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DEMOGRAPHIC ASPECTS OF AGEING AND TIME USE IN A SET OF EUROPEAN COUNTRIES

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ABSTRACT: This study examines demographic aspects of ageing in ten European countries (Austria, Czech Republic, Finland, France, Germany, Italy, Norway, Poland, Switzerland, United Kingdom) and time use in seven countries (Belgium, Denmark, Finland, Germany, Netherlands, Portugal, United Kingdom). In the whole Europe, the total working age population begins to decline after 2010. Ageing accelerates and by 2040 there will be almost equal number of individuals over 59 years compared to active people at age 20-59. The number of oldest old of age 75+ will be close to the number of children (under 15 years). The trend is that by 2050 over 30% of persons over 60 will be over 80 years, which is a dramatic change from the current level of around 10%. The variation in population growth prospects and ageing is noticeable. The biggest expected decrease in population size takes place in Germany, Finland and Italy. The increase in the proportion of middle-aged and elderly persons is most striking in Germany, Italy, Switzerland and Finland. The deepness of ageing problem in Germany explains why the largest countries UK, France and Germany are expected to be of the same size, around 66-73 million people, by 2050. Some countries like Norway and the UK are instead expected to steadily increase in population size. As the older age cohorts are healthier than before with an increase in life expectancy, active non-work time use is likely to be more important than before; also as an important determinant of early retirement. Active ageing policies towards wider participation in working life but also with an appropriate valuation of non-work time such as household work are important.

JEL-codes: J26, J14, J22, J11

Keywords: Ageing, Retirement, Demographic Change

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TIIVISTELMÄ: Tämä tutkimus tarkastelee ikääntymistä kymmenessä eurooppalaisessa maassa (Itävalta, Tsekin tasavalta, Suomi, Ranska, Saksa, Italia, Norja, Puola, Sveitsi, Iso-Britannia) ja ajankäyttöä seitsemässä maassa (Belgia, Tanska, Suomi, Saksa, Hollanti, Portugali, Iso-Britannia). Euroopassa työikäinen väestö alkaa vähentyä vuoden 2010 jälkeen. Ikääntyminen kiihtyy ja vuoteen 2040 mennessä 60-vuotiaita ja sitä vanhempia on melkein yhtä paljon kuin aktiivisessa iässä olevia eli 25-59-vuotiaita. 75-vuotiaita ja sitä vanhempia on lähes yhtä paljon kuin alle 15-vuotiaita. Suuntana on, että vuoteen 2050 mennessä yli 30 prosenttia yli 60 vuotiaista on yli 80-vuotiaita. Tässä on suuri muutos nykyiseen osuuteen, joka on 10 prosenttia. Väestöennusteet vaihtelevat kuitenkin suuresti maittain. Suuri odotettavissa oleva väestön määrän väheneminen tapahtuu Saksassa, Suomessa ja Italiassa. Keski-ikäisten ja vanhemman väestön osuuden suurin kasvu tapahtuu Saksassa, Italiassa, Sveitsissä ja Suomessa. Väestön ikääntymisen jyrkkyys Saksassa selittää sen miksi väestön määrä ei suuresti eroa vuoteen 2050 mennessä Iso-Britanniassa, Ranskassa ja Saksassa ollen noin 66-73 miljoonaa. Eräissä maissa kuten Norjassa ja Iso-Britanniassa väestö jopa kasvaa. Kun vanhemmat ikäryhmät ovat terveempiä kuin ennen ja eliniän odote kasvaa, aktiivinen ajankäyttö myös työajan ulkopuolella kasvaa merkitykseltään myös eläkepäätöksessä. Aktiivisen ikääntymisen ohjelmien on tähdättävä paitsi suureen työhön osallistumisasteeseen myös kotityön ja vapaa-ajan oikeaan arvottamiseen.

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1. Introduction

In the next fifteen years the European population will enter into a new phase of population ageing characterized by a decrease in the size of the youth and the working age populations. Up till now ageing has mainly lead to an increase of average age in the working age population. Increasing share of population will leave labour force in the immediate future. Low fertility rates maintain high uncertainty over population forecasts in the future. However, the relative share of broad age groups from 20-30 years onwards are still rather predictable.

The three important demographic-related changes are (i) the retirement of baby-boom generation, (ii) longer life expectancy and (iii) low birth rate. *Baby-boom generations* are different in southern part of Europe (Spain, Italy), where fertility was highest in early 70s and in northern Europe, where the largest baby-boom cohorts occurred in the immediate post-war period. These variations lead to different period when the share of working age population starts to decline.

Life expectancy has been increasing throughout the 20th century first of all due to cures found for infectious diseases. Elderly experience greater income security than before and population over 75 years can stay relatively healthy for a longer period. This makes active ageing an important issue. Some studies using time-use studies claim that passive time use and home-centred leisure activities predominate among the elderly. Avramov and Maskova (2003) using Multinational Time Use Study (MTUS) database show that among economically inactive people aged 55 to 59 sleep, personal care and leisure take up much of the day. In Poland and in the Czech Republic economically inactive men spend as many as 19 hours each day on self-care, while inactive women spend 15 hours a day sleeping, taking care of themselves and 'leisuring'. Piekkola and Harmoinen (2003), on the other hand, show that active non-work time use is an important determinant of early retirement. Especially the inclusion of domestic work in incentive calculations makes retiring more attractive. In fact, replacement rates are close to or greater than 100% when domestic work is accounted for. For men, the increase in domestic work after withdrawal from the labour market is larger in relative terms (doubles on average), and the effect of accounting for domestic work on the financial incentive to retire is greater for them. This can be explained by the gender specialisation of work and women's continuity of lifetime patterns: Men supply more paid work before retirement while women specialise in domestic work.

Fertility rates differ from a low level in Czech Republic, 1.2, and Germany, 1.3, up to 1.9 in Norway. This study relies mainly on demographic projections of Central Statistical Offices that may differ largely depending on what happens in fertility in the future. Countries with relatively high fertility are more inclined to use estimates with constant fertility. Central European countries follow more easily U.N. forecast, where countries are assumed to move towards a value guaranteeing population replacement (approximately 2.07, United Nations, 2001, p. 589). In countries with high fertility rate U.N. estimates even assumes the fertility first to decline, which is also another way to make the demographic projections more similar. It is indeed true that any demographic projections from 2030 onwards are uncertain. The accuracy is much better within the coming thirty years.

Demographic description uses data from the AGIR project of ENEPRI (www.enepri.org) amended by data from Norway, Austria, Czech Republic and Poland. We thank Jorgen Mortensen, AGIR project manager, for making these data available to us.[1] We also like to

[1] The AGIR project – acronym of ageing, health and retirement in Europe – is a research program of the European Commission with 8 participating institutes from 7 countries: Belgium, Finland, France, Germany, Italy, Netherlands, Spain and United Kingdom. The aim is to study the pressures for active ageing policies, also with regard to the intentions to postpone retirement age.

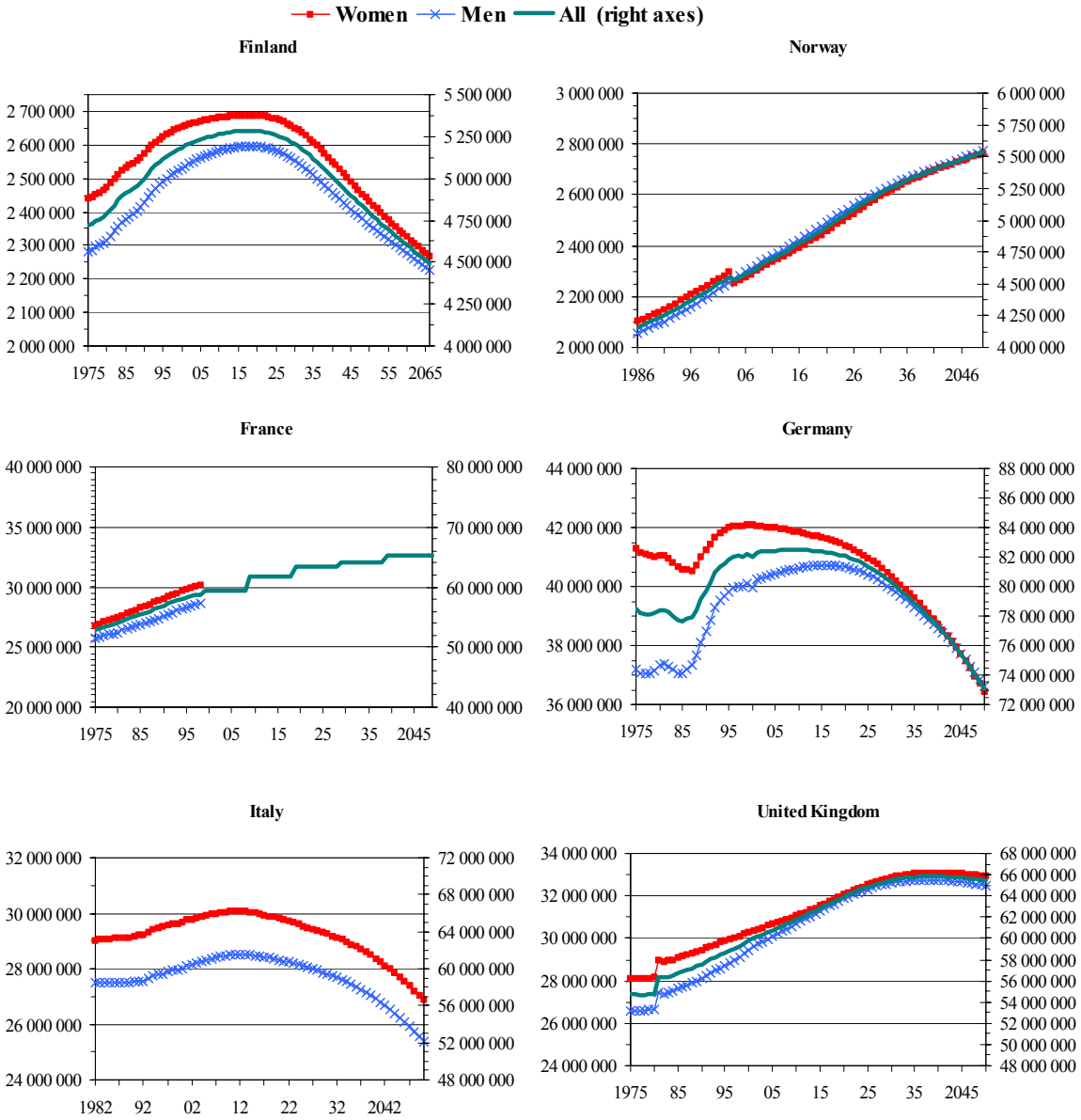
thank Julie Mestdagh and Micheline Lambrect from Federal Planning Bureau of Belgium of their analysis of ageing problem in Belgium, which has helped immensely the analysis here. The output of this description will be used as background information in cross-country comparisons in ActivAge project regarding the active ageing issues in labour market, retirement and health care.

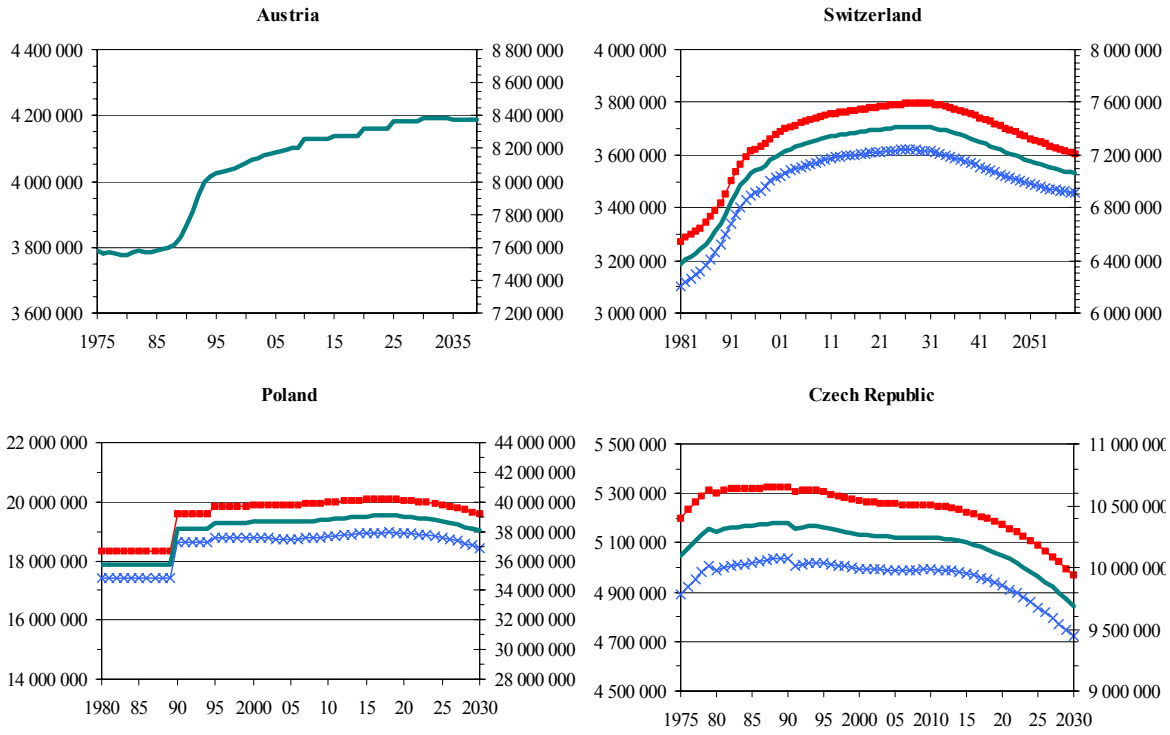
Particular attention here is given to the analysis of demographic projection of individual countries and demographic dependency ratios. Section 2 describes first population prospects. Subsequently ageing of the population is studied. This includes changes in the proportion of inactive population (currently over 60 years of age) and the intensity of ageing. Section 3 shows the changes in life expectancy in past decades. Section 4 considers active time use of older workers, which is very important when economic costs of ageing are assessed. Section 5 concludes.

2. Population Prospects

The first section describes the prospects in the population, life expectancy and birth. Figure 1 shows the prospects of the evolution of the population, total and by gender, from 1975 up to 2065 in ten countries participating in ActivAge project (Polish data has a discontinuity at 2000).

Figure 1. Population and Population Forecast





It is seen that in general the total working age population begins to decline after 2010. According to Kotowska (2003) in western countries the population stays at the level of 260 million in the years 2000-2010 and declines by 4 million thereafter in 2010-2015. In transition countries after the slight increase (by around 1%) labour supply is supposed to drop by 2.3 million (by 3.2%) in 2010-2015.

In fifty years the differences in fertility rates even with the expected increase in fertility have important effects on population size. Both UK and France are expected to be of a size 65-66 million people by 2050 with a current similar fertility rate of around 1.7. These figures are not far from the expected population of Germany in 2050, 73 million people, where the fertility rate, 1.3, is second lowest in the countries considered (In Italy fertility rate is 1.2).[2] These differences in population prospects must have big influence on the acuteness of ageing problem. It is seen that Norway and the UK have demographic projections that show an increase in population size throughout the period. Norway has the highest fertility rate 1.9 in the countries considered. It is seen that the population has grown quite rapidly in Poland to the current level 38.6 million (data before 2000 is obtainable only for certain years 1980, 1990, 1995). The population size is expected to remain about the same in 2030 despite the low fertility rate 1.5. Poland appears to be a real impetus to the working age population in EU area.

UN assumptions in official estimates with an increase in fertility rate and migration also lead to more positive outcomes in Central Europe like in Austria (fertility rate 1.4) and Czech Republic (fertility rate 1.2). In many countries like in Belgium and to some extent in France nearly 10 percent of the population would consist of new immigrants by 2050. In Germany, assumptions regarding immigration are more modest. The population is expected to reach a peak 84 million around 2005 after which declining to 72 million by 2050.

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[2] In Germany, demographic forecast is from DIW in 1999 and close to estimates by Eurostat. The new demographic projections by DIW made in 2003 are somewhat more optimistic with population of 77.5 million instead of 72 million by 2050.

The decrease in population is 17%, as compared to 8% in Finland and 10% in Italy. It is no wonder if Germany is going to or should take the most austere measure to finance the future increase in pension expenditures. Italy faces the challenges of ageing somewhat later, but the decline in population will be much more dramatic after 2040.

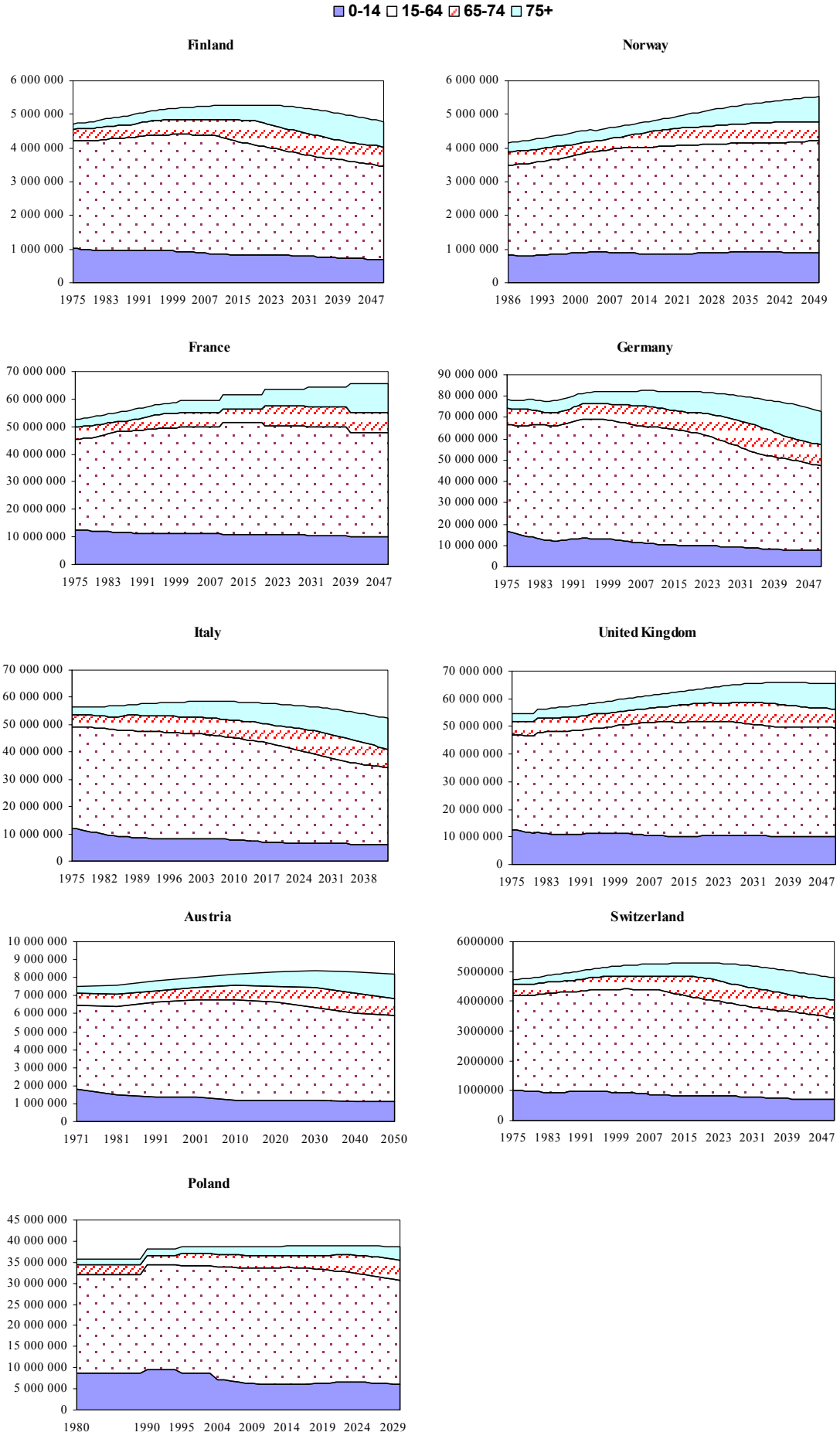
Finland can also be considered as a good example of a country with an ageing problem. Population in Finland has grown from 4.0 million in 1950 to 4.7 million in 1975. Current population in 2001 is 5.2 million of which 2.5 million are men and 2.7 million are women. Statistics Finland has made population projections up to 2050 but this analysis uses calculations by Juha Alho from University of Joensuu which are closely similar (Alho 2002). In Alho's estimations fertility is expected to remain about the current level 1.7, which deviates from UN estimates where the low fertility rates in European Union are expected to increase over time closer to the constant population fertility rate 2.1. Immigration is first expected to stay at the current level of 4,000 per year and then decelerating so that the net effect in 50 years will be 70,000 immigrants. Life expectancy is assumed to increase over the years, though to a lesser extent than in the past decade. It is seen that population reaches the peak value 5.3 million in 2010s after which population starts to recede to 4.8 million in 2050 and to 4.5 million in 2065. With fertility below 2 the population continues to decrease. The low level of migration and no rise in fertility are crucial in this population prospect. While fertility is only to some extent higher in Norway, the assumed continuing higher level of the number of immigrants ensures that population grows over time.

The overall picture of demographic projections is that country variation in expected population prospect is large. Finland and Germany have probably the most realistic/pessimistic assumptions regarding future fertility rates and this is also shown in population prospects. Some countries like France expect to experience an increase in fertility rates upwards from the current reasonable level of 1.7, thus the projections are much more optimistic. Finally, it is seen that the male and female populations have developed in roughly a similar way. The differences between the size of men and women population will narrow over time in Finland, Germany and the UK. In many other countries, men do not instead seem to be catching up in life expectancy as compared with women.

2.1 Ageing

Population prospects including age structure can be assessed relatively safely up to 20-30 years from now. In many other countries, especially in Southern Europe, the peak in fertility rate took place in 1960s, while in Finland the baby boom generation is born after the war in 1945-59. The baby-boom generation is often considered to be 1945-49, but currently the size of the following cohort 1950-54 is larger. Higher mortality and emigration to Sweden explains this. Following demographic projections show prospects of population age structure until 2030 or 2065.

Figure 2. Demographic Projections by Age Structure



According to Kotowska (2003), within 30-year period the labour supply will decline by nearly 40.9 millions i.e. by 12% in reference to 2000. A similar loss or even greater is expected to take place between 2030 and 2050. It is seen that the decrease in the relative size of age cohort 15-64 is most prominent in Germany, Italy, Finland and Switzerland. The Polish age structure has very low size of working age population already (recall that the data has discontinuity at year 2000).

In all countries it is expected that the size of age cohort 75+ is close to the number of children (under 15 years) by 2050. The increase in the proportion of middle-aged and elderly persons is most striking in Germany and Finland, while the share of older workers is expected to stay constant in Poland. In Finland and Germany the increase in the share of older individuals is mainly been caused by ageing of the largest cohorts (for Finland those born in 1946–1949) and by an increase in the average length of life. The population is in these countries ageing faster than in most of the other OECD countries. Currently in Finland, there are more than four persons of working age per one with an old age pension, but until the year 2035 this old-age dependency ratio will no longer be more than two per one. Similar development of dependency ratio takes place on average 15 years later in the rest of Europe (see the discussion on old-age dependency ratio below).

Indexes for Ageing

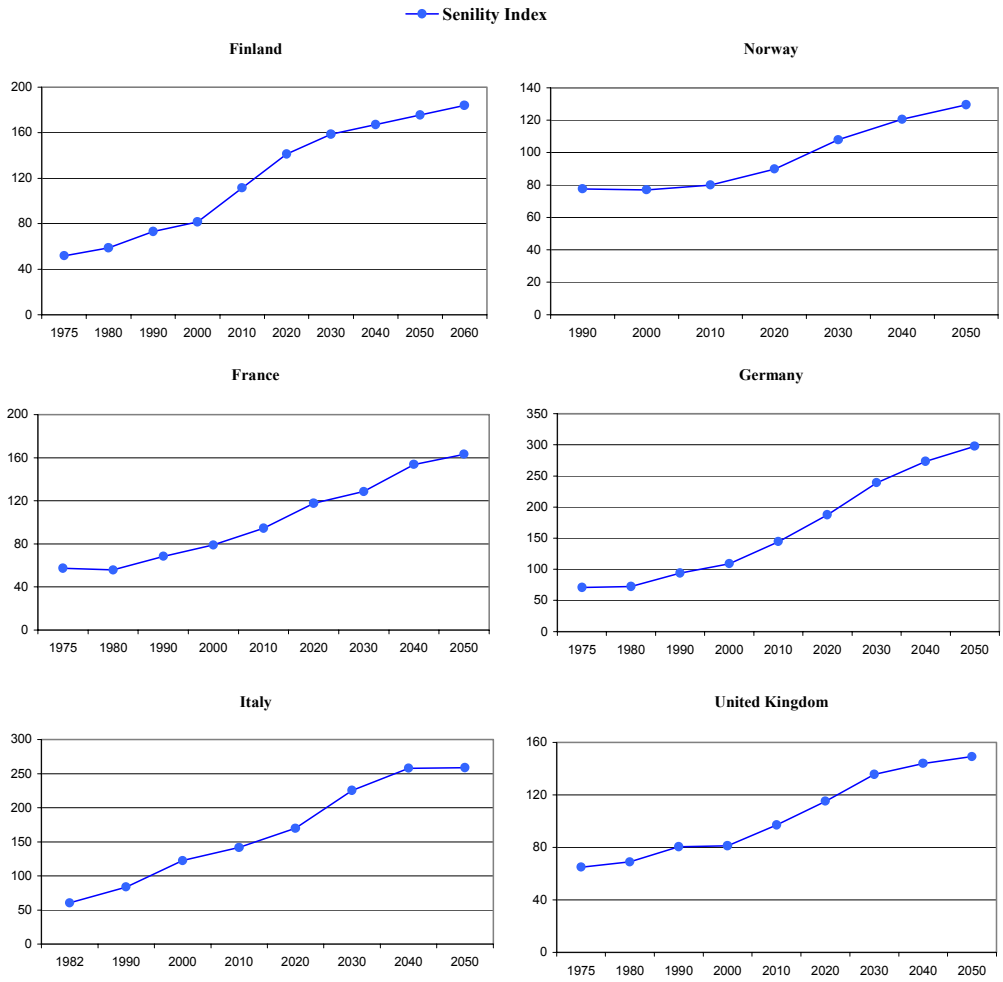
The most frequently cited summary statistics regarding these (projected) demographic changes are the senility index, the so-called 'dependency ratios' and the intensity of ageing. These measures also give us an idea of the extent to which the population is ageing. The first measure is the *senility index*. This is the proportion of people older than 60 in relation to the population of people younger than 20.

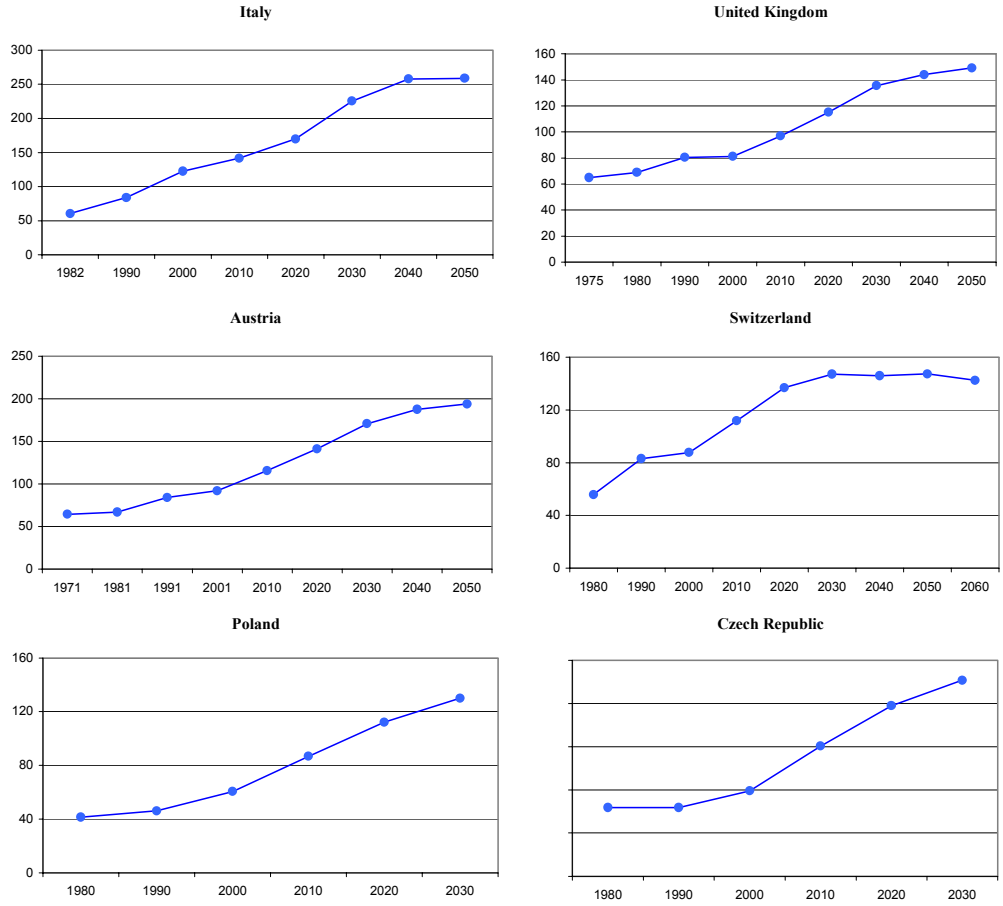
$$Senility\ index = \frac{pop \geq 60}{pop < 20} * 100$$

This index takes into account the population ageing as well as the drop in fertility. By doing so, it estimates 'demographic replacement'. Figure 3 shows the evolution of the senility index.

The rise in senility index is most severe in Germany, Italy and Austria. This is a direct consequence of the low fertility (around 1.2-1.3) and the rise in life expectancy (despite the adjustment of fertility upwards in coming years). In Germany, the senility index was 72.4% in 1975: for every person older than 60, there were approximately 1.4 people younger than 20. By 2000, this figure had risen to 109% and by 2050 the index would rise up to 297%. For every older person, 0.9 younger people could be found in 2000 and 0.3 in 2050.

Figure 3. Senility Index





The dependency ratio, working age population in relation to total population, predicts reasonably well the prospects of social expenditures. Another dependency measure is the *old – age dependency ratio*. This is the number of people older than 60 relative to the number of people between 20 and 59. In other words, it tells us how many active people support non-active elderly people, or indicates the dependency burden on workers. Since the actual retirement age is currently around 60 years, the active people are considered to be between 20 and 59 years old. A ratio < 100 means that there is more than 1 active person for every older person. A ratio > 100 means there is more than one elderly person for every active person.

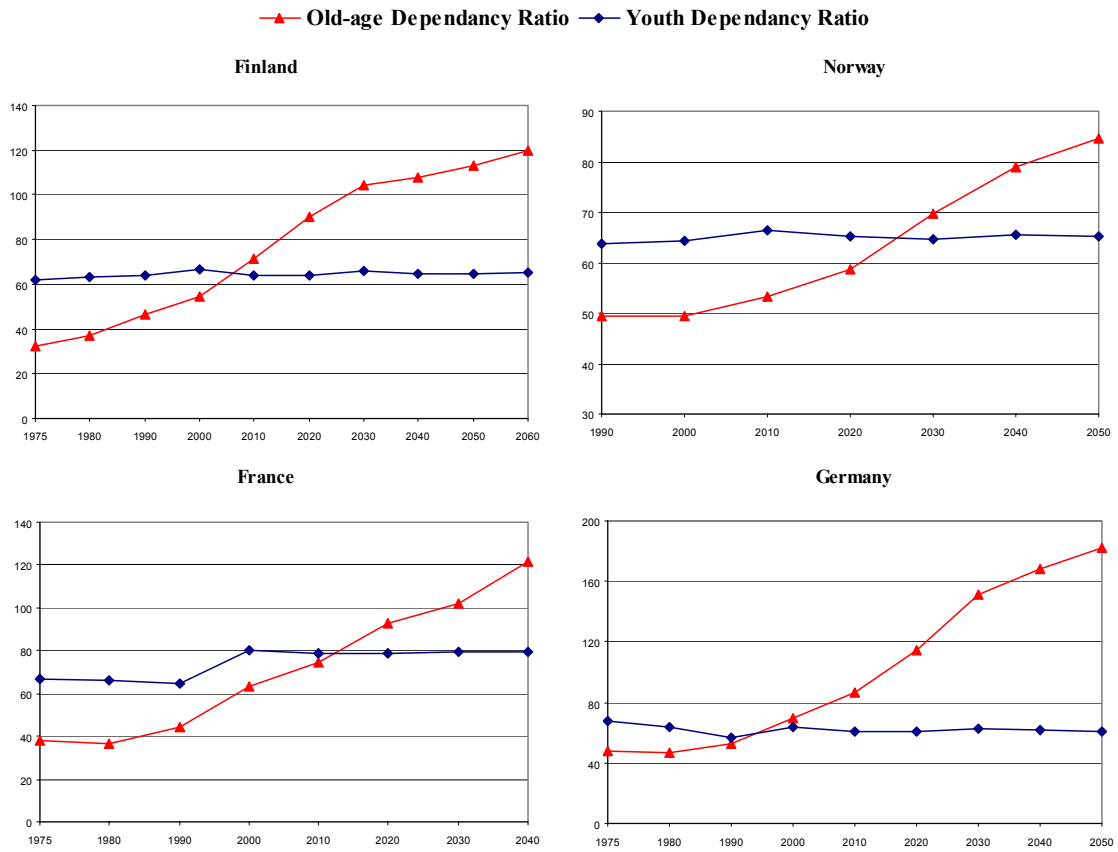
$$Old\ age\ dependency\ ratio = \frac{pop \geq 60}{pop\ 20-59} * 100$$

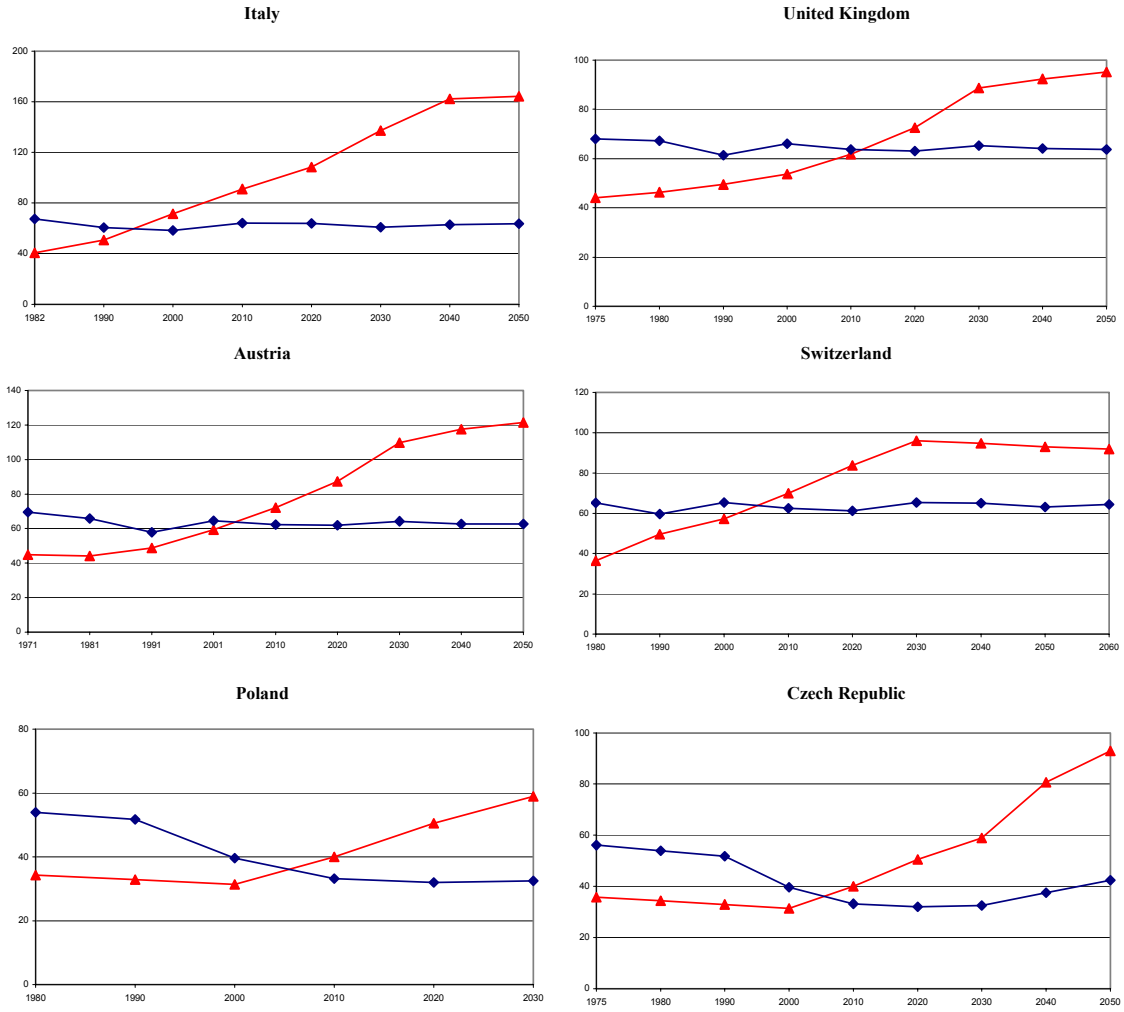
Similarly, we have calculated the *youth-dependency ratio* as the ratio of the number of people in the population younger than 20 relative to the working age population (19-60). A ratio < 100 means that there is more than 1 active person for every younger, dependent person. A ratio > 100 indicates there is more than one younger, dependent person for every active person.

$$Youth\ dependency\ ratio = \frac{pop \leq 19}{pop\ 20-59} * 100$$

Figure 4 shows the old age and youth dependency ratio of the population.

Figure 4. Old Age Dependency Ratio and Youth Dependency Ratio, 1975-2060





The share of the labour force (aged 25 - 59 years) will be reduced in future during the latter half of the current decade (in thousands 130 in Finland, 2,320 in Germany, 3,4 in the UK, 358 in Italy), while the number of those aged 50 - 60 will grow (in thousands by 17 in Finland, 1,823 in Germany, 4,6 in the UK, 390 in Italy). The employment rate of ageing persons is low, and these people are both willing and often advised to retire. Thus, the ageing of the working age population is striking in all countries, although the pace of change differs. Germany will already experience relatively the biggest change in the age structure of the workforce in the near future. Germany will also reach the old-age dependency ratio (ODR) of 151 by 2030 implying one active person per every two older persons. In almost all countries by 2050 there will be more individuals at age 60+ than at age 20-59. Norway, Poland and the UK appear to be the only countries where there will be more working people than inactive by 2050.

In 1975, the youth dependency ratio (YDR) was 62 in Finland, 68 in Germany and in 1980 67.4 in Italy and 63.7 in Poland. This means that for every younger person there were approximately 1.6 active people to support him. The YDR has been very stable and expected to be that way until 2060. YDR stabilizes to around 60. In many countries this requires an increase in fertility from the current low level. The evolution of both indicators tells us something about how the dependency shifts from children to older persons during demographic transition. In the near future before or around 2010, the ODR is expected to exceed the YDR. Workers will now have to support more old people and fewer

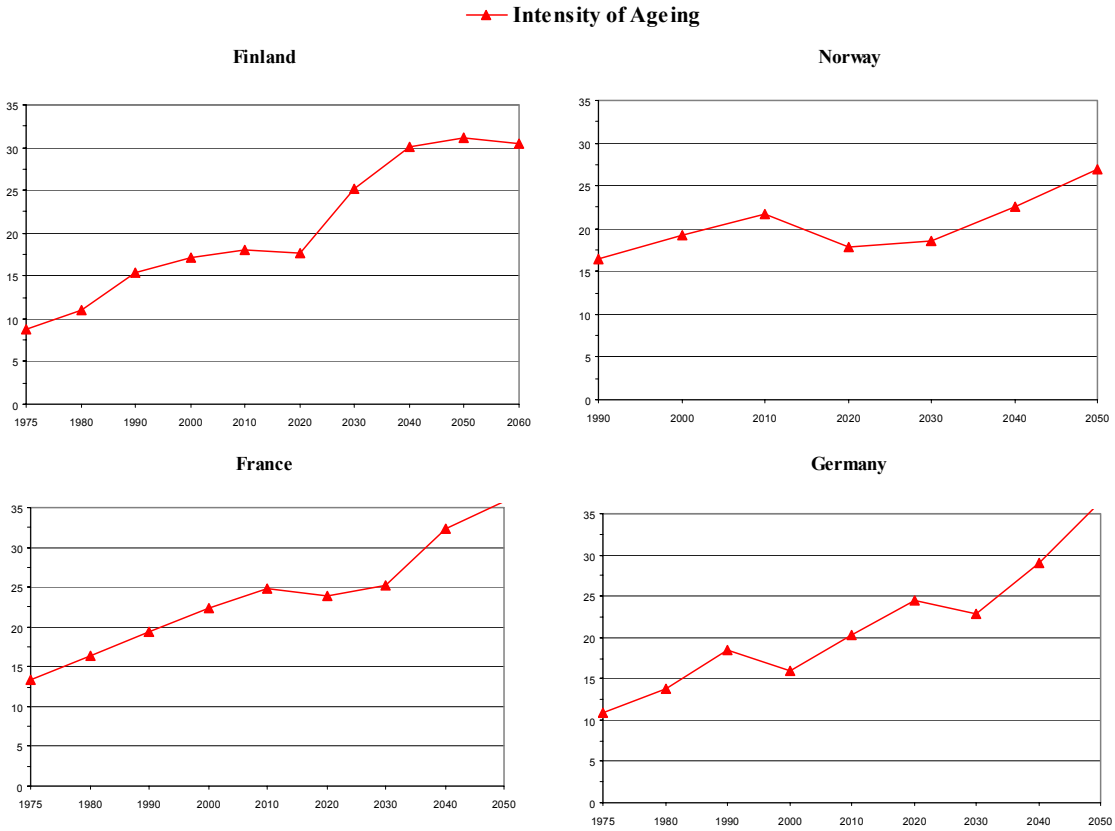
young people. The ODR is expected to increase, while YDR remains fairly stable around 60.

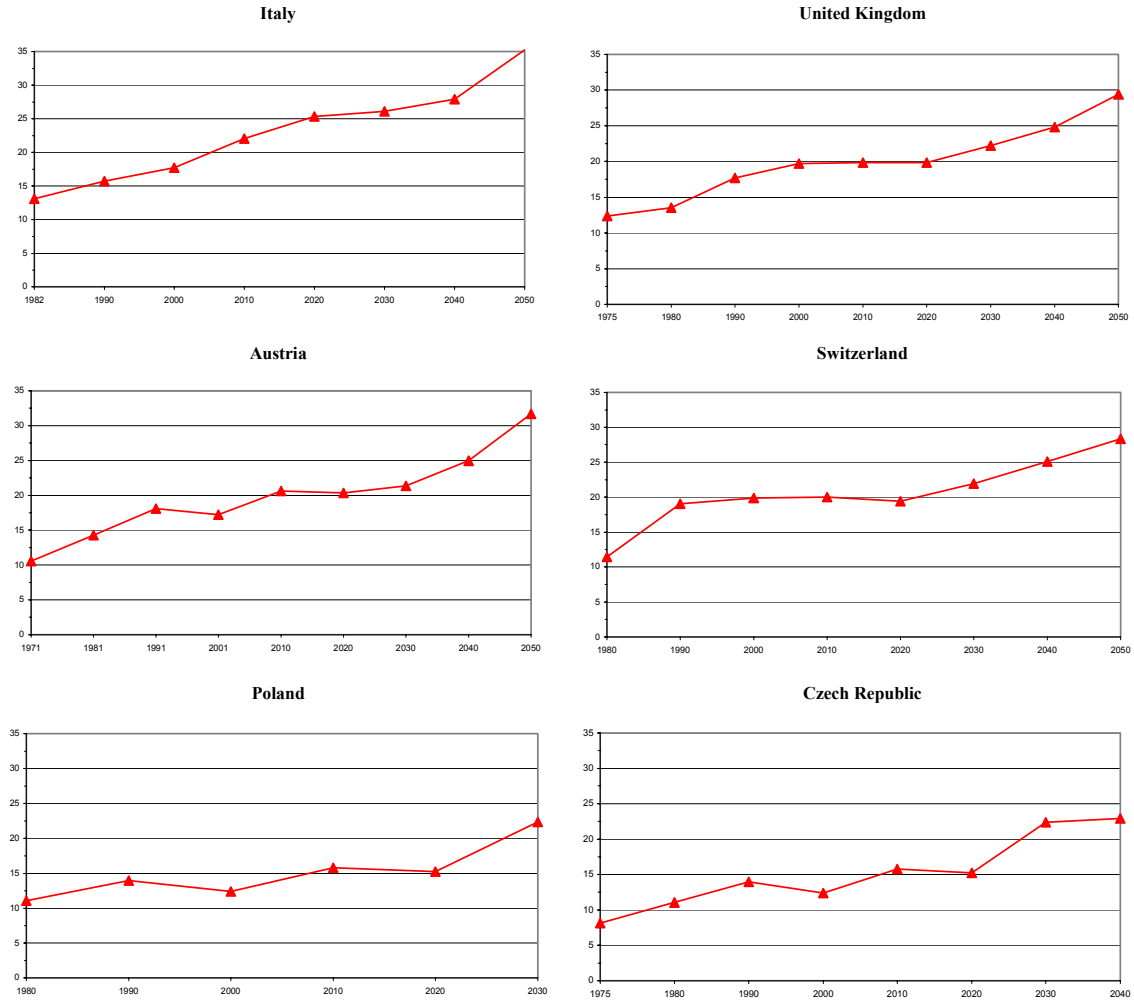
The ageing process, especially in Finland and Germany, will lead to a rise in pension expenditures from 2010 onwards. This will be followed by a rise in social and health care expenditures in 2020-30s. In many other European countries the rise in expenditures will occur some 10 years later. The rise in pension expenditures in all countries is also explained by the rising share of population with a past working career and a large coverage of pensioners entitled to full pensions in the system introduced 40 years ago. An higher share of 65-year-old persons is entitled to the maximal pension level (in Finland 60 percent of earnings in the old system and no limit in the new system effective in 2005).Finally, we study the *intensity of ageing*. This is the proportion of the population older than 80 in relation to the population older than 60, also called the "oldest old".

$$Intensity\ of\ Ageing = \frac{pop \geq 80}{pop \geq 60} * 100$$

Figure 5 shows the intensity of ageing from 1950–2050.

Figure 5. Intensity of Ageing





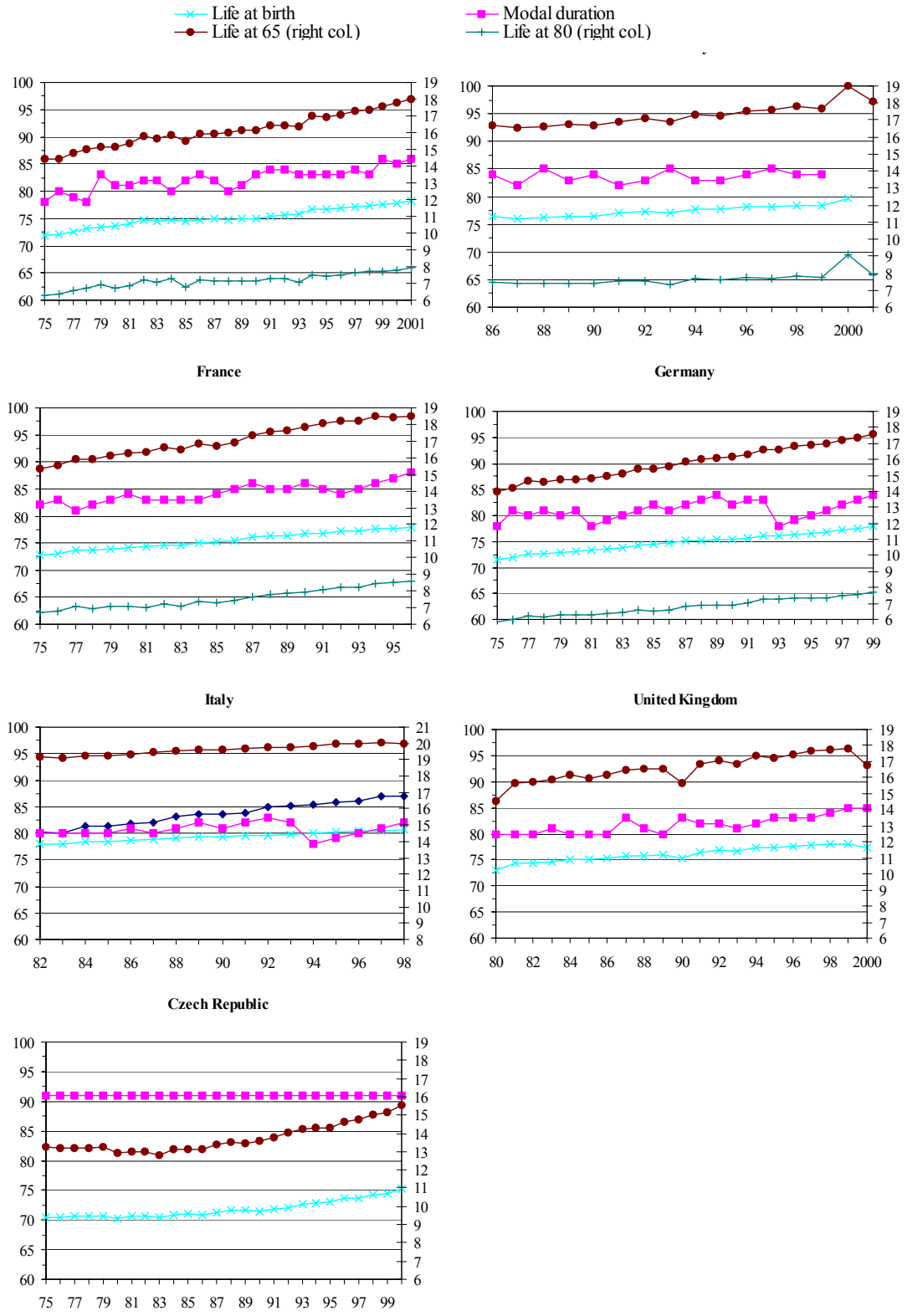
This intensity of ageing has increased over the years, but the most rapid change will take place in the future. The increase in life expectancy is fairly uniform in all the countries, which also explain that the figures are fairly similar across countries. The trend is that over 30% of elder persons over 60 will be over 80 years, which is a dramatic change from the current level of around 10%. In Finland the baby-boom generation reaches the age of 80 by 2020, leading to clear-cut increase in the share of over 80 years old. In Norway, the baby-boom generation was smaller in size and the more favourable demographic projections will keep the figures below 25% until 2050.

The senility index, the dependency ratios and the intensity of ageing yield the same result as before: the population is getting older at fast rate. For every young person, there are more people older than 60 now than there were some 50 years ago, and are fewer active people supporting non-active people. The old-age dependency ratios close to 100 and above will certainly create immense burden for the future finance. Also, the proportion of people older than 80 in the population older than 60 rises to one third, which indicates a high intensity of ageing.

3. Life Expectancy

People live longer and are healthier. Life expectancy of new born increased from 69.8 years to 77.4 years in 1970-1999. Following table shows various measures of life expectancy in 1975-2001.

Figure 6. Life Expectancy, Modal duration and Life Endurance, 1975-2001



Between 1975 and 2001 life expectancy has increased. In Finland, the increase is 6 years at birth to 78.2, 3.5 years at age 65 to 86.3 and 1.5 years to 88.3 at age 80. In Norway, the increase is 11.2 years at birth to 78.9, 4.8 years at age 65 to 83.1 and 2.5 years to 89.1 at age 80. In Germany, between 1975 and 1999 the increase is 6.4 years at birth to 77.8, 4.5 years at age 65 to 86.3 and 2 years to 87.7 at age 80. In France, between 1975 and 1997 the increase is 5.5 years at birth to 78.4, 3.3 years at age 65 to 83.7 and 1.9 years to 88.7 at age 80. In Italy, between 1982 and 1998 the increase is 5.2 years at birth to 80.3, 4 years at age 65 to 84.7 and 4.5 years to 88.5 at the age of 80. It appears that as one moves towards the south the relative increase in life expectancy at the very end of life-time increases. In Finland the increase is 1.5 years but in Italy 4.5 years at the age of 80.

Figure 6 shows that the pace of an increase in life expectancy has not decreased since 1990 and is likely to have accelerated in transition countries. The Czech Republic is the leader by an increase of 3.6 years in life expectancy between 1990 and 2000 (4.2 years for males and 3.2 year for females). In general, the increase is in the range between 1.3 (Greece) and 3.3 years (former GDR) for females (except for the Netherlands – the rise is only by 0.5 year) and between 1.7 (Belgium, the Netherlands) and 3.2 (Finland, former GDR) for males (except for Greece – the rise is only by 0.8 year). Only in Greece, Portugal and Spain the female life expectancy increase is higher than for males. In transition countries persons aged 65 years are also generally supposed to live longer in 2000. In Kotowska (2003), the Czech Republic is again the leader by 1,9 years (2.1 years for males and 1.8 year for females) followed by Poland (1.2 and 1.3 respectively) and Slovenia (0.8 and 1.6 respectively). It thus appears that the life expectancies become more similar across countries.

Modal duration shows the age at which the greatest number of persons dies. This can have significance for health costs, as large share of expenditures occur at the last three years of life. In Finland modal age is now 3-4 years later than in 1975, being at age 82 for men and 86 for women. In Italy the change is more modest around 2 years and typically death occurs at 82 years of age. We can see that although life expectancy at old age has increased the most in southern part of Europe, the modal year for death has shifted relatively less than in Northern countries.

4. Time Use

In active ageing it is not only the age but also the use of time to active and non-active purposes that counts. Labour force participation is considered in several studies, but we restrict here to analyse the time use by employment status. In study by Eurostat (2003) the average daily time used for paid work/study of working age population varies between 6 and 7 hours in the 13 European countries considered. The paid work takes longest hours in transition countries such as Hungary and Slovenia. Piekkola and Harmoinen (2003) have analysed time of older workers at age 45-64 potentially at use in labour force. Unfortunately, there is no relatively new time use data available in many of the countries considered here. We thus also show time use in Portugal (instead of Italy) and from Belgium (instead of France) in order to have some idea of allocation of time in respective regions.

Active and productive time use can be thought as the weekly hours dedicated to earning incomes and to household production. Piekkola and Harmoinen (2003) use original time use surveys used to construct the Multinational Time Use Study (MTUS) database, since in MTUS the age limit was set at 60 years (see Gauthier et al. 2002). The data have been gathered by administering time use diary surveys and linking the results to background information on the respondents. They utilise complete data from five countries (Denmark 1987 survey, Finland 2000, Germany 1991, the Netherlands 1995, and the UK 1999), and cross tabulations by employment status, gender, and time use categories from different sources in Belgium and Portugal. Table 1 presents the weekly hours of paid work and total work (paid + domestic) based on the time use data.

Table 1. Total Work by Gender, Employment Status and Health, 45-64 year-olds (hours per week).

	Paid work		Total work			
	Employed		Employed		Non-employed	
	Male	Female	Male	Female	Male	Female
Belgium	35.4	30.0	42.9	41.3	23.3	37.6
Denmark	35.4	29.1	46.4	44.9	23.1	25.0
Finland	38.5	30.0	54.8	56.8	26.5	38.5
Germany	27.8	21.4	44.5	45.0	31.9	39.0
Netherlands	42.1	25.5	53.6	51.5	26.8	36.2
Portugal	44.9	35.8	51.2	63.5	14.9	41.8
United Kingdom	46.9	35.4	60.7	57.5	30.4	34.0
Average	38.7	29.6	50.6	51.5	25.3	36.0

It appears as if the total time spent on both earned income and household work is relatively the same for both genders so that concentration on paid work alone does not give a sufficient clear picture of the active use of time. Among the employed, men supply on average 9.1 hours more paid work a week than women do. Total work hours, however, are very close to being equal among the employed men and women, women supplying 0.9 hours more total work. This lends strong support to the gender division of work. In a Eurostat (2003, p. 5) comparison of time use in 13 countries, the paid work hours of men are also longer while women supply more domestic work. Eurostat (2003) finds that among the employed, women supply more total work than men in several countries. In older age cohorts there is no gender difference. One reason is that children are grown up and do not require the same amount of household work for women. Instead, there are differences across the countries in total work times: Belgium, Germany and Denmark have the shortest weekly total work hours for the employed, while the British supply the most total work

among men and the Portuguese among women. It also appear from the study by Eurostat (2003) that in transition countries such as Estonia, Hungary and Slovenia total work time is around 7 hours more per week than in other Europe. Table 2 shows the amount of domestic work.

Table 2. Domestic work by employment status and gender and female share of domestic work by employment status

	Employed		Non-employed		Female share	
	Male	**Female**	**Male**	**Female**	**Employed**	**Non-employed**
Belgium	7.5	11.3	23.3	37.6	0.60	0.62
Denmark	11.0	15.8	19.1	23.0	0.59	0.55
Finland	16.4	26.8	25.6	38.0	0.62	0.60
Germany	16.7	23.6	22.7	26.4	0.59	0.54
Netherlands	11.5	26.0	26.1	35.7	0.69	0.58
Portugal	6.3	27.7	14.9	41.8	0.81	0.74
United Kingdom	13.8	22.1	27.0	31.7	0.61	0.54
Average	11.9	21.9	22.7	33.5	0.65	0.59

It is seen that on average and in almost all countries, men supply 10 hours less domestic work a week than women do. For the employed, the domestic work hours are short for men in Belgium and Portugal, and long for Finnish and German men. Portuguese women perform the most domestic work, and domestic work hours are also long for Dutch women. Belgium and Denmark show the shortest domestic work hours for employed women. A similar pattern is seen among the non-employed, but the differences between countries as well as genders are less pronounced. According to Eurostat (2003, p. 4), hours spent in domestic work are longer than paid work hours for women in most European countries. In our data, this is true among the employed only for Germany and the Netherlands, and the differences are small (2.2 and 0.5 hours, respectively). The picture is similar in the Eurostat study if one restricts the employed to individuals aged between 45 and 64 and the countries included in our study.

The increase in domestic work after withdrawal from work in our data is greater for men. This is the case in absolute terms for Denmark, Germany, the Netherlands and the UK. In relative terms men increase their supply in all countries except for Belgium, the average increase being 105%. For women the average increase in domestic work time is 66%. The last two columns in Table 2 show that Denmark and Germany exhibit the most equal allocation of domestic work between men and women with a female share of 0.59. The female share is the highest, 0.81, in Portugal. It is interesting to see that the non-employed share domestic work more equally except in Belgium. Germany draws closest to a fifty-fifty allocation with a female share of 0.51, and Portugal again has the highest figure (0.74).

5. Conclusions

This paper has examined in greater detail demographic aspects of ageing in ten European countries (Austria, Czech Republic, Finland, France, Germany, Italy, Norway, Poland, Switzerland, United Kingdom) and time use in seven countries that may or may not overlap in those considered in demographic analysis. In the whole Europe, the total working age population begins to decline after 2010. This is caused by the retirement of baby-boom generation and by low birth rate, while longer life expectancy raises the relative share of inactive population. Ageing accelerates and by 2040 there will be almost equal number of individuals over 59 years compared to active people at age 20-59. The number of oldest old of age 75+ will be close to the number of children (under 15 years). The trend is that by 2050 over 30% of elder persons over 60 will be over 80 years, which is a dramatic change from the current level of around 10%. The variation in population growth prospects and ageing are still striking. The biggest expected decrease in population size takes place in Germany, Finland and Italy. The increase in the proportion of middle-aged and elderly persons is most striking in Germany, Italy, Switzerland and Finland. The deepness of ageing problem in Germany explains why the largest countries UK, France and Germany are expected to be of the same size 66-73 million people by 2050. Some countries like Norway and the UK are still expected to increase in population size throughout the period. Prevalence of women among elderly is expected to persist in all countries as a result of excess male mortality. However, it appears that as one moves towards the south the relative increase in life expectancy at the very end of life time increases and explained by the relatively rapid decrease in male mortality.

As the older age cohorts are healthier than before with an increase in life expectancy, active non-work time use is likely to be an important determinant of early retirement. Active ageing policies towards wider participation in work-life is more important than before, but with an appropriate valuation of non-work time such as household work; also as a determinant of early retirement. It appears that total work time is fairly equal between men and women so that women supply ten hours more household work per week and ten hours less paid work. Together with the ageing the importance of household work and possibly neighbourhood help (helping other household) will grow over time. Active non-work time is the only contributor to general well being since retirement. On the other hand, retired are increasing in numbers and both passive time use at old age and health expenditures are likely to increase as the oldest old (over 79 years) are one third of older generation (over 59 years) in the future.

References

Alho Juha (2002): The Population of Finland in 2050 and Beyond. The Research Institute of the Finnish Economy (ETLA) Discussion Papers No. 826.

Avramov and Maskova (2003): Active Ageing in Europe. European Population Papers Series No. 12.

Eurostat (2003). Household Production and Consumption. Proposal for a Methodology of Household Satellite Accounts., Unit E1. Forthcoming.

Gauthier, Anne H., Jonathan Gershuny, Kimberly Fisher, Anita Bortnik, Cara Fedick, Sally Jones, Tingting Lu, Fiona Lui, Leslie Macrae, Monica Pauls, Charlemaigne Victorino (2002). Colchester: ISER/University of Essex."MTUS On-Line Documentation." Colchester: ISER/University of Essex.

Kotowska Irene E. (2003): Older workers in labour market and retirement policies. European Population Series Paper No. 9. Strasbourg.

Piekkola Hannu and Harmoinen Liisa (2003): Time Use and Options for Retirement in Europe. The Research Institute of the Finnish Economy (ETLA) Discussion Paper No. 868. Helsinki.

SOMERA report (2002): The development of social expenditure in the long term. Publications of the Ministry of Social Affairs and Health. (Sosiaalimenojen kehitys pitkällä aikavälillä. SOMERA toimikunnan taustaraportti. Helsinki.

United Nations (2001) World population prospects. The 2000 revision. Volume I: comprehensive tables. New York: United Nations.

Appendix A. Population Forecast Assumptions in Finland

In Juha Alho's calculations the starting population is the Finnish population of 5.195 million at the end of year 2001, by single years of age (0,1,2,..., 119, 120+), for females and males. The population being forecasted is the legally resident population as enumerated in the Finnish population register. The median of the distribution of fertility was assumed to be at the level observed empirically in 2001, in each child-bearing age (14-50). A summary measure used to describe the overall level of fertility is the total fertility rate. It is defined as the sum of age-specific fertility rates over the child-bearing ages. The total fertility rate is assumed to remain indefinitely at 1.73, the level observed in the year 2000 (i.e. the number of children per woman experiencing the age-specific rates of the year in a sequence and surviving to the end of the child-bearing ages.). The difference to U.N. forecast is that U.N. assumes the Finnish fertility to decline to about 1.55 in 2000-2005 and then to increase to 1.94 in 2045-2050 (United Nations, 2001, p. 589). Numerically, Alho and U.N. estimates are quite close, however.

The point forecast for mortality was based on a simple trend extrapolation of the recent past age-specific mortality (in the log-scale) by single years of age, for males and females separately. To reduce variation caused by small numbers of events, the rates of change were smoothed by the procedure RSMOOTH of Minitab. This lead to the forecast of 86.7 years for females in 2050, and for 81.6 for males. Or, the gap between males and females is expected diminish. The U.N. forecasts 86.1 and 79.8 for females and males, respectively, in 2045-2050 (United Nations (2001), p. 633). Given the length of the forecast period, the difference between the U.N. forecast and ours must be considered small.

Alho's forecast assumes that age-specific mortality rates continue to decline at the rate they have declined during the past 15 years. One can see from the Figures 5a-e of Alho (1998, pp. 19-21) that especially in the ages 80+ mortality has stagnated since 1980, or so. In fact, during the past 15 years female life expectancy improved by only 81.0 - 78.6 = 2.4 years, or 0.16 years annually. This would imply an improvement to 88 years by 2050. This is at 0.70 fractile of the predictive distribution. The difference between 88 years and the median of 86.7 can be fully reconciled by noting that the continuation of the recent rate of decline in age-specific mortality implies a slowing down of increase in life expectancy (Alho 2002). This, of course, is incompatible with the linear change hypothesis.

A continuing annual gain of 4,000 during a 50 year forecast period would mean that the most likely value for the net gain is 50*4,000 = 200,000 inhabitants. The magnitude of gain may be too optimistic. Instead, it is assumed that net migration would start from the recent past value of 5,000, and decline to zero in 25 years. This implies 70,000 as the most likely gain. This means that a 50% prediction interval for the cumulative net migration is [-206,400; 346,400]

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