Charles University in Prague

Faculty of Science

Department of Demography and Geodemography

DEMOGRAPHIC AGEING IN EUROPE

Master Thesis

Lucie Ungrová

Thesis Supervisor: RNDr. Květa Kalibová, CSc.

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I declare that this thesis is my own work under the supervision of Mrs. RNDr. Květa Kalibová, CSc. Where other sources of information have been used, they have been acknowledged.

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Lucie Ungrová

Motto: "How old would you be if you didn't know how old you are?" – Satchel Paige

It is my pleasure to extend here my thanks to the people, who supported me when I was writing this master thesis. Many thanks to Mrs. RNDr. Květa Kalibová, CSc. for her remarks and advice, which were stimulating as I wrote this thesis. Special gratitudes to my parents Jana and Josef, who always help and motivate me. And the last but not the least I also thank to my partner Petr for his encouragement.

CONTENTS

List of Acronyms and Symbols

ADR_1980	Age-dependency ratio in 1980
ADR_2004	Age-dependency ratio in 2004
awork_05	Ageing of workforce indicator in 2005
awork_90	Ageing of workforce indicator in 1990
child_04	Children group proportion in 2004
child_80	Children group proportion in 1980
EU	The European Union
EU25	25 European Union member states
exc_M_05	Excess/deficit of males as a percentage of the total population in 2005
exc_M_80	Excess/deficit of males as a percentage of the total population in 1980
ICCR	The Interdisciplinary Centre for Comparative Research in Social Sciences, Vienna
LE_F_00	Life expectancy at birth by females in 2000
LE_F_80	Life expectancy at birth by females in 1980
LE_M_00	Life expectancy at birth by males in 2000
LE_M_80	Life expectancy at birth by males in 1980
ODR_1980	Old-dependency ratio in 1980
ODR_2004	Old-dependency ratio in 2004
old_04	Proportion of the old in 2004
old_80	Proportion of the old in 1980
SDT	Second demographic transition
TFR	Total fertility rate
UN	The United Nations
YDR_1980	Young-dependency ratio in 1980
YDR_2004	Young-dependency ratio in 2004

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Demographic ageing in Europe. Demografické stárnutí v Evropě

Abstract:

Demographic ageing is a social process and represents one of the most important changes in the population development in the 20th and 21st centuries in countries, which have finished the process of demographic revolution. The intensity, timing and speed of this process have been varying throughout history; reaching its highest peak in contemporary societies. European populations are in the position to deal with economic, social and political changes that demographic ageing brings. Europe is projected to be a demographically marginalized area in the future, since it is today "the oldest" region in the world by far. The quantitative analysis of indicators describing population ageing development focuses on similarities and differences among the 25 European Union member states. From the application of cluster analysis and data comparison, we can divide the European Union states into different categories. The outcomes of this categorization correspond with the main past and present tendencies of population development in European Union states. As the population ageing process is not uniform, there are many socio-economic consequences and possible policy implications to be suggested.

Demografické stárnutí je sociální proces, který představuje jednu z nejvýznamnějších změn v populačním vývoji ve 20. a 21. století, a to v zemích, u nichž již skončil proces demografické revoluce. Intenzita, časování a rychlost tohoto procesu se v minulosti měnily a svého maxima dosahují v současnosti. Evropské země se zabývají změnami ekonomickými, sociálními a politickými, které demografické stárnutí přináší. Projekce naznačují, že Evropa se v budoucnu stane demograficky marginalizovaným regionem – již dnes je „nejstarším" regionem světa. Kvantitativní analýza ukazatelů demografického stárnutí se zaměřuje na podobnosti a rozdíly mezi 25 členskými státy Evropské unie. Na základě shlukové analýzy a srovnávací analýzy dat můžeme státy Unie zařadit do odlišných skupin. Vytvořená typologie odpovídá svým charakterem minulému a současnému populačnímu vývoji států Evropské unie. Jelikož proces demografického stárnutí nemá jednotnou podobu, je naznačováno mnoho různých socioekonomických důsledků a politik, které z toho vyplývají.

Key words: population, ageing, the European Union, quantitative indicators, typology, cluster analysis, socio-economic consequences

1 Introduction

1.1 Uniqueness of Population Ageing

Population ageing seems to be 'an inevitable development of the composition of human populations' in accordance with Pressat (1972: 270). There are no doubts that today's age structure of European populations tends to be 'non-sustainable' (Coleman 2005: 22). However, although it is true that the age structure of our populations is changing, this is not a new phenomenon as it started more than two centuries ago.

The process of population (demographic) ageing is a social process and one of the most characteristic events of the twentieth and twenty-first centuries as it represents "the natural consequence of the demographic transition" (Weeks 2005: 368). The main denominator of ageing of the population is a decline in fertility ensuing mortality rates decrease.[1] According to Avramov and Cliquet (2005: 139), these demographic changes are an effect of modernization. Walker argues that social and economic progress has led to the increase of life expectancy (Walker 2002: 758). He considers the increasing longevity as "a triumph of science and public policy over many of the causes of premature death which truncated lives in earlier times" (Walker 1999: 391).

By the population ageing development, older individuals become a proportionally larger share of the total population. Their total number does not have to grow necessarily. Although the intensity, timing and speed of this process vary, in fact, all the populations will go through the demographic ageing and will be in the position to face economic, social and political changes, which it brings (Population Division 2002: 1). The important thing is that demographic ageing is a very significantly stable process. Because concerning an age structure, its form results from gradual changes. The current age structure or population ageing intensity depends on past trends of fertility, mortality and migration development.

From the point of numbers, Europe is the most 'affected' region. "Europeans are living longer and healthier life" (Avramov, Cliquet 2005: 136). It is the oldest area in the world. In 2000, the mean

[1] Changes in mortality or migration play only a moderate role in the phenomenon of the Second Demographic Transition (STD).

age for Europe reached 37.7 years. It has been forecasted that until the year 2050 Europe will remain the oldest region with the mean age 47.7 years (Population Division 2003: 15). Laslett argues that European population is uniquely old and observes that "there have never been populations as old before anywhere in the world" (Laslett 1997: 1806). European population as a whole has aged quickly as a consequence of the first and second demographic transitions.

Due to recent population trends characterized by population ageing, which leads also to depopulation tendencies, Europe continues to be 'demographically marginalized' area in the world (Coleman 2002a in Coleman 2005: 11).

This process was connected with the fall of the total fertility rate (TFR), the low labor force participation of the people aged 50 and over and with high unemployment rates because the European Union (EU) states have faced the changes as the demographic ageing. The common aims and strategies to deal with population ageing have been discussed and formulated. In 2000, **the European Council** in Lisbon proposed the key objective and defined it as an effort to make the Union "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable growth with more and better jobs and greater social cohesion" (European Commision 2000). Major goals concerning problems of ageing labor force were to raise the overall participation in the labor market, especially as regards the activity of women and people in the age group 55–64. The support of family friendly policies was also stressed in **the Lisbon strategy** to enable women joining their maternity and work activities by promoting of the professional childcare (ibid.).

The Green Paper suggested by the European Commission in March 2005 emphasizes the importance of applications of Lisbon strategy goals for the sustainable demographic development and discusses the main demographic trends, its consequences and possible policy implication. It pays high attention to the active ageing concept and to intergenerational solidarity as a basis of all the policies (European Commission 2005).

1.2 Outline of the Study

The aim of the master thesis is to discuss and explain the present intensity of demographic ageing in the European Union countries (25 member states) and highlight the regional differences and their conditions. Therefore, we focus on country disparities with respect to their age structure. There were different population developments among European population in the second half of the 20th century, which is the core study period. Two of the main questions are what the previous population development of Europe was and how the European populations have differentiated according to the demographic trends. Another target of this paper is to make a population ageing typology

of European states. The typology is focused on the period of last two decades, it means since the year 1980. The issue is how the level of demographic ageing has been changing during the defined time interval among the European countries and what kind of similarities and differences are among the European countries regarding the intensity and structure of ageing.

The **first chapter** introduces the form of this study, its structure and discussed issues and the **last chapter** reviews the most important findings of this thesis. **Chapter 2** describes the data and data sources used to characterize European population age structures and past and present population development. **Chapter 3** deals with the methodology and terminology applied in the thesis. **Chapter 4** summarizes the most important literature, which enabled the creating of the master thesis basic structure and to formulate main arguments and discussion. Population development in Europe is characterized in **Chapter 5**, which is one of the most important chapters, because it presents the preconditions and the results of the past and recent demographic development in the interconnection with population ageing phenomenon. **Chapter 6** is a continuation of the previous chapter as it explores in detail population ageing timing and intensity in the last three decades, in which the population ageing effect has accelerated dramatically. **Chapter 7** is the core part of this thesis because it constitutes a quantitative statistical analysis of the population ageing characteristics using the method of cluster analysis. There is a suggestion of two different typologies created on the basis of population structure indicators and mortality indicators, as well as their changes during time. In **Chapter 8**, there is a broad discussion about socio-demographic consequences of present and probable future population ageing trends. **Chapter 9** concentrates on population ageing perspectives in the first half of the 21st century proposed by Eurostat in its baseline scenario.

The tables, charts and pictures within the text of this study illustrate the most important data and outcomes of the analysis. The appendix part presents relevant data, which are also graphically depicted and which support the facts and ideas described in the text. The tables, charts and pictures in the appendix are sorted according to the discussed issues in each chapter. They are in the same order, in which they are commented in the text of the thesis.

2 Data and Data Sources

The choice of used data is dependant on the accessible European demographic statistics, which **Eurostat** deals with. Eurostat collects data given by National Statistical Offices of the EU states. To raise the reliability and exactness of published materials, Eurostat gathers only raw numbers to compute its own indicators. Their complex data about fertility, mortality, migration as well as the outcomes of projections are used in this study.

If it is not specified, data and indicators presented here are related to the 1st January of each year. Although the unity and comparability of the demographic data has increased very much recently, it is difficult to collect equivalent data in the same time and unit boundaries. Statistics of some European states are because of different reasons (e.g. political changes) incomplete and there is lack of the same methodology as well. There are also various traditions of demographic statistics and thus, data sources differ (Eurostat – Methodology).

To complete the master thesis database, **Demographic Year Book** outcomes made by the Council of Europe, as well as French National Institute of Demographic Studies **(INED)** and **national statistical offices** contributed to create the database applied here. **Human Mortality Database** provided by University of California and by Max Planck Institute for Demography Research represents the last, but by no means, least source of information about mortality indicators and age structures of European populations.

As we would aim to analyze a coherent group of states, the ideal procedure would be to incorporate all the European states or regions. As formulated earlier, there are still reserves in creating of the consistent European demographic database. According to this reason, the attention is paid to **EU25** member states as the comparability of data is not very problematic. Another motive is that many recent publications have focused on the EU25 region when assessing the demographic ageing trends and proposing projections. When dealing with the term EU, it means 25 EU countries before Bulgaria and Romania entered the EU in 2007 and the EU enlarged the number of members to 27 states. However, despite the limitation of the data described above we think that it is not relevant to influence findings of this study.

3 Methodology and Terminology

The population ageing has deep connections with the age composition of the population with the relative increase of the old as a main feature. There are several main indicators and approaches to assess the age structure and demographic ageing levels and measuring the dynamics of the age transition. They are described in a variety of methodological literature (see e.g. Siegel, Swanson 2004; Weeks 2005; Pavlík, Z., Rychtaříková, Šubrtová 1986, Pressat 1972).

The population can be divided according to the age and the sex, or combining both aspects of the population composition. The age data can be tabulated by single year of age or in 5-year groups. The choice of the age boundaries depends on the purpose of the analysis and on the quantity of the relevant data. When grouping these 1-year or 5-year age groups, we form three most common characteristics of the age composition: the 'child group', the group of the productive people, and the group of the aged. They can be quantified absolutely or relatively. The **proportions of these main age groups** (in %) are the key characteristics when assessing the population ageing. They are very traditional age groups to analyze an age structure. The first group, so-called child group contains children aged under 15. The second group is a 'productive group' that usually covers people between 15 and 64 years old (population of the intermediate age). The component of the old embraces people aged 65 and over, in fact the group of retirees (aged persons). Among the group of the old, there are two age subgroups of elderly people – 'younger old' referring to the age group 65 to 79 years, and 'oldest old' relating to those aged 80 and over. However, there can be many difficulties with these main age groups when using them in the age structure analysis because they were formulated a long time ago. Thus, the application of them is a very traditional procedure from the demographic point of view. When using the economic approach, these three main age groups do not fit with the real situation. The child group – the group of young dependants – is actually much larger because the majority of teenagers do not finish their school part of their lives before they reach 18. Moreover, more and more people decide to study in a university and they enter the labor market when they are in their mid-20s. In the group of so-called productive people, there are big differences in the labor force activity. There are also unemployed people, women with small children, the handicapped people and some other at the age 15–65, who are not economically active and they also represent a dependent population. When we use the total number of people in the age group 15–24 or their relative weight, it is a good procedure how to analyze the potential of new workers entering the labor market.

Regarding the upper age boundary of the productive group (64 years of the age), some discrepancies may occur. The important factor is that the age at the retirement is not uniform and the between sex differences prevails. The tendency of the earlier going to the pension is still common in many states.

To characterize the extent of demographic ageing in a population, **the average age (mean age)** represents a frequently used indicator. It describes generally shifts in the structure of a population but it does not tell where there are or have been major changes. Information about the average age is followed by median age characteristic, which divides the population into two parts with the same total number of people. The median age characteristic represents an indicator that is not so much influenced by extreme values as the average age does. We can form various **indexes** by using specific proportions of population. These indexes can be created on the basis of the traditional demographic approach, which means to take into account three main age groups represented by the child group (0–14), the productive group (15–64) and the post-productive group of people (65+). **The index of ageing** is the ratio of the post-productive group to the child group. **The old-dependency ratio** represents the number of aged persons (65+) to the number of working age (15–64). **The young-dependency ratio** relates the number of children (0–14) to the number of people in productive age (15–64). **The age-dependency ratio**, the total dependency ratio respectively, is the number of persons under the age of 15 and persons aged 65 or older per one hundred persons in intermediate age (15–64). It is the ratio of all inactive people to active people. Coleman (2002: 584) suggests that these delimitated age groups are 'demographic abstractions', which "might be a long way from the ratio of the number of actual dependants to those who are economically active". So, it is important to take into account the limitation, which may occur concerning the reliability of the indicators especially as we use an economic point of view when studying the economic dependency. **The parent support ratio** represents the indicator useful when assessing the consequences of population ageing. The population aged 80 and over is related to the people in the age group 50–64. The level of ageing of the workforce is described by the relation of people aged 35–64 to those at the age 20–34. For our purpose, we call this indicator '**the ageing of the workforce indicator**'.

Sex ratio (in %) represents the number of males per 100 females. This indicator is good when comparing the proportions of males and females in higher age groups because it indirectly demonstrates the rate of the between sex disparities regarding the life expectancy. Siegel and Swanson (2004) define a similar indicator called the **excess (or deficit) of males as a percentage of the total population** measuring also a sex composition. It denotes the variance between the total number of males and the total number of females divided by the total population (in %). The positive value means an excess of males and the negative value means an excess of females.

Dealing with population ageing structure, two main types of population ageing is necessary to distinguish. The slow-down of the child population growth and the acceleration of the old population are factors delimiting the population ageing form. As a consequence of fertility decrease and of the decline in total number of birth, the population ages at '**the bottom of the pyramid**'. The decline in birth rates impacts the young cohorts' population and then the relative size of the old population may rise without 'directly increasing their actual number'. Conversely, as the total number of the aged increases, '**ageing at the top of the pyramid**' affects the age structure.

Using the term population ageing, **the individual ageing** is necessary to differentiate. Individual ageing is characterized by an increase in the longevity of individuals and benefits from a healthy and active way of life (Avramov, Mašková 2003: 13; Siegel, Swanson 2004: 160). "Individual ageing is the chronological development over the life course that leads to the gradual and generalized regression of the mental and physical functions, referred to as senescence, which ends in death" (Finch 1990 in Avramov, Cliquet 2005: 133).

As we focus on the statistical analysis of population ageing indicators, we use quantitative characteristics to describe similarities and differences between units. Therefore, **the cluster analysis** is a good method to create a typology. The key procedure is to make relatively homogenous groups (clusters), which are composed by as many similar units as possible. On the other hand, units of different clusters should differ as much as possible. The combination of methods of **K-Means** and of **hierarchical cluster analysis** is applied in this paper. The hierarchical clustering enables the creation of a dendrogram (so-called tree diagram), as well as the standardization by Z-score. This standardization transforms the variables into same units (Hebák and Hustopecký 1987: 412-433).

4 Literature Overview

The population ageing represents a highly discussed topic in the interconnection with different points of view and fields of studies. It is a multidisciplinary area for a research. This process affects many socio-economic spheres of public systems, as well as private life of people. Many demographers, sociologists, economists, geographers, biologists, human ecologists, gerontologists and other scholars apply their knowledge, perspective and research outcomes to the debate about such a broad issue as population ageing. Some researchers interconnect the findings from more fields of study and present a complex analysis in the population ageing context. The **object** of the population ageing research is a population or an individual and the studied **subject** depends on the concrete approach.

Relating the population ageing phenomenon, sociology concentrates on intergenerational relations in family and society, generational (in)equity, caregivers of the elderly, gender roles in an ageing society, timing of life cycles, active ageing and age discrimination, political power of the older people, etc. Economists study for example the socio-economic consequences of population ageing and focus on sustainability of public finances under population ageing. They usually pay attention on pension schemes, expenditures on the health care system, changes in the economic burden, the labor force participation, investments in human capital, family policies, and the human resources planning. Human ecology and environmentalist studies deal with the health-related quality of life, adequate housing, environment, infrastructure of the neighborhood and communication. The changes in the population size, distribution, rate of growth also represent the centre of the research. Gerontology focuses on the consequences of ageing at the level of individuals and populations. This field of study centers on the trends in mortality and on life expectancy changes.

Demography covers many from the above-described subjects of the study. However, the basic principle is to analyze the characteristics of and changes in the demographic reproduction and migration process, the preceding conditions of the present demographic situation and the following consequences for the future population development and its implications for the society. We used a variety of literature in this master thesis, so the literature discussed here includes the perspectives of demographers as well as of researchers from other fields. The brief overview of the authors and their studies, which are cited in this paper, follows.

Demeny (2005) concentrates on the population ageing very generally emphasizing the historical context of the European population development. He suggests the challenge for population policy and proposes the possible future demographic prospects concerning the EU25. Van de Kaa (1987, 2002) deals with the European population development and he is engaged in the population ageing study rather indirectly. He specializes in the demographic reproduction aspects and changes. Van de Kaa elaborated the concept of the **Second Demographic Transition** (SDT) and he uses his arguments to support this theory. Outlined consequences and effects of the SDT enable us to better understand today's demographic situation in European states. Regarding population development of the EU, Münz summarizes the migration tendencies in the second half of the 20th century. Particularly in the recent past, some researches saw the migration as a possible solution to the ageing problem, which is also an issue in Chapter 8. Coleman brings to the discussion his attitudes to **migration aspects of population ageing** on the basis of the European population development and demographic changes consequences.

Avramov (2003, 2005) cooperates with other authors (Mašková, Cliquet). They deal with the population ageing generally and in Europe very complexly paying the attention especially on the population development of Europe, regional differences and **socio-economic consequences** of expected tendencies of demographic structure changes. Concerning consequences of population ageing, Walker (1999, 2002a, 2002b) presents interesting ideas when discussing this issue regarding especially the **active ageing policy**. MacKellar (2004) also supports the active ageing strategy. This approach should have been a key policy implication to follow rationally present demographic trends and needs, as well as abilities of the aged. Bijak and his colleagues (2004, 2005) summarize socio-economic impact of population ageing and the possible strategies to implement. Johnson (1997), Eatwell (1999) and Légaré (2001) discuss the fiscal implication of population ageing focusing especially on pension system, which is a very controversial issue. All the used literature is quoted properly.

5 Population Development in Europe

5.1 Introduction of the European Population Development

Population development of the EU25 countries has been in the context of demographic changes in all Europe. However, only 25 European countries with the total population higher than 461 million in 2005 are analyzed in this thesis as noted earlier. On the one hand, there are six large countries in the EU25 – France, Germany, Italy, Poland, Spain and the United Kingdom, whose total number of inhabitants overreaches 30 million. On the other hand, seven small countries have the total population number lower than 4 million, namely Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta and Slovenia (see Table 5.1).

Each state has its specific present demographic structure of population, intensity of fertility, mortality and migration, which are determined by a long-term process of population development since demographic revolution came in European countries. Authors engaged in demographic ageing (see e.g. Van de Kaa 2002; Avramov, Mašková 2003; Coleman 2005; Pavlík, Kučera 1999; etc.) pay usually their attention to the past and recent population development in their studies. Population development has the long-term character because the contemporary age structure predetermines the structure in the future. Population development knowledge enables us to understand conditions forming current population structures. Dealing with the population ageing, Coleman (2002: 584) suggests that it is "a permanent, irreversible consequence of the achievement of low average family size and longer expectation of life in developed countries".

The high-discussed demographic issue is that contemporary Europe has started to face the 'rarity of children'. People are living longer and are having fewer children. **Fertility decline** is a global phenomenon linked to the economic development (Walker 2002: 758). A negative balance between the number born and dying is seen among many European countries and will be one of the main demographic features of the near future population development. Although it is controversial, MacKellar (MacKellar 2004: 6) says that the problem is a marriage crisis. Because MacKellar still sees marriage as a symbol of fertility. In 2005, nine EU25 countries passed through a natural decrease regarding their total population (see Table 5.1). This trend occurred in all the Baltic States (Estonia, Lithuania, Latvia), in the Central European states (the Czech Republic, Hungary, Poland),

and in Germany, Italy, Slovenia. The highest absolute natural decrease was in Germany in 2005 (–144.1 thousand people). However, MacKellar thinks that the social pressure to marry and have children continues to be strong. The point is that as the perceived cost of having children has risen, the perceived benefits have declined (ibid.). Parents are not dependant on their children's care in old age. However, fertility is not the only reason why the populations have been ageing. The absolute increase in the number of the old, especially the 'oldest old', has also appeared due to improvements of health in very old age (ibid.).

Table 5.1: Total population, natural increase and total growth (in thousands), EU25 member states, 1970, 2005

Unit	1970			2005		
	Total population	Natural increase	Total growth	Total population	Natural increase	Total growth
EU (25 countries)	406 870.1	2 251.7	1 437.1	461 478.7	381.3	2 044.7
Austria	7 455.1	13.5	23.9	8 206.5	3.0	59.4
Belgium	9 660.2	23.5	-9.3	10 445.9	14.8	65.5
Cyprus	612.0	5.8	4.9	749.2	2.8	17.2
Czech Republic	9 906.5	24.6	-96.8	10 220.6	-5.7	30.5
Denmark	4 906.9	22.6	43.7	5 411.4	9.3	16.1
Estonia	1 356.1	6.4	12.4	1 347.5	-3.0	-2.8
Finland	4 614.3	20.5	-16.0	5 236.6	9.8	19.0
France	50 528.2	305.5	488.0	60 702.3	247.4	342.4
Germany	78 269.1	72.0	-199.6	82 500.8	-144.4	-62.9
Greece	8 780.5	70.9	24.6	11 082.8	2.5	42.5
Hungary	10 322.1	31.6	29.8	10 097.5	-38.2	-21.0
Ireland	2 943.3	30.7	27.9	4 109.2	33.6	99.8
Italy	53 685.3	380.4	273.1	58 462.4	-34.9	289.3
Latvia	2 351.9	7.8	14.5	2 306.4	-11.3	-11.8
Lithuania	3 118.9	27.5	41.5	3 425.3	-13.3	-22.0
Luxembourg	338.5	0.2	1.3	455.0	1.8	4.5
Malta	302.5	2.2	0.3	402.7	0.7	1.7
Netherlands	12 957.6	129.3	161.8	16 305.5	51.5	28.7
Poland	32 670.6	281.0	-12.6	38 173.8	-3.9	-16.8
Portugal	8 697.6	87.6	-34.3	10 529.3	1.9	40.3
Slovakia	4 536.6	38.5	3.3	5 384.8	1.0	4.4
Slovenia	1 718.0	10.0	13.8	1 997.6	-0.7	5.8
Spain	33 587.6	380.9	330.4	43 038.0	78.6	720.2
Sweden	8 004.3	30.2	76.8	9 011.4	9.6	36.4
United Kingdom	55 546.4	248.5	233.7	60 059.9	140.6	333.2

Data source: own calculation based on Eurostat and Council of Europe databases

5.2 The Demographic Transition

One of the denominators of the level of ageing is the **historical timing of the demographic transition** (Avramov, Mašková 2003: 33) as population ageing represents inevitable

end of the demographic revolution (Weeks 2005: 366). According to **the demographic revolution theory**, this process determined gradual ageing of population structures. Indirect trends, namely industrialization, urbanization and secularization, led to changes of demographic processes never experienced before. Scholars perceive it as a universal process (Van de Kaa 2002: 1), which started as a part of so-called 'global revolution of the modern times' (Pavlík 2007: 1). We can understand it as a transition from extensive way of reproduction to intensive. Before the demographic revolution, the fertility level was high; however, there were also very high mortality rates and the infant and child mortality played a crucial role. Many children died before they reached the adulthood. However, internal factors (i.e. senescent deterioration) causing death replaced external causes (i.e. infectious diseases) during the demographic transition. During the demographic revolution, life expectancy at birth was prolonged and now, many people reach a high age.

So, age-specific mortality rates followed by age-specific fertility rates declined to low intensities until the end of the demographic transition. This process was "unique and unrepeatable in the history of human species" (Coleman 2002: 584). Economic utility of children decreased and there was a need to invest for their education to "give them a reasonable chance to live" (Van de Kaa 1987: 5). Family planning was no more out of the question although it was not that effective as today. Life expectancy at birth doubled in a relatively short period. After the end of demographic transition, life expectancy at birth had risen above the level of 70, especially following the mortality improvement in higher age groups "because the possibilities of further mortality decreases in younger ages have been gradually almost exhausted" (Avramov, Mašková 2003: 30).

Because the demographic revolution is a historical process, "it has its beginning and its end" (Pavlík 1990: 31). In many European countries, the demographic revolution ended in the 30s of the 20th century although the profile of demographic changes had different timing and structure. According to Avramov and Mašková (2003: 30), the age pyramid lost 'its regular pre-transitional pyramid shape'. After the Second World War, European populations had noticeably irregular age structures. There were following reasons for these disproportions. During the First World War, the intensity of fertility declined to low levels. After the War was over, many small children died because of so-called Spainish flu. Fertility levels in many European countries fell below the replacement level (2.1 children per woman) in the 30s. Then, the Second World War came and on the one hand, it brought unexpected higher level of intensity of fertility, especially in most low-fertility countries, on the other hand, the mortality rates were also very high and there were huge war losses.

5.3 Population Development in the Second Half of the 20th Century

Demographic characteristics of today's EU populations result from the main features of the past population development. Cultural and structural background together with geographic and historical proximity has also had an impact on the demographic changes in the second half of the 20th century. The population development in the last five decades was determined by huge changes in the reproductive behavior often described as the SDT.

A temporary post-war baby boom appeared in European countries supported by the decline in infant mortality rates. In "Western countries" (advanced economies), the high intensity of fertility persisted to mid-60s, in communist countries, it took only a few years and it was over. These fertility trends after the war caused some more disproportions in age structures and decreased temporarily the population ageing intensity. After year 1950, population ageing at the bottom of the age pyramid was distinctive (Pavlík, Kučera 1998: 82).

There are discussions about the concept of **the Second Demographic Transition**. Scholars are not unit speaking about this theory. However, empirical evidences support this idea (Coleman 2005: 13). According to Van de Kaa (1987: 7), many authors have come to the consensus to characterize the SDT as 'a large change in norms and attitudes'. In "Western" societies, the process of the SDT started in the 1960s. Van de Kaa (1987: 5) dates its start to 1965. As declared by Bijak (2004: 4), "different schedules of the second transition for the particular groups of countries are clearly reflected in the time series of the Total Fertility Rates". There are no doubts that social climate went through significant changes given by the rise of individualistic behavior. Trends of secularization and democratization contributed to changes of personal norms and attitudes (Tietze 2004: 240). New forms of living arrangement arose and became more popular (ibid.).

The main feature of the SDT is a significant long-term decrease of the total fertility rate below the replacement level as it first happened in Western countries and 10 years later in Southern countries (see Table 5.5 in the appendix). Bijak (2004: 5) calls the Skandinavian countries 'the forerunners of the SDT' in terms of fertility decline[2]. There was a different timing of the first fall of the TFR across Europe (see Table 5.5 in the appendix) as it corresponds with the population development in the second half of the 20th century (see next section). The Baltic States, North-Western European states, the Czech Republic and Slovakia belong to a group of countries with the earliest decline of the TFR below 2.1 children per woman. However, the decline was a temporary trend in some countries and the timing of the stabilization of the TFR below replacement level differed as well due

[2] However today, the TFR is relatively high comparing to the rest of EU countries and there are expectations that thanks to the economic development, social care and family friendly policies this trend will continue (Muszyńska 2003 in Bijak 2004: 11).

to different reasons. In the 1970s – with some delay, other "Western" states (Austria, Belgium, Germany, the Netherlands, the United Kingdom, France, Italy), Cyprus and Lithuania followed. Southern European states went through this development in the 1980s as Poland did. The last country of the EU25 passing the fall of the replacement level below 2.1 was Ireland at the beginning of the 1990s and this fact confirms its specific position in the EU regarding "conservative policies and attitudes towards the fertility and family issues" (Bijak 2004: 5).

Van de Kaa (1987: 7) connects such a reproductive behavior especially with post-materialistic tendencies of younger cohorts of people. In Eastern countries (planned economies), the TFR oscillated around the replacement level in the 1970s and 1980s, however, it was due to the pro-natalist population policy and insufficient methods of contraception, which was a part of political forces leading to unnatural development (Tietze 2004: 238). Van de Kaa (2002: 23, 24) formulates 'the engine' which stays behind the social change in last decades as shifts in structural, cultural and technological dimension. He connects such a development with the process of post-industrialization. The persistence of low fertility rates leads to 'new demographic imbalances' (Van de Kaa 2002: 2). EU women have decided to have fewer children and at higher ages. Mean age at childbearing has been increasing although, in Central and Eastern European states, it is relatively a new phenomenon[3].

In this context, Sobotka (2002 in Bijak 2004: 5) formulates the concept named "a socialist greenhouse", which means "an artificial social and economic environment characteristic for the socialist countries". The socialistic socio-economic strategies led to a high activity of women in the labor market, which was not in discordance with their traditional family role and thus the realization of reproduction (ibid.).

Van de Kaa (1987: 3–11) explains the beginning and continuance of the SDT in detail. As has been said, although the timing and intensity of this process varied in Europe, there were many common characteristics among European countries. In the 1950s, the age at first marriage declined because the marriage itself meant an 'official approval of sexual relations' (Van de Kaa 1987: 10). However, many couples practiced family planning methods because the maternity and paternity immediately after the marriage was not a high priority. During so-called 'contraception revolution' (Caldwell and Schindlmayer 2003: 244) birth control became effective and popular for young married couples in the mid-1960s (Tietze 2004: 239). Using modern contraception methods for many couples at the reproductive age has become easy. Almost in all EU countries, the abortion law enables to avoid

[3] Mean age at birth of first child:
1960: Czech Republic – 22.9; France – 24.9; Hungary – 22.9; Sweden – 25.5
2000: Czech Republic – 25.0; France – 27.9; Hungary – 25.1; Sweden – 27.9

unwanted pregnancies. There are only few exceptions such as Poland and Ireland. These countries represent two main extremes concerning induced abortions, which are permitted only when the woman was raped, the pregnancy endangers her life, or the fetus is damaged.

Changes in the family law enabled growth of divorce frequency and new family forms (cohabitations) gained a higher popularity during the last three decades of the 20th century. The SDT represented so-called 'shift from uniform to pluralistic families and household' and 'shift from the golden age of marriage to the dawn of cohabitation' (Van de Kaa 1987: 11). The age at first marriage started to increase and the intensity of out-of-wedlock fertility rose. Van de Kaa (ibid.) defines it as 'shift from the era of the king-child with parents to that of the king-pair with a child'.

Table 5.2: Total fertility rate, EU25 member states, 1960–2005

Unit	1960	1970	1980	1990	2000	2005
EU (25 countries)	2.59	2.34	1.88	1.64	1.48	1.52
Austria	2.69	2.29	1.65	1.46	1.36	1.41
Belgium	2.56	2.25	1.68	1.62	1.61	1.72
Cyprus	3.51	2.54	2.46	2.42	1.64	1.42
Czech Republic	2.11	1.91	2.10	1.89	1.14	1.28
Denmark	2.57	1.95	1.55	1.67	1.77	1.80
Estonia	1.96	2.16	2.02	2.04	1.39	1.50
Finland	2.72	1.82	1.63	1.78	1.73	1.80
France	2.73	2.47	1.95	1.78	1.88	1.94
Germany	2.37	2.03	1.56	1.45	1.38	1.34
Greece	2.28	2.39	2.21	1.39	1.27	1.28
Hungary	2.02	1.98	1.92	1.87	1.33	1.32
Ireland	3.76	3.93	3.25	2.11	1.90	1.88
Italy	2.41	2.42	1.64	1.33	1.26	1.34
Latvia	1.94	2.01	1.90	2.01	1.24	1.31
Lithuania	2.60	2.40	2.00	2.03	1.39	1.27
Luxembourg	2.28	1.98	1.49	1.61	1.78	1.70
Malta	3.62	2.02	1.99	2.05	1.67	1.37
Netherlands	3.12	2.57	1.60	1.62	1.72	1.73
Poland	2.98	2.20	2.28	2.04	1.37	1.24
Portugal	3.10	2.83	2.18	1.57	1.55	1.40
Slovakia	3.07	2.40	2.32	2.09	1.30	1.25
Slovenia	2.18	2.10	2.11	1.46	1.26	1.26
Spain	2.86	2.90	2.20	1.36	1.27	1.34
Sweden	2.20	1.92	1.68	2.13	1.55	1.77
United Kingdom	2.72	2.43	1.90	1.83	1.64	1.80

Data source: Eurostat, Council of Europe
EU 25 (2000, 2005) = Eurostat provisional values
Belgium (2000, 2005) - provisional value, Eurostat estimates

Focusing on the TFR development, there were homogeneous tendencies as far as TFR disparities across Europe concerns during the second half of the 20th century. The changes in the reproduction

are determined by the labor force participation of women and their increasing level of education (Van Nimwegen, Beets et al. 2006: 40). As women have been studying longer, they want to start their labor force activity when they finish their studies rather than realizing their fertility plans (ibid.).

There were five EU states that experienced the **TFR** below the level 1.3 children per woman (group with so-called 'lowest-low' fertility)[4] in 2005: post-communist[5] Czech Republic (1.28), Slovakia (1.25), Slovenia (1.26), Lithuania (1.27) and Poland (1.24), where there was a sharp TFR decrease in the 1990s, and Greece which belongs to the Southern European group and where an unexpected decline of the TFR also occurred in the 1990s (see Table 5.2)[6]. Due to the fall of communism in year 1989 and significant socio-economic changes in Central and Eastern Europe that followed, we may consider the 1990s as the era of the SDT in these countries. The enormous demographic changes came with the rapid intensity never expected before. Thus, their effect was very dramatic and will have a long-term effect.

Only in five EU states, the TFR reached 1.80 (children per woman) and over in 2005: Finland (1.80), Denmark (1.80), Ireland (1.88), France (1.94) and the United Kingdom (1.80). Finland and Denmark have undergone the important TFR decrease more than 25 years ago as a probable part of the SDT. Denmark dates its minimum 1.38 to the year 1983 and Finland reached its minimum 1.49 even 10 years earlier than Denmark.

Ireland and France (see Figure 5.1) are countries with a traditional high level of the TFR relatively to the rest of the EU. However, also in these countries, TFR has dropped below the replacement level, in 1992 in Ireland and in 1975 in France.

When focusing on France, Ireland, Poland and Slovakia, they all were above the EU average level concerning the TFR in 1960. Due to the different population development, these states belonged to distinctive groups in 2005 when analyzing TFR. Slovakia and Poland have reached the lowest low

[4] Kohler et al. 2002 in Caldwell and Schindlmayr 2003: 247

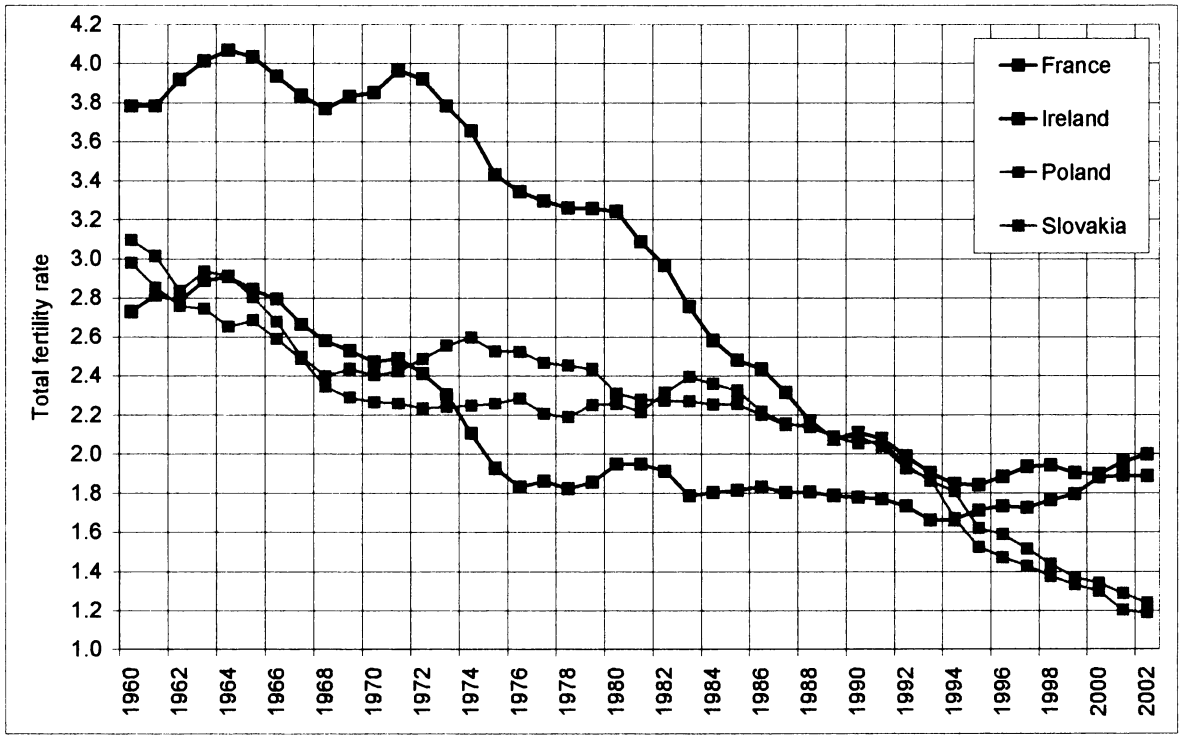
[5] Many authors have discussed the motives leading to the TFR decline in post-communist countries. There are no doubts that there was a key role of socio-economic and political changes after the fall of communism. Some author considered the fertility decline as temporary. Caldwell and Schindlmayer emphasize the importance of a sharp "change from super-welfare state with guaranteed employment to regimes of particularly liberal economies" (Caldwell and Schindlmayer 3003: 251-253).

[6] There are many hypotheses suggesting the motives for the TFR decline in Southern European countries (see discussion in Caldwell and Schindlmayr 2003: 249, 250). In Italy, the traditional model of family prevails so that women are responsible for housework and childcare. Women are discriminated in the labor market as they have children. In addition, a young married woman starts to live with her husband's family after the marriage and she is expected to also take care of the parents of husband and sometimes of other relatives. All these factors support the tendency to have a small family. In Greece and Portugal, the family situation is a little different. Grandmothers are used to taking care of their grandchildren; however, the positive effect of their help is influenced by the non-flexible labor market. Employers are inflexible as far as flexible working hours are concerned and they also have a tendency not to employ or re-employ pregnant women or mothers (Caldwell, Schindlmayr 2003: 250).

fertility in the recent past. France and Ireland with the TFR around the replacement level have a very good position comparing them with the rest of the EU.

The important suggestion of Bongaart (2002 in Caldwell and Schindlmayer 2003: 244) is that it is not probable that the TFR will increase above the replacement level in the EU in the near future.

Figure 5.1: Total fertility rate, France, Ireland, Poland, Slovakia, 1960–2002



Source: Eurostat

As far as the population ageing speed in Europe is concerned, in the second half of the 20th century after year 1960, the ageing process accelerated. It was moderated between 1980 and 1985 because the First World War cohorts aged over 65 years and they were not numerous. Concerning mortality trends, there were differences between 'Western' and 'Eastern' Europe. After the Second World War, **health** improved rapidly in Europe and the life expectancy rose, particularly in the states where the mortality rates had reached a higher level before. The process of **epidemiologic transition** was completed in the mid-1960s (Meslé 2004: 1).

After the Second World War, the mortality development was very similar across Europe until 1960. Then, the mortality rates decreased in Western Europe thanks to the accelerated decline in the circulatory diseases. However, in Central and Eastern Europe, they stayed in higher intensities and **life expectancy** stagnated (the Czech Republic, Poland) or even declined, namely in Estonia and Lithuania (see Figure 5.2). Thus, East-West mortality gap has been extensive since this time

and was interconnected with the development of economic and social inequalities (Bijak 2004: 21). In Central and Eastern Europe, the progress in the circulatory diseases reduction failed as a consequence of missing preventive health care and treatments development (Meslé 2004: 1) and unhealthy life style (smoking, alcohol consumption). Together with an environmental factors (like air pollution), there was an increasing mortality risk in Central and Eastern European countries. Bijak (2004: 22) emphasizes the view of Vallin and Meslé (2004) who argued that the socialist system itself strongly influenced the attitudes of people to their health because the system "discouraged people from taking responsibility for their health through lifestyle and behavioural changes". However, there has been a positive progress in Central and Eastern Europe since the late 1980s (Meslé 2004: 1).

Table 5.3: Life expectancy at birth, males, females, EU25 member states, 1960, 1980, 2000

Unit	Males			Females		
	1960	1980	2000	1960	1980	2000
EU (25 countries)	67.1	69.8	74.4	72.6	76.8	80.8
Austria	66.2	69.0	75.1	72.7	76.0	81.1
Belgium	67.7	70.0	74.6	73.5	76.8	80.8
Cyprus	-	72.3	76.1	-	77.0	81.0
Czech Republic	67.9	66.8	71.6	73.4	73.9	78.4
Denmark	70.4	71.2	74.3	74.4	77.3	79.0
Estonia	64.3	64.1	65.1	71.6	74.1	76.0
Finland	65.5	69.2	74.1	72.5	77.6	81.0
France	67.0	70.2	75.2	73.5	78.3	82.8
Germany	-	69.6	75.0	-	76.1	81.0
Greece	67.3	72.2	75.4	72.4	76.8	80.5
Hungary	65.9	65.5	67.1	70.1	72.7	75.6
Ireland	68.1	70.1	73.9	71.9	75.6	79.1
Italy	67.2	70.6	76.6	72.3	77.4	82.5
Latvia	65.2	63.6	64.9	72.4	74.2	76.2
Lithuania	64.9	65.5	66.8	71.4	75.4	77.4
Luxembourg	66.5	69.1	74.8	72.2	75.9	81.1
Malta	66.5	68.5	74.3	70.5	72.7	80.2
Netherlands	71.5	72.7	75.5	75.3	79.3	80.5
Poland	64.9	66.9	69.7	70.6	75.4	78.0
Portugal	61.2	67.7	73.2	66.8	75.2	80.0
Slovakia	68.4	66.8	69.1	72.7	74.3	77.4
Slovenia	66.1	67.4	71.9	72.0	75.2	79.1
Spain	67.4	72.5	75.6	72.2	78.6	82.5
Sweden	71.2	72.8	77.4	74.9	78.8	82.0
United Kingdom	67.9	70.2	75.4	73.7	76.2	80.2

Data source: Eurostat, Council of Europe
Data for Germany and Cyprus (1960) not available
Data for EU 25 (2000) provisional

By contrast, Western Europe was very successful in the decline of mortality rates thanks to implementing the development in medicine and health care (Tuljapurkar et al. 2000 in Bijak 2004: 21) and also "more hygienic living conditions and adopting healthy lifestyles by individuals" (Olshanksy and Ault 1996 in Bijak 2004: 21).

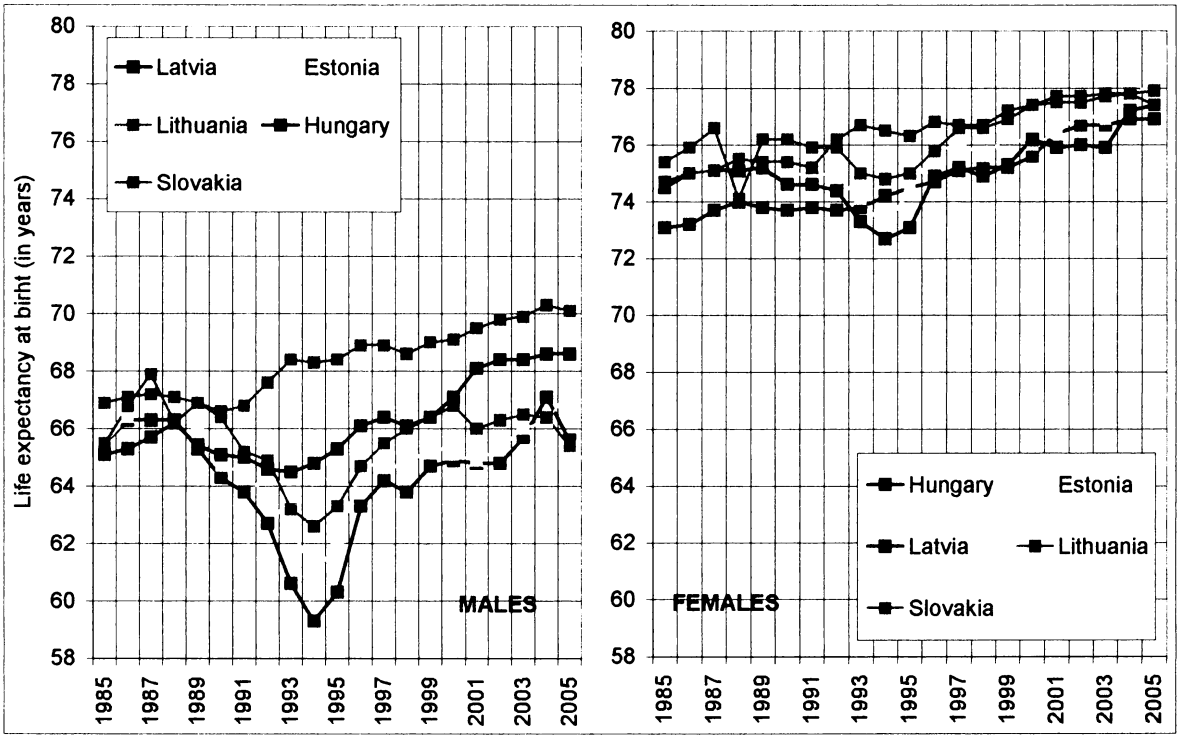
Concerning recent mortality trends, the low mortality level is uniform in the North-Western countries; however, mortality is not improving everywhere. Countries as the Netherlands and Denmark have not made any progress in the recent past years. What regards the female life expectancy at birth, it overreached the 80-year level in the Netherlands in 1987. It was in 2005 in Denmark, and generally, it has been changing slightly in last 20 years.

Sweden has long-term high life expectancy at birth for males as well as for females (see Table 5.3). The longest male life expectancy at birth among the EU countries in 2000 (77.4) was in Sweden. The between sex differences are relatively low in Sweden, less than 5 years in the year 2000. In 2000, large sex differences were in France (7.6 years), Central European states (8.5 years in Hungary, 8.3 years in Poland, 8.3 years in Slovakia) and especially in the Baltic States more than 10.5 years.

There has been a long trend of low life expectancy at birth in the Baltic States and especially in the first five years of the 1990s, the life expectancy at birth even decreased, particularly in Latvia and Estonia (see Figure 5.2). So, we may call this development a trend of long-time feminization of old age. In Latvia, the minimum life expectancy was in 1994 during the 1990s, 59.3 years for males and 72.7 for females. The Estonian minimum was reached also in 1994, 60.0 years for males and 73.1 years for females. Bijak (2004: 22) calls it a 'mortality crisis'. These states accompanied by Lithuania, Hungary and Slovakia made a very slight progress in the life expectancy at birth between 1960 and 2000, especially regarding men, which was lower than 2 years. Schoenmaeckers (2004: 34) connects such a sudden decrease in life expectancy with political and economic changes (in the 1990s) brought by the fall of communism. Bobak (1999 in Schoenmaeckers: 34) suggests that one of the key problems was an unhealthy life style. The changes after the fall of the Iron curtain "would especially have affected personal relationships and resulted in individual isolation, which, in turn would have led to unhealthy life styles such as high alcohol consumption and smoking, especially – among low-educated and unmarried men" (ibid.). Thus, Bijak (2004: 22) argues that the improvement of the working and living conditions as well as the propagation of a healthful lifestyle seems to be necessary to support the decline in mortality rates. Analyzing life expectation shifts in post-communist countries, the Czech Republic and Poland made the most significant progress in the 1990s (both in male and female life expectancy at birth).

Van Nimwegen and Beets et al. (2006: 43) suggest that there are smaller differences between the sexes regarding the life expectancy at age 60 than at birth "mainly due to selection (different mortality) before that age [60 years]". In the recent past, the life expectancy at age 60 was relatively short in the Baltic States, Hungary and Slovakia – 16 years for men and 20 years for women. By contrast, relatively long lives remain (for both sexes) in Austria, France, Greece, Italy, Spain and Sweden (ibid.).

Figure 5.2: Life expectancy at birth, males, females, Latvia*, Estonia*, Lithuania*, Hungary*, Slovakia*, 1985–2005



Source: Eurostat

* States with the lowest life expectancy at birth according to the year 2000

Conversely, in Portugal, Italy and Spain (see Table 5.3), the increase of the female and male life expectancy at birth extended beyond 8 years between 1960 and 2000 although between sex differences increased a little in the study period. Spain with the female life expectancy at birth 83.9 years in 2005 reached the top of EU member states; the life expectancy for males was 77.4 years in 2005.

In all economically developed ("Western") societies, women live longer than men and the question why remains unanswered (Schoenmaeckers 2004: 39). "There is certainly some biological explanation but there should be no doubt that also behavioural factors must play a role" (ibid.). However, a scientifically proved evidence is missing.

As we interconnect the population ageing intensity with the life expectancy level, we should also pay attention to the decrease of **infant mortality**, which contributed to the life expectancy rise during the second half of the 20th century. It is evident that the life expectancy at birth highly correlates with the infant mortality rate. In 1960, the infant mortality rate (number of newborn children that die before their first birth day per 1,000 of newborn children) was lower than 25 per 1,000 only in the Czech Republic (20.0), Denmark (21.5), the Netherlands (16.5), Finland (21.0), Sweden (16.6) and the United Kingdom (22.5). Southern European countries, with the highest level of infant mortality rate in Portugal (77.5 in 1960), belonged together with Hungary and Poland to the group of states, where the infant mortality rate was higher than 40 died children per 1,000 of newborn children in 1960. These states also failed in the decreasing tendency of infant mortality and lowered its rate with some delay according to the rest of the EU25 member states. The infant mortality rate in these states fell below 10 per 1000 around 1990, it was even in 1997 in the case of Poland, and in Hungary in 1998. Northern European countries (Sweden, Finland, Denmark, the Netherlands) were also the most successful countries regarding the decline of the infant mortality rate below 10 per 1000 as it was in the 1970s. The Czech Republic did not benefit from its excellent position in 1960 and failed in the area of the health care system and thus, the rate decreased below 10 per 1000 in 1992.

In the second half of the 20th century, **migration** also influenced the population ageing process in some "Western" countries. Temporary advantage of immigrants is that they tend to be at the productive age and so that they slow-down the population ageing speed. However, foreign immigration causes many problems. Besides, it is also important to realize that immigrant population ages as the majority population does and they will reach the post-productive age as well in the future (see Chapter 8). Migration is many times a discussed subject because it represents an important phenomenon not only in the demographic context. There were large immigration and emigration shifts during the second half of the 20th century. However, it is very difficult to find out their exact numbers and their demographic characteristics. The method of data mining and statistical evidence differs across Europe (IOM in Van Nimwegen and Beets et al. 2006: 47) which leads to the difficulties concerning the comparability and reliability of the data.

Münz deals with the history of migration in some of his studies (2006, 2007) and findings are summarized below. There were three main types of immigration to the EU countries during the second half of the 20th century[7]: **the labor immigration**, **the political immigration** and **the immigration from colonies**. According to Münz, the inflow of people from the colonies was the most significant into the United Kingdom[8], France[9], and the Netherlands[10] since the end of the 1950s

[7] The illegal migration started to be important in the late 1980s.
[8] Immigrants from India, Pakistan, Caribbean Islands

and into Portugal[11] since 1970s. The labor migration policy was aimed on the unskilled workers, who migrated from the Mediterranean area to "Western" Europe. After the oil crisis in 1973, there were tendencies to restrict the number of labor force immigrants. Thus, the principle of the family linking started to play an important role since the mid-1970s and persists until today. The political migration represented a phenomenon especially before the fall of the Iron Curtain. The people migrated because of the communist regime from the East to the West, particularly following the crisis events in each state[12].

Concerning the current situation, 42 million immigrants – defined as people who were not born in the country of their stay, lived in the EU states, Norway, Iceland, Liechtenstein and Switzerland in 2006: 10.3 million in Germany, 5.9 million in France, 4.9 million in the United Kingdom, 4.1 million in Spain and 2.5 million in Italy. Focusing on the relative weight of the immigrant population, the highest proportions were in Estonia (18.6 %), Latvia (18.8 %), Germany (12.4 %), Austria (12.5 %) and Sweden (12.0 %) in 2005.

Following the past population development, we can see today that the intensity of fertility influences the extent of the population ageing. For example Ireland with the total fertility level of 1.99 (2004) has the lowest proportion of people aged 65 and over in the EU25 (11.1 % in 2004). In Europe, we specify two main types of behavior. The first one characterized by a very low level of fertility is typical for Southern Europe although "traditional attitudes towards sexual relationships and living arrangements persist" (Coleman 2005: 15). North-Western Europe forms a second different group of states with higher fertility than awaited (idid.). So, on the one hand, the importance of traditional family remains in Southern Europe. On the other had, the long-term trend of births outside of marriage is characteristic for Sweden (55.5 % in 2005). These tendencies are typical for example for Estonia now, whose share of children born outside of marriage is the highest in the EU now (18.3 % in 1980, 58.5 % in 2005). By contrast, in Cyprus and Greece, these proportions are the lowest in the EU, less than 6 % in 2005.

To characterize the population according to the sex composition, we use the indicator named the excess/deficit of males. It is balanced to the zero value so that positive value represents the excess of males and the negative value denotes their deficit. The disparities among the states reflect the mortality profile according to age and sex composition in each country. The data suggests that countries with the high level of mortality rates differences between males and females prove also

[9] Immigrants from Algeria, Tunisia, Morocco, Vietnam, Western Africa
[10] Immigrants from Indonesia, Netherlands Antilen
[11] Immigrants from Angola, Mozambique, Capverd Islands
[12] In 1956 from Hungary, in 1968 from the Czechoslovakia, in 1980 from Poland and in 1989 from German Democratic Republic

the high level of the presented indicator. Estonia, Lithuania and Latvia had traditionally the crucial deficit of males between 1980 and 2005 (see Table 5.4), which support the connections between this indicator's extent and sex life expectancy disparities in these countries. In 1980, the deficit of males reached –7.41 % in Estonia, –7.97 % in Latvia and –5.87 % in Estonia. These states did not make any progress between 1980 and 2005 and the male deficit even increased in Estonia and Lithuania. However, there is an indication that with the decreasing variance between male and female life expectancies also the deficit of males is declining. Thus, the lowest level of the deficit had been reached in Ireland (–0.36 %), Malta (–0.87 %), Sweden (–0.87 %), Greece (0.99 %), Denmark (–1.05 %) and the Netherlands (–1.06 %) until the year 2005. In the majority of the EU25 countries, there was a decreasing tendency concerning the between sex differences (sex disproportions) between 1980 and 2005.

Table 5.4: Percentage excess/deficit of males, females, EU25 member states, 1980, 1990, 2000, 2005

Unit	1980	1990	2000	2005
EU (25 countries)	-	-2.81	-2.63	-2.45
Austria	-5.53	-4.38	-3.32	-2.85
Belgium	-2.20	-2.29	-2.22	-2.14
Cyprus	-0.39	-0.26	-1.62	-1.44
Czech Republic	-2.97	-2.81	-2.69	-2.53
Denmark	-1.25	-1.45	-1.16	-1.05
Estonia	-7.41	-6.46	-7.77	-7.89
Finland	-3.31	-2.99	-2.42	-2.15
France	-2.31	-2.63	-2.87	-2.83
Germany	-4.95	-3.66	-2.41	-2.17
Greece	-1.87	-1.55	-0.95	-0.99
Hungary	-3.10	-3.90	-4.81	-5.06
Ireland	0.51	-0.59	-0.63	-0.36
Italy	-2.61	-2.89	-3.16	-2.92
Latvia	-7.97	-7.01	-7.89	-7.83
Lithuania	-5.87	-5.38	-6.36	-6.69
Luxembourg	-2.06	-2.27	-1.47	-1.21
Malta	-	-1.32	-0.80	-0.87
Netherlands	-0.73	-1.18	-1.08	-1.06
Poland	-2.56	-2.52	-2.81	-3.23
Portugal	-3.83	-3.58	-3.52	-3.23
Slovakia	-1.61	-2.17	-2.75	-2.93
Slovenia*	-2.87	-3.00	-2.32	-2.18
Spain	-1.87	-2.00	-2.09	-1.61
Sweden	-0.87	-1.21	-1.14	-0.87
United Kingdom	-2.67	-2.82	-2.58	-2.11

Data sources: own calculation based on Eurostat, Statistical office of the Republic of Slovenia and INED data
* 1981 (related to the present territory)
Data for EU25 and Malta (1980) not available

The structure of the old people, which will be analyzed in chapter 6, varies among European countries and the profile was determined by different population development in the 20th century described

above (see Tables 5.6 and 5.7 in the appendix). There is a various relative weight of the elderly in the European populations with the most significant differences between Eastern and the Western countries of the EU25.

5.4 The Future Population Development Trends

European countries have experienced or will undergo 'natural decline' because the number of deaths will exceed the number of births. Analyzing the absolute numbers, the highest natural decline in 2005 was in Germany (–144.4 thousand people). The worst situation seems to be in Eastern European countries with very low fertility intensity (Coleman 2005: 19). The level of fertility is the main predominator of population development in states where foreign migration does not play an important role (Tietze 2004: 240). These countries also show the fastest speed of ageing of populations (Coleman 2005: 21). The population decline will be postponed thanks to the immigration to some EU countries, however, migration is very difficult to predict. The total number of the old will increase rapidly in a few years because numerous cohorts of the post-war baby boom will reach the age of retirement[13]. With regard to fertility stabilization at below replacement level in almost all European countries and to persisting mortality rates decline in older ages, ageing at the top of the age pyramid will be characteristic for the future population development (Avramov and Mašková 2003: 30). The influx of immigrants, their number and demographic characteristics respectively, will influence the population structure and growth.

The factors for future population ageing in European countries are their demographic past, and the future tendencies of fertility, mortality, and migration. When studying changing age structures, it is important to realize that it takes a long time for the cohorts to "mature through the age structure" (Coleman 2002: 585). Coleman (ibid.) speaks about 'the phenomenon of the demographic inertia'.

Projections of the future population of older people should be perceived as very probable because the exposed population is alive (Coleman 2005: 20). So concerning the impact of the low fertility on the age structure of the active population, it takes at least 20 years. Future age structures of European populations will differentiate so that common 'European' solutions to deal with population ageing can not be planned (Coleman 2005: 21, 22). As Coleman (ibid.) suggests, there will be a need for 'individual policy responses'. However, some more factors influencing the population ageing impact is necessary to take into account, namely the levels of workforce participation, labor productivity, structure of pension systems and their sustainability or accumulated indebtedness (see Chapter 8).

[13] This numerous age groups of people in productive age can be considered as a 'demographic bonus' now (Coleman 2005: 19).

6 Population Ageing Timing and Intensity

EU states age structures have been gradually ageing all the second half of the 20th century. The intensity of population ageing, measured for example by proportion indicators or by dependency ratios, as well as the timing of the age structure shift, expressed by the indexes of change, have varied in the EU.

Table 6.1: Average age, EU25 member states, 1980, 2000, 2005

Unit	1980	2000	2000/1980	2005
Austria	37.0	39.4	106.4	40.4
Belgium	36.8	39.6	107.7	40.4
Cyprus	32.7	35.0	107.2	36.6
Czech Republic	35.4	38.5	108.7	39.8
Denmark	36.7	39.1	106.4	39.6
Estonia	*	38.7	-	39.7
Finland	35.4	39.2	110.6	40.3
France	35.7	38.7	108.5	39.5
Germany	37.8	40.8	108.0	41.8
Greece	35.9	39.7	110.5	41.1
Hungary	36.2	39.0	107.6	40.1
Ireland	*	34.8	-	35.5
Italy	35.9	41.4	115.4	42.5
Latvia	36.3	38.8	106.8	40.0
Lithuania	34.3	37.2	108.5	38.7
Luxembourg	37.1	38.3	103.2	38.6
Malta	*	36.7	-	38.5
Netherlands	34.4	38.2	110.9	39.0
Poland	33.0	36.2	109.9	37.9
Portugal	34.0	39.2	115.3	40.3
Slovakia	32.5	35.7	109.8	37.1
Slovenia	34.4	38.6	112.4	40.3
Spain	33.6	39.6	118.0	40.4
Sweden	38.4	40.2	104.7	40.8
United Kingdom	37.0	38.9	105.0	39.5

Data sources: own calculation based on the Eurostat database and Human Mortality Database
* not proper data available
Portugal (1980) - 1981 data
Slovenia (1980) - 1982 data

As population age structures have been changing, the average ages have also shifted to reach almost 43 years in the "oldest" countries in 2005. The extent of changes between 1980 and 2000 (or 2005 respectively) was dependant on the initial average age of each state and on the speed of population

ageing in the two last decades of the 20th century (see Table 6.1). Ireland, Cyprus, Slovakia and Poland had traditionally a relatively young age structure, which is also documented by the average age. In 1980, the average age did not overreach 33 years (32.7 years in Cyprus, 32.5 years in Slovakia, 33.0 years in Poland) and in 2005, the level was lower than 38.0 years (35.5 in Ireland, 36.6 in Cyprus, 37.1 in Slovakia and 37.9 in Poland). On the contrary, the average age reached the highest level during the whole study period in Sweden (38.4 in 1980, 40.8 in 2005) and in Germany (37.8 in 1980, 41.8 in 2005). In 1980, these states were accompanied by Luxembourg (37.1) and the United Kingdom (37.0), and in 2005, by Greece (41.1) and Italy (42.5).

There were the slightest changes between 1980 and 2000 in the states where the extent of the average age was the highest in the beginning of the study period. Thus, Luxembourg, the United Kingdom, Austria and Sweden passed the less significant rise because the growth was lower than 6.5 %. The shifts extended 15 % in Southern European countries (15.3 % in Portugal, 18.0 % in Spain, 15.4 % in Italy). Italy with the average age level of 42.5 years was at the top of the EU25 in 2005. The lowest average age was in Ireland (35.5) in 2005 as expected.

The median age analysis confirms the above described trends (see Table 6.2). In 1980, the median age was lower than 30 years only in four countries, namely in Ireland (26.4), Cyprus (28.5), Slovakia (29.0) and Portugal (29.1). On the other hand, Luxembourg, Latvia, Sweden and Germany achieved the top position with the median age higher than 34.5 years. Ireland, Cyprus and Slovakia remained at the bottom of the EU25 also in 2005 with the median age lower than 36 years. In addition, the highest level (above 40.5 years) was reached in Austria, Finland, Germany and Italy.

Table 6.2: Median age, EU25 member states, 1980, 2000, 2005

Unit	1980	2005	Unit	1980	2005
EU (25 member states)	33.3	39.8	Italy	34.0	42.3
Austria	34.7	40.6	Latvia	35.0	39.5
Belgium	34.2	40.6	Lithuania	31.8	37.8
Cyprus	28.7	35.3	Luxembourg	34.8	38.1
Czech Republic	33.0	39.0	Malta	30.0	38.1
Denmark	34.3	39.5	Netherlands	31.3	39.3
Estonia	33.9	38.9	Poland	29.5	36.5
Finland	32.8	40.9	Portugal	29.1	39.5
France	32.5	39.3	Slovakia	29.0	35.6
Germany	36.4	42.1	Slovenia	31.7	40.2
Greece	34.2	39.7	Spain	30.3	38.6
Hungary	34.4	38.8	Sweden	36.2	40.1
Ireland	26.4	34.2	United Kingdom	34.6	39.0

Source: Van Nimwegen and Beets et al. 2006

As noted earlier, Ireland, followed by Cyprus and Denmark, traditionally has a relatively young age structure to the rest of the EU (see Table 6.7 in the appendix). Although there was a rapid, decrease of **the proportion of children** from 30.5 % in 1980 to 20.9 % in 2004, Ireland is still on the top of the EU. In Denmark, there was a slight decrease in the proportion of the child group from the mid-1980s (21.1 % in 1980, 18.9 % in 2004), however, it started the increasing trend again in 1993 as the total fertility rate, which declined to the lowest level in the 1980s (with minimum 1.38 in 1983), began to growth again. The group of Southern European states, namely consisting of Italy (14.2 % in 2004), Greece (14.6 % in 2004), Slovenia (14.6 % in 2004) and Spain (14.5 % in 2004), has reduced gradually the child proportion to very low levels in the second half of the 20th century, especially since the 1980s, because unexpected decline in the TFR occurred. The Baltic States passed a similar development of the child group proportion as the share declined by 5 % between 1980 and 2004 (from about 22.0–25.0 % to 15.5–17.5 %).

Table 6.3: Proportion of age group 0–14 (in %), min, max (EU25)*, 1980–2004

	1980	1985	1990	1995	2000	2004
max	30.5 Ireland	29.3 Ireland	27.4 Ireland	25.0 Cyprus	22.8 Cyprus	20.9 Ireland
min	18.8 Germany	16.2 Germany	16.0 Germany	14.8 Italy	14.3 Italy	14.2 Italy

Source: Eurostat

*Data for Malta available only for 1995–2004

What regards **the proportions of productive group**, they show the lowest changes according to the transition in the other main age groups. People at age of 15–64 are the most numerous group so that the past and present population structure shift develops with the delayed tendency comparing it with the children and retirees groups.

Table 6.4: Proportion of age group 15–64 (in %), min, max (EU25)*, 1980–2004

	1980	1985	1990	1995	2000	2004
min	67.6 Finland	69.4 Germany	69.1 Germany	69.4 Slovenia	70.0 Slovenia	71.0 Slovakia
max	58.8 Ireland	59.9 Ireland	61.3 Ireland	63.6 Sweden	64.2 Sweden	65.1 Sweden/ France

Source: Eurostat

*Data for Malta available only for 1995–2004

With the exception of Finland and Luxembourg, there was a relative increase of the productive group proportion in the EU states between 1980 and 2004. The rise was the most rapid in Ireland (from 58.8 % to 67.7 %), the Czech Republic (from 63.0 % to 70.9 %) and Slovakia (from 63.3 % to 71.0 %). It was due to the fertility decline and thanks to not so intensive mortality rates fall and last but not least because of numerous young generations entering working age. In the Czech Republic

and Slovakia, these generations were born during the 1970s baby boom which was supported by pro-natalist state policy and which speeded up the fertility of women who had had at least one child before. Therefore, the fertility increase concerned especially the second born or third born children.

As we deal with short-term population ageing consequences, especially regarding the total number of new workers entering the labor market, analysis of the total numbers, proportions and regional differences of **the age group 15–24** is a necessary area to focus on (see Table 6.9 in the appendix). Concerning the youngest productive population group, there was also a significant shift between 1980 and today. Except Poland, Ireland and Slovakia that were with their proportions of the youngest productive people (above 15.5 %) on the top of the EU25 in 2005, there was a decreasing tendency regarding the total number of people at the age group 15–24. The intensity of the changes between 1980 and 2005 is strongly determined by the timing and speed of fertility decline. Thus, the lowest proportion of the youngest productive population was in Italy, Denmark and Luxembourg in 2005 (less than 12.0 %). The total numbers and proportions reached in 1980 had been influenced by the timing and extent of the post-war baby boom. This might be an explanation why the Czech Republic and Hungary were at the bottom of the EU25 when comparing the proportion of the age group 15–24 in 1980. The post-war baby boom was relatively short and without a significant intensity.

The following indicator, proposed by Lisiankova and Wright (2005: 79) and named for our purpose as 'the **ageing of the workforce indicator'**, relates the group of 'older' working age people (35–64) to 'younger' people in the productive age (20–34). This characteristic shows shift in the workforce age structure as there is also an ageing tendency in the productive group of people. This tendency is somewhat hidden (see Table 6.5). As Kotowska (Palomba and Kotowska 2003: 60) suggests the ageing of male labor force is not that intensive as the ageing of female labor force, which is given by the differences in life expectancy.

North-Western countries, especially Germany, Finland, Denmark and Sweden, had the oldest workforce age structure among the EU25 member states in 2005 (2.20 and more older workers to younger workers). This corresponds with the relatively stable long-term ageing process as the TFR has been below the replacement level for a long time. The mortality rates decreased significantly and the life expectancy has been constantly growing since the 1960s. **Southern European countries** were below or around the EU average concerning the ageing of the workforce indicator. The relation of the older workforce to the younger workforce did not change much between 1980 and 2005 and this relation oscillates between 1.50 older workers to a younger worker and 1.80 in the study period with the exception of Italy, where this indicator reached the value 2.05 in 2005. The explanation may arise from the late fall of the TFR and from the fact that these countries started to age rapidly but recently

and the age structure changes have not shifted to the productive group. **Post-communist states** had a lower level of this indicator between 1980 and 2005 because the ageing process and thus ageing of the workforce is assumed to accelerate in the near future. The TFR decrease became stable as late as in the mid-1990s and so today's people at the productive age come from relatively numerous generations.

Table 6.5: Ageing of the workforce indicator, EU25 member states, 1980, 1990, 2000, 2005

Unit	1980	1990	2000	2005
EU (25 countries)	-	-	1.81	1.96
Austria	1.63	1.44	1.84	2.13
Belgium	1.49	1.58	1.92	2.09
Czech Republic	1.40	1.87	1.69	1.73
Cyprus	-	1.36	1.70	1.64
Denmark	1.50	1.64	1.88	2.20
Estonia	1.58	1.70	1.92	1.79
Finland	1.30	1.73	2.16	2.27
France	1.36	1.57	1.83	1.97
Germany	1.76	1.58	2.07	2.38
Greece	1.72	1.74	1.63	1.77
Hungary	1.55	1.94	1.76	1.76
Ireland	1.28	1.41	1.51	1.47
Italy	1.70	1.64	1.78	2.05
Latvia	1.68	1.69	1.93	1.82
Lithuania	1.56	1.50	1.77	1.84
Luxembourg	1.56	1.58	1.86	2.10
Malta	-	-	1.96	1.85
Netherlands	1.28	1.43	1.85	2.18
Poland	1.19	1.57	1.76	1.63
Portugal	1.57	1.58	1.65	1.74
Slovakia	1.23	1.48	1.59	1.56
Slovenia	-	1.61	1.80	1.91
Spain	1.56	1.47	1.51	1.63
Sweden	1.61	1.76	1.95	2.15
United Kingdom	1.58	1.53	1.84	2.02

Source: own calculation based on Eurostat database

The proportion of the old is logically interrelated with the young group proportion (see Table 6.10 in the appendix). In 1980, there were six states with the post-productive proportion lower than 11.0 %, namely Cyprus (10.1 %), Poland (10.2 %), Slovakia (10.6 %), Slovenia (10.8 %), Spain (10.8 %) and Ireland (10.7 %). The position of Cyprus, Ireland, Poland and Slovakia at the bottom of the EU25 did not change during the study period so that in 2004, the old group proportion did not extend 13.0 %. In 1980, the post-productive share higher than 15.0 % was only in three states, namely in Austria (15.5 %), Germany (15.7 %) and Sweden (16.2 %). Until 2004, the number of states with this proportion above 15.0 % increased to 16 with the maximum in Belgium (17.1 %), Germany (18.0 %),

Italy (19.2 %), and Sweden (17.2 %) (see Figure 6.5 in the appendix). Sweden went through a relatively homogenous development of the post-productive people proportion when comparing with Germany, Greece, Italy and Belgium. The share of the old oscillated between 16 and 18 % in Sweden in the analyzed period.

Table 6.6: Proportion of age group 65+ (in %), min, max (EU25)*, 1980–2004

	1980	1985	1990	1995	2000	2004
min	16.2 Sweden	17.0 Sweden	17.8 Sweden	17.4 Sweden	18.1 Italy	19.2 Italy
max	10.1 Cyprus	9.4 Slovakia	10.0 Poland	8.9 Malta	9.8 Malta	10.3 Malta

Source: Eurostat

*Data for Malta available only for 1995–2004

As could be expected on the basis of the EU population development knowledge, the proportion growth of **post-productive group** shows its maximum in Italy (47 %) and in Spain (56 %) between 1980 and 2004 (see Table 6.1 in the appendix). The Italian proportion of the old increased from about 13 % in the 1980s to more than 19 % in 2004. The relative weight of the post-productive people reached the level of 10.8 % in 1980 and rose gradually to 16.8 % in 2004. Almost no growth of the old group proportion was in the Czech Republic, Austria and Luxembourg when comparing the demographic situation in 1980 and in 2004.

Comparing the changes in these proportions during the last three decades, the Baltic States went through a decline in the 1980s as a result of the bad mortality profile (see Figure 6.6 in the appendix). Thus, the relative rise of the aged people proportion in the Baltic States was one of the highest in theEU between 1980 and 2004 (by more than 25 %).

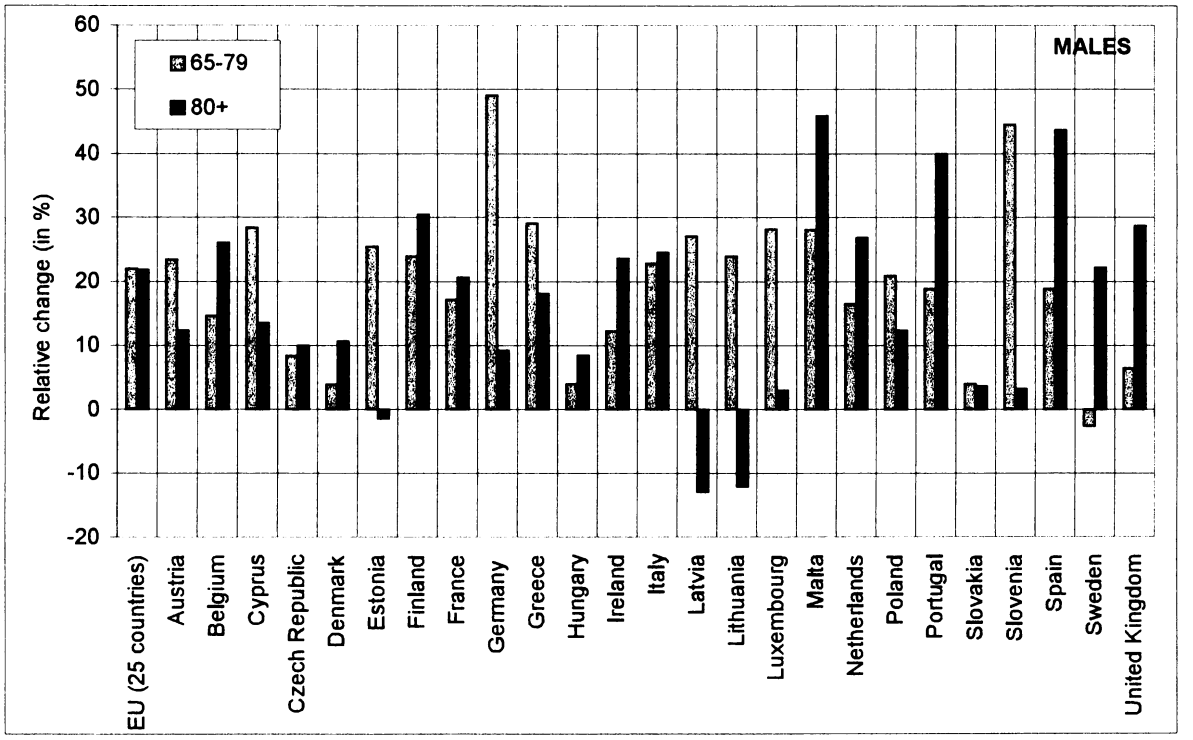
As we focus on **the oldest old proportions (see Table 9.4 in the appendix – Chapter 9 section)**, the highest shares were in Sweden (5.3 %), Italy (4.8 %), the United Kingdom (4.3 %) and France (4.3 %) in 2004. It is predominated by high life expectancy, especially in Sweden, and low fertility, particularly regarding Italy. On the contrary, Cyprus, Ireland and Slovakia reached the bottom of the EU25 in 2004 with the proportion of the oldest old lower than 2.7 %. Mortality rates trends with fertility rates tendencies have determined the differences in these proportions among the analyzed countries (Schoenmaeckers 2004: 11).

In terms of total numbers, the EU25's oldest old male population increased by 21.8 % between 1995 and 2005 from 4.96 million to 6.08 million (see Table 5.6 in the appendix). The total number of the oldest old higher than 900,000 lived in France (921 thousand), Germany (986 thousand), Italy (958 thousand) and the United Kingdom (902 thousand). Concerning women, their total number rose

from 11.13 million in 1995 to 12.86 million in 2005, which means the growth was 15.5 %. The oldest old female populations are, as the male ones, the most numerous in France (1.87 million), Germany (2.57 million), Italy (1.94 million) and the United Kingdom (1.73 million).

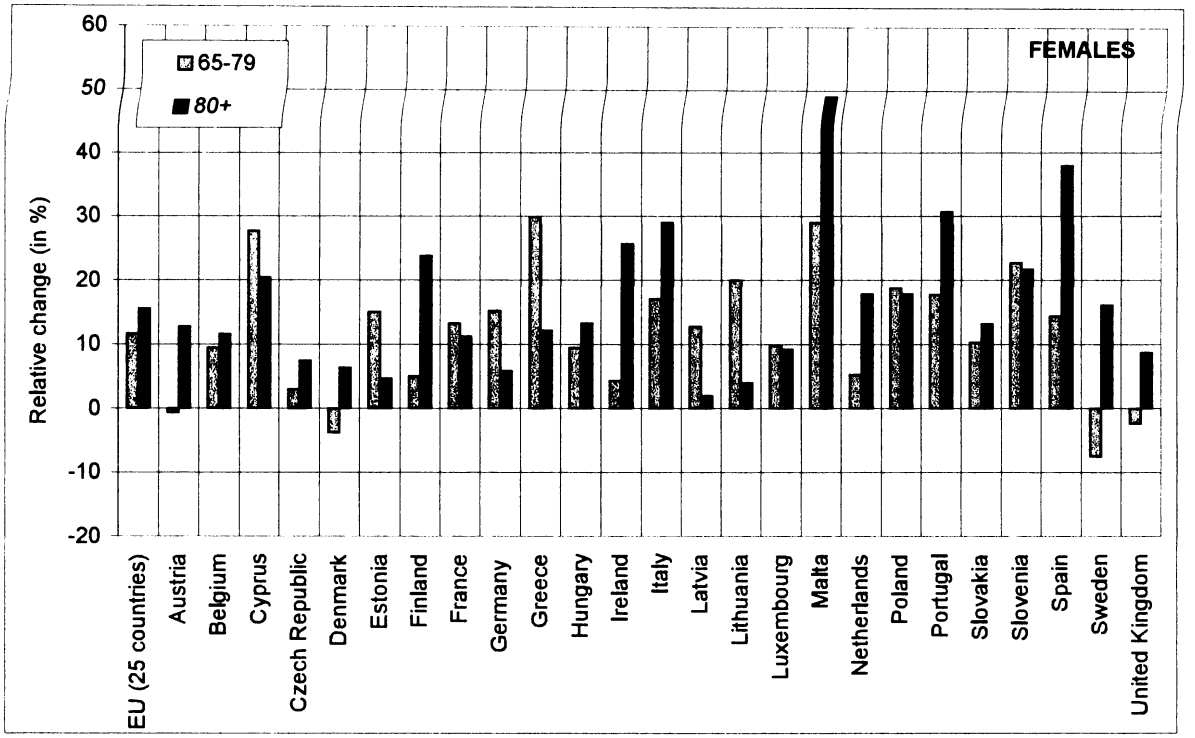
Almost in all EU countries, there was an increase in the total number of people in the group of the younger old, as well as the oldest old between 1995 and 2005 (see Table 5.6 in the appendix, Figures 6.1 and 6.2). In Cyprus, Greece and Malta, the total number of the female younger old had the fastest growth between 1995 and 2005 with an increase more than 27.5 %. Even higher increase was among the female oldest old with maximums over 30.5 % in Portugal, Spain and Malta. There was also a decline in the total number of the female younger old between 1995 and 2005, namely in Austria, Denmark, Sweden and the United Kingdom. We suggest that that it is given by the differences in the total number of new births between 1916 and 1935. There was a rapid decline in fertility in the 30s because of the economic crisis and the timing of the end of the demographic transition. So, older cohorts were significantly more numerous than younger. Regarding the female population, the war losses were not so high in the comparison with the male population of the same age. These disparities of the total number of between wars cohorts persisted.

Figure 6.1: Index of relative change (in %) of the total number of people in the age groups 65–79, 80+, males, 2005/1995



Source: own calculation based on the Eurostat database

Figure 6.2: Index of relative change (in %) of the total number of people in the age groups 65–79, 80+, females, 2005/1995

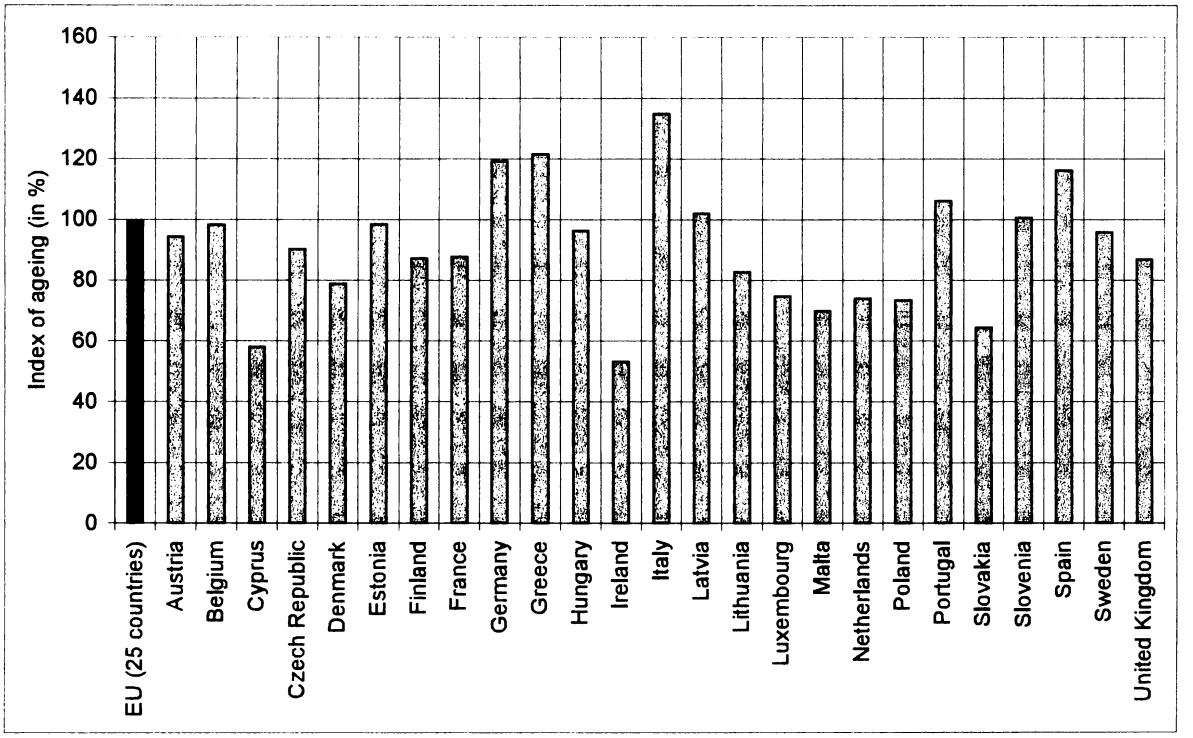


Source: own calculation based on the Eurostat database

In the Baltic States, the proportion of the oldest old males, the number actually decreased (–13 % in Latvia, –12 % in Lithuania, –1.5 % in Estonia). It seemed to be a consequence of high mortality rates among men in the Baltic States during 1990s because, especially in the first five years of this decade, the life expectancy at birth had a decreasing tendency in these three states (see Figure 5.2 in Chapter 5). The rapid increase in the number of the oldest old occurred in Southern European states such as Portugal, Spain and Malta, where the relative change extended beyond 30 %. The highest rise of the total number of the younger old males was in Germany (49 %), Slovenia (44.5 %) and Greece (29 %) between 1995 and 2005. On the contrary, the total number almost did not change in Denmark and Slovakia and even slightly decreased in Sweden (–2.5 %). The reason why is decribed above when analyzing the structural changes in the female older population.

The index of ageing level shows the trends discussed in the Population Development part. In Italy, Greece, Germany and Spain, the population ageing speed in recent years had the highest intensity among EU member states as the data for 2003 described it (see Figure 6.3). With the values over 116 old people to children (134.8 in Italy, 121.5 in Greece, and 119.2 in Germany), the indexes' degree was reached two times higher than in Ireland (53.2), Cyprus (58.2) and Slovakia (60.4) in 2003, which are at the bottom of the EU.

Figure 6.3: Index of ageing, EU25 member states, 2003



Source: own calculation based on the Eurostat database

As we compare **the old-age dependency ratio** progress in the last three decades (see Table 6.12 in the appendix), we identify only four states where the proportion of the aged persons to working persons lowered between 1980 and 2004: in Ireland (from 70.1 to 47.1), the Czech Republic (58.6 to 41.2), Austria (from 56.6 to 46.8) and Slovakia (from 57.9 to 41.0). This development was mainly influenced by the proportional growth of the productive group. On the contrary, the old-dependency growth posed a distinctive population development feature in Finland, Portugal, Italy and Spain, where the relative increase overreached 30 % between 1980 and 2004.

In all states, **the young-age dependency ratio** had a declining tendency in the last three decades. The most rapid decrease was characteristic for Central and Southern European states and for Ireland. The young-age dependency ratio fell between 1980 and 2004 (see Table 6.13 in the appendix) with the highest decline in Spain (from 41.2 to 21.1), Portugal (from 41.6 to 23.3), and the Czech Republic (from 37.1 to 21.5), as this trend was induced by the TFR decrease, and thus, by the relative increase of the productive group. The slightest decline occurred in Finland, Sweden and Luxembourg, as there were less important TFR changes.

In 1980, the young-age dependency ratio extended 40 children per 100 productive people in Portugal (41.6), Spain (41.2) and Ireland (51.8). However, Ireland reached 30.7 (children per 100 people in the productive age group) in 2004, which was slightly below the EU25 average in 1980. In 2004,

the Southern European states were below EU25 average level (24.4) regarding the level of young-age dependency ratio. On the top of the EU25 in 2004, there were Cyprus (29.4), Denmark (28.5), France (28.5) and Ireland (30.7).

The age-dependency ratio has had a decreasing trend in most EU states since the year 1980 with the exceptions of Finland and Luxembourg (see Table 6.14 in the appendix). Now, there is a beginning of an increasing trend, as numerous people of productive age shift into the retirement age. As expected, this trend will accelerate in the near future. The highest decrease in the age-dependency ratio relating working population to all the non-workers between 1980 and 2004 was in Ireland (32.8 %) and in the Czech Republic (29.7 %) because numerous young generations entered the productive age and the fertility gradually declined. In the Czech Republic, it was highlighted by the level of mortality rates because the life expectancy at birth was under the average of the EU about 25 years ago (66.8 years for males, 73.9 years for females). The progress in the 1980s was very slight and speeded up in the 1990s although it is still below the EU average (72.9 years for males, and 79.1 years for females in 2005).

The age-dependency ratio represents an indicator useful when analyzing the economic pressure of dependent people to those being in the productive age. Concerning the present EU situation, there was a decreasing trend of age-dependency ratio between 1980 and 2004, however, we may identify two distinctive groups of states which are on the top and at the bottom when comparing age-dependency level.

As mentioned above the Czech Republic, Poland, Slovenia and Slovakia and other Central European states prove a low level of the age-dependency ratio (less than 44 % in 2004) so that productive people still represent proportionally a large group of people (more than 68 %). So, we may argue that there are still some reserves and time to prepare on the demographic ageing consequences. In these states, an accelerating population ageing progress is expected.

The second (opposite) group consists of **North-Western states,** namely of the United Kingdom, Sweden, France and Belgium with the highest proportion of age-dependency ratio, where there are large both dependant groups: children and the aged people in 2004. Dealing with **the age-dependency ratio**, the indicators show that Sweden, as well as the other North-Western states, have experienced a stable age-dependency ratio development since 1980, specifically in Sweden, the level was between 53 and 57 inactive people to those of working age in the study period. The explanation of this stagnation is that the fertility rates had lowered below the replacement level before the year 1970 and Sweden has been traditionally on the top of Europe regarding the life expectancy at birth with a constant tendency of its improvement in the second half of the 20th century. In the United Kingdom,

the age-dependency ratio shifted from 56.5 in 1980 to 52.1 in 2004, in France from 57.6 to 53.7 and in Belgium, there was almost no change since the 1980s the ratio reached 52.9 (inactive to active people) in 1980 and 52.5 in 2004 (see Figure 6.14 in the appendix).

Mortality rates diversity and differences between sexes influence **the sex ratio** (the number of males per 100 females); particularly as we study the proportion at the age 50–64 (see Figure 6.8 in the appendix). We can consider that there is a direct relationship between the population health and health care and the level of the sex ratio. As there are only slight differences between the life expectancy of men and women, then, the sex ratio is more balanced and the life standard has a high quality in the EU countries. There was a high differentiation in sex ratio (in age group 50–64) in 2003 – minimum in Lithuania (78.8) and maximum in Luxembourg (102.7). Thus, North-Western states with a high level of sex ratio in the age group 50–64 (above 100) are in the contrast with the Baltic States (lower than 80), accompanied by Hungary and Slovakia (lower than 89) that still have a very poor level of the male health status.

7 Population Ageing Analysis

7.1 Cluster Analysis 1 – Dependency Ratios

A) K-Means application

One of the main targets of this study was to create a demographic ageing typology of the EU25 member states. We use **the cluster analysis** to make the typology according to the timing, speed and structure of demographic ageing. Because of the missing data, Malta was not included to the analysis. The first cluster analysis applying both K-Means method and hierarchical clustering method focuses on the shift of the dependencies ratios from 1980 to 2004. These indicators show not only the interrelations between the three age groups but also their proportions and support the ideas about the economic burden. So that our analysis deals with six variables: age-dependency ratio in 2004 (ADR_2004), age-dependency ratio in 1980 (ADR_1980), old-dependency ratio in 2004 (ODR_2004), old-dependency ratio in 1980 (ODR_1980), young-dependency ratio in 2004 (YDR_2004) and young-dependency ratio in 1980 (YDR_1980). On the basis of this analysis' result, which supports the comparisons and arguments from the previous chapter, we can identify five distinctive groups of states (see Table 7.1).

Table 7.1: K-Means cluster analysis – cluster membership, dependency ratios, EU member states*

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Estonia	Ireland	Cyprus	Czech Republic	Austria
Finland		Lithuania	Greece	Belgium
Germany		Netherlands	Hungary	Denmark
Latvia		Poland	Portugal	France
Luxembourg			Slovakia	Italy
			Slovenia	Sweden
			Spain	United Kingdom

Source: own calculation based on the Eurostat database (SPSS)

*Without Malta

Cluster 1 could be marked as **the North-Western group of states** (Estonia, Finland, Germany, Latvia and Luxembourg). The old-dependency ratio in both study year intervals oscillated slightly below the EU average with the exception of Germany (see Figure 7.1). For this cluster, it is specific that in 1980, these states had the lowest level of the young-dependency ratio in the comparison with

the rest of the EU countries as the children proportion was also below the EU average and the productive people proportion was above the EU average (see Figure 7.2). Although the values of young-dependency ratio varied in 2004, they did not reach extreme levels. As regard shifts in age-dependency ratios, these changes were rather unimportant, in Estonia and Luxembourg they even increased.

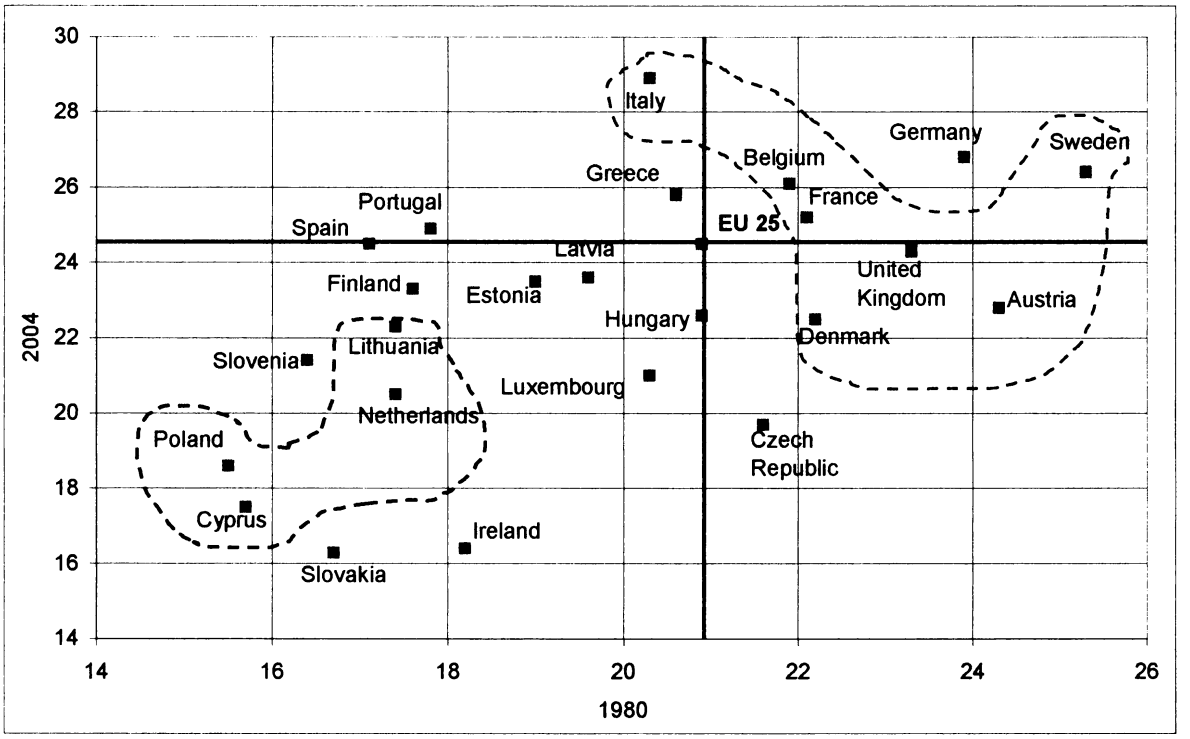
Ireland was the only unit constituting **cluster 2**. In every aspect, it represents the extreme values. The age-dependency ratio has decreased very rapidly; however, it reached the EU maximum in both years. There was only a slight decline in the old-dependency ratio on the one hand, on the other hand, the gradual important decrease of the young-dependency ratio did not change Ireland's position on the top of the EU (see Figures 7.1 and 7.2).

Cluster 3 covers Cyprus, Lithuania, the Netherlands and Poland. The old-dependency ratio remained under the average between 1980 and 2004 (see Figure 7.1). However, the young-age dependency ratio reached the above average level in 1980, and in 2004, rather it oscillated above the EU average (see Figure 7.2).

Cluster 4 is a combination of **post-communist Central European states** (Czech Republic, Hungary, Slovakia, Slovenia) and **Southern Europe states** (Greece, Portugal, Spain). In these states, there was a similar profile of demographic ageing, especially as the speed and timing was concerned. Although the fertility development was not uniform regarding its extent, long-term decline of the TFR since the mid-1980s, which accelerated significantly in the late 1990s, represents a major factor leading to the gradual decrease of the child group proportion. While children born before the year 1980 aged, the proportion of the working age group was becoming a proportionally larger group and the age-dependency ratio had a decreasing tendency between 1980 and 2004. Thus, the young-dependency ratio declined very deeply from the level above the EU average to the level under average, which is the main characteristic of this cluster (see Figure 7.2). The old-dependency ratio increased in the study period with the exception of the Czech Republic and Slovakia (see Figure 7.1).

We can name **cluster 5** as a '**mixed cluster**', as it includes Austria, Belgium, Denmark, France, Italy, Sweden and the United Kingdom. In 1980, the old-dependency ratio reached above the average level, however, except for Italy (see Figure 7.1). The young-dependency ratio fluctuated around the EU average in 1980 and decreased slightly in the study period (see Figure 7.2) as the productive group proportion increased also not highly and the TFR fall had not that much rapid tendency (apart from Italy) comparing it with the rest of the EU.

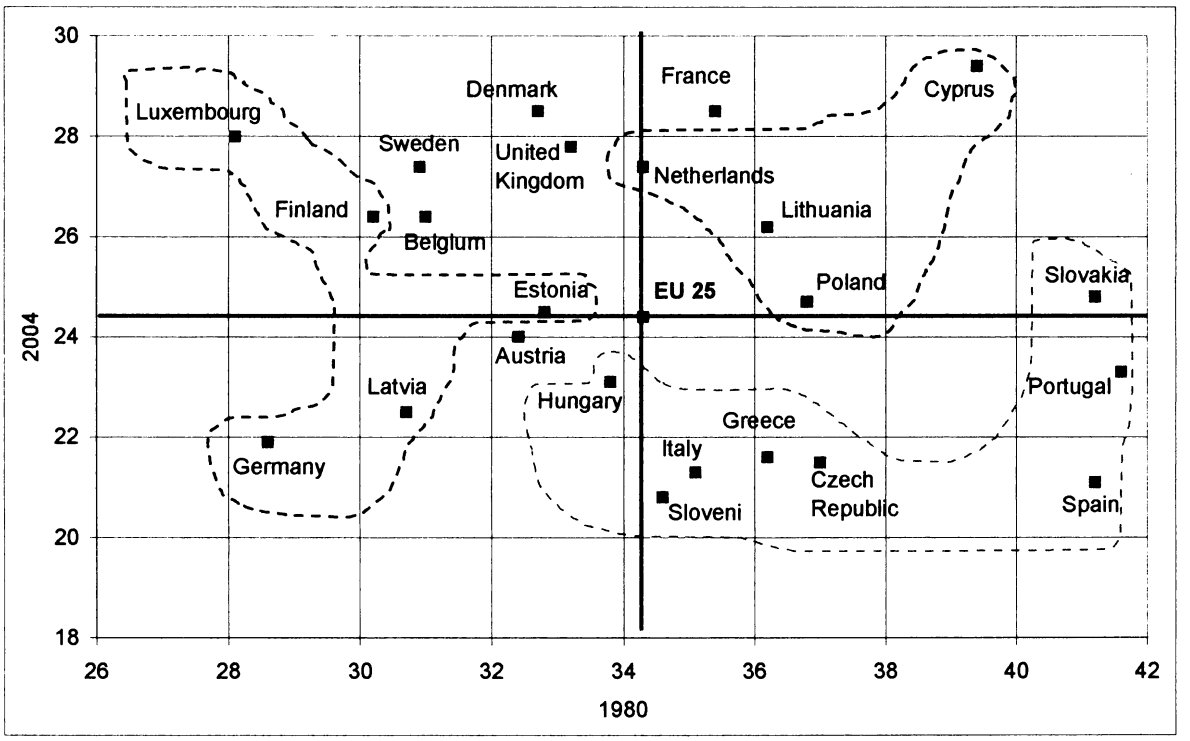
Figure 7.1: Old-dependency ratio, EU25 member states*, 1980, 2004



Source: own calculation based on the Eurostat database

*Without Malta

Figure 7.2: Young-dependency ratio, EU25 member states*, 1980, 2004



Source: own calculation based on the Eurostat database

*Computed without Malta; Ireland is not pictured in this figure

B) Hierarchical Cluster Approach

Hierarchical cluster analysis suggests similar results as the K-Means outcomes. The cluster membership results graphically illustrated by the dendrogram (see Picture 7.2 in the appendix) shows a great variety of the demographic behavior. The dendrogram picturing the clustering of units (states) operates with the Square Euclidean distances as a measuring unit. To display the outcome in a broad way we deal not with five but eight clusters instead (see Table 7.2).

Table 7.2: Hierarchical cluster analysis – cluster membership, dependency ratios, EU25 member states*

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6	Cluster 7	Cluster 8
Austria	Belgium	Cyprus	Czech Republic	Estonia	Greece	Ireland	Poland
Germany	Denmark			Finland	Italy		Slovakia
	France			Hungary	Portugal		Slovenia
	Sweden			Latvia	Spain		
	United Kingdom			Lithuania			
				Luxembourg			
				Netherlands			

Source: own calculation based on the Eurostat database

*Without Malta

The common trends within the Central Europe prove in **cluster 8**, which covers Poland, Slovakia and Slovenia. The shift from young age structures to the oldest populations of Europe is clear when studying cluster 6, namely Greece, Italy, Portugal and Spain. **Cluster 5** represents North-Western demographic changes profile in the hierarchical cluster analysis of the dependency ratios.

Cyprus, the Czech Republic and Ireland form their own cluster as their profile is much too different from the other EU states from the hierarchical cluster point of view. The Czech Republic had one of the highest levels of the age-dependency ratio in 1980, however, it changed completely during the study period and in 2004, it was at the bottom of the EU. As has been described earlier, Ireland has experienced a unique population development in the second half of the 20th century relatively to the rest of the EU. The share of children is also traditionally higher in Cyprus although it lowered by more than 20 % in the last three decades and thus, this trend contributed to the slight proportional increase of productive group. Cyprus is also typical with its stable post-productive group proportion.

7.2 Cluster Analysis 2 – Selected Variables

The first analysis was focused on the interrelations between main age groups and assessed the structure of economic burden. The second following analysis deals with variables, which are more connected with the quality of life and health so that it brings little different conclusions than

the previous analysis. However, the second cluster analysis supports the outcomes from the first one although it uses other selected variables.

Table 7.3: Hierarchical cluster analysis – cluster membership, selected variables*, EU25 member states**

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Austria	Cyprus	Czech Republic	Estonia	Greece	Ireland
Belgium		Poland	Hungary	Italy	
Denmark		Portugal	Latvia	Spain	
Finland		Slovakia	Lithuania		
France		Slovenia			
Germany					
Luxembourg					
Netherlands					
Sweden					
United Kingdom					

Source: own calculation based on the Eurostat database (SPSS)

* awork_90, awork_05, exc_M_80, exc_M_05, LE_M_80, LE_M_00, LE_F_80, LE_F_00, child_04, child_80, old_04, old_80

** Without Malta

We chose **the ageing of the workforce indicator**[14] in 1990 and 2005 to include the recent shift in the workforce structure to the typology. Variables **excess/deficit of males**[15] and **life expectancy at birth**[16] are correlated with each other and reflect the health status, the successfulness of the health care system, the life style of people, sex differences in mortality rates etc. The life expectancy changes reflect mortality response to the transition process in Central and Eastern Europe after 1990.

We used a hierarchical cluster approach to describe the development of the grouping of units of analysis (all the EU25 states apart from Malta) (see Picture 7.2 in the appendix). To show the main differences between the groups of states, a six-cluster variant is presented here (see Table 7.3). The development of hierarchical linkages is illustrated by a dendrogram (see Picture 7.1).

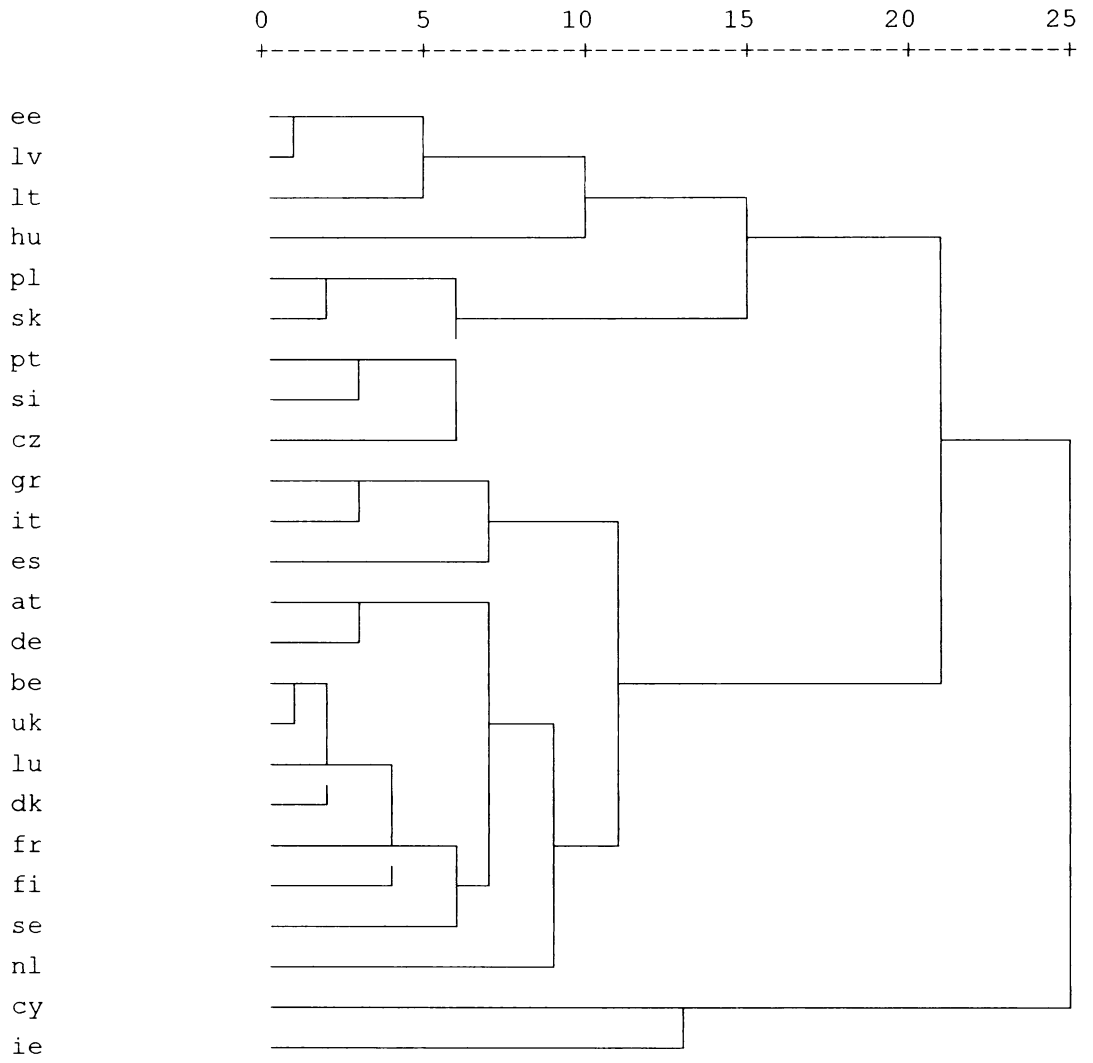
The first cluster, called **the majority cluster**, consists of Northern-Western European states, namely Austria, Belgium, Denmark, Finland, Sweden, France, Germany, Luxembourg, the Netherlands and the United Kingdom. There was an important shift of the ageing of the workforce indicator between 1980 and 2005 from around 1.5 older workers (35–64) per younger workers (20–34) to more than 2.0. One of the main features of this group of countries is that the deficit of males was very small – below the EU average in 1980, as well as in 2005. The child group relative weight declined only slightly from about 21 % to about 18 % between 1980 and 2004.

[14] awork_90, awork_05

[15] exc_M_80 referring to 1980 and exc_M_05 referring to 2005

[16] life expectancy of males and females in 1980 and 2000 (LE_M_80, LE_M_00, LE_F_80, LE_M_00)

Picture 7.1: Dendrogram – hierarchical cluster analysis
(cluster membership, selected variables*, EU25 member states**



Source: own calculation based on the Eurostat database (SPSS)

* awork_90, awork_05, exc_M_80, exc_M_05, LE_M_80, LE_M_00, LE_F_80, LE_F_00, child_04, child_80, old_04, old_80

** Without Malta

The cluster number two is **Cyprus**, which is too specific to match with some other states. In 1990 and also in 2005, the proportion between older and younger workforces was balanced, which is rather an exception in the EU25. The variance between the total number of men and women is slight and the life expectancy for males as well as for females was slightly above EU25 average in 1980 as well as in 2000. The share of the old population was stabilized comparing 1980 and 2004 levels.

The third cluster covers Central European post-communist states (the Czech Republic, Poland, Slovakia, Slovenia) accompanied by Portugal. We named this group the **transitional cluster** because these state recently went through relatively rapid population changes. This group of countries differs from the other with the level of male excess as it was around or above the EU25 average. Life expectancy was relatively uniform among these states: around 75 years for women in 1980 and slightly below 80 years in 2000 and concerning males life expectancy at birth stayed below 68 years in 1980 and oscillated around 70 years in 2000.

The Baltic States (Estonia, Lithuania and Latvia) and **Hungary** represent the fourth cluster with the highest differences between the total number of men and women (characterized by the indicator excess/deficit of males) across European states. This group of states is characteristic with very significant between sex differences regarding the life expectancy and their position at the bottom of the EU. The proportion of older to younger workers was equal to about 1.8 in 2005 and the child group weight decreased to around EU average level in 2004.

Greece, Italy and Spain create cluster number five, so-called a **Southern European** group of states, which is specific with its rapid decrease of the child proportion between 1980 and 2004 and the rise of the old population proportion from about 13 % to around 17 %. The life expectancy at birth is very uniform in this group as there was a shift from the rather below EU average level in 1980 to around or the above average level in 2005 (female life expectancy around 78 years in 1980 and around 82 years in 2000; male life expectancy around 72 years in 1980 and 76 years in 2004).

Ireland forms the last sixth cluster. For Ireland, the balanced proportion between older and younger workers was typical in 1990, as well as in 2005 with almost no shifts between 1990 and 2005. There were also the lowest disproportions between the total numbers of men and women. The life expectancy at birth remained steady around or slightly below the EU average as far as both analyzed years (1980, 2000) were concerned. Although the relative weight of the child group went through the largest decrease between 1980 and 2004, their proportion stopped on the top of the EU in 2004.

8 Socio-economic Consequences of Population Ageing

8.1 Population Ageing as a Social Process

As noted in the Introduction, population ageing is a social process. Each society has its own perception of what it means to be "old". "(...) all societies recognize age as a basis of status, but some of them emphasize it more than others" (Davis 1949 in Weeks 2005: 321). There are different reactions of societies to older and to younger people and a different 'stereotyping of older persons', as their status fell in the 20th century (Weeks 2005: 367, 378, 382). So generational inequalities followed by gender inequalities in the society still influence our lives. Avramov and Mašková (2003: 97) argue that "population ageing will continue with accelerating pace in the next decades and a growing number of people will spend an increasing number of years living alone". There are no doubts that demographic ageing influences the socio-economic sphere of public systems. However, the approaches and ideas concerning demographic ageing and its impacts are diverse in accordance with different authors. The process of demographic ageing is still a huge topic for discussion. According to Walker (1999: 391), "there is not a linear relationship between demographic change and demand for spending on social protections". On the one hand, there are contributors to the public funds (economically active persons) and economically non-active persons (often benefiting recipients), on the other hand. Thus, their relationship influences the sustainable balance between income and expenditure of the public budget. The questions about public expenditure are connected with pensions and other benefits like health care because health and pensions expenditures as a share of GDP have been increasing continually over the last number of decades[17] (Morrow and Roeger 1999: 14, 15). In the second half of the 20th century, pension benefit years doubled on the one hand, on the other hand, the employee's contribution to the public budget lowered by 25 % in the terms of years (Esping-Anderson 1996 in Walker 1999: 392).

[17] Morrow and Roeger even speak about two age related shocks, labor force shock and public expenditure shock, which can appear in the future 50 years (Morrow and Roeger 1999: 35).

The societal adaptations regarding work, family life and social protection needs to be implemented. The changes in the age structure of our societies will influence not only the group of the old but the entire population (Légaré 2001: 11739). Johnson (1997: 1898) claims that population ageing creates some problems of economic and social organization. The question is what the 'real' support ratios are, how many people are taxpayers and how many are dependant, aged dependant respectively (Coleman 2005: 24).

Engaged in population ageing consequences and policy building, we have to take into account the relation between young and elderly dependants. Statistics of public expenditure show that it is several times higher for older persons than for children (Avramov and Mašková 2003: 96). It is also necessary to concentrate on activity rates both for working age and for elderly populations (ibid.).

European states have different strategies for dealing with the population ageing consequences as it is presented as "an institutional problem for the welfare system, especially from the management and financial perspective" (ICCR[18] 2005: 17). The analyses have shown the European north-south axis differences concerning the social expenditure expenses as a share of the national income (Walker 2002a: 759). There is a contrast between Northern European welfare states and the states of Southern Europe, where they are still at the beginning of the welfare state development (ibid.). As dealing with long-term care Scandinavian countries represent a high quality public service model, Southern European states are based on a family model (ibid.).

Nordic states focus on the full active participation of the older people in the labor market on a firm level of supporting individual and environmental capacities. **Bismarckian welfare states** use the social insurance system as a tool to prevent the older workers from the early retirement. **Liberal welfare states** define the labor activity of the older workers as a right and try to support it on the one hand directly, and thus, by concentrating on obstacles in the labor market, or health care. On the other hand, there are also indirect policies regarding for example tax regimes (ICCR 2005: 17–20).

8.2 Health Care

According to Johnson, the most important issues to deal with are problems of pension and health care financing (1997: 1898). Concerning Creedy's and Bravo's (Population Division 2002: 1) statement, "as more people live longer, retirement, pensions and other social benefits tend to extend over longer periods of time". Thus, the social security systems should change substantially in order to remain effective. Increasing longevity can also lead to the growth of **medical costs** and to the increase of **demands for health services**, since older people are more vulnerable to chronic diseases (de Jong-

[18] The Interdisciplinary Centre for Comparative Research in Social Sciences, Vienna

Gierveld and van Solinge in Population Division 2002: 1). We should take into account differences between individuals and the differences over time. The population of the oldest old is considered a group in risk to suffer from a number of chronic degenerative conditions. Thus, they "require permanent intensive care" (Avramov and Cliquet 2005: 142). The public expenses on the health and welfare care will also rise because of many factors that lead to the absence of close family members, which is expected by some estimates (ibid.). ICCR (2005: 23) criticizes the traditional concentration on **remedial** rather than **preventive health care**. The simple logic is that as a person is healthy, he or she could remain active for a longer time. MacKellar (2004: 19) argues that most medical expenditure occurs during the illness. The most important aspect of this perspective is that there is also evidence that deaths occurring in advanced old age are cheaper than deaths occurring in early old age (ibid.). However, according to Légaré (2001: 11740), the group of the old is not homogenous and their **health status** and wealth vary[19]. Walker (1999: 395) argues that it would be an erroneous statement to conclude that all older people need care. The mutual interrelationship between health and activity is very strong. Poor health may have a negative impact on the quality of work and activity, on the one hand. On the other hand, to be active may positively influence the people's health (Walker 2002b: 131).

There is an interesting estimation made by Légaré (2001: 11740) who explains that "the increases in medical costs are more closely linked to the number of old-age deaths than to the size of the elderly population, and the number of old-age deaths is increasing much less rapidly than the size of the elderly population". Nonetheless, Légaré (ibid.) also argues that we should not forget that retired people also pay taxes, both on their income and on consumption. He also says that as people age, their material needs (other than those related to health) decrease and this might be reflected in their pension requirements. Incomes of retired people are by average lower at old age than at other ages. The elderly often have a large share of collective wealth through their assets, in particular because they own dwellings (ibid.).

Present policies try to promote cooperation between the public, private and voluntary organizations and individuals (families) what concerns health care's strategies. Avramov and Cliquet (2005: 149) summarize following strategies to create the functional health and welfare care system: "mandatory insurance system for nursing and dependency care; public support to family care; diversified services adapted to the degree of need and involving as much as possible self-help and family care; diversified institutional care (...); home based care and domiciliary services (...); diversified housing provision".

[19] This has also different consequences for their life-style. In the group of old people there is a majority of widows. The necessary feature of the recent situation is that old people are more and more independent. Old people prefer to live alone if they do not live with their spouse (Légaré 2001: 11740). There are discussions about population's health status and there is a focus on healthy-life expectancy.

According to Walker (1999: 391), the parent support ratio relating population aged 80 and over to the people in the age group 50–64 is presented to describe the extent of social care burden. The level of this indicator in 2005 (see Table 8.1) confirms a high intensity of ageing in Sweden, France and Italy, which are with the values above 25.5 people aged 80 and more to people in the age group 50–64 on the top of the EU25. The high rate of the parent support ratio results from the past decrease of the fertility rates and their stable development below the replacement level as well as from the increase in longevity. By contrast, there is a relatively low ratio in Slovenia, Poland, Malta and the Czech Republic, where the parent support indicators do not overreach level 15 and age structure is less balanced.

Table 8.1: Parent support ratio, EU25 member states, 2005

Unit	PRS	Unit	PRS
EU (25 countries)	22.8	Italy	27.0
Austria	23.8	Latvia	17.3
Belgium	24.1	Lithuania	17.1
Cyprus	16.0	Luxembourg	19.1
Czech Republic	14.5	Malta	14.6
Denmark	20.7	Netherlands	18.8
Estonia	17.6	Poland	14.4
Finland	18.8	Portugal	21.7
France	25.7	Slovakia	13.7
Germany	23.3	Slovenia	16.1
Greece	19.3	Spain	26.2
Hungary	17.0	Sweden	27.3
Ireland	17.5	United Kingdom	24.8

Source: own calculation based on the Eurostat database

8.3 Pension Systems' Debates

What concerns pensions, there are several debates about **the type of pension system**, **the age at retirement**, the pre-retirement schemes, and the level of contributions and benefits, which are interconnected with demographic ageing. Walker (2002a: 758) suggests that the population ageing process is not the problem itself but "its combination with changes in birth rates, the structure of employment and the practice of retirement".

Eatwell (1999: 57) suggests that the problem of intergenerational transfer appears in the social system. He (ibid.) thinks that the population ageing is the cause of today's pension 'crisis'. He does not believe that the **type of financing of pensions** plays a crucial role. Inescapably the share of state pensions in GDP will gradually grow. The speed and level of the growth depends on the initial and future age structure of populations and on the policies of each state.

There have been discussions about the choice of financing pensions. On the one hand, there is **a pay-as-you-go (PAYG) pension scheme**, on the other hand, **fully-funded (FF) pensions**. According to Eatwell (1999: 59), "a PAYG pension scheme is a public sector scheme in which taxes are raised in order to fund the transfer of purchasing power to pensioners". The procedure is a direct transfer of resources from present social security contributors to current pension receivers (Avramov and Cliquet 2005: 140). The right to receive a pension is a political right guaranteed by the state (Eatwell 1999: 59).

Eatwell (ibid.) presents the opposite definition of FF pension scheme: "under an FF scheme an individual saves in his or her lifetime and thus acquires a stock of financial assets which may be used in the future to buy the goods and services required, either by cashing in the assets or by buying an annuity from an insurance company". To receive a pension is a financial right, owned by the individual. According to Eatwell (ibid.), the value of that right depends on a variety of economic circumstances, such as the state of the markets for financial assets, interest rates and the rate of inflation. Walker (2002a: 760) proposes that the FF pension scheme may lead to social exclusion. However, PAYG systems prevail across Europe.

As far as the expenditures on old-age pensions concern, they differ very much among EU25 countries. In 2002, the highest amount (11.4 % of GDP) was spent in Italy, which was on the top of the EU25. Ireland, on the contrary, spent the smallest GDP share (1.6 %) (Van Nimwegen, Beets et al. 2006: 152).

Johnson (1997: 1898) also talks about the question of pension systems. He says "the old age crisis identified by the World Bank is a perceived problem of financing public pay-as-you-go pension systems". Johnson (ibid.) argues that "for the pay-as-you-go type of pension to be sustained in the long run, successive birth cohorts must accept that they will pass through a phase of net contribution during working life before entering a phase of net benefit during retirement". Resources are moving from younger to older age groups and the longer-term dynamic effect is to shift resources from earlier to later-born generations (ibid.).

However, referring to historical experience, Johnson (1997: 1899) claims that "there is no direct relationship between the problem of public pension finance and population aging". He also says that "it is the maturing of public pension systems, rather than population aging that has created the current funding problem that is common to almost all public pension systems" (ibid.). We would agree with Johnson claiming that the reason why many public pension schemes are in deficit is indiscipline rather than ageing per se (Johnson 1997: 1900). Walker (1999: 392) supports this statement by arguing that the key issue is "its [population ageing's] combination with changes in birth rates, the structure

of employment and the practice of retirement". Thus, the complex analysis is necessary to make objective conclusions regarding the population ageing impact.

Also Avramov and Cliquet (2005: 147) cite recent findings of European Commission that defends the potential for improvement of the function of the PAYG system, which supports employment of some inactive working age people and the postponement of the minimum retirement age. Avramov and Cliquet (2005: 140) formulate the compensation strategies to generate income, from which pensions for retired people may be paid, namely economic growth, decreasing unemployment, increasing female labor participation, and decreasing expenses for child allowances and education. Although life expectancy has risen, the exit age from activity paradoxically has decreased.

Concerning the solutions to pension crisis, the most dramatic way of reducing future public pension liabilities is to privatize the entire pension system (Johnson 1997: 1902). However, there are two significant barriers to the successful privatization of public pensions. Johnson argues that the first problem is transition. Because of the intergenerational transfers embodied in a pay-as-you-go pension system, termination of the system inevitably creates a generation of losers – the people who have paid in but will never draw out (ibid.). He says that "the second barrier to pension privatization is that it fundamentally weakens the ties that currently bind different generations to the state in an intergenerational fiscal compact" (ibid.). However, this intergenerational interconnection is important concerning the intergenerational solidarity.

8.4 Labor Force Participation

Dealing with socio-economic consequences of population ageing, the study of labor force participation brings important findings and leads to formulation of challenges which are necessary to face because there have been confirmed the differences in the country-specific labor force behavior. As people are more educated, they enter the labor market at higher ages than they used to 30 years ago. There was also a trend of decreasing labor force participation in the last three decades in 'old' EU member states (15) and in the last decade in 'new' EU member states (10) (Van Nimwegen, Beets et al. 2006: 101). Labor force activity of women varied very much in the past because there were completely different socio-economic and political conditions in Western and Eastern Europe. Communist states were typical with their high activity rates both for men and women before 1990.

Discussing pension system types, Avramov and Cliquet (2005) presented the increase in female labor participation as a useful strategy to generate the income to pay for the pensions. In EU countries, the share of people aged 60 and over who participate actively in labor market is also very low. Avramov and Mašková (2003: 22) speak about under-using of younger old human resources. They

support the idea to rise the retirement age as Avramov and Cliquet (2005: 154) do. However, the highest disparities across Europe are the older workers' participation (55–64).

Table 8.2: Activity rates (in %) of the age groups 25–54, 55–64, males, females, 2003

Unit	Males		Females	
	25-54	55-64	25-54	55-64
EU (25 countries)	91.8	53.8	74.4	32.9
Austria	94.6	42.9	79.9	21.7
Belgium	90.9	38.9	73.6	19.2
Cyprus	95.2	73.2	76.9	33.2
Czech Republic	94.4	59.9	81.0	30.0
Denmark	91.8	70.4	83.7	55.9
Estonia	89.6	64.4	82.2	50.3
Finland	90.1	55.3	84.8	52.2
France	93.5	43.2	79.2	34.6
Germany	93.2	54.9	78.6	36.2
Greece	94.3	60.6	65.2	26.4
Hungary	84.8	38.9	71.0	22.4
Ireland	91.0	66.3	67.2	33.8
Italy	91.5	44.4	60.9	19.3
Latvia	89.7	56.1	83.0	41.8
Lithuania	90.5	62.0	87.2	41.8
Luxembourg	94.1	40.1	66.5	21.2
Malta	93.5	55.5	36.8	13.1
Netherlands	93.5	58.2	77.0	32.6
Poland	87.1	39.7	75.8	22.0
Portugal	92.3	65.2	79.7	44.0
Slovakia	94.1	48.1	84.8	12.4
Slovenia	90.6	34.5	84.3	14.9
Spain	92.5	62.9	66.5	25.7
Sweden	89.9	74.9	85.4	68.9
United Kingdom	91.3	67.4	76.4	47.3

Source: Eurostat (Labour Force Survey)

Analyzing activity rates in the EU25 member states we may conclude that there are more significant differences regarding female labor activity than male labor activity across Europe. Countries in Northern Europe (Nordic welfare states) such as Sweden, Denmark and Finland have had traditionally a high level of labor force participation of women (Van Nimwegen, Beets et al. 2006: 103) and they are very successful concerning employability for women in both studied age groups: 25–54 and 55–64 (see Table 8.2). As stated earlier, for these states it is typical to deal with population ageing tendencies as with the problem of full employment. The support of older workers to remain active in the labor market has been their strategy (ICCR 2005: 18, 19). In 2003, activity rates for women in the age group 25–54 overreached 80 % in these countries (91.8 % in Denmark,

90.1 % in Finland, 89.9 % in Sweden) and for women in the age group 55–64 is higher than 50 % with an excellent value 68.9 % in Sweden.

As we focus on female activity rates at the age 55–64, especially in Slovakia (12.4 %), Malta (13.1 %), Slovenia (14.9 %), Luxembourg (21.2 %) and Greece (26.4 %), evident reserves concerning female labor force participation exist. Generally, there is traditionally low labor force participation of women in Southern European countries (Van Nimwegen, Beets et al. 2006: 103). We may suggest this potential without deeper knowledge of the socio-economic conditions in each state. According to Kotowska (Palomba and Kotowska 2003: 72), the female labor force participation is expected to rise following present changes in the labor market (flexible working management), increases in human capital of women (increasing school enrolment), changes in the social and cultural environment (changes in norms and values).

Concerning male labor force participation (see Table 8.2), EU countries went through a decreasing trend of men at age 55–64 in the last three decades (Van Nimwegen, Beets et al. 2006: 103). These tendencies are considered a consequence of the lower average retirement age (see section 8.5). The male activity rates (55–64) reach their maximums in Sweden, Denmark and Cyprus, where they are higher than 70 %. Focusing on the minimal activity rates among older workers, they are lower than 40 % in Belgium, Poland, Slovenia and Hungary. Regarding the activity rates of males at the age 25–54, we may conclude that the high level of their activity is uniform across the EU25.

Studying the inter-gender differences in the activity of men and women is very important in the context of population ageing. The countries with the highest inter-gender disparities, especially regarding the older productive-age labor force participation, may have some potential in non-active older women before the retirement age. The between sex differences in the age group 55–64 are lowest in Sweden and Finland (less than 6 %). On the contrary, Southern European countries such as Malta, Spain and Cyprus show very high inter-gender imbalances, which exceed 37 %.

8.5 The Labor Market Aspects

It has been noted that demographic ageing has a direct impact on the labor market sphere. Now, there is a persistence of relatively high unemployment rates in many European countries. It seems to be evidence that new technologies have lowered the demand for labor. On the other hand, people live longer, and remain healthier to a higher age. There is a presumption that they will rather choose to work longer (Mirrlees 1999: 1881) and they also represent a large potential regarding volunteer jobs (Walker 2002b: 133).

Fellegi (Fellegi 1988 in Légaré 2001: 11739) suggests that "to assess the economic impacts of aging and our ways of dealing with them, we needed to take into account not only population numbers, but perhaps more importantly labor force participation rates and worker productivity". Following the previous section, there are still demographic reserves concerning people 55 years and over and women with children. The young people have tended to enter the labor force participation at a higher age due to their longer studies. According to Légaré (2001: 11739), we have also witnessed a decline in the labor force participation rate of older workers during the last century.

The ever-earlier retirement from the labor market is increasingly questioned. As life expectancy increases and as the time spent taking education is extended, the life segment in retirement is growing longer and the segment in which one works is getting shorter. Consequently, when a large and growing share of the costs of social security, including pensions and health insurance, is borne by those who work, some adjustments must be considered. It is not possible to keep contribution and benefit levels and bring down, or maintain, the age of access to benefits (ibid.).

When focusing on changes in the average age at retirement, we find a general trend of the last three decades which is a substantial decrease of this age for men and as well as for women. This is a paradox because people live a longer and healthier life and they spend a shorter time in the labor market. Large disparities between standard retirement age and the real one prevail across Europe. Kotowska (Palomba and Kotowska 2003: 75) suggests that "the effective retirement age is on average five years lower" than the standard one. People tend to leave the labor market early although there are some disadvantage consequences of this decision, particularly the reductions in pension benefits (Van Nimwegen, Beets et al. 2006: 106). People going into pension have to fulfill a criterion of the minimum insured years before retirement. However, there have been retirement policies applied to change these negative tendencies (ibid.).

There are important differences between **average exit ages from the labor force** in each state which are connected with labor force participation rates in a higher age (see Table 8.3). On the one hand, there is Poland with the minimum average exit age of females (56.4 years) and Belgium with the minimum male average exit age (58.6 years) in 2003.

On the other hand, Ireland with 63 years occupied the top of the EU25 regarding the average exit age for females. The maximal average exit age for males was in Portugal (63.7 years) in 2003. In many states, there is still a possibility to take an advantage of the low average exit age. Improvements in workforce rates are welcomed; however, they also have their maximum. So, we should not overestimate its effect (Coleman 2005: 24).

Légaré (2001: 11740, 11741) suggests that the labor market is undergoing major changes. New workers will tend to enter the labor market later in their lives and they will hold part-time jobs with varying employers more often. They could also be self-employed. They will have periods of unemployment, or retraining from time to time. Consequently, retirement systems based on previous labor market participation and involving individual employers will be subject to deep modification.

Unfortunately, **mandatory retirement** is virtually universal across firms and is the "solution" to the problem of how to get rid of high-cost elderly workers. However, we can argue that this policy is at odds with scientific knowledge of mental skills of younger old. As there is diversity in mental and physical abilities of older workers, "uniform pension ages make no sense" (Walker 2002b: 128). MacKellar (2004: 11) argues that demographic ageing can cause problems in some sectors of labor market. According to this author, the problems seem to be more acute in sectors requiring physical labor, like construction, or in sectors requiring mental concentration and reaction, like the trading of financial instruments.

Table 8.3: Average exit age from the labor force, selected EU member states, 2003 – weighted by the probability of withdrawal from the labor market

Unit	Females	Males	Unit	Females	Males
Austria	58.2	59.4	Ireland	63.0	62.7
Belgium	58.7	58.6	Italy	61.0	60.9
Czech Republic	59.0	61.2	Netherlands	60.1	61.0
Denmark	62.0	62.3	Poland	56.4	59.8
Finland	60.0	60.7	Portugal	60.6	63.7
France	59.6	59.7	Slovakia	55.9	60.0
Germany	61.4	61.9	Spain	61.3	61.7
Greece	62.2	63.4	Sweden	62.8	63.5
Hungary	62.1	60.9	United Kingdom	61.9	64.2

Source: Eurostat (Labour Force Survey)

Therefore, there is a big promotion of the concept of **'active ageing'** (MacKellar 2004: 8). There is a strong argument of Walker is (2002b: 128) that inactivity in the old age should not be perceived as a norm. Active ageing concept involves active life strategies of the old in the spheres of their personal, family, social and professional life (Avramov and Mašková 2003 in Avramov and Cliquet 2005: 150). Many people over 60 are in good health conditions and have a high motivation to self-realize in the labor market (Avramov and Cliquet 2005: 150, 151). However, due to the prejudices, **age discrimination**, as the opposite to active ageing, characterizes the labor market sphere and affects not only old people but the whole society (Walker 2002b: 127, 128, 135). Employers usually misjudge their cognitive abilities and high level of their experience and highlight their lower knowledge of modern methods and new technologies instead. Thus, long-term unemployment of older workers

is a result of this perception. The goals of **lifelong learning**, which should contribute to the long-time activity of employees, as well as **flexible management of working times**, remain big challenges for labor market policies (Bijak et al. 2005: 17). To adapt successfully to the labor force demographic changes "must be self-interest to all employees" (Van Nimwegen, Beets et al. 2006: 117). The retired people could participate especially in housework and childcare or in community life, also as volunteers and unpaid workers (ibid.). Walker (2002b: 125) states that it is important to realize that the concept of active ageing is intergenerational and "should cover the whole of the life course" (Walker 2002b: 134). We all will face the older ages.

The issue of **'invisible workers'** is connected with the concept of active ageing. Invisible workers are those who respond to labor force surveys by saying that they would like to work but are unable for some reasons (MacKellar 2004: 8). So labor force policies should be directed to find and recruit them.

8.6 Discussion about Policy Implications

At the turn of the 21st century, population ageing is the dominant demographic process in Europe and the new phase of demographic ageing is coming. Lutz et al. (2003 in Bijak et al. 2005: 21) even speak about **a negative population momentum** caused by population ageing development. It is a long process for small generations to shift through age structure. So, a fertility increase, which would be very welcomed in European states, would only "decelerate the ageing process also with a time delay" (ibid.). Walker (2002a: 759) argues that the main problem is not the population ageing process by itself. However, regarding its combination with social end economic changes, it leads to a huge challenge for the system of social protection. Europe will be in state of the need of older actively participating people. So there is a necessary change in the culture "to enable people to work longer" (Walker 2002b:130).

Avramov and Mašková (2003: 14) summarize that there is a gradual adaptation of economic and social policies of modern societies to changes in the population age structure. However, they do not consider the alteration to the population ageing consequences sufficient as far as the long-term strategies concern (ibid.). They (2003: 93) also suggest that there is an absence of integrated public policies to support an active role of the retired people in society. European societies have not started to use the potential for work of elderly people above the age of **statutory retirement**. The encouragement of the economic activity of elderly workers cannot be achieved if there are still tendencies of early retirement. Avramov and Mašková (ibid.) deal with the gradual retirement, which has not been very common. They argue (ibid.) that "on the whole, the proportion of people working beyond the standard retirement age is very low in all European countries". To support not only

the activity of the older workers but also the labor participation of both men and women generally is an important strategy, which represents a necessary investment in human capital[20] (EC 2005 in Van Nimwegen, Beets et al. 2006: 116). The workforce is ageing and the total number of workers may decrease in the future.

Regarding to what has been mentioned, there are various possibilities how to deal with the demographic ageing and its consequences. The basis of the changes should be **the intergenerational solidarity** in Europe (Walker 2002b: 135). If the number of pensioners is given and the share of pensions on the GDP and health care expense are growing, then there can be used several "solutions" to the ageing problem. There continue to be great challenges in the sphere of labor market to increase the share of the workforce. Various policies and their combination are necessary to use, namely strategies to reduce the unemployment rate, to increase the participation rate of those of the working age (participation of women or the labor imported from areas which have surpluses), to raise the age of retirement, to initiate the **'minimum pension age'**, to lower the age at which young people enter the workforce, to support the employment of retirees who want to work, etc. The struggle with **age-based discrimination** remains a big challenge for labor market policies as "the sociocultural challenge of demographic ageing is the same for all Europeans" (ICCR 2005: 24). Because there is still a perception of 'youth-good' and 'old age-bad' culture (ICCR 2005: 22). Thus, policies aiming on **the political emancipation of the old** are welcomed. There should be pressure on the labor market to be more flexible to support lifelong learning and flexible management of working time, and which enable people to remain psychically active.

As Johnson (1997) deals with the pension systems schemes and economic strategies to moderate population ageing consequences, he purposes to enhance savings and taxes, to growth the productivity rate and to decline the growth rate of the real value of the average pension.

Regarding **family policies**[21] which should be focused on supporting the 'family', they should make maternity attractive for women and marriage for both men and women. Although there is a trend of out-wedlock fertility, Caldwell and Schindlmayer (2006: 246) stress the importance of marriage and reproduction to young couples. The authors ask themselves "whether the forces delaying marriage are the same as those lowering marital fertility, and whether late age at marriage, especially for women, is itself a determinant of the decision to curb family growth early". The impact of decline in fertility on population ageing extent is much stronger than the influence of mortality rates

[20] Walker (1999: 394) also declares it as he suggests that "there should be investment in young people too, for example in educational training, so as to prevent unemployment and create a sound economic base on which to build for retirement".

[21] Family policies in Europe vary among the states and they are influenced by the overall public service model. Gauthier (2002 in Caldwell and Schindlmayr 2006: 247) divides 'industrialized 'countries into four groups (see Table 5.5 in the final appendix).

improvements (Van Nimwegen, Beets et al. 2006: 38). Ryder (1999 in Caldwell and Schindlmayer 2006: 244) suggests an interesting hypothesis. He connects the fertility decline with the female empowerment by arguing that "(...) our past success at population replacement, throughout all of human history, has been conditioned on the discriminatory treatment of women". Thus, family policies should be formulated with the respect to needs of women who usually want to self-realize not only in family life but also in their profession. **Family friendly labor market policies**, including the promotion of part time job opportunities, may have a significant impact to support fertility when they enable the reconciliation of working and family life. There should be a balance between maternity (to raise the number of newborn children) and women successful integration in the labor market also when they have children (to support the public finance budget).

Van de Kaa (in Bijak et al. 2005: 21) argues that only "changes in the normative systems of societies" may lead to sustainable higher fertility rates in the present post-modern societies characterized by well developed individualism. He strongly emphasizes the importance of "perceiving children and family life as a way of self-realization of parents" for the fertility increase (ibid.). We think it is relevant to promote the importance of men in taking care of children to enable the couples to have as many children as they wish.

In the relation with population ageing, **migration** is a much discussed topic. During the European integration process, migration and asylum policy "has moved from the responsibility of member states to Community competence" (Coleman 2005: 34). Coleman (2005: 26) finds many factors influencing migration, namely the economic and demographic situation in the sending countries, labor demand in host countries, political situation in each and historical connections between them. "Western "European age structures are changing due to the high total number of immigrants and the increasing population of immigrant origin (Coleman 2005: 34).

Some authors have found immigration as a solution to problems following the process of demographic ageing. In the 1990s, immigration was seen as a possible quick-fix to European population ageing (Avramov and Mašková 2003: 15). Although older people are very stable and do not migrate as much as those of the working age, as Avramov and Mašková (ibid.) say that "the average age of immigrants is a little lower than that of natives and the initially higher fertility of new immigrants soon decreases to lower level". Van Nimwegen and Beets (2006: 38) argue that the fertility of the first generation of immigrants is influenced by their cultural background to a certain extent, however, the second generations' fertility rates lower almost to the non-immigrant level. Only a huge number of immigrants coming continuously would help to slow down or neutralize the process of demographic ageing (ibid.).

In addition, it is of high importance to reach and maintain functional immigration and integration policies. Mass migration often causes societal problems connected with cultural and economic integration of immigrants (Thienpont and Cliquet 1999 in Avramov and Cliquet 2005: 157).

However, as Bijak et al. (2005: 20) suggest, future long-term migration policies are difficult to predict. There is an assumption that the number of immigrants will oscillate dependently on the labor market needs and potential social tensions in a given country.

Regarding present discussions about the immigration as a potential 'remedy' against population ageing, it has been agreed that immigration is "a partial measure to reduce its [population ageing's] consequences in the short term" (European Commission 2004 in Bijak et al. 2005: 20). Van Imhoff and van Nimwegen (in Bijak 2005: 20) contributed to the discussion about a **replacement migration concept** with a powerful logical argument, which we consider very useful to quote:

The "absurd numbers [of 'replacement migrants'] make it clear that migration does not help against the population ageing. The ageing has namely its origin in two processes that have nothing to do with migration: firstly with fertility changes (previous high, currently low), secondly, mortality changes (ever higher life expectancy). (...) We should simply accept that the young [population] structure will never come back due to the modern mortality and childbearing patterns. Before these processes cause problems in the society, we should adjust the organization of our social life to them, and not talk in panic about immigration".

Walker summarizes the policy implications to implement according to socio-demographic consequences of population ageing by claiming that "the extent to which any society in Europe can recognize and respond effectively to these challenges will determine its degree of success in adapting to its own ageing process".

9 Perspectives of Population Ageing of Europe

Population projections play a key role in the preparation and adaptation on the population ageing development and its consequences. They represent possible variants of demographic future, which should be taken into account although we have not known the level of their uncertainty (Scherbov, Mamolo[22] 2006: 4). This aspect has been discussed many times as we may only expect the evolution of three main parts of demographic reproduction (fertility, mortality and migration). The important motion is that the level of uncertainty is highly dependant on the age of projected population (Scherbov, Mamolo 2006: 14) and the time horizon. As we deal with today's projections with the horizon around 2050, future numbers of children followed by the oldest old group are the most difficult groups to project. By contrast, the level of uncertainty is the lowest for cohorts born around 1970 because they have been aged enough not to migrate so much as younger cohorts do (ibid.). And as Scherbov and Mamolo argue (ibid.), cohorts born around the year 1970 are "not yet affected by the uncertainty about future old-age mortality".

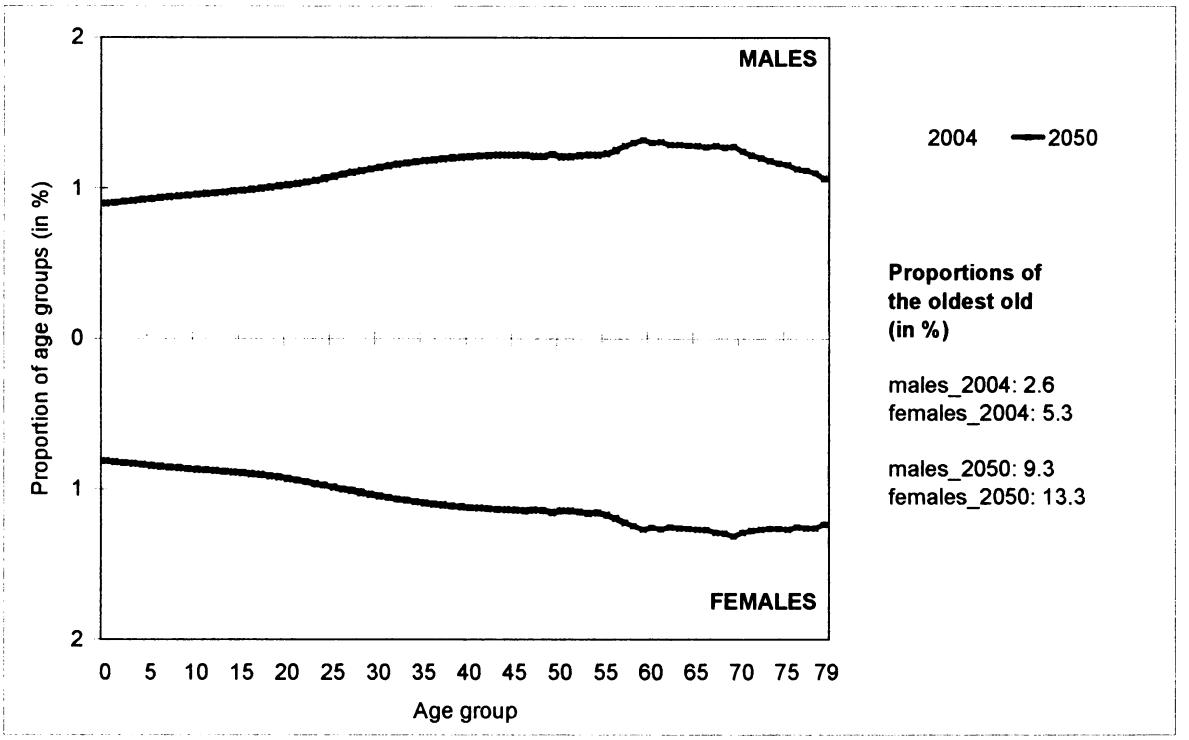
Various organizations produce population projections in the micro- as well as macro- level. When interpreting the projection outcomes, it is necessary to keep in mind their uncertainty. The results from Eurostat projections and United Nations' projections are presented here. **Eurostat** prepares several scenarios of the possible population development of the EU. **The baseline variant** described in the thesis represents the essential approach of Eurostat's projections (Eurostat 2005, Eurostat online database). As the other scenarios, the baseline variant of population shifts is made on the basis of fertility, mortality and migration suppositions. However, these concrete presumptions are not published. **United Nations**' projections were published in 2004 with the horizon in 2050 and its **'medium' variant** presents similar tendencies like Eurostat projections (Kisiankova, Wright 2005: 77). If not specified differently, the data produced by Eurostat are discussed.

The total number of the EU25 population is expected to rise from more than 456.8 million in 2004 by more than 13.2 million to the year 2025; however then, between 2025 and 2050 the decreasing tendency is projected (see Table 9.3 in the appendix). According to the presented baseline scenario, the total population of the EU will decline in the next five decades to 449.8 million in 2050. Concerning the decrease of the total number of productive people, it will fall by almost 52 million

[22] Scherbov and Mamolo have produced probabilistic projections for the EU on the basis of Eurostat data (2004). As presumptions, they used the high and low scenarios presented in the Eurostat projections.

active people in the study period. The outcome of the estimated shifts in the EU25 age structure will be a more balanced age structure profile (see Figure 9.1).

Figure 9.1: Relative age structure (in %), EU25, 2004, 2050



Source: own calculation based on the Eurostat database

Eurostat assumes that **the total population increase** in these two decades will be determined by net migration effect on the one hand. On the other hand, the number of states experiencing natural decline will be increasing, particularly regarding states of Southern and Central Europe and the Baltic States. In 2030, all EU25 countries apart from Ireland, France and Luxembourg will undergo natural decrease trends. In 2050, Ireland will be the only country with the natural increase of population. The highest proportional decline of the total population is estimated for Latvia (19.2 %), Estonia (16.6 %), Lithuania (16.4 %), the Czech Republic (12.9 %), Slovakia (11.9 %) and Hungary (11.9 %) (see Table 9.3 in the appendix). Comparing the population growth in absolute terms, Germany, Italy, Poland and the Czech Republic will undergo the largest population decrease, namely 7.89 million in Germany, 5.18 million in Italy, 4.53 million in Poland and 1.32 million in the Czech Republic. However, the highest population increase is proposed in France (5.80 million), the United Kingdom (4.68 million), Ireland (1.45 million) and Sweden (1.23 million).

Table 9.1: The main age groups proportion (in %), baseline projection variant, EU25 member states 2004, 2025, 2050

Unit	0-14			15-64			65+		
	2004	2025	2050	2004	2025	2050	2004	2025	2050
EU (25 countries)	16.4	14.4	13.4	67.1	63.0	56.7	16.5	22.5	29.9
Austria	16.3	15.6	14.7	68.2	61.9	57.6	15.5	22.5	27.7
Belgium	17.3	13.5	12.6	65.6	64.1	56.5	17.1	22.4	31.0
Cyprus	20.0	15.9	15.7	68.1	62.9	60.2	11.9	21.2	24.1
Czech Republic	15.2	12.9	11.9	70.9	62.5	56.5	14.0	24.6	31.5
Denmark	18.9	16.2	14.8	66.3	63.9	59.6	14.9	20.0	25.7
Estonia	16.6	18.2	16.0	67.6	65.3	57.8	15.8	16.4	26.2
Finland	17.6	13.3	12.3	66.8	63.9	55.2	15.5	22.7	32.5
France	18.6	12.8	11.5	65.1	65.2	52.9	16.4	21.9	35.7
Germany	14.7	16.7	15.8	67.3	60.9	57.0	18.0	22.5	27.3
Greece	14.6	12.1	11.2	67.8	62.9	53.5	17.5	25.0	35.3
Hungary	15.9	15.6	13.3	68.6	65.2	60.5	15.5	19.1	26.1
Ireland	20.9	16.2	14.8	67.9	64.1	59.1	11.1	19.7	26.1
Italy	14.2	15.1	13.7	66.5	65.7	59.6	19.2	19.2	26.7
Latvia	15.4	17.1	16.6	68.5	64.9	61.3	16.2	18.0	22.1
Lithuania	17.7	14.3	13.8	67.3	63.7	58.1	15.0	22.0	28.1
Luxembourg	18.8	15.6	14.5	67.2	63.1	60.8	14.1	21.3	24.7
Malta	18.2	16.1	15.8	68.8	63.3	60.7	13.0	20.6	23.5
Netherlands	18.5	13.8	12.3	67.6	64.1	57.3	13.8	22.1	30.4
Poland	17.2	14.6	13.0	69.8	64.3	57.6	13.0	21.1	29.4
Portugal	15.7	14.2	13.1	67.5	63.7	55.0	16.8	22.1	31.9
Slovakia	17.6	13.4	12.8	71.0	63.8	56.0	11.6	22.8	31.1
Slovenia	14.6	14.0	12.8	70.4	67.1	57.9	15.1	18.8	29.3
Spain	14.5	16.0	15.3	68.6	59.4	57.8	16.8	24.6	27.0
Sweden	17.8	17.1	16.3	65.1	60.7	59.4	17.2	22.1	24.3
United Kingdom	18.3	16.1	14.7	65.8	63.0	58.7	16.0	20.9	26.6

Source: own calculation based on the Eurostat database

Regarding the possible future population, an accelerating population ageing trend, which can be illustrated on the main age groups proportional shifts (see Table 9.1), will characterize development in the EU25. The EU average proportion of the child group will sligthly decline from 16.4 % in 2004 to 13.4 % in 2005. However, there will be almost no change concerning the child group proportion in Latvia, Estonia and Sweden in next 50 years. The child group relative weight will be on or above 16 % level in 2050 in these states. The smallest share of pre-productive group will be in the Czech Republic, France and Greece in 2050, where the child proportion will decline below 12 % by 2050.

From the economic point of view, the shifts in the working age group are very essential. The best situation will be in Latvia, Luxembourg and Malta, where the proportion of the productive group (15–64) will not decrease below 60 % by 2050 (see Table 9.1). However, the most alarming development is expected in France, Greece and Portugal, where the proportion of working people will fall below 55 % by 2050. According to Eurostat baseline scenario, there will be only six EU25

member states, which are expected to grow in their total number of people at the age 20–64, namely Sweden (5,299 thousand in 2005, 5,505.4 in 2050) Malta (249 thousand in 2005, 283 thousand in 2050), Ireland (2,503 thousand in 2005, 2,879 thousand in 2050) and Luxembourg (277 thousand in 2005, 358 in 2050). The most rapid decreases are estimated for the Czech Republic (from 6,602 thousand in 2005 to 4,637 in 2050), Italy (from 35,938 in 2005 to 26,025 in 2050) and Latvia (from 1,399 thousand in 2005 to 1,021 in 2050).

Regarding **the total number of old age working group of people** (50–64), Avramov and Mašková (2003: 45) propose that there will be differences between Western Europe and Estonia, Sweden, Hungary and the Czech Republic in the near future. Because in Western states, the old pre-retirement cohorts were born during the post-war baby boom, and thus, the cohorts are relatively numerous compared to the age structures of population where the post-war baby boom occurred only very slightly. Then, after 2015, the numerical increase in the 50–64 age group will slow down, as the less numerous cohorts will reach the post-productive age (Avramov and Mašková 2003: 46). And in the last two decades of the projected period, it is expected that the total number of people in the age group 50–64 will decrease (ibid.) as this trend will reflect the total population development.

The near future population development of demographic ageing will be characteristic especially by a high level of diversity in the younger old proportions and total numbers (Avramov and Mašková 2003: 46). The continuous disparities among males and females in the relation with demographic ageing have been predetermined by the different age specific mortality levels profile and also by high war losses when analyzing the group of the oldest old (Avramov and Mašková 2003: 51). However, the gender gap in the life expectancy is projected to decline (Avramov and Mašková 2003: 53). "The so called feminization of the ageing process should be stopped" (ibid.).

The demographic ageing will reach the highest intensity in France, Greece and Finland because the **post-productive group proportion** will gradually extend beyond 32 % by 2050 although their number is estimated to decline between 2030 and 2050 (Avramov and Mašková 2003: 48). As the less alarming demographic structure can be considered a population composition in Cyprus, Malta and Latvia because the aged people proportion will account for less than 24.5 % in 2050 although the rise of this group will also be significant. The most important growth of the oldest old group will pass in the Czech Republic, France and Greece as their proportion will overreach 12.5 % by 2050 (see Table 9.4 in the appendix). The oldest old group will be the fastest rising group of the European population age structures (Avramov and Mašková 2003: 40). At the bottom of the EU25, regarding the group of people at the age of 80 and over, will be Luxembourg, Denmark and Slovenia with the oldest old level below 8.5 %.

As far as **the oldest old population** is concerned, Schoenmaeckers (2004: 30–41) summarizes 'medium variant' estimates made by United Nations' Statistical Division that deal with the old group population development on the basis of recent demographic changes. In his study, he characterizes the phenomenon of double ageing which has been expected to accelerate in near future and by which the oldest old increase is more rapid than the growth of the younger old group.

UN pay high attention to the oldest old group because of the argument that they represent a risk group to suffer from poor health and therefore, they will be in need of satisfactory health care (Lisiankova, Wright 2005: 77). They are expected to increase in terms of total number from 7.5 million in 2005 to about 26 million in 2050 (ibid.).

Eurostat's data suggests that **the index of ageing** indicator will go through significant shifts during the projected period (see Table 9.2 and Figure 9.2 in the appendix). There will be an enormous growth of imbalances between post- and pre- reproductive groups of population. The slightest increase of the index of ageing (less than 80 % measured by the level of year 2003) will be in Sweden, Latvia and Estonia. Conversely, the rise will overreach 200 % in Poland, Ireland, Cyprus and Slovakia. Germany, Greece, Italy and Spain will remain at the EU top regarding the index of the ageing level in 2025, as well as in 2050. With the lower level than 155, Denmark, Luxembourg, the Netherlands and Sweden will represent the bottom of the EU in 2050.

It is a key task to focus on **the dependency ratios changes** as they are important to deal with the socio-economic consequences of demographic ageing. **The young-age dependency ratio** in the Czech Republic and Greece is projected to stop at the level of about 21 % until 2050, however, this will be the lowest proportion in 2050 (see Table 9.5 in the appendix). The Netherlands will accompany them with the proportion of 21.5 %. The highest young-age dependency ratio will be in Germany, Estonia and Sweden at around 27 % in 2050. **The old-age dependency** development will closely correspond with the post-productive proportion shifts, as the lowest level of the ratio is expected in Latvia, Cyprus and Malta (less than 40 %) as well as it is with the aged people proportion. In France, Greece and Finland, the age-dependency ratio will overreach 58 % by 2050, with the maximum 67.5 % in France and 66.0 % in Greece. It means that the present demographic ageing leaders will not change their position during time (Avramov and Mašková 2003: 56). **The age-dependency ratio** results from both young- and old-dependency ratios, and thus, it will be lowest in Latvia, Luxembourg and Malta (less than 65 %) and the highest in Portugal, Greece and France (over 81.5 %) in 2050. To implement new population policies, it is a key procedure to study not only the level of the age-dependency ratio but also its structure.

Table 9.2: Index of ageing (in %), baseline projection variant, EU25 member states, 2003, 2025, 2050

Unit	2003	2025	2050	2050/2003
EU (25 countries)	99.5	156.0	222.7	223.8
Austria	94.4	160.1	247.8	262.7
Belgium	98.4	144.5	188.9	192.0
Cyprus	58.1	122.2	196.5	338.5
Czech Republic	90.4	165.9	246.4	272.7
Denmark	78.9	133.4	154.0	195.1
Estonia	98.5	123.5	174.2	176.9
Finland	87.3	153.2	176.8	202.6
France	87.7	134.7	173.2	197.4
Germany	119.2	190.0	264.3	221.7
Greece	121.5	170.2	264.1	217.3
Hungary	96.5	153.5	204.1	211.5
Ireland	53.2	90.2	163.6	307.6
Italy	134.8	206.0	314.8	233.4
Latvia	102.2	121.9	176.3	172.5
Lithuania	82.8	126.5	195.4	236.1
Luxembourg	74.8	104.8	133.3	178.2
Malta	70.0	136.9	169.7	242.4
Netherlands	74.2	128.2	148.3	199.8
Poland	73.5	144.7	225.6	306.9
Portugal	106.1	155.9	243.9	229.8
Slovakia	64.4	134.4	228.0	353.9
Slovenia	100.7	170.1	242.8	241.1
Spain	116.3	170.8	311.0	267.5
Sweden	95.8	129.4	148.9	155.4
United Kingdom	86.9	130.0	181.4	208.6

Source: own calculation based on the Eurostat database

10 Conclusion

The thesis was focused on the analysis of the process of demographic ageing, which is the core feature of the recent past, the current day and the future population development in Europe. Population ageing leads to many implications both for public and private life. Each country has its specific current age structure determined by last population development. For all the countries, the proper policy actions are essential to formulate and apply.

The fertility decline accompanied by the decrease in mortality rates have been the main denominators of age structure shifts. Assessing these demographic changes in the regional point of view represented one of the main purposes of the study. The second main issue was to suggest a typology of the EU25 states concerning the timing, speed and intensity of population ageing changes.

EU25 countries aged in a very rapid way during the second half of the 20th century as the first demographic transition was finished and the second demographic transition became an important phenomenon since the mid-1960s. The post-war baby boom played a crucial role in 'Western' countries where the high fertility persisted to mid-1960s. In communist countries, the baby boom was only a short-term trend. The population development in Europe was divided into two different paths. In general, 'Western' countries went through a long-term fertility decrease below the replacement level (although the timing and intensity was not uniform) and continuously raised the life expectancy as a consequence of high level of health care and medicine and a healthier life style. In communist countries, total fertility rate oscillated around the replacement level until 1990 and these states failed regarding mortality improvement before the fall of communism. The 1990s represented a transitional period as the mortality did not improve immediately after the political change but with a small delay. The mortality patterns used to be so different comparing 'East' and 'West' that their consequences persist until today and there are still disparities in EU25 concerning male and female life expectancy. Post-communist countries passed the sharp fertility decline in the 1990s, which was connected with structural, socio-economic and also with political changes. All these main tendencies have led to a current demographic ageing situation with some similarities and differences among the EU25 countries.

We may identify six distinctive groups of states on the basis of age structure shifts and life expectancy improvements. Every group has some specifications, which differ it from the other groups. There is a so-called majority cluster covering Northern-Western European states with significant ageing of the workforce between 1980 and 2004 and with small differences in the total number of males and females, which result from low between sex life expectancy differences. The second distinctive group is represented only by Cyprus, which is typical with its balanced proportion between older and younger workforce when comparing the years 1980 and 2000. The weight of the old was also stable in the study period. Central European post-communist states together with Portugal represent the third group of countries characterized by the same life expectancy shifts between 1980 and 2004 (1980: women – around 75 years, males – 68 years; 2000: women – slightly below 80 years, men – around 70 years). The Baltic States together with Hungary went through a similar mortality development distinct from the other states with high between sex imbalances regarding life expectancy and the total number of males and females. Southern European states are uniform with the rapid decrease of the child proportion and a rapid rise of the old people share.

As has been summarized in the socio-demographic section, there are many possible policy actions, which can be used to deal with the consequences of demographic ageing in Europe. Although demographic ageing has had and will have an enormous impact on the social security system together with the pension system, the labor market and the health care system as well as private family life, I would agree with Johnson's statement that "population aging is a positive, not a negative, social phenomenon. Ageing implies a reduction in fertility to lower and more sustainable levels, a reduction in infant mortality, and longer life expectancy – these are some of the most significant benefits that we have reaped from the economic growth and medical and social advances of the past 50 years" (Johnson 1997: 1898).

The question is how each state will prepare for the coming changes, which policies they will use. According to Demeny (2005: 6), "time will inevitably force these reforms to be implemented." As suggested above, it is not difficult to identify the main spheres influenced by population ageing. There have also been strategies proposed; however, the application into the public policies seems to be a very problematic issue. Therefore, all the activities leading to public discussions about population ageing are welcomed because there is not so much time left for realization new policies as population ageing is expected to accelerate in the next years.

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Appendix

The tables, charts and pictures in the appendix are sorted according to the discussed issues in each chapter. They are in the same order, in which they are commented in the text of the thesis.

Table 5.5: Timing of the TRF fall below the replacement level, EU25 member states

before 1970	1970-1974	1975-1979	1980-1984	1985-1989	1990 and after
Czech Republic	Austria	Cyprus	Greece	Poland	Ireland
Finland	Belgium	France	Portugal	Slovakia	
Hungary	Germany	Italy	Slovenia		
Latvia	Netherlands	Lithuania	Spain		
Luxembourg	United Kingdom				
Malta					
Sweden					

Data Source: Eurostat, Council of Europe

Table 5.6: Total population of the age groups 65–79, 80+, index of relative change (in %), males, EU25 member states, 1995, 2005

Unit	1995	2005	2005/1995	1995	2005	2005/1995
	65-79			80+		
EU (25 countries)	20 912 075	25 503 334	122.0	4 995 790	6 084 889	121.8
Austria	340 700	420 496	123.4	87 451	98 210	112.3
Belgium	524 346	601 197	114.7	115 047	145 050	126.1
Cyprus	24 958	32 044	128.4	7 076	8 035	113.6
Czech Republic	428 628	464 560	108.4	84 923	93 385	110.0
Denmark	262 396	272 712	103.9	67 347	74 535	110.7
Estonia	51 188	64 235	125.5	9 611	9 475	98.6
Finland	219 930	272 685	124.0	44 416	57 973	130.5
France	2 714 311	3 181 175	117.2	751 789	906 842	120.6
Germany	3 546 520	5 286 361	149.1	903 114	986 574	109.2
Greece	569 324	734 854	129.1	134 662	159 057	118.1
Hungary	456 225	474 202	103.9	94 580	102 593	108.5
Ireland	144 823	162 604	112.3	31 152	38 511	123.6
Italy	3 058 003	3 758 573	122.9	769 752	958 597	124.5
Latvia	85 870	109 170	127.1	17 593	15 307	87.0
Lithuania	122 873	152 355	124.0	28 227	24 795	87.8
Luxembourg	17 521	22 460	128.2	4 034	4 153	102.9
Malta	14 327	18 348	128.1	2 933	4 278	145.9
Netherlands	671 338	782 267	116.5	143 655	182 197	126.8
Poland	1 336 792	1 616 092	120.9	250 930	282 051	112.4
Portugal	509 871	605 874	118.8	102 213	143 050	140.0
Slovakia	186 887	194 244	103.9	38 331	39 739	103.7
Slovenia	69 401	100 308	144.5	15 219	15 709	103.2
Spain	2 026 654	2 410 046	118.9	447 919	643 472	143.7
Sweden	509 868	496 606	97.4	142 383	173 913	122.1
United Kingdom	3 019 321	3 214 000	106.4	701 433	902 500	128.7

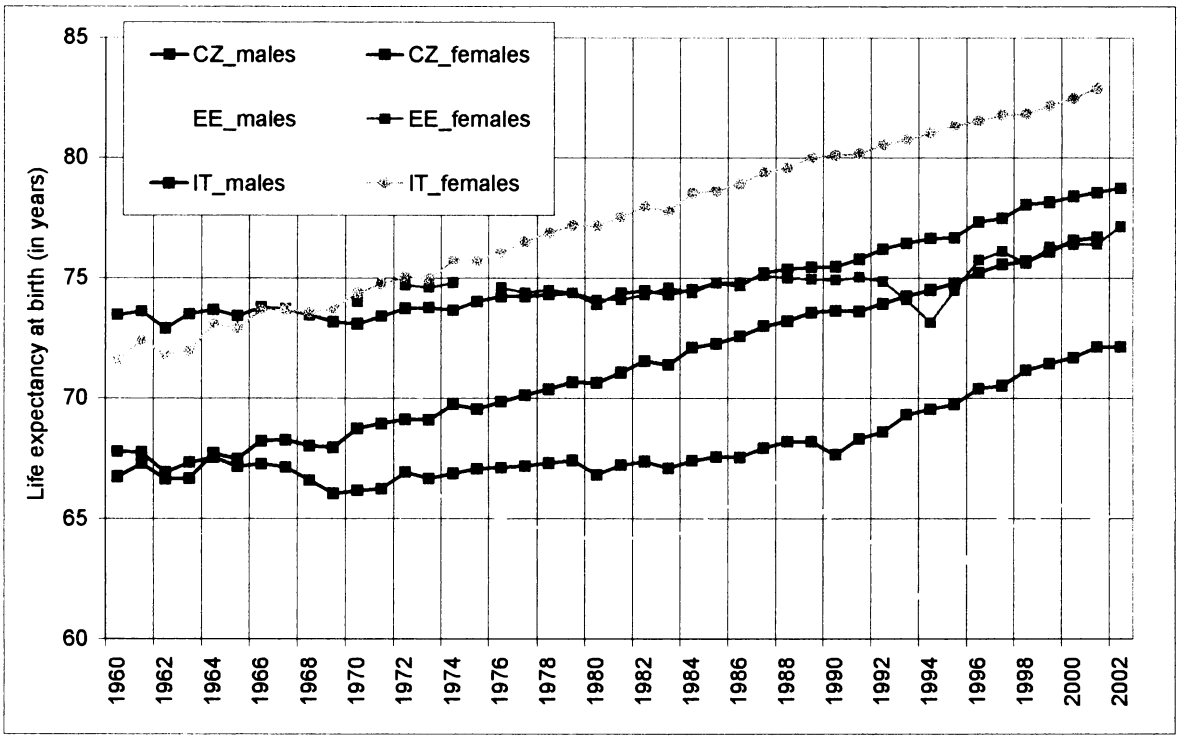
Source: own calculation based on the Eurostat database

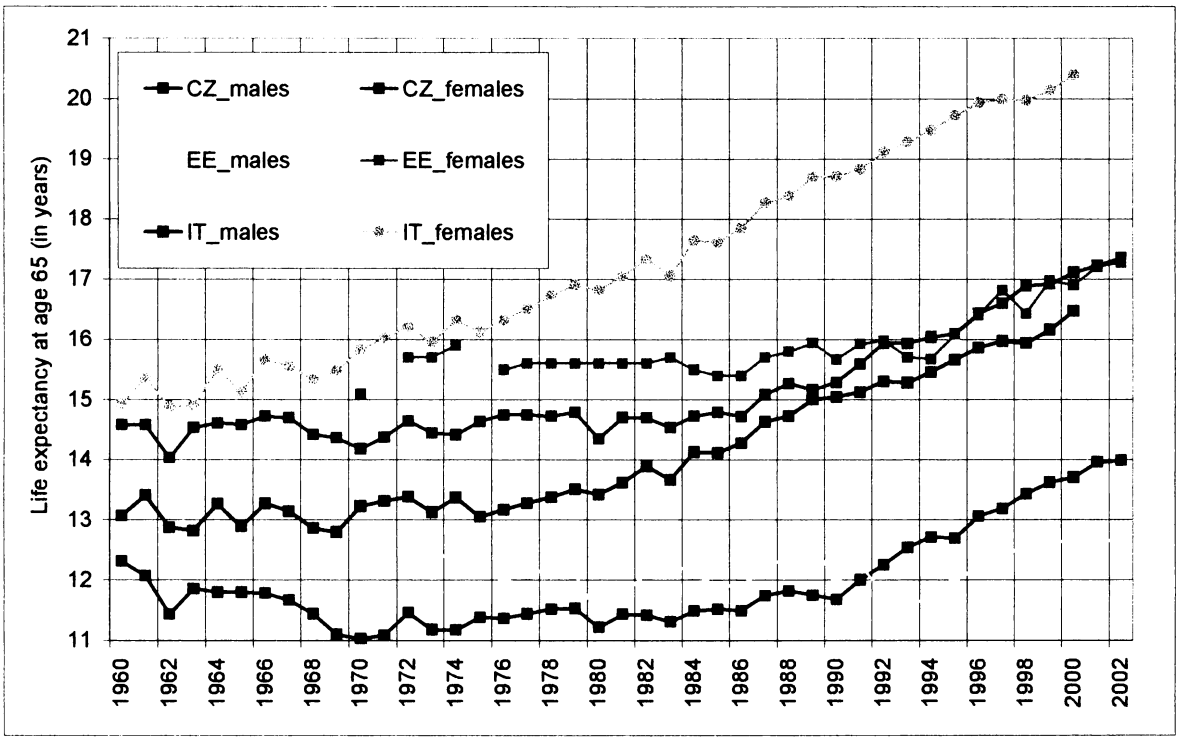
Table 5.7: Total population of the age groups 65–79, 80+, index of relative change (in %), females, EU25 member states, 1995, 2005

Unit	1995	2005	2005/1995	1995	2005	2005/1995
	65-79			80+		
EU (25 countries)	29 028 938	32 423 896	111.7	11 130 209	12 860 765	115.5
Austria	547 737	543 800	99.3	220 986	249 230	112.8
Belgium	685 941	750 651	109.4	271 211	302 602	111.6
Cyprus	29 585	37 801	127.8	9 561	11 521	120.5
Czech Republic	642 508	661 738	103.0	200 173	214 947	107.4
Denmark	331 342	318 920	96.3	137 572	146 336	106.4
Estonia	100 903	116 064	115.0	31 181	32 631	104.7
Finland	338 031	354 937	105.0	117 341	145 345	123.9
France	3 562 591	4 034 790	113.3	1 657 805	1 845 111	111.3
Germany	5 662 296	6 524 108	115.2	2 429 843	2 570 408	105.8
Greece	689 260	895 796	130.0	193 767	217 275	112.1
Hungary	699 517	765 508	109.4	207 680	235 296	113.3
Ireland	177 622	185 323	104.3	57 170	71 871	125.7
Italy	4 034 123	4 722 564	117.1	1 503 975	1 939 607	129.0
Latvia	178 904	201 718	112.8	53 928	54 981	102.0
Lithuania	224 170	268 962	120.0	68 203	70 925	104.0
Luxembourg	25 335	27 820	109.8	9 588	10 467	109.2
Malta	18 385	23 726	129.1	4 840	7 213	149.0
Netherlands	886 481	932 830	105.2	332 102	391 376	117.8
Poland	2 051 256	2 435 994	118.8	580 469	684 136	117.9
Portugal	665 741	783 657	117.7	197 414	257 958	130.7
Slovakia	275 783	304 291	110.3	77 475	87 668	113.2
Slovenia	118 778	145 717	122.7	36 747	44 750	121.8
Spain	2 600 473	2 973 667	114.4	871 219	1 201 206	137.9
Sweden	622 115	575 392	92.5	265 749	308 424	116.1
United Kingdom	3 860 059	3 767 700	97.6	1 594 211	1 733 200	108.7

Source: own calculation based on the Eurostat database

Figures 5.3, 5.4: Life expectancy at birth and at the age 65, the Czech Republic, Estonia*, Italy, 1960–2002





Source: Council of Europe

**Data for 1960–1969, 1975 not available*

Table 6.7: Proportion of children at the age 0–14 (in %), EU25 member states*, 1980–2004

Unit	1980	1985	1990	1995	2000	2004
EU (25 countries)	22.1	20.5	19.2	18.3	17.2	16.4
Austria	20.7	18.4	17.5	17.8	17.1	16.3
Belgium	20.3	18.9	18.1	18.0	17.6	17.3
Cyprus	25.4	25.5	26.0	25.0	22.8	20.0
Czech Republic	23.3	23.4	21.7	18.9	16.6	15.2
Denmark	21.1	18.6	17.1	17.3	18.4	18.9
Estonia	21.6	22.2	22.3	20.9	18.3	16.6
Finland	20.5	19.4	19.3	19.1	18.2	17.6
France	22.5	21.4	20.1	19.6	18.9	18.6
Germany	18.8	16.2	16.0	16.3	15.7	14.7
Greece	23.1	21.1	19.5	17.6	15.5	14.6
Hungary	21.9	21.6	20.5	18.3	16.9	15.9
Ireland	30.5	29.3	27.4	24.5	21.9	20.9
Italy	22.6	19.6	16.8	14.8	14.3	14.2
Latvia	20.4	21.2	21.4	20.9	18.0	15.4
Lithuania	23.6	23.1	22.6	21.9	20.2	17.7
Luxembourg	19.0	17.3	17.2	18.3	18.9	18.8
Malta	-	-	-	22.0	20.4	18.2
Netherlands	22.6	19.7	18.2	18.4	18.6	18.5
Poland	24.1	25.4	25.3	23.1	19.6	17.2
Portugal	26.1	23.9	20.8	17.9	16.2	15.7
Slovakia	26.1	26.4	25.5	22.9	19.8	17.6
Slovenia	22.9	22.4	20.9	18.5	16.1	14.6
Spain	26.0	23.5	20.2	16.9	14.9	14.5
Sweden	19.8	18.2	17.8	18.9	18.5	17.8
United Kingdom	21.2	19.3	18.9	19.4	19.0	18.3

Source: Eurostat

*Malta 1980–1990: break in series

Table 6.8: Proportion of people at the age 15–64 (in %), EU25 member states*, 1980–2004

Unit	1980	1985	1990	1995	2000	2004
EU (25 countries)	64.4	66.5	66.8	66.9	67.2	67.1
Austria	63.9	67.4	67.6	67.1	67.4	68.2
Belgium	65.4	67.4	67.1	66.2	65.5	65.6
Cyprus	64.5	63.7	63.1	63.9	66.0	68.1
Czech Republic	63.0	64.8	65.8	68.0	69.6	70.9
Denmark	64.5	66.4	67.3	67.4	66.8	66.3
Estonia	65.8	66.2	66.2	65.8	66.8	67.6
Finland	67.6	68.1	67.4	66.8	67.0	66.8
France	63.4	65.8	66.0	65.3	65.1	65.1
Germany	65.5	69.4	69.1	68.3	68.1	67.3
Greece	63.8	65.5	66.8	67.5	68.0	67.8
Hungary	64.6	66.2	66.2	67.6	68.0	68.6
Ireland	58.8	59.9	61.3	64.0	66.8	67.9
Italy	64.3	67.4	68.5	68.7	67.5	66.5
Latvia	66.5	67.1	66.8	65.6	67.2	68.5
Lithuania	65.1	66.6	66.6	65.9	66.1	67.3
Luxembourg	67.4	69.4	69.4	67.7	66.8	67.2
Malta	-	-	-	67.1	67.5	68.8
Netherlands	65.9	68.3	68.9	68.4	67.9	67.6
Poland	65.6	65.2	64.7	65.9	68.4	69.8
Portugal	62.8	64.3	65.9	67.3	67.7	67.5
Slovakia	63.3	64.2	64.3	66.3	68.7	71.0
Slovenia	66.2	67.5	68.5	69.4	70.0	70.4
Spain	63.2	64.5	66.4	67.9	68.4	68.6
Sweden	64.1	64.7	64.3	63.6	64.2	65.1
United Kingdom	64.0	65.6	65.4	64.8	65.3	65.8

Source: Eurostat

*Malta 1980–1990: break in series

Table 6.9: Proportion and total numbers of the people aged 15–24 (in %), EU25 member states*, 1980, 2005

Unit	Total number	Proportion	Total number	Proportion	Index
	1980		2005		2005/1980
EU (25 countries)	-	-	58 405 984	12.7	-
Austria	1 234 650	16.4	1 011 444	12.3	81.9
Belgium	1 587 974	16.1	1 260 948	12.1	79.4
Cyprus	-	-	119 040	15.9	-
Czech Republic	1 409 255	13.7	1 365 982	13.4	96.9
Denmark	762 551	14.9	597 123	11.0	78.3
Estonia	219 294	14.9	209 916	15.6	95.7
Finland	770 267	16.1	651 469	12.4	84.6
France	8 543 512	15.9	7 870 130	13.0	92.1
Germany	12 467 904	15.9	9 678 080	11.7	77.6
Greece	1 420 226	14.8	1 377 092	12.4	97.0
Hungary	1 464 409	13.7	1 322 024	13.1	90.3
Ireland	590 253	17.4	637 907	15.5	108.1
Italy	8 524 548	15.1	6 098 866	10.4	71.5
Latvia	386 635	15.4	359 602	15.6	93.0
Lithuania	570 769	16.8	526 150	15.4	92.2
Luxembourg	56 322	15.5	52 445	11.5	93.1
Malta	-	-	58 552	14.5	-
Netherlands	2 438 903	17.3	1 948 735	12.0	79.9
Poland	6 208 670	17.5	6 287 233	16.5	101.3
Portugal	1 598 780	16.5	1 327 586	12.6	83.0
Slovakia	854 317	17.2	868 833	16.1	101.7
Slovenia	-	-	268 126	13.4	-
Spain	6 127 655	16.5	5 284 907	12.3	86.2
Sweden	1 117 147	13.5	1 097 009	12.2	98.2
United Kingdom	8 752 813	15.6	7 832 500	13.0	89.5

Source: Eurostat

*Malta, Cyprus, Slovenia in 1980: break in series

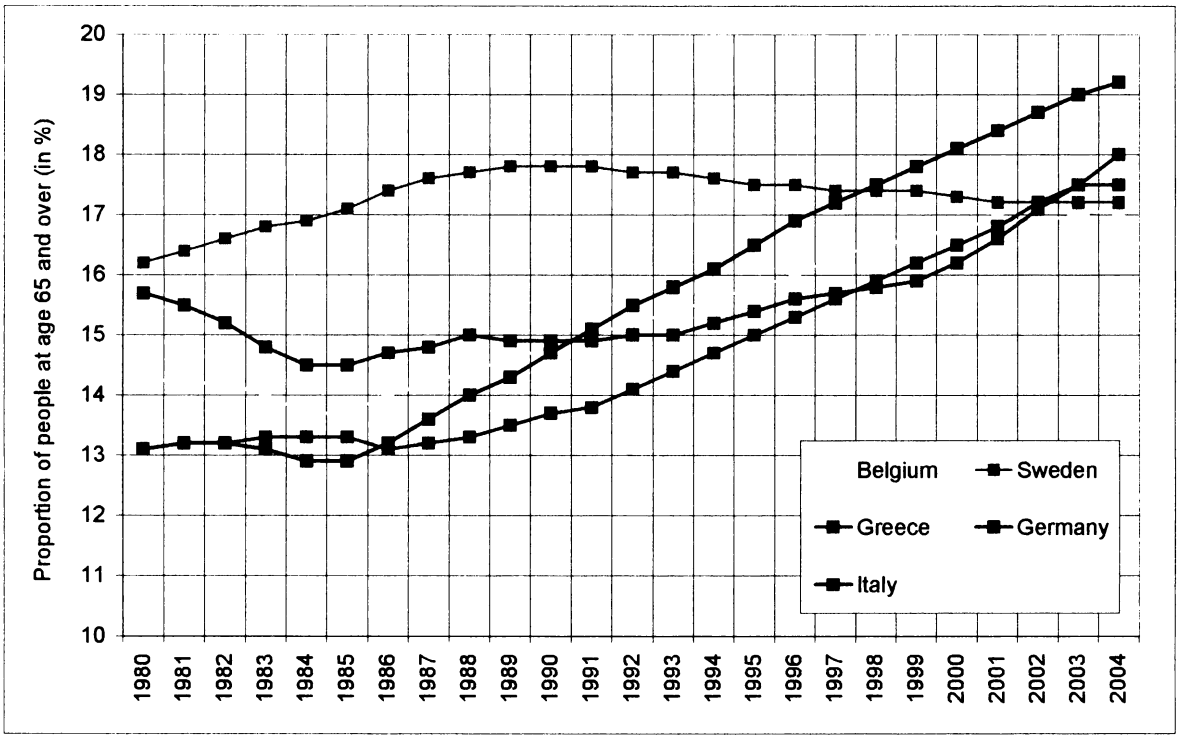
Table 6.10: Proportion of people at the age 65+, EU25 member states*, 1980–2004

Unit	1980	1985	1990	1995	2000	2004
EU (25 countries)	13.5	13.0	13.9	14.8	15.7	16.5
Austria	15.5	14.1	14.9	15.1	15.4	15.5
Belgium	14.3	13.7	14.8	15.7	16.8	17.1
Cyprus	10.1	10.8	10.9	11.1	11.2	11.9
Czech Republic	13.6	11.8	12.4	13.2	13.8	14.0
Denmark	14.4	15.0	15.6	15.3	14.8	14.9
Estonia	12.5	11.5	11.5	13.3	14.9	15.8
Finland	11.9	12.4	13.3	14.1	14.8	15.5
France	14.1	12.7	13.9	15.1	16.0	16.4
Germany	15.7	14.5	14.9	15.4	16.3	18.0
Greece	13.2	13.4	13.7	15.0	16.5	17.5
Hungary	13.6	12.2	13.2	14.1	14.9	15.5
Ireland	10.7	10.8	11.4	11.5	11.2	11.1
Italy	13.1	12.9	14.7	16.5	18.1	19.2
Latvia	13.1	11.8	11.9	13.5	14.8	16.2
Lithuania	11.3	10.3	10.8	12.1	13.7	15.0
Luxembourg	13.7	13.2	13.4	14.0	14.3	14.1
Malta	-	-	-	8.9	9.8	13.0
Netherlands	11.5	12.0	12.8	13.2	13.6	13.8
Poland	10.2	9.4	10.0	11.0	12.0	13.0
Portugal	11.2	11.7	13.3	14.7	16.0	16.8
Slovakia	10.6	9.4	10.3	10.8	11.3	11.6
Slovenia	10.8	10.1	10.6	12.1	13.9	15.1
Spain	10.8	11.9	13.4	15.2	16.8	16.8
Sweden	16.2	17.0	17.8	17.4	17.3	17.2
United Kingdom	14.9	15.0	15.6	15.7	15.6	16.0

Source: Eurostat

*Malta 1980–1990: break in series

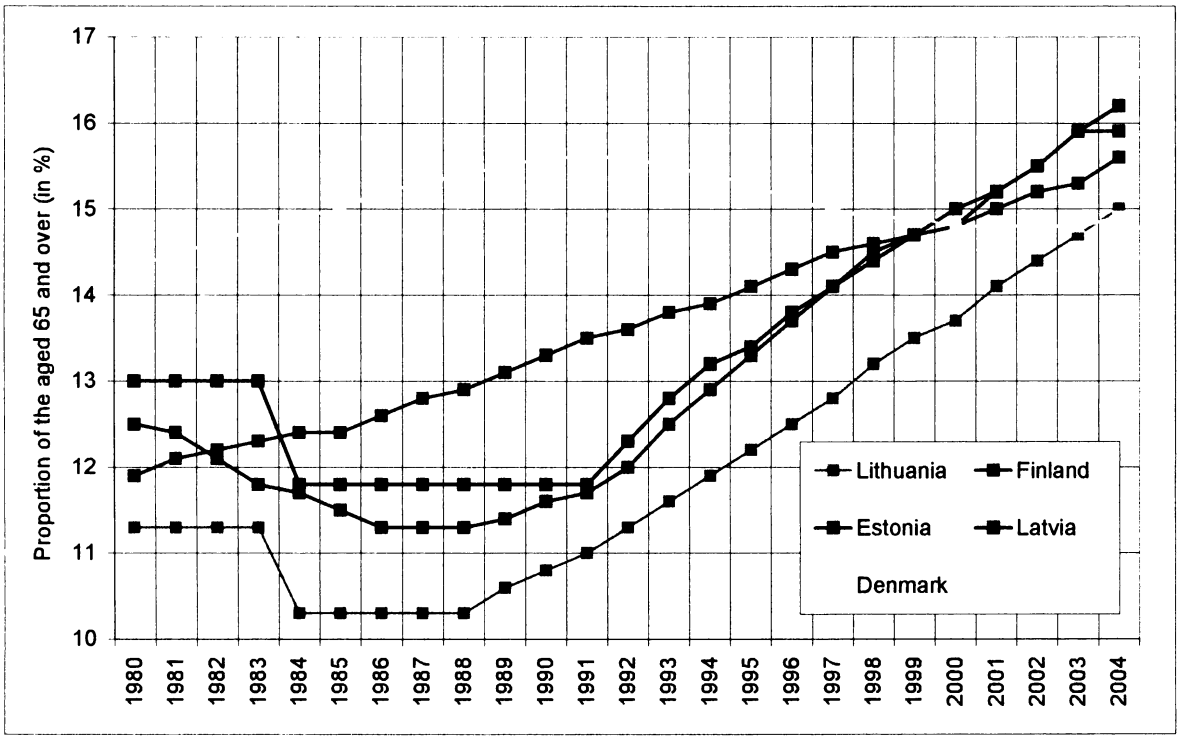
Figure 6.5: Proportion of people at the age 65+, Belgium, Germany, Greece, Italy, Sweden*, 1980–2004



Source: Eurostat

* States with the highest proportion of people aged 65 and over according to the year 2004

Figure 6.6: Proportion of people at the 65+, Denmark, Estonia, Finland, Latvia, Lithuania, 1980–2004



Source: Eurostat

Table 6.11: Index of change of main age group proportions (in %), EU25 member states, 2004/1980

Unit	Age group 0-14			Age group 15-64			Age group 65+		
	1980	2004	2004/1980	1980	2004	2004/1980	1980	2004	2004/1980
EU (25 countries)	22.1	16.4	74.2	64.4	67.1	104.2	13.5	16.5	122.2
Austria	20.7	16.3	78.7	63.9	68.2	106.7	15.5	15.5	100.0
Belgium	20.3	17.3	85.2	65.4	65.6	100.3	14.3	17.1	119.6
Cyprus	25.4	20.0	78.7	64.5	68.1	105.6	10.1	11.9	117.8
Czech Republic	23.3	15.2	65.2	63.0	70.9	112.5	13.6	14.0	102.9
Denmark	21.1	18.9	89.6	64.5	66.3	102.8	14.4	14.9	103.5
Estonia	21.6	16.6	76.9	65.8	67.6	102.7	12.5	15.8	126.4
Finland	20.5	17.6	85.9	67.6	66.8	98.8	11.9	15.5	130.3
France	22.5	18.6	82.7	63.4	65.1	102.7	14.1	16.4	116.3
Germany	18.8	14.7	78.2	65.5	67.3	102.7	15.7	18.0	114.6
Greece	23.1	14.6	63.2	63.8	67.8	106.3	13.2	17.5	132.6
Hungary	21.9	15.9	72.6	64.6	68.6	106.2	13.6	15.5	114.0
Ireland	30.5	20.9	68.5	58.8	67.9	115.5	10.7	11.1	103.7
Italy	22.6	14.2	62.8	64.3	66.5	103.4	13.1	19.2	146.6
Latvia	20.4	15.4	75.5	66.5	68.5	103.0	13.1	16.2	123.7
Lithuania	23.6	17.7	75.0	65.1	67.3	103.4	11.3	15.0	132.7
Luxembourg	19.0	18.8	98.9	67.4	67.2	99.7	13.7	14.1	102.9
Malta	-	18.2	-	-	68.8	-	-	13.0	-
Netherlands	22.6	18.5	81.9	65.9	67.6	102.6	11.5	13.8	120.0
Poland	24.1	17.2	71.4	65.6	69.8	106.4	10.2	13.0	127.5
Portugal	26.1	15.7	60.2	62.8	67.5	107.5	11.2	16.8	150.0
Slovakia	26.1	17.6	67.4	63.3	71.0	112.2	10.6	11.6	109.4
Slovenia	22.9	14.6	63.8	66.2	70.4	106.3	10.8	15.1	139.8
Spain	26.0	14.5	55.8	63.2	68.6	108.5	10.8	16.8	155.6
Sweden	19.8	17.8	89.9	64.1	65.1	101.6	16.2	17.2	106.2
United Kingdom	21.2	18.3	86.3	64.0	65.8	102.8	14.9	16.0	107.4

Source: own calculation based on the Eurostat database

Table 6.12: Old-age dependency ratio, EU25 member states*, 1980–2004

Unit	1980	1985	1990	1995	2000	2004	2004/1980
EU (25 countries)	20.9	19.5	20.8	22.1	23.4	24.5	117.2
Austria	24.3	21.0	22.1	22.5	22.9	22.8	93.8
Belgium	21.9	20.3	22.1	23.8	25.5	26.1	119.2
Cyprus	15.7	16.9	17.2	17.2	17.0	17.5	111.5
Czech Republic	21.6	18.2	19.0	19.3	19.8	19.7	91.2
Denmark	22.2	22.6	23.2	22.7	22.2	22.5	101.4
Estonia	19.0	17.3	17.5	20.2	22.4	23.5	123.7
Finland	17.6	18.2	19.8	21.1	22.2	23.3	132.4
France	22.1	19.4	21.1	23.0	24.6	25.2	114.0
Germany	23.9	20.9	21.6	22.5	23.9	26.8	112.1
Greece	20.6	20.3	20.4	22.2	24.2	25.8	125.2
Hungary	20.9	18.5	20.0	20.9	22.0	22.6	108.1
Ireland	18.2	18.1	18.6	17.8	16.8	16.4	90.1
Italy	20.3	19.1	21.5	24.0	26.8	28.9	142.4
Latvia	19.6	17.6	17.7	20.5	22.1	23.6	120.4
Lithuania	17.4	15.5	16.2	18.5	20.8	22.3	128.2
Luxembourg	20.3	19.0	19.3	20.6	21.4	21.0	103.4
Malta	-	-	-	16.3	17.9	19.0	-
Netherlands	17.4	17.5	18.6	19.3	20.0	20.5	117.8
Poland	15.5	14.5	15.4	16.6	17.6	18.6	120.0
Portugal	17.8	18.2	20.0	21.9	23.7	24.9	139.9
Slovakia	16.7	14.7	16.0	16.3	16.6	16.3	97.6
Slovenia	16.4	15.0	15.5	17.4	19.8	21.4	130.5
Spain	17.1	18.5	20.2	22.3	24.5	24.5	143.3
Sweden	25.3	26.4	27.7	27.4	26.9	26.4	104.3
United Kingdom	23.3	22.9	24.0	24.3	23.9	24.3	104.3

Source: Eurostat

*Malta 1980–1990: break in series

Table 6.13: Young-age dependency ratio, EU25 member states*, 1980–2004

Unit	1980	1985	1990	1995	2000	2004	2004/1980
EU (25 countries)	34.3	30.7	28.8	27.3	25.6	24.4	71.1
Austria	32.4	27.4	26.0	26.6	25.4	24.0	74.1
Belgium	31.0	28.0	27.0	27.2	26.9	26.4	85.2
Cyprus	39.4	40.1	41.2	39.1	34.5	29.4	74.6
Czech Republic	37.0	36.2	33.0	27.7	23.9	21.5	58.1
Denmark	32.7	28.0	25.5	25.6	27.6	28.5	87.2
Estonia	32.8	33.5	33.7	31.8	27.3	24.5	74.7
Finland	30.2	28.5	28.7	28.5	27.2	26.4	87.4
France	35.4	32.4	30.5	30.0	29.0	28.5	80.5
Germany	28.6	23.3	23.1	23.9	23.1	21.9	76.6
Greece	36.2	32.2	29.3	26.0	22.9	21.6	59.7
Hungary	33.8	32.6	31.0	27.1	24.8	23.1	68.3
Ireland	51.8	48.9	44.7	38.3	32.8	30.7	59.3
Italy	35.1	29.1	24.5	21.5	21.2	21.3	60.7
Latvia	30.7	31.6	32.1	31.8	26.7	22.5	73.3
Lithuania	36.2	34.6	33.9	33.2	30.6	26.2	72.4
Luxembourg	28.1	24.9	24.9	27.1	28.3	28.0	99.6
Malta	-	-	-	32.8	30.2	26.5	-
Netherlands	34.3	28.9	26.4	26.9	27.4	27.4	79.9
Poland	36.8	39.0	39.0	35.1	28.6	24.7	67.1
Portugal	41.6	37.1	31.6	26.6	24.0	23.3	56.0
Slovakia	41.2	41.1	39.6	34.5	28.8	24.8	60.2
Slovenia	34.6	33.2	30.6	26.7	23.0	20.8	60.1
Spain	41.2	36.5	30.5	24.9	21.8	21.1	51.2
Sweden	30.9	28.2	27.7	29.6	28.8	27.4	88.7
United Kingdom	33.2	29.5	29.0	29.9	29.1	27.8	83.7

Source: Eurostat

*Malta 1980–1990: break in series

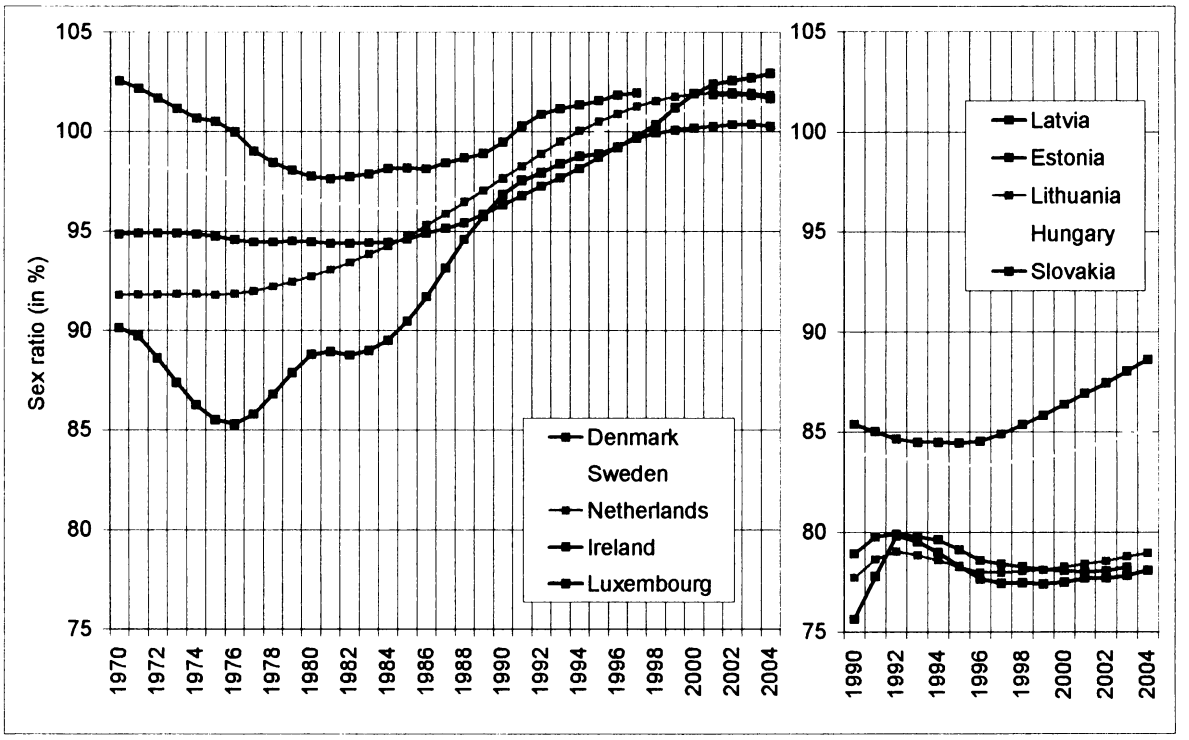
Table 6.14: Age-dependancy ratio, EU25 member states*, 1980–2004

Unit	1980	1985	1990	1995	2000	2004	2004/1980
EU (25 countries)	55.2	50.3	49.6	49.4	48.9	48.9	88.6
Austria	56.6	48.3	48.0	49.0	48.3	46.8	82.7
Belgium	52.9	48.4	49.1	51.0	52.4	52.5	99.2
Cyprus	55.1	56.9	58.4	56.4	51.5	46.9	85.1
Czech Republic	58.6	54.4	52.0	47.0	43.7	41.2	70.3
Denmark	54.9	50.6	48.7	48.3	49.8	51.0	92.9
Estonia	51.8	50.9	51.2	52.0	49.8	48.0	92.7
Finland	47.8	46.7	48.5	49.7	49.4	49.7	104.0
France	57.6	51.9	51.6	53.0	53.6	53.7	93.2
Germany	52.6	44.1	44.7	46.4	46.9	48.7	92.6
Greece	56.7	52.5	49.7	48.3	47.1	47.4	83.6
Hungary	54.8	51.1	51.0	47.9	46.8	45.7	83.4
Ireland	70.1	67.0	63.3	56.2	49.6	47.1	67.2
Italy	55.4	48.2	46.0	45.4	48.0	50.2	90.6
Latvia	50.3	49.2	49.8	52.3	48.8	46.1	91.7
Lithuania	53.6	50.1	50.1	51.7	51.4	48.6	90.7
Luxembourg	48.4	43.9	44.2	47.6	49.7	49.0	101.2
Malta	-	-	-	49.1	48.1	45.5	-
Netherlands	51.7	46.4	45.0	46.2	47.4	47.9	92.6
Poland	52.3	53.5	54.4	51.7	46.2	43.3	82.8
Portugal	59.4	55.4	51.6	48.5	47.6	48.3	81.3
Slovakia	57.9	55.8	55.6	50.8	45.4	41.0	70.8
Slovenia	51.0	48.2	46.1	44.1	42.8	42.1	82.5
Spain	58.3	54.9	50.8	47.2	46.3	45.6	78.2
Sweden	56.2	54.6	55.4	57.1	55.8	53.8	95.7
United Kingdom	56.5	52.3	52.9	54.2	53.0	52.1	92.2

Source: Eurostat

*Malta 1980–1990: break in series

Figure 6.8: Sex ratio in the age group 50–64, selected* EU member states, 1970–2004**

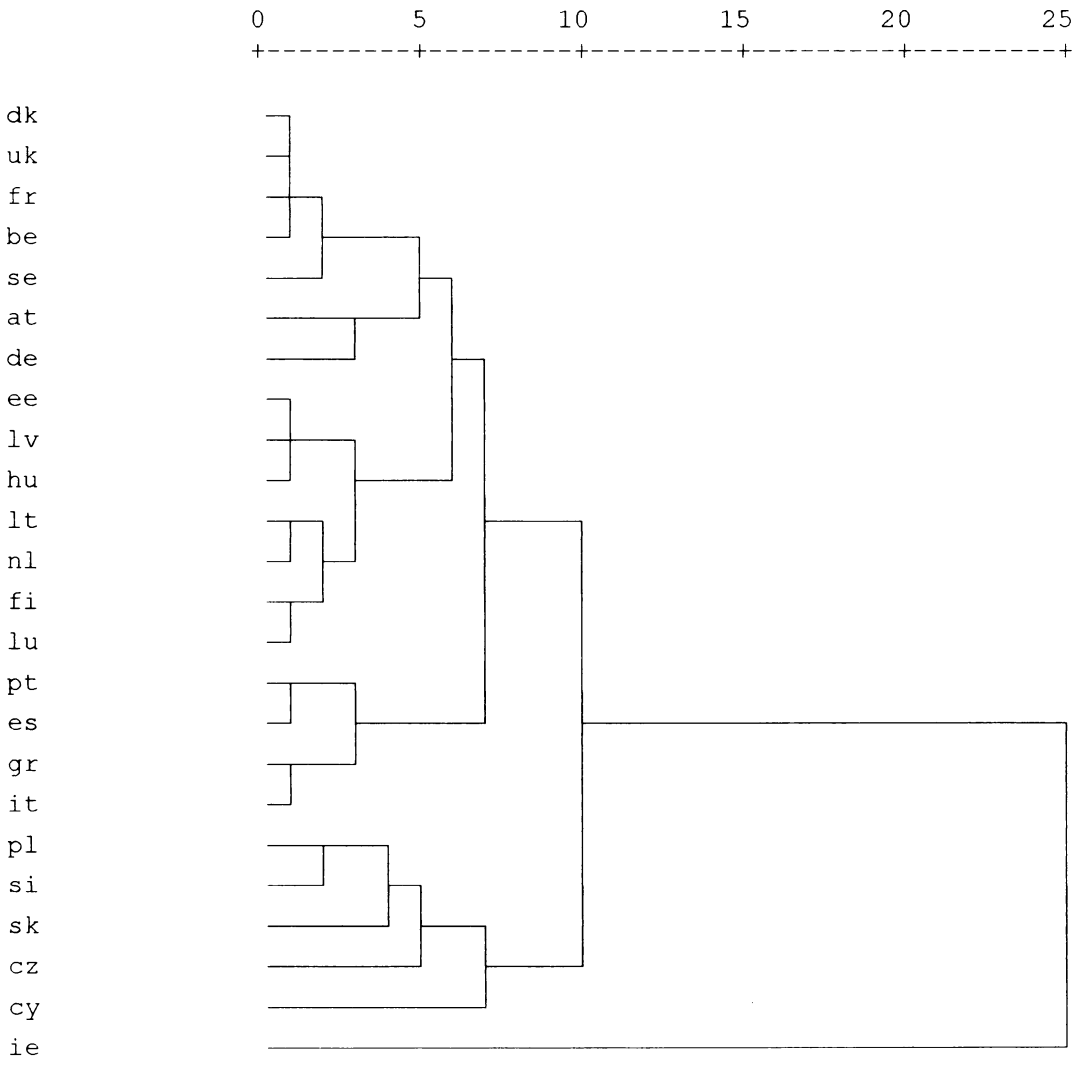


Source: Eurostat

* States with the lowest and highest rates of sex ratio according to the year 2003

** Ireland 1998–2000: break in series

Picture 7.2: Dendrogram – hierarchical cluster analysis
(cluster membership, dependency ratios, EU25 member states*)



source: own calculation based on the Eurostat database (SPSS)

*Without Malta

Table 7.4: Hierchical clustering – cluster membership, selected variables*, EU25 member states**

Unit	2 Clusters	3 Clusters	4 Clusters	5 Clusters	6 Clusters	7 Clusters	8 Clusters
Austria	1	1	1	1	1	1	1
Belgium	1	1	1	1	1	1	1
Cyprus	2	2	2	2	2	2	2
Czech Republic	1	3	3	3	3	3	3
Denmark	1	1	1	1	1	1	1
Estonia	1	3	4	4	4	4	4
Finland	1	1	1	1	1	1	1
France	1	1	1	1	1	1	1
Germany	1	1	1	1	1	1	1
Greece	1	1	1	1	5	5	5
Hungary	1	3	4	4	4	6	6
Ireland	2	2	2	5	6	7	7
Italy	1	1	1	1	5	5	5
Latvia	1	3	4	4	4	4	4
Lithuania	1	3	4	4	4	4	4
Luxembourg	1	1	1	1	1	1	1
Netherlands	1	1	1	1	1	1	
Poland	1	3	3	3	3	3	3
Portugal	1	3	3	3	3	3	3
Slovakia	1	3	3	3	3	3	3
Slovenia	1	3	3	3	3	3	3
Spain	1	1	1	1	5	5	5
Sweden	1	1	1	1	1	1	1
United Kingdom	1	1	1	1	1	1	1

Source: own calculation based on the Eurostat database (SPSS)

* awork_90, awork_95, exc_M_80, exc_M_05, LE_M_80, LE_F_80, LE_M_00, LE_F_00, child_04, child_80, old_04, old_80

** Without Malta

Table 8.4: Family policy types according to Gauthier

Family policy type	Social democratic	Conservative	Southern European	Liberal
main characteristic	universal welfare good leave conditions for mothers	support according to employment status sex differences	no guaranteed minimum income	support targeted to needy families
childcare support	good childcare	limited childcare	limited childcare	little provision of childcare
countries	Skandinavian	Western Europe	Southern European	United Kingdom
average TFR	1.7	1.7	1.3	1.7

Source: Gauthier 2002 in Caldwell and Schindlmayr 2006: 247
Germany, Austria, Portugal, post-communist states not classified

Table 9.3: Total population Eurostat projection, baseline variant, EU25 member states, 2004, 2025, 2050

Unit	2004	2025	2050	Percentage increase with respect to 2004	
				2025	2050
EU (25 countries)	456 815 263	470 057 265	449 831 159	2.9	-1.5
Austria	8 113 996	8 500 626	8 215 955	4.8	1.3
Belgium	10 396 421	10 898 439	10 905 788	4.8	4.9
Cyprus	730 367	896 858	975 071	22.8	33.5
Czech Republic	10 211 455	9 811 677	8 893 511	-3.9	-12.9
Denmark	5 397 640	5 556 633	5 429 990	2.9	0.6
Estonia	1 350 615	1 224 074	1 125 770	-9.4	-16.6
Finland	5 219 732	5 438 812	5 217 029	4.2	-0.1
France	59 900 680	64 392 005	65 703 588	7.5	9.7
Germany	82 531 671	82 107 628	74 642 408	-0.5	-9.6
Greece	11 041 095	11 393 535	10 631 774	3.2	-3.7
Hungary	10 116 742	9 588 374	8 914 869	-5.2	-11.9
Ireland	4 027 732	4 922 321	5 477 863	22.2	36.0
Italy	57 888 245	57 750 958	52 709 211	-0.2	-8.9
Latvia	2 319 203	2 068 066	1 872 855	-10.8	-19.2
Lithuania	3 445 857	3 133 654	2 881 125	-9.1	-16.4
Luxembourg	451 600	544 009	642 576	20.5	42.3
Malta	399 867	467 809	508 268	17.0	27.1
Netherlands	16 258 032	17 428 784	17 405 784	7.2	7.1
Poland	38 190 608	36 836 280	33 665 040	-3.5	-11.8
Portugal	10 474 685	10 729 751	10 009 042	2.4	-4.4
Slovakia	5 380 053	5 236 550	4 737 558	-2.7	-11.9
Slovenia	1 996 433	2 014 180	1 900 849	0.9	-4.8
Spain	42 345 342	45 555 524	42 833 755	7.6	1.2
Sweden	8 975 670	9 768 566	10 201 539	8.8	13.7
United Kingdom	59 651 522	63 792 152	64 329 941	6.9	7.8

Source: own calculation based on the Eurostat database

Table 9.4: The oldest old proportion (in %), baseline projection variant, EU25 member states, 2004, 2025, 2050

Unit	80+			Unit	80+		
	2004	2025	2050		2004	2025	2050
EU (25 countries)	4.0	6.3	11.4	Italy	4.8	5.2	9.2
Austria	4.1	6.1	11.3	Latvia	2.9	4.6	8.4
Belgium	4.1	4.9	8.7	Lithuania	2.8	5.4	8.5
Cyprus	2.6	5.4	8.7	Luxembourg	3.1	4.6	7.5
Czech Republic	2.9	7.9	13.6	Malta	2.7	4.6	8.3
Denmark	4.0	5.0	8.0	Netherlands	3.4	6.6	12.6
Estonia	3.0	3.8	8.1	Poland	2.4	4.3	8.8
Finland	3.7	6.0	10.4	Portugal	3.7	6.0	10.7
France	4.3	6.4	12.8	Slovakia	2.3	5.6	10.6
Germany	4.2	6.3	11.3	Slovenia	2.9	3.5	8.0
Greece	3.3	7.8	14.1	Spain	4.2	6.0	10.3
Hungary	3.2	4.5	8.2	Sweden	5.3	6.3	8.9
Ireland	2.6	5.4	8.3	United Kingdom	4.3	5.7	10.2

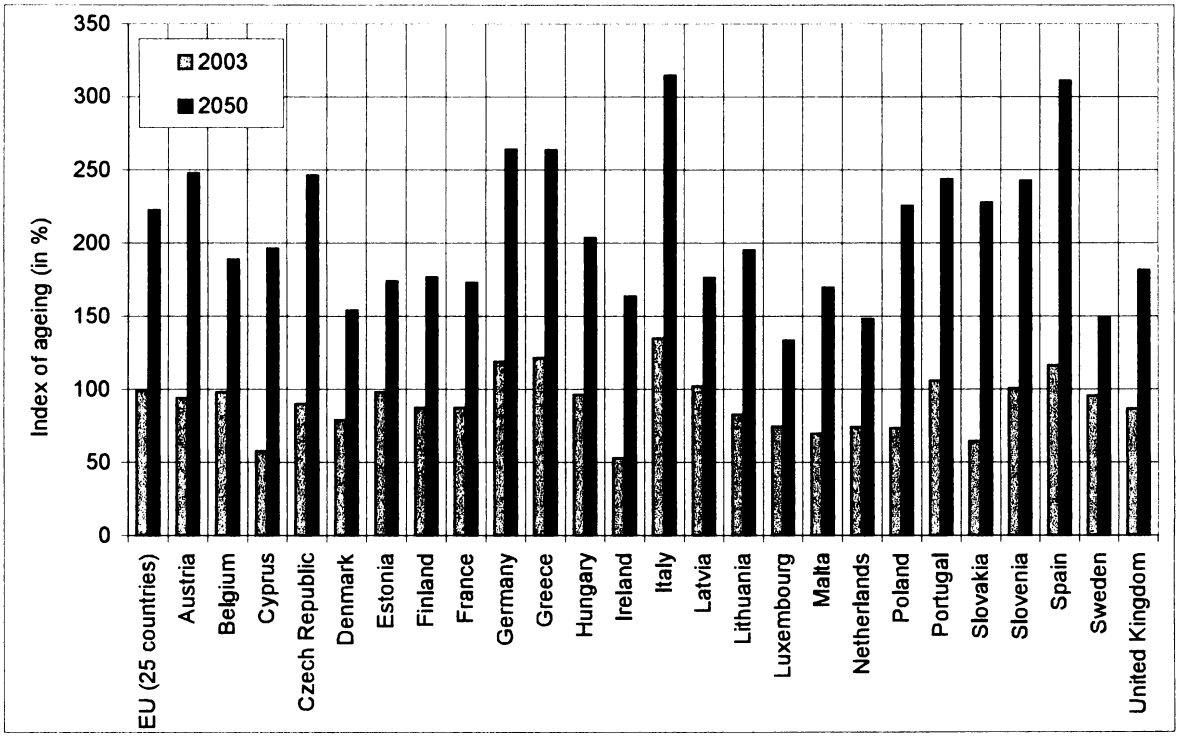
Source: own calculation based on the Eurostat database

Table 9.5: The dependency ratios, baseline projection variant, EU25 member states, 2004, 2025, 2050

Unit	young-age dependency ratio			old-age dependency ratio			age dependency ratio		
	2004	2025	2050	2004	2025	2050	2004	2025	2050
EU (25 countries)	24.4	22.9	23.7	24.5	35.7	52.8	48.9	58.7	76.5
Austria	24.0	25.2	25.4	22.8	36.5	48.1	46.8	61.7	73.5
Belgium	26.4	21.1	22.2	26.1	35.0	54.8	52.5	56.1	77.1
Cyprus	29.4	25.3	26.0	17.5	33.8	40.0	46.9	59.1	66.0
Czech Republic	21.5	20.7	21.1	19.7	39.3	55.8	41.2	60.0	76.9
Denmark	28.5	25.3	24.8	22.5	31.3	43.1	51.0	56.6	67.9
Estonia	24.5	27.9	27.7	23.5	25.2	45.3	48.0	53.0	73.0
Finland	26.4	20.9	22.3	23.3	35.5	58.8	49.7	56.4	81.1
France	28.5	19.7	21.7	25.2	33.6	67.5	53.7	53.3	89.2
Germany	21.9	27.4	27.7	26.8	36.9	47.9	48.7	64.3	75.6
Greece	21.6	19.3	21.0	25.8	39.7	66.0	47.4	59.0	86.9
Hungary	23.1	24.0	22.0	22.6	29.3	43.2	45.7	53.3	65.2
Ireland	30.7	25.2	25.0	16.4	30.7	44.1	47.1	55.9	69.1
Italy	21.3	23.1	23.0	28.9	29.2	44.9	50.2	52.2	67.8
Latvia	22.5	26.4	27.1	23.6	27.7	36.1	46.1	54.1	63.3
Lithuania	26.2	22.4	23.7	22.3	34.5	48.3	48.6	56.9	72.0
Luxembourg	28.0	24.7	23.9	21.0	33.8	40.6	49.0	58.4	64.6
Malta	26.5	25.4	26.1	19.0	32.5	38.6	45.5	57.9	64.7
Netherlands	27.4	21.5	21.5	20.5	34.5	53.2	47.9	56.0	74.6
Poland	24.7	22.6	22.6	18.6	32.8	51.0	43.3	55.4	73.5
Portugal	23.3	22.3	23.8	24.9	34.7	58.1	48.3	57.0	81.9
Slovakia	24.8	21.1	22.9	16.3	35.8	55.6	41.0	56.9	78.5
Slovenia	20.8	20.9	22.2	21.4	28.1	50.6	42.1	49.0	72.9
Spain	21.1	27.0	26.4	24.5	41.4	46.7	45.6	68.3	73.1
Sweden	27.4	28.2	27.5	26.4	36.5	40.9	53.8	64.6	68.4
United Kingdom	27.8	25.5	25.0	24.3	33.2	45.3	52.1	58.7	70.3

Source: own calculation based on the Eurostat database

Figure 9.2: Index of ageing (in %), baseline projection variant, EU25 member states, 2003, 2050



Source: own calculation based on the Eurostat database