OECD Economics Department Working Papers No. 371

Coping with Ageing: A Dynamic Approach to Quantify the Impact of Alternative Policy Options on Future Labour Supply in OECD Countries

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https://dx.doi.org/10.1787/224538175006

OECD

Unclassified **ECO/WKP(2003)25**

Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

21-Jun-2004

English - Or. English

ECONOMICS DEPARTMENT

ECO/WKP(2003)25
Unclassified

Cancels & replaces the same document of 11 May 2004

COPING WITH AGEING: A DYNAMIC APPROACH TO QUANTIFY THE IMPACT OF ALTERNATIVE POLICY OPTIONS ON FUTURE LABOUR SUPPLY IN OECD COUNTRIES

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JT00166462

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ABSTRACT/RESUMÉ

Coping with ageing: a dynamic approach to quantify the impact of alternative policy options on future labour supply in OECD countries

In the face of the substantial ageing of population expected to occur in OECD countries over coming decades, policies that boost labour-force participation attract considerable interest. There remain large cross-country divergences in participation rates that are largely accounted for by differences in participation of specific groups, in particular prime-age women, older workers and also youth. This suggests that policies targeting these groups could have important effects. The aim of this paper is to examine whether the potential impact of several policy reforms is able to attenuate or to offset the adverse trend in aggregate participation rates that would otherwise occur because of ageing population. It uses a simple dynamic modelling framework that generates longer-term projections of participation rates and labour supplies in OECD countries and alternative scenarios of policy reforms. The main outcome of this analysis is that the combined effect of possible reforms targeting prime-age women, older workers and youth might suffice to stabilize the average participation rate in OECD countries over the next 25 years but will be insufficient to offset the additional reduction of participation likely to be caused by demographic changes beyond 2025.

JEL Classification: J11, J16, J21, J26

Key words: Demographic Trends and Forecasts; Economics of Gender; Labor Force and Employment, Size and Structure; Retirement; Retirement policies

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Faire face au vieillissement : une approche dynamique pour mesurer l'impact d'alternatives politiques sur l'offre future de travail dans les pays de l'OCDE.

Les pays de l'OCDE sont confrontés à un vieillissement important de leur population au cours des décades à venir et ceci explique le regain d'intérêt considérable pour les politiques susceptibles de stimuler la participation au marché du travail. Il subsiste des différences importantes de participation entre les pays de l'OCDE qui s'expliquent en grande partie par des différences de participation de groupes spécifiques, en particulier les femmes dans la force de l'âge, les travailleurs âgés et les jeunes. Ces différences suggèrent qu'il reste une marge de manoeuvre importante pour des réformes de politique économique visant ces groupes. Le but de ce papier est d'examiner si l'impact potentiel d'un certain nombre de réformes est susceptible d'atténuer, voire de compenser, la tendance future à la diminution des taux de participation agrégés telle qu'elle résulterait du vieillissement de la population. Cette analyse utilise un modèle dynamique simple qui génère des prévisions à long terme des taux de participation agrégés et des offres de travail dans les pays de l'OCDE ainsi que des scénarios alternatifs simulant les réformes. Le résultat principal de cette analyse est que l'effet combiné des réformes pour stimuler la participation des femmes, des travailleurs âgés et des jeunes pourrait stabiliser le taux de participation moyen dans les pays de l'OCDE pour les prochaines 25 années mais ne suffirait pas à empêcher une chute probable de participation liée à l'évolution démographique au-delà de 2025.

Classification JEL : J11, J16, J21, J26

Mots Clés : Tendances et Prévisions Démographiques ; Economie de l'Egalité des Sexes; Force de Travail et Emploi, Taille et Structure; Retraite, Politiques des Retraites.

COPING WITH AGEING: A DYNAMIC APPROACH TO QUANTIFY THE IMPACT OF ALTERNATIVE POLICY OPTIONS ON FUTURE LABOUR SUPPLY IN OECD COUNTRIES

By

Jean-Marc Burniaux, Romain Duval and Florence Jaumotte[1]

1. Most OECD countries face a substantial ageing of their population over coming decades. This will put downward pressure on labour supply, with negative implications for material living standards and public budgets. In consequence, policies that boost labour-force participation attract considerable interest. Furthermore, participation is of interest in its own right as increasing the number of individuals involved in the job market may be seen as a way of raising the degree of social cohesion (see Box 1).

2. Large cross-country divergences in participation rates suggest that policies could have important effects. These differences are largely accounted for by differences in participation of specific groups, in particular prime-age women, older workers and also youth. Though cross-country differences in participation decisions of these groups may partially depend on non-economic (cultural, social) factors, they suggest that there remains room to increase participation in many OECD countries by removing the distortions that generate disincentives for these groups to work.

Box 1. Why look at participation rates?

Arguably, labour supply should be measured in terms of hours. By focusing exclusively on a headcount indicator of aggregate participation and leaving aside changes in hours worked, the present study presents a biased picture of the evolution of labour supply. For instance, the number of hours worked annually has declined during the 1990s (by three per cent for the whole OECD average and four per cent in the European Union). Were this decline in hours worked to persist in the future, the participation rates projected in the baseline scenario discussed in Chapter 4 would provide an inflated impression of trends in labour supply.

Nonetheless, there are a number of reasons for focusing on participation rates rather than hours.

First, most of this study relies on data concerning labour supply by age groups that is usually not available in terms of hours worked. Besides, both employment and hours worked are inaccurate indicators of labour supply as they exclude those who are rationed on the hours component of their employment relation as well as those unemployed or inactive who would be willing to work.

Second, part of the differences across countries in hours worked reflect different incidences of part-time work, which can be addressed by data on a head-count basis. Indeed, Chapter 2 of this paper discusses the determinants of part-time female participation.

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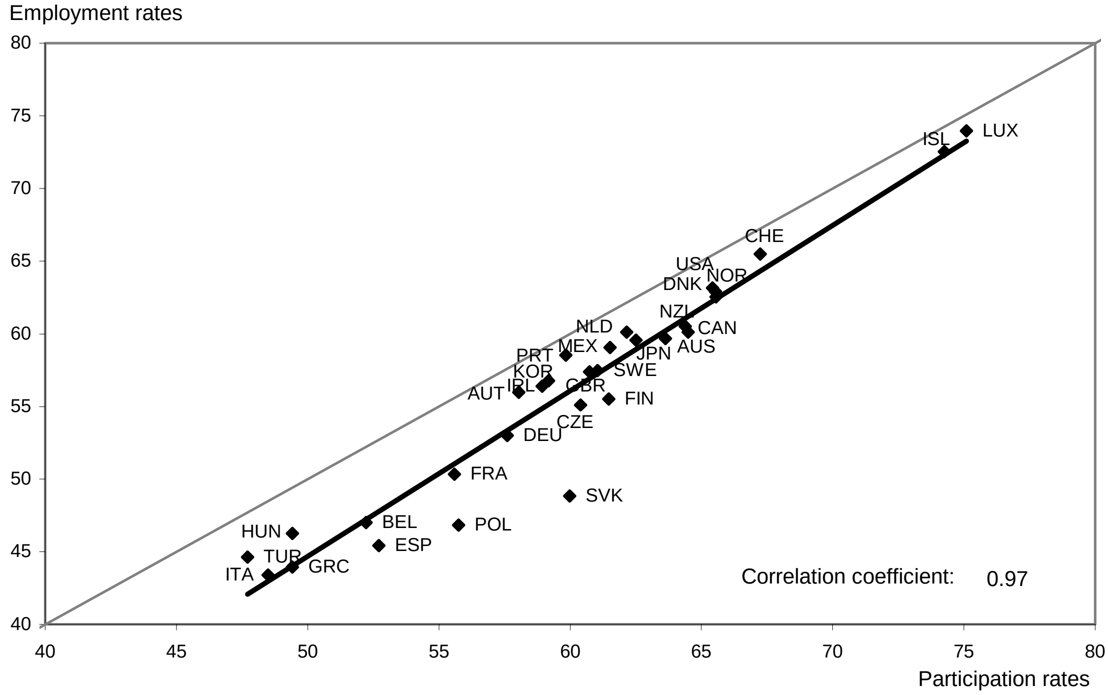
Box 1. Why look at participation rates? Contd.

Third, participation may be of interest in its own right to the extent that having a larger number of individuals involved in the job market is thought to be associated with a higher degree of social cohesion. Furthermore, the fiscal implications of a change in hours worked or participation may not be identical, suggesting that both are of interest.

Figure 1. **Participation and employment rates in OECD countries, 2000**[1]

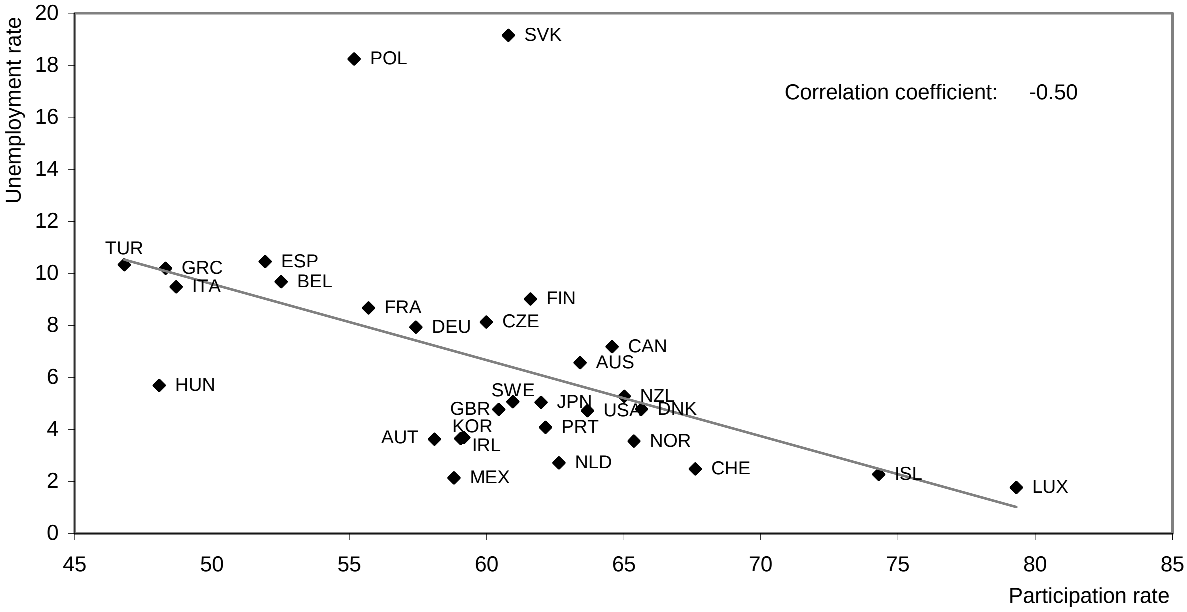


1. Participation rates refer to total labour force divided by population aged 15 and over, employment rates refer to total employment divided by population aged 15 and over.

Source: Labour Force Statistics (Part II).

contd..

Figure 2. **Participation [1] and unemployment rates in OECD countries, 2001**
percentage



1. Participation rates refer to total labour force divided by population aged 15 and over.
Source: Labour Force Statistics (Part II).

A further issue concerning the coverage of this paper is the focus on the supply side of the labour market, with litte consideration of the interaction between demand and supply. Two arguments apply:

- The paper puts the focus on long-term trends and spontaneous market adjustment would normally be expected to translate higher labour supply into increased employment over such a horizon. Indeed, across countries, there is a close and positive correlation between participation and employment rates (Figure 1). Furthermore, unemployment seems to be negatively correlated with participation rates (Figure 3) – at variance with what might be expected under the "lump of labour" hypothesis.

- That said, policy and institutional features may prevent the full adjustment from taking place spontaneously. Where this threatens to be the case, reforms that remove impediments to labour-force participation will have to be accompanied by policy action to allow labour demand to fully respond as set out in the OECD Jobs Strategy.

3. This Working Paper quantifies the potential impact of several policy reforms to increase future participation of these groups. It uses the information that is reported in two others Economic Department Working Papers about the factors underlying the participation of women (Jaumotte, 2003) and older workers (Duval, 2003). This information is incorporated here into a simple dynamic modelling framework in order to generate longer-term scenarios of participation rates and labour supplies in OECD countries.

4. This paper is organised as follows. A first section briefly describes the main trends in participation over the past decades. It serves primarily to put in perspective the future evolution of participation rates, as they are projected in the baseline scenario that is presented in the second section. The third section reports the results of various policy reforms that have been simulated by using the econometric estimates in Jaumotte (2003) and Duval (2003). These involve reforms of the existing pension systems – including a removal of early retirement schemes, a shift towards actuarial neutrality of the old-age pension system and a delay in the normal retirement age – as well as improved incentives for women to participate in the labour market, including tax incentives and expanded child care provision. Although youth participation is given less attention in this paper, an additional scenario simulates a shortening of the school-to-work transition that would increase the level of youth participation in those OECD countries where it is particularly low. The analysis of policy reforms focuses on the supply side of labour markets and does not consider any policy measures that might be necessary if spontaneous market adjustment is impeded from ensuring an expansion of employment in line with additional supply. Likewise, the study leaves aside reforms that could affect international migration flows and alleviate, at least for a transitory period, the demographic effects of population ageing on labour supply.

5. The main results from this analysis are summarized below:

- In many OECD countries, expected demographic developments will lead to significant declines in the growth (and sometimes the levels) of the labour force and aggregate participation rates over the next decades. The overall participation rate could fall by some 4-5 percentage points for the OECD on average between 2000 and 2025. This will be accompanied by an increasing share of older workers in the labour force and a significant increase in old-age dependency ratios.

- By implementing further reforms involving additional work incentives for older workers and women and raising the propensity of youth to combine work and education, it is, however, possible to mitigate, offset or, in some cases, even reverse these adverse demographic effects. While the combined effect of all these reforms might suffice to stabilize the average participation rate over the next 25 years, it will be difficult to offset the additional reduction of participation likely to be caused by demographic changes beyond 2025.

- Reforms with the largest potential effects on participation concern pension systems, particularly those achieving actuarial neutrality of old-age pensions. Additional working incentives for women are also influential and may be politically easier to implement. The relative contributions from reforms affecting, respectively, women and older workers vary across countries depending on initial conditions, with reforms affecting female participation providing the largest contributions in Ireland, Australia, the United States and New Zealand.

- The largest scope for increasing participation by additional reforms is found in France, Korea, Germany, Belgium, Luxembourg, Spain and Portugal. But, in a number of other countries – such as Sweden, Finland, New Zealand, the United States and Canada – the effects of further reforms may not be large enough to prevent a decline in labour participation.

- Overall, the impact of these reforms on participation in the European Union is substantial and would suffice to meet the targets fixed at the Lisbon summit in March 2000, though it is most unlikely that the effects could materialize by 2010, as desired.

1. Past trends

1.1 Aggregate evolutions

6. The aggregate participation rate is usually calculated over the working-age population, comprising individuals aged 15 to 64. This definition is inappropriate for the purpose of this study because first, in many countries the participation of individuals aged 65 and over is substantial; and, second, the impact of pension reforms on the participation of those aged 65 and over could be large (see Duval, 2003). Moreover, the trend increase in life expectancy suggests that the definition of the working-age population should be reconsidered. But most participation data are still based on the usual concept of the working-age population and do not disaggregate individuals aged 65 and over into quinquennal age groups. Therefore, this study calculates average participation rates over an extended population comprising individuals aged 15 and over. This, of course, does not imply that all these individuals are able to work. Compared with the standard definition (see Annex 1), participation rates calculated over this extended population are lower than those referring to the usual working-age population (to the extent that they incorporate an additional age group – 65 and over – with a much lower participation rate) and particularly so for countries where population ageing is more pronounced.

7. For the OECD on average, the labour force has expanded continuously during the past 25 years, with a more pronounced increase in the United States and Canada than in Europe and Japan (Figure 1). Population increase has been the major engine for this growth, although rises in participation rates also played a role. During the 1990s, labour force growth was generally lower than in previous decades and relied entirely on demography, with no further improvement in aggregate participation rates (Table 1).

8. Relative to the OECD average, labour participation has constantly been lower in Europe and higher in Japan (Figure 1). It has increased continuously in United States and Canada, up to the highest level among OECD regions in 2000. Past trends in participation partly reflect the demographic evolution, in particular in Europe and Japan, where some improvement in participation of the population aged 15-64 has been offset by the increasing proportion of individuals aged 65 and above. Finally, in contrast with the rest of the OECD, participation in Eastern Europe has been lower and strongly declining during the 1990s. Among the countries where labour force growth was particularly strong over the 1990s some benefited from both favourable demographics and significant increases in participation rates (Mexico, Ireland, New Zealand) (see Table 1). In some countries where the labour force stagnated or declined, declining participation rates have offset demographic gains (Finland, Denmark, Sweden, Poland). Given the expected unfavourable demographic trends in many OECD countries, as described in the following section, it is clear that future labour force growth will decline in the absence of further progress in participation.

[Figure 1: Participation rates in OECD countries, 1970-2000]

[Table 1: Trends in population and aggregate labour supply in OECD countries]

1.2 Participation rates by age and sex

9. Participation of prime-age males (25-54 years old) is above 90 per cent in a vast majority of OECD countries and varies little across countries (see Figure 2). Hence, divergence of overall participation across countries and over time largely reflect differences for other age and gender groups. Indeed, there are much larger disparities in the participation of women, youths and older workers across OECD countries.

[Figure 2: Participation rates by age and gender groups in OECD countries, 2000]

10. Country-ranking of group-specific participation rates show similarities across different groups (Figure 2)[2]. In other words, countries where participation of one group is lower (higher) also report lower (higher) participation for other groups. This explains in part the large divergence in participation across countries and suggests that certain common economic, social and institutional causes underlie the level of participation of youths, women and older workers. There are a few exceptions, however, that reveal the institutional diversity across countries, such as in France, where participation of youths and older workers is lower than average and where female participation is higher.

11. Aggregate labour-force participation (and its change over time) partly depends on the age (and gender) structure of the population (and their changes). For instance, countries with relatively large (or increasing) proportions of youths, older workers or women in the population will tend to have a lower (or declining) aggregate participation rate, all other things being equal. The analysis of past trends and future evolution of aggregate participation uses a decomposition method based on a version of shift-share analysis that allows distinguishing the contributions of changing demographic structure and shifts in participation of specific sub-groups.

12. Increasing participation of women in the labour market has been the largest component of the increase of the aggregate participation rates over the past decades (Tables 2 and 3). By contrast, male participation has declined in many OECD countries. During the 1990s, the largest declines in male participation were reported in Hungary, Sweden, Poland, Spain, Portugal, the United Kingdom and Turkey (Table 3, column 2). Only in the Netherlands – and to a lesser extent in Norway and Japan – has male participation remained almost unchanged over the past 25 years. In many countries, falling youth participation has been the most influential cause of declining or stagnating overall participation during the 1990s: such as in Portugal, Sweden, the United Kingdom and France. Over the past decades, drops in participation of older workers has been an influential factor too in shaping the evolution of the aggregate participation rate (column 7 in Tables 2 and 3), though to a lesser extent during the 1990s than before, probably reflecting pension (and other) reforms that occurred in a number of OECD countries during this period.

[Table 2: Contributions of demographic changes and group-specific shifts in participation to changes of aggregate participation rates in OECD countries over the period 1975-1990]

[Table 3: Contributions of demographic changes and group-specific shifts of participation to changes of aggregate participation rates over the period 1990-2000]

13. Demographic changes have had a small and overall positive impact on aggregate participation rates over the past 25 years (column 1 in Tables 2 and 3). The mixed pattern of the demographic component highlights the diversity in the timing of population ageing across countries, with a group of countries (Finland, Norway, Spain, Luxembourg, Korea, France and the United States) being at an earlier stage, where the drop of the youth's share in the total population raises the overall participation and another group (including Japan, Germany and Austria) where overall participation falls as the proportion of older workers rises.

1.3 Lifetime allocation of working

14. From a static perspective, the overall participation rate in a given year can be seen as a snapshot showing the number of individuals who participate in the labour force, as opposed to those who are

2. Spearman rank correlation between youths and older workers and women and youths are significantly different from zero (at 5 per cent) but there is no significant rank correlation between women and older workers.

inactive. At the same time, a majority of the latter do not remain inactive during their entire lifetime. They have spells of inactivity during childhood and education, child-rearing for women, and when they retire. In a dynamic perspective, overall participation also depends on the lifetime allocation of participation and, in particular, the ages at which, on average, individuals decide to enter the job market and eventually retire[3]. Calculating the average age of entry into and exit from the labour market requires identifying the lifetime distribution of participation of all the cohorts that coexist in the labour market in a given year (see Annex 2)[4]. Data from Labour Force Surveys on participation by quinquennial age groups allow estimating these average entry and exit ages.

15. Average entry (exit) ages in 2000 are calculated as the average of ages at which individuals enter (exit) the job market, weighted by the distribution of entries (exits) of all the cohorts in existence in 2000. It is then possible to calculate the lifetime allocation of labour and leisure (including schooling and household production) normalised over the life expectancy at birth in each country. On average, for the OECD, men worked 55 per cent of their lifetime in 2000, spent 26 per cent (on childhood and education) before entering the labour force, and 18 per cent in retirement (Figure 3). But, these proportions vary widely across countries, ranging from 47 per cent lifetime activity rate[5] in Belgium to 72 per cent in Mexico. Overall, it is below-average in Continental Europe (around 50 per cent in France, Italy, Germany and Austria) and in Eastern European countries (Hungary and Poland). Countries with above-average lifetime activity rates include the United States, Japan, New Zealand and some European countries (such as Iceland, Portugal, Ireland and Denmark). On average, for the OECD area and even abstracting from temporary spells of inactivity, women worked proportionally less than men in 2000 (48 per cent instead of 55 per cent). But, the ranking of women's lifetime activity rates across countries is similar to that of men.

[Figure 3: Lifetime allocation of labour and leisure across OECD countries, 2000]

16. On average, for the OECD, men and women spend roughly one-quarter of their lifetime in childhood and/or in education[6]. Overall, countries with a longer lifetime activity period tend to have shorter retirement periods and, to a lesser extent, shorter childhood/education periods. Differences in life expectancy, together with differences in pension systems, explain why women spend one-quarter of their lives in retirement, compared with only 18 per cent for men. The longest periods of inactivity for older women are observed in Turkey and Belgium (30 per cent), Austria (28.6 per cent) and Australia (28.3 per cent). By contrast, inactivity periods for older men are relatively shorter in Mexico (three per cent), Iceland (12 per cent), Portugal (12 per cent), Ireland and Japan (15 per cent).

17. During the past decades, lifetime allocation of labour and leisure (or home production) has changed substantially (Table 4). The proportion of their lifetime that men dedicate to work has declined in all OECD countries. The increase in life expectancy by itself is part of the explanation. In many countries,

3 This abstracts from temporary spells of inactivity, for instance during child-rearing for women.

4 . As explained in Annex 2, this calculation has to be based on lifetime distributions of participation, and not on cross-sectional distributions, in order to eliminate the effect of shifts of participation across cohorts. Ideally, lifetime participation profiles should be drawn from longitudinal data that follow the same women over the life-cycle. However, in the absence of such data, "synthetic cohort" data were constructed by combining cross-sectional data at five-year intervals.

5 . The lifetime activity rate is calculated as the proportion of the period in which individuals participate in the labour market, either as employed or unemployed, to the life expectancy at birth.

6 This period also covers child rearing for women. Women enter the job market later than men but, as their life expectancy is higher, the proportion of their lifetime in childhood, child rearing and/or education is about the same as that for men.

this has been reinforced by a lowering of the average effective age of retirement, resulting in a sharp reduction of the proportion of working time (in particular in Turkey and Korea, where the increase in life expectancy over the reference period was larger than in other OECD countries, but also in France and Germany). In all OECD countries, this reduction of the working time proportion for men has been accompanied by an increase in the proportion spent in retirement. In a majority of countries, the proportion of working time for women has declined less than for men and it even increased in Belgium, Greece, Norway and the United Kingdom, probably reflecting the emergence of more educated female cohorts (though the estimation of the working time proportion for women is subject to a bias over time, see Annex 2).

[Table 4: Changes in lifetime allocation of labour and leisure across OECD countries, 1965-2000]

2. Baseline scenario

18. The baseline scenario projects the labour force from 2000 to 2050. In doing so, it combines demographic factors, effects related to cohort dynamics, the projected evolution of several control variables (including unemployment and fertility) and the simulated impact of pension reforms that have been recently undertaken or enacted. The following sections review these different components.

2.1 Demographic and cohort effects

19. In all OECD countries, the demographic projections[7] imply a drastic reduction of the share of children and youth in the total population accompanied by a substantial increase of the proportion of persons aged 55 and above. There are some countries – Eastern European countries, Korea, Mexico and Turkey – where the decline in the proportion of children and youth exceeds ten percentage points from 2000 to 2025 (see Table 5, Panel A). The drop in the proportion of youth is accompanied by a sharp increase in the population share aged 55 and over (Table 5, Panel B). On average, this share is expected to increase by 11 percentage points from 2000 to 2025.

[Table 5: Demographic evolutions in OECD countries, past and projected]

20. Scenarios of participation rates are often based on the assumption that participation by individual age groups remains constant over the future or some explicit assumptions about catching-up of female participation relative to males[8]. However, neither approach is satisfactory as they imply implausible changes in the lifetime profiles of participation rates for individual cohorts (see Annex 3). To deal with this limitation, the approach followed here is dynamic in the sense that it explicitly takes into account lifetime profiles of participation. As a result, the baseline scenario contains an autonomous increase of female participation – referred to as a “cohort effect” - corresponding to the gradual replacement of currently older by younger women, leading in the longer term to a homogenous female population with the same

7 These are based on the most recent demographic projections using national and Eurostat (1999 revision) sources when these are available and United Nations sources by default (UN World Population Prospects, 1950-2050 (The 2000 Revision), February 2001). Assumptions about migration vary across countries, depending on projections made by national authorities that in all cases correspond to “medium” variants and so usually incorporate an assumption of migration continuing at some historical average level.

8 For instance, the baseline scenario used here differs from the one used in previous work of the Economic Department on ageing (see Dang, Antolin and Oxley, 2001) in that it is based on more recent demographic projections and incorporates cohort dynamics for both men and women.

individual characteristics as women who entered the labour force in 2000 (see Annex 3).[9] It should be noted that this assumption is more restrictive than assuming catching-up of women's participation towards male levels, or levels in countries where women participation is higher as it implies no further modification of women individual characteristics beyond those of the last cohort in 2000.

2.2 Projected changes in control variables

21. Participation of the various age groups is sensitive to the unemployment rate. The baseline scenario contains the assumption that unemployment rates will converge towards the estimated NAIRU in the medium term (2005). Therefore, this incorporates the impact of recent labour-market reforms on structural unemployment.[10] The change in the aggregate unemployment rate is spread out uniformly across all age categories[11] and its impact on sub-group participation is then calculated by using specific elasticities. The impact of unemployment change on the participation rates of older workers is calculated using the coefficients estimated in Duval (2003) (as presented in Model B of Table 2). The impact of changes in unemployment on female participation is twofold: for example, if actual unemployment in 2000 is above the NAIRU and declines in the medium term for both women and men, the decline in female unemployment will encourage women to enter the labour force, whereas the decline in male unemployment will have the opposite effect[12]. The net effect on participation is calculated by using the coefficients estimated in Jaumotte (2003) (as reported in Model II of Table 8)**.** Finally, the impact of overall unemployment on youth participation is derived using the coefficients estimated by Bertola, Blau and Kahn (2002)[13].

22. The demographic projections that underlie the baseline scenario imply future changes in fertility and, as shown in Jaumotte (2003), these changes are likely to affect female participation over and above the cohort effects. In many countries, the projections show a recovery of women's fertility during the period 2000-2025 and the corresponding decline in participation is calculated by applying the coefficient estimated in Jaumotte (2003) (Model II in Table 8).[14]

9 Similarly the baseline incorporates a negative "cohort effect" for men but in a large majority of country, this effect is negligible.

10 With the exception of a few countries where this estimate is not available and the current NAIRU has been used instead.

11 . Though a change in aggregate unemployment is likely to affect some categories (for instance, youths) more than others.

12 . Some women may leave the labour force as their husbands become employed.

13. And assuming that, over the long term, changes in employment correspond to changes in participation.

14 An additional problem arises from the fact that the cohort effect already reflects some fertility change that has to be disentangled from the overall fertility change embodied in the demographic projections in order to avoid double-counting. For simplicity, it is assumed that the child ratio (measured as the ratio of the number of children aged 14 or below to the number of women aged 15-64) associated with the cohort effect corresponds to the one simulated by assuming that the fertility rate of young women in 2000 (calculated as the ratio of the number of children aged 0 to 4 to the number of women aged 15-34) remains constant in the future. This is consistent with the interpretation that the cohort effect for women corresponds to the gradual convergence through time towards the individual characteristics of the last cohort entering the job market in 2000. The additional fertility change implied by the demographic projection is then calculated as the difference between the child ratio from the demographic projections and the one simulated with constant fertility in 2025.

2.3 Impact of recent pension reforms

23. The baseline scenario incorporates the potential participation effects of a number of recently (*i.e.,* since 1999) enacted pension reforms, including reforms of early retirement schemes that will be phased in gradually.[15] Annex 4 describes for each country which ongoing factors affecting early retirement incentives are included in the construction of the baseline scenario.[16]

24. In order to estimate the potential participation effects of recent reforms, implicit tax rates for each of the three ages 55, 60 and 65 and standard retirement ages once recently enacted reforms are fully phased-in (*i.e.,* post-reform) are compared with those prevailing in 1999 (*i.e*., pre-reform). The potential impacts on participation of these changes are estimated by using the coefficients from the econometric regressions reported in Model B of Table 2 in Duval (2003). Finally, adding the resulting participation effects of recent reforms to pre-reform participation rate levels in the baseline scenario yields post-reform participation rates.[17]

25. The expected effects on participation rates of recent reforms appear to be rather small in most OECD countries, mainly because few major reforms have been enacted. Italy is a noticeable exception, where the gradual move towards the "new" pension system is expected to raise the labour force participation rate of the 55-64 age group by almost eight percentage points by 2025, *ceteris paribus*. Other noticeable positive impacts are projected in the Czech Republic, Greece, the United States and Turkey, due to ongoing or scheduled increases in standard retirement ages. In Finland, the recent package of reforms to both old-age pensions and early retirement provisions should also significantly raise the attachment of older workers to the labour market. Conversely, the maturation of the old-age pension system in Korea and, to a lesser extent, the maturation of the Superannuation Guarantee Scheme in Australia, should reduce participation rates over 1999-2025.

2.4 Labour force and participation rates in the baseline scenario, period 2000-2025

26. The labour force in the OECD area, as projected in the baseline scenario, should increase by almost five per cent from 2000 to 2025 (Column 8 of Table 6, Panel A) but developments are quite different across countries. While in Japan, Austria, Finland and some Central European countries, the

15 In some cases -most importantly Korea, they also include the future impact of the maturation of pension schemes.

16 For countries not covered in the modelling of early retirement incentives (Czech Republic, Denmark, Greece, Hungary, Mexico, Poland, Slovak Republic, Turkey), no attempt is made at assessing the future effects of recent reforms and/or the maturation of pension systems on implicit tax rates and labour force participation. However, the impact of recent or projected changes in standard retirement ages is incorporated (Czech Republic, Greece, Turkey and Denmark).

17 The introduction of recent reforms in the baseline scenario is based on a number of simplifying assumptions. First, it assumes that implicit tax rates and participation elasticities are the same for both males and females, which is unlikely to be true. As discussed in Duval (2003), labour supply is likely to be more elastic for women. In addition, ceilings and tapers for joint pensions exist in many countries, thereby creating higher implicit tax rates for women than for men (Holzmann *et al.*, 2003). Second, labour supply effects of standard retirement ages are assumed to be similar between in-sample and out-of-sample (Czech Republic, Greece, Turkey) countries, and for the latter the impact of rising standard retirement ages on labour force participation via their effect on implicit tax rates is omitted. Third, all participation effects of ongoing changes in retirement incentives are assumed to materialize by 2025, even though some recent reforms will continue to be phased in beyond this date (*e.g.* the move to the "new" pension system in Italy, the increase in the standard retirement age for women in Austria). Finally, only reforms implemented since 1999 are taken into account. In other words, this assumes that reforms implemented before 1999 have no effect beyond this year.

labour force is projected to fall up to a maximum of 17 per cent points in Hungary, it is projected to increase by 60 per cent in Mexico and more than 30 per cent in Ireland. In other countries, such as the United States, Australia, Iceland, Luxembourg, Turkey, Canada, New Zealand and Norway the labour force is projected to increase by more than ten per cent. Overall, the prospects in European countries are mixed, ranging from modest drops in Nordic countries, France, Germany and Italy to gains in Spain, Portugal, Greece, the Netherlands and the United Kingdom.

27. The projected development in total population (column 7 of Table 6, Panel A) is the most important factor explaining the change in labour supply. But in a number of countries, participation rates decline significantly, leading to a significant decline in labour supply (Hungary, Czech Republic, Japan, Austria, Poland, Finland). Other countries still record significant increases in labour supply, despite large projected declines in participation (Australia, Canada, New Zealand).

28. Demographic (*i.e.,* compositional) changes are by far the largest single force behind the fall in aggregate participation rates and reduce participation on average by around six percentage points (Column 1 of Table 6, Panel A).[18] The "cohort effect" is the second most important factor in determining the evolution of aggregate participation rates (Column 2 of Table 6, Panel A). This effect mostly reflects higher female participation in currently younger cohorts and contributes, on average, for the OECD to an increase by 1.4 percentage points of aggregate participation. High positive female cohort effects are projected in Ireland, Luxemburg, the Netherlands, Greece and Spain. By contrast, negative cohort effects lower both male and female participation in Central European countries and there is a very strong – and possibly exaggerated – negative cohort effect in Turkey.

29. By comparison, the impact of the other effects in the baseline scenario, such as changes in unemployment, fertility and recent reforms, is relatively small. As the initial year – 2000 – corresponds to a cyclical peak, there is little gain in participation expected from the convergence towards the NAIRU (Column 3 of Table 6, Panel A). Column 4 of Table 6, Panel A confirms that the estimated impact of recent pension reforms is small in all countries with the exception of Italy. For the OECD as a whole, these gains are offset by lost participation due to maturing pension regimes in Korea and the removal of the possibility to combine earnings from job and pension benefits in Sweden. Finally, demographic projections imply some recovery of fertility in many "higher income" OECD countries (Column 5 of Table 6, Panel A). This will contribute negatively to female participation, particularly in Spain, Sweden and Finland.

[Table 6: The baseline scenario: projected evolution of aggregate labour supply (aged 15 and over) and contributions of various factors]

2.5 Dependency ratios in the baseline scenario, period 2000-2025

30. The old-age dependency ratio is usually calculated as the ratio between the population aged 65 and over and the working-age population (population at age 15-64 or sometimes 20-64). However, this ratio poorly approximates the degree of dependency to the extent that many people of working age are inactive while, at least in some countries, many people aged 65 and over are still active. Therefore, an

18 For reference, Annex 5 provides results for the baseline using the standard definition of the working-age population. Annex 6 shows a complete decomposition of the changes of participation rates in the baseline scenario into demographic and group-specific participation changes.

alternative indicator is used here – the ratio of the inactive population aged 65 and over to the total labour force (aged 15 and over) – which better reflects the "true" level of old-age dependency.[19]

31. On average for the OECD, the old-age dependency ratio thus defined increased moderately, from 23 per cent to 26 per cent during the 1990s but a sharp increase to 42 per cent is projected until 2025 (Table 7).[20] Old-age dependency ratios are set to reach high levels in 2025 in many European and, in particular, Central-European countries. In contrast, they remain moderate in Mexico, Iceland, Turkey, Ireland, Portugal and the United States.

32. An indicator of the "greying" of the labour force is provided by the share of workers aged 55 and over in the labour force (aged 15 and over). While this ratio has remained more or less stable during the 1990s, it is projected to increase sharply from less than 12 per cent to 18 per cent for the OECD on average by 2025. In several OECD countries, in particular Korea, Italy, New Zealand and Spain, the share of older workers in the labour force is projected to increase by around ten percentage points or more and in Korea and Japan older workers will account for almost 30 per cent of the labour force in 2025.

33. The overall dependency ratio (calculated as the ratio of the whole inactive population – children included – to the labour force) declined on average during the 1990s, reflecting the reduction in the number of children and the increasing participation of women, but is projected to increase again to the level it had in 1990 by 2025. In 2000, the inactive population exceeded the active one by more than a third in Turkey, Belgium, Italy and Hungary. By 2025, Luxemburg, Austria, Poland and France will join this group. Large increases of overall dependency are also expected in Korea, the Czech Republic, Sweden and Finland. At the other end, a combination of high positive female cohort effects, declining proportion of children and relatively moderate ageing contributes to falling overall dependency in Mexico, Southern European countries (Greece, Italy and Portugal), Iceland, Ireland and Belgium.

[Table 7: Dependency ratios and proportion of aged workers in the baseline scenario]

2.6 Evolution of participation and dependency rates over the longer term

34. The baseline projection embodies a further deterioration after 2025. From 2025 to 2050, the total labour supply for the whole OECD area should drop by nine per cent (Table 6, Panel B). The major force driving this fall is the persistence of the demographic (*i.e.,* compositional) changes, while the total population (aged 15 and over) would slightly decline (instead of increasing by 13 percentage points over the previous 2000-2025 period). Furthermore, no further positive cohort effect is projected to take place after 2025.[21] In a majority of countries, the negative impact of the demographic changes is attenuated during the 2025-2050 period compared with the previous decades, with the exception of Central European countries, Mexico, Turkey, Iceland, Korea and Portugal.

35. Consistent with this evolution, the old-age dependency ratio on average for the OECD will rise still further after 2025, though at a lower pace than during the previous decades. It is projected to reach

19 In most countries the old-age dependency ratio based on demography underestimates the "true" level of dependency. For instance, in Belgium, the old-age dependency ratio based on demography was equal to 32 per cent in 2000 while the ratio calculated by taking into account participation was equal to 48 per cent. Table 1 in Annex 5 provides results expressed using the standard definition of the old-age dependency ratio.

20 This implies that in 2000 one (inactive) pensioner was supported on average by 3.8 members of the labour force (including those over 65) while by 2025 one pensioner will be only supported by 2.4 workers.

21 . As all older cohorts have been eliminated and no further change of participation is assumed for cohorts entering the job market after 2000 (see Annex 3).

60 per cent in 2050, compared with 26 per cent in 2000 (Table 7). The rise of the average overall dependency ratio will accelerate after 2025, mostly reflecting the absence of any further gains in female participation in the longer term together with a persistent recovery of fertility.

3. Potential impact of policy reforms on future participation and dependency

36. Further policy reforms (over and above those enacted already) can mitigate or even reverse the adverse evolution described in the baseline scenario. This section assesses the specific (and relative) impact of selected reforms, using the econometric estimates in Duval (2003) and Jaumotte (2003).

3.1 Pension reforms

37. Three potential pension reforms have been simulated to assess the impact on labour-force participation of older workers: *i)* a removal of early retirement schemes; *ii)* a move towards actuarial neutrality of old-age pension systems; *iii)* a convergence of standard retirement ages to 67 (*i.e.* currently the highest age level among OECD countries). The three reforms are simulated cumulatively[22], using the coefficients in the panel data regressions (Model B, as presented in the Table 2 of Duval (2003)), beginning with the removal of early retirement systems (scenario Reform 1). Then, the shift of old-age pension systems to actuarial fairness is simulated by removing the remaining implicit tax on continued work and the corresponding impact on participation (scenario Reform 2). Finally, the impact on participation of the change of standard retirement age is estimated. The detailed methodology is discussed in Annex 7. However, as discussed in Duval (2003), panel data estimates such as those presented in Table 2 may underestimate the "true" long-run participation elasticities with respect to implicit tax rates. They are used here to simulate a "low-case" policy scenario. Alternatively, coefficients from simple bivariate regressions (reported in Figure 7 and 8 of Duval(2003)), whose magnitude is more in line with the elasticities typically found in the micro-econometric literature, are used to construct the "high-case" scenario.

3.2 Improving conditions for female labour participation

38. Three policy scenarios are considered that could potentially increase the labour force participation of women by modifying their incentives to work part- and full-time. In a majority of OECD countries, the average tax rate on second earners is higher than on single individuals. In the first scenario, the impact of an equal tax treatment (at 67 per cent of APW) on the full-time participation of women is simulated using the coefficients estimated in the model of full-time participation reported in Table 8 of Jaumotte (2003). The second scenario considers the impact of public child care expenditures on the full-time participation of women. In one version – "low case" – public expenditures per child are set to the OECD average in those countries where it is currently below average. Alternatively, the corresponding "high case" version sets public expenditures in all countries equal to the highest observed level among OECD countries (Denmark). Finally, the third scenario concerns the incentives for women to work part-time. In most OECD countries, sharing work among spouses implies an increase of household disposable income. But, the magnitude of this increase varies across countries depending on different fiscal treatment of part- relative to full-time work. This scenario assumes fiscal convergence towards the country where the increase of disposable income from work sharing is largest.[23] The impact on women's part-time participation is calculated by using the coefficients estimated in the model of part-time participation in

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22. And assuming that the impact of the reform increases linearly up to its full magnitude in 2025.

23. The way this convergence is simulated disregards differences in earnings of men and women in full and part-time jobs respectively, as well as the impact t of tax treatment of social benefits received by the household (see Annex 8).

Table 8 (see Jaumotte, 2003). The three scenarios are simulated cumulatively under the constraint that female participation rates cannot exceed those of males. The results of these scenarios are reported in Annex 8.

3.3 Overall impact of reforms

39. The overall impact of the policy reforms focused on participation by women and older workers is reported in Table 8.[24] This table also contains the results of a more ad hoc scenario in which youth participation converges towards the current level in the United States (used here as a reference[25] because the high educational achievement in the United States suggests that participation does not come at the price of reduced investment in human capital but as a result of greater efficiency in this respect. (See Section 1 in OECD, 2003).

[Table 8: Impact of policy reforms on future participation rates, 2000-2025]

40. The combined effect of all measures (including the increase in youth participation) would be sufficient, on average, to offset or even reverse the decline of the aggregate participation rate until 2025 in the baseline scenario (by 4.3 percentage points). In the low-case scenario**,** the aggregate participation rate would increase by 0.6 percentage points, and in the high-case, the increase would amount to 2.8 percentage points. Of course, the validity of this outcome is subject to the uncertainty surrounding the baseline projections, in particular, the fact that no autonomous increase of early retirement incidence has been incorporated in this projection[26]. These results also exclude any general equilibrium effects, in particular those arising from induced additional net budgetary costs and their financing (see Box 2).

24 For reference, Annex 9 reports the main results of the scenario simulating policy reforms using the standard definition of the working-age population (ages 15-64).

25 This scenario assumes that in countries where youth's participation is below its level in the United-States, the corresponding gap is cut by half in 2025.

26 Although some studies suggest that such an increase has taken place in the past (*e.g.* Johnson, 2000; Costa, 1987).

Box 2. Budgetary implications of higher female participation

Table 1 shows for selected countries the implied budgetary cost of increasing childcare subsidies (per child) to the OECD average (Panel A) and to the maximum value observed in Denmark (Panel B) respectively. The increase in childcare subsidies (column 1) leads to an increase in full-time participation (column 2), which results in higher tax revenues (columns 3 or 4), thereby reducing the net budgetary cost. The increase in income tax revenues embodies several assumptions. First, all new participants are assumed to find a job. Second, the new female workers are assumed to earn either 67 per cent of APW (column 3) or 100 per cent of APW (column 4). Third, the applied tax rate is the corresponding average tax rate for a married woman whose husband earns 100 per cent of APW and with two children.

Under the scenario where public childcare spending per child is set at the average OECD level, the net budgetary cost is relatively low, with a maximum of 0.5 percentage point of GDP for Korea. The net cost is even negative in Turkey. Under the extreme scenario where public childcare spending per child is set at Denmark's level, the net budgetary cost is expectedly higher, ranging between 1 and 2 percentage points of GDP. The net cost per point of participation (column 7) is much higher than in Panel A, reflecting diminishing returns in the effect of childcare subsidies on female participation.

These calculations are illustrative only. They do not incorporate other budgetary costs (*e.g.* from lowering taxation on second earners) nor all general equilibrium effects that will depend, inter alia, on how the net budgetary costs are financed.

Table 1: Net budgetary cost of an increase in childcare subsidies, selected countries, 2025

Panel A: Increase to the OECD average spending per child

Country	Increase in childcare subsidies as % GDP[a]	Increase in full-time participation (percentage points)[b]	Increase in tax revenues (67 % APW)[c]	Increase in tax revenues (100 % APW)[c]	Net budgetary cost (67 % APW)	Net budgetary cost (100 % APW)	Net budgetary cost per percentage point of participation (100 % APW)
Korea	0.8	8.3	0.1	0.3	0.6	0.5	0.06
New Zealand	0.6	3.8	0.2	0.2	0.5	0.4	0.10
Australia	0.4	3.0	0.2	0.3	0.3	0.1	0.04
Turkey	0.4	2.5	0.4	0.6	0.0	-0.2	-0.09
Portugal	0.3	2.1	0.0	0.1	0.3	0.3	0.13
Canada	0.3	2.0	0.1	0.2	0.1	0.1	0.03
Spain	0.3	2.0	0.1	0.1	0.2	0.2	0.09

Table 1: Net budgetary cost of an increase in childcare subsidies, selected countries, 2025 contd.
Panel B: Increase to Denmark's spending per child

Country	Increase in childcare subsidies as % GDP[a]	Increase in full-time participation (percentage points)[b]	Increase in tax revenues (67 % APW)[c]	Increase in tax revenues (100 % APW)[c]	Net budgetary cost (67 % APW)	Net budgetary cost (100 % APW)	Net budgetary cost per percentage point of participation (100 % APW)
New Zealand	2.7	7.3	0.3	0.5	2.4	2.2	0.30
Portugal	2.3	6.9	0.1	0.2	2.2	2.1	0.30
Australia	1.9	6.4	0.3	0.6	1.6	1.3	0.20
Spain	1.8	6.2	0.2	0.3	1.6	1.5	0.24
United States	1.7	5.4	0.2	0.3	1.5	1.4	0.26
Netherlands	1.5	2.3	0.1	0.2	1.4	1.3	0.58
Japan	1.2	4.2	0.1	0.1	1.1	1.1	0.25
France	1.2	2.2	0.1	0.1	1.1	1.1	0.49

Notes:

a) The increase in total public childcare spending is calculated using demographic projections of the number of children under primary school age in 2025.
b) The percentage point increase in the full-time participation of women aged 25-54 years is expressed relative to the participation rate projected in the baseline for 2025.
c) The increase in tax revenues assumes that all new participants find a job and earn either 67 per cent (column 3) or 100 per cent (column 4) of APW. The applied tax rate is the average tax rate for married woman whose husband earns 100 per cent of APW, and with two children. The APW earnings, cost of childcare and GDP are from 1999, while the tax rate is from 2000-2001.

Source: OECD estimates.

41. Pension reforms account for the largest impact and, among pension reforms, the shift towards actuarial neutrality (after early-retirement schemes have been eliminated) is most influential. However, the uncertainty about the effect of pension reforms is large as the impact in the high case (an increase by four percentage points on average) is double that in the low case. Increasing women’s incentive to work also has a significant impact on overall participation rates – almost equal on average to that of pension reforms in the low case. These gains should be seen in light of the fact that increased work incentives for women may be politically far easier to implement.

42. These simulated policy reforms affect individual countries to different degrees. First, there is a group of countries with a significant fall in labour-force participation in the baseline scenario where the potential impact of policy reforms is quite large. This group includes France, Korea, Japan and Germany. For instance, if all the reforms were implemented, labour participation would increase in France and Germany, whereas in the other countries the decline would be much smaller than projected in the baseline scenario. There is another group of countries including Spain, Portugal, Luxembourg, the Netherlands, Belgium and Italy where reforms also have relatively large effects but where the baseline reductions in labour participation are smaller. Thus, if these countries would implement the reforms, labour participation

could increase significantly. But, there remain several countries – including Sweden, Austria, Finland, New Zealand, Canada and the United States – where the potential impact of policy reforms is more moderate and may not suffice to offset the adverse consequences of demographic shifts on participation. By contrast, the impact of these reforms on participation in the EU is substantial and would suffice to meet the targets fixed at the Lisbon summit in March 2000, though it is most unlikely that this could be achieved by 2010, as desired (Box 3).

Box 3. Impact of structural reforms in the context of the 2000 Lisbon Summit

In March 2000, the EU member countries agreed to fix targets on aggregate, women and older worker employment. The total employment rate (of those aged 15 to 64) was suggested to increase between 2000 and 2010 on average by 6½ percentage points to 70 per cent, the employment rate of women by around six percentage points to 60 per cent, and the employment rate of older workers by 12 percentage points to 50 per cent. Though the scenarios discussed in this Chapter are expressed in terms of participation and not employment, they can help to assess whether the targets of the Lisbon Summit may be reached or not.

The following Table shows that, in the absence of any reform (as in the baseline scenario), the Lisbon target could be met for women if their unemployment rate is cut by half – in addition to the underlying rising trend caused by the cohort effect - but it is unlikely that the target for older workers could be achieved by 2010. The reform package simulated in the policy scenario suffices to meet the target for women employment, but the target for older workers may still be missed; it will only be achieved in the high case and only under the condition of an unrealistic cut (by half) of the older workers' unemployment rate. However, in accordance with the reform scenario, the target for older workers could finally be reached, but only by 2015 to 2020[27]. Thus, though this hypothetical reform package would, in principle, suffice to meet the Lisbon target over the longer term, the inertia inherent to any pension reform makes its implementation timing overly ambitious unless even stronger measures than in the reform package are implemented.

Table 1. **Participation rates in the European Union**

Low case

	2000	2010	2025
Total 15-64	69.8	73.9	77.1
Women 15-64	60.3	67.5	73.6
Total 55-64	42.4	48.8	55.9

High case

	2000	2010	2020
Total 15-64	69.8	74.6	79.3
Women 15-64	60.3	68.3	76.0
Total 55-64	42.4	51.9	63.7

Baseline

	2000	2010	2020
Total 15-64	69.8	71.5	71.1
Women 15-64	60.3	63.6	64.2
Total 55-64	42.4	46.3	49.6

43. With all reforms implemented, the average old-age dependency ratio for the OECD which is projected in the baseline scenario to increase by 14.7 percentage points would still increase by seven percentage points in the high case and nine percentage points in the low case (Table 9). Countries where the effects of reforms on old-age dependency ratios are most pronounced involve several European countries, Korea and Japan. Pension reforms also contribute to increase the proportion of aged workers in

27. This reflects the assumption that the full impact of pension reforms takes 25 years to materialize.

the labour force (by three and 5.5 percentage points on average for the OECD in the low and high cases). With all reforms implemented the share of older workers is significantly higher than in the baseline (nine and 11 percentage points in the low and high cases, respectively). Finally, reforms also have a significant impact on overall dependency ratios. In the baseline scenario, an average increase by almost 9 percentage points is projected but, if these reforms were implemented, overall dependency ratios would fall (by 9 and 15.6 percentage points in the low and high cases, respectively). Again, reforms of pension systems would have the biggest impact on these ratios but the effects of removing disincentives to female participation and improving youth access to work are also important.

[Table 9: Impact of policy reforms and future dependency ratios (2000-2025)]

44. While the combined effect of all reforms would suffice to stabilize the average participation rate during the next 25 years, it would likely fail to offset the additional deterioration due to the change in the demographic structure that will take place after 2025, even in the high-case scenario (Table 10). Over the next fifty years, the average participation rate of the OECD area would drop by 1 and 3 percentage points in the high- and low-cases, respectively. Over this longer time horizon, the impact on the average old-age dependency ratio would be even more modest with an increase by 17.5 percentage points in the high-case and 20.5 percentage points in the low-case (against 28 percentage points in the baseline scenario) (Table 11). Thus, reforms would have to go even further than what has been simulated in this hypothetical scenario if participation rates are to be stabilised during the next fifty years

[Table 10: Impact of policy reforms on future participation rates, 2000-2050]

[Table 11: Impact of policy reforms and future dependency ratios (2000-2050)]

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ANNEX 1

PARTICIPATION AND DEPENDENCY RATES ACROSS OECD COUNTRIES AND THEIR PAST EVOLUTION USING ALTERNATIVE DEFINITIONS OF THE WORKING-AGE POPULATION

45. The following Table 1 provides a comparison of participation and old-age dependency rates calculated by using the standard definition of the working-age population (aged 15 to 64) and the alternative definition used in this paper, *i.e.*, aged 15 and over.

46. The new definition yields aggregate participation rates that are lower on average than with the standard definition: 61 per cent instead of 71 per cent for the whole of OECD. Also, with the new definition the aggregate participation rates tend to increase less, reflecting the trend increase of the proportion of individuals aged 65 and over in the total population.

47. Using a reference-population aged 15 and over leads to higher old-age dependency ratios: 25 per cent against 19 per cent with the standard definition. The evolution of old-age dependency ratios with the standard and new definition is rather similar on average, though there are divergences in some countries.

Table 1. **Participation and dependency rates across OECD countries and their past evolution using alternative definitions of the working-age population.**

	Participation rates				Old-age dependency ratios			
	Levels in 2000 (per cent)		1990-2000 (percentage point changes)		Levels in 2000 (per cent)		1990-2000 (percentage point changes)	
	population aged 15 to 64	population aged 15 and over	population aged 15 to 64	population aged 15 and over	population aged 15 to 64[1]	population aged 15 and over[2]	population aged 15 to 64	population aged 15 and over
Australia	73.8	63.3	0.8	0.1	18.3	23.0	1.6	1.5
Austria[3]	70.6	58.0	-0.2	-0.7	22.9	31.2	0.6	1.3
Belgium	65.2	52.3	6.5	4.0	25.5	38.3	3.5	1.4
Canada	76.3	65.9	-0.3	-1.2	17.4	21.1	1.7	2.3
Czech Republic[5]	71.6	60.4	-0.5	-1.0	19.8	26.3	0.6	1.6
Denmark	80.0	65.5	-2.4	-2.6	23.0	27.8	-0.5	1.9
Finland[6]	74.3	66.4	-2.3	-2.9	12.6	16.2	1.1	2.2
France	68.0	54.8	2.0	0.0	24.7	35.7	3.2	4.1
Germany	72.2	58.4	2.9	1.0	24.8	33.1	2.8	2.6
Greece	63.0	50.0	3.9	0.1	29.1	42.7	7.4	9.7
Hungary[6,7]	60.2	53.5	-4.2	-4.8	13.3	21.3	1.1	4.2
Iceland[4]	86.6	76.3	4.5	2.1	18.3	16.3	1.3	2.1
Ireland	67.4	58.9	7.4	6.9	16.7	22.3	-2.0	-5.2
Italy	60.3	48.5	0.8	-1.0	26.1	41.3	4.6	6.7
Japan	72.5	62.4	2.4	-1.0	25.2	24.9	8.0	7.4
Korea	64.3	60.7	1.4	0.7	11.2	11.8	2.9	2.3
Luxemburg	64.2	53.4	4.1	3.4	20.9	31.8	-0.1	-2.2
Mexico[4]	62.3	59.8	2.4	2.0	8.7	9.2	0.8	0.6
Netherlands	74.6	63.3	7.9	6.7	18.7	24.1	0.9	-2.0
New Zealand	75.2	65.4	2.2	1.6	17.1	20.6	1.0	0.3
Norway[6]	80.7	73.5	3.5	4.0	11.6	12.5	-3.3	-2.8
Poland[7]	65.8	56.6	-3.6	-5.1	18.9	25.8	2.7	6.5
Portugal	71.1	61.5	0.2	0.2	22.3	24.1	2.6	0.7
Slovakia[3]	69.9	60.1	0.6	0.2	16.7	23.5	0.5	0.6
Spain	66.7	53.8	5.8	3.7	24.6	36.1	1.9	0.1
Sweden[6]	78.9	70.8	-5.8	-3.6	13.3	14.9	-2.3	-1.7
Switzerland[4]	80.5	67.4	0.9	-1.1	22.7	24.9	1.7	3.3
Turkey	51.8	49.2	-7.6	-7.4	8.8	13.1	1.1	3.1
United Kingdom	76.6	63.1	-1.2	-0.9	23.3	28.4	-0.3	0.2
United States	77.2	67.2	0.7	0.6	18.5	20.2	0.2	-0.3
OECD unweighted average	70.7	60.7	1.1	0.1	19.2	24.8	1.5	1.8

1. Defined as the ratio of the population aged 65 and over to the population aged 15 to 64
2. Defined as the ratio of inactive individuals aged 65 and over to the total labour force aged 15 and over
3. Changes over the period 1994-2000
4. Changes over the period 1991-2000
5. Changes over the period 1993-2000
6. Population aged 75 and over excluded
7. Changes over the period 1992-2000

ANNEX 2

AGE AND COHORT EFFECTS IN THE DYNAMICS OF ENTRY AND EXIT FROM THE LABOUR MARKET

Cross-sectional and lifetime participation profiles

48. The Labour Force Statistics (LFS) publish for each year data on population, employment and unemployment by quinquennal age groups (reference). These data make it possible to draw cross-sectional (or cross-cohort) participation profiles for a given year, such as the one in bold in Figure 1 that reports the participation rates of women by age groups in the Netherlands in 2000. This profile is cross-sectional in the sense that it compares participation rates of women born at different periods of time, i.e., belonging to different generations or cohorts. For instance, between ages 30-34 and 55-59, the participation rate of women falls substantially (from 70 per cent to 40 per cent). However, this cannot be interpreted as an indicator of the propensity of retiring between 30-34 and 55-59 because it compares women born at different periods of time – 1966-70 and 1941-45 respectively – and it is reasonable to think that women born during World-War II had different individual characteristics than women of the 1960s.

49. This is confirmed when looking at the lifetime profiles of participation of women born in different periods[28]. For instance, in Figure 1, the participation rate of women aged 30-34 who were born in 1941-45 was much lower (30 per cent) than the corresponding rate for women of the same age in 2000 (more than 70 per cent). Moreover, lifetime profiles of women's participation in the Netherlands have evolved over time. Both their shape and specific level of participation have changed. Typically, women's participation declined after 24, as they have children, and rose again after 34 as they come back to work after having raised their children. These shifts tended to vanish for women of more recent cohorts, possibly reflecting better opportunities to work part-time. In the meantime, the participation of younger women (15-19) has fallen across cohorts, as their schooling attendance increased. Overall, lifetime participation profiles of past cohorts were more or less parallel and shifting upward over time. Such an upward shift is observed in many, but not all, countries. It is associated, *inter alia*, with cohort-specific individual characteristics, such as the number of children and the level of education. All other things being equal, women of more recent generations have a higher rate of participation, because they have less children on average and a better level of education, though unobserved socio-cultural factors likely matter too.

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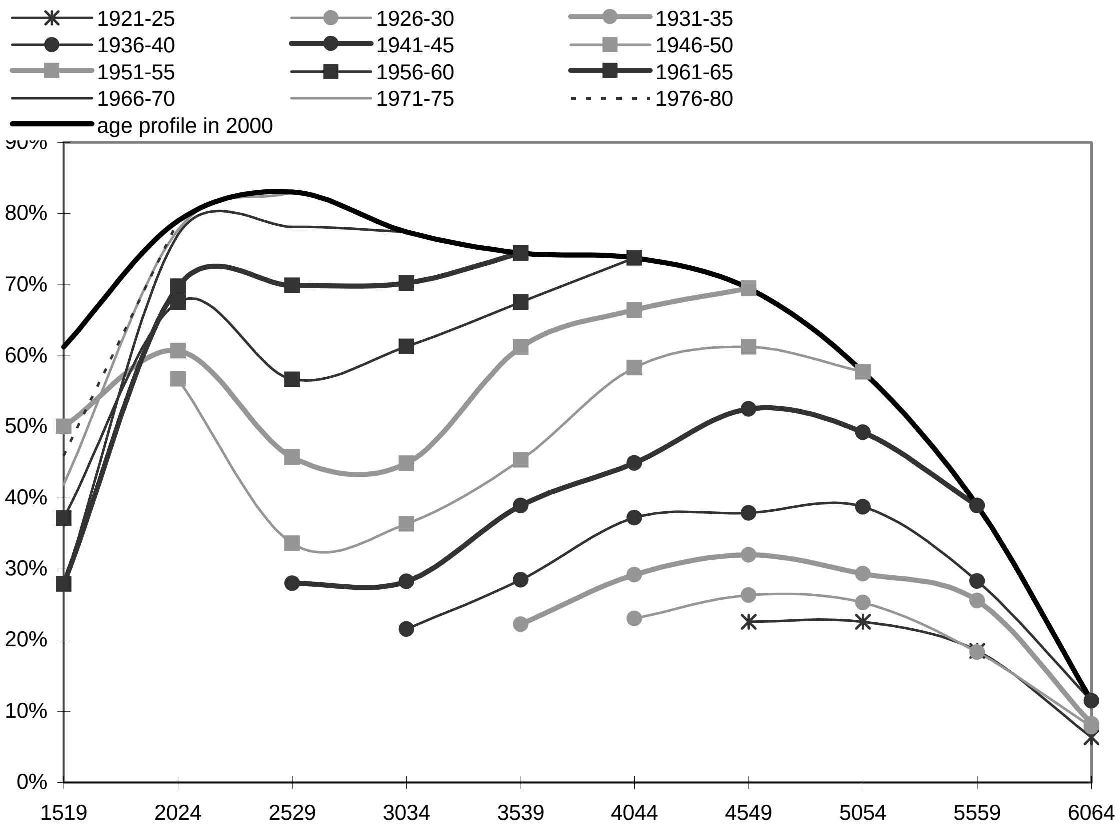
28 In the absence of longitudinal data, life-time participation rates at different ages do not refer to the same women. The life-time profiles in Figure 1 are based on "synthetic" cohorts. For instance, the change in participation of women born in 1941-45 between ages 25-29 and 30-34 is calculated by comparing women aged 25-29 in 1970 with women aged 30-34 five years later, *i.e.* in 1975.

Figure 1. **Cross sectional and cohort-specufic participation profiles of women in the Netherlands, 2000**

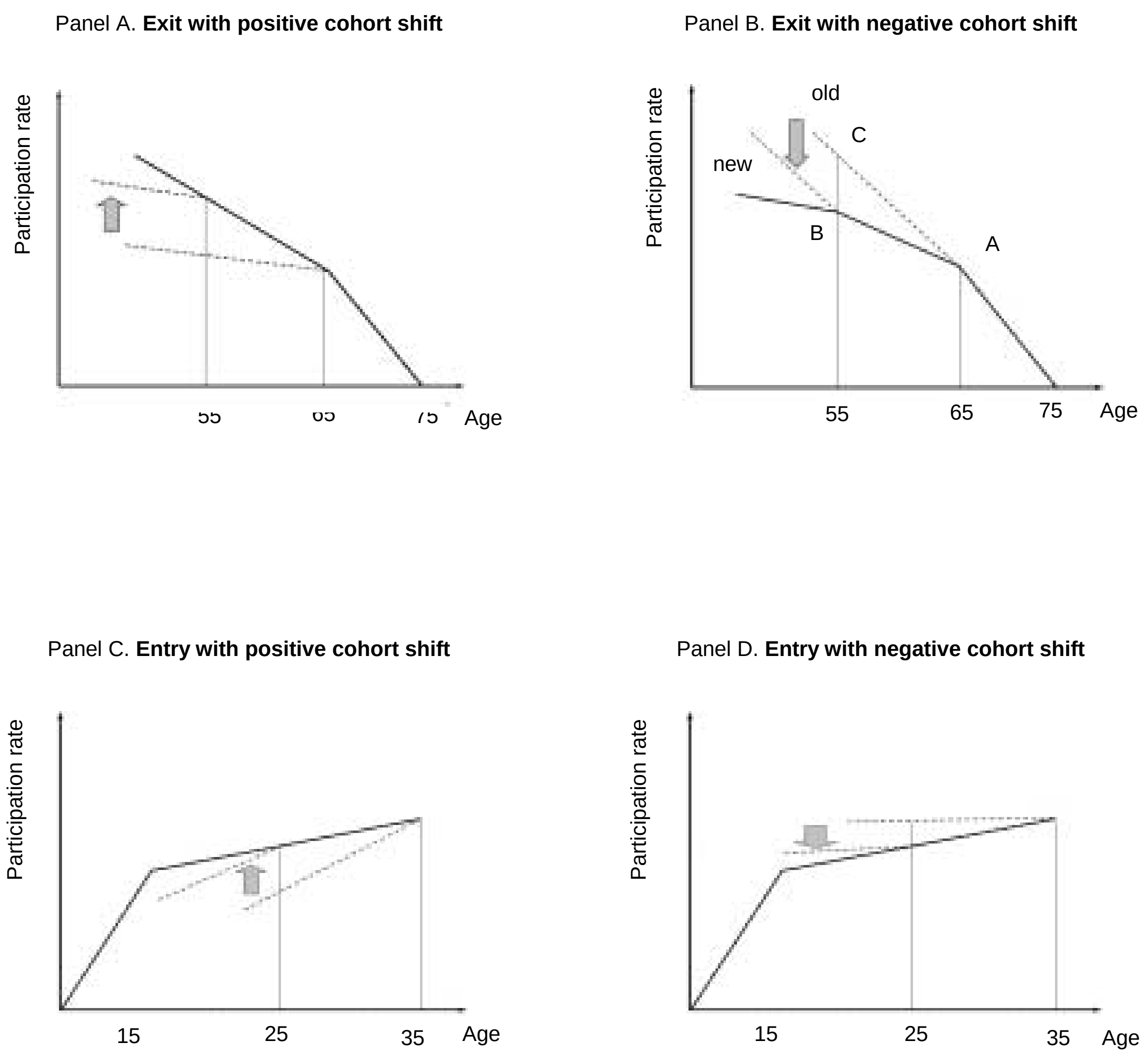


Static and dynamic indicators of entry and exit

50. The lifetime allocation of home and market production differs across countries and has evolved substantially across cohorts. This allocation can be determined by calculating average ages of entry into and exit from the labour market. In turn, calculating these ages requires estimates of the probability distributions of entering or exiting the job market by ages. To be unbiased, these distributions have to be calculated by using the lifetime participation profile of a given cohort rather than the cross-sectional profile for a given year.

51. This is illustrated by the Panel A of Figure 2 which shows the cross-section profile in a given year – say 2000 – in bold and two lifetime profiles of cohorts referred to as old and new respectively. Because the "new" cohort has a higher participation rate than the "old" one, all other things being equal, using the cross-section profile overestimates the probability of exit between ages 55 and 65 (i.e., calculated by comparing A and B). This probability is better approximated by using a cohort profile, i.e., by comparing A with C. Conversely, the cross-section profile underestimates the probability of exit between 55 and 65 if the participation rate declines from one cohort to another (Panel B of Figure A2.2). Panel C and D refer to similar situations for entry on the job market.

Figure 2. **Interaction between cohort shifts and entries on or exits from the labour market**



52. Thus, in order to be unbiased, average entry and exit ages should be based on the distribution of entries and exits between age groups calculated by using subsequent cohorts rather than the cross-sectional participation profile. For instance, in the Panel A of Figure 2, the exits between 45 and 55 are estimated by comparing the participation of individuals aged 55 in 2000 with that of individuals aged 45 in 1990 instead of those aged 45 in 2000. Therefore, the distribution of exits in 2000 between 45 and 75 is established by considering those of the "new" cohort between 45 and 55, then the exits of the "old" cohort between 55 and 65 (i.e., the participation of individuals aged 65 in 2000 (A) less the participation of individuals aged 55 in 1990(C) and, finally, the observed drop in participation in 2000 between 65 and zero at age 75. Because the cohort-specific exits exclude the positive shift of participation across cohorts and are smaller than the ones estimated from the cross-sectional participation profile, the average age of exit based on

cohort profiles – referred to as "dynamic" – will be higher than that based on the cross-sectional profile – referred to as "static". On the contrary, if participation of two subsequent cohorts is falling, the static age of entry is biased upwards.

53. In a similar way, the distribution of entries in the job market in 2000 comprises the initial increase of participation observed in 2000 between five and 15, and the further participation increases observed for the "new" cohort between 15 and 25 and for the "old" cohort between 25 and 35 (Panel C of Figure 2). If the participation of the "new" cohort is higher than the "old" one, the static age of entry is biased downward and the opposite if it is lower (Panel D). The following Table 1 summarizes the relationship between static and dynamic ages of entry and exit.

Table 1: Static and dynamic ages of entry on and exit from the labour market

	Positive cohort shift	Negative cohort shift
Entry	Static < Dynamic	Static > Dynamic
Exit	Static < Dynamic	Static > Dynamic

Effective and expected ages

54. Many studies have used the method developed at the ILO by Latulippe (1996) to calculate average effective age of retirement. The retirement distribution of the whole population is estimated, for a given year, by considering the proportion of the population in each quinquennial age group expected to retire over the next five years:

[1] $$EX_{x,x+4} = \left(PR_{x,x+4} - PR_{x+5,x+9}\right) \cdot P_{x,x+4}$$

Where $EX_{x,x+4}$ is the number of individual aged from x to x+4 who will retire within five years; $PR_{x,x+4}$ *and* $PR_{x+5,x+9,}$, the participation rates of groups aged from x to x+4 and from x+5 to x+9 respectively; and $P_{x,x+4}$, the population aged from x to x+4.

The average exit (retirement) age is then calculated as the average of retirement ages[29] weighted by the retirement distribution:

[2] $$AEXA = \frac{0.5 \cdot EX_{40,44} \cdot 46.7 + \sum_{x=45,50,..}^{75} EX_{x,x+4} \cdot (x+5)}{0.5 \cdot EX_{40,44} + \sum_{x=45,50,..}^{75} EX_{x,x+4}}$$

Where $EX_{40,44}$ is the number of individuals aged from 40 to 44 who, according to the Latulippe's specification are, on average, assumed to retire at 46.7.

29 Assuming that all persons aged x to x+4 who are no longer participating at ages x+5 to x+9 have retired at age x+5.

This method only uses the information embodied in the cross-sectional participation profile for a given year and generates a static estimate of the average exit age that is biased by cross-cohort shifts of participation, as explained above. Therefore, the specification used here is a dynamic extension of the original Latulippe's specification with the retirement distribution specified as follows:

[3] $$EX^{t}_{x,x+4} = \left(PR^{t-5}_{x,x+4} - PR^{t}_{x+5,x+9}\right) \cdot P^{t-5}_{x,x+4}$$

In equation [3], the number of individual expected to retire between age x and x+5 is estimated by comparing the participation rates of the age groups that belong to the same synthetic cohort: for instance, the rate of participation of individuals aged 50-54 in 1995 with the rate of the corresponding[30] individuals five years later, in 2000, when they are aged 55-60. Then, an equation similar to [2] but without a priori restriction on the earliest age of retirement is used to calculate the average effective age of exit (EfEX):

[4] $$EfEX^{t} = \frac{\sum_{x=30,35,..}^{75} EX^{t}_{x,x+4} \cdot (x+5)}{\sum_{x=30,35,..}^{75} EX^{t}_{x,x+4}} \quad \text{for all } EX^{t}_{x,x+4} \geq 0$$

Similarly, the number of persons aged x to x+4 expected to enter the job market within five years is estimated as follows:

[5] $$EN^{t}_{x,x+4} = \left(PR^{t}_{x+5,x+9} - PR^{t-5}_{x,x+4}\right) \cdot P^{t-5}_{x,x+4}$$

In turn, the average effective age of entry (EfEN) on the job market is calculated as follows:

[6] $$EfEN^{t} = \frac{\sum_{x=10,15,...}^{40} EN^{t}_{x,x+4} \cdot (x+5)}{\sum_{x=10,15,...}^{40} EN^{t}_{x,x+4}} \quad \text{for all } EN^{t}_{x,x+4} \geq 0$$

Scherer (2002) has developed an alternative method to calculate expected retirement ages adjusted to take account of cross-cohort shift of participation. This method bases on the observed distribution of retirement probabilities by age. Let $WX_{x,x+4}$ be the probability of persons aged x,x+4 to retire at age x+5 calculated as:

[7] $$WX^{t}_{x,x+4} = 1 - \frac{PR^{t}_{x+5,x+9}}{PR^{t-5}_{x,x+4}} \geq 0$$

with PR being the rate of participation of age groups x,x+4 and x+5,x+9.

Its supplement, $SX^{t}_{x,x+4} = 1 - WX^{t}_{x,x+4}$, corresponds to the probability of persons aged x,x+4 still to be in the labour force at age x+5, x+9. The overall probability that any individual will still be in the labour force at age xx+4 is then calculated as :

30 Though, in the absence of longitudinal data, they are not the same individuals.

[8] $$sx^{t}_{x,x+4} = \prod_{j=35,39,...}^{x,x+4} SX^{t}_{j,j+4}$$

Then, the probability of exit at age x+5 is calculated by multiplying the probability of still being in the labour force at age x,x+4 with the partial probability of retiring at age x+5 :

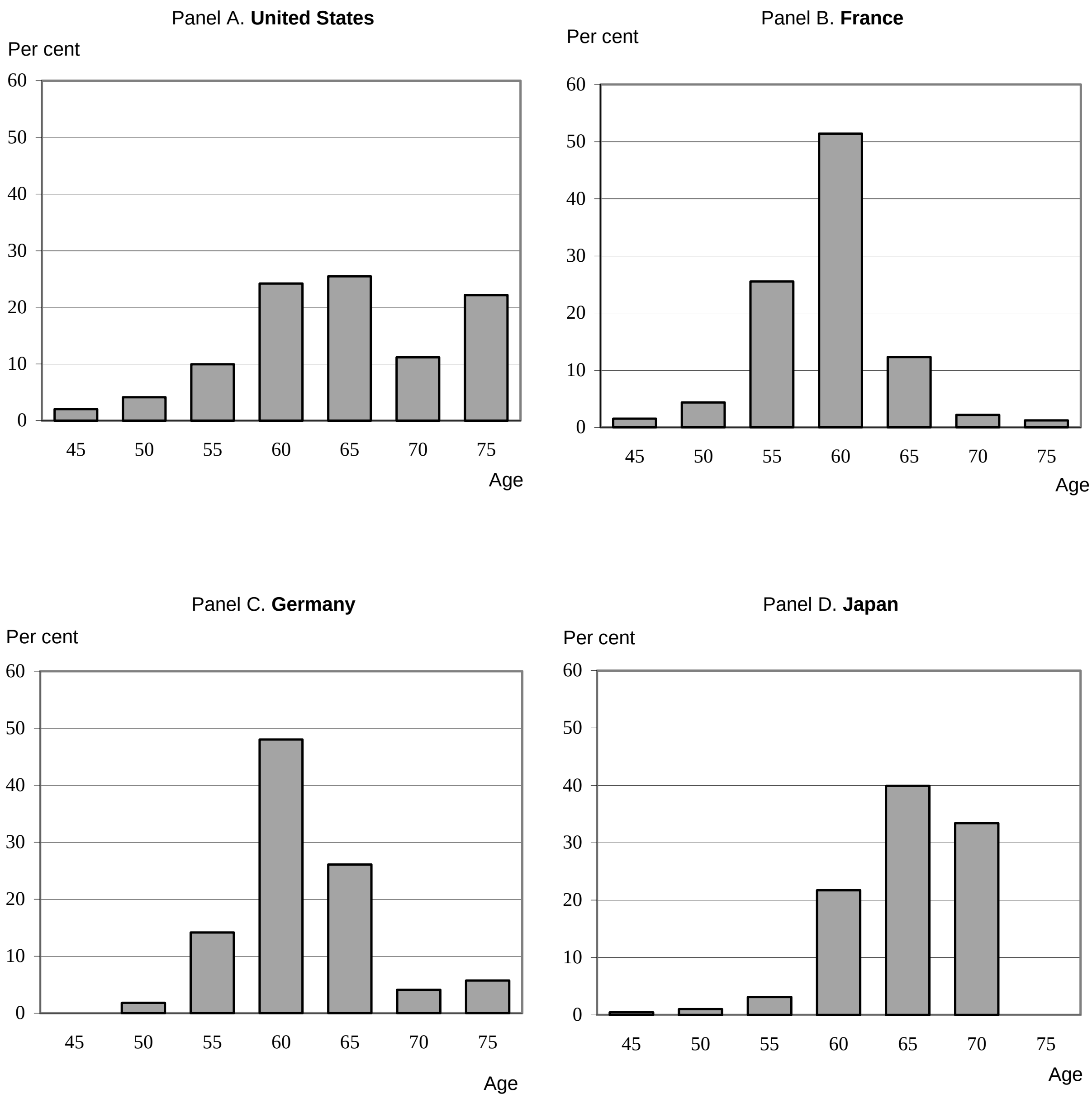
[9] $$wx^{t}_{x,x+4} = sx^{t}_{x,x+4} \cdot WX^{t}_{x,x+4}$$

The distribution of exit probabilities varies across countries, reflecting the divergences across pension systems, as illustrated for men in Figure 3. In France, the distribution is most narrow with most of retirements taking place at the normal retirement age (60) and pre-retirements at 55 accounting for the second largest exit probability. In Germany, where old-age pensions can be taken starting from 62, the largest probability of retirement is also at 60[31] but the probability of retirement at 55 is lower and at 65 larger than in France. In contrast, retirement probabililites are much more evenly distributed in the United States, with many retirements likely to take place at age 75 and over.[32] Among the four illustrative countries in Figure 3, Japan has the lowest retirement probability at age 55 and the highest ones at ages 65 and 70 (40 and more than 30 per cent, respectively).

31 Given quinquennal age groups and the assumption stated in footnote 2 above, all those retiring between 60 and 64 are accounted for as if they retired at age 60.

32 As the oldest age group (75 and over) has no upper limit, the probability of retiring at 75 is higher than in reality.

Figure 3. **Probabilities of exit from the labour market by age for men in several OECD countries, 2000**
(percentages)



The sum of exit probabilities (up to a maximum age where no one remains in the labour force) is equal to unity and an average expected age of exit (ExEX) is finally calculated as the sum of the retirement ages weighted by the corresponding exit probabilities :

[10] $$ExEX^{t} = \sum_{x=35,39,...}^{100} wx_{x,x+4}^{t} \cdot (x+5)$$

The methodology developed by Scherer (2002) can be applied to entries in the job market. The probability that individuals aged x,x+4 enter on the job market at age x+5 is calculated as:

[11] $$WN^{t}_{x,x+4} = 1 - \frac{\left(\overline{PR} - PR^{t}_{x+5,x+9}\right)}{\left(\overline{PR} - PR^{t-5}_{x,x+4}\right)} \geq 0$$

where $\overline{PR}$ is an upper limit on participation rates.

The overall probability of still being inactive at age x,x+4 is calculated in a similar way as for retirement (equations [8] above):

[12] $$sn^{t}_{x,x+4} = \prod_{j=35,39,...}^{x,x+4} SN^{t}_{j,j+4}$$

where $SN^{t}_{x,x+4} = 1 - WN^{t}_{x,x+4}$ is the probability of a person aged x,x+4 still to be inactive at age x+5, x+9.

Finally, the probability of entry on the job market at age x+5 is calculated as in the above equation [9] :

[13] $$wn^{t}_{x,x+4} = sn^{t}_{x,x+4} \cdot WN^{t}_{x,x+4}$$

And an average expected age of entry (ExEN) is calculated as the sum of the entry ages weighted by the corresponding entry probabilities (divided by the total entry probability that may be different from unity[33]) :

[14] $$ExEN^{t} = \frac{\sum_{x=10,15,...}^{45} wn^{t}_{x,x+4} \cdot (x+5)}{\sum_{x=10,15,...}^{45} wn^{t}_{x,x+4}}$$

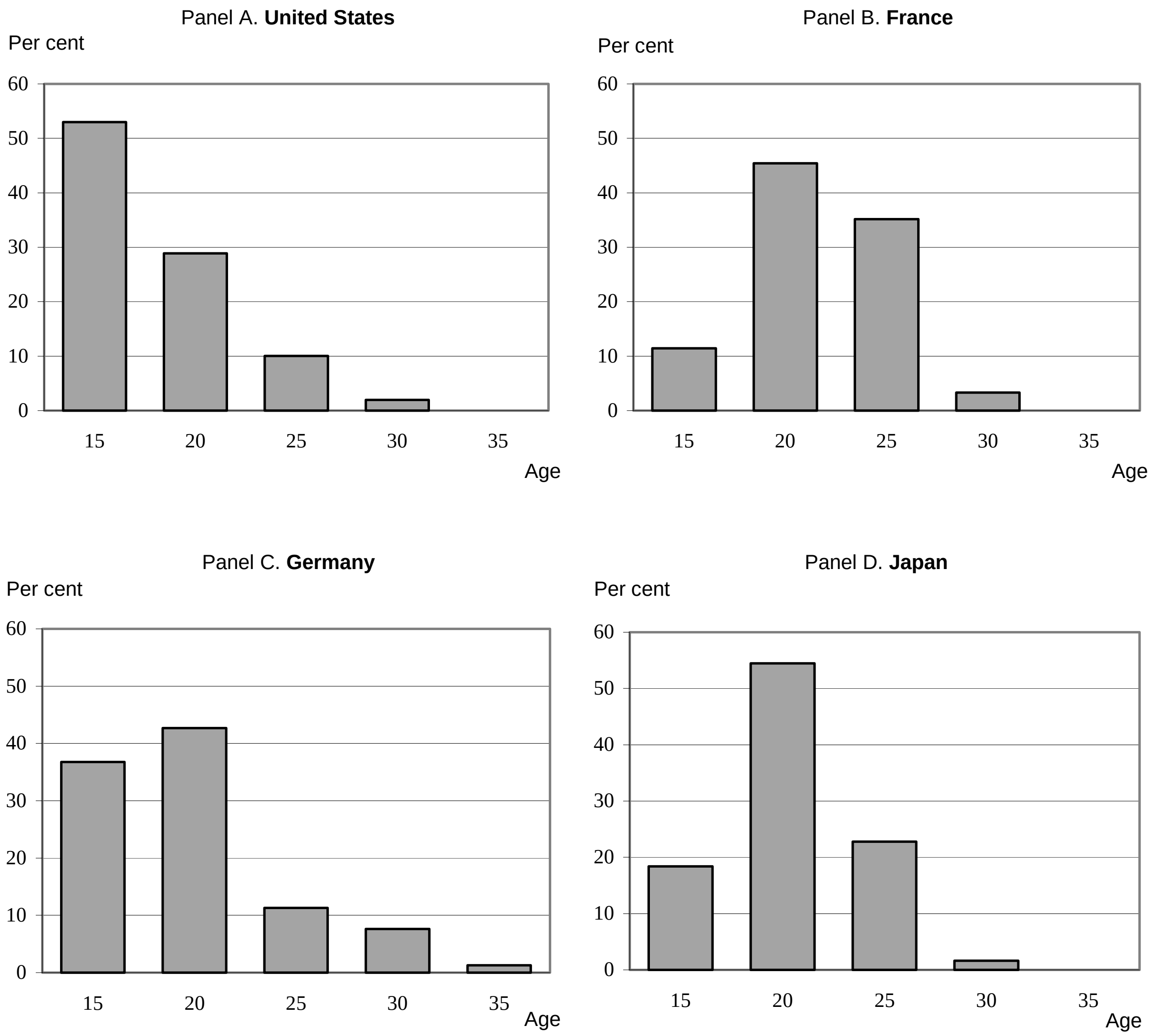
55. As for retirement, the entry probabilities across a sample of countries exhibit quite different distribution (Figure 4). In France, the largest entry probabilities are at the ages of 20 and 25, as in Japan but to a lesser extent. In Germany, the largest entry probabilities are at ages 15 and 20. In contrast, in the United States, young men have the highest probability to enter the job market at age 15 (more than 50 per cent) and this probability drops gradually at later ages.

56. Both methods described above have some limitations in common. First, average entry and exit ages and corresponding estimates of lifetime activity period are conditional on working at some point. This is particularly important in countries where a large proportion of women never work. Thus, both indicators exclude changes across countries and over time of the proportion of those who never participate. Despite this limitation, they are of interest in their own right in the context of this study as they reflect the degree of lifetime dependency of those who are working including, in particular, the period during which they contribute to their pension relative to the expected average duration of retirement. Second, and more

33 Alternatively the upper limit to participation $\overline{PR}$ can be chosen such as the total probability of entry equals unity.

important, the continuity assumption implied in the above equations may be problematic for women. Entry ages for women must be interpreted as ages at which women enter into the job market for the first time. In other words, spells of temporary inactivity for child rearing are omitted in the calculation of average lifetime activity for women. Therefore, in countries where the lifetime participation profiles of the two last cohorts are not continuously increasing and then declining with age, periods of lifetime activity in 2000 are over-estimated. These countries include Australia, France, Ireland, Japan, Korea, the Netherlands, New Zealand and Spain. For the same reason, periods of female lifetime activity have increased more or declined less over the past than reported in Table 4 of the main text and Tables 2 and 3 of this Annex.

Figure 4. **Probabilities of entry on the labour market by age for men in several OECD countries, 2000**
(percentages)



57. Tables 2 and 3 report dynamic average effective ages of entry and exit (as calculated by using equations [4] and [6]) and compare them with the corresponding static ages (using the same equations, but comparing group-specific participations for the same year, thus belonging to different cohorts, just as in the initial Latulippe formulation (equation [1]). The difference between these two ages provides an

approximation of the direction and magnitude of the participation shifts across cohorts (column labelled "cohort effect" in Tables 2 and 3). The expected ages of entry and exit (using equations [10] and [14]) are also reported as well as the average effective and expected durations of the working life.

Table 2. **Effective and expected ages of entry on the labour market for men and women**

Pannel A. **Men**

Country	Period for which data are available		effective age of entry	expected age of entry number of years	cohort effect
New Zealand	1986-2000	2000	**17.2**	17.3	-0.7
Australia	1966-2000	average	17.0	17.2	-0.3
		2000	**17.2**	17.3	-0.4
		trend	0.1	0.0	
Turkey	1988-2000	2000	**17.3**	18.3	-1.5
Mexico	1995-2000	2000	**17.3**	18.0	-0.4
United Kingdom	1984-2000	2000	**17.4**	17.2	-0.1
Denmark	1983-2000	2000	**17.8**	17.5	0.2
United States	1960-2000	average	17.6	17.6	-0.2
		2000	**17.9**	17.9	-0.1
		trend	0.1	0.0	
Iceland	1991-2000	2000	**18.2**	18.0	0.0
Canada	1976-2000	average	17.6	17.6	-0.2
		2000	**18.3**	18.2	0.3
		trend	0.1	0.2	
Switzerland		2000	**18.5**	18.2	0.3
Netherlands	1971-2000	average	19.2	18.9	0.1
		2000	**18.8**	17.6	1.2
		trend	0.0	-0.4	
Ireland	1981-2000	average	18.6	18.9	-0.1
		2000	**19.2**	19.1	0.1
		trend	0.5	0.3	
Austria	1984-2000	2000	**19.6**	19.2	0.2
Slovak Republic		2000	**19.7**	19.9	-0.4
Norway	1972-2000	average	19.9	18.9	0.2
		2000	**19.8**	18.1	1.1
		trend	-0.3	-0.2	
Czech Republic	1993-2000	2000	**19.8**	20.2	-0.7
Sweden	1963-2000	average	18.7	18.5	-0.4
		2000	**20.1**	19.6	-0.3
		trend	0.1	0.2	
Portugal	1974-2000	average	18.0	18.6	-0.3
		2000	**20.1**	19.9	-0.1
		trend	0.8	0.8	
Hungary	1992-2000	2000	**20.2**	20.4	-0.8
Finland	1962-2000	average	19.4	19.6	0.1
		2000	**20.3**	19.8	0.5
		trend	0.3	0.2	
Poland		2000	**20.3**	20.7	-0.5
Japan	1960-2000	average	20.0	20.2	-0.1
		2000	**20.6**	20.4	0.0
		trend	0.3	0.1	
Greece	1983-2000	2000	**20.7**	20.9	-0.2
Spain	1972-2000	average	18.9	19.2	-0.2
		2000	**20.9**	20.2	0.0
		trend	0.7	0.5	
Korea	1989-2000	2000	**21.3**	22.0	-0.7
France	1962-2000	average	20.1	20.7	0.0
		2000	**21.6**	21.6	-0.1
		trend	0.6	0.4	
Belgium	1983-2000	2000	**21.7**	21.1	0.6
Germany	1970-2000	average	19.6	19.5	0.1
		2000	**21.8**	19.7	2.0
		trend	1.1	0.3	
Italy	1993-2000	2000	**21.9**	21.5	-0.3
Luxembourg	1983-2000	2000	**22.3**	21.8	0.3

Table 2. **Effective and expected ages of entry on the labour market for men and women** (continued)

Pannel B. **Women**

Country	Period for which data are available		effective age of entry	expected age of entry number of years	cohort effect
Turkey	1988-2000	2000	**15.0**	15.0	-1.3
Iceland	1991-2000	2000	**18.4**	17.3	-0.6
Australia	1966-2000	average	20.0	18.7	2.3
		2000	**18.7**	17.8	0.0
		trend	-0.3	-0.3	
United States	1960-2000	average	21.2	19.2	3.0
		2000	**18.9**	18.2	0.5
		trend	-0.6	-0.5	
Mexico	1995-2000	2000	**19.5**	20.6	1.8
Canada	1976-2000	average	20.1	18.7	2.8
		2000	**19.8**	18.7	2.1
		trend	-0.5	-0.2	
Austria	1993-2000	2000	**20.2**	19.8	1.3
Sweden	1963-2000	average	22.1	19.5	2.8
		2000	**20.4**	19.8	-1.0
		trend	-1.3	-0.5	
Netherlands	1971-2000	average	21.6	19.5	4.3
		2000	**20.7**	17.8	4.1
		trend	0.0	-0.5	
Portugal	1974-2000	average	20.2	20.1	2.1
		2000	**20.8**	20.4	0.4
		trend	0.3	0.6	
Denmark	1983-2000	2000	**20.8**	19.1	1.9
United Kingdom	1984-2000	2000	**20.8**	18.6	2.2
Switzerland		2000	**21.2**	18.6	3.6
Finland	1962-2000	average	21.0	20.8	0.9
		2000	**21.6**	20.2	0.4
		trend	-0.1	0.1	
Spain	1972-2000	average	20.5	19.6	2.5
		2000	**21.7**	20.5	1.2
		trend	1.1	0.9	
Belgium	1983-2000	2000	**21.7**	21.3	0.5
Norway	1972-2000	average	23.2	20.7	3.2
		2000	**21.8**	19.0	2.2
		trend	-1.1	-0.6	
Slovak Republic		2000	**21.8**	21.9	0.1
Poland		2000	**21.9**	22.0	0.2
Ireland	1981-2000	average	21.3	20.2	3.0
		2000	**22.0**	20.5	2.6
		trend	0.6	0.5	
New Zealand	1986-2000	2000	**22.1**	21.3	0.9
Italy	1993-2000	2000	**22.4**	21.5	2.0
France	1962-2000	average	22.9	22.2	2.9
		2000	**22.6**	22.3	0.4
		trend	-0.1	0.2	
Greece	1983-2000	2000	**22.7**	21.7	2.4
Czech Republic	1993-2000	2000	**22.8**	23.4	-0.7
Germany	1970-2000	average	21.7	20.1	3.6
		2000	**22.9**	21.1	2.9
		trend	0.9	0.6	
Korea	1989-2000	2000	**23.0**	21.9	0.0
Japan	1960-2000	average	22.2	20.8	0.1
		2000	**23.0**	21.4	0.4
		trend	0.7	0.4	
Hungary	1993-2000	2000	**23.3**	23.4	-0.3
Luxembourg	1983-2000	2000	**27.4**	23.6	5.5

Table 3. **Effective and expected ages of exit from the labour market and average duration of the working life for men and women**

Pannel A. **Men**

Country	Period for which data are available		effective age of exit	expected age of exit	cohort effect	effective working life	expected working life
Hungary	1992-2000	2000	**54.4**	55.8	-1.4	34.2	35.4
Turkey		2000	**54.8**	57.8	-1.5	37.5	39.5
Slovak Republic		2000	**57.3**	58.0	-0.2	37.7	38.1
Poland		2000	**57.6**	58.0	1.4	37.3	37.3
Belgium	1983-2000	2000	**57.6**	57.7	0.5	35.9	36.6
Luxembourg		2000	**57.9**	58.7	0.5	35.7	36.9
Finland	1962-2000	average	59.5	60.7	-0.6	40.1	41.2
		2000	**58.1**	60.3	-0.6	37.8	40.5
		trend	-0.5	-0.8		-0.8	-1.0
France	1962-2000	average	61.5	60.9	0.4	41.4	40.4
		2000	**58.5**	58.8	0.2	36.9	37.2
		trend	-1.2	-1.1		-1.7	-1.5
Austria	1993-2000	2000	**58.6**	58.9	0.0	39.1	39.7
Netherlands	1971-2000	average	59.5	59.6	-0.5	40.3	40.7
		2000	**59.1**	61.1	-0.1	40.3	43.5
		trend	-0.4	0.2		-0.4	0.6
Italy	1993-2000	2000	**59.3**	59.5	0.4	37.5	38.0
Australia	1966-2000	average	61.5	62.0	-1.1	44.5	44.8
		2000	**59.4**	61.1	-1.7	42.2	43.8
		trend	-0.9	-0.6		-0.9	-0.7
Korea	1989-2000	2000	**59.4**	63.3	-2.8	38.2	41.2
Czech Republic	1993-2000	2000	**60.3**	59.8	0.5	40.5	39.6
United Kingdom	1984-2000	2000	**60.5**	61.6	-0.4	43.1	44.4
Germany	1970-2000	average	61.1	61.1	-0.3	41.5	41.6
		2000	**60.7**	61.7	0.3	38.9	42.0
		trend	-0.6	-0.2		-1.7	-0.5
Spain	1972-2000	average	61.4	61.0	-0.3	42.4	41.9
		2000	**60.9**	61.3	0.5	39.9	41.1
		trend	-0.5	-0.3		-1.2	-0.8
Denmark	1983-2000	2000	**61.0**	60.7	0.3	43.3	43.2
Canada	1976-2000	average	61.2	62.1	-0.7	43.5	44.5
		2000	**61.2**	62.5	0.4	42.9	44.3
		trend	-0.5	-0.4		-0.6	-0.6
New Zealand		2000	**61.7**	64.7	-1.7	44.7	47.3
Sweden	1963-2000	average	63.4	63.9	-0.6	44.8	45.4
		2000	**62.1**	63.4	-0.8	42.0	43.9
		trend	-0.7	-0.4		-0.8	-0.6
United States	1960-2000	average	63.1	64.0	-0.4	45.5	46.3
		2000	**62.4**	64.3	0.4	44.5	46.4
		trend	-0.7	-0.5		-0.8	-0.5
Greece	1983-2000	2000	**62.6**	60.8	0.5	41.9	39.9
Switzerland		2000	**62.7**	63.5	-1.4	44.2	45.3
Norway	1972-2000	average	63.9	64.0	-0.3	44.0	45.1
		2000	**62.7**	63.8	0.1	42.9	45.7
		trend	-1.0	-0.9		-0.7	-0.8
Ireland	1981-2000	average	61.8	62.1	-0.5	43.2	43.1
		2000	**63.4**	64.2	2.4	44.2	45.0
		trend	0.5	1.2		0.0	0.8
Portugal	1974-2000	average	63.7	63.3	-0.7	45.8	44.7
		2000	**63.7**	64.1	-1.3	43.5	44.3
		trend	-0.4	0.1		-1.3	-0.7

Table 3. **Effective and expected ages of exit and average duration of the working life for men anc**
(continued)

Pannel B. **Women**

Country	Period for which data are available		effective age of exit	expected age of exit	cohort effect	effective working life	expected working life
Turkey		2000	**51.2**	51.7	-8.6	36.2	36.7
Slovak Republic		2000	**55.2**	55.5	0.5	33.4	33.6
Hungary	1993-2000	2000	**55.2**	56.2	-0.1	32.0	32.8
Belgium	1983-2000	2000	**57.4**	57.8	4.4	35.6	36.5
Czech Republic	1993-2000	2000	**57.5**	57.1	0.5	34.7	33.8
Poland		2000	**57.5**	56.3	1.7	35.6	34.3
Austria	1993-2000	2000	**58.2**	57.6	2.3	38.0	37.8
Italy	1993-2000	2000	**58.3**	58.7	3.6	35.9	37.2
Netherlands	1971-2000	average	60.6	60.9	4.2	39.0	41.4
		2000	**58.4**	60.8	3.0	37.7	43.0
		trend	-0.9	-0.3		-1.0	0.2
Denmark	1983-2000	2000	**58.6**	59.8	-0.4	37.8	40.8
Australia	1966-2000	average	59.7	60.5	2.0	39.7	41.8
		2000	**58.8**	61.3	0.1	40.1	43.5
		trend	-0.3	-0.1		0.0	0.2
Finland	1962-2000	average	60.6	60.8	0.9	39.6	40.0
		2000	**59.1**	59.8	0.0	37.5	39.6
		trend	-0.4	-0.5		-0.3	-0.5
Luxembourg		2000	**59.3**	61.3	7.6	31.9	37.6
France	1962-2000	average	62.9	62.1	2.7	40.0	39.9
		2000	**59.5**	59.5	1.4	36.8	37.2
		trend	-1.4	-1.2		-1.3	-1.4
Germany	1970-2000	average	61.4	60.8	2.0	39.7	40.7
		2000	**59.7**	60.4	0.7	36.8	39.3
		trend	-0.7	-0.4		-1.6	-0.9
New Zealand		2000	**59.8**	59.8	0.0	36.9	41.3
Canada	1976-2000	average	60.9	61.8	2.4	40.8	43.0
		2000	**59.9**	61.5	1.3	40.2	42.8
		trend	-0.7	-0.6		-0.2	-0.3
United Kingdom	1984-2000	2000	**60.4**	61.1	0.3	39.6	42.4
Sweden	1963-2000	average	62.9	63.2	1.2	40.8	43.7
		2000	**61.2**	62.1	-0.8	40.8	42.3
		trend	-0.8	-0.7		0.5	-0.2
Spain	1972-2000	average	63.1	62.5	6.5	42.6	42.9
		2000	**61.2**	61.4	8.1	39.5	40.8
		trend	-0.8	-0.3		-1.9	-1.2
Portugal	1974-2000	average	64.2	64.3	5.7	44.1	44.2
		2000	**61.8**	63.7	0.6	41.0	43.3
		trend	-1.1	-0.3		-1.5	-0.8
Greece	1983-2000	2000	**62.2**	61.0	6.3	39.6	39.2
Switzerland		2000	**62.8**	63.0	0.7	41.6	44.3
Korea	1989-2000	2000	**62.9**	65.4	-1.2	40.0	43.5
United States	1960-2000	average	64.1	64.8	1.8	42.9	45.1
		2000	**63.0**	64.0	1.0	44.1	45.8
		trend	-0.3	-0.3		0.3	0.2
Norway	1972-2000	average	64.0	64.1	1.6	40.7	43.4
		2000	**63.8**	64.2	2.3	42.0	45.2
		trend	-0.5	-0.6		0.6	0.0
Japan	1960-2000	average	64.4	63.3	0.6	42.2	42.5
		2000	**64.7**	62.9	0.2	41.7	41.5
		trend	0.0	-0.1		-0.7	-0.4
Iceland	1991-2000	2000	**65.4**	64.8	3.4	47.0	47.5

Average entry ages (Table 2): They range from 17 to 22 for men and from 18 to more than 23 for women. In several countries – including Portugal, Spain, France and Germany – the average entry age has increased over the last decades.

Average exit ages (Table 3): They range from 55 to 64 for men and from 52 to 64 for women. In a majority of countries – particularly Norway, France, Australia, Sweden – the average retirement age for men and women has been falling during the last decades.

Average duration of working life (Table 3): It ranges from 35 to 45 for men and from 33 to 43 for women (excluding Iceland). In many countries, the duration of the working life tended to decline over the last decades, most notably in France, Germany, Spain and Portgual.

Cohort effects: They are negligible or slightly negative for men, while there has been a noticeable positive participation shift across cohorts for women in many countries over the last decades, especially in the Netherlands, Germany, France, Ireland, Norway, Canada and the United States.

Effective vs. Expected ages of entry and exit: The major difference between both methods is that, contrary to expected ages, effective ages are weighted by taking into account the demographic structure of the population ($P_{x,x+4}^{t-5}$ in equations [3] and [5]). In other words, effective ages better reflect ages at which individual on average enter into or exit from the job market, given the demographic structure at a given period, while expected ages correspond to ages at which a representative individual has the highest probability to enter into or exit from the job market, given the lifetime participation profile that prevails at a given period. Since both methods have a different perspective, both age indicators are reported in Tables 2 and 3. Overall, effective and expected ages of entry and exit are similar, though there are divergences in some countries.

ANNEX 3

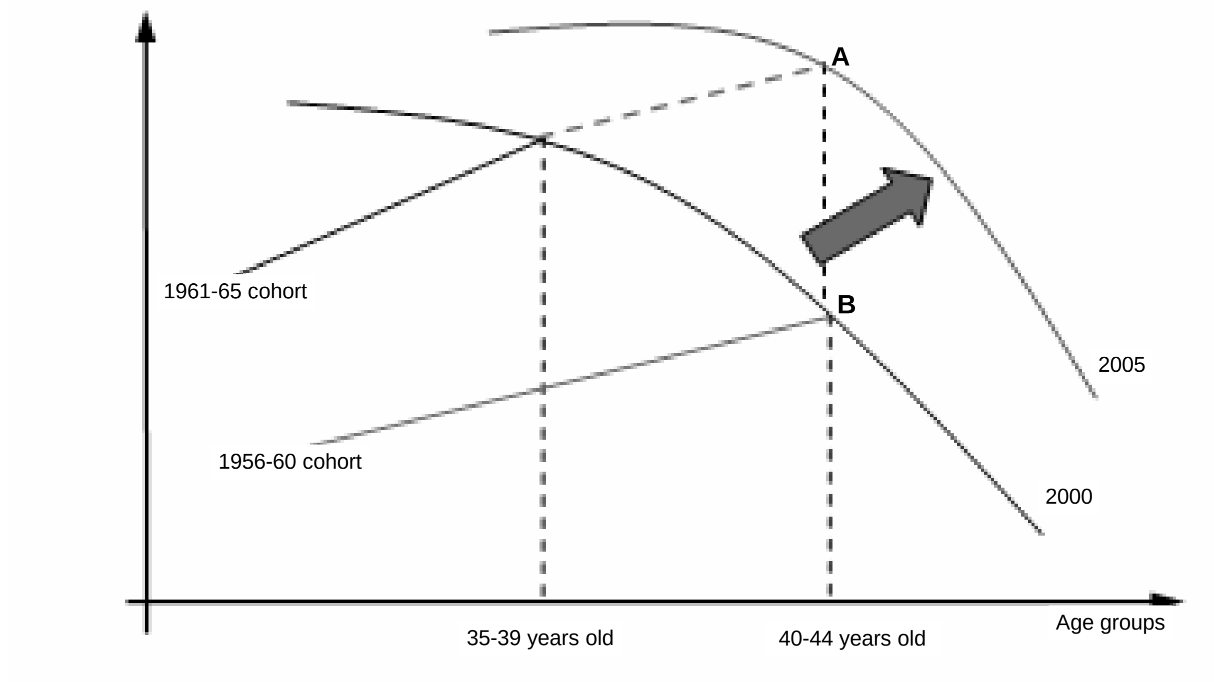
STATIC VERSUS DYNAMIC BASELINE SCENARIOS

58. Projections of aggregate participation rates are often based on the assumption that participation rates by age groups remain unchanged in the future at their levels for the last year for which data are available. In such projections, changes in aggregate participation rates result only from shifts in the population age structure. Certain assumptions about the evolution of female participation in the future are sometimes added. Often, these imply some convergence of female participation towards male or female levels in countries where these are particularly high, e.g. the Nordic countries. These projections are static in the sense that they do not incorporate the dynamics resulting from the gradual replacement over time of older cohorts by new ones with different characteristics. As Figure 1 of Annex 2 illustrates for the Netherlands, lifetime participation profiles have evolved during the past decades. Women of a given age in 2000 have a much higher participation level than women of the same age born before World War II. In other words, women belonging to a certain generation or cohort have a specific level of participation that is higher at all ages than the corresponding level of participation of older cohorts. The participation gaps between subsequent cohorts reflect not only socio-cultural factors but also individual characteristics, such as the level of education and number of children.

59. The assumption of constant participation rates embodied in a static baseline projection has odd implications in terms of lifetime participation profiles. Taking for instance women aged 30-34 in 2000, in Figure 1 in Annex 2, and assuming that participation rates remain constant in the future, their participation rate in 2005 -- when they will be aged 35-39 -- will be falling further, while for all previous cohorts, female participation increases again after 35, as they come back to work after child-rearing. Thus, by collapsing together the lifetime profiles of different cohorts, the static baseline fails to incorporate the re-entry shift of women after they have raised their children.

60. The baseline projection used here is based on an assumption that keeps lifetime participation profiles in the future parallel to those observed in the past, contrary to the static baseline where profiles of different cohorts are collapsed together. Figure 1 illustrates the nature of this assumption. It shows the cross-cohort participation profile in 2000 with two subsequent cohorts: the cohort born in 1956-60, aged 40-44 in 2000 and the cohort born in 1961-65, aged 35-39 in 2000. The participation rate of this group in 2005 – when it will be aged 40-44 – is projected by assuming the same slope as is observed for the participation profile of the previous cohort. In the case of Figure 1, the participation rate of women is projected to increase after 39 up to A, instead of falling to B (*i.e.* the participation rate of women aged 40-44 belonging to the previous cohort) as would be the case under the assumption of constant participation rates. In turn, this implies that the cross-cohort participation profile shifts upward in 2005, as shown in Figure 1

Figure 1. **Projected cohort participation profile in the dynamic baseline scenario**



61. The method illustrated in Figure 1 implies the assumption that the probability of exit – as defined in equation 7 in Annex 2 – calculated for the last available cohort between 1995 and 2000 is kept constant in the future. A symmetric assumption is made for the probability of entry defined in the equation [11] of Annex 2.[34] Thus, introducing cohort dynamics only requires participation data since 1995. Longer time series would allow some refinements, such as to introduce trends in the evolution of the probabilities of exit and entry over time.

62. Figure 2 shows the future lifetime profiles by cohort for the Netherlands, as they are projected by assuming constant probabilities of entry and exit. With this assumption, women belonging to more recent cohorts come back to work after child-rearing, just as observed for previous cohorts. By contrast, there is no re-entry shift in the static baseline (that corresponds to the 2000 cross-cohort participation profile in bold in Figure 2). Thus, compared with the static baseline, this method implies a gradual increase of future female participation rates, mostly for women aged 35 and over, as shown by the evolution of the cross-cohort profiles from 2000 to 2050 in Figure 3.

34 And assuming that this upper limit for the participation rate (PR) is equal to 99 per cent for men and 95 per cent for women.

Figure 2. **Projected lifetime participation profiles of female cohorts in the Netherlands**

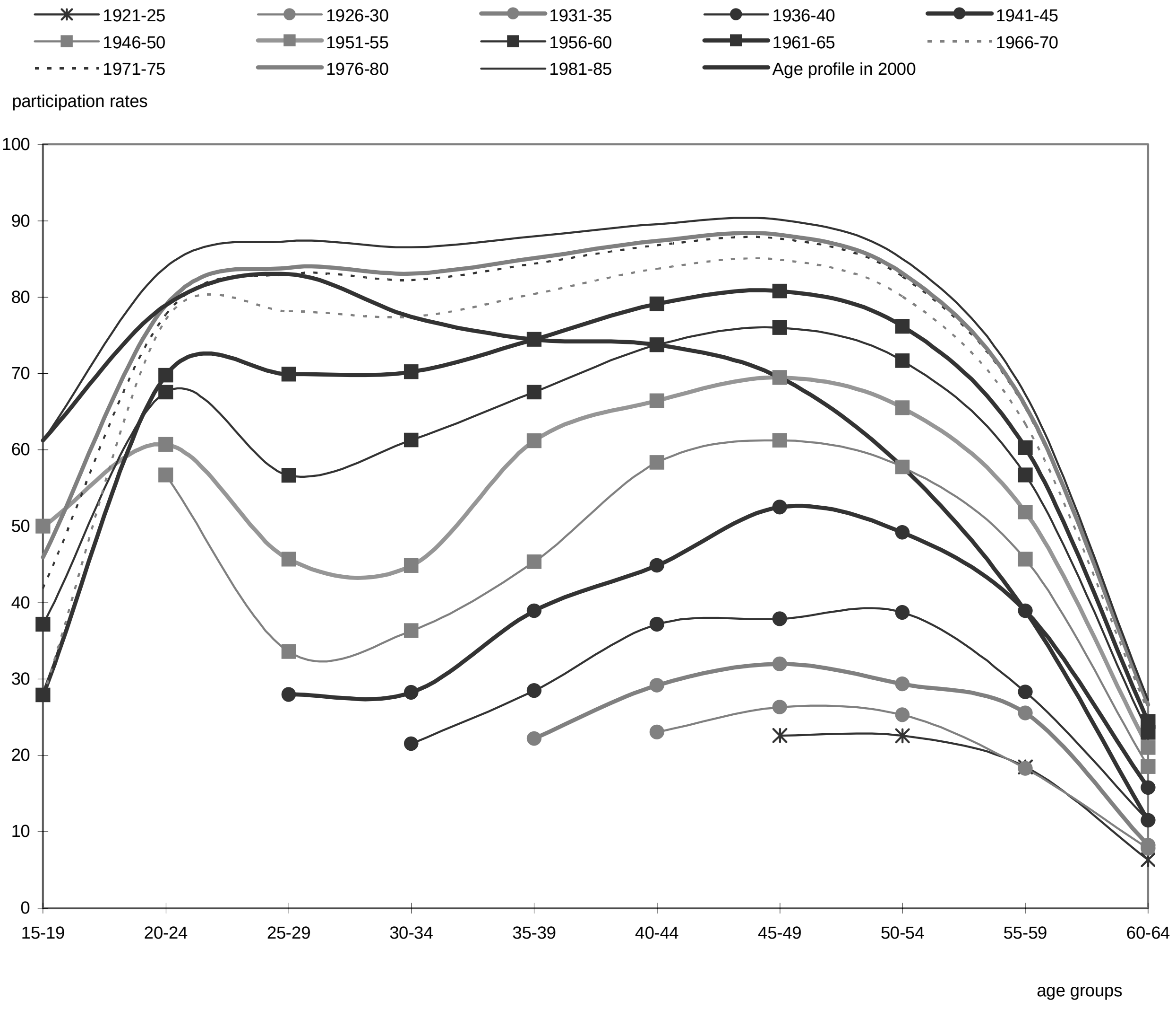
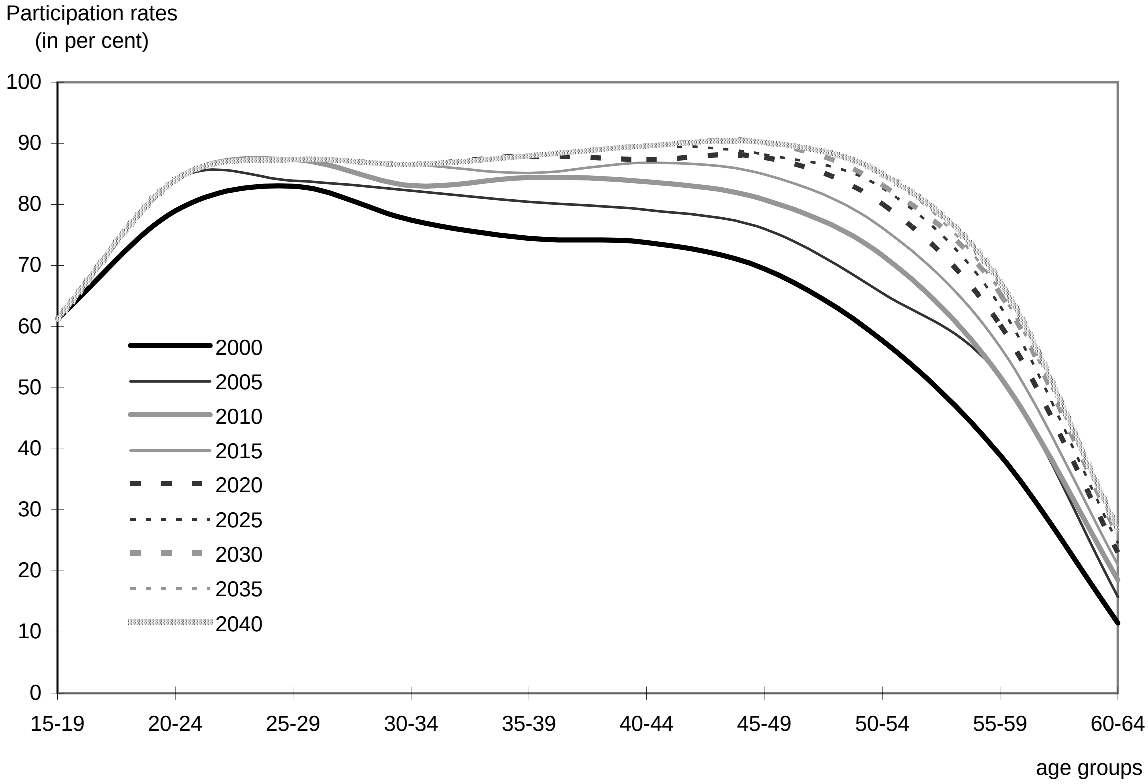


Figure 3. **Future cross-sectional participation profiles in the Netherlands as projected in the baseline scenario, 2000-2050**



63. Comparison of Figures 2 and 3 reveals that the cross-cohort profiles converge over time to the lifetime profile of the last cohort entering the job market in 2000, consistent with the interpretation that the "cohort effect" reflects the gradual attrition of women of older generations. Women not yet in the labour force in 2000 are further assumed to have the same individual characteristics as the cohort entering the job market in 2000. This explains why future female participation rates gradually stabilize over time as all women of older generations have disappeared and the labour force only comprises women who have the same individual characteristics than those of the last cohort.

64. The assumption of constant probabilities of entry and exit, though a progress compared with constant participation rates, still remains mechanical, resting on the assumption that the cross-cohort deviations observed in 1995-2000 would remained unchanged over the future. Besides, the assumption of no further modification of individual characteristics beyond those of the last cohort in 2000 is more restrictive than assuming catching-up of women's participation towards male levels, or levels in countries where women participation is higher. It mainly restricts further participation rises to women aged over 35 and there are countries where the cohort effect for women is small, or even negative, such as in Sweden. Overall, cohort effects are negligible for men. Tables 2 and 3 in the Annex 2 report an indicator of the magnitude of the cohort effects across countries observed over the past.

ANNEX 4

ONGOING AND ALREADY DECIDED PENSION REFORMS

65. The baseline labour force participation scenarios presented in the main text incorporate the projected participation effects of the following factors:[35]

Australia: While no occupational pension scheme is modelled for 1999, the existence of the Superannuation Guarantee Scheme – which became mandatory in 1992 and was, therefore, not yet mature in 1999 – is incorporated in the baseline scenario. At the margin, an additional year of work increases future pension benefits paid out by this scheme, but it also reduces those received through the public old-age pensions system, due to an income test. As a result, implicit tax rates on continued work are higher in the baseline scenario than in 1999, and participation rates are lower. However, there is a presumption that this projected decline in participation is overstated, because existing private occupational schemes – omitted in the calculations for the year 1999 – already affect negatively labour force participation *via* the income test. Also included in the baseline scenario is the increase in the standard retirement age for women from 61.5 to 65 between 1999 and 2013.

Austria: The steady state results incorporate the long run effects of the 2003 pension reform. The latter includes a decline in the accrual rate – and a corresponding increase in the number of contribution years required to reach the maximum replacement rate – as well as larger actuarial adjustments for early and deferred retirement. As a result, implicit tax rates on continued work are lower in the current system at its steady state than in 1999.

Belgium: The standard retirement age for women is scheduled to rise from age 60 to age 65 between 1999 and 2009.

Denmark: Following the 1999 reform, the standard retirement age is now 65 instead of 67 previously for all individuals born after June 1939. Therefore, this reform will fully come into force on 1 July, 2004.

Finland: A wide package of reforms to both old-age pensions and early retirement provisions will be phased in during 2003 and 2004. As a result, implicit taxes on continued work will be reduced at virtually all ages. For details, see *OECD Economic Surveys: Finland*, 2003.

France: The 1993 reform ("réforme Balladur") continues to be phased in over 1999-2003, thereby slightly lowering implicit tax rates on continued work beyond age 60. In addition, the calculations incorporate the 2003 pension reform. The latter includes an increase in the length of the contribution period required to get a full pension, lower actuarial adjustments for insufficient

35. These factors include recent policy reforms only to the extent that they affect the standard retirement age and/or the calculation of replacement rates and implicit taxes on continued work. Therefore those elements of recent reforms which are not relevant to the modelling are omitted from this Annex (for a more detailed survey of recent pension reforms in 15 OECD countries, see Casey et al. (2003)).

contribution years, as well as the introduction of an actuarial adjustment for deferred retirement. As a result, post-reform implicit tax rates are higher at age 55 (more precisely, the implicit subsidy which prevailed previously is now significantly lower) but lower at ages 60 and 65.

Germany: An actuarial adjustment for early retirement at age 63 has been introduced following the 2001 reform.

Iceland: Occupational pension schemes became mandatory in 1974. Therefore, the "typical" scheme modelled here pays out benefits in 1999 but is mature only at the steady state.

Italy: Older workers are in the "old" pension system in 1999 but will be in the "new" one -which applies to all individuals having first entered the labour market after 1995 – in the long run. Therefore, the baseline scenario assumes all workers are in the new system. The latter entails lower implicit tax rates on continued work at virtually all ages, except beyond age 65 when pension rights stop accruing and, apart from exceptions, work can not be freely combined with the receipt of a pension.

Japan: The 2000 pension reform, which was implemented in April 2002, includes a reduction in the actuarial adjustment for deferred retirement beyond age 65, a small decline in the employee’s pension accrual rate and an increase in the maximum number of covered years from 45 to 50 (assuming labour market entry at age 20). The projected rise in the minimum retirement age from 60 to 65 (over 2013-2025 for men and 2018-2030 for women) is not incorporated in the calculations. The consequences of this omission should be analysed carefully, since the introduction of an early pension available from age 60 is also scheduled.

*Korea: T*he old-age pension system – which was introduced in 1988- does not pay out benefits yet in 1999 but is assumed to be mature in the baseline scenario. However, the latter does not incorporate the rise in the standard retirement age from 60 to 65 scheduled between 2011 and 2033.

Luxembourg: The 2001 reform introduced a supplementary accrual rate (the "93 rule") which has slightly lowered implicit tax rates on continued work. At the same time, replacement rates have been increased.

New Zealand: The standard retirement age is 64 in 1999 but 65 from 2001 onwards.

Norway: Unlike in the baseline scenario, the pension system -introduced in 1967- is not fully mature yet in 1999.

Portugal: The 2003 reform reduced replacement rates at age 65, introduced an actuarially reduced pension from age 55 and an actuarial bonus for deferred retirement beyond age 65. Overall, following this reform, implicit tax rates remain broadly unchanged for workers in their sixties. However, implicit tax rates in the unemployment pathway into retirement have risen over the recent years, because benefit duration was extended and the unemployment assistance amount increased in 1999.

Spain: The two per cent actuarial adjustment for late claiming, which did not exist in 1999, is included in the baseline scenario.

Sweden: As for Italy, older workers are in the "old" pension system in 1999 but will be in the "new" one in the long run. Therefore, the baseline scenario assumes that all workers are in the new system. The latter is not actuarially neutral, while in the “old” system there was no implicit tax on continued work beyond age 60 because work could be fully combined with the receipt of a pension. Therefore, implicit tax rates are higher, and participation rates lower, in the baseline scenario than in 1999.

Switzerland: The standard retirement age for women is scheduled to rise from age 62 in 1999 to age 64 in 2005.

United Kingdom: the state earnings-related pension system (SERPS) was replaced by the State Second Pension in 2003. Therefore, the latter is incorporated in the baseline scenario.

United States: the standard retirement age is scheduled to rise from 65 to 67 over the period 2000-2022 and the actuarial adjustment for deferred retirement will be increased.

66. For those countries not covered in the modelling of early retirement incentives (Czech Republic, Denmark, Greece, Hungary, Mexico, Poland, Slovak Republic, Turkey), no attempt is made at assessing the future effects of recent reforms and/or the maturation of pension systems on implicit tax rates and labour force participation. However, the impact of changes in the standard retirement age is incorporated, assuming that participation elasticities are similar to those estimated over the panel of in-sample countries. Changes in standard retirement ages from 1999 for these countries are the following:

Czech Republic: the standard retirement age is scheduled to rise from 60.5 to 62 for men and from 58 to 61 for women between 1999 and 2007.

Greece: the standard retirement age is 65 for all persons who first started to work after 1992, against 62 for men and 57 for women in 1999.

Turkey: the standard retirement age is 60 for men and 55 for women who first started to work after 1990, against 55 and 50 respectively in 1999.

Finally, other planned reforms and changes in pension systems are not incorporated in the baseline scenario either because they are very recent (such as the reforms enacted during the summer of 2003 in Austria and France), or because it remains unclear at this stage to what extent they will be implemented in practice (indexation of the basic pension amount on prices instead of wages in the future in Canada and the United Kingdom) or what their impact on implicit tax rates will be (planned changes in Japan over the period 2013-2025 are not modelled). Also not included is the projected rise in the standard retirement age from 60 to 65 in Korea (as part of the 1998 reform).

ANNEX 5

PARTICIPATION AND DEPENDENCY CHANGES IN THE BASELINE SCENARIO USING THE STANDARD DEFINITION OF THE WORKING-AGE POPULATION

67. Table 1 provides participation and dependency ratios calculated for the baseline scenario based on the standard definition of the working-age population (aged 15 to 64).

68. Compared with the indicator reported in Table 6, the average participation rate for the OECD over the population 15 to 64 is projected to remain roughly constant in the future, instead of declining when the population aged 15 and over is considered. Since the total labour supply remains unchanged whatever the population considered, this implies a lower increase during the period 2000-2025 and a larger drop during the period 2025-2050 of the population aged 15-64 compared with the population aged 15 and over.

69. The increase of the old-age dependency is, on average for the OECD, somewhat more moderate when it is calculated over the standard working-age population. Overall for the OECD, the predicted changes of the overall dependency ratio and the share of older workers are roughly similar than for the corresponding indicators calculated over the population aged 15 and over, as in Table 7.

Table 1. **Participation and dependency changes in the baseline scenario using the standard definition of the working-age population**
(percentage point changes)

	Participation rate[1]		Old-age dependency ratio[2]		Overall dependency ratio[3]		Share of older workers (aged 55-64)[4]	
	2000-2025	2025-2050	2000-2025	2025-2050	2000-2025	2025-2050	2000-2025	2025-2050
Australia	-0.3	-0.6	13.2	12.0	10.9	17.2	3.9	1.1
Austria	-4.6	0.4	11.1	16.7	25.3	25.2	4.8	-1.2
Belgium	1.7	0.4	9.9	10.1	6.4	14.8	4.3	-0.1
Canada	1.2	0.2	15.8	8.3	11.9	8.9	5.7	1.1
Czech Republic	-1.4	-5.3	15.8	25.3	19.7	66.8	2.9	3.8
Denmark	-2.3	0.3	10.3	4.3	15.5	5.3	3.5	-0.8
Finland	0.3	1.4	21.0	5.3	29.8	1.8	4.7	-0.8
France	-2.6	0.3	12.4	9.1	24.6	12.5	4.5	-0.4
Germany	2.2	0.3	13.3	10.0	9.6	12.9	4.6	-1.9
Greece	8.4	0.6	9.3	12.0	-17.4	16.9	4.6	0.9
Hungary	-1.9	-5.7	18.2	24.4	30.0	87.1	2.2	3.0
Iceland	2.3	-0.9	10.4	10.1	-0.8	13.7	5.7	2.5
Ireland	9.7	1.1	8.0	15.5	-22.8	16.2	6.9	2.5
Italy	2.9	0.2	13.9	24.6	5.9	43.2	9.3	-1.4
Japan	1.4	-0.3	22.6	19.2	24.2	28.2	2.6	1.3
Korea	-3.2	0.9	22.9	31.5	42.9	46.4	8.7	-2.1
Luxemburg	2.0	1.8	11.7	7.5	11.8	5.9	7.8	-2.4
Mexico	6.5	0.2	6.5	13.8	-42.9	13.6	5.3	4.9
Netherlands	2.2	1.6	14.8	7.3	11.2	6.5	6.7	-1.5
New Zealand	-2.3	-0.9	14.5	12.1	17.2	18.3	7.5	-0.2
Norway	1.7	1.1	8.7	3.6	2.7	1.1	5.9	-0.8
Poland	-0.7	-6.2	19.1	18.9	22.4	66.8	2.7	4.2
Portugal	1.4	0.4	6.5	16.4	3.6	24.1	4.0	-0.1
Slovakia	-1.3	-5.8	15.3	27.6	13.9	68.4	2.6	3.1
Spain	3.2	1.7	9.0	20.7	1.1	26.5	9.3	-1.7
Sweden	-5.0	0.0	10.9	1.7	27.5	1.0	2.8	-0.2
Switzerland	1.7	-0.6	10.5	5.6	5.8	10.0	5.4	-1.2
Turkey	-10.2	-2.4	4.3	13.1	52.8	50.2	2.2	1.0
United Kingdom	-1.2	0.8	9.7	6.4	11.8	5.4	5.5	-1.2
United States	-1.7	0.8	12.6	2.2	21.7	1.3	5.7	-1.2
OECD unweighted average	*0.3*	*-0.5*	*12.7*	*13.2*	*12.5*	*23.9*	*5.1*	*0.3*

1. Calculated as the ratio of the active (employed and unemployed) to the total population aged 15 to 64.
2. Calculated as the ratio of the population aged 65 and over to the population aged 15 to 64.
3. Calculated as the ratio of the inactive population (total population less labour force aged 15-64) to the labour force aged 15-64
4. Calculated as the share of the active population aged 55 to 64 to the total labour force aged 15 to 64.

ANNEX 6

DEMOGRAPHIC AND GROUP-SPECIFIC PARTICIPATION CHANGES IN THE BASELINE SCENARIO

70. The ageing of the population has different effects on labour-force participation across countries depending on where in the ageing process countries are. Generally, a decline in the proportion of youths leads to a higher aggregate participation given that youths participate less in the job market. Similarly, rising proportions of older workers would lead to a lower aggregate participation. Table 1 decomposes the total change in the aggregate participation rate into the effect of demographic changes and the effects of group-specific participation rates.

71. Countries in a later stage of ageing – *i.e.* with a large proportional increase of older workers while the share of youths is stabilizing – record the largest adverse impact on aggregate participation from the demographic effect. These countries include Finland, the Netherlands, Canada, Luxembourg, Australia, Austria and Spain. In some of these countries, the adverse demographic impact is compensated by large positive female cohort effects (the Netherlands and Luxemburg) and/or yet a relatively dynamic population growth (Canada and Australia). By contrast, countries that are still at an earlier stage of ageing – with a more pronounced decline in the share of youths and a still moderate increase in the share of older workers – experience a smaller (adverse) impact from demographics on participation. Mexico and Turkey belong to this group of countries and – with somewhat bigger but still moderate adverse demographic effects – Portugal, Belgium and Iceland.

72. In line with the assumption that the previous decline in the youth participation rate which had been caused by longer education will not continue in the future, participation of youths will change little. (Table 1, column 2). Similarly, there is little change in participation for prime-age men, apart from negative cohort effects in Korea and Turkey. By contrast, cohort effects will induce participation of prime-age women to continue to increase substantially in Ireland, Luxemburg, the Netherlands, Greece and Spain, though in line with the trend already observed during the 1990s. However, some countries, such as Sweden, the Czech Republic and Turkey will experience negative cohort effects on female labour participation.

73. Participation rates of older workers are projected to increase in most countries reflecting in particular the effect of recent reforms (for instance in Italy) and positive cohort effects on participation of older female workers (see Annex 3).

Table 1. **Contributions to the change of aggregate participation rates in the baseline scenario, past and projected**

(changes in percentage points)

	Demography	Participation rate: Youths	Participation rate: Prime-age men	Participation rate: Prime-age women	Participation rate: Older workers[1]	Participation rate: Total	Interaction effect	Total change of participation rate
Australia								
1990-2000	-0.7	-0.3	-0.7	1.1	0.6	0.6	0.1	0.1
2000-2010	-2.2	0.2	-0.6	1.0	0.5	1.2	0.1	-1.0
2010-2025	-5.0	0.0	-0.4	1.1	-0.3	0.4	-0.1	-4.7
Austria								
1990-2000	-1.1	-1.1	0.2	1.2	-0.1	0.3	0.1	-0.7
2000-2010	-2.0	-0.2	-0.1	0.3	0.1	0.1	0.2	-1.7
2010-2025	-6.0	0.0	-0.1	-0.5	0.4	-0.2	0.2	-6.0
Belgium								
1990-2000	0.6	0.0	0.0	3.1	0.1	3.2	0.1	4.0
2000-2010	-2.1	0.1	0.2	1.9	0.4	2.6	0.0	0.5
2010-2025	-4.3	0.0	0.2	0.8	0.7	1.7	-0.1	-2.7
Canada								
1990-2000	-0.6	-1.0	-0.6	0.9	-0.1	-0.7	0.1	-1.2
2000-2010	-2.9	0.0	0.2	1.2	0.3	1.7	0.0	-1.2
2010-2025	-6.1	0.0	0.2	0.9	0.3	1.4	-0.1	-4.9
Czech Republic								
1990-2000	0.0	-1.0	-0.1	-0.4	0.4	-1.1	0.1	-1.0
2000-2010	-2.4	-0.5	-0.4	-0.3	0.2	-1.1	0.3	-3.2
2010-2025	-3.6	0.0	-0.6	-0.3	0.1	-0.7	0.0	-4.3
Denmark								
1990-2000	-0.2	-0.3	-0.8	-0.9	-0.4	-2.4	-0.1	-2.6
2000-2010	-2.6	-0.2	0.0	0.1	0.1	-0.1	0.1	-2.5
2010-2025	-4.2	0.0	-0.2	0.1	-0.1	-0.2	0.0	-4.4
Finland								
1990-2000	-0.6	-1.2	-0.7	-0.4	0.0	-2.3	0.0	-2.9
2000-2010	-4.4	0.5	0.2	0.5	0.6	1.8	0.1	-2.6
2010-2025	-6.3	0.0	0.2	0.2	0.3	0.7	0.0	-5.6
France								
1990-2000	1.0	-1.3	-0.3	1.4	-1.0	-1.2	0.2	0.0
2000-2010	-2.2	0.1	-0.2	0.2	0.4	0.5	0.1	-1.5
2010-2025	-4.7	0.0	-0.1	0.0	0.3	0.2	0.1	-4.5
Germany								
1990-2000	-1.9	-1.2	0.4	1.2	0.7	1.1	0.1	-0.7
2000-2010	-2.2	0.0	0.4	0.8	0.9	2.0	0.0	-0.2
2010-2025	-4.1	0.0	0.0	0.1	0.6	0.7	0.1	-3.3
Greece								
1990-2000	-0.4	-0.2	0.0	2.5	-1.7	0.6	-0.1	0.1
2000-2010	-0.8	0.1	0.0	2.4	1.2	3.7	0.1	3.0
2010-2025	-2.3	0.0	0.0	1.4	1.9	3.3	0.2	1.2
Hungary								
1990-2000	0.1	-0.9	-1.5	-1.6	-0.9	-4.9	0.0	-4.8
2000-2010	-2.6	-0.2	-1.0	-0.2	0.3	-1.2	0.3	-3.5
2010-2025	-3.4	0.0	-0.7	0.1	-0.2	-0.9	0.0	-4.3
Iceland								
1990-2000	0.4	2.6	-0.2	1.4	-1.8	1.9	-0.2	2.1
2000-2010	-0.4	0.1	0.0	0.8	-0.4	0.5	-0.1	0.0
2010-2025	-3.8	0.0	-0.1	1.2	0.0	1.1	-0.1	-2.8
Ireland								
1990-2000	0.9	0.3	0.0	4.9	0.5	5.8	0.2	6.9
2000-2010	0.4	0.0	0.5	2.9	1.1	4.6	0.4	5.4
2010-2025	-4.1	0.0	0.2	1.2	1.9	3.4	0.3	-0.3
Italy								
1990-2000	0.0	-0.5	-0.2	1.5	-0.7	0.0	0.1	0.1
2000-2010	-1.8	0.1	-0.1	1.3	1.4	2.8	0.2	1.2
2010-2025	-4.7	0.0	-0.1	0.5	1.7	2.1	0.4	-2.2
Japan								
1990-2000	-0.8	0.6	-0.1	0.6	-0.8	0.2	-0.3	-1.0
2000-2010	-3.2	0.1	-0.1	0.3	0.0	0.3	0.0	-2.8
2010-2025	-3.9	0.0	0.0	0.0	-0.1	-0.1	0.0	-4.0

Table 1. **Contributions to the change of aggregate participation rates in the baseline scenario, past and projected** (continued)

(changes in percentage points)

	Demography	Participation rate: Youths	Participation rate: Prime-age men	Participation rate: Prime-age women	Participation rate: Older workers[1]	Participation rate: Total	Interaction effect	Total change of participation rate
Korea								
1990-2000	1.4	-0.8	-0.8	1.1	-0.3	-0.8	0.1	0.7
2000-2010	-0.7	0.0	-1.0	0.2	-1.0	-1.8	-0.3	-2.7
2010-2025	-5.5	0.0	-0.6	0.2	-1.0	-1.5	-0.3	-7.3
Luxembourg								
1990-2000	1.4	-1.7	-0.2	4.0	-0.4	1.6	0.4	3.4
2000-2010	-3.3	-0.2	0.1	3.2	0.9	4.0	0.1	0.8
2010-2025	-5.9	0.0	0.1	1.1	1.2	2.4	0.0	-3.5
Mexico								
1990-2000	0.3	-0.2	-0.1	2.0	-0.2	1.5	0.2	2.0
2000-2010	0.0	-0.1	0.0	2.0	0.4	2.2	0.2	2.4
2010-2025	-0.9	0.0	-0.1	1.7	0.8	2.4	0.3	1.8
Netherlands								
1990-2000	-0.7	1.9	0.0	3.8	0.8	6.6	-0.2	5.6
2000-2010	-3.8	0.2	0.4	2.0	1.0	3.5	0.1	-0.2
2010-2025	-6.1	0.0	0.4	0.7	1.0	2.1	-0.1	-4.1
New Zealand								
1990-2000	-0.2	-1.1	-0.5	1.2	1.9	1.4	0.3	1.6
2000-2010	-2.0	0.0	-0.7	0.2	1.0	0.5	0.3	-1.2
2010-2025	-5.3	0.0	-0.9	-0.1	0.3	-0.7	0.3	-5.7
Norway								
1990-2000	1.5	0.8	-0.3	1.2	0.9	2.6	-0.1	4.0
2000-2010	-1.4	0.4	0.3	1.0	0.5	2.1	-0.1	0.7
2010-2025	-4.1	0.0	0.4	0.4	0.2	1.0	-0.2	-3.2
Poland								
1990-2000	-0.2	-1.2	-0.9	-0.5	-2.3	-4.9	0.0	-5.1
2000-2010	-2.2	-0.1	-0.2	0.0	-0.6	-0.9	-0.1	-3.2
2010-2025	-4.5	0.0	-0.2	0.2	-0.1	-0.1	-0.1	-4.7
Portugal								
1990-2000	-0.1	-2.9	-0.4	2.0	1.2	-0.1	0.4	0.2
2000-2010	0.6	0.0	-0.3	0.5	1.3	1.6	0.0	2.2
2010-2025	-2.8	0.0	-0.1	0.2	0.3	0.5	0.1	-2.2
Slovak Republic								
1990-2000	0.3	-0.3	-0.3	0.5	-0.1	-0.1	0.0	0.2
2000-2010	-1.5	-0.2	-0.4	0.3	0.0	-0.3	0.1	-1.8
2010-2025	-5.7	0.0	-0.4	0.1	-0.1	-0.4	0.0	-6.1
Spain								
1990-2000	1.9	-1.2	-0.3	3.8	-1.1	1.2	0.6	3.7
2000-2010	-1.3	0.0	0.0	2.1	0.8	2.9	0.4	2.1
2010-2025	-5.4	0.0	0.0	0.8	1.1	2.0	0.5	-2.9
Sweden								
1990-2000	0.3	-2.9	-1.2	-1.4	1.3	-4.2	0.4	-3.6
2000-2010	-2.9	0.1	-0.4	-0.7	-0.5	-1.5	0.1	-4.2
2010-2025	-3.3	0.0	-0.2	-0.5	-0.9	-1.6	0.0	-4.9
Switzerland								
1990-2000	-0.5	-0.6	-0.3	1.1	-0.9	-0.6	0.0	-1.1
2000-2010	-1.7	0.1	-0.2	1.4	0.2	1.4	-0.1	-0.3
2010-2025	-4.0	0.0	-0.1	1.0	0.4	1.4	-0.1	-2.7
Turkey								
1990-2000	0.8	-3.9	-1.3	-2.1	-1.0	-8.3	0.0	-7.4
2000-2010	-0.1	-0.7	-1.8	-2.0	-0.9	-5.5	0.0	-5.7
2010-2025	-1.5	0.0	-1.5	-1.4	-0.6	-3.5	-0.2	-5.2
United Kingdom								
1990-2000	0.3	-1.4	-0.8	0.8	-0.1	-1.4	0.2	-0.9
2000-2010	-1.8	0.2	-0.2	0.6	0.4	1.0	0.0	-0.8
2010-2025	-4.3	0.0	-0.1	0.3	0.4	0.6	0.0	-3.7
United States								
1990-2000	0.0	-0.2	-0.5	0.8	0.5	0.6	0.0	0.6
2000-2010	-2.0	-0.3	0.1	0.1	0.3	0.3	0.0	-1.7
2010-2025	-4.8	0.0	0.1	0.3	0.5	0.9	0.1	-3.9

1. For 8 out 30 OECD countries (Denmark, Hungary, Czech Republic, Mexico, Slovak Republic, Poland, Greece and Turkey), only the impact of recently enacted changes in the standard retirement age are taken into account. The effect of possible changes in implicit tax rates is omitted for these countries.

ANNEX 7

IMPACT OF PENSION REFORMS ON PARTICIPATION OF OLDER WORKERS

74. The econometric regressions presented in Table 2 of Duval (2003) (Model B) can be used to assess the participation effects of three potential policy reforms: *i)* a removal of early retirement schemes (*i.e.*, implicit tax rates are reduced from the levels observed in the "early retirement route" to those prevailing in regular old-age pension schemes); *ii)* a move towards actuarial neutrality of old-age pension systems (*i.e.* implicit tax rates are reduced from the levels prevailing in regular old-age pension schemes to zero); and *iii)* a convergence of standard retirement ages to 67, which is currently the highest level among OECD countries. The three reforms are simulated cumulatively using this sequential order. The methodology used is the same as for the estimation of the impact of recent pension reforms. As a first step, differences between post and pre-reform implicit tax rates are computed for each of the three ages 55, 60 and 65, as well as the difference between the post and the pre-reform standard retirement age. As a second step, in order to assess their potential impact on participation, each of these differences is multiplied by its corresponding coefficient in the panel data regressions. Finally, adding the resulting participation effects of recent reforms to baseline (steady state) participation rate levels yields post-reform participation rates.

75. However, panel data estimates such as those presented in the above mentioned Table 2 may underestimate the "true" long-run participation elasticities with respect to implicit tax rates, and are, therefore, used in "low case" policy scenarios. Simple cross-section correlations (*i.e.*, the slopes presented in Panel B of Figures 7 and 8 of Duval(2003)), whose magnitude is more in line with the elasticities typically found in the micro-econometric literature, are used instead to construct "high case" scenarios.

76. The results, expressed as differences in participation rates (in percentage points) compared with the baseline projections, are presented in Table 1 for the 55-64, 65+ and 55+ age groups. It is instructive that even in the high case scenario, these policy simulations suggest that combining the three reforms mentioned above would not be sufficient to bring participation rates in low-participation countries (*e.g.* France, Belgium) back to their levels of the late 1960s, nor would it be enough to reach the levels currently observed in high-participation countries such as Iceland or Japan. This result probably reflects the fact that a number of influences on the retirement decision have been omitted from the empirical analysis presented in Duval (2003), including a range of country-specific institutional, cultural and historical factors.[36]

36. Another reason for this finding may be that all the policy simulations presented in Table A3.8 assume no impact on the labour force participation of workers aged under 55, which is unlikely to be true. Yet since the dependent variable in all regressions is the difference in participation rates between two consecutive age groups, the inentitial level at age 55 plays an important role in the simulations. For instance, the low labour market attachment of the 50-54 age group in Italy explains to a large extent why participation rates of workers aged 55 and over remain relatively low in both baseline projections and reform scenarios.

Table 1. **Participation effects of three policy scenarios for older workers**

Panel A. **55-64**

	Baseline scenario	Reform 1 Early schemes removed		Reform 2 Actuarial fairness		Reform 3 Standard age to 67	Total	
		Low case	High case	Low case	High case		Low case	High case
	Level	In percentage points						
Australia	48.0	-12.0	-2.6	1.6	4.4	13.6	3.2	15.3
Austria	30.3	5.7	15.1	7.3	19.4	8.1	21.1	42.6
Belgium	32.1	3.5	9.3	2.6	6.9	0.8	6.9	16.9
Canada	53.6	0.0	0.0	1.5	3.5	1.2	2.6	4.7
Czech Republic	38.0	..	..	..	..	2.3	2.3	2.3
Denmark	55.8	..	..	..	..	1.2	..	..
Finland	49.0	4.4	11.2	2.8	7.2	1.1	8.3	19.6
France	38.0	6.4	16.8	2.4	6.3	3.4	12.1	26.5
Germany	52.2	4.4	11.3	1.9	5.0	1.2	7.5	17.4
Greece	55.4	..	..	..	..	1.0	..	..
Hungary	23.8	..	..	..	..	1.3	..	..
Iceland	82.8	0.0	0.0	0.9	2.3	0.0	0.9	2.3
Ireland	67.8	3.6	9.2	2.3	6.1	0.6	6.6	15.9
Italy	43.4	0.0	0.0	1.0	2.4	0.8	1.8	3.2
Japan	67.8	0.0	0.0	3.0	7.2	1.2	4.2	8.4
Korea	50.7	0.0	0.0	2.4	5.6	3.5	5.9	9.1
Luxembourg	40.8	11.1	29.4	-0.9	-1.9	0.9	11.1	28.4
Mexico	62.3	..	..	..	..	1.0	..	..
Netherlands	48.5	4.4	11.5	6.8	18.2	1.1	12.3	30.8
New Zealand	62.0	0.0	0.0	0.1	0.3	1.2	1.3	1.5
Norway	72.2	1.0	2.2	2.8	7.0	0.0	3.8	9.2
Poland	29.3	..	..	..	..	1.3	..	..
Portugal	57.5	6.7	17.3	2.0	5.4	1.0	9.7	23.7
Slovak Republic	24.0	..	..	..	..	2.6	..	..
Spain	54.0	4.8	12.3	3.2	8.5	1.0	9.0	21.8
Sweden	64.2	0.0	0.0	2.9	7.0	1.2	4.2	8.3
Switzerland	66.5	0.0	0.0	3.1	7.7	1.7	4.7	9.3
Turkey	24.5	..	..	..	..	1.6	..	..
United Kingdom	54.5	1.6	4.1	1.6	4.1	1.1	4.4	9.4
United States	60.4	0.0	0.0	1.2	2.9	0.0	1.2	2.9
OECD average[1]	50.3	2.1	6.7	2.4	6.2	1.9	6.3	14.8

1. Unweighted average.

Table 1. **Participation effects of three policy scenarios for older workers** (continued)

Panel B. **65 and over**

	Baseline scenario	Reform 1 Early schemes removed		Reform 2 Actuarial fairness		Reform 3 Standard age to 67	Total	
		Low case	High case	Low case	High case		Low case	High case
	Level	In percentage points						
Australia	7.4	-3.1	-1.2	2.9	5.5	4.1	3.8	8.4
Austria	2.7	1.5	3.5	4.4	9.0	5.1	11.0	17.6
Belgium	2.6	0.3	0.7	3.2	5.6	0.6	4.1	6.9
Canada	6.7	0.0	0.0	0.8	1.3	1.4	2.1	2.7
Czech Republic	4.3	..	..	..	..	2.5	2.5	2.5
Denmark	1.1	..	..	..	..	0.9	..	..
Finland	4.5	0.7	1.7	3.8	5.9	1.0	5.4	8.6
France	1.4	0.2	0.5	4.1	7.5	2.4	6.7	10.5
Germany	3.7	0.7	1.7	0.4	1.0	1.0	2.1	3.8
Greece	9.1	..	..	..	..	1.5	..	..
Hungary	1.8	..	..	..	..	1.3	..	..
Iceland	19.6	0.0	0.0	2.5	3.1	0.0	2.5	3.1
Ireland	10.6	1.1	2.5	1.4	2.5	0.9	3.3	5.9
Italy	8.4	0.0	0.0	5.1	6.0	1.2	6.3	7.2
Japan	17.5	0.0	0.0	3.1	5.6	2.1	5.2	7.7
Korea	20.3	0.0	0.0	4.6	7.6	7.2	11.7	14.8
Luxembourg	3.2	0.9	2.3	0.6	1.8	0.9	2.4	5.0
Mexico	32.7	..	..	..	..	2.6	..	..
Netherlands	5.7	0.5	1.4	2.6	7.0	1.2	4.3	9.6
New Zealand	12.8	0.0	0.0	0.0	0.1	1.8	1.9	1.9
Norway	6.2	1.5	1.8	4.4	5.7	0.0	5.8	7.5
Poland	5.8	..	..	..	..	1.7	..	..
Portugal	23.2	4.5	11.4	2.6	5.3	2.2	9.3	18.9
Slovak Republic	1.0	..	..	..	..	1.8	..	..
Spain	3.1	0.5	1.2	7.4	10.4	1.1	9.0	12.7
Sweden	1.7	0.0	0.0	3.8	4.5	1.3	5.1	5.8
Switzerland	10.4	0.0	0.0	2.4	3.9	2.2	4.7	6.1
Turkey	14.0	..	..	..	..	4.5	..	..
United Kingdom	7.5	0.4	1.0	1.9	2.7	1.4	3.7	5.1
United States	16.8	0.0	0.0	1.7	2.6	0.0	1.7	2.6
OECD average[1]	8.9	0.4	1.3	2.9	4.8	1.9	5.0	7.9

1. Unweighted average.

77. Removing early retirement schemes where they are still being used extensively would yield sizeable participation effects on the 55-64 age group (Table 1, Reform 1). This mainly concerns Continental European countries, such as Austria, Belgium, France, Germany, Luxembourg, Netherlands, Portugal or Spain. For these eight countries and Finland, simulations point to an average impact of almost six percentage points in the low case scenario and above 15 points in the high case one. The labour force participation of the 55+ age group would be less affected (three and 7.7 percentage points respectively), due to a limited effect on the 65+.

78. Such removal of early pathways into retirement would leave older workers facing only the incentives embedded in old-age pension systems. If the latter then moved towards actuarial neutrality, the impact on the labour force participation of the 55+ age group would be even larger than that of removing early retirement schemes, mainly because the 65+ age group would be more clearly affected[37] (Reform 2). In countries where early retirement schemes are not widespread but old-age pension systems are still far from actuarial neutrality, such as Korea or Japan, the working life would also be lengthened (compared with baseline projections) by moving towards actuarial neutrality.

79. The third policy simulation presented in Table 1 is a convergence of standard retirement ages to 67 for both males and females (Reform 3). This stimulates participation by creating "liquidity" and/or "customary" effects on the retirement decision, which come over and above those *via* implicit tax rates (see para. 7 in Duval (2003)). Reform 3 in Table A7.1 only concerns this channel. The results should be interpreted as the additional impact of raising the standard age – and the early age simultaneously by the same number of years[38] – once early retirement schemes are removed and the pension system is actuarially neutral. The effects on the 55+ age group appear to be sizeable in those countries where the standard retirement age is currently low (Czech Republic, France, Hungary, Korea, Slovak Republic, Turkey) and/or where it is significantly lower for females (Poland, Slovak Republic, Turkey).[39]

37. The population aged 65 and over is larger in size than that aged between 55 and 64 in all OECD countries, and in some cases significantly so (1.7 times in France in 2000). Therefore increases in the labour market attachment of the 65+ age group have disproportionately large impacts on the labour force participation rate of the 55+ age group.

38. The early age was significant at the 5 per cent level in the regressions presented in Duval (2003) (Table 2, Model B), when the standard age was excluded. However it was left out of the final estimates, due both to multicollinearity problems and the higher level of statistical significance of the standard age. Therefore, even though it was not possible to separate the effects of both eligibility ages, there is indication that the early age also affects labour force participation, mostly through liquidity effects.

39. However, it remains unclear whether an increase in early and standard retirement ages, in an already actuarially neutral pension system, would be desirable. Indeed, to the extent that its impact on the retirement decision mainly comes from "liquidity" rather than "customary" effects, it would merely raise participation by forcing liquidity-constrained individuals to remain in the labour market longer than they wish to. In this context raising eligibility ages to benefits would not be welfare-enhancing.

ANNEX 8

STIMULATING LABOUR PARTICIPATION OF WOMEN

80. This section considers four policy scenarios that could potentially increase the labour force participation of women. The first scenario (policy one) assumes an equal tax treatment of second earners relative to single individuals (at 67 per cent of APW), as is already the case in Finland, Sweden, Hungary, Mexico, and Turkey. In all other countries, this scenario implies a reduction of the average tax rate on second earners. In the second scenario (policy two), female participation is stimulated through increasing public childcare spending to the OECD average of $2 314 per child (PPP-corrected, in 1995 prices), only for countries with below-average expenditures. For countries with above-average expenditures, spending per child is maintained constant. The third scenario (policy three) assumes that public childcare spending in all countries converges to the maximum value of $8 009 per child observed in Denmark. Finally, in the fourth scenario (policy four), part time participation of married women is stimulated through increasing the tax incentives to share market work between spouses. Specifically, the increase in household disposable income between a situation where husband and wife share market work (100 per cent and 33 per cent of APW respectively) and a situation where the husband earns all the market income (133 per cent of APW) is set at the maximum value of 11 per cent observed in Finland and Mexico.

81. The simulations are based on Model II (Table 8) in Jaumotte (2003), which provides distinct predicting equations for part-time and full-time participation. The predicted changes in full-time and part-time participation are then aggregated to yield the change in aggregate female participation relative to the female participation rate projected for 2025 in the baseline. The constraint is imposed that the female participation rate can not exceed the male participation rate projected for 2025 in the baseline ("participation constraint").[40] Table 1 shows the increase in participation rates of women aged 25-54 years old which can be achieved under each scenario.[41] The average participation gain from equalising the tax

40 There are several reasons why this constraint may be binding. In some countries, the policy changes involved are very large and the estimated coefficients – which mostly apply at the margin – may not be appropriate. Second, the estimated model captures an average effect of policies in the sample countries but policies may work differently in some countries due to the countries' specificities. Finally, an imperfect control for general equilibrium effects, may also lead to excessive estimated increases in participation rates, particularly when participation rates have already reached a high level.

41 The effect of a policy variable includes its direct effect on participation as well as its indirect effects through the three potentially endogenous variables (public childcare spending, female and male unemployment rates) for which first-stage regressions were estimated. Specifically, a more favourable tax treatment of part-time tends to decrease the female and male unemployment rates, as well as public childcare spending per child.

treatment of second earners is about four percentage points.[42] The largest increases are observed in the Czech Republic, Ireland, Spain, and Italy. On the other hand, the catch-up of public childcare spending to the OECD average leads to a moderate average increase in participation rates of 1.5 percentage points. The participation gain from a convergence of public childcare spending to the OECD maximum value is 4.4 percentage points on average, with particularly large gains in Korea, the Czech Republic, Australia, New Zealand, Canada and Southern European countries. Finally, the favourable tax treatment of part-time leads to an average participation gain of 4.9 percentage points. Interestingly, the largest predicted gains are for countries with an already high level of part-time participation, such as Germany, Japan, the Netherlands, Switzerland, and Ireland.

42 The average participation gain is calculated for all countries, including those for which the scenario does not imply a policy change.

Table 1. **Predicted labour force participation rate of women aged 25-54 years, 2025** [1, 2]

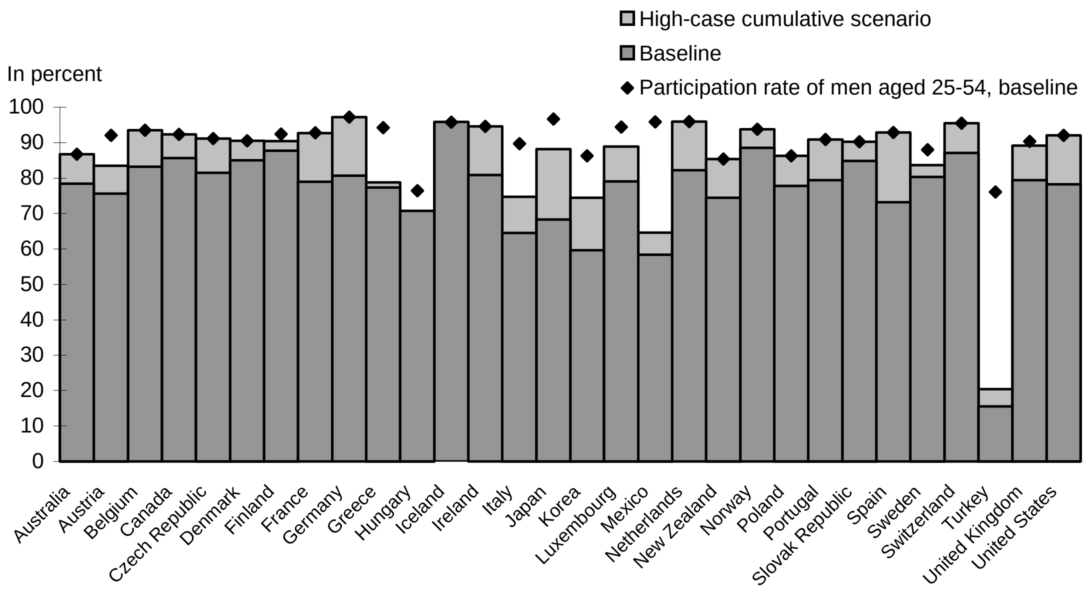
	Baseline	Increase in full-time participation (percentage points)			Increase in part-time participation (percentage points)	Increase in total participation (percentage points)	
		Scenario 1	Scenario 2	Scenario 3	Scenario 4		
		Equal tax treatment second earner	Increase in childcare to OECD average	Increase in childcare to Denmark's level	Favourable tax treatment part time	Cumulative scenario low-case	Cumulative scenario high-case
Australia	78.4	4.8	3.0	6.4	6.1	86.7	86.7
Austria	75.6	1.7	0.0	2.6	3.5	80.8	83.5
Belgium	83.2	6.8	0.5	4.1	10.3	93.5	93.5
Canada	85.7	6.7	2.0	6.6	4.3	92.4	92.4
Czech Republic	81.5	9.7	1.7	7.0	0.0	91.2	91.2
Denmark	85.0	4.7	0.0	0.0	4.1	90.5	90.5
Finland	87.7	0.0	0.0	2.7	0.1	87.8	90.5
France	79.0	2.6	0.0	2.2	8.9	90.4	92.7
Germany	80.7	6.2	0.0	2.6	13.6	97.2	97.2
Greece	77.4	0.3	..	..	1.1	78.8	78.8
Hungary	70.7	0.0	..	..	-0.1	70.7	70.7
Iceland	95.9	-0.1	-0.1	-0.1	-0.1	95.8	95.8
Ireland	80.9	13.7	1.4	5.0	8.5	94.6	94.6
Italy	64.5	7.6	..	..	2.7	74.7	74.7
Japan	68.3	2.4	1.4	4.2	13.2	85.2	88.2
Korea	59.6	1.2	8.3	12.4	1.2	70.4	74.5
Luxembourg	79.1	1.8	..	..	8.0	88.9	88.9
Mexico	58.4	0.1	3.0	6.1	0.0	61.6	64.6
Netherlands	82.2	2.4	0.0	2.3	13.8	96.0	96.0
New Zealand	74.5	4.2	3.8	7.3	6.3	85.4	85.4
Norway	88.6	2.9	0.0	0.9	5.2	93.8	93.8
Poland	77.8	5.1	..	..	4.4	86.2	86.2
Portugal	79.4	4.9	2.1	6.9	2.2	88.7	90.9
Slovak Republic	84.8	5.4	3.2	5.4	..	90.2	90.2
Spain	73.2	9.8	2.0	6.2	4.9	89.9	92.9
Sweden	80.4	0.0	0.0	1.3	2.0	82.4	83.6
Switzerland	87.0	3.6	1.8	5.0	8.4	95.5	95.5
Turkey	15.5	0.0	2.5	3.4	1.5	19.4	20.4
United Kingdom	79.4	2.5	0.6	3.8	3.4	85.8	89.2
United States	78.2	4.9	0.9	5.4	3.8	87.7	92.0
OECD average[3]	76.4	3.9	1.5	4.4	4.9	84.4	85.5

1. Scenario 1 assumes equal tax treatment of second earners and single individuals (at 67 percent of in APW), as is already the case in Finland, Sweden, Hungary, Mexico, and Turkey. The second scenario assumes a catch-up of public expenditures on childcare to the OECD average of $2314 per child, only in countries with below-average expenditures. Scenario 3 assumes that public childcare spending converges in all countries to the OECD maximum of US$8009 observed in Denmark. Finally, scenario 4 sets the increase in household disposable income between a situation where husband and wife share market work (100 percent and 33 percent of APW respectively) and a situation where the husband earns all the market income (133 percent of APW) to the maximum value of 11 percent observed in Finland and Mexico. The "low-case cumulative scenario" combines the effects of scenarios 1, 2, and 4, while the "high-case cumulative scenario" combines scenario 1, 3, and 4.
2. All scenarios are simulated under the constraint that the female participation rate can not exceed the male participation rate projected in the baseline for 2025.
3. Unweighted average.

Source: OECD estimates.

82. Two cumulative policy scenarios are calculated based on these individual policy changes. The high-case scenario combines the effects of policies one, three, and four, again under the constraint that the female participation rate can not exceed the male participation rate projected in the baseline. Under this cumulative scenario, public childcare spending per child is assumed to converge to the OECD maximum value in all countries. Alternatively, the low-case scenario which combines policies one, two, and four, assumes only a catch-up of public childcare spending (per child) to the OECD average level, in countries which have below-average expenditures. Figure 1 compares female participation rates under the high-case scenario with female participation rates in the baseline, as well as baseline male participation rates. The projected average female participation rate under the high-case scenario is 85.5 per cent, against 72 per cent in 2000 and 76.4 per cent in the baseline scenario. Thus, policies contribute an average of nine percentage points to female participation. However, female participation rates remain low – in absolute level or relative to those of men – in Austria, Greece, Hungary, Italy, Japan, Korea, Luxembourg, Mexico, and Turkey.[43] The gender participation gap is closed – or even reversed – for most other countries.

Figure 1. **Predicted labour force participation rate of women aged 25-54 years, 2025**



Note: see Table A3.10.1.

Source: OECD estimates.

43 Note that the simulations for Greece, Hungary, Italy, and Luxembourg do not include a change in public childcare spending due to lack of data. The gender participation gap may be much lower for these countries if the effects of a change in childcare spending could be included.

In most countries, it is not necessary to implement all simulated reforms to reach a female participation level similar to that of men, as indicated by the fact that the participation constraint is binding. Moreover, there may be some overlap between reforms one and four, as a change in the tax system – such as a reduction of the dependent spouse's allowance – may affect both measures of taxation (for full-time and part-time respectively) at the same time. Hence, most countries have the choice between different policy instruments.

83. Beyond the participation effects, the policy mix chosen will affect the share of part-time and full-time, hence the average hours of work or, rather, "hours supplied for participation" (Table 2). For example, the first policy scenario, which reduces average taxation on second earners earning 67 per cent of APW, tends to increase the share of full-time, and hence the average hours of work. The highest predicted increase in the share of full-time is 4.7 percentage points in Ireland, while the average increase is quite moderate at 1.1 percentage point. Similarly, the increase in public childcare expenditures in the second and third scenarios tends to increase the share of full-time in participation, though moderately so. Here the highest predicted increase in the share of full-time is 3.3 percentage points in Turkey. Finally, an increase in the tax incentives to part-time (scenario 4) obviously decreases the share of full-time in participation. The effect is more important in this scenario with an average decrease is of 5.2 percentage points, and the largest decrease of about 11 percentage points predicted for Japan and Germany.

Table 2. **Predicted share of full-time in participation of women aged 25-54 years, 2025** [1, 2]

	Baseline	Increase in the share of full-time in participation (percentage points)			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
		Equal tax treatment second earner	Increase in childcare to OECD average	Increase in childcare to Denmark's level	Favourable tax treatment part time
Australia	62.9	2.1	1.4	2.8	-5.2
Austria	73.3	0.6	0.0	0.9	-3.9
Belgium	65.3	2.6	0.2	1.6	-8.3
Canada	78.6	1.5	0.5	1.5	-4.7
Czech Republic	96.0	0.4	0.1	0.3	-2.0
Denmark	83.7	0.9	0.0	0.0	-5.2
Finland	90.7	0.0	0.0	0.3	-0.1
France	76.8	0.7	0.0	0.6	-9.4
Germany	64.8	2.5	0.0	1.1	-10.6
Greece	90.8	0.0	..	..	-2.4
Hungary	96.0	0.0	..	..	-0.9
Iceland	71.0	0.0	0.0	0.0	-1.3
Ireland	67.9	4.7	0.5	1.9	-7.5
Italy	75.9	2.5	..	..	-3.8
Japan	62.4	1.3	0.7	2.2	-11.3
Korea	91.3	0.2	1.1	1.5	-3.6
Luxembourg	70.5	0.7	..	..	-7.6
Mexico	74.2	0.0	1.3	2.4	0.0
Netherlands	44.1	1.6	0.0	1.5	-7.3
New Zealand	67.6	1.7	1.6	2.9	-6.1
Norway	71.4	0.9	0.0	0.3	-5.0
Poland	84.9	0.9	..	..	-6.3
Portugal	88.9	0.6	0.3	0.9	-3.8
Slovak Republic	97.3	0.2	0.1	0.2	..
Spain	84.7	1.8	0.4	1.2	-7.2
Sweden	82.1	0.0	0.0	0.3	-2.7
Switzerland	53.6	1.8	1.0	2.5	-5.7
Turkey	81.6	0.0	2.5	3.3	-9.2
United Kingdom	61.4	1.2	0.3	1.8	-2.8
United States	87.5	0.7	0.1	0.8	-6.0
OECD average[3]	76.6	1.1	0.5	1.3	-5.2

1. Scenario 1 assumes equal tax treatment of second earners and single individuals (at 67 percent of in APW), as is already the case in Finland, Sweden, Hungary, Mexico, and Turkey. The second scenario assumes a catch-up of public expenditures on childcare to the OECD average of $2314 per child, only in countries with below-average expenditures. Scenario 3 assumes that public childcare spending converges in all countries to the OECD maximum of US$8009 observed in Denmark. Finally, scenario 4 sets the increase in household disposable income between a situation where husband and wife share market work (100 percent and 33 percent of APW respectively) and a situation where the husband earns all the market income (133 percent of APW) to the maximum value of 11 percent observed in Finland and Mexico. The "low-case cumulative scenario" combines the effects of scenarios 1, 2, and 4, while the "high-case cumulative scenario" combines scenario 1, 3, and 4.
2. All scenarios are simulated under the constraint that the female participation rate can not exceed the male participation rate projected in the baseline for 2025.
3. Unweighted average.

Source: OECD estimates.

ANNEX 9

PARTICIPATION AND DEPENDENCY CHANGES AFTER POLICY REFORMS USING THE STANDARD DEFINITION OF THE WORKING-AGE POPULATION

84. Table 1 reports the forecasted changes of participation and dependency rates in the scenarios including all policy reforms using the standard definition of the working-age population (15-64). The changes of old-age dependency ratios are not reported since the standard definition (as used in Table 1 of Annex 1) of this ratio is based on demographic (total population) data exclusively. Hence, policy reforms do not affect this ratio. The impact of the reforms on the aggregate participation rates remains roughly unchanged with the standard definition compared with the extended population aged 15 and over. The impact of these reforms on the overall dependency ratio is slightly lower when the usual working-age population is considered.

Table 1. **Participation and dependency changes after policy reforms using the standard definition of the working-age population,**
(percentage point changes)

Panel A. **Low case**

	Participation rate[1]		Overall dependency ratio[3]		Share of older workers (aged 55-64)[4]	
	2000-2025	2000-2050	2000-2025	2025-2050	2000-2025	2025-2050
Australia	2.9	2.3	2.0	18.6	4.2	5.3
Austria	-0.4	-0.1	11.2	35.3	7.0	5.6
Belgium	8.7	9.1	-16.2	-2.7	5.4	5.2
Canada	3.8	4.0	5.3	14.1	5.9	7.0
Czech Republic	3.8	-1.4	4.5	65.0	2.8	6.5
Denmark	-0.7	-0.4	11.3	16.5	3.2	2.4
Finland	3.0	4.2	21.9	24.2	6.6	5.7
France	6.5	6.8	-5.9	5.4	6.4	6.0
Germany	9.6	9.9	-9.8	1.9	5.3	3.4
Greece	11.1	11.7	-25.6	-9.2	4.2	5.1
Hungary	0.3	-4.8	20.1	98.9	2.3	5.3
Iceland	2.5	1.5	-1.1	12.6	5.9	8.4
Ireland	16.3	17.4	-38.3	-23.1	7.1	9.6
Italy	8.1	8.3	-13.3	26.5	8.6	7.3
Japan	8.9	8.6	3.2	28.6	1.9	3.2
Korea	3.9	4.5	16.8	59.8	8.8	6.6
Luxemburg	10.3	11.9	-15.1	-8.6	9.6	6.7
Mexico	9.1	9.1	-50.9	-37.2	5.1	9.9
Netherlands	9.0	10.3	-5.5	1.3	8.9	7.1
New Zealand	1.4	0.4	6.6	24.1	7.0	6.8
Norway	4.1	5.2	-2.7	-1.5	6.3	5.4
Poland	4.2	-1.9	4.9	64.6	2.4	6.4
Portugal	7.8	8.2	-13.4	8.9	5.2	5.1
Slovakia	2.4	-3.3	2.7	66.0	2.9	6.2
Spain	11.8	13.5	-23.1	1.1	10.0	8.3
Sweden	-4.3	-0.2	25.3	1.4	2.6	-0.2
Switzerland	5.4	4.6	-2.3	7.4	5.9	4.6
Turkey	-6.3	-8.9	23.2	68.3	1.9	3.0
United Kingdom	1.7	2.5	4.0	9.4	6.1	4.9
United States	1.4	2.2	13.2	14.5	5.3	4.2
OECD average[5]	4.9	4.5	-1.6	19.7	5.5	5.7

1. Calculated as the ratio of the active (employed and unemployed) to the total population aged 15 to 64.
2. Calculated as the ratio of the population aged 65 and over to the population aged 15 to 64.
3. Calculated as the ratio of the inactive population (total population less labour force aged 15-64) to the labour force aged 15-64
4. Calculated as the share of the active population aged 55 to 64 to the total labour force aged 15 to 64.
5. Unweighted average.

Table 1. **Participation and dependency changes after policy reforms using the standard definition of the working-age population, (percentage point changes)**

Panel B. **High case**

	Participation rate[1]		Overall dependency ratio[3]		Share of older workers (aged 55-64)[4]	
	2000-2025	2000-2050	2000-2025	2025-2050	2000-2025	2000-2050
Australia	3.6	3.0	0.3	16.6	5.0	6.1
Austria	3.4	3.4	-0.3	23.5	10.4	8.8
Belgium	10.9	11.2	-22.5	-9.0	7.9	7.6
Canada	4.2	4.4	4.2	13.0	6.4	7.4
Czech Republic	3.8	-1.4	4.5	65.0	2.8	6.5
Denmark	-0.7	-0.4	11.3	16.5	3.2	2.4
Finland	6.3	7.3	13.1	15.9	9.1	7.9
France	10.2	10.4	-16.3	-5.5	9.7	9.2
Germany	12.0	12.2	-15.6	-3.7	7.7	5.6
Greece	11.1	11.7	-25.6	-9.2	4.2	5.1
Hungary	0.3	-4.8	20.1	98.9	2.3	5.3
Iceland	2.7	1.8	-1.6	11.9	6.1	8.6
Ireland	17.1	18.5	-40.2	-25.7	8.9	11.5
Italy	8.5	8.6	-14.5	25.2	9.0	7.7
Japan	10.7	10.5	-1.3	23.3	2.5	4.0
Korea	5.9	6.4	10.3	52.5	9.3	7.0
Luxemburg	14.3	15.0	-25.8	-17.3	13.8	10.2
Mexico	10.1	10.1	-53.8	-40.2	4.9	9.6
Netherlands	13.2	14.0	-14.7	-6.8	13.0	10.6
New Zealand	1.4	0.4	6.5	24.0	7.0	6.8
Norway	5.2	6.3	-5.3	-3.9	7.4	6.5
Poland	4.2	-1.9	4.9	64.6	2.4	6.4
Portugal	11.2	11.6	-21.4	0.1	7.8	7.7
Slovakia	2.4	-3.3	2.7	66.0	2.9	6.2
Spain	15.7	17.2	-32.5	-8.8	12.8	10.8
Sweden	-4.3	-0.2	25.3	1.4	2.6	-0.2
Switzerland	6.4	5.6	-4.5	5.4	6.9	5.5
Turkey	-6.0	-8.6	21.1	65.9	1.9	2.9
United Kingdom	3.9	4.6	-1.3	4.1	7.1	5.8
United States	3.1	3.8	8.9	10.3	5.5	4.3
OECD average[5]	*6.4*	*5.9*	*-5.5*	*15.8*	*6.7*	*6.8*

1. Calculated as the ratio of the active (employed and unemployed) to the total population aged 15 to 64.
2. Calculated as the ratio of the population aged 65 and over to the population aged 15 to 64.
3. Calculated as the ratio of the inactive population (total population less labour force aged 15-64) to the labour force aged 15-64
4. Calculated as the share of the active population aged 55 to 64 to the total labour force aged 15 to 64.
5. Unweighted average.

Tables

Figures

Table 1. **Trends in population and aggregate labour supply in OECD countries**
(Average annual growth rate)

	Population		Participation rate[1]		Labour force	
	1975-1989	1990-2000 [2]	1975-1989	1990-2000 [2]	1975-1989	1990-2000 [2]
Australia	1.9	1.4	0.2	0.0	2.1	1.4
Austria	0.6	0.6	0.4	0.5	1.0	1.1
Belgium	0.4	0.3	-0.1	0.2	0.4	0.5
Canada	1.7	1.3	0.7	-0.1	2.4	1.2
Czech Republic	0.2	0.5	..	-0.2	..	0.3
Denmark	0.6	0.2	0.5	-0.4	1.1	-0.2
Finland	0.6	0.5	0.3	-0.5	0.9	0.0
France	0.8	0.5	-0.1	0.1	0.7	0.7
Germany	..	0.4	..	-0.3	..	0.1
Greece	1.2	0.9	0.2	0.1	1.4	1.0
Hungary	..	0.0	..	-1.2	..	-1.2
Iceland	1.6	1.2	0.6	1.0	2.1	2.2
Ireland	1.0	1.5	-0.3	1.2	0.7	2.7
Italy	0.9	0.3	0.0	-0.6	1.0	-0.3
Japan	1.2	0.7	0.0	-0.1	1.2	0.6
Korea	2.6	1.5	0.2	0.2	2.8	1.7
Luxembourg	0.6	1.1	0.5	2.2	1.1	3.3
Mexico	..	2.7	..	2.1	..	4.8
Netherlands	1.2	0.6	0.9	1.0	2.1	1.6
New Zealand	1.2	1.4	0.7	0.3	1.9	1.6
Norway	0.8	0.4	0.6	0.5	1.4	0.9
Poland	0.7	0.9	..	-1.0	..	-0.1
Portugal	1.0	0.5	0.1	-0.2	1.1	0.3
Slovak Republic	0.8	0.9	..	0.1	..	1.1
Spain	1.2	0.9	-0.2	0.5	1.0	1.3
Sweden	0.5	0.3	0.1	-0.6	0.6	-0.3
Switzerland	0.8	0.7	0.5	-0.2	1.3	0.5
Turkey	2.8	2.7	-1.1	-1.8	1.7	0.9
United Kingdom	0.6	0.4	0.2	-0.2	0.8	0.2
United States	1.3	1.0	0.6	0.2	2.0	1.2
OECD average[3]	1.3	0.9	0.2	-0.1	1.5	0.9
European union[4]	0.8	0.5	0.1	0.0	0.9	0.5

1. Data refer to total labour force and population aged 15 and over.
2. 1991-2000 for Germany, 1992-2000 for Hungary and Poland, 1994-2000 for Slovak Republic.
3. Weighted average. Not included Czech Republic, Germany, Hungary, Mexico, Poland and Slovak Republic.
4. Weighted average. Not included Germany.
Source: Labour Force Statistics (Part II).

Table 2. **Contributions of demographic changes and group-specific shifts of participation to changes of aggregate participation rates over the period 1975-1990[1]**

(percentage changes)

	Demographic effect	Variation of group-specific participation rate							Interaction effect	Total change of the aggregate participation rates over 1975-1990
		Men	Women	Total 15-24	Men 25-54	Women 25-54	Total 55 and above	Total		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Australia	-0.5	-2.7	4.9	0.6	-0.8	4.4	-2.0	2.2	0.0	1.7
Canada	-0.4	-1.0	7.0	1.6	-0.4	5.9	-1.2	6.0	0.0	5.6
Finland	1.5	-1.4	2.0	0.5	0.2	2.1	-2.3	0.5	-0.1	1.8
France	-0.4	-3.7	2.0	-3.0	-0.3	3.8	-2.3	-1.7	0.2	-1.9
Germany	0.2	-1.3	2.6	-0.5	-0.9	3.0	-0.5	1.2	0.0	1.4
Ireland	0.2	-5.4	3.1	-2.8	-1.0	4.4	-2.9	-2.3	0.8	-1.3
Italy	-1.1	-1.3	6.4	1.0	-0.9	5.4	-0.5	5.1	-0.4	3.6
Japan	-1.7	-1.0	3.6	-0.8	0.0	3.6	-0.3	2.6	-0.5	0.3
Netherlands	0.5	-0.9	8.9	2.2	-0.2	7.5	-1.4	8.0	0.2	8.8
Norway	1.1	-0.6	7.1	2.1	0.1	6.0	-1.8	6.4	0.6	8.1
Portugal	-0.4	-3.4	4.8	-2.2	-0.1	6.1	-2.4	1.4	-0.4	0.5
Spain	-1.2	-3.6	3.7	-1.4	-0.5	4.9	-2.8	0.1	-0.7	-1.8
Sweden	1.1	-1.9	5.4	0.0	-0.1	4.4	-0.7	3.5	0.2	4.8
United States	0.9	-1.5	5.5	0.6	-0.2	4.9	-1.2	4.0	0.3	5.3
Average[3]	0.0	-2.1	4.8	-0.2	-0.4	4.8	-1.6	2.7	0.0	2.6
Absolute average[3]	0.8	2.1	4.8	1.4	0.4	4.8	1.6	3.2	0.3	3.4

1. 1976-1990 for Canada ,1975-1991 for Germany, Iceland, Mexico and Switzerland, 1975-1992 for Hungary and Poland, 1975-1994 for Austria and Slovak Republic.
2. 25-59 and 60 and above instead of 25-54 and 65 and above.
3. Unweighted average.

Source: Labour Force Statistics (Part III).

Table 3. **Contributions of demographic changes and group-specific shifts of participation to changes of aggregate participation over the period 1990-2000**[1]
(percentage changes)

	Demographic effect	Variation of group-specific participation rate							Interaction effect	Total change of the aggregate participation rates over 1990-2000
		Men	Women	Total 15-24	Men 25-54	Women 25-54	Total 55 and above	Total		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Australia	-0.7	-1.2	1.8	-0.3	-0.7	1.1	0.6	0.6	0.1	0.1
Austria	-1.1	-0.1	0.4	-1.1	0.2	1.2	-0.1	0.3	0.1	-0.7
Belgium	0.6	-0.1	3.3	0.0	0.0	3.1	0.1	3.2	0.1	4.0
Canada	-0.6	-1.5	0.8	-1.0	-0.6	0.9	-0.1	-0.7	0.1	-1.2
Czech Republic	0.0	-0.7	-0.4	-1.0	-0.1	-0.4	0.4	-1.1	0.1	-1.0
Denmark	-0.2	-1.4	-0.9	-0.3	-0.8	-0.9	-0.4	-2.4	-0.1	-2.6
Finland	-0.6	-1.5	-0.7	-1.2	-0.7	-0.4	0.0	-2.3	0.0	-2.9
France	1.0	-1.7	0.5	-1.3	-0.3	1.4	-1.0	-1.2	0.2	0.0
Germany	-1.9	-0.1	1.2	-1.2	0.4	1.2	0.7	1.1	0.1	-0.7
Greece	-0.4	-1.5	2.1	-0.2	0.0	2.5	-1.7	0.6	-0.1	0.1
Hungary	0.1	-2.2	-2.7	-0.9	-1.5	-1.6	-0.9	-4.9	0.0	-4.8
Iceland	0.4	0.1	1.9	2.6	-0.2	1.4	-1.8	1.9	-0.2	2.1
Ireland	0.9	0.4	5.4	0.3	0.0	4.9	0.5	5.8	0.2	6.9
Italy	0.0	-1.3	1.3	-0.5	-0.2	1.5	-0.7	0.0	0.1	0.1
Japan	-0.8	-0.3	0.5	0.6	-0.1	0.6	-0.8	0.2	-0.3	-1.0
Korea	1.4	-1.3	0.5	-0.8	-0.8	1.1	-0.3	-0.8	0.1	0.7
Luxembourg	1.4	-1.5	3.1	-1.7	-0.2	4.0	-0.4	1.6	0.4	3.4
Mexico	0.3	-1.0	2.5	-0.2	-0.1	2.0	-0.2	1.5	0.2	2.0
Netherlands	-0.7	1.3	5.3	1.9	0.0	3.8	0.8	6.6	-0.2	5.6
New Zealand	-0.2	-0.3	1.8	-1.1	-0.5	1.2	1.9	1.4	0.3	1.6
Norway	1.5	0.2	2.4	0.8	-0.3	1.2	0.9	2.6	-0.1	4.0
Poland	-0.2	-2.7	-2.2	-1.2	-0.9	-0.5	-2.3	-4.9	0.0	-5.1
Portugal	-0.1	-1.9	1.8	-2.9	-0.4	2.0	1.2	-0.1	0.4	0.2
Slovak Republic	0.3	-0.8	0.6	-0.3	-0.3	0.5	-0.1	-0.1	0.0	0.2
Spain	1.9	-2.0	3.2	-1.2	-0.3	3.8	-1.1	1.2	0.6	3.7
Sweden	0.3	-2.0	-2.2	-2.9	-1.2	-1.4	1.3	-4.2	0.4	-3.6
Switzerland	-0.5	-1.3	0.6	-0.6	-0.3	1.1	-0.9	-0.6	0.0	-1.1
Turkey	0.8	-4.0	-4.3	-3.9	-1.3	-2.1	-1.0	-8.3	0.0	-7.4
United Kingdom	0.3	-2.0	0.6	-1.4	-0.8	0.8	-0.1	-1.4	0.2	-0.9
United States	0.0	-0.7	1.3	-0.2	-0.5	0.8	0.5	0.6	0.0	0.6
Average[2]	0.1	-1.1	1.0	-0.7	-0.4	1.2	-0.2	-0.1	0.1	0.1
Absolute average[2]	0.6	1.2	1.9	1.1	0.5	1.6	0.8	2.1	0.2	2.3

1. 1991 for Germany, Iceland, Mexico and Switzerland, 1992 for Hungary and Poland, 1994 for Austria and Slovak Republic.
2. Unweighted average.

Source: Labour Force Statistics (Part III).

Table 4. **Changes in lifetime allocation of labour and leisure across OECD countries (1965-2000) normalised over a ten years period**
(Percentage deviations)

		Men			Women		
	Period	Childhood and education	Length of working life	Length of retirement	Childhood and education	Length of working life	Length of retirement
Australia	1970-2000	-0.7	-5.5	6.3	-1.8	-1.9	3.7
Belgium	1990-2000	-0.3	-1.8	2.0	0.9	2.1	-3.0
Canada	1980-2000	-0.2	-3.1	3.3	-0.5	-1.9	2.4
Denmark	1990-2000	0.1	-7.1	7.1	2.6	-8.6	6.0
Finland	1970-2000	0.2	-3.9	3.8	-0.2	-2.7	2.9
France	1970-2000	0.8	-6.8	6.1	-1.6	-4.4	6.0
Germany	1975-2000	2.0	-6.5	4.6	0.2	-4.9	4.7
Greece	1990-2000	1.0	-1.0	0.0	1.3	0.4	-1.7
Ireland	1985-2000	0.6	-1.1	0.4	0.7	-3.5	2.8
Japan	1970-2000	-0.3	-3.4	3.6	0.4	-3.8	3.4
Korea	1995-2000	-0.6	-12.0	12.6	-0.6	-2.0	2.6
Luxembourg	1990-2000	1.5	-4.6	3.1	7.0	-8.6	1.6
Netherlands	1975-2000	-0.3	-2.1	2.4	-0.3	-3.2	3.5
New Zealand	1990-2000	0.2	-0.9	0.7	3.2	-5.7	2.5
Norway	1980-2000	-1.1	-3.5	4.7	-3.4	0.7	2.7
Portugal	1980-2000	1.8	-5.6	3.8	0.1	-5.2	5.1
Spain	1980-2000	1.8	-4.4	2.6	1.7	-6.1	4.4
Sweden	1970-2000	0.2	-3.8	3.6	-2.9	-0.7	3.6
Turkey	1995-2000	-0.2	-11.0	11.1	-0.8	-7.2	7.9
United Kingdom	1990-2000	0.3	-3.9	3.6	-2.5	0.6	1.9
United States	1965-2000	-0.4	-4.3	4.7	-2.4	-0.3	2.7
OECD average	1990-2000	0.2	-3.3	3.1	0.0	-2.3	2.3

Based on average effective ages of entry and exit, as calculated in Appendix 2.

Table 5. **Demographic evolutions in OECD countries, past and projected**

(percentage-point change of share in total population over the period considered)

Panel A. **Youths**

	0-14				**15-24**				**Total 0-24**	
	1990-2000	share in 2000	2000-2025	2025-2050	1990-2000	share in 2000	2000-2025	2025-2050	2000-2025	2025-2050
Australia	-1.5	20.5	-4.6	-1.5	-1.6	14.1	-2.5	-0.7	-7.1	-2.2
Austria	-0.7	16.7	-3.4	-0.8	-1.3	11.8	-1.9	-0.2	-5.3	-1.1
Belgium	-0.5	17.6	-1.9	-0.6	-1.4	12.2	-1.1	-0.3	-3.1	-0.9
Canada	-1.6	19.1	-4.2	-1.2	-1.1	13.6	-2.9	-0.3	-7.1	-1.5
Czech Republic	-5.0	16.4	-4.2	1.4	-0.5	15.2	-6.1	-0.2	-10.4	1.1
Denmark	1.4	18.5	-2.6	-0.2	-2.8	11.5	0.3	0.1	-2.3	-0.1
Finland	-2.4	16.9	-1.3	-0.9	0.2	13.2	-2.4	-0.1	-3.7	-0.9
France	-1.3	18.8	-2.5	-0.9	-1.7	12.8	-1.4	-0.7	-3.8	-1.5
Germany	-0.4	15.7	-2.2	-0.6	-2.7	11.1	-1.0	-0.3	-3.2	-0.9
Greece	-4.2	15.1	-1.6	-0.2	-0.6	13.0	-2.2	-1.1	-3.8	-1.3
Hungary	-3.3	17.0	-4.8	1.3	0.0	15.2	-6.6	0.3	-11.4	1.6
Iceland	-1.7	23.3	-4.9	-1.0	-1.5	15.0	-3.0	-0.1	-7.9	-1.1
Ireland	-5.4	21.7	-3.2	-2.0	0.5	17.5	-4.6	-1.9	-7.8	-3.9
Italy	-2.2	14.4	-3.0	0.0	-4.7	11.9	-2.7	-0.4	-5.8	-0.4
Japan	-3.7	14.6	-3.0	-0.8	-2.6	12.8	-3.4	-1.0	-6.4	-1.9
Korea	-8.2	17.4	-4.4	-2.5	-3.1	15.2	-4.5	-2.0	-8.9	-4.4
Luxembourg	0.0	17.4	-1.0	-0.4	-1.1	11.6	0.1	0.2	-0.9	-0.2
Mexico	-5.4	33.1	-9.9	-3.9	-1.1	19.8	-4.3	-2.7	-14.2	-6.6
Netherlands	0.4	18.6	-2.7	-0.1	-4.0	11.9	-0.2	-0.2	-2.9	-0.3
New Zealand	-0.5	22.9	-5.3	-1.7	-2.7	14.0	-1.8	-0.6	-7.1	-2.3
Norway	1.1	20.0	-2.7	-0.6	-4.5	11.0	0.9	-0.1	-1.7	-0.8
Poland	-5.9	19.2	-5.4	1.1	2.0	15.4	-6.3	0.1	-11.8	1.2
Portugal	-3.8	16.6	-1.3	-0.4	-1.3	15.6	-3.5	-1.2	-4.8	-1.6
Slovak Republic	-5.8	19.5	-6.4	-0.7	0.9	16.9	-7.4	-1.0	-13.8	-1.7
Spain	-5.1	14.8	-1.6	-0.5	-2.1	13.5	-2.8	-1.9	-4.3	-2.5
Sweden	0.5	18.4	-1.5	-0.7	-3.4	10.5	0.4	0.1	-1.0	-0.6
Switzerland	-0.5	17.4	-2.6	0.2	-3.0	11.5	-1.4	0.9	-4.0	1.1
Turkey	-7.7	27.4	-6.9	-2.7	1.8	20.2	-5.5	-1.6	-12.4	-4.3
United Kingdom	0.0	18.9	-2.7	-0.9	-2.5	11.1	-0.1	-0.1	-2.8	-1.0
United States	-0.4	21.2	-1.4	-0.1	-0.9	12.9	0.0	0.2	-1.4	0.1
OECD average[1]	-2.5	19.0	-3.4	-0.7	-1.6	13.7	-2.6	-0.6	-6.0	-1.3

1. Unweighted average.

Table 5. **Demographic evolutions in OECD countries, past and projected** (continued)

(percentage-point change of share in total population over the period considered)

Panel B. **Olders**

	55-64				**65 and older**				**Total 55 and older**	
	1990-2000	share in 2000	2000-2025	2025-2050	1990-2000	share in 2000	2000-2025	2025-2050	2000-2025	2025-2050
Australia	0.7	9.1	3.6	-0.1	-0.4	12.3	7.8	5.8	11.4	5.7
Austria	1.6	11.2	5.2	-3.0	0.4	15.5	6.5	7.4	11.7	4.4
Belgium	-1.1	10.2	3.4	-1.5	0.1	16.8	5.3	4.5	8.8	3.0
Canada	0.4	9.3	4.3	-0.2	1.2	12.0	9.2	4.1	13.5	3.9
Czech Republic	1.1	10.6	2.6	1.1	1.2	13.8	9.2	9.7	11.9	10.8
Denmark	1.5	11.0	2.4	-1.3	-2.3	15.2	5.8	2.0	8.2	0.7
Finland	0.8	11.0	2.4	-1.4	0.3	13.7	10.7	2.4	13.1	1.1
France	-0.8	9.3	3.6	-0.9	0.2	16.1	6.5	4.1	10.2	3.1
Germany	2.9	14.1	1.5	-2.3	1.6	16.8	7.1	4.4	8.6	2.2
Greece	-0.9	12.1	1.1	-0.8	3.0	19.1	4.9	5.1	6.0	4.2
Hungary	-1.2	10.9	1.8	1.4	5.5	14.1	10.4	8.9	12.2	10.4
Iceland	-0.2	8.0	4.2	0.4	1.2	11.8	6.3	4.9	10.5	5.3
Ireland	0.6	8.5	3.1	0.3	-0.2	11.2	4.9	7.8	8.0	8.1
Italy	0.5	11.8	4.4	-3.6	1.0	17.7	7.6	9.5	12.0	5.9
Japan	1.3	13.0	0.1	-0.7	5.2	17.2	11.4	7.2	11.5	6.6
Korea	2.4	9.5	6.5	-4.0	2.6	8.3	13.8	13.3	20.3	9.3
Luxembourg	-1.2	10.3	4.3	-3.5	-0.1	14.3	6.3	3.5	10.6	0.0
Mexico	0.4	5.4	4.1	2.6	0.8	5.4	4.8	8.0	8.8	10.6
Netherlands	0.7	10.2	4.3	-2.5	1.1	12.8	8.3	3.3	12.5	0.7
New Zealand	0.3	8.8	4.6	-0.8	0.6	11.3	8.6	5.8	13.1	4.9
Norway	0.0	9.9	3.5	-1.1	4.9	15.4	4.9	1.8	8.3	0.7
Poland	-1.3	8.7	3.5	2.3	2.4	12.8	10.9	7.1	14.5	9.4
Portugal	0.1	10.6	2.3	-1.6	2.1	15.2	3.7	7.6	6.0	6.0
Slovak Republic	0.2	8.8	4.4	1.9	1.1	11.5	9.6	11.6	14.0	13.5
Spain	-2.1	10.1	5.3	-3.3	2.0	16.9	5.0	8.9	10.3	5.6
Sweden	0.5	11.6	1.3	0.0	6.3	17.4	5.5	0.9	6.8	1.0
Switzerland	0.7	10.8	3.7	-2.0	3.4	15.3	6.0	2.5	9.7	0.5
Turkey	-1.0	6.3	4.2	1.8	1.2	5.9	3.3	7.9	7.5	9.7
United Kingdom	0.1	10.5	3.9	-1.5	-0.1	15.3	5.5	3.1	9.3	1.7
United States	0.3	8.9	3.3	-1.3	0.2	12.3	6.7	1.0	10.0	-0.3
OECD average[1]	0.2	10.0	3.4	-0.8	1.6	13.8	7.2	5.8	10.6	5.0

1. Unweighted average.

Table 6. **The baseline scenarios : projected evolution of aggregate labour supply (aged 15 and over) and contributions of various factors**

Panel A. **Percentage point changes during the period 2000-2025**

	Change of aggregate participation rates						**total population change %**	**total labour supply %**
	demographic change	cohort effect	impact of unemployment change	impact of ongoing and forthcoming pensions reforms[1]	impact of fertility change	total change during 2000-2025		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Australia	-7.2	0.6	0.4	-0.5	1.1	-5.6	29.8	18.3
Austria	-8.0	0.3	-0.2	0.0	-0.3	-8.0	4.7	-9.8
Belgium	-6.3	4.1	0.0	0.2	-0.2	-2.2	8.0	3.5
Canada	-8.9	2.7	-0.1	-0.1	0.3	-6.0	23.8	12.4
Czech Republic	-6.2	-1.6	0.0	0.3	0.0	-7.5	-0.5	-12.9
Denmark	-7.3	1.0	-0.2	-0.4	0.0	-7.0	7.8	-3.7
Finland	-10.7	1.5	0.7	0.6	-0.3	-8.2	5.6	-8.3
France	-6.9	0.4	0.1	-0.1	-0.2	-6.7	10.0	-3.4
Germany	-6.4	3.0	0.0	0.1	-0.3	-3.5	2.5	-3.7
Greece	-3.0	5.4	0.4	1.4	-0.1	4.1	1.4	9.8
Hungary	-3.9	-3.9	0.0	0.0	0.0	-7.8	-1.9	-17.0
Iceland	-4.0	0.5	-0.5	0.2	1.1	-2.8	21.1	16.6
Ireland	-3.7	9.5	-0.5	-0.1	-0.1	5.1	24.2	34.8
Italy	-6.8	3.0	0.6	2.5	-0.3	-1.0	-2.2	-4.2
Japan	-6.9	0.6	0.3	-0.4	-0.4	-6.8	-1.0	-11.8
Korea	-5.6	-2.9	0.0	-1.4	-0.1	-10.0	11.2	-7.2
Luxemburg	-9.1	6.9	0.0	0.0	-0.6	-2.7	18.6	12.6
Mexico	-1.1	3.2	0.0	0.0	2.1	4.2	49.8	60.4
Netherlands	-9.7	6.7	-0.4	0.0	-0.9	-4.4	14.5	6.6
New Zealand	-7.6	-0.2	0.3	0.4	0.2	-6.9	25.1	11.9
Norway	-5.4	3.5	-0.1	-0.3	-0.3	-2.5	14.4	10.1
Poland	-5.0	-3.1	0.0	0.0	0.2	-7.8	5.7	-9.0
Portugal	-2.3	2.6	0.1	-0.1	-0.3	0.0	8.1	8.0
Slovakia	-5.3	-2.6	0.0	0.0	0.1	-7.8	10.0	-4.4
Spain	-6.6	6.1	0.1	0.2	-0.6	-0.8	10.7	9.1
Sweden	-7.5	-0.2	0.0	-0.9	-0.5	-9.1	8.9	-6.9
Switzerland	-5.6	1.8	0.1	0.3	0.3	-3.1	6.4	1.6
Turkey	-1.4	-10.1	0.0	0.4	0.2	-10.9	43.4	11.8
United Kingdom	-6.1	1.2	0.2	0.6	-0.4	-4.5	12.0	4.0
United States	-7.1	1.7	-0.7	0.7	-0.2	-5.6	24.9	14.5
OECD average[1]	-6.1	1.4	0.0	0.1	0.0	-4.5	13.2	4.8

1. Unweighted average.

Table 6. **The baseline scenarios : projected evolution of aggregate labour supply (aged 15 and over) and contributions of various factors** (continued)

Panel B. **Percentage point changes during the period 2025-2050**

	Change of aggregate participation rates					**total population change %**	**total labour supply %**
	demographic change	cohort effect	Others[2]	impact of fertility change	total change during 2025-2050		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Australia	-4.7	0.0	-0.1	-0.3	-5.1	9.8	0.0
Austria	-4.7	-0.3	0.0	-0.1	-5.1	-5.8	-15.4
Belgium	-2.8	-0.1	0.0	-0.2	-3.1	2.1	-4.1
Canada	-3.3	0.2	0.0	0.0	-3.2	3.6	-1.9
Czech Republic	-11.1	0.0	0.1	0.0	-11.1	-14.7	-32.5
Denmark	-1.4	-0.2	0.0	-0.1	-1.7	-0.7	-3.5
Finland	-1.4	0.3	0.0	0.2	-0.9	-6.8	-8.4
France	-2.7	0.0	0.0	0.0	-2.7	-1.0	-6.6
Germany	-3.1	-0.2	0.0	-0.1	-3.3	-7.8	-13.4
Greece	-3.4	0.2	0.2	0.0	-3.1	-5.7	-11.1
Hungary	-8.8	-0.8	0.0	-0.1	-9.7	-15.6	-34.8
Iceland	-5.1	0.2	0.0	-0.9	-5.7	5.1	-3.1
Ireland	-5.4	0.1	0.0	0.3	-5.0	7.5	-0.8
Italy	-4.7	-1.1	0.2	-0.2	-5.8	-14.2	-24.7
Japan	-4.6	0.0	-0.1	0.1	-4.7	-16.1	-23.1
Korea	-6.2	0.0	-0.4	0.1	-6.5	-13.1	-24.2
Luxemburg	0.0	-1.3	0.0	-0.1	-1.4	8.4	5.5
Mexico	-3.6	0.7	0.0	-0.5	-3.4	17.8	11.6
Netherlands	-1.8	0.2	0.0	-0.2	-1.8	0.9	-2.2
New Zealand	-4.5	-0.7	0.0	-0.2	-5.3	5.9	-3.8
Norway	-1.7	0.4	0.0	0.1	-1.2	4.4	2.5
Poland	-7.6	-1.1	0.0	-0.6	-9.3	-11.9	-28.6
Portugal	-4.6	0.3	0.0	0.0	-4.2	1.6	-5.4
Slovakia	-11.5	-1.0	0.0	-0.1	-12.5	-10.3	-31.8
Spain	-5.1	-0.8	0.1	0.1	-5.7	-5.0	-15.2
Sweden	-0.7	-0.4	0.0	0.1	-1.0	2.8	0.8
Switzerland	-2.2	0.2	0.0	-0.8	-2.8	-3.5	-7.6
Turkey	-4.0	-1.1	0.2	-0.1	-5.0	17.7	2.4
United Kingdom	-2.3	0.1	0.0	0.1	-2.0	1.1	-2.3
United States	-0.4	-0.5	0.0	0.0	-0.9	19.0	17.3
OECD average[3]	-4.1	-0.2	0.0	-0.1	-4.4	-0.8	-8.8

1. For 8 out 30 OECD countries (Denmark, Hungary, Czech Republic, Mexico, Slovak Republic, Poland, Greece and Turkey), only the impact of re enacted changes in the standard retirement age are taken into account. The effect of possible changes in implicit tax rates is omitted for these co
2. Includes the composition effect associated with the adjustments made to take account the convergence of unemployment towards the NAIRU and the impact of ongoing and forthcoming pension reforms.
3. Unweighted average.

Table 7. **Dependency ratios and proportion of aged workers in the baseline scenario**
(percentages)

	Old age dependency ratio[1]					**Share of older workers[2]**					**Overall dependency ratio[3]**				
	2000	2025	2050	Change 2000-2025	Change 2025-2050	2000	2025	2050	Change 2000-2025	Change 2025-2050	2000	2025	2050	Change 2000-2025	Change 2025-2050
Australia	23.0	38.5	54.3	15.5	15.8	10.4	15.6	16.9	5.3	1.3	98.6	106.0	122.1	7.3	16.1
Austria	31.2	49.4	73.1	18.2	23.8	7.7	12.9	12.1	5.1	-0.8	107.1	131.1	154.8	23.9	23.7
Belgium	38.3	50.9	64.9	12.6	14.0	6.7	11.7	11.9	5.0	0.2	132.1	136.7	150.6	4.6	13.8
Canada	21.1	38.9	48.6	17.7	9.8	10.2	17.1	18.4	6.9	1.3	87.6	96.5	104.5	8.8	8.0
Czech Republic	26.2	47.5	86.9	21.3	39.4	9.2	13.0	17.9	3.8	4.9	98.0	115.3	176.5	17.2	61.3
Denmark	27.8	42.1	47.7	14.4	5.5	12.4	15.7	14.7	3.3	-1.0	87.2	103.1	108.7	15.9	5.6
Finland	25.9	51.6	57.3	25.7	5.7	10.5	16.3	15.5	5.8	-0.8	93.0	118.6	120.1	25.7	1.5
France	35.7	55.5	68.8	19.8	13.3	8.3	13.0	12.7	4.7	-0.3	125.0	148.7	160.9	23.7	12.2
Germany	33.1	48.4	60.8	15.3	12.4	13.7	19.0	17.4	5.3	-1.6	103.0	110.5	122.6	7.5	12.1
Greece	42.7	46.6	59.4	3.9	12.8	14.0	20.3	22.5	6.4	2.1	135.6	113.6	125.9	-22.0	12.3
Hungary	33.3	64.5	116.2	31.2	51.7	6.6	9.3	12.7	2.7	3.4	139.6	167.7	252.0	28.1	84.3
Iceland	16.3	24.3	34.7	8.1	10.4	15.7	22.7	25.5	7.1	2.7	70.9	66.6	78.6	-4.3	11.9
Ireland	22.3	27.6	43.2	5.3	15.5	10.5	18.4	22.5	7.9	4.1	116.7	91.7	102.9	-25.0	11.2
Italy	41.3	55.2	86.7	13.9	31.5	9.7	21.8	22.7	12.1	0.9	140.9	137.7	171.1	-3.2	33.4
Japan	24.9	47.9	65.0	23.0	17.1	23.5	28.2	32.1	4.7	3.9	87.5	103.3	119.8	15.9	16.5
Korea	11.8	40.0	74.1	28.2	34.1	16.1	28.6	31.1	12.6	2.4	99.3	126.7	152.6	27.4	25.9
Luxemburg	31.8	46.9	56.3	15.1	9.4	6.9	15.5	13.3	8.6	-2.2	126.7	136.0	141.4	9.3	5.4
Mexico	9.2	13.8	25.2	4.7	11.3	11.4	18.7	27.5	7.3	8.8	149.9	103.3	104.1	-46.6	0.9
Netherlands	24.1	40.2	48.2	16.1	8.0	8.5	16.5	15.2	8.0	-1.4	94.0	101.7	107.8	7.7	6.1
New Zealand	20.6	35.9	51.6	15.2	15.7	12.2	22.4	22.6	10.3	0.1	98.4	107.6	123.9	9.2	16.4
Norway	27.5	36.2	40.6	8.6	4.4	14.2	20.7	19.4	6.4	-1.3	88.9	90.0	92.1	1.1	2.1
Poland	25.8	53.2	86.9	27.4	33.7	8.2	11.8	17.3	3.6	5.4	118.7	137.9	197.5	19.3	59.6
Portugal	24.1	27.9	42.0	3.7	14.1	16.4	22.7	25.9	6.3	3.2	94.9	92.1	105.2	-2.8	13.1
Slovakia	23.5	45.9	93.2	22.4	47.2	4.7	7.4	10.8	2.7	3.4	106.8	120.3	187.3	13.5	67.1
Spain	36.1	46.0	72.3	9.8	26.4	9.6	19.6	18.3	9.9	-1.3	117.9	117.1	141.9	-0.8	24.8
Sweden	32.1	50.2	53.5	18.1	3.3	17.4	19.4	18.7	2.1	-0.7	94.3	123.1	125.5	28.9	2.4
Switzerland	24.9	34.8	41.1	9.9	6.3	15.3	21.7	20.9	6.5	-0.8	79.7	82.5	91.3	2.9	8.7
Turkey	13.1	26.0	55.0	12.9	29.1	9.7	12.6	16.2	2.9	3.6	179.9	227.9	264.4	48.0	36.5
United Kingdom	28.4	39.1	46.5	10.8	7.4	12.4	19.2	18.2	6.7	-1.0	95.4	103.6	108.6	8.2	4.9
United States	20.2	32.1	35.4	11.8	3.3	12.9	21.3	19.7	8.4	-1.7	89.0	102.6	105.3	13.6	2.7
OECD average[5]	26.5	41.9	59.6	15.4	17.7	11.5	17.8	19.0	6.3	1.2	108.5	117.3	137.3	8.8	20.0

1. Calculated as the ratio of the inactives aged 65 and over to the labour force aged 15 and over.
2. Calculated as the ratio of workers aged 55 and over to the total labour force aged 15 and over.
3. Calculated as the ratio of the total inactive population to the total labour force aged 15 and over.
4. 1991 for Switzerland, 1992 for Hungary and Poland, 1993 for Czech Republic and Italy, 1994 for Austria and Slovak Republic.
5. Unweighted average.

Table 8. **Impact of policy reforms on future participation rates, 2000-2025**
(percentage point changes)

Panel A. **Low case**

	Aggregate participation change in the baseline scenario [1]	Impact of pension reforms: Removal of early retirement schemes [2]	Impact of pension reforms: Actuarial neutrality of old-age pensions [3]	Impact of pension reforms: Delaying normal retirement age [4]	Impact of pension reforms: Total impact [5] =[2]+[3]+[4]	Impact of additional incentives to women participation [6]	Impact of increasing youths participation [7]	Total impact of policy reforms [8] =[5]+[6]+[7]	Aggregate participation rates changes including all reforms [9] =[1]+[8]	Rate of growth of aggregate labour supply including all reforms %
Australia	-5.6	0.0	1.0	0.5	1.4	1.9	0.0	3.4	-2.3	25.2
Austria	-7.7	1.4	0.8	0.3	2.5	1.1	0.5	4.1	-3.6	-1.8
Belgium	-2.2	0.8	1.1	0.3	2.2	2.3	1.8	6.3	4.1	16.5
Canada	-6.0	0.0	0.4	0.5	0.9	1.5	0.0	2.5	-3.5	17.1
Czech Republic	-7.5	..	..	1.0	..	2.3	1.2	..	..	-5.5
Denmark	-7.0	..	..	0.4	..	0.8	0.0	..	..	-1.6
Finland	-8.2	0.9	1.5	0.5	2.9	0.0	0.6	3.5	-4.6	-2.3
France	-6.0	0.6	1.3	1.3	3.2	2.5	2.2	7.9	1.9	13.8
Germany	-3.5	1.0	0.5	0.5	1.9	3.4	0.6	5.9	2.4	6.7
Greece	4.1	..	..	0.6	..	0.3	1.5	..	..	14.6
Hungary	-7.8	..	..	0.5	..	0.0	1.4	..	..	-13.2
Iceland	-2.8	0.0	0.7	0.0	0.7	0.0	0.0	0.7	-2.1	17.7
Ireland	5.1	0.7	0.6	0.3	1.6	3.4	0.9	5.9	11.0	47.3
Italy	-1.0	0.0	1.6	0.5	2.1	2.1	1.3	5.5	4.5	7.0
Japan	-6.8	0.0	1.4	0.9	2.3	3.5	0.9	6.8	0.0	-1.0
Korea	-10.0	0.0	1.6	2.5	4.1	2.4	1.8	8.2	-1.8	7.9
Luxemburg	-2.7	2.1	-0.1	0.3	2.2	2.2	2.2	6.6	3.9	27.3
Mexico	4.2	..	..	0.5	..	0.9	1.2	..	..	66.9
Netherlands	-4.4	0.9	1.8	0.5	3.2	2.9	0.0	6.1	1.8	17.7
New Zealand	-6.9	0.0	0.0	0.6	0.7	2.5	0.1	3.3	-3.7	18.1
Norway	-2.5	0.5	1.5	0.0	2.0	1.2	0.0	3.2	0.7	15.7
Poland	-7.8	..	..	0.7	..	2.0	1.4	..	..	-1.4
Portugal	0.0	2.0	0.9	0.6	3.6	2.2	1.3	7.0	7.0	20.4
Slovakia	-7.8	..	..	0.8	..	1.3	1.0	..	..	1.5
Spain	-0.8	1.0	2.4	0.5	3.9	3.7	1.2	8.7	7.9	27.0
Sweden	-9.1	0.0	1.5	0.5	2.0	0.4	0.8	3.3	-5.8	-1.2
Switzerland	-3.1	0.0	1.1	0.8	2.0	1.9	0.0	3.9	0.8	7.8
Turkey	-10.9	..	..	0.7	..	1.1	2.2	..	..	23.4
United Kingdom	-4.5	0.4	0.7	0.5	1.7	1.4	0.0	3.1	-1.4	9.5
United States	-5.6	0.0	0.6	0.0	0.6	2.2	0.0	2.8	-2.8	19.7
OECD average [1]	-4.3	0.6	1.1	0.6	2.2	2.0	0.7	4.9	0.7	14.4

1. Excluding countries where pension data are not available.

Table 8. **Impact of policy reforms on future participation rates, 2000-2025** (continued)
(percentage point changes)

Panel B. **High case**

	Aggregate participation change in the baseline scenario	Impact of pension reforms				Impact of additional incentives to women participation	Impact of increasing youths participation	Total impact of policy reforms	Aggregate participation rates changes including all reforms	Rate of growth of aggregate labour supply including all reforms %
		Removal of early retirement schemes	Actuarial neutrality of old-age pensions	Delaying normal retirement age	Total impact					
	[1]	[2]	[3]	[4]	[5] =[2]+[3]+[4]	[6]	[7]	[8] =[5]+[6]+[7]	[9] =[1]+[8]	
Australia	-5.6	0.0	1.7	0.5	2.2	1.9	0.0	4.1	-1.5	26.8
Austria	-7.7	3.4	1.6	0.3	5.3	1.7	0.5	7.5	-0.2	4.4
Belgium	-2.2	2.1	2.4	0.3	4.8	2.3	1.8	8.9	6.7	21.8
Canada	-6.0	0.0	0.9	0.5	1.4	1.5	0.0	3.0	-3.1	18.0
Czech Republic	-7.5	..	..	1.0	..	2.3	1.2	..	..	-5.5
Denmark	-7.0	..	..	0.4	..	0.8	0.0	..	..	-1.6
Finland	-8.2	2.3	2.9	0.5	5.6	0.5	0.6	6.8	-1.4	3.2
France	-6.0	1.5	2.4	1.3	5.3	3.0	2.2	10.5	4.4	18.9
Germany	-3.5	2.5	1.2	0.5	4.2	3.4	0.6	8.2	4.7	10.7
Greece	4.1	..	..	0.6	..	0.3	1.5	..	..	14.6
Hungary	-7.8	..	..	0.5	..	0.0	1.4	..	..	-13.2
Iceland	-2.8	0.0	1.0	0.0	1.0	0.0	0.0	1.0	-1.8	18.2
Ireland	5.1	1.8	1.4	0.3	3.4	3.4	0.9	7.7	12.8	45.3
Italy	-1.0	0.0	2.2	0.5	2.6	2.1	1.3	6.1	5.0	8.0
Japan	-6.8	0.0	2.9	0.9	3.7	4.2	0.9	8.8	2.0	2.2
Korea	-10.0	0.0	3.0	2.5	5.4	3.3	1.8	10.5	0.5	12.1
Luxemburg	-2.7	5.4	-0.1	0.3	5.6	2.2	2.2	10.0	7.2	34.7
Mexico	4.2	..	..	0.5	..	1.8	1.2	..	..	69.1
Netherlands	-4.4	2.3	4.9	0.5	7.7	2.9	0.0	10.6	6.3	25.8
New Zealand	-6.9	0.0	0.1	0.6	0.7	2.5	0.1	3.3	-3.6	18.2
Norway	-2.5	0.8	2.5	0.0	3.3	1.2	0.0	4.5	2.0	17.9
Poland	-7.8	..	..	0.7	..	2.0	1.4	..	..	-1.4
Portugal	0.0	5.2	2.0	0.6	7.8	2.7	1.3	11.8	11.8	28.8
Slovakia	-7.8	..	..	0.8	..	1.3	1.0	..	..	1.5
Spain	-0.8	2.5	4.1	0.5	7.1	4.4	1.2	12.6	11.8	35.0
Sweden	-9.1	0.0	2.3	0.5	2.9	0.7	0.8	4.4	-4.7	0.7
Switzerland	-3.1	0.0	2.3	0.8	3.1	1.9	0.0	5.1	2.0	9.6
Turkey	-10.9	..	..	0.7	..	1.4	2.2	..	..	24.2
United Kingdom	-4.5	1.0	1.4	0.5	2.9	2.2	0.0	5.0	0.5	13.0
United States	-5.6	0.0	1.1	0.0	1.1	3.2	0.0	4.3	-1.3	22.4
OECD average [1]	-4.3	1.4	2.0	0.6	4.0	2.3	0.7	7.0	2.7	18.0

1. Excluding countries where pension data are not available.

Table 9. **Impact of policy reforms on future dependency ratios (2000-2025)**
(Percentage points)

Panel A. **Low case**

	Old-age dependency ratio[1]					Share of older workers[2]					Overall dependency ratio[3]				
	Change in the baseline scenario	Impact of pension reforms [4]	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms	Change in the baseline scenario	Impact of pension reforms [4]	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms	Change in the baseline scenario	Impact of pension reforms [4]	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms
Australia	15.5	-2.5	-1.1	0.0	11.8	5.3	2.0	-0.6	0.0	6.7	7.3	-4.9	-6.4	0.0	-4.0
Austria	17.5	-4.5	-0.9	-0.4	11.7	5.7	4.1	-0.4	-0.2	9.3	22.4	-10.8	-4.6	-1.9	5.0
Belgium	12.6	-4.1	-2.0	-1.4	5.1	5.0	3.8	-0.6	-0.5	7.6	4.6	-10.1	-9.5	-6.8	-21.8
Canada	17.7	-1.5	-0.9	0.0	15.3	6.9	1.3	-0.5	0.0	7.7	8.8	-3.1	-4.8	0.0	0.9
Czech Republic	21.3	..	-1.9	-0.9	..	3.8	..	-0.6	-0.3	..	17.2	..	-8.6	-4.2	..
Denmark	14.4	..	-0.2	0.0	..	3.3	..	-0.9	0.0	..	15.9	..	-2.7	0.0	..
Finland	25.2	-5.4	0.0	-0.5	19.4	6.2	4.2	0.0	-0.2	10.2	25.7	-11.1	-0.1	-2.2	12.3
France	18.7	-6.7	-2.2	-1.8	8.0	5.9	5.3	-0.9	-0.7	9.5	20.4	-15.1	-10.5	-8.7	-13.9
Germany	15.3	-2.7	-2.6	-0.4	9.6	5.3	2.7	-1.2	-0.2	6.6	7.5	-7.1	-11.6	-1.8	-13.0
Greece	3.9	..	-0.3	-1.2	..	6.4	..	-0.1	-0.6	..	-22.0	..	-1.2	-5.6	..
Hungary	31.2	..	0.0	-2.0	..	2.7	..	0.0	-0.3	..	28.1	..	0.1	-8.5	..
Iceland	8.1	-1.0	0.0	0.0	7.1	7.1	0.7	0.0	0.0	7.8	-4.3	-1.6	0.1	0.0	-5.8
Ireland	5.3	-1.7	-1.3	-0.3	2.0	7.9	2.0	-1.0	-0.3	8.6	-25.0	-4.7	-9.2	-2.3	-41.2
Italy	13.9	-6.0	-2.0	-1.1	4.8	12.1	3.4	-1.0	-0.6	13.8	-3.2	-10.2	-9.4	-5.3	-28.1
Japan	23.0	-4.8	-2.5	-0.6	15.1	4.7	2.8	-1.8	-0.4	5.3	15.9	-8.1	-11.3	-2.7	-6.2
Korea	28.2	-8.4	-1.3	-0.9	17.6	12.6	5.3	-1.4	-1.0	15.5	27.4	-16.9	-8.8	-6.0	-4.3
Luxembourg	15.1	-3.1	-1.8	-1.6	8.7	8.6	4.1	-0.8	-0.7	11.2	9.3	-10.0	-9.0	-8.2	-17.9
Mexico	4.7	..	-0.2	-0.2	..	7.3	..	-0.3	-0.4	..	-46.6	..	-2.8	-3.7	..
Netherlands	16.1	-3.8	-1.6	0.0	10.6	8.0	4.3	-0.9	0.0	11.4	7.7	-10.4	-8.6	0.0	-11.3
NewZealand	15.2	-1.2	-1.4	-0.1	12.6	10.3	0.9	-0.9	0.0	10.2	9.2	-2.3	-8.2	-0.4	-1.8
Norway	8.6	-3.3	-0.6	0.0	4.8	6.4	2.5	-0.4	0.0	8.5	1.1	-5.9	-3.2	0.0	-8.0
Poland	27.4	..	-2.0	-1.3	..	3.6	..	-0.5	-0.3	..	19.3	..	-9.1	-6.1	..
Portugal	3.7	-4.7	-0.8	-0.4	-2.1	6.3	4.2	-0.9	-0.5	9.2	-2.8	-10.5	-5.9	-3.3	-22.6
Slovak Republic	22.4	..	-1.1	-0.8	..	2.7	..	-0.2	-0.2	..	13.5	..	-5.3	-4.0	..
Spain	9.8	-7.1	-2.4	-0.7	-0.3	9.9	5.5	-1.5	-0.4	13.5	-0.8	-14.8	-12.3	-3.5	-31.4
Sweden	18.1	-4.3	-0.4	-0.6	12.8	2.1	2.9	-0.2	-0.3	4.5	28.9	-8.2	-1.7	-3.0	16.0
Switzerland	9.9	-2.8	-0.9	0.0	6.2	6.5	2.3	-0.7	0.0	8.1	2.9	-5.5	-5.0	0.0	-7.6
Turkey	12.9	..	-0.7	-1.2	..	2.9	..	-0.4	-0.7	..	48.0	..	-8.8	-16.1	..
United Kingdom	10.8	-2.6	-0.8	0.0	7.3	6.7	2.2	-0.5	0.0	8.4	8.2	-5.6	-4.6	0.0	-1.9
United States	11.8	-1.0	-1.1	..	9.8	8.4	0.7	-0.8	..	8.4	13.6	-1.9	-6.8	..	4.8
OECD average [5]	14.6	-3.8	-1.3	-0.5	9.0	7.2	3.1	-0.8	-0.3	9.2	8.4	-8.1	-6.9	-2.6	-9.2

1. Defined as the ratio of the inactive population aged 65 or more to the total labour force (aged 15 and over).
2. Defined as the share of the active population aged 55 and over to the total labour force (aged 15 and over).
3. Defined as the ratio of the inactive population (including children) to the total labour force (aged 15 and over).
4. For 8 out 30 OECD countries (Denmark, Hungary, Czech Republic, Mexico, Slovak Republic, Poland, Greece and Turkey), only the impact of recently enacted changes in the standard retirement age are taken into account. The effect of possible changes in implicit tax rates is omitted for these countries.
5. Excluding countries where pension data are not available.

Table 9. **Impact of policy reforms on future dependency ratios (2000-2025)** (continued)
(Percentage points)

Panel B. **High case**

	Old-age dependency ratio[1]					**Share of older workers[2]**					**Overall dependency ratio[3]**				
	Change in the baseline scenario	Impact of pension reforms[4]	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms	Change in the baseline scenario	Impact of pension reforms[4]	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms	Change in the baseline scenario	Impact of pension reforms[4]	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms
Australia	15.5	-3.4	-1.1	0.0	11.0	5.3	3.1	-0.6	0.0	7.7	7.3	-7.5	-6.3	0.0	-6.4
Austria	17.5	-8.4	-1.2	-0.3	7.6	5.7	8.3	-0.6	-0.2	13.2	22.4	-22.0	-6.2	-1.7	-7.5
Belgium	12.6	-7.9	-1.7	-1.2	1.8	5.0	7.8	-0.8	-0.6	11.4	4.6	-20.9	-8.6	-6.2	-31.0
Canada	17.7	-2.0	-0.9	0.0	14.8	6.9	1.9	-0.5	0.0	8.3	8.8	-4.5	-4.7	0.0	-0.5
Czech Republic	21.3	..	-1.9	-0.9	..	3.8	..	-0.6	-0.3	..	17.2	..	-8.6	-4.2	..
Denmark	14.4	..	-0.2	0.0	..	3.3	..	-0.9	0.0	..	15.9	..	-2.7	0.0	..
Finland	25.2	-8.9	-0.4	-0.4	15.5	6.2	7.8	-0.2	-0.2	13.5	25.7	-20.5	-1.8	-2.0	1.4
France	18.7	-9.7	-2.3	-1.6	5.0	5.9	8.4	-1.2	-0.8	12.2	20.4	-23.9	-11.5	-7.9	-23.0
Germany	15.3	-5.2	-2.4	-0.4	7.4	5.3	5.7	-1.4	-0.2	9.5	7.5	-14.9	-10.8	-1.7	-19.8
Greece	3.9	..	-0.3	-1.2	..	6.4	..	-0.1	-0.6	..	-22.0	..	-1.2	-5.6	..
Hungary	31.2	..	0.0	-2.0	..	2.7	..	0.0	-0.3	..	28.1	..	0.1	-8.5	..
Iceland	8.1	-1.2	0.0	0.0	6.8	7.1	1.1	0.0	0.0	8.2	-4.3	-2.3	0.1	0.0	-6.5
Ireland	5.3	-3.1	-1.2	-0.3	0.7	7.9	4.2	-1.1	-0.3	10.7	-25.0	-9.8	-8.7	-2.2	-45.7
Italy	13.9	-7.0	-2.0	-1.1	3.8	12.1	4.1	-1.1	-0.6	14.6	-3.2	-12.6	-9.2	-5.2	-30.1
Japan	23.0	-7.2	-2.7	-0.5	12.5	4.7	4.5	-2.1	-0.4	6.7	15.9	-12.8	-12.5	-2.6	-12.0
Korea	28.2	-10.6	-1.6	-0.8	15.2	12.6	6.9	-2.0	-1.0	16.5	27.4	-22.0	-11.4	-5.6	-11.6
Luxembourg	15.1	-6.8	-1.5	-1.4	5.4	8.6	9.4	-0.9	-0.9	16.2	9.3	-23.5	-8.0	-7.3	-29.5
Mexico	4.7	..	-0.4	-0.2	..	7.3	..	-0.5	-0.3	..	-46.6	..	-5.4	-3.6	..
Netherlands	16.1	-8.3	-1.3	0.0	6.5	8.0	9.7	-1.1	0.0	16.6	7.7	-23.3	-7.5	0.0	-23.1
NewZealand	15.2	-1.2	-1.4	-0.1	12.6	10.3	0.9	-0.9	0.0	10.2	9.2	-2.5	-8.2	-0.4	-1.9
Norway	8.6	-4.5	-0.5	0.0	3.6	6.4	3.9	-0.4	0.0	9.9	1.1	-9.4	-3.1	0.0	-11.4
Poland	27.4	..	-2.0	-1.3	..	3.6	..	-0.5	-0.3	..	19.3	..	-9.1	-6.1	..
Portugal	3.7	-9.2	-0.7	-0.3	-6.5	6.3	8.7	-1.2	-0.5	13.3	-2.8	-21.7	-6.4	-2.9	-33.9
Slovak Republic	22.4	..	-1.1	-0.8	..	2.7	..	-0.2	-0.2	..	13.5	..	-5.3	-4.0	..
Spain	9.8	-10.7	-2.4	-0.6	-3.8	9.9	9.5	-2.0	-0.5	17.0	-0.8	-25.6	-12.9	-3.1	-42.4
Sweden	18.1	-5.3	-0.6	-0.6	11.6	2.1	4.1	-0.3	-0.3	5.5	28.9	-11.3	-2.6	-2.9	12.1
Switzerland	9.9	-3.9	-0.9	0.0	5.2	6.5	3.6	-0.7	0.0	9.4	2.9	-8.4	-4.9	0.0	-10.4
Turkey	12.9	..	-0.8	-1.2	..	2.9	..	-0.5	-0.7	..	48.0	..	-10.9	-15.9	..
United Kingdom	10.8	-3.9	-1.2	0.0	5.7	6.7	3.8	-0.8	0.0	9.7	8.2	-9.5	-6.6	0.0	-7.9
United States	11.8	-1.5	-1.5	..	8.8	8.4	1.3	-1.1	..	8.7	13.6	-3.4	-9.6	..	0.5
OECD average[5]	14.6	-5.9	-1.3	-0.4	6.9	7.2	5.4	-1.0	-0.3	11.3	8.4	-14.2	-7.3	-2.4	-15.5

1. Defined as the ratio of the inactive population aged 65 or more to the total labour force (aged 15 and over).
2. Defined as the share of the active population aged 55 and over to the total labour force (aged 15 and over).
3. Defined as the ratio of the inactive population (including children) to the total labour force (aged 15 and over).
4. For 8 out 30 OECD countries (Denmark, Hungary, Czech Republic, Mexico, Slovak Republic, Poland, Greece and Turkey), only the impact of recently enacted changes in the standard retirement age are taken into account. The effect of possible changes in implicit tax rates is omitted for these countries.
5. Excluding countries where pension data are not available.

Table 10. **Impact of policy reforms on future participation rates, 2000-2050**
(percentage point changes)

Panel A. **Low case**

	Aggregate participation change in the baseline scenario	Impact of pension reforms				Impact of additional incentives to women participation	Impact of increasing youths participation	Total impact of policy reforms	Aggregate participation rates changes including all reforms	Rate of growth of aggregate labour supply including all reforms %
		Removal of early retirement schemes	Actuarial neutrality of old-age pensions	Delaying normal retirement age	Total impact					
	[1]	[2]	[3]	[4]	[5] =[2]+[3]+[4]	[6]	[7]	[8] =[5]+[6]+[7]	[9] =[1]+[8]	
Australia	-10.7	0.0	1.1	0.5	1.6	1.7	0.0	3.4	-7.4	26.0
Austria	-12.8	1.3	1.0	0.4	2.6	1.0	0.5	4.1	-8.7	-16.1
Belgium	-5.3	0.8	1.2	0.3	2.3	2.1	1.7	6.1	0.9	12.1
Canada	-9.2	0.0	0.4	0.6	1.0	1.4	0.0	2.5	-6.8	15.0
Czech Republic	-18.6	..	..	1.4	..	1.7	1.2	..	..	-35.2
Denmark	-8.6	..	..	0.4	..	0.8	0.0	..	..	-5.1
Finland	-9.1	0.8	1.6	0.5	2.9	0.0	0.6	3.5	-5.6	-10.4
France	-8.8	0.5	1.4	1.4	3.4	2.3	2.1	7.8	-1.0	7.0
Germany	-6.9	0.9	0.4	0.5	1.9	3.3	0.6	5.7	-1.1	-7.4
Greece	1.1	..	..	0.7	..	0.3	1.4	..	..	2.0
Hungary	-17.5	..	..	0.7	..	0.0	1.5	..	..	-42.2
Iceland	-8.5	0.0	0.8	0.0	0.8	0.0	0.0	0.8	-7.7	14.4
Ireland	0.1	0.8	0.7	0.4	1.9	3.0	0.8	5.6	5.7	46.4
Italy	-6.9	0.0	2.2	0.6	2.7	1.7	1.2	5.7	-1.2	-18.1
Japan	-11.5	0.0	1.7	1.0	2.7	3.1	0.8	6.6	-4.9	-23.4
Korea	-16.5	0.0	2.1	3.2	5.3	2.0	1.4	8.7	-7.8	-15.8
Luxemburg	-4.1	1.6	-0.1	0.2	1.7	2.2	2.2	6.1	2.0	33.4
Mexico	0.9	..	..	0.7	..	0.8	1.0	..	..	86.3
Netherlands	-6.2	0.8	1.7	0.5	3.0	2.9	0.0	5.9	-0.3	14.9
New Zealand	-12.2	0.0	0.0	0.7	0.8	2.2	0.1	3.1	-9.2	13.9
Norway	-3.7	0.5	1.6	0.0	2.1	1.2	0.0	3.3	-0.4	18.7
Poland	-17.1	..	..	0.8	..	1.5	1.4	..	..	-28.8
Portugal	-4.2	2.3	1.1	0.8	4.2	1.9	1.2	7.3	3.1	15.3
Slovakia	-20.4	..	..	1.2	..	1.0	0.9	..	..	-29.7
Spain	-6.5	0.8	3.1	0.6	4.4	3.4	0.9	8.7	2.2	9.6
Sweden	-10.2	0.0	1.5	0.6	2.1	0.4	0.8	3.3	-6.8	-0.3
Switzerland	-5.9	0.0	1.1	0.9	2.0	1.9	0.0	3.9	-2.0	-0.3
Turkey	-15.8	..	..	1.2	..	0.9	1.9	..	..	28.0
United Kingdom	-6.5	0.4	0.8	0.6	1.7	1.4	0.0	3.1	-3.4	7.2
United States	-6.5	0.0	0.6	0.0	0.6	2.2	0.0	2.8	-3.7	40.5
OECD average [1]	-7.8	0.5	1.2	0.6	2.4	1.9	0.7	4.9	-2.9	8.3

1. Excluding countries where pension data are not available.

Table 10. **Impact of policy reforms on future participation rates, 2000-2050** (continued)
(percentage point changes)

Panel B. **High case**

	Aggregate participation change in the baseline scenario	Impact of pension reforms				Impact of additional incentives to women participation	Impact of increasing youths participation	Total impact of policy reforms	Aggregate participation rates changes including all reforms	Rate of growth of aggregate labour supply including all reforms %
		Removal of early retirement schemes	Actuarial neutrality of old-age pensions	Delaying normal retirement age	Total impact					
	[1]	[2]	[3]	[4]	[5] =[2]+[3]+[4]	[6]	[7]	[8] =[5]+[6]+[7]	[9] =[1]+[8]	
Australia	-10.7	0.0	1.9	-0.5	1.5	2.7	0.0	4.2	-6.5	27.8
Austria	-12.8	3.1	3.7	-5.2	1.6	5.2	0.5	7.3	-5.4	-10.6
Belgium	-5.3	2.0	2.5	-0.7	3.8	3.1	1.7	8.7	3.4	17.5
Canada	-9.2	0.0	0.9	-0.4	0.5	2.4	0.0	2.9	-6.3	15.9
Czech Republic	-18.6	..	..	1.4	..	1.7	1.2	..	..	-35.2
Denmark	-8.6	..	..	0.4	..	0.8	0.0	..	..	-5.1
Finland	-9.1	2.1	2.9	-0.5	4.4	1.5	0.6	6.6	-2.5	-5.5
France	-8.8	1.4	2.6	0.4	4.4	3.8	2.1	10.3	1.6	12.0
Germany	-6.9	2.3	1.1	-0.5	2.9	4.3	0.6	7.8	0.9	-4.0
Greece	1.1	..	..	0.7	..	0.3	1.4	..	..	2.0
Hungary	-17.5	..	..	0.7	..	0.0	1.5	..	..	-42.2
Iceland	-8.5	0.0	1.2	-1.0	0.2	1.0	0.0	1.2	-7.3	15.0
Ireland	0.1	0.8	0.7	-0.6	0.9	4.0	0.8	5.6	5.7	44.7
Italy	-6.9	0.0	2.7	-0.4	2.3	2.7	1.2	6.3	-0.6	-17.1
Japan	-11.5	0.0	3.3	0.0	3.3	4.6	0.8	8.8	-2.7	-20.5
Korea	-16.5	0.0	3.7	2.2	5.9	3.7	1.4	11.1	-5.4	-12.0
Luxemburg	-4.1	4.2	-0.1	-0.8	3.3	3.2	2.2	8.6	4.6	39.6
Mexico	0.9	..	..	0.7	..	1.5	1.0	..	..	88.5
Netherlands	-6.2	2.0	4.6	-0.5	6.1	3.9	0.0	10.0	3.8	22.4
New Zealand	-12.2	0.0	0.1	-0.3	-0.2	3.2	0.1	3.1	-9.1	14.0
Norway	-3.7	0.8	2.5	-1.0	2.3	2.2	0.0	4.5	0.8	21.0
Poland	-17.1	..	..	0.8	..	1.5	1.4	..	..	-28.8
Portugal	-4.2	5.9	2.4	-0.2	8.1	3.4	1.2	12.7	8.4	24.8
Slovakia	-20.4	..	..	1.2	..	1.0	0.9	..	..	-29.7
Spain	-6.5	2.1	4.9	-0.4	6.6	5.0	0.9	12.5	6.0	16.9
Sweden	-10.2	0.0	2.4	-0.4	1.9	1.7	0.8	4.4	-5.8	1.7
Switzerland	-5.9	0.0	2.2	-0.1	2.1	2.9	0.0	4.9	-0.9	1.3
Turkey	-15.8	..	..	1.2	..	1.2	1.9	..	..	28.8
United Kingdom	-6.5	0.9	1.4	-0.4	1.9	3.1	0.0	5.0	-1.5	10.6
United States	-6.5	0.0	1.0	-1.0	0.0	4.2	0.0	4.2	-2.2	43.7
OECD average [1]	-7.8	1.3	2.2	-0.6	2.9	3.3	0.7	6.9	-1.0	11.8

1. Excluding countries where pension data are not available.

Table 11. **Impact of policy reforms on future dependency ratios (2000-2050)**
(Percentage points)

Panel A. **Low case**

	Old-age dependency ratio[1]					Overall dependency ratio[2]				
	Change in the baseline scenario	Impact of pension reforms	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms	Change in the baseline scenario	Impact of pension reforms	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms
Australia	31.3	-3.8	-1.6	0.0	26.0	23.5	-6.7	-6.7	0.0	10.1
Austria	40.9	-7.2	-1.3	-0.6	31.8	45.7	-13.9	-4.9	-2.2	24.6
Belgium	26.6	-5.5	-2.5	-1.8	16.8	18.5	-11.6	-9.9	-7.4	-10.4
Canada	27.5	-1.9	-1.1	0.0	24.4	16.9	-3.6	-4.8	0.0	8.4
Czech Republic	60.7	..	-3.0	-2.0	..	78.5	..	-10.0	-6.7	..
Denmark	19.9	..	-0.2	0.0	..	21.5	..	-2.7	0.0	..
Finland	30.8	-6.0	0.0	-0.5	24.3	27.2	-11.3	-0.1	-2.2	13.6
France	31.6	-8.7	-2.7	-2.2	18.1	32.3	-17.6	-10.8	-8.9	-5.0
Germany	27.7	-3.4	-3.3	-0.5	20.4	19.6	-7.7	-12.5	-2.0	-2.6
Greece	16.7	..	-0.3	-1.5	..	-9.8	..	-1.2	-5.6	..
Hungary	82.9	..	0.1	74.1	..	112.4	..	0.2	-14.7	90.1
Iceland	18.5	-1.5	0.0	0.0	17.0	7.7	-2.2	0.1	0.0	5.5
Ireland	20.8	-2.9	-1.9	-0.4	15.6	-13.8	-6.4	-9.1	-2.2	-31.4
Italy	45.4	-10.9	-2.8	-1.9	29.8	30.2	-16.8	-9.4	-6.4	-2.4
Japan	40.0	-7.1	-3.1	-0.8	29.0	32.3	-11.1	-11.3	-2.8	7.1
Korea	62.3	-17.3	-2.2	-1.4	41.4	53.3	-27.2	-8.7	-5.7	11.8
Luxembourg	24.5	-3.2	-2.2	-2.0	17.1	14.7	-8.1	-9.5	-8.9	-11.8
Mexico	16.0	..	-0.3	-0.4	..	-45.8	..	-2.5	-3.1	..
Netherlands	24.1	-4.5	-2.0	0.0	17.6	13.9	-10.3	-9.0	0.0	-5.5
NewZealand	31.0	-1.8	-2.0	-0.1	27.1	25.5	-3.1	-8.7	-0.4	13.2
Norway	13.1	-3.7	-0.6	0.0	8.7	3.2	-6.3	-3.3	0.0	-6.3
Poland	61.1	..	-3.0	-2.7	..	78.9	..	-10.6	-9.4	..
Portugal	17.9	-7.6	-1.0	-0.6	8.6	10.2	-14.1	-5.8	-3.3	-13.0
Slovak Republic	69.7	..	-2.1	-1.9	..	80.5	..	-6.5	-5.9	..
Spain	36.2	-12.3	-3.7	-0.9	19.3	24.0	-20.8	-13.5	-3.5	-13.7
Sweden	21.4	-4.6	-0.4	-0.7	15.7	31.3	-8.5	-1.7	-3.1	18.0
Switzerland	16.2	-3.4	-1.1	0.0	11.7	11.6	-6.0	-5.3	0.0	0.3
Turkey	42.0	..	-1.3	-2.4	..	84.6	..	-9.3	-17.1	..
United Kingdom	18.2	-3.1	-1.0	0.0	14.0	13.2	-6.1	-4.7	0.0	2.4
United States	15.1	-1.0	-1.2	..	12.9	16.3	-2.0	-7.0	..	7.3
OECD average[4]	28.2	-5.5	-1.7	-0.7	20.3	20.8	-10.1	-7.1	-2.7	0.9

1. Defined as the ratio of the inactive population aged 65 or more to the total labour force (aged 15 or more).
2. Defined as the ratio of the inactive population (including children) to the total labour force (aged 15 or more).
3. Only countries for which all data are available.
4. Excluding countries where pension data are not available.

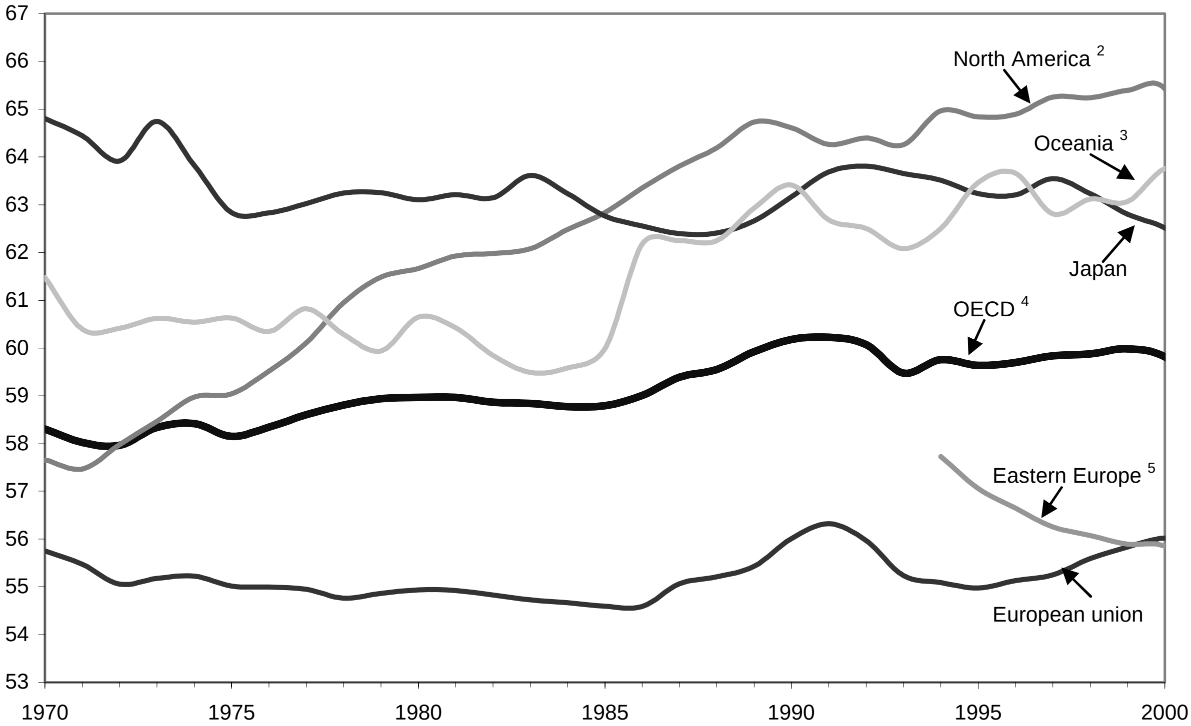
Table 11. **Impact of policy reforms on future dependency ratios (2000-2050)** (continued)
(Percentage points)

Panel B. **High case**

	Old-age dependency ratio[1]					Overall dependency ratio[2]				
	Change in the baseline scenario	Impact of pension reforms	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms	Change in the baseline scenario	Impact of pension reforms	Impact of additional incentives to women participation	Impact of increasing youths participation	Total change including all reforms
Australia	31.3	-5.2	-1.5	0.0	24.6	23.5	-10.0	-6.5	0.0	7.0
Austria	40.9	..	-14.7	-0.5	..	45.7	..	-33.3	-2.0	..
Belgium	26.6	-10.3	-2.2	-1.6	12.6	18.5	-23.3	-9.0	-6.7	-20.5
Canada	27.5	-2.6	-1.1	0.0	23.8	16.9	-5.2	-4.8	0.0	6.8
Czech Republic	60.7	..	-3.0	-2.0	..	78.5	..	-10.0	-6.7	..
Denmark	19.9	..	-0.2	0.0	..	21.5	..	-2.7	0.0	..
Finland	30.8	-9.9	-0.4	-0.5	20.1	27.2	-20.4	-1.8	-2.0	2.9
France	31.6	-12.5	-2.8	-1.9	14.3	32.3	-27.2	-11.8	-8.1	-14.9
Germany	27.7	-6.5	-3.1	-0.5	17.6	19.6	-15.8	-11.6	-1.8	-9.7
Greece	16.7	..	-0.3	-1.5	..	-9.8	..	-1.2	-5.6	..
Hungary	82.9	..	0.1	74.1	..	112.4	..	0.2	-14.7	..
Iceland	18.5	-1.8	0.0	0.0	16.6	7.7	-3.1	0.1	0.0	4.6
Ireland	20.8	-5.4	-1.7	-0.4	13.3	-13.8	-12.9	-8.5	-2.1	-37.2
Italy	45.4	-12.7	-2.7	-1.8	28.2	30.2	-20.0	-9.2	-6.2	-5.2
Japan	40.0	-10.7	-3.3	-0.7	25.3	32.3	-17.3	-12.4	-2.6	0.1
Korea	62.3	-21.4	-2.7	-1.3	37.0	53.3	-34.2	-11.1	-5.2	2.8
Luxembourg	24.5	-7.2	-1.9	-1.8	13.7	14.7	-19.3	-8.6	-8.1	-21.3
Mexico	16.0	..	-0.6	-0.4	..	-45.8	..	-4.8	-3.0	..
Netherlands	24.1	-9.7	-1.7	0.0	12.8	13.9	-23.0	-7.9	0.0	-17.1
NewZealand	31.0	-1.9	-2.0	-0.1	27.0	25.5	-3.3	-8.7	-0.4	13.0
Norway	13.1	-5.1	-0.6	0.0	7.4	3.2	-9.8	-3.2	0.0	-9.7
Poland	61.1	..	-3.0	-2.7	..	78.9	..	-10.6	-9.4	..
Portugal	17.9	-14.7	-0.9	-0.4	1.8	10.2	-28.1	-6.1	-2.8	-26.9
Slovak Republic	69.7	..	-2.1	-1.9	..	80.5	..	-6.5	-5.9	..
Spain	36.2	-18.1	-3.6	-0.8	13.6	24.0	-33.4	-14.0	-3.0	-26.5
Sweden	21.4	-5.7	-0.6	-0.7	14.4	31.3	-11.7	-2.6	-3.0	14.0
Switzerland	16.2	-4.6	-1.0	0.0	10.6	11.6	-9.1	-5.1	0.0	-2.6
Turkey	42.0	..	-1.6	-2.4	..	84.6	..	-11.5	-16.8	..
United Kingdom	18.2	-4.7	-1.4	0.0	12.0	13.2	-10.1	-6.8	0.0	-3.7
United States	15.1	-1.7	-1.6	..	11.8	16.3	-3.4	-9.9	..	3.0
OECD average[4]	28.2	-7.8	-2.3	-0.6	16.3	20.8	-15.5	-8.8	-2.5	-6.4

1. Defined as the ratio of the inactive population aged 65 or more to the total labour force (aged 15 or more).
2. Defined as the ratio of the inactive population (including children) to the total labour force (aged 15 or more).
3. Only countries for which all data are available.
4. Excluding countries where pension data are not available.

Figure 1. **Participation rates[1] in OECD countries, 1970-2000**
In per cent

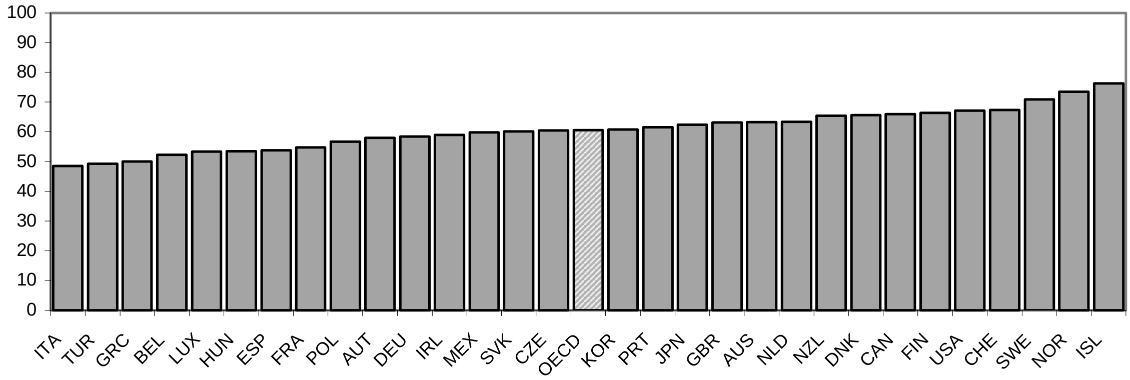


1. Participation rates refer to total labour force (including aged 65 and above) divided by population aged 15 and above.
2. United States and Canada.
3. Australia and New Zealand.
4. Excluding Czech Republic, Hungary, Mexico, Poland and Slovak Republic.
5. Czech Republic, Hungary, Poland and Slovak Republic.

Source: OECD, Labour Force Statistics (Part I).

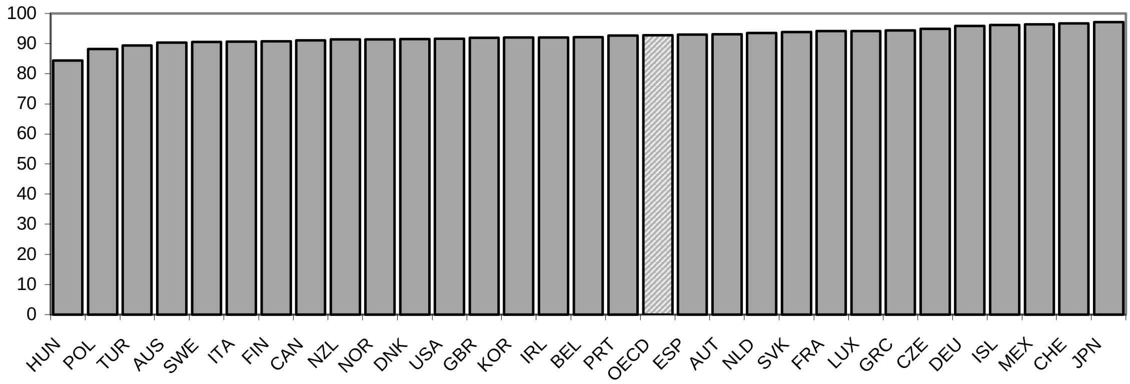
Figure 2. **Participation rates by age and gender groups in OECD countries, 2000**

Panel A. **Total (15 and over)**



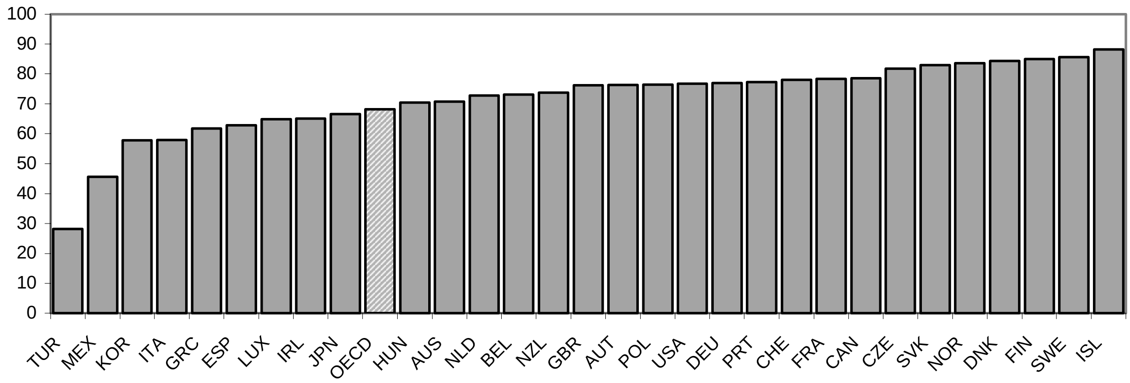
Mean: 60.68
Standard deviation: 6.97

Panel B. **Prime-age men (25-54 years old)**



Mean: 92.52
Standard deviation: 2.70

Panel C. **Prime-age women (25-54 years old)**

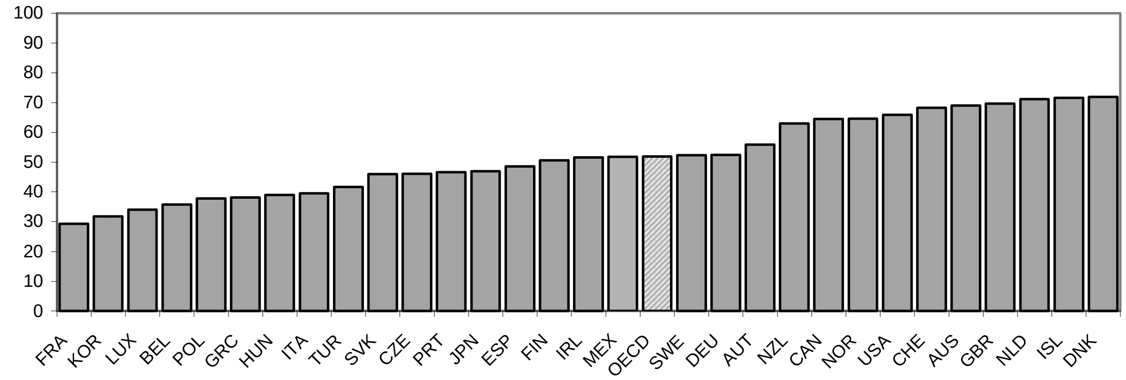


Mean: 71.91
Standard deviation: 12.75

Source: Labour Force Statistics (PartIII).

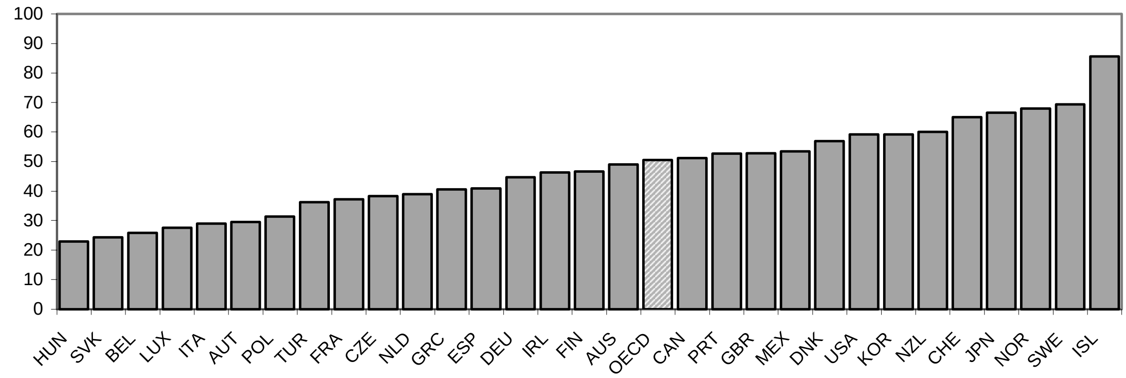
Figure 2. **Participation rates by age and gender groups in OECD countries, 2000** (continued)

Panel D. **Youths (15-24 years old)**



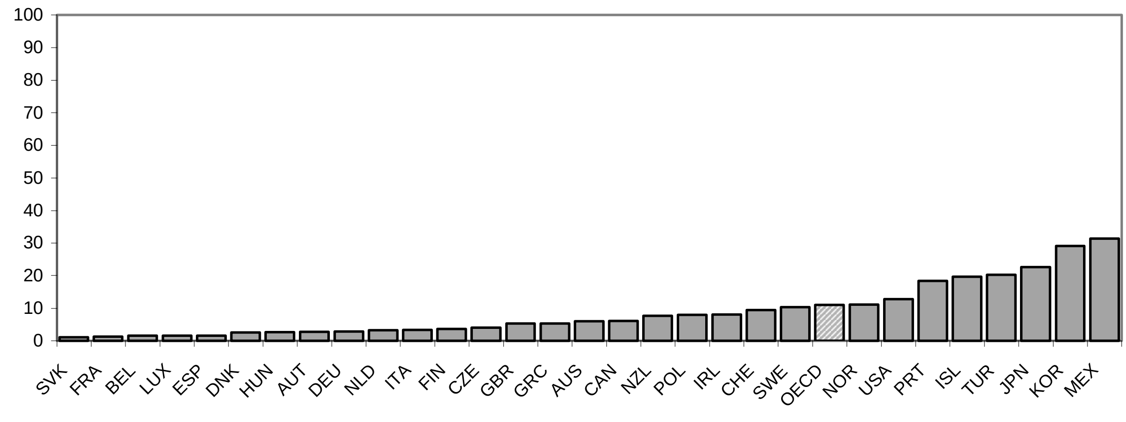
Mean:	51.85
Standard deviation:	13.30

Panel E. **Workers (55-64 years old)**



Mean:	46.97
Standard deviation:	15.62

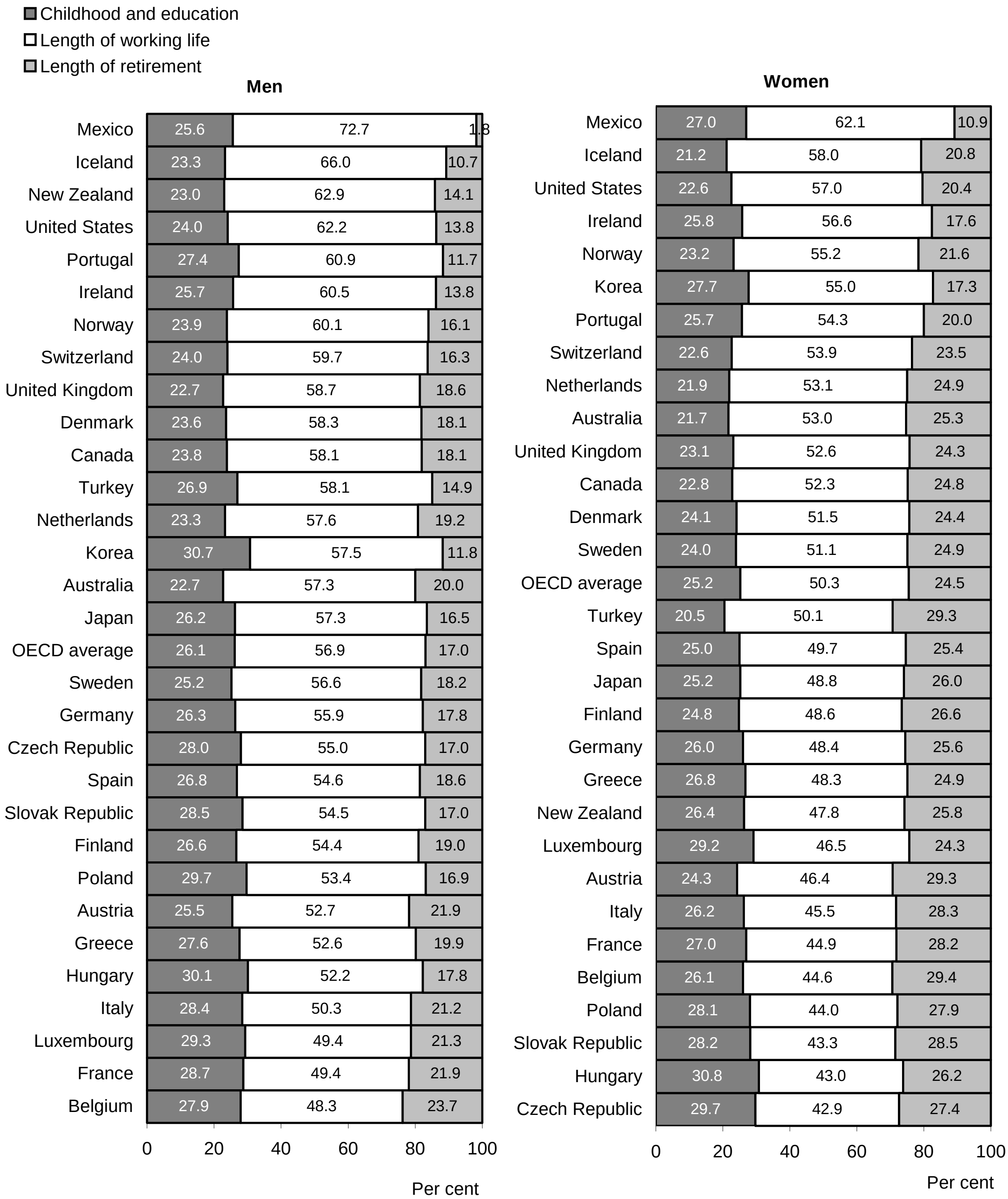
Panel F. **Older workers (65 and over)**



Mean:	8.80
Standard deviation:	8.42

Source: Labour Force Statistics (PartIII).

Figure 3. **Lifetime allocation of labour and leisure across OECD countries, 2000**[1]



1. Based on average expected ages of entry and exit calculated for 2000 as described in Appendix 2 of Annex 2 and life expectancy at birth from United Nations, World Population Prospects: The 2000 Revision.

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