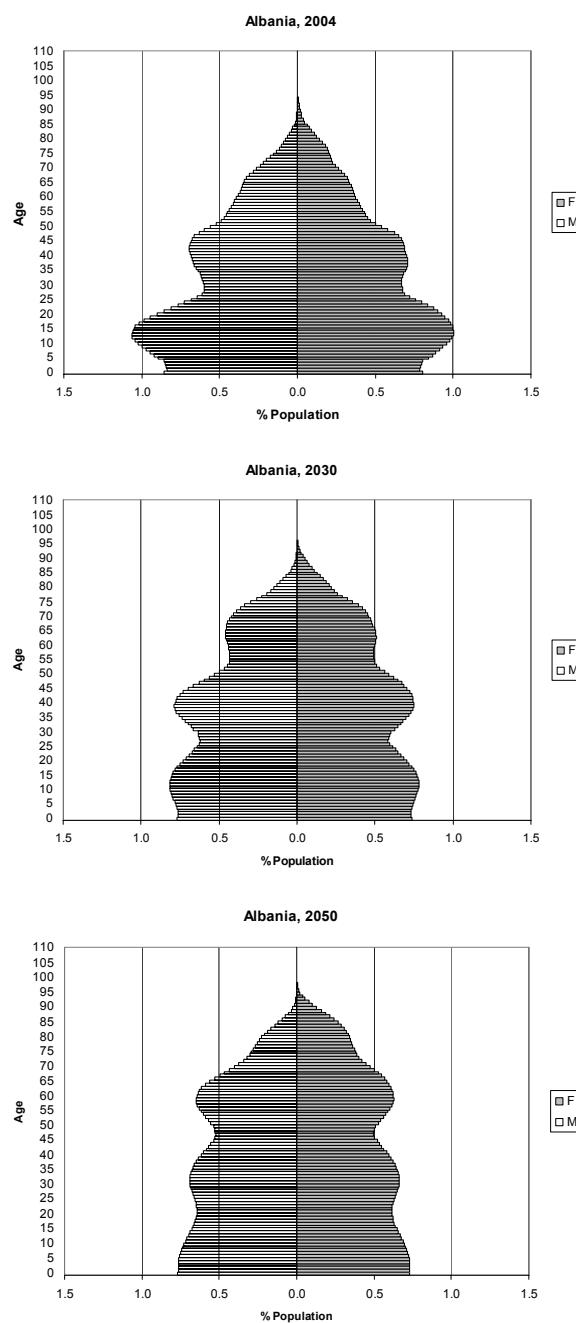
Table A.7 Old-age dependency ratio (%); years 2004, 2020, 2030, 2050.

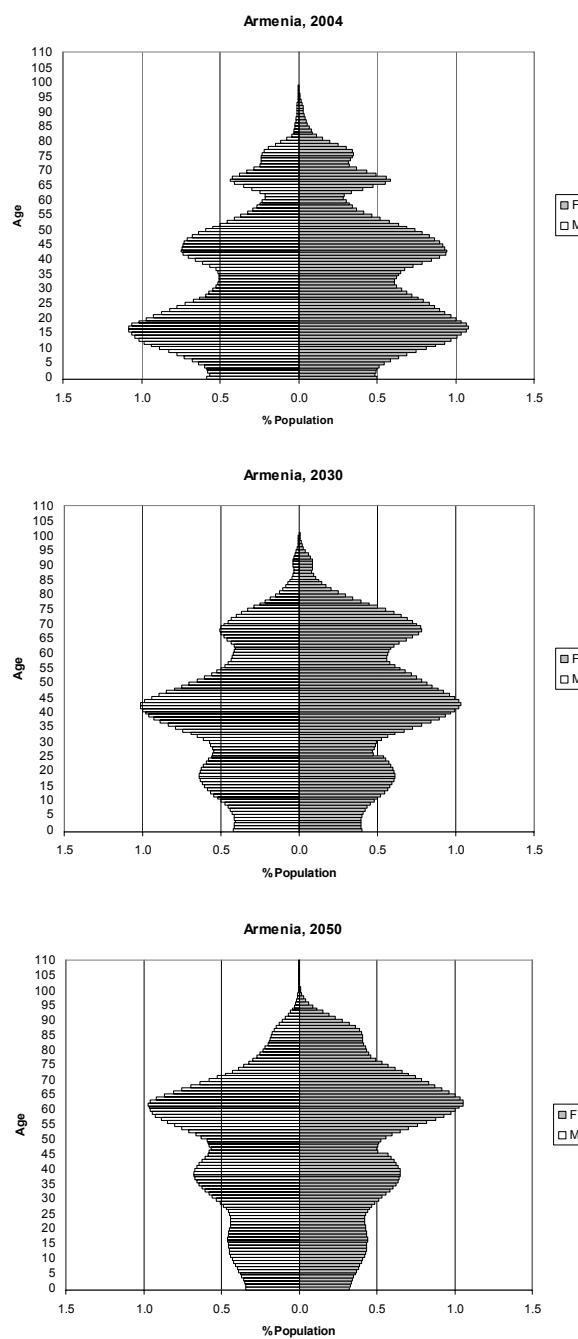
	2004	2020	2030	2050
Albania	12.6	16.2	21.7	27.3
Armenia	17.9	17.8	26.9	41.1
Azerbaijan	10.5	11.2	19.9	32.3
Belarus	20.9	21.7	30.3	45.5
Bosnia-Herzegovina	19.3	27.4	35.4	54.3
Bulgaria	24.2	30.2	35.4	57.3
Croatia	25.3	31.4	39.4	54.7
Georgia	21.2	21.6	29.0	39.9
Republic of Moldova	14.1	17.6	24.0	38.3
Romania	21.0	24.9	28.4	52.4
Russian Federation	19.3	22.0	29.2	41.9
Serbia & Montenegro	20.7	25.7	29.8	40.8
TFYR Macedonia	15.8	21.7	28.1	42.5
Turkey	8.3	10.6	14.7	24.2
Ukraine	23.0	25.5	31.9	47.5

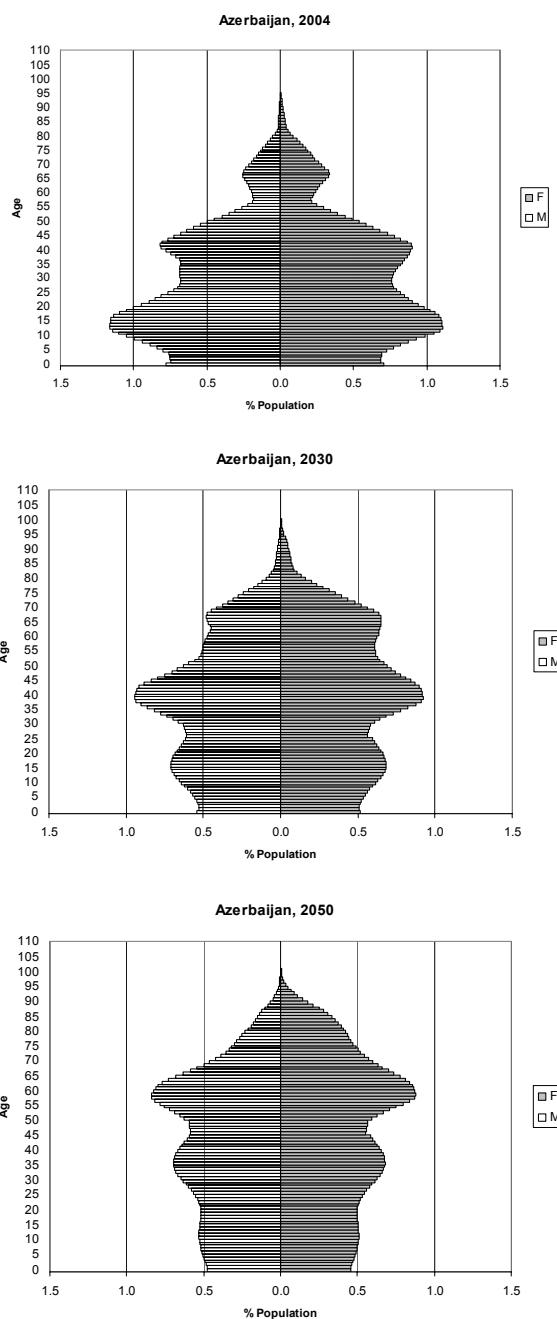
APPENDIX B

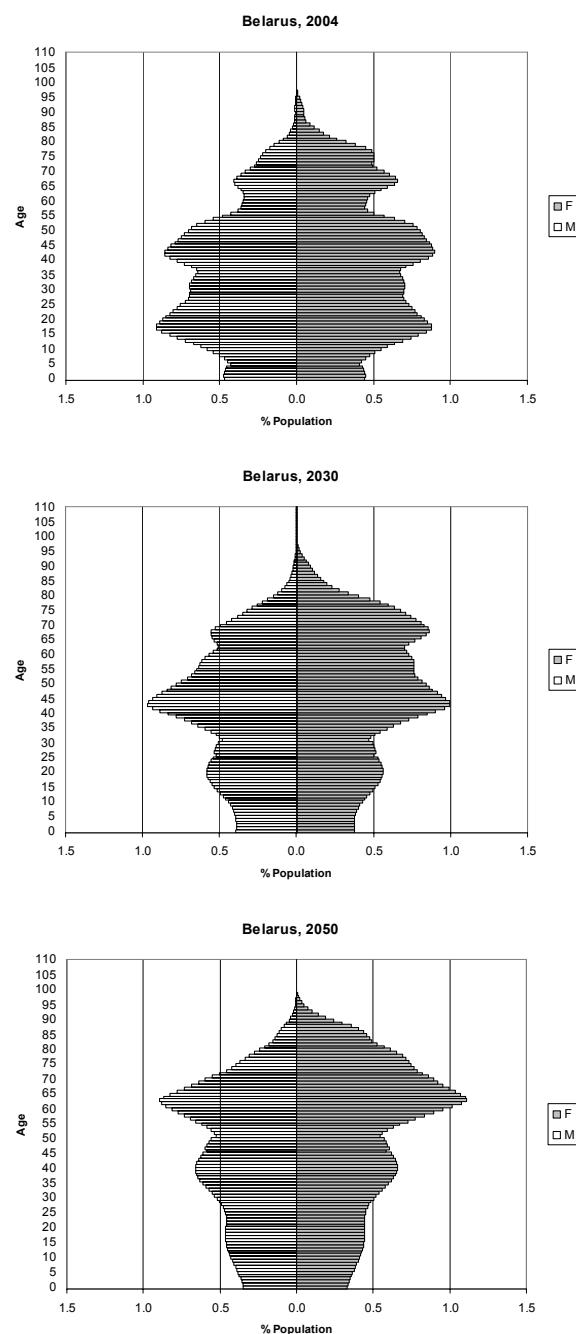
POPULATION AGE PYRAMIDS

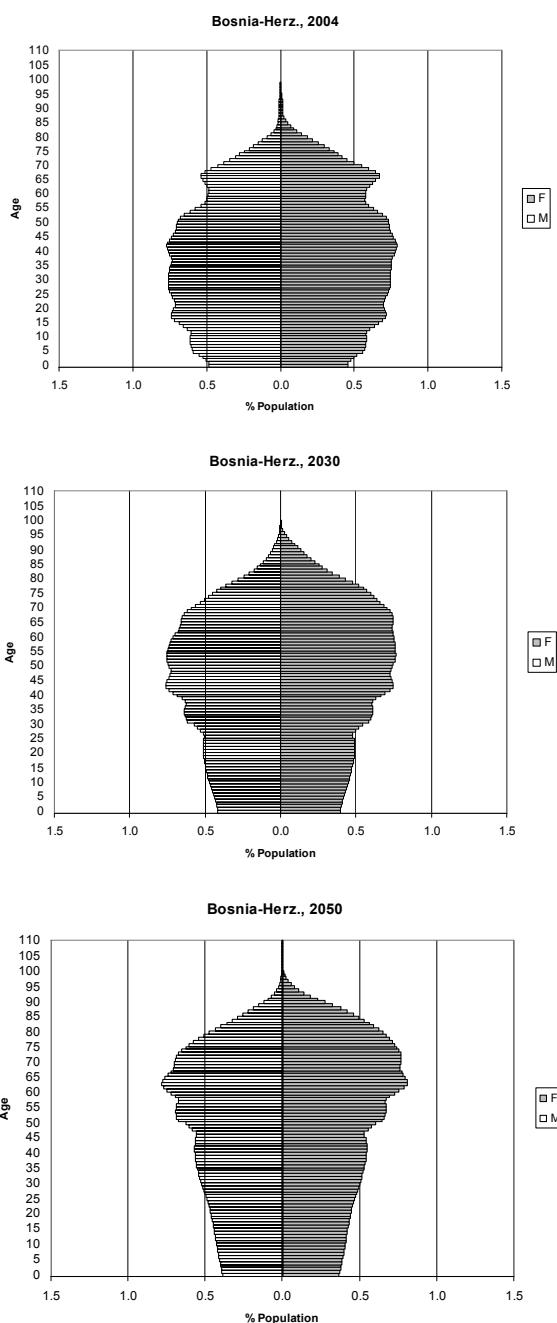
(years 2004, 2030, 2050)

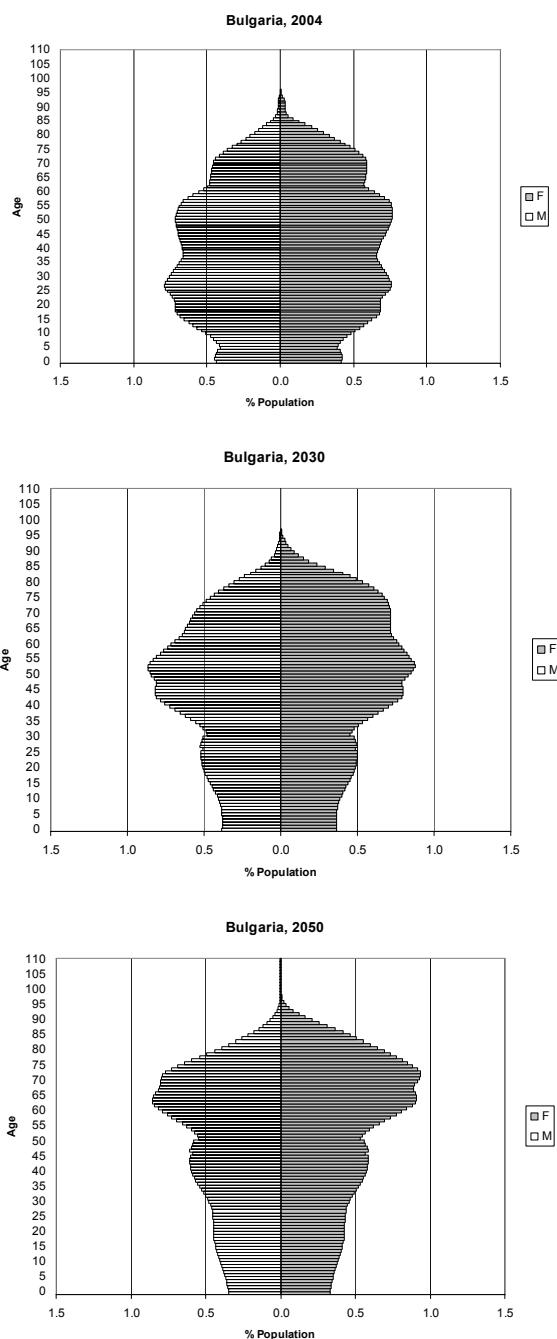


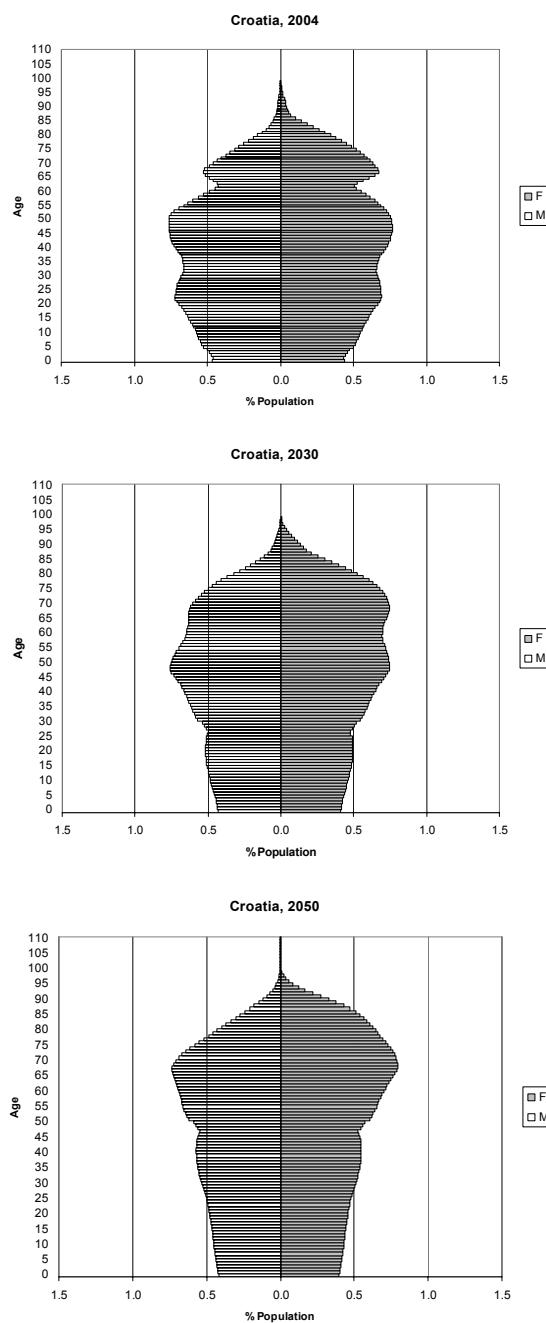


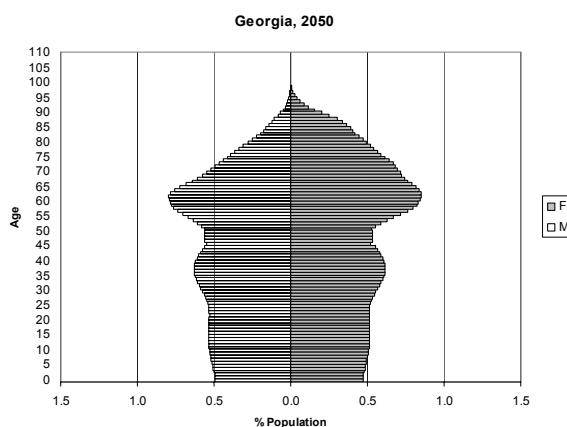
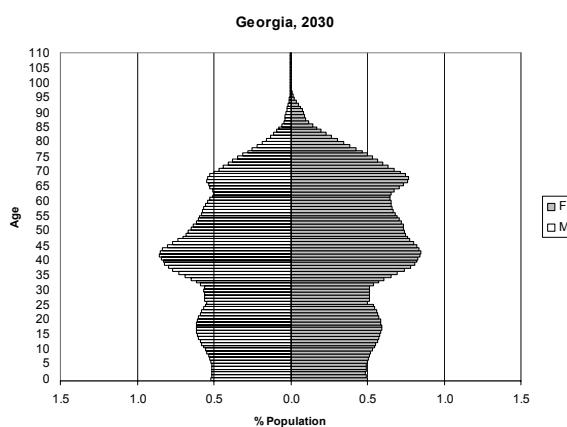
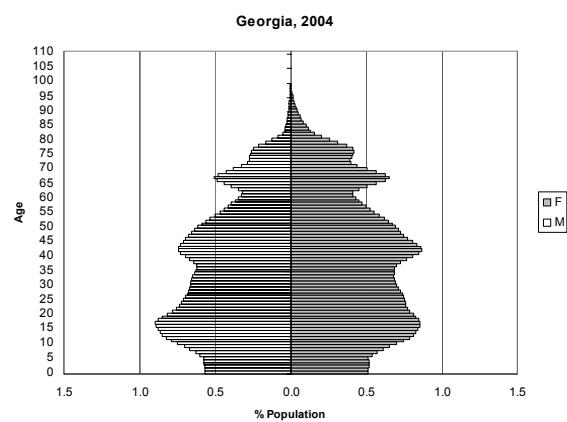




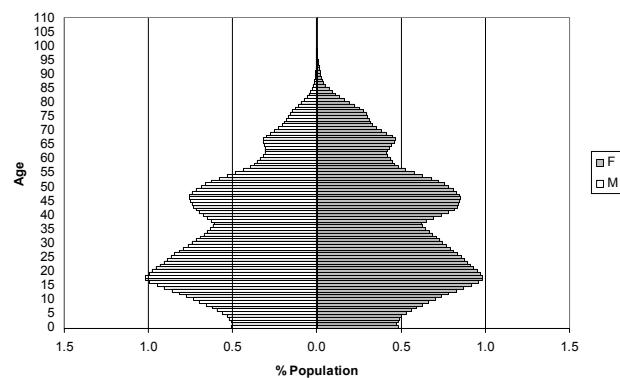




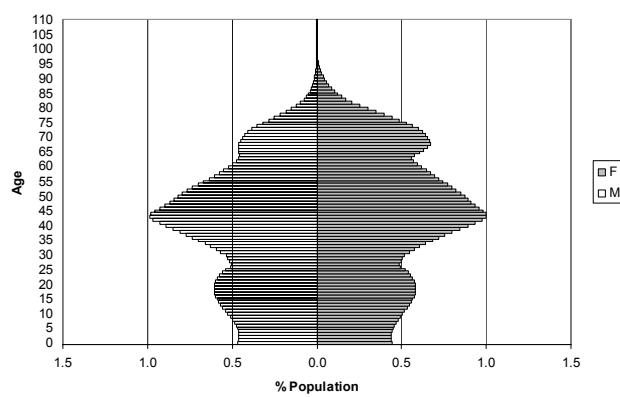




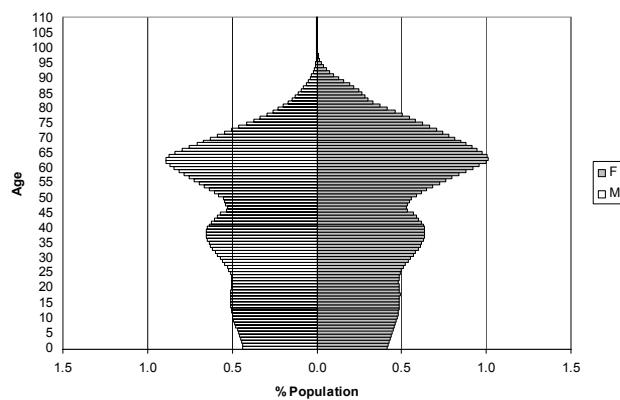
Rep. Moldova, 2004

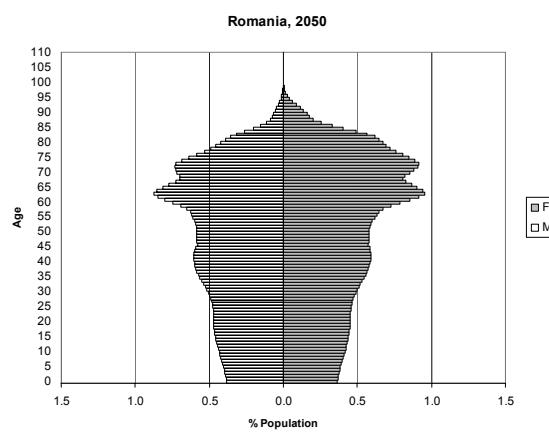
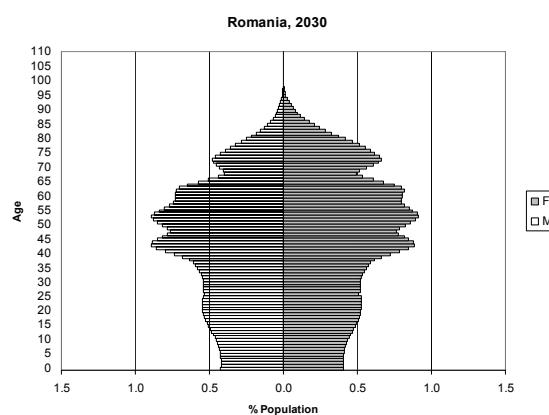
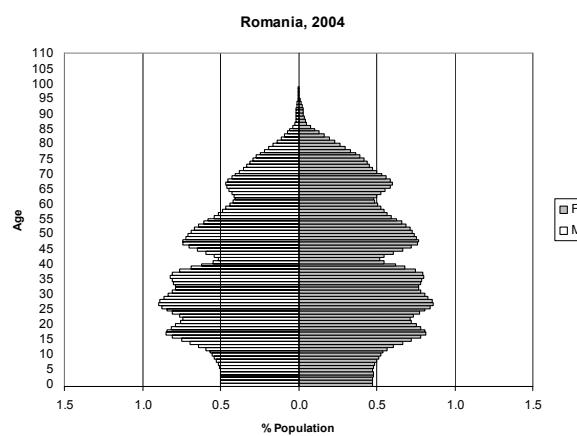


Rep. Moldova, 2030

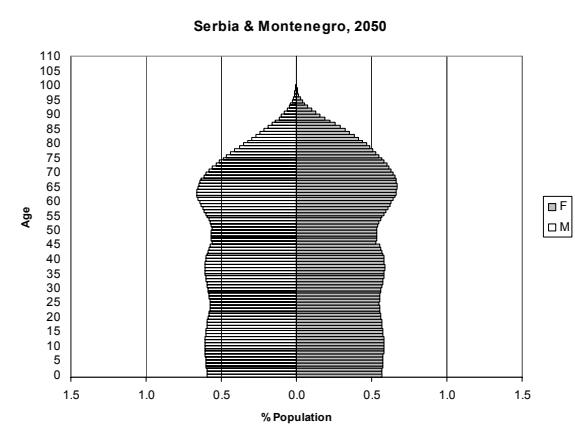
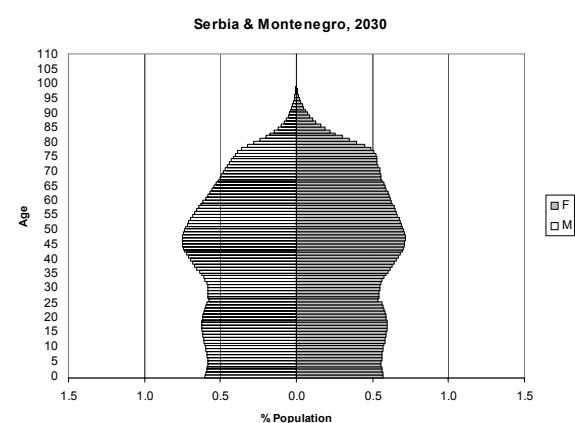
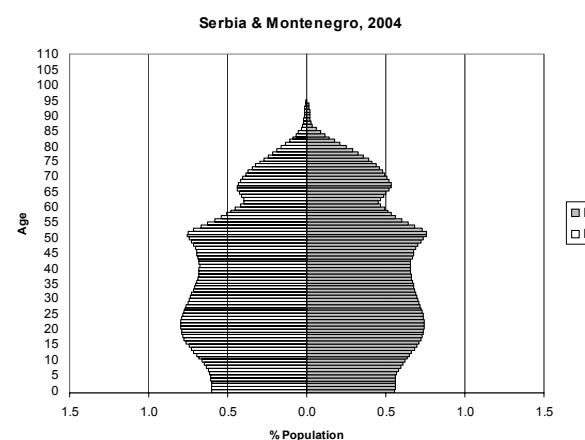


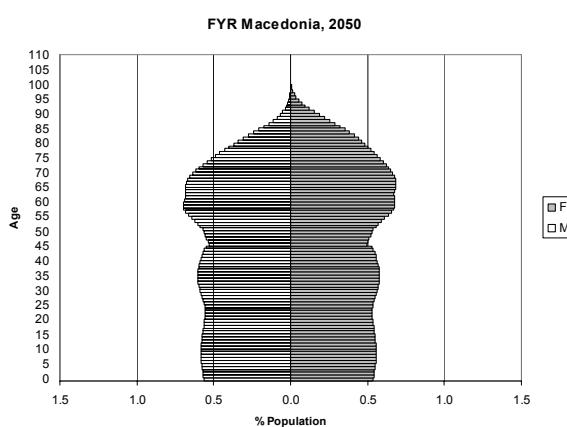
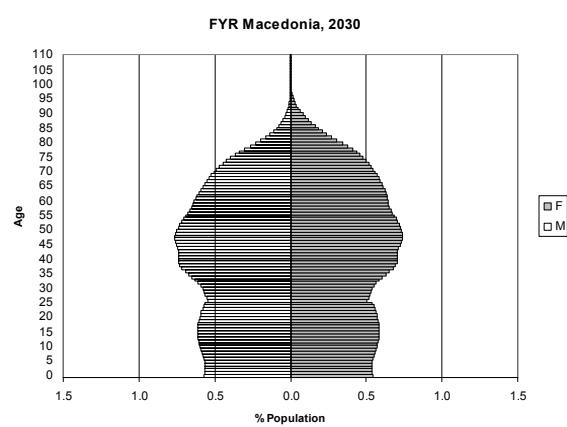
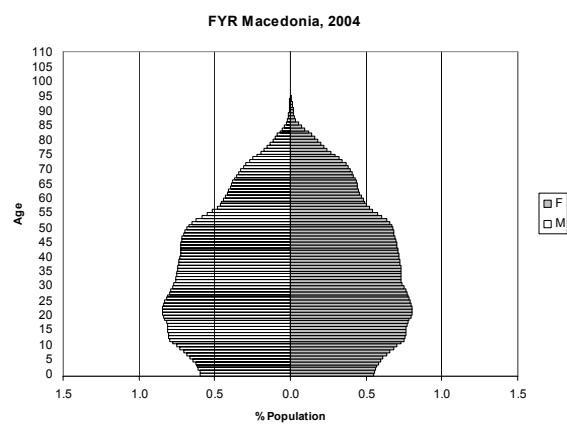
Rep. Moldova, 2050



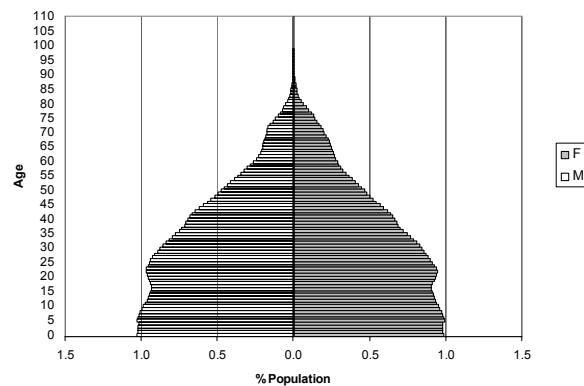




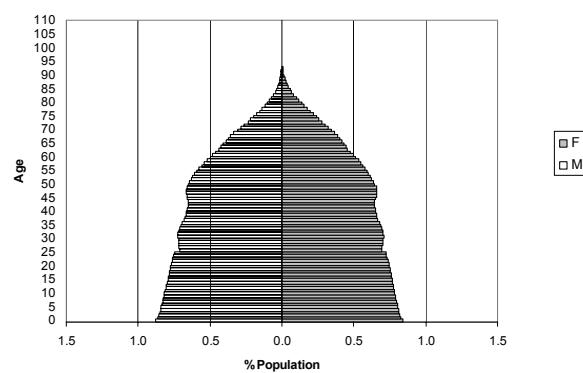




Turkey, 2004



Turkey, 2030



Turkey, 2050

