

IV. RESULTS

A. OVERVIEW

Past trends

At the middle of the 20th century, the average fertility level stood at 2.6 children per woman in Europe, and 2.4 children for the countries of the European Union (see table IV.1). For the countries in this study the range was from 2.2 children per woman in Germany and the United Kingdom, to 2.7 children in France and in Japan. Fertility was markedly higher in the United States, 3.4 children, and even higher in the Republic of Korea, 5.4 children per woman. By 1965-1970, fertility had increased a little on average for the countries of the European Union, to 2.5 children per woman, but had fallen below replacement level in the Russian Federation and in Japan, at 2.0 children, and had also decreased in the United States, to 2.5 children and more slowly in the Republic of Korea, to 4.7 children. By 1995-2000, fertility was below replacement level in all countries and regions of the study, with a relatively wide range of levels, from a high of 2.0 children in the United States to 1.2 children in Italy. The average for Europe and for the European Union was 1.4 children per woman.

As a consequence of this low, and decreasing, fertility history, coupled with a continuous decline of mortality, all populations aged rapidly. The potential support ratio (PSR), which is defined as the ratio of the population aged 15-64 years to the population aged 65 years or older, ranged between 6 and 8 in 1950 for the European Union countries, the United States and for Europe, and was 10 in the Russian Federation, 12 in Japan and 18 in the Republic of Korea. By 2000, the PSR had decreased by about 40 per cent, to 4 in the countries of the European Union and in Japan, 5 in the United States, the Russian Federation and Europe, and 11 in the Republic of Korea.

Scenario I

According to scenario I, the medium variant of the *1998 Revision*, the eight countries and two regions considered in this study would have below-replacement fertility levels until 2050 (see table IV.1). As a result, all of them, with the exception of the United States, would see their total population start declining before 2050. The population of Europe, for example, would be 101 million less (14 per cent) in 2050 than in 2000. The population of the European Union would be 44 million less in 2050 than in 2000, a 12 per cent reduction. Italy would see the largest relative loss, 28 per cent, followed by Japan, 17 per cent. The population of the United States would keep increasing significantly because its fertility does not fall far below replacement and substantial immigration is assumed to continue into the future. (The results of the *1998 Revision* are shown in the annex tables.)

All populations would continue to age rapidly. The PSR of the European Union and that of Europe would decrease by more than half between 2000 and 2050, from 4.1 to 2.0 and from 4.6 to 2.1, respectively. The largest decline, however, would be in the Republic of Korea, where the PSR would fall from 10.7 persons in the age-group 15-64 years per one person aged 65 or older, to 2.4.

Scenario II

Scenario II is the medium variant of the *1998 Revision* in which no migration is assumed after 1995. It serves mostly as a backdrop, in order to measure, by comparison, the effects of the migrations assumed in the other scenarios. The European Union would lose 62 million people (17 per cent) between 2000 and 2050, and Europe would lose 123 million people (17 per cent) (see table IV.2). Because the migration streams assumed in scenario I are not very large, the results of scenario II are not substantially

different from those of scenario I. The exception is the United States, where large flows of migration were assumed in scenario I. In scenario II the population of the United States would also start decreasing before 2050, and the increase between 2000 and 2050 would be 16 million (6 per cent), instead of 71 million as in scenario I. The only other countries in the group being studied where the population would be higher in 2050 than in 2000 are the Republic of Korea (10 per cent higher) and France (1 per cent higher).

In all countries and regions, the population aged 15-64 years would decline earlier and faster than the total population. For example, while the European Union would see its total population decline by 17 per cent between 2000 and 2050, the population aged 15-64 would decline by 30 per cent.

The proportion of the population aged 65 years or older would continue to increase rapidly, and, in 2050, would reach 30 per cent for the European Union and 28 per cent for Europe. The highest proportion aged 65 years or older in 2050 would be in Italy (35 per cent) and in Germany and Japan (32 per cent), and the lowest in the United States (23 per cent), with the Russian Federation, the Republic of Korea and the United Kingdom at 25 per cent, and France at 26 per cent. The potential support ratio would decrease rapidly for all countries and regions, reaching 1.9 for the European Union and 2.0 for Europe in 2050 (see table IV.3). The lowest level for the PSR in 2050, 1.5, would be in Italy, and the highest, 2.6, in the United States.

Scenario III

In the absence of migration after 1995, all countries and the two regions would see their populations start declining before 2050. Scenario III keeps the size of the total population at the maximum level it would reach in the absence of migration. The dates at which this maximum will be reached differ by country. The earliest is 1995 for Germany, Italy, the Russian Federation and Europe, and 2000 for the European Union. The latest is 2035 for the Republic of Korea and 2030 for the United States. The total number of migrants needed to keep the total population constant at its maximum size until 2050, would be 47 million for the European Union and 100 million for Europe (see table IV.4). It would be 28 million in the Russian Federation, 18 million in Germany and 17 million in Japan, but only 1.5 million in France and in the Republic of Korea. In 2050 the proportion of the total population which would be made up of post-1995 immigrants and their descendants would range from 2 per cent in the United States and 3 per cent in France and in the Republic of Korea, to 28 per cent in Germany and 29 per cent in Italy. The potential support ratios in 2050 would be a little higher than in scenario II, and range from 2.0 in Italy and 2.1 in Japan to 2.6 in the United States and 2.9 in the Russian Federation (see table IV.5).

Scenario IV

Scenario IV keeps the size of the population aged 15-64 years at the maximum level it would reach in the absence of migration. The dates at which this maximum will be reached differ by country. They range from 1995 for the European Union, Germany, Italy and Japan, 2000 for the Russian Federation and 2005 for Europe, to 2010 for France and for the United Kingdom, 2015 for the United States and 2020 for the Republic of Korea. The total number of migrants needed to keep the population aged 15-64 constant until 2050 would be larger than in scenario III. The number that would be needed under scenario IV is 80 million for the European Union and 161 million for Europe (see table IV.4). The numbers range from 5 million in France and 6 million in the Republic of Korea and the United Kingdom, to 25 million in Germany and 33 million in Japan. However, when the number of migrants are related to population size in the year 2000, it is Italy and Germany which need the largest number of migrants over the period to 2050, respectively 6,500 and 6,000 annually per million inhabitants (see table IV.6 and figure IV.1). Among the countries studied, the United States needs the smallest number, approximately 1,300 per million inhabitants. In 2050 the proportion of the total population which would be made up of post-1995 immigrants and their descendants would range from 8 per cent in the United States and 12 per

cent in France, to 36 per cent in Germany and 39 per cent in Italy (see table IV.7). The potential support ratios would range from 2.2 in Italy and in Japan, to 2.8 in the Republic of Korea and 3.1 in the Russian Federation.

Scenario V

Scenario V keeps the potential support ratio at its 1995 level, which was 4.3 for the European Union and 4.8 for Europe, and ranged from 4.1 in Italy and in the United Kingdom to 5.6 in the Russian Federation and 12.6 in the Republic of Korea. The total number of migrants needed to keep the potential support ratio constant until 2050 is extremely large in all countries (see table IV.4). It is 700 million for the European Union and nearly 1.4 billion for Europe. It ranges from 60 million in the United Kingdom and 94 million in France to more than half a billion in Japan and in the United States, and 5 billion in the Republic of Korea. In 2050, the proportion of the population that would be post-1995 migrants or their descendants would range from 59 per cent in the United Kingdom to 99 per cent in the Republic of Korea.

Discussion

In the absence of migration all eight countries and the two regions with fertility below replacement will see their total population start declining before 2050 and their populations in the working-age group 15-64 years will decline even faster. Their populations will also age very rapidly. However many, if not most of them, have had immigrants in the recent past, and can be expected to have immigrants in the future also. Table IV.8 shows the annual net numbers of migrants for the period 1990 to 1998.

During the period 1990 to 1994, for example, the European Union received an average of a little over a million net immigrants per year, and a little over 600,000 per year during 1995 to 1998. These numbers are quite close to the numbers of migrants that the European Union would need to receive to prevent its total population from declining: 612, 000 per year between 2000 and 2025 and 1.3 million per year between 2025 and 2050. However, the annual numbers of immigrants who would be needed to prevent the population in working-age from declining are about double the numbers received in the last decade.

While the situation varies from country to country, it is somewhat similar in many of the countries with past experience with immigration. In France, Germany and the United Kingdom, the numbers of immigrants needed to keep constant the total population or the working-age population vary irregularly through time because of specific age-structures. They are comparable to, or at most double, the numbers of immigrants received during the past decade. In the United States, the annual numbers of immigrants needed for both purposes are smaller than past immigration. In addition, the proportion in 2050 of the post-1995 migrants and their descendants in the total population (see table IV.7), in scenarios III and IV, is less than or equal to the proportion of migrants in the total population in 1990 in France (10.4 per cent) and in the United States (7.9 per cent). In Germany and in Italy, however, scenario III would result in about 30 per cent, and scenario IV about 40 per cent, of post-1995 migrants and their descendants in the 2050 population, which is much more than the current situation (see table IV.9).

In scenarios III and IV, in all countries and regions, the potential support ratio would be much lower in 2050 than its 1995 level, and in some cases the decline in the PSR is substantial.

The annual numbers of immigrants needed to keep the potential support ratios constant at their 1995 levels (scenario V) are vastly larger, in every country, than any past experience (see figure IV.2). Scenario V would furthermore result in having between 59 per cent and 99 per cent of the population of all countries in 2050 composed of post-1995 migrants and their descendants.

In the absence of migration (scenario II), the figures show that the ratios between population in working-age and population past working-age would remain in 2050 at their 1995 levels if, by 2050, the upper limits of the working-age span were increased from 65 years to about 72 years in the United Kingdom, 73 years in the Russian Federation, 74 years in France and in the United States, 77 years in Germany, Italy and Japan, and 82 years in the Republic of Korea (see table IV.10).

The European Union and the United States - the world's two largest economic blocks, often in competition with each other - are projected to follow starkly contrasting demographic paths in the coming decades: while the population of the United States would increase by 82 million between 1995 and 2050, that of the European Union would decline by 41 million (see table IV.11). As a result, the population of the United States, which in 1995 was 105 million smaller than that of European Union, will become larger by 18 million in 2050. The same trends will characterize their working-age populations: while the number of people aged 15-65 years will decline by 61 million in the European Union, in the United States it will increase by 39 million. By 2050, the working age population of the United States will outnumber that of the European Union by 26 million, while in 1995 it was outnumbered by 75 million. Therefore, although the elderly population would increase more and faster in the United States than in the European Union, the potential support ratio will continue to be less favourable in the European Union compared to the United States - in 2050 it would stand at 2.0 persons of working-age per elderly person in the case of the European Union, against 2.8 in the United States.

TABLE IV.1. TOTAL FERTILITY RATES, 1950 TO 2050, BY COUNTRY OR REGION
(Number of children per woman)

Country or region	Period				
	1950-1955	1965-1970	1995-2000	2020-2025	2045-2050
France	2.73	2.61	1.71	1.96	1.96
Germany	2.16	2.32	1.30	1.58	1.64
Italy	2.32	2.49	1.20	1.47	1.66
Japan	2.75	2.00	1.43	1.73	1.75
Republic of Korea	5.40	4.71	1.65	1.90	1.90
Russian Federation	2.51	2.02	1.35	1.70	1.70
United Kingdom	2.18	2.52	1.72	1.90	1.90
United States	3.45	2.55	1.99	1.90	1.90
Europe	2.56	2.35	1.42	1.67	1.78
European Union	2.39	2.52	1.44	1.45	1.80

Source: United Nations Population Division, *World Population Prospects: The 1998 Revision*.

TABLE IV.2. TOTAL POPULATION (ZERO MIGRATION AFTER 1995), 1950 TO 2050, BY COUNTRY OR REGION
(Thousands)

Country or region	Year				
	1950	1975	2000	2025	2050
France	41 289	52 699	58 879	61 121	59 357
Germany	68 376	78 679	80 985	72 643	58 812
Italy	47 104	55 441	56 950	50 679	40 722
Japan	83 625	111 524	126 714	121 150	104 921
Republic of Korea	20 357	35 281	46 946	53 020	51 751
Russian Federation	102 192	134 233	144 960	131 824	114 248
United Kingdom	50 616	56 226	58 600	58 768	55 594
United States	157 813	220 165	274 335	296 616	290 643
Europe	547 318	676 390	723 482	684 055	600 464
European Union	296 151	349 313	372 440	354 500	310 839

TABLE IV.3. POTENTIAL SUPPORT RATIO (ZERO MIGRATION AFTER 1995), 1950 TO 2050, BY COUNTRY OR REGION
(Number of persons aged 15-64 per person aged 65 or older)

Country or region	Year				
	1950	1975	2000	2025	2050
France	5.79	4.65	4.10	2.82	2.26
Germany	6.90	4.29	4.11	2.45	1.75
Italy	7.92	5.29	3.72	2.40	1.52
Japan	12.06	8.60	3.99	2.24	1.71
Republic of Korea	18.16	16.25	10.67	4.43	2.40
Russian Federation	10.49	7.66	5.51	3.63	2.41
United Kingdom	6.24	4.50	4.08	2.93	2.36
United States	7.83	6.15	5.21	3.09	2.57
Europe	7.99	5.67	4.65	3.03	2.04
European Union	6.97	4.84	4.06	2.66	1.89

TABLE IV.4. NET NUMBER OF MIGRANTS, 1995-2050, BY SCENARIO AND COUNTRY OR REGION
(Thousands)

Country or region	Scenario				
	I	II	III	IV	V
	Medium variant	Medium variant with zero migration	Constant total population	Constant age group 15-64	Constant ratio 15-64/65 years or older
<i>A. Total number</i>					
France	525	0	1 473	5 459	93 794
Germany	11 400	0	17 838	25 209	188 497
Italy	660	0	12 944	19 610	119 684
Japan	0	0	17 141	33 487	553 495
Republic of Korea	-450	0	1 509	6 426	5 148 928
Russian Federation	7 417	0	27 952	35 756	257 110
United Kingdom	1 200	0	2 634	6 247	59 775
United States	41 800	0	6 384	17 967	592 757
Europe	23 530	0	100 137	161 346	1 386 151
European Union	16 361	0	47 456	79 605	700 506
<i>B. Average annual number</i>					
France	10	0	27	99	1 705
Germany	207	0	324	458	3 427
Italy	12	0	235	357	2 176
Japan	0	0	312	609	10 064
Republic of Korea	-8	0	27	117	93 617
Russian Federation	135	0	508	650	4 675
United Kingdom	22	0	48	114	1 087
United States	760	0	116	327	10 777
Europe	428	0	1 821	2 934	25 203
European Union	297	0	863	1 447	12 736

TABLE IV.5. POTENTIAL SUPPORT RATIO IN 1995, AND IN 2050 BY SCENARIO AND COUNTRY OR REGION
(Number of persons aged 15-64 per person aged 65 or older)

Country or region	1995	2050				
		I	II	III	IV	V
		Medium variant	Medium variant with zero migration	Constant total population	Constant age group 15-64	Constant ratio 15-64/65 years or older
France	4.36	2.26	2.26	2.33	2.49	4.36
Germany	4.41	2.05	1.75	2.26	2.44	4.41
Italy	4.08	1.52	1.52	2.03	2.25	4.08
Japan	4.77	1.71	1.71	2.07	2.19	4.77
Republic of Korea	12.62	2.40	2.40	2.49	2.76	12.62
Russian Federation	5.62	2.43	2.44	2.86	3.12	5.62
United Kingdom	4.09	2.37	2.36	2.49	2.64	4.09
United States	5.21	2.82	2.57	2.63	2.74	5.21
Europe	4.81	2.11	2.04	2.38	2.62	4.81
European Union	4.31	1.97	1.89	2.21	2.42	4.31

TABLE IV.6. AVERAGE ANNUAL NET NUMBER OF MIGRANTS BETWEEN 2000 AND 2050, PER MILLION INHABITANTS IN 2000, BY SCENARIO AND COUNTRY OR REGION

<i>Scenario</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>
<i>Country or region</i>	<i>Medium Variant</i>	<i>Medium variant with zero migration</i>	<i>Constant total population</i>	<i>Constant age group 15-64</i>	<i>Constant ratio 15-64/65 years or older</i>
France	110	0	500	1 854	30 430
Germany	2 519	0	4 244	6 009	44 825
Italy	109	0	4 414	6 531	39 818
Japan	0	0	2 705	5 103	82 634
Republic of Korea	138	0	643	2 738	2 184 700
Russian Federation	752	0	3 435	4 933	34 958
United Kingdom	341	0	899	2 132	20 383
United States	2 770	0	465	1 310	43 201
Europe	519	0	2 650	4 460	37 511
European Union	724	0	2 548	4 262	36 194

TABLE IV.7. PER CENT OF POST-1995 MIGRANTS AND THEIR DESCENDANTS IN TOTAL POPULATION IN 2050, BY SCENARIO AND COUNTRY OR REGION

<i>Scenario</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>
<i>Country or region</i>	<i>Medium variant</i>	<i>Medium variant with zero migration</i>	<i>Constant total population</i>	<i>Constant age group 15-64</i>	<i>Constant ratio 15-64/65 years or older</i>
France	0.9	0.0	2.9	11.6	68.3
Germany	19.8	0.0	28.0	36.1	80.3
Italy	1.2	0.0	29.0	38.7	79.0
Japan	0.0	0.0	17.7	30.4	87.2
Republic of Korea	-0.9	0.0	3.2	13.9	99.2
Russian Federation	5.8	0.0	22.9	27.6	71.9
United Kingdom	1.9	0.0	5.5	13.6	59.2
United States	16.8	0.0	2.5	7.9	72.7
Europe	4.3	0.0	17.5	25.8	74.4
European Union	6.2	0.0	16.5	25.7	74.7

TABLE IV.8. NET ANNUAL MIGRATION FLOWS, 1990 TO 1998

Country or region/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998
France	80 000	90 000	90 000	70 000	50 000	40 000	35 000	40 000	40 000
Germany	656 166	602 563	776 397	462 284	315 568	398 263	281 493	93 433	50 821
Italy	24 212	4 163	181 913	181 070	153 364	95 499	149 745	126 554	113 804
Japan	2 000	38 000	34 000	-10 000	-82 000	-50 000	-13 000	14 000	38 000
Republic of Korea ^a	-	-	-10 000	-	-	-	-	-20 000	-
Russian Federation	164 000	51 600	176 100	430 100	810 000	502 200	343 600	352 600	285 200
United Kingdom	68 384	76 416	44 887	90 141	84 242	116 869	104 075	88 476	-12 406
United States	1 536 483	1 827 167	973 977	904 292	804 416	720 461	915 900	798 378	660 477
Europe ^a	-	-	1 047 000	-	-	-	-	950 000	-
European Union	1 008 251	1 078 441	1 350 132	1 062 116	782 855	805 363	734 596	512 208	378 687

Sources: European Union, France, Germany, Italy and the United Kingdom: European Commission, Eurostat, *Demographic Statistics: Data 1960-99* (Luxembourg, 1999); Japan: Management and Coordination Agency, Statistics Bureau, *Japan Statistical Yearbook 2000* (Tokyo, 1999); Russian Federation: State Committee of the Russian Federation, *Russian Statistical Yearbook 1999* (Moscow, 1999); United States: Department of Justice, Immigration and Naturalization Service, *1997 Statistical Yearbook of the Immigration and Naturalization Service* (Washington, D.C., 1999a); Ibid, *Legal Immigration, Fiscal Year 1998*, Annual report No.2 (Washington, D.C., 1999b).

^a Europe and the Republic of Korea: Averages for 1990-1995 and 1995-2000 from *World Population Prospects: The 1998 Revision*, vol.1 (United Nations).

NOTE: Data for the United States of America contains only immigration; data for all other countries is net migration

TABLE IV.9. MIGRANT STOCK (FOREIGN-BORN), 1990

Country or region	Number of migrants (thousands)	Per cent of total population
France	5 897	10.4
Germany ^a	5 037	6.4
Italy	1 549	2.7
Japan ^a	868	0.7
Russian Federation ^b
Republic of South Korea	900	2.1
United Kingdom	3 718	6.5
United States	19 603	7.9
Europe ^c	11 152	4.3
European Union	21 378	5.8

Source: *Trends in total migration stock, Revision 4* (POP/IB/DB/96/1/Rev.4), database maintained by the Population Division, Department of Economic and Social Affairs of the United Nations Secretariat.

^aThe data refer to foreign citizen.

^bData are not readily available.

^cData includes Bulgaria, Hungary, Poland, Romania, Denmark, Finland, Iceland, Ireland, Norway, Sweden, United Kingdom, Albania, Andorra, Greece, Italy, Malta, Liechtenstein, Luxembourg, Monaco, Netherlands, Switzerland; for the other European countries data are not readily available.

TABLE IV.10. UPPER LIMIT OF WORKING-AGE NEEDED TO OBTAIN IN 2050 THE POTENTIAL SUPPORT RATIO OBSERVED IN 1995, SCENARIO II, BY COUNTRY OR REGION

<i>Country or region</i>	<i>Age</i>
France	73.9
Germany	77.2
Italy	77.3
Japan	77.0
Republic of Korea	82.2
Russian Federation	72.7
United Kingdom	72.3
United States	74.3
Europe	75.1
European Union	75.7

TABLE IV.11. TOTAL POPULATION IN 1995 AND IN 2050, AND GROWTH RATES BY SCENARIO, BY COUNTRY OR REGION

<i>Country or region</i>	<i>1995</i>	<i>2050</i>				
		<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>
		<i>Medium variant</i>	<i>Medium variant with zero migration</i>	<i>Constant total population</i>	<i>Constant age group 15-64</i>	<i>Constant ratio 15-64/65 years or older</i>
<i>A. Total population (thousands)</i>						
France	58 020	59 883	59 357	61 121	67 130	187 193
Germany	81 661	73 303	58 812	81 661	92 022	299 272
Italy	57 338	41 197	40 722	57 338	66 395	193 518
Japan	125 472	104 921	104 921	127 457	150 697	817 965
Republic of Korea	44 949	51 275	51 751	53 470	60 125	6 233 275
Russian Federation	148 097	121 256	114 178	148 097	157 658	406 551
United Kingdom	58 308	56 667	55 594	58 833	64 354	136 138
United States	267 020	349 318	290 643	297 970	315 644	1 065 174
Europe	727 912	627 691	600 464	727 912	809 399	2 346 459
European Union	371 937	331 307	310 839	372 440	418 509	1 228 341
<i>B. Average annual growth rate 1995-2050 (per cent)</i>						
France		0.06	0.04	0.09	0.27	2.13
Germany		-0.20	-0.60	0.00	0.22	2.36
Italy		-0.60	-0.62	0.00	0.27	2.21
Japan		-0.33	-0.33	0.03	0.33	3.41
Republic of Korea		0.24	0.26	0.32	0.53	8.97
Russian Federation		-0.36	-0.47	0.00	0.11	1.84
United Kingdom		-0.05	-0.09	0.02	0.18	1.54
United States		0.49	0.15	0.20	0.30	2.52
Europe		-0.27	-0.35	0.00	0.19	2.13
European Union		-0.21	-0.33	0.00	0.21	2.17

Figure IV.1. Average annual net number of migrants between 2000 and 2050 to maintain size of working-age population, per million inhabitants in 2000

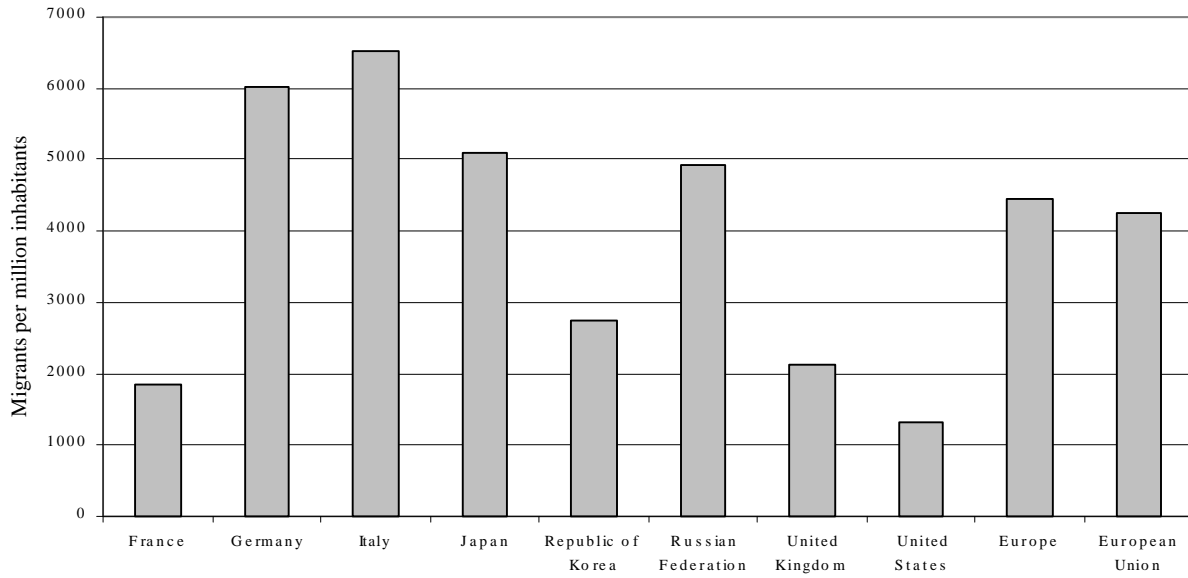
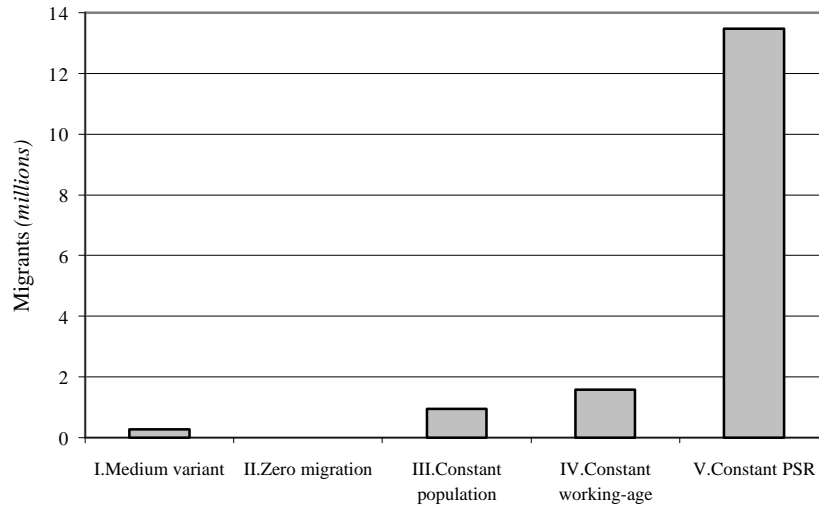


Figure IV.2. Average annual net number of migrants between 2000 and 2050, by scenario, for the European Union



B. COUNTRY RESULTS

