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Chapter 15

Implications of Population Decline for the European Union (2000-2050)

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Population prospects for the European Union seem to coincide in forecasting a general population decline for this area, due to a persistent low level of fertility (below replacement level) and an increasing ageing of the population [9]. Population trends in the European Union countries are very similar at present, both when the present 15 or the 10 candidate countries are considered. They all have the lowest rates of growth, the lowest fertility rates, and the highest life expectancies, which combined are producing the most aged populations in the world. If these trends continue the population of the European Union will not only decline, but will become even more aged, and will have a smaller population force. Some of the measures that have been proposed to avoid this prospect are to increase fertility and to increase immigration, under the assumption that they will increase population growth, that they will make the population younger and that they will increase the population force. This paper intends to demonstrate that higher fertility and immigration are not the only possible answers to these processes, and that some benefits may also be derived from non growing and ageing populations, provided that societies adopt the necessary changes to adapt to this new demographic situation.

1. The population of the European Union within the context of world population

When the four regions of Europe (according to UN definitions) are compared with other world regions, it is evident that they show the lowest projected rates of increase for the periods 2002-2025 and 2025-2050. More specifically, the four rates of increase are below 0.5% for the first period, and Eastern Europe even shows negative growth. In the second period three of the rates are negative, while Northern Europe shows a zero-population growth, but only East Asia (outside Europe) is expected to experience negative growth between 2025 and 2050 (due to expected negative growth both in Japan and China). All other world regions show positive growth rates for the two periods (apart from the already mentioned exception regarding East Asia), though the rates for the second period are expected to be lower in all regions, without any exception. As a matter of fact, all non-European regions, except North America and East Asia, will eventually grow over 1% per year between 2002 and 2025, but only two regions, Sub Saharan Africa and Western Asia might grow over 1% between 2025 and 2050. Population

growth will therefore decline throughout the next two twenty-five year periods only in Eastern Europe and in the European Union, and it will also decline, but only between 2025 and 2050, in Western and Southern Europe, so that probably only Western Europe will grow between 2000 and 2025.

The four European regions and the European Union as a whole show at present the lowest total fertility rates, all five of them well below the generally accepted replacement level of 2.1 children per woman [10], while the world average is at 2.8. And the range varies from a low 1.7 in East Asia to a high 5.6 in Sub Saharan Africa. All other non-European regions, with the only exception of East Asia, have a total fertility rate that is above replacement level, though there seems to be a general trend towards lower fertility rates in all regions of the world.

Table 1. Demographic Indicators and Projections for World Regions, 2002-2050

	Population mid 2002 (Millions)	Projected population (Millions)		Projected annual rate of increase (%) (a)		Total fertility rate	Life expectancy at birth (both sexes)	Percent of population of age		Projected percent of population in 2050 (b)	
		2025	2050	2002-2025	2025-2050			< 15	65 +	65 +	80 +
World	6,215	7,859	9,104	1.15	0.63	2.8	67	30	7	15.6	4.1
Northern Africa	180	249	302	1.67	0.85	3.5	66	36	4	14.1	2.6
Sub-Saharan Africa	693	1,081	1,606	2.43	1.94	5.6	49	44	3	6.9	1.1
North America	319	382	450	0.86	0.71	2.1	77	21	13	21.4	7.7
Latin America & Caribbean	531	697	815	1.36	0.68	2.7	71	32	6	16.9	4.1
Western Asia	197	298	404	2.23	1.42	3.9	68	36	5	11.3	2.4
South Central Asia	1,521	2,047	2,474	1.50	0.83	3.3	63	37	4	13.2	2.6
Southeast Asia	536	706	811	1.38	0.60	2.7	67	32	5	16.1	3.5
East Asia	1,512	1,690	1,608	0.51	-0.19	1.7	72	22	8	23.6	7.4
Northern Europe	96	103	103	0.32	0.0	1.6	78	19	15	27.2	10.4
Western Europe	184	187	178	0.07	-0.19	1.5	78	17	16	29.0	11.9
Eastern Europe	301	279	231	-0.32	-0.69	1.2	68	18	13	27.9	7.3
Southern Europe	147	149	139	0.06	-0.27	1.3	78	16	17	33.5	11.9
Oceania	32	40	46	1.09	0.60	2.5	75	25	10	18.0	5.6
European Union-15	381.2	391.7	374.1	0.12	-0.18	1.6	79	17	16	30.8	12.0

Source: Population Reference Bureau, *World Population 2002*.

(a) Calculated by the author.

(b) United Nations, *World Population Ageing, 1950-2050* [11].

Three of the four European regions (all but Eastern Europe) and the European Union show at present the highest total life expectancy at birth, 78 and 79 years. The exception of Eastern Europe is mainly due to the recent increase in mortality rates in Russia and some other republics of the former Soviet Union, such as Moldova, Ukraine and Belarus. This fact is quite exceptional (only comparable to the rise of mortality rates in many African countries due to AIDS). And it seems to be a result of social disorganisation processes that have taken place in some of those countries as a consequence of the economic change from a state planned economy to a free market economy.

All four European regions and the European Union show the lowest proportions of population of less than 15 years of age (below 20% in all cases), as well as the highest proportions of population of 65 years and over (above 13% in all cases). And the four European regions are expected to reach the highest proportions of population of over 65 and over 80 years of age in 2050. The proportions will be above 27% and above 7% respectively in the four regions and in the European Union, though East Asia will have a similar proportion to Eastern Europe regarding those of 80 years and over.

To summarise, there seems to be a common European demographic pattern, from Portugal to Russia, which definitely contrasts with all other regions of the world. Only North America and East Asia, and less so also Oceania (because of Australia and New Zealand), resemble the European pattern in some respects. And, certainly, there are also differences within Europe, with Eastern Europe being the region that more frequently departs from the common pattern shown by the other three regions. As a consequence of this pattern, the total European population, which amounted to 728 million in 2002, is expected to decrease to 718 million in 2025 and to 651 million in 2050. As for the enlarged European Union of 25 countries, its population may increase from 456 million in 2002 to 465 million in 2025, but will decrease to 439 million in 2050 if the United Nations forecasts are fulfilled. The main factors that explain those prospects are the maintenance of fertility below replacement level and a very low level of mortality (high life expectancy) that will produce an increasingly ageing population [14].

In general, many politicians and social scientists evaluate these prospects as non desirable. They argue that negative population growth, below replacement fertility level and increasingly ageing populations are all undesirable, because they will produce a demographic structure that may jeopardise the payment of retirement pensions and, ultimately, endanger the whole Social Security system and the Welfare State that have characterised free market European societies in the past century. The European pattern just described seems to reflect very accurately the situation of the present fifteen countries of the European Union, that account for 381.2 million out of the 728 million that make up the total population of Europe. The remaining 346.8 million correspond to Eastern Europe (301 million) and to countries in Northern, Western and Southern Europe that do not yet belong to the European Union (45.8 million). Therefore, the population of the European Union, in 2002, represents 52% of the total population of Europe. And the prospects estimate that the EU-15 population will be 391.7 million in 2025 and only 374.1 million in 2050, representing 55% and 58% respectively of the total European population on those two dates. The projected population for the European Union in 2050 is smaller than in 2002, so that its weight over the total European population will grow from the present 52% to a projected 58%. This can only imply that the European population outside the European Union as defined today will have an even lower (and more negative) rate of population growth over the next fifty years.

2. Demographic trends in member and candidate countries of the European Union

The demographic trends that have been described for Europe as a whole, compared with those of other world regions, are also characteristic of the present fifteen member countries of the European Union. As has been said, the total population of these countries represents a little more than half of the total European population. But, because of its low growth rates, the total projected population for the fifteen countries in 2025 will be only slightly higher than that of 2002. This may be due to the fact that four countries (Portugal, Greece, Germany and Italy) will experience negative growth rates during that period, while only two of the remaining eleven countries are expected to grow over 0.5% per year (Luxembourg and Ireland). However, it is estimated that the European Union will have a negative population growth between 2025 and 2050, when only six countries may have positive growth rates (Denmark, Sweden, Belgium, the Netherlands, France and the United Kingdom) and two additional ones are expected to have zero-population growth (Ireland and Luxembourg). The total European Union population will have a more important loss between 2025 and 2050, but considering the whole period 2002-2050, the total population of the European Union will decline only slightly. This may be a result of the very significant decrease expected in Germany and to some extent in Finland, Greece, Italy and Portugal, that will be compensated by annual average positive growth rates in the remaining twelve countries. Therefore, it seems that most countries in the European Union will grow positively for the next twenty-three years, but most of them too will have negative growth rates between 2025 and 2050. A second conclusion seems to be that the total population of the European Union may decline over the next fifty years, but only because of a population decline in five countries, since the other ten countries will grow, slowly, but positively.

The prospects for slow and even negative population growth rates in the European Union are due to the fact that the average number of children per woman is at present below replacement level in all countries (almost half that level in Spain, for example). The combined effect of such low fertility with very low mortality (that results in very high life expectancy) is a very pronounced process of demographic ageing. In fact, the proportion of the population of 65 years and over is greater than the proportion that is less than 15 years of age already in three countries (Italy, Greece and Spain), and equal to it in two additional countries (Germany and Portugal). That proportion is at present between 15-20% in most countries, though still lower in Ireland, Luxembourg and the Netherlands, but it will be greater than 20% in all countries by 2050, and even greater than 30% in six countries (Spain, Italy, Greece, Austria, Germany and Sweden). In that same year, population prospects estimate that the proportion of the population of 80 years and over will be higher than 10% in all but three countries (Ireland, Luxembourg and Portugal). Population ageing, according to United Nations projections, will accelerate in all European Union countries over the next 50 years, but especially in Southern European ones [8].

When discussing the future population of the European Union the ten countries that will become members in 2004 must be included. The total population for the ten applying countries was 74.9 million in 2002 (19.6% of the present total population of the European Union, or 16.4% of the total population of the enlarged EU-25, which in 2002 will amount to 456.1 million).

Table 2. Demographic Indicators and Projections for the Member and Candidate Countries of the European Union, 2002-2050

	Population mid 2002 (Millions)	Projected population (Millions)		Projected annual rate of increase (%) (a)		Total Fertilit y Rate	Life expectancy at birth (both sexes)	Percent of population of age		Projected percent of population in 2050 (b)	
		2025	2050	2002- 2025	2025- 2050			< 15	65 +	65 +	80 +
Members: (a)	381.2	391.7	374.1	0.12	-0.18	1.6	79	17	16	30.8	12.0
Austria	8.1	8.4	8.2	0.16	-0.10	1.3	78	17	15	34.0	14.5
Belgium	10.3	10.8	11.0	0.21	0.07	1.7	78	18	17	29.0	11.5
Denmark	5.4	5.9	6.4	0.40	0.34	1.7	77	19	15	25.9	9.7
Finland	5.2	5.3	4.8	0.08	-0.38	1.7	78	18	15	27.9	10.6
France	59.5	64.2	65.1	0.34	0.06	1.9	79	19	16	26.7	10.4
Germany	82.4	78.1	67.7	-0.22	-0.53	1.3	78	16	16	31.0	13.2
Greece	11.0	10.4	9.7	-0.24	-0.27	1.3	78	15	17	34.1	11.8
Ireland	3.8	4.5	4.5	0.80	0.00	1.9	77	21	11	22.0	5.9
Italy	58.1	57.5	52.2	-0.04	-0.37	1.3	80	14	19	35.9	14.1
Luxembourg	0.5	0.6	0.6	0.87	0.00	1.8	78	19	14	19.7	6.9
Netherlands	16.1	17.7	18.0	0.43	0.07	1.7	78	19	14	26.5	10.1
Portugal	10.4	9.7	8.6	-0.29	-0.45	1.5	76	16	16	29.8	9.1
Spain	41.3	44.3	42.1	0.32	-0.20	1.2	79	15	17	37.6	13.4
Sweden	8.9	9.5	9.8	0.29	0.13	1.6	80	18	17	30.4	12.2
United Kingdom	60.2	64.8	65.4	0.33	0.04	1.6	78	19	16	27.3	10.8
Candidates: (a)	74.9	73.6	65.0	-0.08	-0.47	1.3	74	18	13	28.9	7.8
Cyprus	0.9	1.0	1.0	0.48	0.00	1.7	77	22	10	23.2	7.5
Czech Rep.	10.3	10.3	9.4	0.00	-0.38	1.1	75	16	14	32.7	9.5
Estonia	1.4	1.2	0.9	-0.62	-1.00	1.3	71	18	15	26.9	7.3
Hungary	10.1	9.2	8.1	-0.39	-0.48	1.3	72	17	15	29.0	7.7
Latvia	2.3	2.2	1.8	-0.19	-0.73	1.2	71	17	15	28.2	8.2
Lithuania	3.5	3.5	3.1	0.00	-0.46	1.3	73	19	14	28.8	9.4
Malta	0.4	0.4	0.4	0.00	0.00	1.7	77	20	12	26.9	9.0
Poland	38.6	38.6	33.9	0.00	-0.49	1.3	74	19	12	27.9	7.4
Slovakia	5.4	5.2	4.7	-0.16	-0.38	1.2	73	19	11	28.9	
Slovenia	2.0	2.0	1.7	0.00	-0.60	1.3	76	16	14	34.8	11.8

Source: Population Reference Bureau, *World Population 2002* [2].

(a) Calculated by the author.

(b) United Nations, *World Population Ageing, 1950-2050* [4].

It must be underlined that all the trends that were ascribed to the European Union countries are even more pronounced in the group of ten candidate countries. In fact, it is estimated that their total population will decrease not only between 2025 and 2050 (as in the present EU-15), but also between 2002 and 2025 (contrary to the present European

Union countries). Growth rates, however, will be even more negative in the second period than in the first one (similarly to what was observed for the present EU-15). Only one country is expected to have a positive growth between 2002 and 2025 (Cyprus) and none at all between 2025 and 2050 (while there were ten and five countries, respectively, that were estimated to achieve positive growth rates in the same two time periods). Fertility levels in the present EU-15 range from 1.2 children per woman in Spain to 1.9 in France and Ireland, while among the ten candidate countries the range varies from 1.1 in the Czech Republic to 1.7 in Cyprus and Malta. Only five out of the fifteen present member countries of the European Union have a fertility rate below 1.5 compared to eight out of ten among the candidate countries. Life expectancy at birth varies from 76 to 80 among the EU-15 countries, and it varies from 71 to 77 among the applying countries, which implies still higher mortality (lower life expectancy) among the candidate countries.

As a consequence, the population of the candidate countries is at present a little younger than that of the present members. In fact, the proportion of the population which is 65 years and older is not greater or equal to the proportion which is less than 15 years of age in any of the candidate countries, while it is larger or equal to it in five of the fifteen member countries. And the population of the candidate countries in 2050 will continue to be a little younger than that of the present members, though their age distributions will be more homogeneous. Thus, of the present fifteen members, two will have less than 25% of their population aged 65 or more (Ireland and Luxembourg), while six will have more than 30% (Spain, Italy, Greece, Austria, Germany and Sweden). And of the ten candidate countries only one will have less than 25% of its population aged 65 or more (Cyprus), while two will have more than 30% (Slovenia and Czech Republic).

Taking into account the enlarged EU-25, its present population is 456.1 million, and according to United Nations it will increase to 465.3 million in 2025 but will decrease to 439.1 million in 2050, with annual rates of growth of 0.09% during the first period and -0.22% during the second period. The total fertility rate for this enlarged European Union would be, at present, 1.4 children per woman (lower than the present average for the fifteen member countries), and its life expectancy at birth would be 78 years. The age structure of the resulting enlarged population is, at present, a little younger than the present fifteen member-European Union since, although the proportion of the population under 15 years of age is 17%, the proportion of 65 years and older is only 14%. But the future projected population for the enlarged European Union in 2050 will be almost as old as if only the present fifteen countries were projected. Thus, 30.5% of the population will be 65 years or older and 11.4% will be 80 and older, both proportions being slightly lower than those projected for the present fifteen countries, because of the younger projected population for the candidate countries.

3. The components of population growth

The data that have been presented seem to demonstrate that the future of the European Union population will not be very different whether one considers only its present composition of fifteen countries or the enlarged composition of twenty five member countries. All European populations, even those outside the twenty five, show very

similar patterns and processes, characterised by very low fertility and very low mortality levels (high life expectancy at birth) that in combination lead to small or even negative population growth rates and to increasingly ageing population distributions.

This is the present situation and the forecasted future, provided that the present trends continue for the next twenty-three and the following twenty-five years. But it must be underlined that the projections require that present trends continue for such a long period of time, and they also require the assumption of a closed population, without migration flows. Both assumptions, as will be now discussed, are only a demographic exercise, and do not necessarily have to be accepted as the most likely outcomes. And, besides, there are other variables that are not demographic and should be considered as potential intervening variables with very important consequences.

First of all, the assumption that present trends will continue is certainly the most conservative hypothesis, and to challenge it evidence must be presented to the contrary. Thus, it does not seem reasonable to expect a rise in mortality levels, unless the European Union suffers great natural or human catastrophes (wars that produce massive casualties, huge economic crises that produce mass starvation, etc.). Quite on the contrary it seems more natural to expect still more important gains in life expectancy during the next fifty years, due to the great advances that are expected in biology, medicine, genetics and other related fields.

For similar reasons, a rise in fertility is not expected. All European Union countries, both present members and candidates, show fertility levels that are, for the most part, significantly below replacement. Under what conditions could a rise in fertility be expected? Marriage patterns, new roles for men and women, incorporation of women to the labour force, new life styles and, more important, rising expectations in standards of living and consumption patterns, all seem to go in a direction that is not favourable to rising fertility.

In fact, if it were accepted that most of these variables are responsible for the recent fall of fertility since the decade of the eighties in European countries, in order to expect a change in fertility it would first be necessary to expect changes in those explanatory variables.

But, on the contrary, research on attitudes towards marriage, the family and childbearing across most European countries during the past twenty years does not seem to guarantee rising fertility that might have any significant consequences on the structure of their populations, at least within the near future [5].

The second assumption, based on the model of a closed population, must also be rejected, not only because migration flows must always be considered when discussing population growth, but because they represent at present the most important component of population growth in the majority of European Union countries.

Until a few decades ago, net migration (the difference between immigrants and emigrants) represented a small proportion of the total demographic growth in any European Union country, since natural growth (the difference between births and deaths) contributed to total growth more than net migration. Certainly, births were more numerous than deaths, and the opposite was an exception until very recently, due to the significant fall in fertility. Net migration was positive in most Central and Western European countries (the more developed ones), but it was negative in Southern European countries (economically less developed) during the decade of the seventies, and positive

Table 3. Total Population Growth, Natural Growth and Net Migration Rates per 1,000 inhabitants in Member and Candidate Countries of the European Union, 1980 and 2000

	Population mid 2002 (Millions)	1980			2000		
		Total growth	Natural growth	Net Migration	Total growth	Natural growth	Net migration
Members: (a)	381.2						
Austria	8.1	0.10	-0.02	0.12	0.23	0.02	0.21
Belgium	10.3	0.08	0.10	-0.02	0.24	0.11	0.12
Denmark	5.4	0.03	0.03	0.01	0.36	0.17	0.19
Finland	5.2	0.34	0.39	-0.05	0.19	0.14	0.05
France	59.5	0.55	0.47	0.08	0.50	0.41	0.09
Germany	82.4	0.28	-0.11	0.39	0.04	-0.09	0.12
Greece	11.0	1.15	0.63	0.52	0.21	-0.02	0.23
Ireland	3.8	1.17	1.19	-0.02	0.11	0.61	-0.51
Italy	58.1	0.16	0.15	0.01	0.28	-0.04	0.31
Luxembourg	0.5	0.38	0.02	0.37	1.28	0.45	0.83
Netherlands	16.1	0.83	0.47	0.36	0.77	0.42	0.36
Portugal	10.4	1.08	0.65	0.43	0.63	0.14	0.49
Spain	41.3	1.05	0.75	0.30	0.97	0.06	0.91
Sweden	8.9	0.18	0.06	0.11	0.24	-0.03	0.28
United Kingdom	60.2	0.10	0.17	-0.07	0.40	0.12	0.28
Candidates: (a)	74.9						
Cyprus	0.9	1.14	1.11	0.04	0.57	0.46	0.11
Czech Rep.	10.3	0.20	0.18	0.02	-0.11	-0.18	0.06
Estonia	1.4	0.68	0.27	0.41	-0.37	-0.39	0.02
Hungary	10.1	-0.04	0.03	-0.07	-0.38	-0.38	0.00
Latvia	2.3	0.23	0.14	0.10	-0.58	-0.50	-0.08
Lithuania	3.5	0.53	0.47	0.06	-0.16	-0.13	-0.03
Malta	0.4	0.98	0.74	0.25	0.61	0.34	0.27
Poland	38.6	0.90	0.96	-0.06	-0.02	0.03	-0.05
Slovakia	5.4	0.83	0.89	-0.06	0.07	0.04	0.03
Slovenia	2.0	0.87	0.58	0.29	0.12	-0.02	0.14

Source: Council of Europe, *Recent Demographic Developments in Europe 2001* [1]

(a) Calculated by the author.

but relatively small during the decade of the eighties. In any case, net migration, whether positive or negative, had in general less weight on the total growth of a country's population than natural growth. Seven countries had negative net migration in 1980, and only one of them had, in addition, negative natural growth: Hungary. Net migration represented more than half of the total growth only in five of the eighteen countries that had positive net migration (Germany, Austria, Luxembourg, Sweden and Estonia) [1]. It must be also pointed out that the relatively high positive migration rate in some Southern European countries in 1980 was partly due to the return of former emigrants who, during the decades of the fifties and sixties, had migrated to more developed European countries searching for better jobs. This would be the case of Spain, Portugal and Greece. The

situation has changed significantly during the past two decades. First, total population growth has generally been lower in 2000 than it was in 1980, and this has been particularly true in all the candidate countries, though seven of the fifteen member countries show higher rates of growth in 2000. Besides, while only one country had a negative rate of growth in 1980 (Hungary), six of them (all candidate countries) show negative population growth in 2000. Second, of the eighteen countries that had positive net migration in 2000, in nine of them it represented more than half of their total growth for that year (Germany, Sweden, Slovenia, Spain, Austria, Portugal, the United Kingdom, Luxembourg, and Denmark). Besides, comparing the data for 2000 with those of 1980, it may be seen that total population growth has decreased in eighteen of the twenty-five countries, natural growth has diminished in nineteen countries, but net migration has increased in sixteen countries.

Some general conclusions can be proposed at this time. First, population growth has decreased in most European Union countries, both members and candidates, over the past twenty years. Second, natural growth was the main component of population growth two decades ago, but net migration is at present the more important component of growth. Third, the rate of immigration more and more often compensates for the low or even negative rate of natural increase, as seems to be the case with respect to Austria, Germany, Greece, Italy, Spain and Sweden. Immigration is compensating or supplementing low or negative natural population growth [10], not only through the direct effect of immigrants themselves, but also through their contribution to fertility, since most immigrants are young adults in their childbearing years who generally come from countries where fertility is higher. Therefore, population projections that assume the continuation of present demographic trends in the European Union may be greatly underestimating the population that will be reached in 2025 and 2050, because they do not take immigration into account. Though significant increases in fertility rates are not to be expected in the native receiving populations, the double contribution of immigration, through the increase of population numbers themselves, and through their contribution to fertility, may result in larger populations than those that are usually forecasted.

4. Implications of present and expected population trends in the European Union

Population projections seem, therefore, to be underestimating future growth of the European Union member and candidate countries, mainly because they have generally not taken into account the role of migration in-flows [6]. But, even if it were true that European populations will not grow or that they will decrease within the next fifty years, it is not clear why that should be a matter of concern. There is no empirical evidence that population size or population growth rates are positively correlated with economic wealth (GNP) or social well being (HDI). In fact, one could even argue in favour of the opposite relationship, that is, that high economic and social development leads to low population growth rates [13].

Besides, from a global perspective, the real problem in world population today does not seem to be the lack of growth, but rather the maintenance of still high population

growth rates that have characterised world population since the end of World War II. Even with the present growth rate (1.3% per year) world population would double within 70 years, though with great differences between the more and the less developed regions. The latter are growing sixteen times as rapidly as the former, since the more developed countries (which include the European Union) have reached almost zero population growth. One should not forget that world population took approximately sixteen centuries and a half to double since the year 0 of the Christian era, but doubled again in only two hundred years, and again in one hundred years, and has trebled since 1950 to the present. Therefore, decreasing world population growth rates may even be beneficial, since population pressure on natural resources will be lessened. And, as has been happening since the beginning of the agricultural and the industrial revolutions, the more developed countries are usually the ones that first initiate new demographic trends, which are followed afterwards by the less developed countries. Thus, the second demographic transition, characterised by below replacement fertility levels and close to zero or even negative population growth, first started in the European countries during the decade of the eighties, but is being followed more or less intensively by practically all countries in the world at present. The total fertility rate in less developed countries is still above 3 children per woman, but it used to be 5 or even more children per woman only a few decades ago, and consequently population growth rates have also decreased dramatically in most less developed countries. It must not be forgotten, in this respect, that for the past fifty years the less developed countries have benefited from a very rapid decline in mortality rates that would have caused higher growth rates had it not been for the decline in fertility.

If it is accepted that low, zero or even negative population growth rates are preferable to high rates of growth, the conclusion must be that this can only be achieved through low fertility, because rising mortality levels are not a desirable social goal in any society. The problem today seems to be that while the developed countries (in particular European countries) have almost achieved zero population growth, the less developed countries still have a high rate of growth that will lead them to double their population in only thirty five to forty years. All signs point in the direction that population growth is falling in most of these countries due to falling fertility rates that seem to be adjusting themselves to the falling mortality rates of previous and future decades. On the other hand, most of the less developed countries are also reducing their population growth through negative net migration.

Some politicians and social scientists express a second area of concern regarding the possibility of population decline in the European population within the next fifty years that refers to fertility. Before 1970 no country in the European Union had a fertility level below replacement. Even in 1970 only four countries had already decreased below that level (Luxembourg, Denmark, Sweden and Finland), but by 1985 fertility in all fifteen countries except Ireland was already below the replacement level of 2.1 children per woman. And that situation, including Ireland since 1995, has been maintained since then, that is, no European Union country has returned to the level of replacement fertility. As a matter of fact, it is not possible to identify a trend of increasing fertility in recent years, as some would like to argue, because the lowest level of fertility has been reached in some countries precisely in very recent years. Thus, if one examines fertility rates since 1970, when the highest rates were attained, it may be noticed that the lowest fertility rates were reached in 1998 or later

Table 4. Total Fertility Rates in European Union Member and Candidate Countries, 1970-2000

	Total Fertility Rate (number of children per woman)										
	1970	1975	1980	1985	1990	1995	1996	1997	1998	1999	2000
Members:											
Austria	2.29	1.83	1.65	1.47	1.45	1.40	1.42	1.37	1.34	1.32	1.34
Belgium	2.25	1.74	1.68	1.51	1.62	1.55	1.59	1.59	1.59	1.61	1.66
Denmark	1.95	1.92	1.55	1.45	1.67	1.80	1.75	1.75	1.72	1.73	1.77
Finland	1.83	1.68	1.63	1.64	1.78	1.81	1.76	1.75	1.70	1.74	1.73
France	2.47	1.93	1.95	1.81	1.78	1.71	1.72	1.71	1.76	1.79	1.89
Germany	2.03	1.48	1.56	1.37	1.45	1.25	1.32	1.37	1.36	1.36	1.36
Greece	2.43	2.32	2.22	1.67	1.39	1.32	1.30	1.31	1.29	1.28	1.29
Ireland	3.97	3.43	3.24	2.48	2.11	1.84	1.89	1.92	1.93	1.88	1.89
Italy	2.38	2.17	1.64	1.42	1.33	1.20	1.19	1.22	1.20	1.23	1.23
Luxembourg	1.98	1.55	1.49	1.38	1.60	1.69	1.76	1.71	1.68	1.73	1.79
Netherlands	2.57	1.66	1.60	1.51	1.62	1.53	1.53	1.56	1.63	1.65	1.72
Portugal	2.84	2.63	2.20	1.72	1.57	1.40	1.44	1.46	1.46	1.49	1.52
Spain	2.86	2.79	2.20	1.64	1.36	1.18	1.17	1.18	1.16	1.20	1.24
Sweden	1.92	1.77	1.68	1.74	2.13	1.73	1.60	1.52	1.50	1.50	1.54
United Kingdom	2.43	1.81	1.89	1.79	1.83	1.71	1.72	1.72	1.71	1.68	1.65
Candidates:											
Cyprus	2.54	2.01	2.46	2.38	2.42	2.13	2.08	2.00	1.92	1.83	1.83
Czech Rep.	1.90	2.40	2.10	1.96	1.90	1.28	1.18	1.17	1.16	1.13	1.14
Estonia	2.16	2.04	2.02	2.12	2.04	1.32	1.30	1.24	1.21	1.24	1.39
Hungary	1.98	2.35	1.91	1.85	1.87	1.57	1.46	1.38	1.33	1.29	1.32
Latvia	2.02	1.96	1.90	2.09	2.01	1.26	1.16	1.11	1.10	1.18	1.24
Lithuania	2.39	2.18	1.99	2.09	2.02	1.49	1.42	1.39	1.36	1.35	1.27
Malta	...	2.17	1.98	1.99	2.05	1.83	2.10	1.95	1.81	1.72	1.67
Poland	2.26	2.26	2.26	2.32	2.05	1.62	1.58	1.51	1.44	1.37	1.34
Slovakia	2.41	2.53	2.31	2.26	2.09	1.52	1.47	1.43	1.38	1.33	1.29
Slovenia	2.12	2.17	2.10	1.71	1.46	1.29	1.28	1.25	1.23	1.21	1.26

Source: Council of Europe, *Recent Demographic Developments in Europe 2001* [1].

in eight of the fifteen member countries and in all of the candidate countries. (Two of these countries may be considered exceptions, Denmark and Finland, both of which reached an all period-low rate in 1985 and 1980 respectively, but attained another peak in 1995 and another lowest rate in 1998, with increasing rates again afterwards. Ireland is another exception, in that its rates fell till 1995, rose until 1998 and fell again afterwards.) Seven member countries, then, reached their lowest rates around 1995 or earlier, and have experienced increasing rates since then. When fertility rates in 2000 are compared with the most recent lowest rates throughout the whole thirty year period, it is observed that the increase in fertility has been under 5% in seven of the member countries, 5% to 10% in four countries, and over 10% in only three countries. Only the United Kingdom reached its lowest rate ever in 2000. And, among the candidate countries, the increase has been less than 5% in three countries and more than 10% in two countries (Estonia and Latvia), but all other five countries reached their lowest rate precisely in 2000.

It may be concluded that no European Union country, member or candidate has returned to replacement fertility levels. The highest rates in 2000 are those of Ireland and Cyprus (1.89 and 1.83 respectively), both of which may be considered as rates that are still on their way down, and France (1.89). France is usually taken as an example of recovered fertility, but it must be noticed that its rate has never been lower than 1.71 children per woman. The only real examples of recovered fertility are those of Luxembourg and the Netherlands, both of which had their lowest rates in 1985 and their highest rates since then in 2000, with increases of 30% and 14% respectively. But Denmark, as has been said, though reaching an all time lowest rate in 1985, rose again to another highest of 1.80 in 1995 which has not been matched since then. And the case of Sweden, often cited too as an example of recovered fertility, is certainly not an example. Though it reached a low rate of 1.68 in 1980, it rose to 2.13 in 1990 but fell again afterwards, reaching its lowest rates of 1.50 in 1998 and in 1999 exceeded only by .04 points in 2000. Therefore, there seems to be no ground for claiming a clear recovery of fertility in European countries, since all rates in 2000 were not only below 2.1, but only ten out of twenty five were above 1.6 children per woman.

Unemployment among young men and women, increased women's participation in the labour force and access to housing facilities, have often been cited as the main causes for the fall of fertility since 1970. However, empirical evidence has not supported these supposed relationships at the country or the individual levels of analysis with sufficient reliability, nor where either a cross-sectional or a longitudinal analysis is performed. Rather, it seems that new cultural values and life styles are responsible for retarding the emancipation of youngsters, the age at which they construct couples and families (if at all), the age at which they have children and, consequently, the number and spacing of their children (if any) [3]. Therefore, unless the values and life styles that have caused the fall of fertility change, it seems difficult to foresee fertility increasing significantly in the near future. It does not seem casual that some of the lowest fertility rates are found in Southern and Eastern European countries, that is those that have arrived later to mass consumption and have more recently experienced great economic, social and political change in a short period of time.

Fertility decline, combined with a very low mortality, is responsible for the ageing of population, a process that has taken place first in the countries of the European Union and other developed countries, but which is being followed by all other countries in the world. Therefore, population ageing does not seem to be a temporary process, but one that will probably last for a long and unpredictable period of time.

The first thing that should be said is that population ageing must not be considered a social problem. It would be ironic to label as a problem one of the most important successes in the history of mankind: making it possible for the great majority of human beings to postpone death until what continues to be the culmination of human life, one hundred years. Life expectancy at birth was around thirty-five years for most populations in the world until the beginning of the last century, and in more developed countries until the middle of the nineteenth century. Today there is almost no country in the world with such a low life expectancy at birth. On the contrary, more than 80% of each cohort in developed countries can expect to survive till the age of 70, and more than half can expect to reach the age of 80. This great and unprecedented historic success cannot be turned into a "problem". The real problem is that society has not yet assimilated this new

fact, and has not produced the social reorganisation necessary to cope with this new situation.

Interactions between population, environment (resources), technology (material culture) and social organisation (non-material culture), including belief and value systems, have been explained by the social ecosystem paradigm [4]. According to this theoretical model, human populations adapt to (and survive in) their environment through culture, something that makes this adaptation process totally different from what is found in other biotic but non-human populations (plants and animals). Significant changes in any of the four elements of the social ecosystem may have repercussions in the other three elements, so that change is an immanent trait of human ecosystems. The equilibrium among the four elements is always unstable, never complete, so that tensions and conflicts in their interactive processes make conflict and change ever present to a greater or lesser degree. Changes in value systems and life styles (non-material culture), as has been argued above, may probably explain the low fertility of more developed countries and the present process of falling fertility in developing countries. For the same reason, it is argued here, changes in the population structure must bring changes in the social organisation of more developed societies [2].

The only possible ways to avoid population ageing in the European Union, and in effect, in any country in the world, are three: to increase mortality, to increase fertility, or to increase positive net migration. When considering the total world population, needless to say, the third alternative is not viable. Certainly, if mortality increases, the proportion of each cohort arriving to high ages would decrease, and would produce a pyramidal shape of the population, as in pre-industrial times. But it does not seem plausible that any government should want to implement a policy to increase mortality. On the contrary, efforts to increase life expectancy even beyond the traditional threshold of 100 years of age will continue. Therefore, at world level there is no other alternative than to increase fertility, so that new in-coming cohorts will be larger than the preceding ones. In this way, though most of the population in each cohort will reach older ages, the numbers in younger cohorts will always be larger than in the older ones, thus producing a pyramidal distribution. But, as it may be easily demonstrated, this alternative requires that the number of births in each cohort should continue to increase indefinitely, because whenever the number of births in two successive cohorts is the same, a rectangular rather than a pyramidal shape will result. Besides, according to the analysis presented above, there is no evidence whatsoever that fertility may return to replacement levels in the more developed countries, and more specifically in European Union member or candidate countries. On the contrary, empirical evidence seems to support the hypothesis that fertility will continue to be below 2.1 children per woman and, furthermore, that all countries will tend to drop more or less rapidly towards fertility levels that stay around or below replacement. As regards positive net migration, it may be considered as a temporary alternative for those countries that have initiated their ageing process earlier. Thus, more developed countries, including members and candidates of the European Union, may reduce the process of ageing of their populations through net immigration, as has been discussed above, because migrants tend to be young adults. The flow of migrants towards the more developed countries, though contributing to retard population ageing in the receiving countries, will contribute to the ageing of the populations of origin, since the weight of the young and old age groups will increase at the expense of

diminishing the middle age groups. The temporary character of net immigration as an alternative to ageing is also due to the fact that immigrants will eventually also age, so that if population ageing is to be avoided, a continuous current of net immigration must be maintained indefinitely. (Needless to say, net immigration occurs for reasons other than avoiding ageing of the population in developed countries, though some politicians often use that explanation. Net immigration is more a consequence of economic, than purely demographic, factors).

In other words, to avoid the process of population ageing European Union countries should increase their fertility rates indefinitely and/or increase their net immigration also indefinitely. If increases are only temporary, the process of ageing will recur. Besides, increases in fertility will produce higher population growth rates, a scenario that is not free of criticisms and problems, especially at world level. Consequently, and not considering the alternative of rising mortality, the only other alternative is to admit that populations will tend to age. This implies making the necessary changes in social organisation to take into account this new demographic situation, characterised by low fertility, low mortality, low or even negative growth and an age distribution that will be more similar in shape to a rectangle than to a pyramid.

The age distribution of populations has changed through time as a consequence of the levels of mortality and fertility, though migration, as has been mentioned above, has only had a more significant weight in specific populations and dates in present times and with respect to European Union countries. When the population is divided into three major age groups: the young (less than 15 years of age), the adult and potentially active (15 to 64 years) and the old (65 and over), it is observed that in pre-industrial populations, the proportions are 30-35, 60-65 and 3-5 per cent respectively. In industrializing populations the proportions were 40-50, 40-55 and 5-7 per cent. In industrial populations the distribution is 25-35, 60-65 and 10-15 per cent. And in post-industrial populations the proportions may be 15-20, 55-65 and 20-30 per cent. The threat of present demographic trends on the potentially active population is not really such a threat, because that segment of the population will not diminish significantly. The greater changes are taking place, and will take place, when comparing the young and the old age groups. But even the apparent reduction of the potentially active population may be solved by intelligent social responses, that is, adaptive changes in social organisation.

Most of the fears attached to low fertility refer to the assumption that smaller cohorts will imply that the number of contributors to Social Security will be less than the number of retired people entitled to receive a pension, and that this situation will lead to a bankrupt Social Security. This argument has led many social scientists and politicians to support rising fertility rates. However, this response misplaces the real goal that is desired. The goal is to have more contributors to Social Security than pensioners, and therefore one must promote measures to increase contributors, not necessarily to increase births. Increasing births will only affect the number of contributors to Social Security after about thirty years, when the newborn reach the age to enter the labour force, and therefore is a long-term answer. But there are other short-term measures that may help to increase the number of contributors, such as policies to reduce unemployment among the young, to facilitate women's access to the labour force (through family support policies), or to increase the number of immigrants that are admitted into the country. More specifically, there is one measure that may have immediate and profound effects:

retarding the age of retirement, or even better, to make retirement voluntary. Besides, retirement pensions should be dependent on the total time that a person has contributed to Social Security (something that is compatible with a minimum pension for everybody, regardless of having contributed or not to Social Security).

When life expectancy at birth was 60 years (only a few decades ago), it seemed reasonable to establish retirement age at 65 years, because only about 5-7 per cent of the population survived to that age or even surpassed it. In those times, people entered the labour force at around 20 years of age and retired at 65, so that in a 60 year long average life span, individuals were self-sufficient for about three-quarters of their life. At present, youngsters enter the labour force at around 30 years, and due to early retirement or long-term unemployment many individuals retire at 55 years. But, since the average life expectancy is 80 years, they are self-sufficient only during one third of their life, the rest being dependent on their families or on society. Besides, being compulsorily retired for more than 30 years of one's life is certainly not a very desirable future. It seems as if society parks these individuals in a waiting hall until they die. Certainly, individuals have a right to retire from active work, and to receive a pension that will help them to live decently, but a right cannot and should not be transformed into an obligation. As individuals reach older ages in much better physical and mental conditions than ever before, they should have the right to decide when they want to retire. Retirement means, no matter how high pensions are, a loss of income, a loss of social prestige and self-esteem, and a loss of power. On the contrary, if retirement age is postponed the same number of years as the average age of entry into the labour force, around ten years, the proportion of the population over 75 years (about 25% in developed countries) will be similar to the proportion over 65 years at present. It is a question of adjusting retirement age to the age of entry into the labour force, and of accommodating it to the new life expectancy. In the theoretical example of a stationary population there is a permanent inflow of 100,000 thousand births every year. If nobody died till age 100, there would be exactly 100,000 persons in each of the one hundred age groups and there would be zero population growth (because there would be 100,000 deaths per year, due to a cohort of 100,000 reaching the upper limit of 100 years of age). And consequently there would be a fixed age distribution with 15 per cent of the population under 15 years of age, 25 per cent over 75 years of age, and 60% in the potentially active population age group. This theoretical example provides a way to visualise the impact of changing fertility or mortality levels in the shape and volume of the total population.

What is needed, then, is that societies make the necessary changes in their organisation to give individuals over 60 years a social role that cannot be that of waiting patiently to die, a role that must be coherent with the one they had until they reached the age of 60, not better nor worse. This is the real challenge of European Union societies today, and the challenge that developing societies will have to face in a non-distant future. A challenge that implies changes in the social organisation, and one that does not require imperative changes in fertility, mortality or even migration.

On the contrary, these changes should be compatible with individuals' decisions about the number of children that they have, with new gains in life expectancy, and they should not require massive population redistribution due to scarcity of living opportunities in some places and the abundance of opportunities in other places.

5. Conclusions

This paper argues that population trends in the enlarged European Union will continue to be characterised by high and even increasing life expectancy, below replacement fertility, close to zero population growth and, consequently, increasing ageing of the population. In order to reverse these trends, if that was considered necessary, and discarding a rise in mortality, only a significant increase in fertility would produce a younger population. This would have the cost of high rates of population growth, which might not be convenient from a world perspective due to its impact on natural resources and on the environment.

For the past years the European Union has received an increasing number of immigrants, and it seems likely that it will continue to do so for the next few decades. However, this demographic input has not had, and is not likely to have, a significant impact on the structure of the receiving population, though it may increase slightly the younger adult age-groups and the labour force, and even the rate of fertility. But immigration flows will not alter significantly the fact that European populations will continue to age (among other things because immigrants will also age).

Therefore, unless European societies are prepared to accept and/or promote a rise in mortality (something that is unthinkable), their populations will continue to have a close to zero population growth, and they will continue to age. The shape of their age distributions will approximate a rectangle rather than a pyramid meaning that most of the individuals in each cohort will survive till 100 years of age. But, as individuals reach higher ages in much better physical and mental conditions, European societies should probably consider the need to make structural changes that postpone retirement age till 75 years of age or, even better, to make retirement voluntary. This measure would reduce the weight of the dependent older population to a proportion similar to the present one with retirement age at 65 years.

In brief, social rather than demographic changes are needed to adapt to the present and expected population trends in the European Union. As for net immigration flows, they will probably continue and even increase in the future, but their demographic impact on fertility or the age structure will not alter significantly present and expected population trends.

References

1. Council of Europe (2002) *Recent Demographic Developments in Europe 2001*, Strasbourg.
2. Díez-Nicolás, J. and Inglehart, R. (eds.) (1993) *Tendencias mundiales de cambio en los valores sociales y políticos*, Fundesco, Madrid.
3. Díez-Nicolás, J. (2001) Causas y consecuencias del reciente descenso de la fecundidad en España, in *Demografía y Cambio Social*, Consejería de Servicios Sociales. Comunidad de Madrid, Madrid.
4. Hawley, A.H. (1986) *Human Ecology. A theoretical essay*, The University of Chicago Press. Chicago.
5. Kaa, D.J.van de (1993) *The second demographic transition revisited: theories and expectations*, in *Population and Family in the Low Countries: Late Fertility and other Current Issues*, NIDI-CBGS pub. 30, The Hague.
6. Martin, Ph. And Widgren, J. (2002) International migration: facing the challenge, *Population Bulletin of the Population Reference Bureau*, 1, 1-40.
7. Population Reference Bureau (2002) *World Population Data Sheet*, PRB, Washington.

8. Shroots, J.J., Fernández-Ballesteros, R. and Rudinger, G. (eds.) (1999) *Ageing in Europe*, IOS Press, Amsterdam.
9. United Nations (1999) *Population Ageing*, Population Division, Department of Economic and Social Affairs, New York.
10. United Nations (2000a) Below Replacement Fertility, *Population Bulletin of the United Nations, Special Issue Nos. 40/41*, New York.
11. United Nations (2000b) *World Population Ageing 1950-2050*, Population Division, Department of Economic and Social Affairs, New York.
12. United Nations (2001a) *Replacement Migration*, Population Division, Department of Economic and Social Affairs, New York.
13. United Nations (2001b) *Population, Environment and Development, The Concise Report*, Population Division, Department of Economic and Social Affairs, New York.
14. United Nations (2002) *World Population Prospects: The 2000 Revision*, Population Division, Department of Economic and Social Affairs, New York.