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Trends in Pension Eligibility Ages and Life Expectancy, 1950-2050

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TRENDS IN PENSION ELIGIBILITY AGES AND LIFE EXPECTANCY, 1950-2050

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JEL Codes: H55; J11; J14; J26

Edward Whitehouse leads the pensions team in the Social Policy division of the OECD. Rafal Chomik was on secondment to the OECD from the Department of Work and Pensions in the United Kingdom at the time the paper was prepared. *The authors are grateful to Delegates to the OECD Working Party on Social Policy and other national officials for providing comments and information; to John Turner, whose earlier paper – Turner (2007) – provided a good starting point for this work; and to Anna D'Addio, Andrew Reilly and Monika Queisser of the OECD's Social Policy division for their input to the paper. Martine Durand and John P. Martin, also of the OECD Secretariat, offered useful comments on earlier drafts. Nevertheless, full responsibility for the contents of the paper rests with the authors and the opinions expressed commit neither the OECD nor any of its member governments.*

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SUMMARY

The pensionable age is the most visible parameter of retirement-income systems. This paper surveys pensionable ages in the OECD for a period of a century: back to 1950 and forward to 2050. Average pensionable age in OECD countries dropped by nearly two years during the second half of the 20th century to 62.5 for men and 61.1 for women. Legislation already in place will increase it almost to 65 for both sexes by 2050.

At the same time, life expectancy has increased in most countries at most times. Between 1960 and the turn of the century, life expectancy after pensionable age is grew from 13.4 to 17.3 years for men and 16.8 to 22.1 years for women on average in OECD countries. However, life expectancy after normal pension age is projected to reach 20.3 and 24.6 years (for men and women respectively) in 2050. This continued increase is projected despite many OECD countries having already legislated for phased increases in the pension age in the future.

RESUME

L'âge de la retraite est le paramètre le plus visible des systèmes de retraite. Ce document passe en revue les changements dans l'âge de la retraite des pays de l'OCDE sur une période d'environ un siècle: de 1950 jusqu'en 2050. La moyenne d'âge de la retraite dans les pays de l'OCDE a chuté de près de deux ans durant la seconde moitié du 20ème siècle s'établissant à 62,5 pour les hommes et 61,1 pour les femmes. En considérant la législation déjà en place, dans les pays de l'OCDE, pour les années à venir, il augmentera de nouveau, s'établissant à environ 65 pour les deux sexes d'ici à 2050.

Dans le même temps, l'espérance de vie a augmenté dans la plupart des pays la plupart du temps. Entre 1960 et 2000, l'espérance de vie, après avoir atteint l'âge de départ à la retraite est passé de 13,4 à 17,3 ans pour les hommes et de 16,8 à 22,1 ans pour les femmes en moyenne dans les pays de l'OCDE. Cependant cette augmentation ne semble pas avoir pris fin: L'espérance de vie après l'âge normal de la retraite devrait atteindre 20,3 et 24,6 ans (pour les hommes et les femmes respectivement) en 2050. Cette augmentation continue est prévue dans de nombreux pays de l'OCDE nonobstant le fait que la plupart des ceux-ci aient déjà légiféré pour tenir compte de l'augmentation progressive de l'âge de retraite à l'avenir.

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TRENDS IN PENSION ELIGIBILITY AGES AND LIFE EXPECTANCY, 1950-2050

1. Voltaire, the French writer and philosopher, advised a friend to "go on living solely to enrage those who are paying your annuities", before suggesting rhubarb and sobriety as the means to such an end.[1] The rapid ageing of the population around the world is unlikely to be a result of heeding this advice. But it provides a major challenge to the affordability of pensions and the financial sustainability of retirement-income systems. This problem has been reinforced by a long period during which increases in life expectancy were continually under-estimated by experts.[2]

2. This paper begins by exploring trends in the evolution of one key parameter of the pension system: the age of eligibility for mandatory pension benefits. The "retirement age" is the most visible parameter of the pension system and one which sets a clear signal for people in making economic decisions. As such, increases in pension age have often proved among the more contentious elements of pension reforms, compared with other changes to retirement-income provision. This paper presents a new dataset of the evolution of pension eligibility age covering a period of a century. It looks backwards to 1950 and forwards to 2050, examining the phased increases in pension ages that many OECD countries already plan.

3. Section 1 of the paper discusses some of the issues in defining pensionable age, which is not always as clear cut a concept as one might imagine. Section 2 presents the key results on pension ages in OECD countries. The main finding is that average pensionable age in OECD countries dropped by nearly two years during the second half of the 20th century to 62.5 for men and 61.1 for women. Legislation already in place will increase it almost to 65 for both sexes by 2050.

4. Section 3 then examines the relationship between pension age and life expectancy, both observed in the past and forecast into the future. The analysis shows how the expected duration of retirement has been, and is likely to be, affected by changes in pension age and by the near-continuous growth in life expectancy observed in the past. Most projections show continued increases in life expectancy in the future. Between 1960 and the turn of the century, life expectancy after pensionable age is shown to have grown from 13.4 to 17.3 years for men and 16.8 to 22.1 years for women on average in OECD countries. However, life expectancy after normal pension age is projected to reach 20.3 and 24.6 years (for men and women respectively) in 2050, despite many OECD countries having already legislated for phased increases in the pension age in the future.

5. Section 4 of the paper concludes with a summary of the results and an exploration of the implications for pension policy.

1. Defining "pensionable age"

6. In most OECD countries, the normal pension age is clearly set out in legislation. It is that age at which people can first draw full benefits (that is, without reduction for early retirement). In others,

1 . Parton (1881).

2. See the discussion in Whitehouse (2007).

however, there are complexities. For example, it may be possible to retire earlier than the normal age, without an "actuarial" reduction in pension benefits (to reflect the longer duration of benefit payment), provided certain contribution requirements are met.[3] Some countries do not have a "normal" pension age, instead defining a range of ages at which the pension may first be drawn.

7. For the sake of comparability between countries, pensionable age is defined here as the age at which an individual with a full career can first receive full pension benefits in the main pension scheme. The term "full" here means that benefits are "actuarially" unreduced. Following the conventions of OECD *Pensions at a Glance* (OECD, 2005, 2007a, 2009), a full career is defined as an individual starting work at age 20 and contributing in every year from that time. In countries where there are different retirement-income programmes for different groups of workers, the data relate to the main, national scheme for private-sector workers.

8. Many countries offer more favourable retirement provisions for certain groups of workers. (These have been discussed extensively elsewhere in OECD studies and are not analysed further here.) Some countries have different schemes for public-sector employees, often with lower pension ages or more favourable rules for early retirement.[4] There are examples of special treatment for private-sector workers in specific hazardous or arduous occupations.[5] Finally, the Czech Republic and the former Czechoslovakia offered earlier retirement for women, depending on the number of children that they had. In Denmark, there used to be a lower pensionable age for unmarried women. In Switzerland, the reverse was true until the 1990s: for them pension eligibility age was higher than had they been married. In these cases, the pension ages are shown for childless, unmarried women.

9. Country-specific issues when it comes to defining pension age are addressed in detail in Box 1. In the main, these relate to cases where the binding constraint on entitlement is the number of years of contributions rather than attaining a particular age. In other cases, there are problems arising because different components of the retirement-income system have different eligibility ages. Again, Box 1 explains the reasoning behind the approach adopted in this paper.

10. The information on pension ages over time presented below shows the conditions applying to individuals reaching pension age at a particular point in time (between 1949 and 2050). In many cases, the phasing-in of changes in pension ages affects different date-of-birth cohorts differently. It is easy then to convert these into the times that particular people will reach pension age. In others – Italy and Turkey, for example – different conditions apply depending on the number of years of contributions achieved at a certain date or the age of first entry into the pension system. Following the conventions outlined above, the relevant pension age has been computed for individuals with a full contribution history from age 20.

3. See Queisser and Whitehouse (2006) for a detailed discussion.

4. On which, see OECD (2007b) and Palacios and Whitehouse (2006).

5. See Zaidi and Whitehouse (2009) for a discussion of such rules.

Box 1. Defining pensionable age: country-specific issues

In ***France***, recent pension reforms have maintained the standard retirement age at 60. However, they have introduced a phased increase of the minimum number of covered years, increasing from 37.5 years before the reforms to 40 years in 2008 and 41 years in 2012. For many people, this will delay the age at which they can receive a full pension. Assuming that individuals start work at age 20, the current pensionable age in France will move from 60 to 61 in 2012 on the OECD measure, that is from 20+40 to 20+41 years. Increases in the standard retirement age from 60 to 62 and in the number of years of contributions required for a full benefit from 41 to 42 years are currently being debated.

A similar difficulty arising with analysis of ***Turkey***: the abolition of the standard retirement age in 1969 meant that the sole binding constraint to receive a full pension was the required 25 years of contributions. As a result, pensionable age for Turkey during the 1970s and 80s was around age 45 on the standard OECD assumption of entry at age 20. This will change in the future as the standard retirement age has been reinstated and will be gradually increased. (See Brook and Whitehouse, 2006 for more details on the pension system in Turkey.)

The standard retirement age in ***Hungary*** was 62 for men and 58 for women in 2002 (reaching a unisex age of 62 in 2009). However, in 2002, a full pension was also accessible as early as 60 for men (with a minimum of 38 covered years) and 55 for women (with 37 years of contributions). Recent reforms have tightened the rules for early retirement. For men born after 1950 and women after 1958, early retirement without reduction will no longer be allowed. Consequently the pensionable age as defined in this paper and standard retirement age will coincide for these cohorts.

Similarly, the statutory retirement age in ***Belgium*** is 65 for men and for women. However, actuarially unreduced benefits are available from age 60 with 35 years' contributions. Also, in ***Greece*** the normal pension age is 65 but unreduced benefits are now paid from any age with 37 years of contributions, giving a pensionable age of 57 (20+37) on the definition used here. The recent reform, however, will restrict access to early retirement to age 60 in the future.

The phased increase in the statutory pension age – from 65 to 67 beginning in 2035 – in ***Germany*** will open up a difference between this and the OECD definition of pensionable age. It will still be possible to claim a full pension after the reform with 45 years of contributions. Thus, pensionable age on the OECD definition will remain at 65 (that is, 20+45 years).

In ***Italy***, statutory pension ages in the long term will be 65 for men but 60 for women. However, the notional-accounts scheme means that benefits for women retiring at age 60 will be actuarially reduced to reflect the longer expected duration over which the benefit will be paid compared with drawing the pension from age 65. For the purposes of this paper, the earlier statutory pension age for women of age 60 is treated as preferential access to early retirement and not as a difference in pensionable age.

The final question is how to deal with countries that do not set a normal pension age in their main schemes. In ***Finland*** and ***Sweden***, for example, there is no fixed age for public, earnings-related benefits. However, access to resource-tested schemes – the national and guarantee pensions respectively – is restricted to age 65 and above. This is used as pensionable age in this paper.

2. Trends in pensionable ages over a century

11. Figures 1 and 2 and Tables 1 and 2 present the first set of key results of the paper, showing the development of pensionable ages in OECD countries. The data begin in 1949, by which time all OECD countries bar Korea and Turkey already had some sort of public, retirement-income provision in place. From this early starting point of 1949, the paper then looks at historical trends to today and onwards to 2050, including phased increases in pensionable ages in the future. This gives a century of pensionable ages for 30 OECD countries.

12. Between 1949 (or the time data are first available) and 2010, pension ages were constant for both men and women in only six countries: Finland, Iceland, Mexico, the Netherlands, Spain and the United Kingdom. Pension ages for men remained the same (while those for women changed) in Australia, Austria, Belgium, Hungary, Portugal and Switzerland. Only in Poland did the pension age for women remain unchanged while that for men was raised.

13. Looking forward, from 2010 to 2050, 11 OECD countries plan to increase pension ages for both men and women: Australia, the Czech Republic, Denmark, France, Greece, Hungary, Italy, Korea, Turkey, the United Kingdom and the United States.[6] A further two – Austria and the Slovak Republic – will increase pensionable ages for women to equalise those of men during that period. Switzerland will increase women's pension age but it will still be one year below men's. These changes have already been legislated but will be phased in over the coming years.

14. Figure 1 shows the time series of pensionable ages for men, country-by-country. (The data underlying the charts is given in Table 1). The charts group the countries into five different time series patterns. By far the most common pattern – illustrated in panels a and b at the top of Figure 1 – is for an increase in pension age over time. For example, Australia, the United Kingdom and the United States had pension ages for men of age 65 for much of the period since 1950. But increases to 67 or 68 are now underway or are planned for the future. Poland increased its pensionable age from 60 to 65: the Czech Republic and Hungary are in the process of following suit.

15. The left-hand side of the middle row of Figure 2 (panel c) confirms that, for men, there has been no change in pension age since 1950, nor is any currently planned in the period 2010-2050, in nine OECD countries. This is the second most common pattern of pensionable ages over time. Most stick at 65 over this period, but Iceland has retained a pension age of 67 while Belgium provides full-career workers with early retirement at age 60 without reduction in benefits.

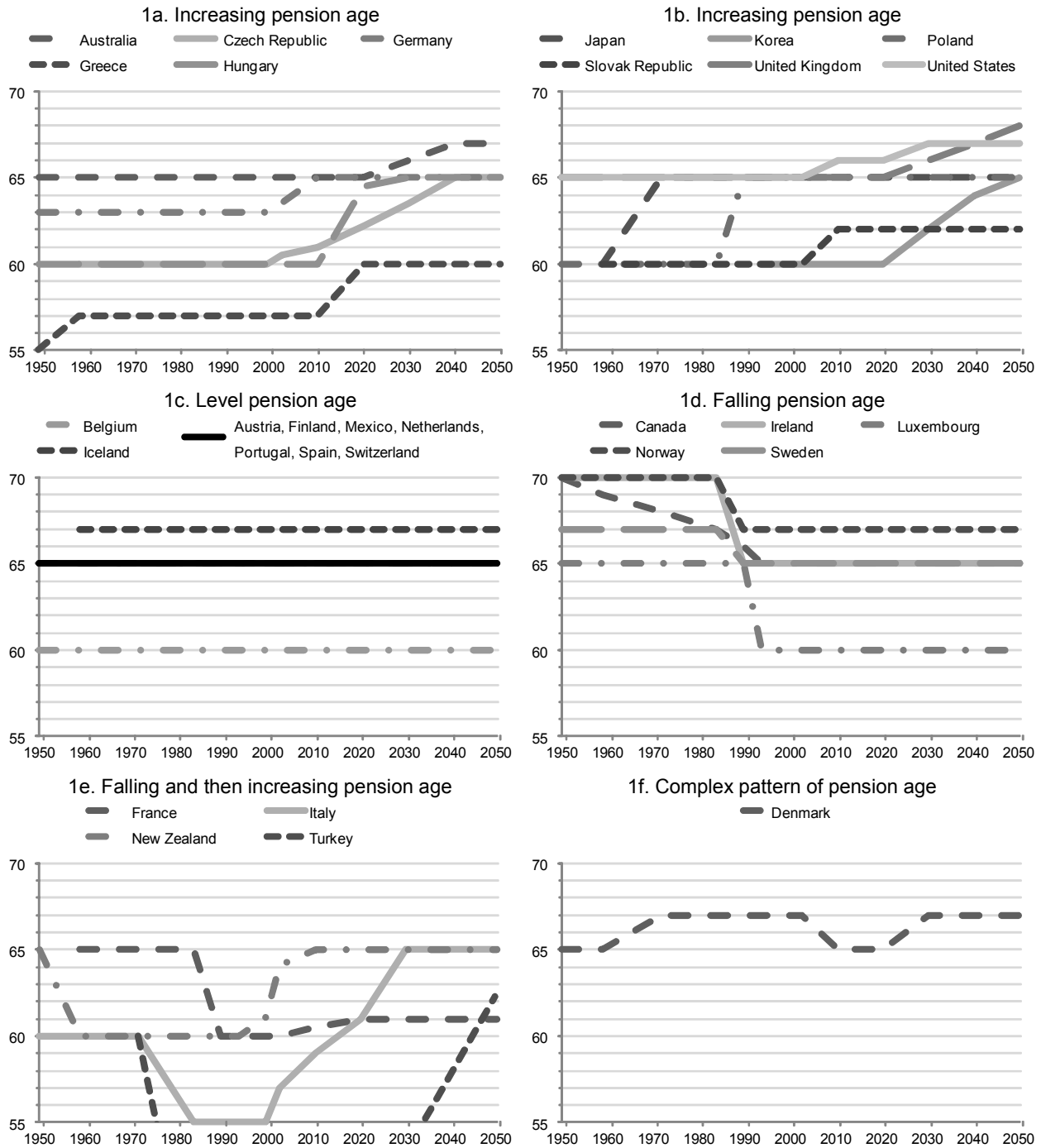
16. The right-hand chart in this middle row (panel d) shows the pattern for five countries that reduced the pension age in the past. In Canada, Ireland and Norway, for example, pensionable age was as high as age 70 in the earlier part of the period studied. The other reductions were from 67 to 65 in Sweden and from 65 to 60 in Luxembourg (for unreduced early-retirement benefits, as in Belgium). In all these cases, the declines in pension age took place some time ago, with the most recent being completed by the early 1990s.

17. The penultimate group of countries – at the bottom, left-hand side of Figure 1 (panel e) – show a U-shaped pension age for men over time. This has involved a reduction at some point in the past, followed by a period of no change, and now a reversal of earlier declines that is already being phased in or has been announced. For example, France cut pensionable age from 65 to 60 in the 1980s. However, the increase in the number of contribution years required for a full benefit to 41 from 2012 increases the OECD measure of pensionable age above 60. There has been discussion of increasing the number of years further to 42 after 2012 and to link the number of contribution years to life expectancy, but these changes have not yet been legislated. New Zealand cut pension age from 65 to 60 some time ago, only to return fairly quickly to 65 around the turn of the century.

18. The most striking development was in Turkey: the statutory retirement age of 60 was abolished and replaced with a requirement of around 25 years' contributions to receive a full pension, which translates into a pension age of 44-45 on the OECD definition. (This pensionable age is such an outlier that it is not shown in the chart for much of the time.) It is interesting to note that this has had a measurable effect on economic behaviour in Turkey, with average effective retirement age falling by over a decade between 1970-75 and 1980-85. This decline has occurred in spite of the fact that coverage of the formal pension system is far from complete and there is a large informal sector unaffected by incentives in the pension system.

6. Germany does plan to increase the statutory pension age, but, for the reasons explained in Box 1 above, the OECD measure of the pensionable age is not affected.

Figure 1. Pensionable age in OECD countries, men, 1950-2050



Source: Table 1.

Note: Changes in pensionable age are based on the data points in Table 1. The lines do not therefore show year-to-year changes. Data for Turkey when the pension age is less than 55 are not shown.

19. Finally, Denmark is shown alone in the bottom right of Figure 1 (panel f). This is because it is unique in having an increase in pension age from 65 to 67, a cut back to 65 and then an increase again to 67 by 2027. Denmark has raised the possibility of linking the pension age to life expectancy after 2027 but this policy has not been legislated.

20. Figure 1 illustrates significant differences in the pace at which pension ages are changed. In most cases where pensionable age fell (panels d and e of Figure 1) the fall was very rapid. In general, increases in pensionable age were phased in more gradually. For example, the Italian reform only affected workers who had been in the system for 18 years or less. The new system will only be fully in place once labour market entrants of 1995 and thereafter have retired. Under reforms in Turkey, the new retirement age of 65 will only be reached for people retiring after 2050, since an increase from age 60 to 65 will be phased in for labour-market entrants from 2008 onwards. In contrast, New Zealand and Poland increased pension ages much more rapidly.

21. Turning to women's pension ages, exactly one half of OECD countries have had at some time a different pension age for women from men. This is demonstrated in the detailed data of Table 2: where women's pension age is lower than men's – it is never higher – the data are shown in bold face. These cases account for 28% of the data points in Table 2.[7] The difference in pensionable age between the sexes is most commonly five years. It is never larger than five years and averages 3.8 years.

22. Figure 2 repeats the country-country time-series analysis of Figure 1, this time for women. Again, countries have been grouped into five time-series patterns.

23. The first row of Figure 2 (panels a and b) shows the time series for 11 countries where women's pension ages were flat and then increased. Of these countries, only in Greece, Korea and the United States have women's pension ages always been the same as men's. In five other countries in this group, women's pensionable ages were below those for men and so have increased further. These comprise Australia, Germany, Hungary, Italy and the United Kingdom. In Belgium and Switzerland, women's pension ages have increased while men's remained the same. Finally, Japan increased pensionable ages for both sexes from 60 to 65, but the increase was a little earlier in time for men than for women.

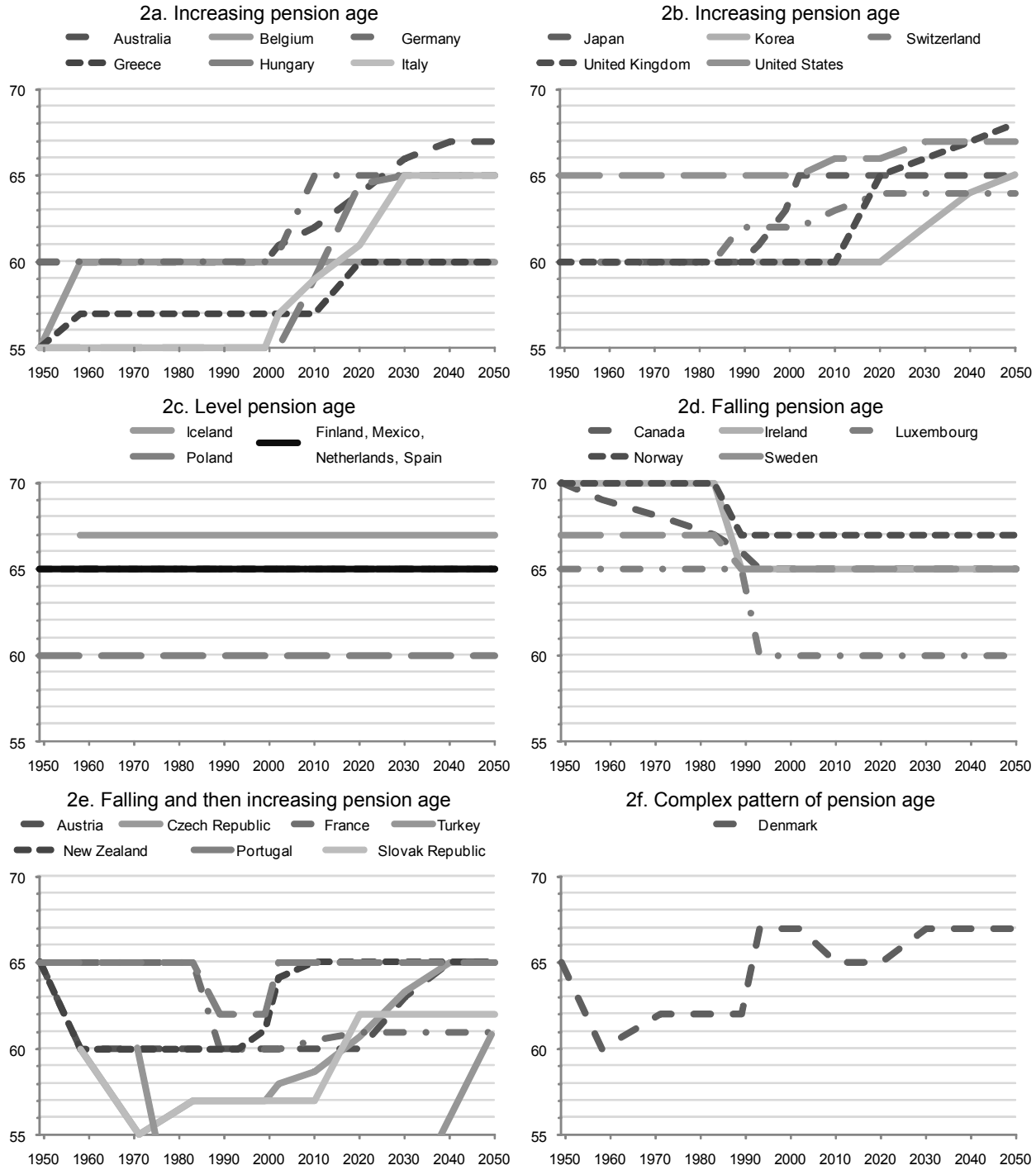
24. In the second row of Figure 2 at the left-hand side (panel c), both men's and women's pension ages have remained the same since 1950 and will remain the same until 2050 in Finland, Iceland, Mexico, the Netherlands and Spain. Only Poland, of this group, plans to maintain differential pension ages for women in the long term, with an increase in pension age for men from 60 to 65 while women's pension age remains at 60.

25. There have never been different pension ages for men and women in the five countries in panel d. Women's pension age – as for men's – fell in the past but there are no current plans to increase it in the future.

26. Panel e shows seven countries where pension ages for women fell in the past and have, in most cases, since increased. Future increases are already legislated in Austria, the Czech and Slovak Republics, and Turkey to equalise pension ages between men and women and, in some cases, then increase pension age for both sexes. Portugal equalised pension ages between men and women in the past, while France and New Zealand have always had equal pension ages, with the same pattern of pension age over time applying to men and women. Finally, panel f shows the more complex time series pattern of pension age in Denmark. Through the 1960s, 1970s and 1980s, pension age for women was below that for men.

7. There are 390 data points, comprising 30 countries and up to 13 points in time.

Figure 2. Pensionable age in OECD countries, women, 1950-2050



Source: Table 2.

Note: Changes in pensionable age are based on the data points in Table 1. The lines do not therefore show year-to-year changes. Data for Turkey when the pension age is less than 55 are not shown.

27. To summarise the results briefly, many governments relaxed retirement-age rules so that the official pensionable age was lowered in the 1970s and 1980s, and for some, also in the 1990s. In fact,

between 1950 and 2002, ten countries experienced at least one drop in pensionable age for men, and 12 saw a drop for women. Since 1989, 14 countries have increased or plan to increase the age for men, and 18 for women. The average pension age in the OECD countries fell from 64.3 years in 1949 to a nadir of 62.5 years in 1993 for men, a drop of nearly two years. For women, the fall over the same period was also just below two years, from 62.9 to 61.1 years in 1993.

28. Recent pension reforms increased the pensionable ages slightly up to 2010, to reach 63.0 years for men and 61.9 years for women. Looking forward, the average pension age for men is expected to reach 64.6 by 2050, with women's pension age slightly lower – at 64.4 years – because Poland and Switzerland still have legislation in place to keep differential ages in the long term and equalisation of men's and women's pension ages in Turkey will not be complete. Nevertheless, the average pension age for men in OECD countries has been consistently below its 1949 level and will remain so until 2040.

Table 1. Men's pensionable age in OECD countries, 1949-2050

	1949	*1958*	*1971*	*1983*	*1989*	*1993*	*1999*	*2002*	*2010*	*2020*	*2030*	*2040*	*2050*
Australia	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	66.0	67.0	67.0
Austria	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Belgium	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Canada	70.0	69.0	68.0	67.0	66.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Czech Republic		60.0	60.0	60.0	60.0	60.0	60.0	60.5	61.0	62.2	63.5	65.0	65.0
Denmark	65.0	65.0	67.0	67.0	67.0	67.0	67.0	67.0	65.0	65.0	67.0	67.0	67.0
Finland		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
France		65.0	65.0	65.0	60.0	60.0	60.0	60.0	60.5	61.0	61.0	61.0	61.0
Germany	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.5	65.0	65.0	65.0	65.0	65.0
Greece	55.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	60.0	60.0	60.0	60.0
Hungary	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	64.5	65.0	65.0	65.0
Iceland		67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Ireland	70.0	70.0	70.0	70.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Italy	60.0	60.0	60.0	55.0	55.0	55.0	55.0	57.0	59.0	61.0	65.0	65.0	65.0
Japan		60.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Korea						60.0	60.0	60.0	60.0	60.0	62.0	64.0	65.0
Luxembourg	65.0	65.0	65.0	65.0	65.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Mexico		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Netherlands	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
New Zealand	65.0	60.0	60.0	60.0	60.0	60.0	61.1	64.1	65.0	65.0	65.0	65.0	65.0
Norway	70.0	70.0	70.0	70.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Poland	60.0	60.0	60.0	60.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Portugal	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Slovak Republic		60.0	60.0	60.0	60.0	60.0	60.0	60.0	62.0	62.0	62.0	62.0	62.0
Spain	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Sweden	67.0	67.0	67.0	67.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Switzerland		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Turkey			60.0	45.0	45.0	45.0	45.0	44.0	44.9	48.6	53.1	57.7	62.3
United Kingdom	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	66.0	67.0	68.0
United States	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	66.0	66.0	67.0	67.0	67.0
Average	***64.3***	***63.9***	***63.9***	***63.2***	***62.8***	***62.5***	***62.6***	***62.7***	***63.0***	***63.5***	***64.1***	***64.4***	***64.6***

Source: National officials, OECD calculations and Turner (2007).

Note: Germany refers to West Germany for the period 1949-2002. Czechoslovakian data are used for the Czech and Slovak Republics where appropriate. Where there is more than one value per calendar year, these have been averaged.

Table 2. Women's pensionable age in OECD countries, 1949-2050

	1949	*1958*	*1971*	*1983*	*1989*	*1993*	*1999*	*2002*	*2010*	*2020*	*2030*	*2040*	*2050*
Australia	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**61.0**	**62.0**	**64.0**	66.0	67.0	67.0
Austria	65.0	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**63.0**	65.0	65.0
Belgium	**55.0**	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Canada	70.0	69.0	68.0	67.0	66.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Czech Republic		60.0	**55.0**	**57.0**	**57.0**	**57.0**	**57.0**	**58.0**	**58.7**	**60.7**	**63.3**	65.0	65.0
Denmark	65.0	**60.0**	**62.0**	**62.0**	**62.0**	67.0	67.0	67.0	65.0	65.0	67.0	67.0	67.0
Finland		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
France		65.0	65.0	65.0	60.0	60.0	60.0	60.0	60.5	61.0	61.0	61.0	61.0
Germany	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.5**	65.0	65.0	65.0	65.0	65.0
Greece	55.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	60.0	60.0	60.0	60.0
Hungary	**55.0**	**55.0**	**55.0**	**55.0**	**55.0**	**55.0**	**55.0**	**55.0**	**59.0**	64.5	65.0	65.0	65.0
Iceland		67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Ireland	70.0	70.0	70.0	70.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Italy	**55.0**	**55.0**	**55.0**	55.0	55.0	55.0	55.0	57.0	59.0	61.0	65.0	65.0	65.0
Japan		60.0	**60.0**	**60.0**	**60.0**	**61.0**	**63.0**	65.0	65.0	65.0	65.0	65.0	65.0
Korea						60.0	60.0	60.0	60.0	60.0	62.0	64.0	65.0
Luxembourg	65.0	65.0	65.0	65.0	65.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Mexico		65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Netherlands	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
New Zealand	65.0	60.0	60.0	60.0	60.0	60.0	61.1	64.1	65.0	65.0	65.0	65.0	65.0
Norway	70.0	70.0	70.0	70.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Poland	60.0	60.0	60.0	60.0	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**
Portugal	65.0	65.0	65.0	65.0	**62.0**	**62.0**	**62.0**	65.0	65.0	65.0	65.0	65.0	65.0
Slovak Republic		60.0	**55.0**	**57.0**	**57.0**	**57.0**	**57.0**	**57.0**	**57.0**	62.0	62.0	62.0	62.0
Spain	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Sweden	67.0	67.0	67.0	67.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Switzerland		**60.0**	**60.0**	**60.0**	**62.0**	**62.0**	**62.0**	**62.0**	**63.0**	**64.0**	**64.0**	**64.0**	**64.0**
Turkey			60.0	45.0	45.0	45.0	45.0	**40.0**	**41.0**	**45.2**	**50.4**	**55.6**	**60.8**
United Kingdom	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	**60.0**	65.0	66.0	67.0	68.0
United States	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	66.0	66.0	67.0	67.0	67.0
Average	***62.9***	***62.5***	***62.1***	***61.7***	***61.1***	***61.1***	***61.2***	***61.4***	***61.9***	***62.9***	***63.7***	***64.1***	***64.4***

Source: National officials, OECD calculations and Turner (2007).

Note: Data shown in **bold** type indicates that pension ages are different for women than men. Germany refers to West Germany for the period 1949-2002. Czechoslovakian data are used for the Czech and Slovak Republics where appropriate. Where there is more than one value per calendar year, these have been averaged.

3. Expected duration of retirement: life expectancy at pensionable age

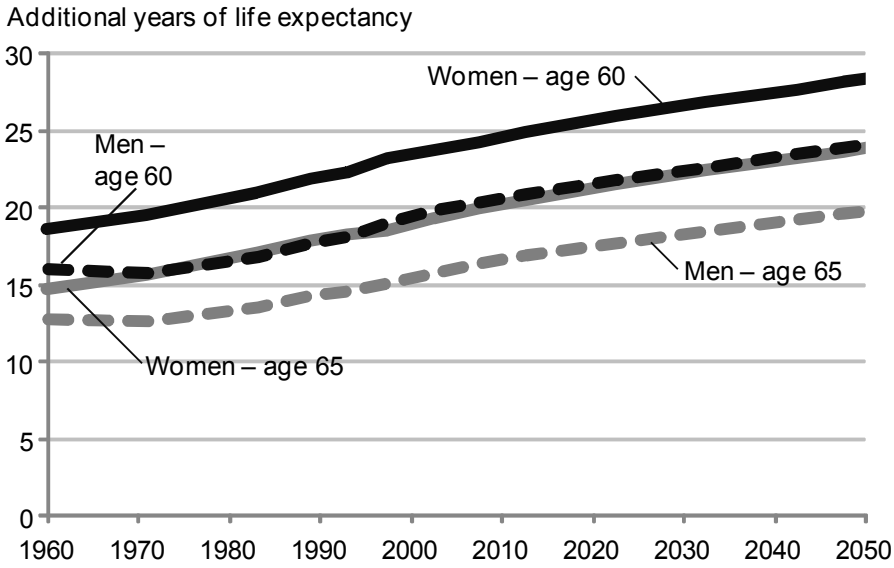
29. The reductions in pension age up to 1993 in many OECD countries came at the same time as rapid increases in life expectancy. In the early part of the last (the 20th) century, much of the gains in overall life expectancy were due to lower mortality at younger ages: at birth, during childhood and at working age. But in the second half of the 20th century, the risk of mortality at retirement ages has also fallen substantially. Between 1960 and 2010, OECD-average life expectancy at age 65 increased by around 3.9 years for men and 5.4 years for women (Figure 3). Increases in life expectancy at age 60 were larger than at age 65.

30. The United Nations population division projects further increases in life expectancy between 2010 and 2050. These amount to 3.1 additional years for men and 3.6 years for women at age 65. As in the past, the lengthening of life expectancy at age 60 is greater, but by a smaller margin than observed between 1960 and 2010.

31. Data on national pension ages from section 2 above are now combined with information on developments in mortality and life expectancy. The calculations give the number of years of additional

years of life after normal pension age (on average[8]) between countries and over time. This concept is here called "expected retirement duration" for short. Since this illustrates the length of the period over which pension benefits must be paid, it is an important determinant of cost of paying for pensions.

Figure 3. Life expectancy at age 60 and 65 by sex, OECD average, 1960-1050



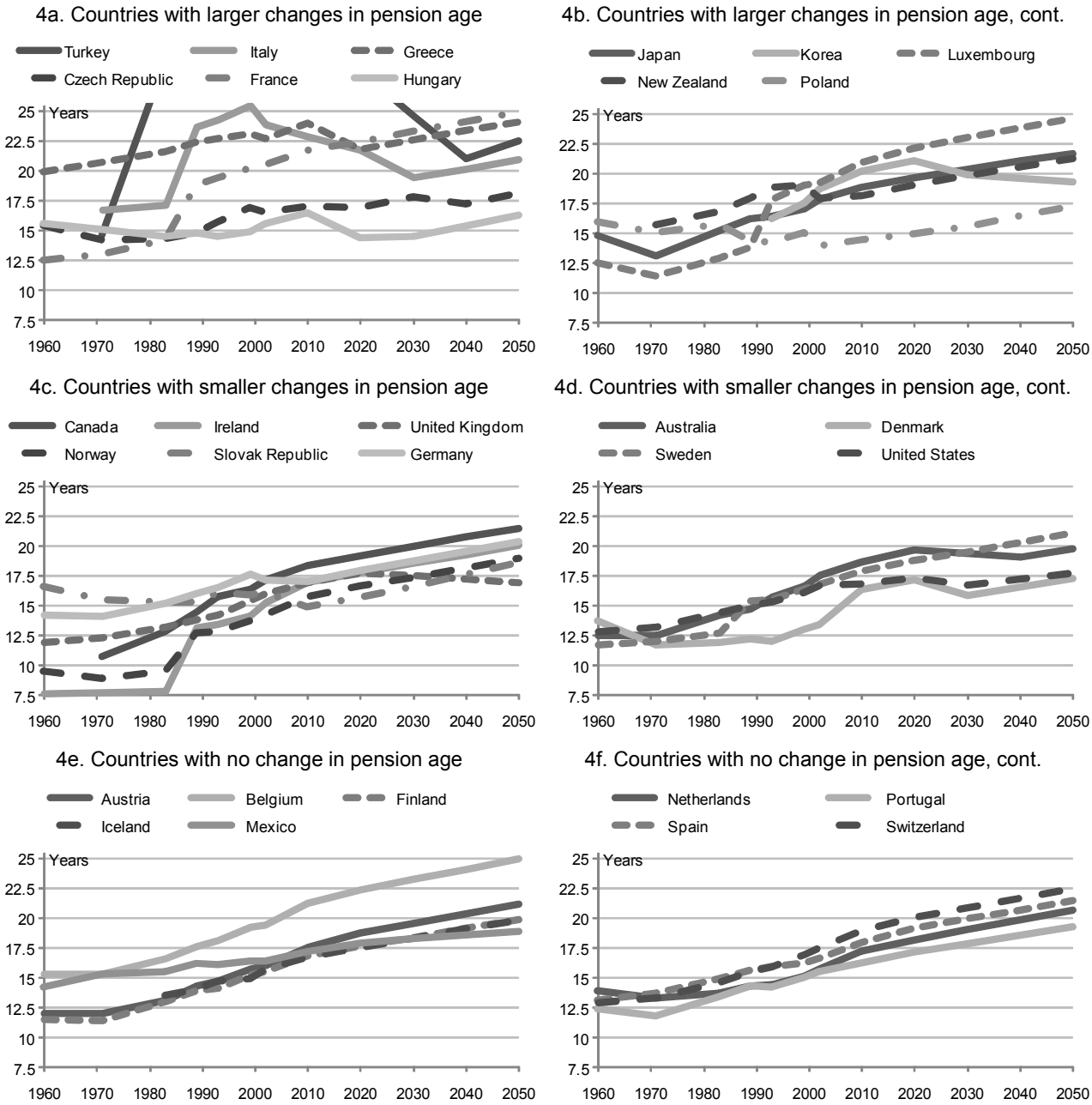
Source: Historical data on life expectancy from the OECD Health Database (1960-95). Recent data and projections of life expectancy in the future based on the United Nations Population Division database, *World Population Prospects – The 2008 Revision*.

32. Tables 3 and 4 provide detailed national calculations for men and women respectively. In 2010, the period in retirement to death from normal pension age is 18.5 years on average for men. For women, the expected duration in retirement from normal pension age averages 23.2 years, nearly five years longer than for men. The longest retirement durations for men in 2010 – over 20 years – are found in seven countries where the pension age is age 60 or lower: Belgium, France, Greece, Italy, Korea, Luxembourg and Turkey. Long retirement durations for women in 2010 – above 25 years – are also found in countries with low pension ages, such as Austria, Belgium, France, Greece, Italy and Korea. In contrast, retirement durations are the shortest for men in Poland and the Slovak Republic, reflecting the short life expectancy in these countries: at age 65, for example, life expectancy for men at age 65 is 14.4 and 13.8 years respectively, compared with an OECD average of 16.9 years and 18.8 years or more in Iceland, Japan and Switzerland. Other countries with short retirement durations for men in 2010 include those with pension ages already above age 67: Iceland and Norway. There are also short expected retirement durations for women in these countries plus the United States. However, different pension ages for the sexes in Hungary, Poland and the Slovak Republic mean that these do not feature among those with the shortest life expectancy at pension age for women (whereas they do for men). Moreover, life expectancy at age 60 or age 54 is closer to the OECD average for women than it is for men.

8. The measures of life expectancy are for a given country's population as a whole. Differences in life expectancy within countries between different socio-economic groups are analysed in Whitehouse and Zaidi (2008). The key finding of that paper is that socio-economic differentials in mortality in OECD countries are much smaller for people of pension age than they are at working age.

33. Figures 4 and 5 summarise the pattern in life expectancy at pensionable age over time for different countries, again for men and women separately. These Figures group countries by the degree to which pension age has changed over the period from 1960 to 2050.

Figure 4. Life expectancy at pensionable age in OECD countries, men, 1950-2050



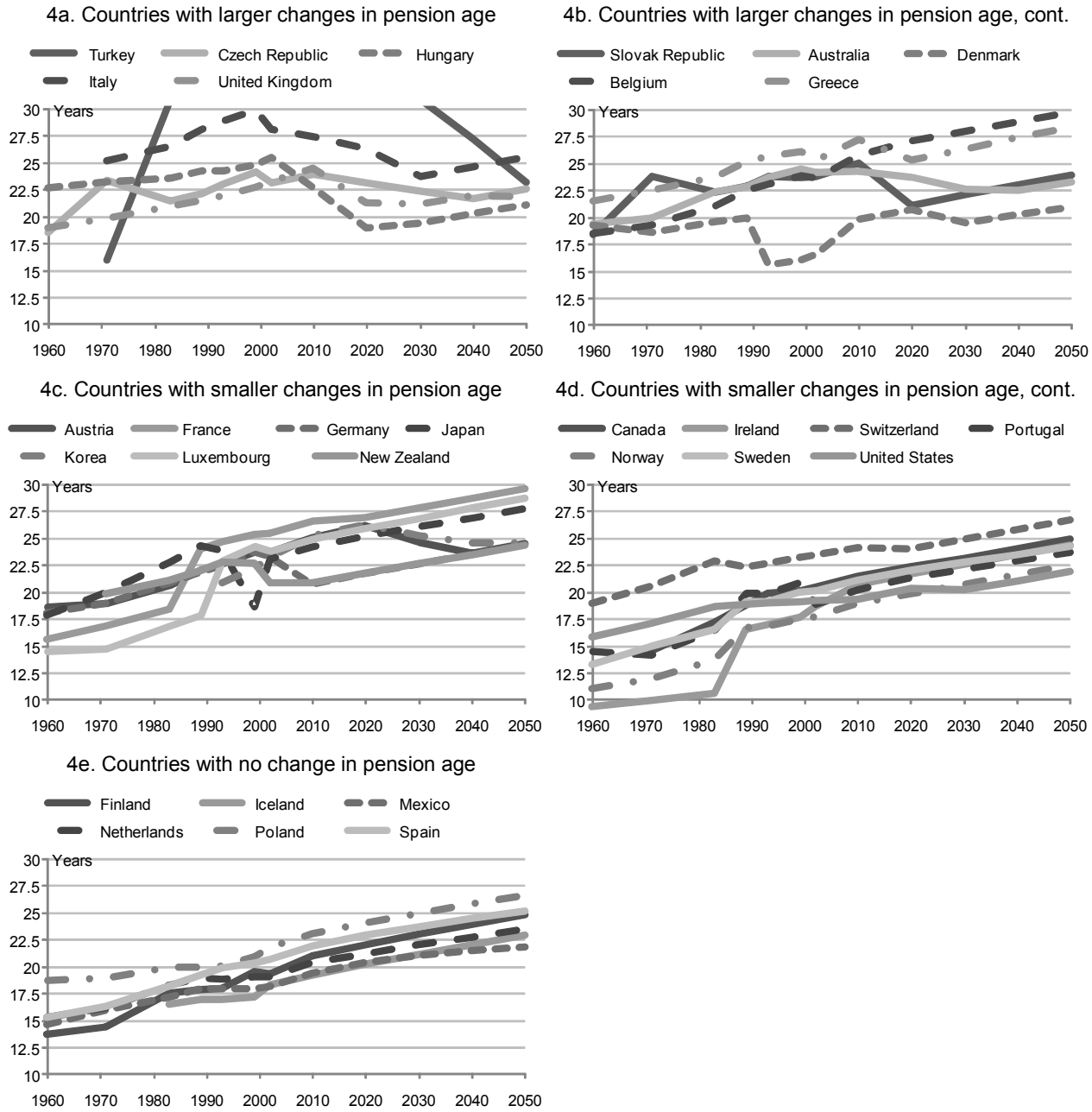
Note: Values have been capped at 25 years, which means that expected retirement duration in Turkey is off the scale.

Source: Table 3.

34. To explore the impact of life-expectancy changes over time, it is useful first to focus on the countries that saw no change in pension age over the period analysed. This group comprises nine countries for men, as shown in the bottom row of Figure 4 (panels e and f). Average expected duration in retirement

increased for these countries from 13.2 years for men in the 1960s to 17.8 years in 2010. With no future increase in pension age as on current plans, men's retirement duration in these countries will expand further to a projected 20.9 years in 2050. The equivalent analysis for the five countries where women's ages have not changed (Figure 5, panel e), shows an increase from 15.5 years in 1960 to 20.8 years in 2010 and 24.1 years in 2050. This illustrates that a policy of "no change" on pension age does not, in practice, mean there are no changes: it means an ever extending average period in retirement and so a continual increase in pension costs.

Figure 5. Life expectancy at pensionable age in OECD countries, women, 1950-2050



Note: Values have been capped at 30 years, which means that expected retirement duration in Turkey is off the scale.

Source: Table 4.

35. Turning to the countries where pension ages have changed over time, the top rows for Figures 4 and 5 show countries with relatively large adjustments. The increase in pensionable ages in Italy will significantly reduce expected retirement duration: from a peak of over 25 years for men to around 20 years at the end of the forecast horizon. For women, expected retirement duration peaked at 30 years in 1999 and is projected to fall to 25.5 years in 2050. With the possibility of retiring at any age with 20-25 years of contributions, the expected duration of retirement in Turkey is way off the scale of the charts. For men, the peak value is 32 years and for women, 37 years (both occurring in 2002). This means that a woman with a full contribution history from age 20 could draw a pension for nearly twice as many years as the time she spent paying into the system. For men, the expected duration of drawing a pension could be nearly 30% longer than the period they spent contributing.

Table 3. Life expectancy after pensionable age in the OECD, 1958-2050, men

	1958	*1971*	*1983*	*1989*	*1993*	*1999*	*2002*	*2010*	*2020*	*2030*	*2040*	*2050*
Australia	12.5	12.5	14.2	14.7	15.7	16.6	17.5	18.6	19.5	19.3	19.0	19.7
Austria	12.0	12.0	13.1	14.3	14.7	15.7	16.0	17.5	18.7	19.5	20.3	21.1
Belgium	15.3	15.3	16.6	17.6	18.1	19.2	19.4	21.1	22.3	23.1	24.0	24.8
Canada		10.7	12.8	14.4	15.8	16.3	17.1	18.3	19.1	19.9	20.7	21.4
Czech Republic	15.4	14.2	14.3	14.8	15.7	16.9	16.5	17.0	16.9	17.8	17.2	18.1
Denmark	13.7	11.7	11.9	12.2	12.0	13.0	13.4	16.4	17.1	15.8	16.5	17.2
Finland	11.5	11.4	13.0	13.9	14.1	15.2	15.5	16.8	17.6	18.3	19.1	19.8
France	12.5	13.0	14.2	18.8	19.4	20.2	20.5	21.7	22.4	23.3	24.0	24.8
Germany	14.2	14.1	15.2	16.0	16.5	17.6	17.2	17.0	17.9	18.7	19.5	20.3
Greece	19.9	20.7	21.6	22.4	22.7	23.1	22.7	24.0	21.8	22.5	23.3	24.1
Hungary	15.6	15.1	14.5	14.8	14.5	14.9	15.6	16.5	14.4	14.5	15.4	16.3
Iceland			13.5	14.0	14.7	14.9	15.8	16.8	17.5	18.3	19.1	19.8
Ireland	7.6	7.7	7.9	13.1	13.4	14.1	15.2	16.9	17.7	18.5	19.2	20.0
Italy		16.7	17.1	23.6	24.2	25.4	23.8	22.8	21.7	19.4	20.1	20.9
Japan	14.8	13.1	15.2	16.2	16.4	17.0	17.8	18.8	19.6	20.3	21.0	21.6
Korea					16.2	17.5	18.7	20.2	21.1	19.9	19.6	19.3
Luxembourg	12.5	11.4	12.9	13.8	17.8	19.0	19.2	20.8	22.1	23.0	23.8	24.6
Mexico	14.2	15.3	15.5	16.2	16.1	16.4	16.4	17.2	17.9	18.3	18.6	18.9
Netherlands	13.9	13.3	13.7	14.3	14.4	15.1	15.7	17.3	18.1	19.0	19.8	20.6
New Zealand		15.7	16.8	17.9	18.8	19.0	17.9	18.1	19.0	19.7	20.5	21.2
Norway	9.5	8.9	9.5	12.7	12.8	13.7	14.3	15.7	16.6	17.3	18.1	18.9
Poland	15.9	15.0	15.7	14.3	14.2	15.0	13.9	14.4	14.9	15.6	16.4	17.2
Portugal	12.4	11.8	13.4	14.3	14.2	15.0	15.5	16.3	17.1	17.8	18.5	19.2
Slovak Republic	16.6	15.5	15.3	15.3	16.1	15.9	16.1	14.9	15.7	16.6	17.6	18.6
Spain	13.1	13.7	14.9	15.6	15.9	16.2	16.6	17.9	19.0	19.9	20.6	21.4
Sweden	11.7	12.0	12.7	15.4	15.5	16.4	16.8	17.9	18.8	19.5	20.3	21.1
Switzerland	12.9	13.3	14.6	15.5	15.9	16.9	17.5	18.9	20.0	20.8	21.6	22.4
Turkey		14.6	29.2	29.9	30.5	31.1	31.5	31.1	28.4	24.5	21.0	22.5
United Kingdom	11.9	12.3	13.2	13.8	14.2	15.4	16.0	16.9	17.7	17.5	17.2	16.9
United States	12.8	13.2	14.4	15.0	15.3	16.1	16.7	16.8	17.3	16.8	17.2	17.7
Average	***13.4***	***13.4***	***14.7***	***16.0***	***16.5***	***17.3***	***17.6***	***18.5***	***18.9***	***19.2***	***19.6***	***20.3***

Source: Data on pensionable ages over time from Table 1. Historical data on life expectancy are taken from the OECD Health Database for 1960-95. Recent data and projections of life expectancy in the future based on the United Nations Population Division database, *World Population Prospects – The 2008 Revision*.

Note: Life-expectancy is calculated using data from 1960 for the pensionable ages applicable in 1958.

36. In some other cases where pension ages have been increased, the expected duration in retirement will remain broadly stable for significant periods. In Greece, for example, life expectancy at pensionable age for men is projected to remain in the range 22-24 years from 1993 to 2050. Similarly, in the Czech Republic, retirement duration for men is expected to be around 17 years from 1999 to 2040. A comparable pattern is observed for men in Hungary, Korea, New Zealand and Poland. In Australia and the United Kingdom, increases in pension age for women from 60 to 67 and 68 respectively are sufficient to ensure

that expected duration of retirement in 2050 is about the same as it was in 1993. However, men's pension age started at 65 in both countries. In the United Kingdom, expected duration of retirement for men is projected to fall to its 2010 level by 2050. But the increase in Australia for men is insufficient to prevent a continued increase in life expectancy at pensionable age.

Table 4. Life expectancy after pensionable age in the OECD, 1958-2050, women

	1958	*1971*	*1983*	*1989*	*1993*	*1999*	*2002*	*2010*	*2020*	*2030*	*2040*	*2050*
Australia	19.4	20.0	22.4	22.8	23.7	24.5	24.2	24.3	23.7	22.6	22.5	23.3
Austria	18.6	19.0	20.6	22.1	22.6	23.7	23.8	25.1	26.1	24.6	23.6	24.5
Belgium	18.5	19.3	21.1	22.5	23.1	23.9	23.6	25.8	27.0	28.0	28.9	29.8
Canada		14.5	17.2	18.7	19.9	20.1	20.4	21.4	22.3	23.1	24.0	24.8
Czech Republic	18.5	23.3	21.4	22.1	23.0	24.1	23.1	23.8	23.1	22.3	21.6	22.5
Denmark	19.3	18.6	19.6	19.9	15.6	16.1	16.6	19.8	20.8	19.6	20.3	21.0
Finland	13.7	14.4	17.5	17.8	18.0	19.5	19.3	21.0	22.0	22.9	23.8	24.7
France	15.6	16.8	18.4	24.0	24.6	25.3	25.4	26.5	26.9	27.8	28.7	29.5
Germany	18.1	19.0	20.8	21.8	22.5	23.7	23.3	20.7	21.7	22.6	23.5	24.4
Greece	21.5	22.5	23.7	25.2	25.6	26.1	25.3	27.1	25.3	26.3	27.4	28.3
Hungary	22.6	23.2	23.5	24.2	24.2	24.7	25.4	22.6	19.0	19.4	20.3	21.1
Iceland			16.5	17.0	17.0	17.2	18.3	19.2	20.2	21.1	22.0	22.9
Ireland	9.4	10.0	10.6	16.5	17.0	17.6	18.6	20.6	21.6	22.5	23.4	24.3
Italy		25.2	26.5	28.1	28.8	29.9	28.1	27.4	26.3	23.7	24.6	25.5
Japan	17.8	20.0	22.7	24.3	23.9	18.6	23.1	24.1	25.2	26.0	26.9	27.7
Korea					20.8	22.2	23.2	25.2	26.2	25.1	24.6	24.5
Luxembourg	14.5	14.7	16.8	17.8	22.9	24.2	23.7	24.9	25.9	26.8	27.7	28.6
Mexico	14.6	16.0	17.2	17.9	17.9	18.0	18.2	19.4	20.4	21.0	21.5	21.9
Netherlands	15.3	16.2	18.3	18.9	18.8	19.1	19.1	20.4	21.2	22.0	22.8	23.5
New Zealand		19.8	21.1	22.0	22.7	22.6	20.9	20.9	21.8	22.6	23.4	24.3
Norway	11.1	11.9	13.7	16.7	16.8	17.5	17.7	18.9	19.9	20.8	21.7	22.5
Poland	18.7	18.9	19.9	19.9	20.1	21.0	21.8	23.1	24.0	24.9	25.8	26.6
Portugal	14.5	14.2	16.5	19.8	19.8	20.8	18.8	20.2	21.2	22.1	22.9	23.6
Slovak Republic	18.4	23.7	22.3	22.8	23.7	23.6	23.8	24.9	21.0	22.0	23.0	23.9
Spain	15.3	16.3	18.2	19.2	19.8	20.3	20.6	21.8	22.8	23.6	24.4	25.1
Sweden	13.3	14.9	16.5	19.1	19.1	19.9	20.0	21.1	21.9	22.7	23.4	24.2
Switzerland	19.0	20.5	22.9	22.3	22.6	23.2	23.4	24.1	24.0	24.9	25.8	26.6
Turkey		16.0	30.8	31.9	32.5	33.1	37.2	36.9	34.7	30.9	27.2	23.2
United Kingdom	18.9	19.8	21.0	21.5	21.9	22.7	23.3	24.5	21.2	21.1	22.0	21.9
United States	15.8	17.1	18.6	18.8	18.9	19.1	19.1	19.3	20.2	20.1	21.0	21.9
Average	***16.8***	***18.1***	***19.9***	***21.2***	***21.6***	***22.1***	***22.3***	***23.2***	***23.2***	***23.4***	***23.9***	***24.6***

Source: Data on pensionable ages over time from Table 2. Historical data on life expectancy are taken from the OECD Health Database for 1960-95. Recent data and projections of life expectancy in the future based on the United Nations Population Division database, *World Population Prospects – The 2008 Revision*.

Note: Life-expectancy is calculated using data from 1960 for the pensionable ages applicable in 1958.

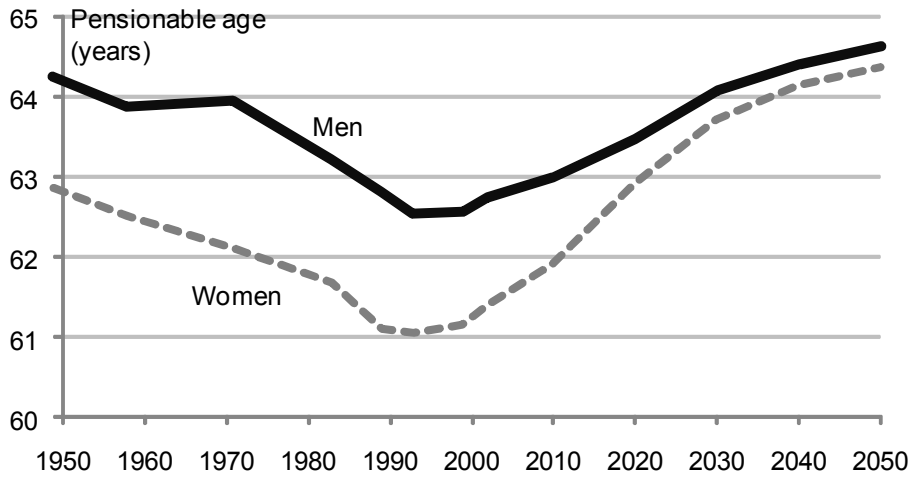
4. Conclusions and policy implications

37. The pension age is the most visible parameter of the retirement-income system. It has an impact on financial incentives to retire at different ages. And as a signal, it can also have an important effect on people's retirement decisions.

38. This paper's long-term survey of policy has revealed a period of significant decline of pension age in the latter half of the 20th century (Figure 6). Between 1950 and 2002, ten countries reduced pensionable age for men at some point and 13 did so for women. The average pension age in 30 OECD countries fell from 64.3 years in 1949 to a nadir of 62.5 years in 1993 for men, a drop of nearly two years. For women, the fall over the same period was also just below two years, from 62.9 to 61.1 years in 1993.

39. In the mid 1990s and after, governments started taking action to reverse the trend and put in place legislation that has already increased or will increase pensionable age up to 2050. From a low point in 1993, 14 countries have increased or plan to increase pension ages for men and 18 for women. Already by 2010, average pension ages have increased by 0.5 years for men and 0.8 years for women from the low point. Looking forward, current plans will increase the average pensionable age to 64.6 years for men and 64.4 years for women in 2050. However, it is important to bear in mind that the average pension age for men will only reach the same level as 1950 by 2040. Increases in pension age are larger and often earlier for women than for men, reflecting the equalisation of pension ages between the sexes in 12 of the 15 countries that have had different pensionable ages at some point. However, even for women, the pensionable age will only reach the level it was in 1950 from 2020 onwards.

Figure 6. Average pensionable age in OECD countries by sex, 1950-2050



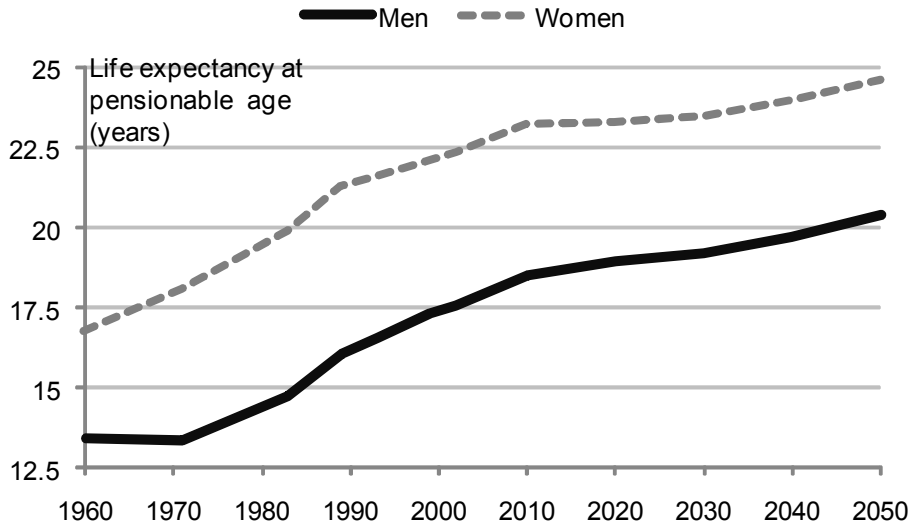
Source: Tables 1 and 2.

40. Life expectancy has seen a near-continuous increase in the latter half of the 20th century; and most estimates show continued growth in the future. Over the period from 1960 to the low-point for pension ages in 1993, the amount of time a man of pension age could expect to live grew from 13.4 to 16.5 years (Figure 7). Over 40% of the growth in expected retirement duration was a result of falling pension ages, with a small majority coming from longer life expectancy. For women, the increase in expected duration of retirement from 1960 was 4.8 years, to reach 21.6 years in 1993. For women, 70% of the growth was a result of longer life expectancy and 30% from lower pension ages.

41. In the recent period of 1993-2010, the expected duration of retirement has increased more slowly than before: 1.6 additional years for women taking it to 23.2 years and 2.0 extra years for men, increasing to 18.5 years. The slower growth for women reflects the fact that pension ages increased more rapidly than men's over this period. If pension ages had not increased, expected retirement duration would have been 0.8 years longer for women and 0.4 years for men in 2010.

42. Looking forward to 2050, expected retirement duration in the coming four decades is projected to grow at a much slower than observed in the five decades from 1960 to 2010. On average in OECD countries, women in 2050 are projected to have a life expectancy of 24.5 years at pensionable age, compared with 20.3 years for men. Only five OECD countries – Hungary, Italy, Korea, Turkey and the United Kingdom – have increased pension ages by sufficient to stabilise or reduce the expected duration of retirement between 2010 and 2050 for both men and women. Australia, Austria and the Czech and Slovak Republics will do so for women alone (due to equalisation of pension ages).

Figure 7. Life expectancy after pensionable age by sex, 1960-2050



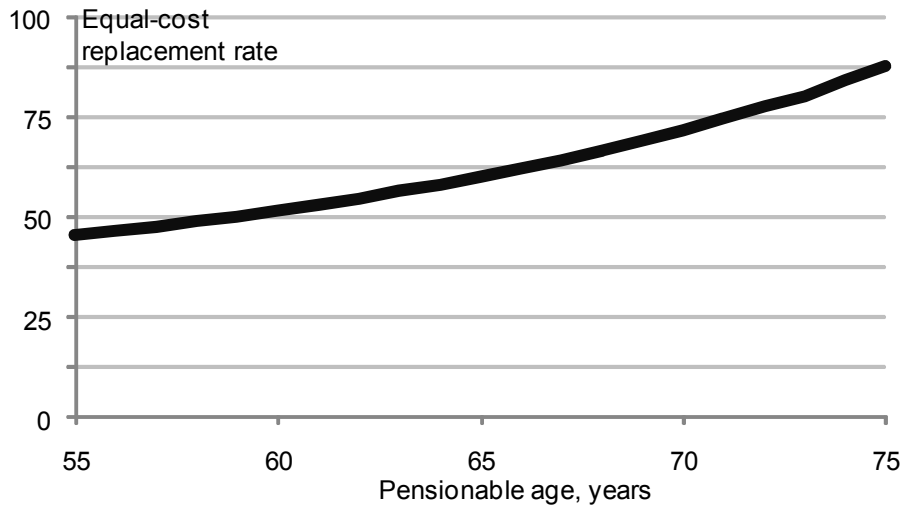
Source: Tables 3 and 4.

43. In the absence of redistribution between generations, it is only working years that can finance retirement benefits at the same level of today, as life expectancy increases and populations age. This is the case whether pensions are provided on a pay-as-you-basis (where today's workers finance the benefits of today's pensioners, or through pre-funding (where workers accumulate assets which similarly give them claims on the production of the next generation). Yet, the number of years of people's lives spent in work has declined. First, this is because of the longer period spent in retirement. But it is also a result of delayed entry into work of young people. While increased periods of education may be of public and private benefit – due to increased productivity – this trend places a further strain on pension-system finances.[9]

44. In some countries, debate about a later pensionable age has been framed not only in terms of sustainable pension-system finances but also higher pension levels for retirees than would otherwise be affordable. This benefit can be demonstrated by using annuity rates to calculate pension replacement rates at different pensions ages for a given budget constraint on the pension provider. Such a hypothetical scenario is illustrated in Figure 8 using the OECD pension models. It shows that delaying retirement by five years from age 65 allows for a pension replacement rate of 72%, compared with 60% at 65. (The rate of 60% was chosen because it is approximately the average replacement rate for people with mean earnings in OECD countries.) Conversely, earlier retirement means that the given budget needs to be spread over a longer period. In this case, retiring five years earlier, at age 60 would result in a replacement rate of 52%.

9. See OECD (various years) *Education at a Glance* and Barro and Lee (2001).

Figure 8. The trade-off between the replacement rate and pensionable age



Source: OECD pension models. Annuity rates calculated from mortality data by age from the United Nations Population Division database, *World Population Prospects – The 2008 Revision*.

45. In interpreting the findings of this paper, other reforms to pension systems should be borne in mind. For example, around half OECD countries have taken measures over the past decade, other than increases in pension age, to encourage people to work longer. First, a range of countries – Austria, Belgium, Denmark, France, Greece, Hungary, Italy and Poland (for some worker categories) – have tightened the qualifying conditions for early retirement: the number of years of contributions required or the eligibility age or both. The Netherlands has removed tax incentives for private, occupational early-retirement schemes. Austria, Germany, Italy and Portugal either introduced or raised the level of reductions in benefits for early retirees. Increments to benefits for late retirement were introduced or enhanced in Australia, Belgium, Spain and the United Kingdom. Four countries – the Czech Republic, Finland, France and the United States – adjusted incentives for both early and late retirement.[10] It is also notable that countries have generally refrained from resorting to early retirement schemes to weather the financial and economic crisis.

46. A second significant set of reforms relates to the introduction of schemes that will automatically link the value of pension benefits to life expectancy. Traditionally, pensions were of the "defined-benefit" type, where the value of entitlements depends on some measure of individual earnings and a set of rules. As life expectancy increases, these schemes continue to pay the same benefit per period, and so pay more over a lifetime as the expected duration of retirement grows. By linking retirement benefits to life expectancy, some new schemes will cut benefits per period as people live longer. The objective of these particular schemes is to keep the lifetime cost of paying benefits constant or close to constant regardless of what happens to life expectancy.

47. OECD countries have set up automatic links between benefit values and life expectancy in three ways:[11]

- with defined-contribution plans (Australia, Denmark, Hungary, Mexico, Norway, Poland, Slovak Republic and Sweden);

10. For more details on these changes, see Whitehouse *et al.* (2009), the chapters on pension reforms in OECD (2007, 2009) and Ebbinghaus (2006).

11. For a detailed discussion of these policies, see Whitehouse (2007).

- by adopting notional accounts instead of traditional defined-benefit plans (Italy, Poland and Sweden); and

- by adjusting benefit levels in defined-benefit plans with life expectancy (Finland, Germany and Portugal).

48. In a defined-contribution plan, individuals' retirement benefits depend on the accumulation of contributions and investment returns in their accounts. This is then converted to a pension or "annuity", a stream of pension payments, on retirement. Private annuity providers will reduce the benefit per period for a given accumulation of retirement savings as life expectancy increases. The government makes a similar annuity calculation with notional accounts, which are sometimes called notional defined-contribution (NDC) schemes because of the similarity with defined-contribution plans. Finland and Portugal have retained their existing defined-benefit, public schemes, but will automatically reduce benefits as life expectancy increases.

49. These changes can be seen as a substitute for increases in pension age: it will be possible to continue to retire at the same age over time, even if life expectancy increases, but the pension benefit per period will be lower. Many of these reforms are predicated on the idea that many people will choose to work longer as life expectancy increases to make up for this reduction.

50. To conclude, the key policy question is: "What happens next?" Almost half of OECD countries will increase pension ages over the coming four decades. But in many, the policy is a case of "running to stand still": in only a few will increases in pension age be sufficient to offset future growth in life expectancy, let alone claw-back some of the past extension of life. The expected duration of retirement in 2050 is projected to be 25 years for women and 20 years for men 7-8 years or 50% longer than it was in 1960.

51. In some countries, the pension-policy discourse is already suggesting the possibility of further increases in pension ages to mitigate the impact of continuing rises in life expectancy. For example, the former head of the pension-reform commission in the United Kingdom, Lord Turner, has floated the idea of a further increase in pension age to 70 beyond the increase to 68 already planned. In other countries, the debate over the future pension age has only just started, but if past experience is any guide, many are likely to follow those that have already announced increases in pension ages. Furthermore, the pension-reform discussion in a range of countries has focused on the experience of other OECD members that have introduced automatic life-expectancy links. In the coming years, expect more reforms designed to improve the long-term financial sustainability of pension systems in the face of population ageing.

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