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**PUBLIC PENSION EXPENDITURE PROSPECTS IN THE
EUROPEAN UNION:
A SURVEY OF NATIONAL PROJECTIONS**

(Note for the Economic and Policy Committee and the Monetary Committee)

EXECUTIVE SUMMARY

The demographic structure of European countries is changing considerably. *The old-age dependency ratio is increasing in most countries and reaching historically unprecedented levels.* Although the long term effects of the ageing process on public budgets are rather uncertain, depending on the way the economy and society will adapt to the process, a significant pressure towards higher public expenditure is very likely to occur in the coming decades. Pension schemes and health care systems will bear much of the pressure since their expenditure is highly dependent on the age structure of the population.

This paper provides a survey of the national projections on pension expenditure carried out in the 15 Member States of the European Union. Although these projections are not homogeneous in approach, have been produced in different years and are based on different economic and demographic assumptions, they are essential for understanding pension dynamics in the Union Member States. National projections are based on a wealth of data and institutional knowledge concerning Member States' public finances that international studies cannot achieve. In particular, they provide an estimate of the effects of legislative, social and economic changes influencing pension dynamics over and above demographic trends.

Although *the focus of this survey is on the latest projections produced by public institutions*, an effort has been made to examine all relevant projections carried out in each country. *The survey focuses on unchanged policy projections.* It must be stressed that *all projections are taken at face value*, and no judgement is made about their validity.

The future shape of European pension systems is examined over three periods: the next five years, the first decade of the 21st century and the following decades.

The conclusions, which are based on unchanged policy projections, are the following:

- a) *In the next 5 years, expenditure pressures stemming from public pension systems, although non-negligible, are expected to be rather limited in most countries.* Under favourable economic scenarios, over the period 1995-2000 the unweighted average of the ratios of pension expenditure to GDP in the 15 countries considered will increase by about 0.1 percentage points. The outlook would be rather worse if economic activity were to slow down markedly: under unfavourable scenarios, the unweighted average of the ratios of pension expenditure to GDP would increase by 0.4 percentage points.
- b) *In the first decade of the next century, the outlook for the pension systems gets worse. Even under favourable economic assumptions, the expenditure to GDP ratio is expected to increase in most countries.* In the period 2000-2010, the unweighted average of pension expenditure to GDP ratios in the 13 countries for which projections up to the year 2010 are available will increase by about 0.5

percentage points. Under the least favourable economic scenarios, the increase will reach 1.2 percentage points.

- c) *After 2010, when the baby-boom generation retires, the situation of European pension systems deteriorates more sharply.* The change in the pension expenditure trend is quite radical for the countries where the ageing process is relatively late. Over the period 2010-2030, the unweighted average of pension expenditure to GDP ratios in the 11 countries for which projections up to the year 2030 are available will increase by about 2.0 percentage points (see Chart A below; the GDP-weighted increase is steeper, see Chart B). Under the least favourable economic scenarios, the increase will reach 2.3 percentage points.

Chart A

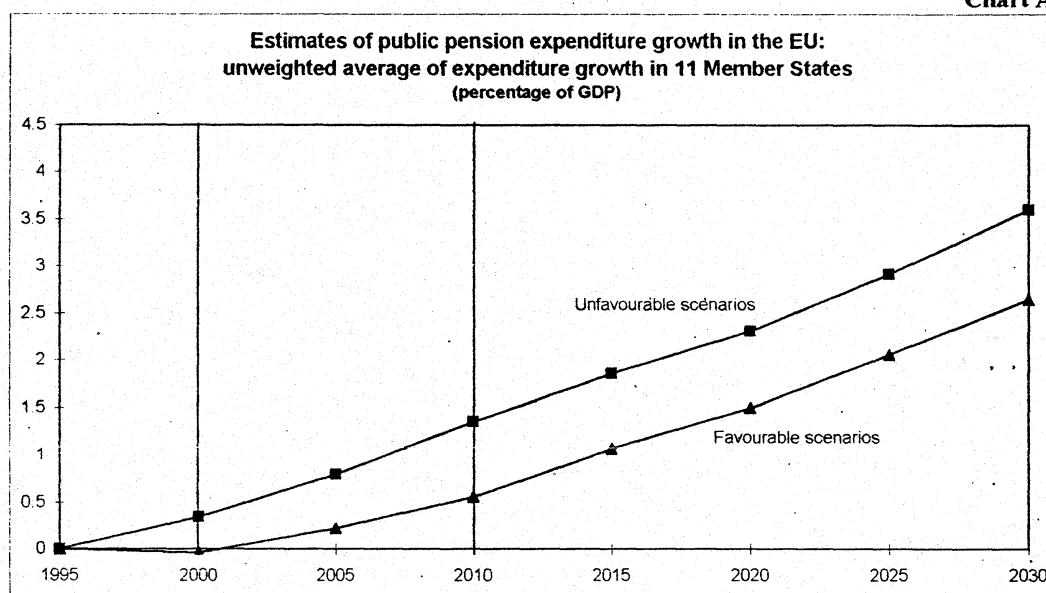
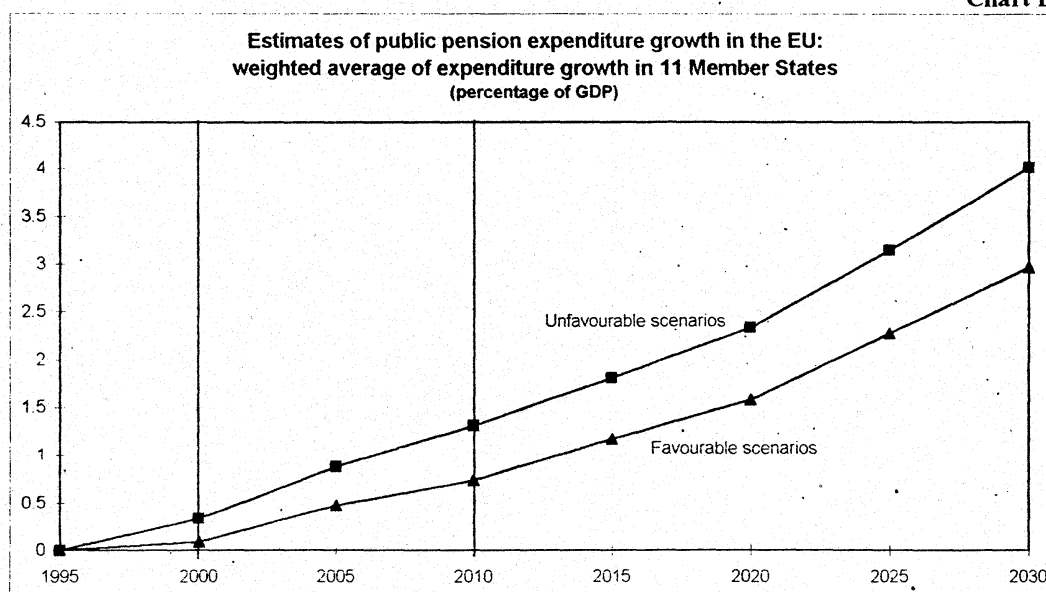


Chart B



- d) *Over the whole period 1995-2030*, the cumulative increase in the average expenditure ratio for the 11 above-mentioned countries would reach 3.0 points in the favourable scenarios and 4.0 in the unfavourable ones. Considerable increases in the pension burden will occur also in some countries that have already reformed their pension schemes. By the year 2030 in several countries (Belgium, Finland, France, Germany, Italy and the Netherlands) the ratio of pension expenditure to GDP might be in the range of 15 to 20 per cent. Expenditure would be lower in Denmark, Spain, Sweden (in the 10 to 15 per cent range), and in Ireland and the United Kingdom (below 10 per cent).

The survey also highlights the following points:

- e) Over the last decade, several national projections have been revised. The estimate of the contribution rate required to finance pension expenditure has generally been *revised upwards*. Some changes have been quite substantial. Past revisions do not offer any insights into possible future revision of present estimates. However, they point to the usefulness of carrying out regular reviews of projections and analysing past projection errors.
- f) In most countries present pension policies are quite different from those implemented in previous decades. *The phase of extension of coverage and improvement of benefits is over, although in a few countries past extensions and improvements are still affecting expenditure growth*. Since the mid-eighties several pension schemes have been reformed in order to reduce pension expenditure growth.
- g) In most countries only demographic trends are presently increasing the expenditure to GDP ratio. In several countries *the effects of demographic trends will be partly offset by reforms aimed at restraining expenditure growth*. For this reason, the projections carried out by the IMF and the OECD in the eighties (based on constant transfer and eligibility ratios) have generally turned out more pessimistic than present national projections.
- h) *Given the large expected changes in demographic structure, in several countries the preservation of present benefit levels and eligibility rules requires a substantial increase in the national resources devoted to the pension systems; alternatively, the stabilisation of pension expenditure requires further severe cuts in pension benefit levels and substantial restrictions in pension eligibility.*

The national projections surveyed in this paper give an account of the efforts of national authorities and researchers to develop forecasting models that provide more accurate, more frequent and longer term projections. It shows how the gradual recognition of the ageing problem has led to similar methodological solutions. However, the differences in approach, in the periods of reference, in coverage, and in economic and demographic assumptions, severely hamper the comparability of national estimates.

In order to develop internationally comparable projections of pension expenditure, common forecasting methodologies should be defined and economic and demographic assumptions should be harmonised.

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INTRODUCTION

The demographic structure of European countries is changing considerably. *The old-age dependency ratio is increasing in most countries and reaching historically unprecedented levels.*¹ Although the long-term effects of the ageing process on public budgets are rather uncertain,² depending on the way the economy and society will adapt to the process, a significant pressure towards higher public expenditure is very likely to occur in the coming decades. Pension schemes and health care systems will bear much of the pressure since their expenditure is highly dependent on the age structure of the population.³

This paper is part of a research project that examines the prospects for public expenditure in the Member States of the European Union. The project aims at assessing the *dimension, the timing and the nature of the strain on the budget consolidation process arising from demographic changes.*

More specifically, *this paper provides a survey of national projections on pension expenditure* (about 55 studies have been examined). Although these projections are not homogeneous in approach, have been produced in different years and are based on different economic and demographic assumptions, they are essential for understanding pension dynamics in the Union Member States. National projections are based on a wealth of data and institutional knowledge concerning Member States' public finances that international studies cannot achieve. In particular, they provide an estimate of the effects of legislative, social and economic changes influencing pension dynamics over and above demographic trends.

The survey also aims at giving an account of the efforts of national authorities and researchers to develop forecasting models that provide more accurate, more frequent and

¹ See European Commission (1994a, 1994b) and OECD (1988a).

² See, for instance, Pearson *et al.* (1989).

³ See the data reported in OECD (1988a).

longer term projections. It shows how the gradual recognition of the ageing problem has led to similar methodological solutions.

The survey covers projections produced in all the 15 European Union countries. Projections carried out by public institutions are available for 14 countries, the exception being Portugal, where forecasts by academic institutions have been considered.

Although *the focus of this survey is on the latest projections produced by public institutions*, an effort has been made to examine a few alternative projections for each country. This allows some comparisons of the estimates carried out by different institutions or by the same institution in different years. Whenever possible, academic or private institutions' projections have been considered besides those produced by public institutions. In the case of the countries that have implemented recent major reforms of the pension system, the outlook for the system before and after the reforms is usually considered.

The survey focuses on unchanged policy projections. This approach provides a useful benchmark for evaluating the need for reform.

All projections are taken at face value, and no judgement is made about their validity.

The future shape of European pension systems is examined over three periods: the next five years, the first decade of the 21st century and the following decades. Given the long-term nature of pension arrangements, these periods can be respectively named the short-, the medium- and the long-term.

The paper is structured as follows. Part I provides a general overview of the features and results of pension expenditure projections carried out in the EU Member States. Section I.1 outlines the main problems involved in forecasting pension expenditure. Section I.2 surveys the projections carried out by the IMF and the OECD. Section I.3 examines the main features of the projections carried out in the European Union countries. Section I.4 examines the prospects for the European pension schemes as presented in the most recent projections carried out by a public institution in each Member State. Section I.5 presents some tentative estimates of the overall effects of pension schemes on public budgets. Section I.6 summarises the main result of the study. Part II outlines the characteristics and the results of the main projections carried out in each Member State. The main problems raised in national debates on pension policy are also briefly considered. Annex A reports data on social spending in the EU Member. Annex B presents Charts outlining the role of demographic and non-demographic factors in expected future expenditure trends in each country.

PART I

A GENERAL OVERVIEW

I.1 FORECASTING PENSION EXPENDITURE

The ratio of the elderly to working-age population (i.e., the old-age dependency ratio) is increasing fast in most Western countries. In the European Union, according to some recent projections, it will rise from 22.9 per cent in 1995 to 25.8-28.7 per cent in 2010 and to 30.8-40.6 per cent in 2025 (see Box 1).⁴ It is an unprecedented trend that, since the early eighties, has raised worries about pension expenditure growth and the sustainability of PAYG pension systems. The recent development of models forecasting pension expenditure dynamics is largely a reflection of these worries.

Box No. 1

DEMOGRAPHIC PROJECTIONS FOR THE EUROPEAN UNION

In recent years national and international institutions have carried out several long-term projections of population. Forecasts for the European Union Member States were produced in 1991 by Eurostat; forecasts for all countries were released in 1994 by the World Bank (see Bos. *et al.*). New long-term demographic projections for the European Union were recently commissioned by the European Commission (see Eding, 1995; see also the papers presented at the seminar *New Long-Term Population Scenarios for the European Economic Area - Eurostat-European Commission - Luxembourg 1995*).

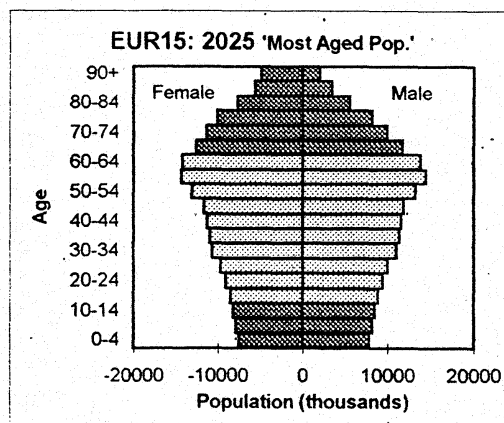
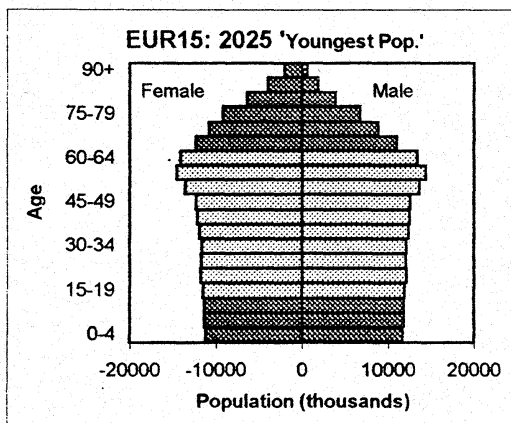
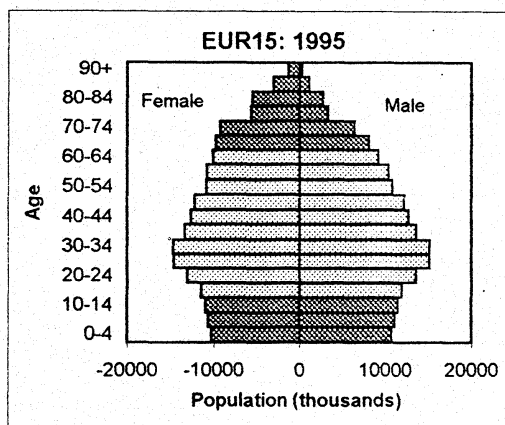
Among the four scenarios considered in the new projections, two are most relevant for pension expenditure: the 'youngest population' scenario and the 'most aged population' scenario. The former assumes high fertility (with total fertility rates in the 15 countries in the 1.8-2.1 range in

⁴ The data refer to the ratio of population 65 and over to population 15-64. Different age brackets could be considered for the numerator (for instance, population 60 and over) and the denominator (for instance, population 20-59, or 15-64, or 20-64). The level of the dependency ratio would obviously change, but the tendency toward higher levels would be unaffected.

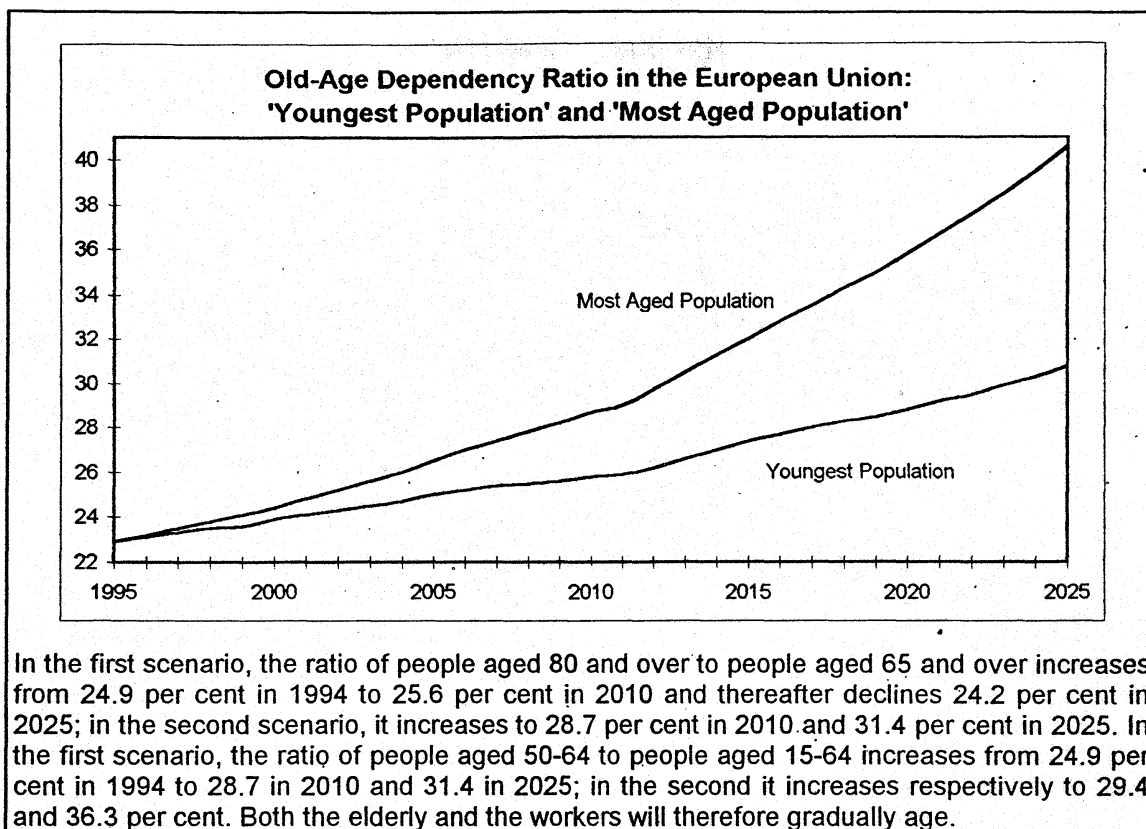
the year 2020), small increases in life expectancy (1.4-2.2 years in the different countries for males and 1.0-1.9 years for females at birth in the period up to 2050) and high net migration (an inflow of 800,000 persons per year for the Union). The latter assumes low fertility (total fertility rates in the 1.3-1.6 range), high increases in life expectancy (8.1-10.3 years for males and 6.7-8.1 years for females) and low net migration (250,000 persons per year).

In the first scenario, total EU population increases from 370.4 million in 1994 to 396.0 in 2010 and 400.1 in 2025. Population increases are most relevant in France (7.8 million), the United Kingdom (4.8 million), Germany (4.2 million), the Netherlands (2.9 million) and Spain (2.2 million); the percentage increase is highest in Luxembourg (44.6 per cent). Italy is the only country with a declining population (0.5 million). In the second scenario, total EU population will increase up to the year 2010 (to 376.3 million) and decrease afterwards (to 371.6 million in 2025). Germany, Ireland and Italy record a peak in the population before the year 2000. Only France, Luxembourg, the Netherlands, Sweden and the United Kingdom will experience a continuing increase in total population.

A significant ageing of European population occurs under both scenarios (see the population pyramids below). In the 'youngest population' scenario the ratio of the citizens aged 65 and over to total population increases from 15.3 per cent in 1995 to 19.5 per cent in 2025; in the 'most aged population' scenario it reaches 25.1 per cent. This process affects all countries, with Germany and Italy reaching the highest ratios in both scenarios; Ireland and Luxembourg record the lowest ratios in the first scenario, while Denmark and Portugal record the lowest ratios in the second scenario.



The ratio of the elderly (population aged 65 and over) to working-age population (aged 15 to 64) would increase even faster (see Chart below). The worsening of the ratio accelerates after the year 2010, when the generations born after the Second World War reach 65. The ratio will peak after the year 2025, when the generations born in the sixties move from the working-age group to the elderly group.



This section aims at outlining the following four points:

- a) Pension expenditure cannot be accurately forecast only on the basis of demographic trends; legislative, social and economic changes greatly influence pension dynamics over and above demographic trends.
- b) Most pension systems are quite complex. Accurate projections therefore require a wealth of data and institutional knowledge that only national institutions can have.
- c) Pension expenditure projections are largely affected by demographic and macroeconomic assumptions; the uncertainty concerning the long-term values of these factors suggests that projections outcomes should be evaluated quite cautiously. Different assumptions should be considered in order to provide the range of likely outcomes.
- d) In order to provide a measure of the need for reform, in the projections pension policies can be assumed as unchanged. On the contrary, changes in social attitudes should be envisaged. Citizens' retirement behaviour can change over time and can be affected by the demographic and economic scenarios and by their effects on the contribution rates of pension schemes. Ideally, the behaviour of individuals should be endogenized in the projections. This also points to the need for some sensitivity analysis.

The most common indicators of the evolution of pension expenditure are also presented.

I.1.1 Demographic and non demographic factors - Although demographic change is the most important exogenous factor affecting pension expenditure growth, pension expenditure cannot be accurately forecast only on the basis of demographic trends.⁵

Pension expenditure dynamics are actually influenced also by changes in legislation (that defines eligibility rules, the amount granted to new pensioners, indexation mechanisms, etc.), past and present employment (that influences the length of workers' membership in pension schemes and the distribution of workers among the different schemes), and social attitudes (as those towards early retirement and the demand for disability benefits).⁶ While legislation basically determines the supply of pensions, the other factors define the demand for them stemming from citizens. These factors can affect the various benefits provided by pension schemes in most countries in different ways.⁷

In order to highlight the problems faced in projecting pension expenditure, one can refer to some simple accounting identities. Following the OECD (1988b) approach, the ratio of pension expenditure (EXP_p) to GDP can be expressed on the basis of the four following ratios:

- a) The Old-age dependency ratio = Population at pensionable age (POP_p) divided by the population at working age (POP_w).
- b) The Eligibility ratio = Number of pension beneficiaries ($NPEN$) divided by the population at pensionable age (POP_p).
- c) The Transfer ratio = Average pension per beneficiary (p_a) divided by GDP per worker (gdp_w).
- d) The Employment ratio = Population at working age (POP_w) divided by employment ($NWOR$).

The ratio of public expenditure on old-age pensions to GDP can therefore be written as:⁸

$$\frac{EXP_p}{GDP} = \left(\frac{POP_p}{POP_w} \right) * \left(\frac{NPEN}{POP_p} \right) * \left(\frac{p_a}{gdp_w} \right) * \left(\frac{POP_w}{NWOR} \right)$$

⁵ The methodology for forecasting social expenditure is examined in Coppini and Laina (1985).

⁶ See OECD (1988b).

⁷ Most pension schemes provide three kinds of pensions with specific eligibility conditions: old-age benefits for citizens over a certain minimum age, disability benefits for disabled citizens, survivors' benefits for widowers and orphans. European Commission (1993b) provides a detailed description of the main pension benefits paid in the 12 EU member states in 1994. The schemes providing old-age, disability and survivors in the 12 countries are respectively described in Eurostat (1992a, 1992b, 1993). OECD (1988b) provides a brief description of the pension systems of the other Western countries.

⁸ The old-age dependency, eligibility and transfer ratios can be jointly expressed as $\frac{NPEN}{NWOR}$ (Dependency ratio). The ratio of expenditure to GDP will then result: $\frac{EXP_p}{GDP} = \left(\frac{NPEN}{NWOR} \right) * \left(\frac{p_a}{gdp_w} \right)$.

Somewhat similar identities can be written for disability and survivors' pensions.

Ratio a) represent the pure demographic component of expenditure dynamics. Ratios b) and c) depend on legislation and economic factors. Ratio d) is affected by economic factors.

Ratios b) and c) can change considerably over time because of the 'maturing' of pension schemes, i.e. because of the process of adjustment of all pensions to present retirement rules.⁹ On the one hand, pension coverage extensions and benefit improvements usually produce their full effects on the two ratios after many decades. On the other, quite often pension reforms curtailing benefits are implemented gradually and only display their full effects a long time later.

The UK State Earnings Related Pension Scheme (SERPS) represents an interesting case: over a period of 16 years new benefits were first introduced and then substantially reduced twice. All measures were implemented very gradually: the scheme will reach full maturity in the second half of the next century.

Box No. 2

THE MATURING OF PENSION SCHEMES: THE CASE OF SERPS (UK)

The State Earnings Related Pension Scheme (SERPS) was introduced in the United Kingdom in 1978 (see Department of Social Security, 1993) in order to supplement the basic pension paid to all elderly citizens. The new pension (that substituted the 'graduated pensions' awarded on contributions paid between 1961 and 1975) was to be related to the contributions paid after April 1978. Each pensioner was to receive 1.25 per cent of the average of the best 20 years' earnings (each year's earnings were to be revalued to retirement age in line with movements in the general level of earnings) up to a maximum of 20 years. Benefits were to be raised gradually during a 20 years period, with full entitlements to be paid to new pensioners only in 1998. The system would have reached maturity well into the next century, when all living pensioners would have been in the position of paying contributions to SERPS for 20 years.

The scheme was substantially reformed in 1986:

- a) While the accrual rate for contributions paid between the financial years 1978-1979 and 1987-1988 was maintained at 1.25 per cent, the accrual rate on later contributions was gradually reduced to 1 per cent between the year 2000-2001 and the year 2009-2010; the replacement rate (i.e., the pension to wage ratio) was therefore reduced from 25 to 20 per cent.
- b) Starting from 1999-2000 the assessment period for benefit calculation was gradually extended to the whole period from age 16 to retirement.

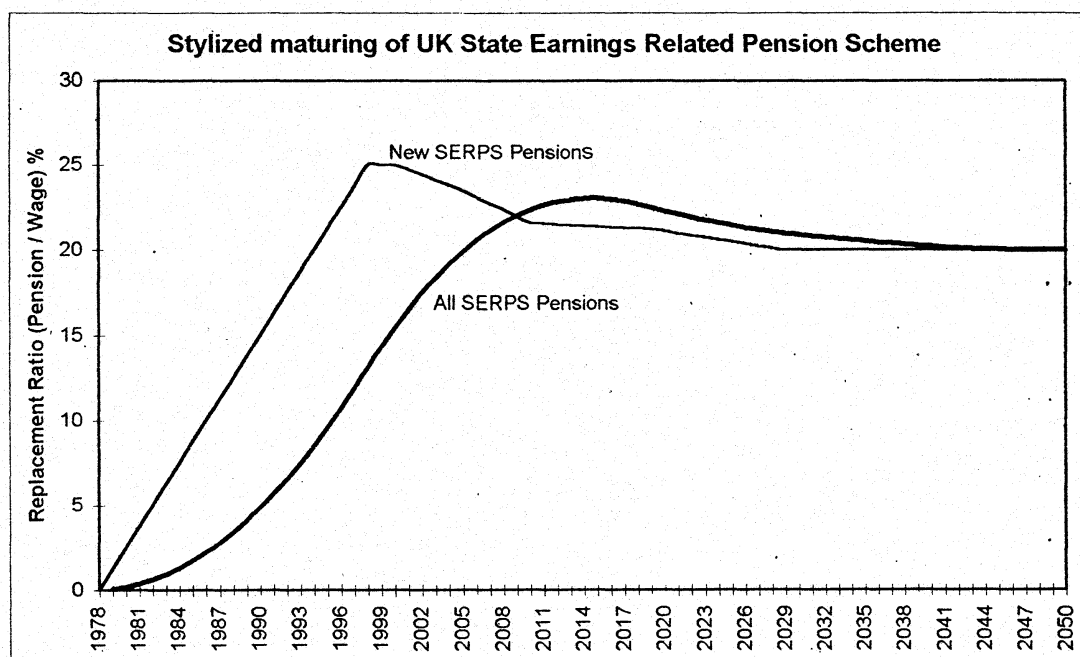
This reform will produce its full effects over several decades. The scheme will therefore reach maturity in the second half of next century when all existing pensioners will have paid all their contributions after the year 1987-1988.

In order to examine the 'pure' maturation effects of the 1986 reform on pension expenditure, the following simplifying assumptions can be made:

⁹ See OECD (1988b).

- Each generation comprises the same number of individuals.
- Each individual works for 40 years and gets an old-age pension for 20 years;
- Earnings and pensions levels are stable through time (this assumption actually voids the effects of the lengthening of the assessment period for benefit calculation decided in 1986).

The Chart below outlines the replacement ratio for the new pensions paid in each year and for the average pension paid by SERPS in each year. The trend of the latter is an indicator for the trend of the ratio of SERPS expenditure on GDP. The new pensions, after having reached their 25 per cent peak at the end of the present decade, will gradually decline to the 20 per cent level up to the year 2029, when the 1.25 per cent accrual rate will no longer apply. On the basis of the three assumptions listed above, the average SERPS pension will keep increasing (in terms of the average wage) up to the year 2015; it will then gradually decline towards the 20 per cent level, reaching it in 2048 (by this year all pensioners will have retired after the year 2029). This means that the 1986 reform will take about half of a century (from 1999) to produce its full effects on the transfer ratio and on the ratio of pension expenditure to GDP.



New changes in pension rules were introduced in 1994: female pensionable age will increase from 60 to 65 (the increase will be phased in between 2010 and 2020); the calculation of the earnings factors used to derive SERPS entitlements is to be amended from April 2000 onwards; contributors will no longer accrue any SERPS entitlement in respect of contracted-out earnings from 1997. These changes, particularly the new calculation of the earnings factor, will further delay the maturation of SERPS.

Changes in the relative number of workers enrolled in the different schemes are also likely to influence ratios b) and c). In many countries, for instance, in the last decades public employment has grown faster than total employment and, since public employees frequently have better retirement rules, the shift in employment increases pension expenditure.

According to OECD (1988b), between 1960 and 1985 in the OECD countries the old-age dependency, eligibility, transfer and employment ratios respectively contributed to

25.6, 38.0, 33.2, and 3.2 per cent of total change in the pension expenditure to GDP ratio. Among the 15 EU countries, only in Denmark and the United Kingdom was the old-age dependency ratio the most relevant factor in contributing to expenditure growth.¹⁰ These data reflect the widespread process of expansion of pension coverage and improvement of benefits that took place in many European countries from the fifties to the seventies.¹¹

Any precise assessment of future pension expenditure must therefore take the likely changes in the eligibility and transfer ratios into account. While in the past these changes increased expenditure in most countries, in the future they are likely to work both ways (this subject will be dealt with in Section I.4.5). In some countries the effects of past extensions and improvements of pension schemes are still expanding expenditure; in others, the reforms recently introduced are reducing eligibility and transfer ratios. The latter ratio might also be negatively influenced by the present widespread unemployment, which limits the contribution record of future pensioners.

1.1.2 The complexity of pension systems - The problems encountered in projecting pension expenditure are compounded by the complexity of most pension systems. In many countries workers are covered by several pension schemes with different rules (e.g., for private sector employees, for civil servants, for the self-employed).¹² In some countries there are both insurance and assistance schemes: the former providing benefits to workers with a certain contributory record, the latter paying benefits to poor elderly citizens or to disabled citizens. Some groups of workers may be eligible for two pensions, a basic and a supplementary one, paid by different schemes.

Ideally, pension expenditure should be projected separately for each scheme. The dynamics of expenditure of each scheme would reflect, among other factors, the age structure of its workers and pensioners and its maturity with regard to past changes in legislation.

Accurate projections can also be obtained by estimating the pension that will be paid to each present pensioner and to each present worker.¹³ Several elements ought to be taken into account for each individual: the benefits provided by her or his scheme(s), life expectancy and several possible events, such as that of receiving disability benefits before retirement age and that of leaving relatives eligible for survivor benefits.¹⁴

¹⁰ This point is stressed in Holzman (1989).

¹¹ See ILO (1989).

¹² The several pension schemes existing in the 12 Member States of the European Union in 1994 are described in Eurostat (1992a, 1992b, 1993).

¹³ It should be obviously considered that some citizens may have already acquired the title to a pension, in spite of the fact that they are not presently working, and that in some countries all citizens may be entitled to a pension under certain age or income conditions.

¹⁴ This approach, requiring detailed information, can be applied by referring to large samples of workers and pensioners (see Box 4 in Section I.3).

It is therefore obvious that the production of accurate projections requires extensive datasets and precise institutional knowledge. Only national institutions are in the position to satisfy such requirements. The decision to evaluate the prospects of European pension schemes through a survey of national projections is largely due to this consideration.

1.1.3 The uncertainty about demographic and macroeconomic scenarios - Pension projections are necessarily based on demographic and macroeconomic assumptions. As to demography, assumptions are to be made about fertility rates, life expectancy and migration flows. As to the macroeconomic scenario, GDP, wage and employment growth are most relevant; assumptions about employment structure and income distribution are also important.

The long-term demographic outlook is quite uncertain.¹⁵ Fertility rates can fluctuate considerably and rather unpredictably even in the short-term. In the early nineties, for instance, the number of births in the European Union was lower than that predicted by Eurostat in 1991 in the low-fertility scenario.¹⁶ Mortality rates, although the margins of error are relatively smaller, are also difficult to predict.¹⁷ Even greater uncertainties stem from the projection of net migration flows, which depend on several economic and social factors, on political decisions and on the enforcement of policies.¹⁸

The uncertainty of long-term projections is stressed in Danish Ministry of Finance (1995). By assuming a higher birth-rate and higher net immigration, in its 1994 projection Denmark's Statistical Department estimated for 2025 a population of five million people, as against the four million estimated in the 1984 projection.

Box No. 3

DEMOGRAPHIC SCENARIOS UNDERLYING PENSION EXPENDITURE PROJECTIONS: A COMPARISON WITH NEW EC SCENARIOS

Pension expenditure forecasts are usually based on demographic projections, which are often carried out by national statistical offices. The Charts included in the Box compare some of these national projections with those recently developed for the European Commission (see Box 1). More specifically the ratio of the elderly to working age population (old-age dependency ratio) referred to in the pension projections is compared with the ratios of the two extreme EC scenarios (the 'Most-Aged Population' and the 'Youngest Population').

¹⁵ Long (1995) and Rogers (1995) evaluate the methodological problems underlying long-term population projections. Rogers points to the difficulty of assessing the quality of projections, as "they inevitably depend not only on the models used but also on the particular historical periods selected for examination" (p.187). Long analyses the accuracy of official population projections used for government planning.

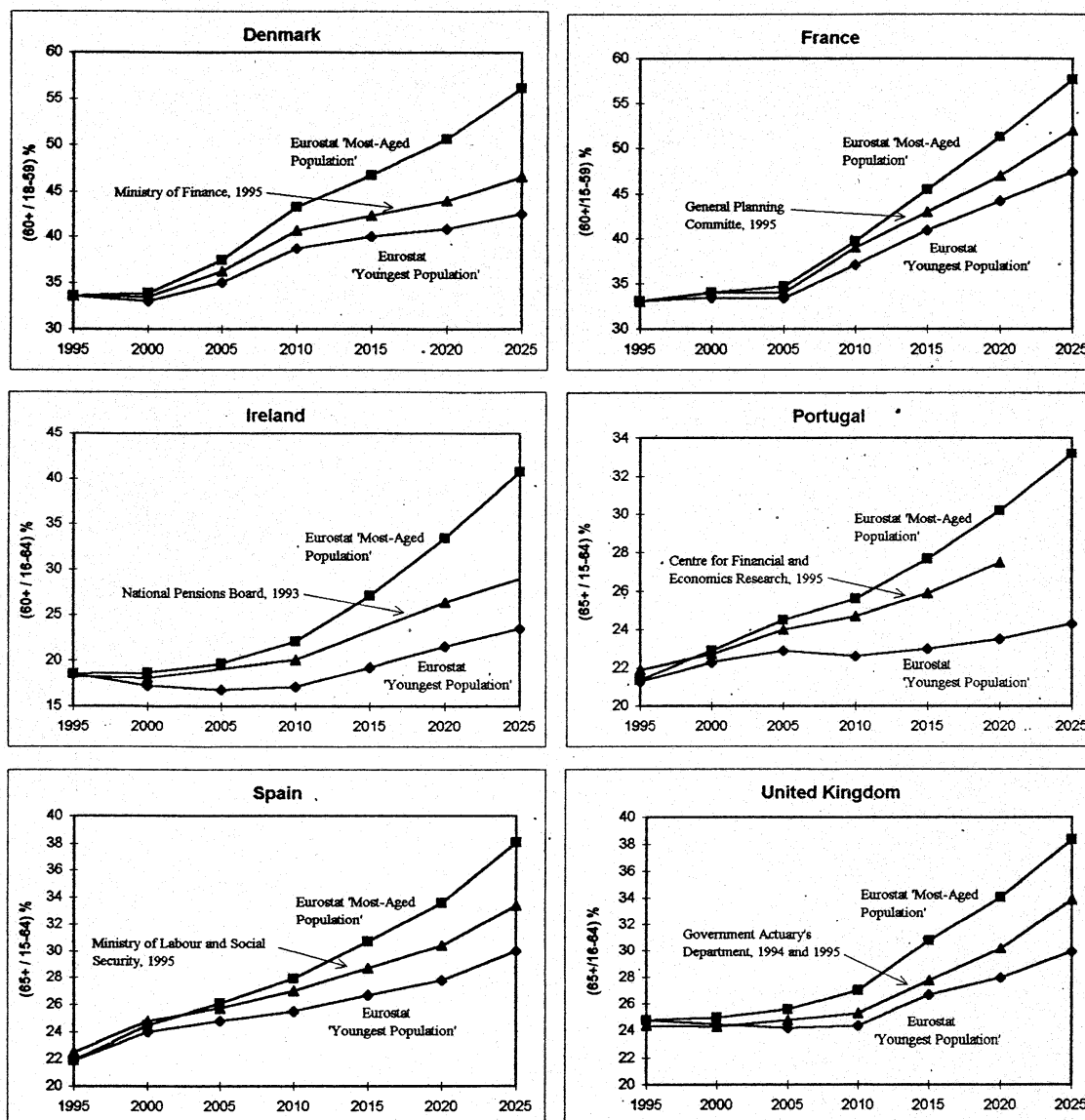
¹⁶ The topic is extensively examined in De Jong (1995) and Crujsen and Eding (1995). According to the latter paper (p. 4), "fertility showed once again its capricious and unpredictable nature".

¹⁷ See Van Hoorn and De Beer (1995) and Crujsen and Eding (1995).

¹⁸ The topic is examined in Visser (1995).

For all six countries taken into consideration (see Charts below), the national old-age dependency ratio line lies between the lines of the two EC scenarios. In Portugal it is closer to the Most-aged scenario; in Denmark, Ireland (in the long-run) and the United Kingdom it is closer to the Youngest Population scenario. In France and Spain it lies exactly in between the two.

National Demographic Scenarios and New EC Scenarios



National pension projections are evidently based on intermediate and, presumably, most likely scenarios. The gap between national pension projection lines and the two extreme EC lines provides a measure of the uncertainty of long-term demographic prospects and of the possible effects on pension expenditure of extreme fertility and mortality rate trends.

The long-term economic outlook is also uncertain. As will be shown in Section II, in several countries the projections carried out by different institutions or by the same institution in different periods are frequently based on different assumptions. Even if the changes in the rate of growth of parameters are often relatively limited in scope, their long-term effects are considerable.

The uncertainty concerning the long-term values of demographic and economic parameters suggests that projections should be evaluated quite cautiously. Different assumptions should be systematically considered in order to provide the range of likely outcomes. In the following Sections, in reporting the results of national projections, great attention will be paid to the effects of alternative assumptions and to sensitivity analysis tests (see also Box 7).

I.1.4 Assumptions on pension policies and the behaviour of individuals - As already mentioned in Section I.1.1, pension expenditure dynamics is influenced also by changes in pension policies and in social attitudes.

Changes in pension rules can modify eligibility and transfer ratios. Most studies, however, project expenditure over long periods applying exogenous demographic and economic scenarios over unchanged policies. This approach, although unrealistic, as policies are likely to be adjusted frequently, provides a useful benchmark for evaluating the need for reform.

On the other hand, changes in social attitudes should be taken into consideration. Assumptions on the behaviour of individuals in the labour market and in the retirement decisions (e.g., choice of retirement age, demand for disability pensions) should be explicitly specified. Labour supply and retirement decisions can change over time and are not independent of the economic and demographic scenarios and of their effects on contribution rates. For instance, an increase in contribution rates which reduces net wages and the gap between net wages and net pensions may provide an incentive for early retirement.

Danish Ministry of Finance (1995) observes that actual retirement age is affected by unemployment, the business cycle, and the general levels of wealth and health of the population. Lower unemployment and a better state of health will increase the retirement age. Greater prosperity is likely to lower retirement age.

Ideally, the behaviour of individuals should be endogenized in the projections. This is particularly relevant for pension systems that allow flexible retirement. Some recent pension reforms will greatly increase the freedom of choice of individuals as to retirement age: workers will choose their retirement age within a certain age-bracket and receive an actuarially discounted pension.¹⁹ Although the long-term effects of different decisions are not very relevant since pensions are actuarially discounted, in the short- to medium-term they may substantially influence the dynamics of pension expenditure.

Wide-ranging effects of demographic and economic factors, complexity of the factors affecting pension expenditure dynamics, changes in individual behaviour and in pension policies all contribute to the necessity of periodic revisions of expenditure projections (see Box 6).

¹⁹

This is one of the main features of the reforms introduced in Sweden in 1994 and in Italy in 1995. See Part II.

I.1.5 Indicators of pension systems sustainability - Pay-as-you-go (PAYG) pensions can be paid by different institutions (social security institutes, the state) and can be financed in a variety of ways (social security institutes usually rely on contributions and transfers from the public budget; the state can rely on earmarked taxes, general revenues, borrowing). In order to compare the economic situation of national pension systems, it is necessary to use a measure of the burden of pension expenditure that is not affected by the way expenditure, directly or indirectly, is funded. Comparisons based on the deficits or surpluses resulting from pension expenditure and earmarked contributions would not be relevant.

Two indicators are most frequently referred to in works concerning the future of pension schemes:

- a) The ratio of pension expenditure to GDP.
- b) The rate of contribution required to finance pensions.

The first ratio implicitly measures the burden that public pensions impose on the whole society. The contribution rate measures the burden on the workers and employers enrolled in the pension schemes. If, as is frequently assumed in long-term-projections, the ratio of labour income to GDP is constant, the two indicators are equivalent.

As to the second indicator, in order to avoid any influence of the composition of financing (e.g., to avoid the contribution rate to be affected by changes in government transfers to pension schemes), one can refer to the 'equilibrium contribution rate' (*ECR*). This is the rate required to finance all current pension expenditure from a uniform contribution levied on current labour income. It can be defined as:

$$ECR = \left(\frac{EXP_p}{w * POP_w} \right)$$

where w is the taxable average income. If pension expenditure is partly covered by other fund sources (budgetary transfers, income from assets, etc.), *ECR* is obviously higher than the actual rate levied on workers and employers.

I.2 MAJOR INTERNATIONAL PROJECTIONS

In the last decade, when it became apparent that Western countries were experiencing major changes in their demographic structure, both the IMF and the OECD tried to estimate the effects of these changes on public expenditure. While OECD (1988b) evaluated the pure impact of demographic changes,²⁰ the IMF (with a paper by Heller, Hemming and Kohnert, 1986) also considered some factors influencing eligibility and transfer ratios. OECD covered 21 countries; IMF considered only the major seven.

I.2.1 Main assumptions - OECD's baseline population projections were based on the following hypothesis:

- a) A gradual convergence of fertility rates to replacement level (i.e., to a total fertility rate of 2.1) by 2050.²¹
- b) An increase in life expectancy of 2 years for each sex between 1983 and 2030.
- c) Zero net migration or low levels of net migration.

IMF's baseline scenario is somewhat similar. The main assumptions are the following:

- a) A gradual increase in the 1980 total fertility ratio that by 2010 reaches replacement level in five out of the seven countries.
- b) An increase in life expectancy at birth of 3.4 years for males and 2.5 for females between 1980 and 2010.
- c) Limited net emigration from Germany and immigration to Canada and the United States.

Two more scenarios were considered in the IMF paper. They both envisage a "Greater Ageing" situation with fertility broadly constant at 1980 levels and with a life expectancy increase of 6.7 years for males and 4.8 years for females. One scenario shares the baseline economic assumptions, while the other takes a more pessimistic view of growth and employment.

In OECD (1988b), the share of the elderly (65 and over) in total population for the whole OECD was projected to rise from 12.2 per cent in 1980 to 15.4 per cent in 2010 and 22.1 in 2040. For the seven major countries it was projected to rise from 12.5 in 1980 respectively to 16.4 and to 22.8 per cent. The share of the elderly on the working age population was expected to grow at a faster rate. In the IMF projections the ageing process was slower; in the seven countries the share of population aged 65 and over was

²⁰ OECD's "projections assume constant benefit levels per beneficiary relative to national income per worker, constant labour force participation rates, as well as a constant portion of elderly people in receipt of benefits" (p. 35).

²¹ Two more projections were produced: a "high variant" one with a progressive convergence on a final fertility rate of 2.5, and a "low variant" one with convergence to a fertility rate of 1.4.

projected to rise from 12.5 per cent in 1980 to 15.9 in 2010 and 19.5 in 2025 (respectively 17.3 and 22.3 per cent in the Greater Ageing scenario).

I.2.2 Main results - As to pension expenditure, OECD (1988b, p. 35), assuming "constant benefit levels per beneficiary relative to national income per worker, constant labour force participation rates, as well as a constant portion of elderly people in receipt of benefits," estimated that between 1984 and 2040 demographic changes could nearly double its share in national income for the OECD area as a whole (see Table 1). Demographic pressure on pension expenditure would be quite large in most European countries. As a result, in 2040 pension expenditure was estimated to be around 30 per cent of national income in Austria, France, Germany, Italy and the Netherlands and around 20 per cent in Belgium, Denmark, Greece, Spain and Sweden. Only in Ireland and the United Kingdom would it remain close to 10 per cent of national income.

These projections were considered as conservative, since other factors were expected to increase pension expenditure. It was suggested (p. 42) that "The extension of coverage to new groups will raise the proportion of beneficiaries among the elderly in many schemes, especially in earnings-related ones. Furthermore, the benefit level will continue to rise more rapidly than the average income per worker as some of the schemes have been introduced only recently or have experienced substantial improvements in the benefit structure". In other words, pension systems were not considered fully mature.

IMF projections are more complex. Starting from the growth in the number of citizens of pensionable age,²² Heller *et al.* projected the growth in the number of pensioners on the basis of several assumptions on the eligibility ratio dynamics in each country. The dynamics of the average pension in real terms were then projected on the basis of hypothesis concerning the maturity of the different systems.

In the baseline projection (Table 1), between 1980 and 2025 the share of pension expenditure in GDP rises considerably in Germany (from 13 to 20 per cent) and Italy (from 10 to 18 per cent) and to a smaller extent in France (from 10 to 13 per cent) and the United Kingdom (from 6 to more than 8 per cent). In the more pessimistic scenario the expenditure ratio is noticeably higher in France (reaching 16 per cent) and in Italy (reaching 20 per cent).

Although the IMF and the OECD projections are not fully comparable, because of the different starting years and the different pension aggregate considered for some countries, they both point to large expected increases in public expenditure on pensions. Both studies suggest that the pressure on pension expenditure will increase from 2010 onwards, when the "baby boom" generation reaches retirement age.

The IMF and OECD studies largely contributed to raising awareness of governments and public opinion to the public expenditure consequences of demographic changes. In the same period, the growing awareness concerning population ageing has also led to a

²²

They consider the retirement age applied in each country to males and females.

substantial increase in the resources devoted to national long-term projections of pension expenditure.²³ During the last decade, national projections considering the several non-demographic factors affecting pension expenditure dynamics in each country have been made available in most Western countries.²⁴

²³ Some long-term projections were nevertheless carried out in the past. The Beveridge Report in 1942 included, for instance, a 30 year estimate of social expenditure in the UK.

²⁴ In the United States, regular projections over a 75 year period are required by the Social Security Act. They have been recently considered in Steuerle - Bakija (1994). Long term projections for Canada are surveyed in Bayoumi (1994). As to Japan, see Japanese Ministry of Health and Welfare (1985) and Takayama (1996).

Table 1

MAIN INTERNATIONAL STUDIES											
Country	IMF (1986): Pension Expenditure / GDP ⁽¹⁾ %				OECD (1988): Equilibrium Contribution Rate %						
	1980	2000	2010	2025	1984	2000	2010	2020	2030	2040	2050
Austria					16.5	17.6	20.7	23.7	29.6	31.7	28.2
Belgium					14	13.8	14.8	17	21	22.7	21.5
Denmark					10.1	9.5	10.8	13.5	16.2	18.7	17.4
Finland					8.5	9.7	11.4	16	18.2	17.8	17.6
France	10	11.0/11.0	11.5/12.6	13.0/16.3	14.3	16.5	17.3	21.6	25.3	27	26.6
Germany ⁽²⁾	13.3	17.1/17.1	18.6/18.8	20.5/21.1	13.7	16.4	19.7	21.6	28.1	31.1	26.8
Greece					10.8	13	14.7	15.7	17.7	19.5	19.6
Ireland					6.7	6.2	6	6.8	8.3	9.9	11.2
Italy	10.5	12.7/13.1	14.4/15.4	18.0/20.1	14.7	17.1	19.5	22.3	26.8	31.1	28.7
Luxembourg											
The Netherlands					12.1	13.4	15	19.6	25.7	28.5	25.5
Portugal					8.2	10.6	10.9	12.1	14.6	16.9	17
Spain					10	11.7	12.3	13.6	16.6	20.4	20.7
Sweden					12.9	12.1	12.8	15.9	17	18	17
United Kingdom	5.8	6.6/6.8	7.2/7.7	8.4/9.3	7.7	7.5	7.6	8.6	10.6	11.2	10.2
U.S.A.	6.3	5.8/6.4	5.7/6.6	6.9/8.5	8.1	8.2	8.5	11.3	14.4	14.6	14.2
Canada	3.5	3.1/3/4	3.1/3.6	4.3/5.3	6.1	7.6	8.6	11.6	15	15.2	14.4
Japan	4.2	9.6/10.5	12.9/14.4	13.4/15.5	6	9.4	12.3	14	13.2	15.7	15.4

1) Left: Baseline Economic and Demographic Scenario. Right: Pessimistic Economic and "Greater Aging" Scenario.

2) West Germany.

Sources: Heller, Hemming and Kohnert (1986) and OECD (1988).

I.3 MAIN FEATURES OF NATIONAL PROJECTIONS

The present survey covers projections produced in 15 European Union countries. Projections carried out by public institutions are available for 14 countries,²⁵ the exception being Portugal, where forecasts by academic institutions have been considered.²⁶

In all countries recent projections are available. In 1995, public institutions released long-term projections in 8 EU Member States.²⁷ In 4 other countries projections had been released in 1994. In the 3 remaining countries they had been released in 1992-1993.

Projections usually cover 30 to 55 years. At present, available estimates reach the year 2015 in Luxembourg, 2020 in Portugal, 2030 in Austria, Finland Germany and Spain, 2035 in Ireland, 2040 in Denmark and France, 2045 in The Netherlands, 2050 in Belgium, Greece, Italy, Sweden and the United Kingdom.

In most countries projections are not carried out on a regular basis. They are usually produced when some major reform of the pension system is considered. Periodic reviews of the outlook of public pension schemes are envisaged in Germany every year and in the United Kingdom every 5 years (Box 6 in Section I.4 reports the outcomes of some revisions of expenditure estimates). German projections are produced by the Federal Government over a 15 year time range; British projections are carried out by the Government Actuary and cover the period up to 2050.

Some countries are moving towards the introduction of regular projections. The 1995 Italian pension reform created a technical committee aimed at producing periodic reviews of pension expenditure trends. Both the 1993 Final Report of the Irish National Pensions Board and the 1995 Spanish *Pacto de Toledo* envisaged reviews of long-term public pension system prospects to be carried out every five years.

Most projections provide estimates either for the equilibrium contribution rate or the ratio of expenditure to GDP. As already mentioned, although the two types of data will be plotted in different charts, their trends convey similar information concerning the evolution of the burden of pension expenditure.

²⁵ In most countries the projections were carried out by the ministries of social security, or by the institutes in charge of social security benefits or by councils for social security (Austria, Finland, Luxembourg, Ireland, Italy, Germany, The Netherlands, Spain, United Kingdom). In other countries the projections were produced by the ministries of finance or of economic affairs (Denmark, Italy, Sweden) or by the central planning offices (Belgium, France). In Greece they were produced by the IMF in co-operation with the Greek government.

²⁶ The projections are however endorsed by the Ministry of Finance, which has also financed them.

²⁷ Including Portugal, where, as already mentioned, projections endorsed by the Ministry of Finance have been released in 1995.

Several projections take two or more demographic and economic scenarios into consideration. Different mortality and fertility hypotheses are considered for Belgium in Boulanger *et al.* (1991), for the Netherlands in Scientific Council of Government Policy (1993) and for United Kingdom in Government Actuary's Department (1986, 1990 and 1995). Different fertility assumptions are considered for Denmark in Jensen and Nielsen (1995a), for France in Government of France (1991) and in General Planning Committee (1995), for the Netherlands in Committee on the Financing of Pension Schemes (1987), for Portugal in Portuguese Federation of Insurance Companies (1994).

Different hypotheses concerning labour participation ratios are examined for Austria in Council of Economic and Social Affairs (1991), for France in Government of France (1991) and General Planning Committee (1995), for Germany in Federal Government of Germany (1994 and 1995). Different employment growth rates are considered in Luxembourg (1995). Different assumptions concerning employment growth, real wage growth and real GDP growth are considered for Belgium in Boulanger *et al.* (1991) and Englert *et al.* (1994), for Denmark in Jensen and Nielsen (1995b), for Finland in Social Expenditure Committee (1994), for France in the National Old-Age Insurance Fund projections quoted in Ruellan (1993), for Spain in Ministry of Labour and Social Security (1995) and Herce and Pérez-Díaz (1995), for Sweden in Swedish Parliament (1994).²⁸

The main economic assumptions considered in the latest national projections are reported in Table 2. Wherever an estimate is put forward for GDP growth, it usually ranges between 1.5 and 3 per cent. Most estimates for real wage growth range between 1.5 and 2.5 per cent. Some projections are based on assumptions concerning employment growth rate (which is generally rather moderate); others are based on assumptions concerning activity and unemployment ratios (which are usually constant).²⁹

The projections included in Table 2 cover a large part of public expenditure on pensions. Among the schemes omitted there are those providing pensions to civil servants in some countries (Austria, France and Germany) or to some categories of self-employed workers (France and Italy). Some public supplementary pension schemes are also omitted (e.g. France), as are some non-contributory schemes (e.g. Italy).

Some projections for countries in which pensions are automatically adjusted to prices also provide estimates of the effects of wage indexation on pension benefits.³⁰ It is

²⁸ Some projections (i.e., those by the Austrian Council of Economic and Social Affairs, 1991) also considered different scenarios concerning the share of the pension burden between employers and employees' contributions and the public budget.

²⁹ In Government Actuary's Department (1990) the trend towards higher activity rates for young females and lower activity rates for elderly males is assumed to continue in the United Kingdom.

³⁰ In most countries pensions are automatically adjusted to prices. Some countries (France, Italy, the United Kingdom) switched from wage to price indexation in recent years in order to restrain pension expenditure growth. Only in Austria and Germany are pensions still adjusted to wage dynamics (both these countries recently changed from the adjustment of pensions to the dynamics of gross wage to that of the dynamics of wages net of pension contributions). See Box 5.

Table 2

MAIN ECONOMIC ASSUMPTIONS					
Country	Projections reported in Charts 2 - 8	Scenario	Real GDP Growth ⁽¹⁾ %	Employment Growth ⁽¹⁾ %	Real Wage Growth ⁽¹⁾ %
Austria ⁽²⁾	Council for the Adjustment of Pensions, 1995	Main Scenario	2.7	0.6	
Belgium	Bureau du Plan, 1994	Favourable Scenario	2.35	0.75	
		Unfavourable Scenario	2.26	0	
Denmark	Ministry of Finance, 1995	Main Scenario		Constant unemployment level	2
Finland	Social Expenditure Committee, 1994 and Ministry of Social Affairs and Health, 1994	Favourable Scenario	1.5 to 3.8		1.8 to 2.1
		Intermediate Scenario	1.2 to 2.7		1.4 to 1.8
		Unfavourable Scenario	1.1 to 1.5		0.9 to 1.5
France	General Planning Committee, 1995	Main Scenario	3.5 to 1.75	1.25 to -0.25	1.0 to 2.0
Germany ⁽³⁾	Social Advisory Board, 1994	Main Scenario		0.8 to 0.1	3.7 to 3
Greece ⁽²⁾	IMF and Government of Greece, 1992	Main Scenario		0.7 to 1.4	1.0 to 2.2
Ireland	National Pensions Board, 1993	Main Scenario		Constant unemployment ratio	
Italy ⁽⁴⁾	State General Accounting Office, 1995	Main Scenario	2	0	2
Luxembourg	Ministry of Social Security, 1995	Favourable Scenario		2	1.5
		Intermediate Scenario		1.6	1.5
		Unfavourable Scenario		0	1.5
The Netherlands	Scientific Council of Government Policy, 1993	Favourable Scenario	2.8	Unemployment rate: 11.5 to 4.3	
		Unfavourable Scenario	1.5 to 2.3	Unemployment rate: 11.5 to 7.5	
Portugal	Centre for Financial Economics Research, 1995	Main Scenario		Constant activity ratio	1.5
Spain	Ministry of Labour and Social Security, 1995	Favourable Scenario	3.7 - 4.0 to 2.5	2.4 - 2.9 to 0.9	
		Unfavourable Scenario	3.7 - 4.0 to 2	2.4 - 2.9 to 0.9	
Sweden	Swedish Parliament, 1994	Favourable Scenario			3
		Intermediate Scenario			1.5
		Unfavourable Scenario			1
United Kingdom	Government Actuary's Department, 1994 and 1995	Main Scenario		5% unemployment rate; changes in activity rates ⁽⁵⁾	1.5

1) Data reported refer to the years from 1996 onwards.

2) Data refer only to private sector.

3) Data refer to old Bundesländer. In the new Bundesländer the rates of growth are lower.

4) Data refer to the pension schemes for private sector employees and self-employed artisans and businessmen.

5) Increase in female activity rates (for ages under 45). Decline in male activity rates (for ages over 60).

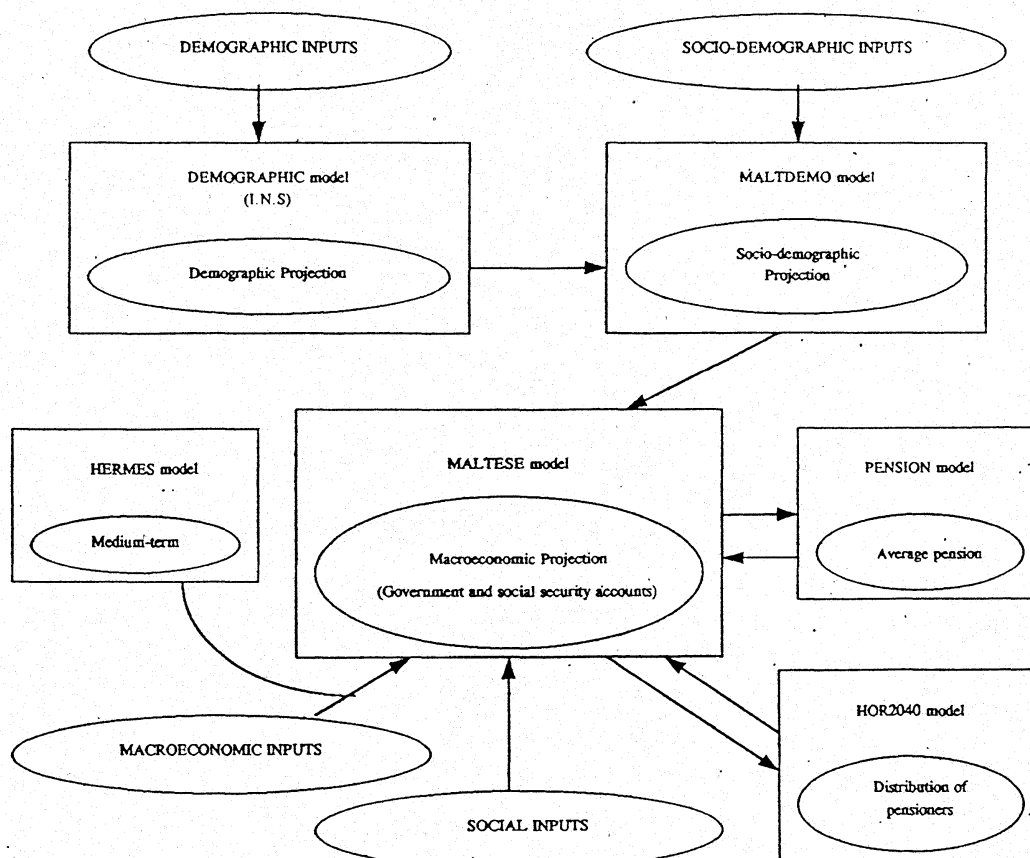
considered that, whatever the indexation arrangement, governments can decide discretionary pension increases in order to maintain their purchasing power relative to wages. This issue is particularly relevant for schemes providing pensions which are not related to the earnings career of workers (see Box 5). These estimates were produced for Denmark by Jensen and Nielsen (1995a), for France by the National Old-age Insurance Fund (see Ruellan 1993), for Italy by the State General Accounting Office (1994) and the National Social Security Institute (1993), for the United Kingdom by the Government Actuary's Department (1990 and 1995).

The methodology of some projections is briefly examined in Box 4. Three forecasting models are considered: that of the Belgian Bureau du Plan, that of the Italian National Social Security Institute and that of Tilburg University in the Netherlands.

Box No. 4

FORECASTING TECHNIQUES: THREE MODELS

The model of the Belgian *Bureau du Plan* - In 1989 the Belgian *Bureau du Plan* developed the MALTESE forecasting model ("Model for Analysis of Long Term Evolution of Social Expenditure" - see Englert 1990 and 1992, Festjens-Becquaert-Bogaert 1990), which is a system of interconnected models, with a central core bearing the same name and a set of macroeconomic, demographic, socio-demographic, and social modules (see Chart below). The model aims at projecting expenditure trends of all social security schemes up to the year 2050. Various scenarios are considered.



The demographic projections are carried out by a model developed by the National Institute of Statistics. The main exogenous variables are: fertility rate, life expectancy, migrations.

The socio-demographic projections for activity rates, retirement rates and school attendance rates, are carried out by a specific model (MALTEMO) which provides an exhaustive breakdown of the population between appropriate socio-demographic categories for each age and sex group. There is a feed-back mechanism from unemployment rates to participation rates.

The projection of the distribution of pensioners among the different pension schemes is provided by a special peripheral model (HOR2040). A special model called PENSION computes the average pension in the general scheme for wage earners.

Long-term projections concerning macroeconomic variables and Government and Social Security accounts are carried out by the central MALTESE model based on the medium-term macroeconomic projections supplied by the HERMES medium-term econometric model and on the output of the before-mentioned peripheral models. The main macroeconomic assumptions concern productivity growth, wage growth, employment changes, unemployment rates and interest rates. The main "social" assumptions concern transfers from central government budget, contribution rates and the rate of adjustment of benefits to living standards.

The model generates the main factors explaining the long-term evolution of receipts and expenditure of social security schemes, namely:

- a) The number of beneficiaries of the different types of benefits.
- b) The average benefit amount.
- c) Contributions and transfer receipts to the social security.

The first projections were produced at the end of 1989 (the basic scenario is presented in Englert, 1990). New projections were produced in 1994 (see Englert, Fasquelle and Weesmaes, 1994). Estimates for the ECR have not undergone substantial changes up to year 2020; in both the 1989 and the 1994 projections the ECR is between 22 and 23 per cent. As to the following decades, the new projections are more optimistic, with the ECR in the year 2040 about 3 points below the level expected in the 1989 projections (25.1-25.4 per cent as against 28.5 per cent - Tables II.2a-II.2b).

The model of the Italian National Social Security Institute (*Istituto Nazionale per la Sicurezza Sociale*) - The model insures most Italian private sector employees and a large part of the self-employed workers. Its forecasting model (see National Social Security Institute, 1989 and 1993) developed in the late eighties, aims at producing 20 to 25 years projections of the pensions paid by the four main pension schemes managed by the Institute (those of private sector employees, farmers, craftsmen and other self-employed businessmen). The model provides estimates of expenditure trends under existing rules, of the effects of pension reforms and of different employment and earnings scenarios.

The model is based on a sample of workers and pensioners and tries to simulate the changes that will occur to each individual included in the sample in each year of the forecasting period. The sample includes about 2 per cent of the workers currently paying contributions to the schemes (or who have paid contributions but are not yet receiving a pension) and about 1.5 per cent of the schemes' pensions (574,000 contributory files and 222,000 pension files are considered).

Each worker's situation is projected into the future by considering, each year, his or her probability to retire, to die, to leave employment, to move to another economic sector, to move to another earnings level. For each pensioner his or her probability of death is considered. In case of death, the probability of leaving survivors and the features of survivors as to sex and age is considered. New pensions are paid taking the contributory record of each worker into

account. New workers are not introduced in the sample; this means that the model cannot produce projections over very long periods.

The macroeconomic scenario is exogenous. The main assumptions concern inflation, real income and employment changes in each of the four sectors insured by the schemes.

Projections were published in 1989, 1991, 1993 and 1995 (see Senate of Italy, 1995). Estimates concerning the ECR have undergone substantial changes. While in National Social Security Institute (1989) the ECR of the Private Sector Employees' Pension Scheme was expected to remain rather stable (rising from 37.7 per cent in 1988 to 39.1 per cent by the year 2010), in the 1991 projections it was expected to increase from 42.8 in 1990 to 48.5 per cent in 2010. In the 1993 projections it was expected to rise even more steeply, from 42.5 per cent in 1992 to 53.7 per cent in 2010. The 1992 reform substantially reduced the projected ECR. The 1993 projections also included an estimate of the new situation: the ECR was expected to decline from 43 per cent in 1995 to 40 per cent in 2010. These data were substantially revised in 1995. The ECR was revised upward and expected to remain nearly stable: 49.4 per cent in 1995, 47.8 in 2010, 48.8 in 2030 (see Table II.9a).

The Dutch NEDYMAS model (Tilburg University) - The NEDYMAS model was built in the late eighties in the University of Tilburg (see Nelissen 1994 and 1995 and Dekkers *et al.* 1994) with the purpose of evaluating the distributional effects of the Dutch social security system and simulating different possible policy measures. The model considers both the basic public pension scheme and the supplementary pension schemes. It was initially created as a microsimulation model and then extended by a macro shell. Decisions at household level are dealt with by the microsimulation model, whereas spill-overs to and from other markets are handled by the macro shell.

The microsimulation model is dynamic, meaning that it takes changes in the composition of the population structure over time into account, and cross-sectional, meaning that in each period it checks which individual characteristics change and to what extent they do so.

The initial population of the model has been formed on the basis of data from the 1947 Census (the 1930 cohort is the first which can be followed over time). It is then followed period by period by looking at the characteristics of individuals (and therefore of households) and by verifying which ones changed in those periods. This results in the creation of a fictitious panel in which individual life histories can be simulated. The sample population increases as a consequence of births and immigration and decreases because of deaths and emigration. In order to simulate life histories, 320 personal characteristics are considered. In each period the sample is subjected to the different modules of the NEDYMAS model in the following order:

- a) The demographic main module containing the following sub-modules: immigration, emigration, mortality, marriage, cohabitation, divorce, flows into and out of institutional households, leaving the parental home and fertility;
- b) The labour market, consumption and wage income main module (part 1) containing the following sub-modules: education, labour income, transitions between the several possible economic activities (employed, unemployed, disabled, househusband/housewife, conscript, retired); these sub-modules provide estimates of labour supply and labour income;
- c) The social security main module containing sub-modules about contributions and benefits of all different social security benefits existing in the Netherlands;
- d) The labour market, consumption and wage income main module (part 2) which determines medical consumption and tax payments.

The NEDYMAS model now covers 79 per cent of total benefits paid by Dutch social security schemes in 1950, 91 per cent of those paid in 1960 and over 95 per cent of those paid from 1970 onwards.

In Dekkers *et al.* (1994) the model is used to provide projections concerning the basic and supplementary pension schemes: the contribution rates required to finance the schemes is projected up to the year 2060 under the assumption of unchanged legislation. The effects of several policy measures are also considered. In Nelissen (1994), the model is used to evaluate the costs and the redistributive impacts of current pension arrangements and of three alternative pension systems (Tables II.11a - II.11b).

I.4 THE PROSPECTS FOR PENSION EXPENDITURE IN EUROPE

This Section outlines the **most recent long-term national projections** produced in each country by a public institution. The projections included in the charts are listed in Table 2. The projections per country are presented in Part II.

Before examining the data, it is necessary to point out that:

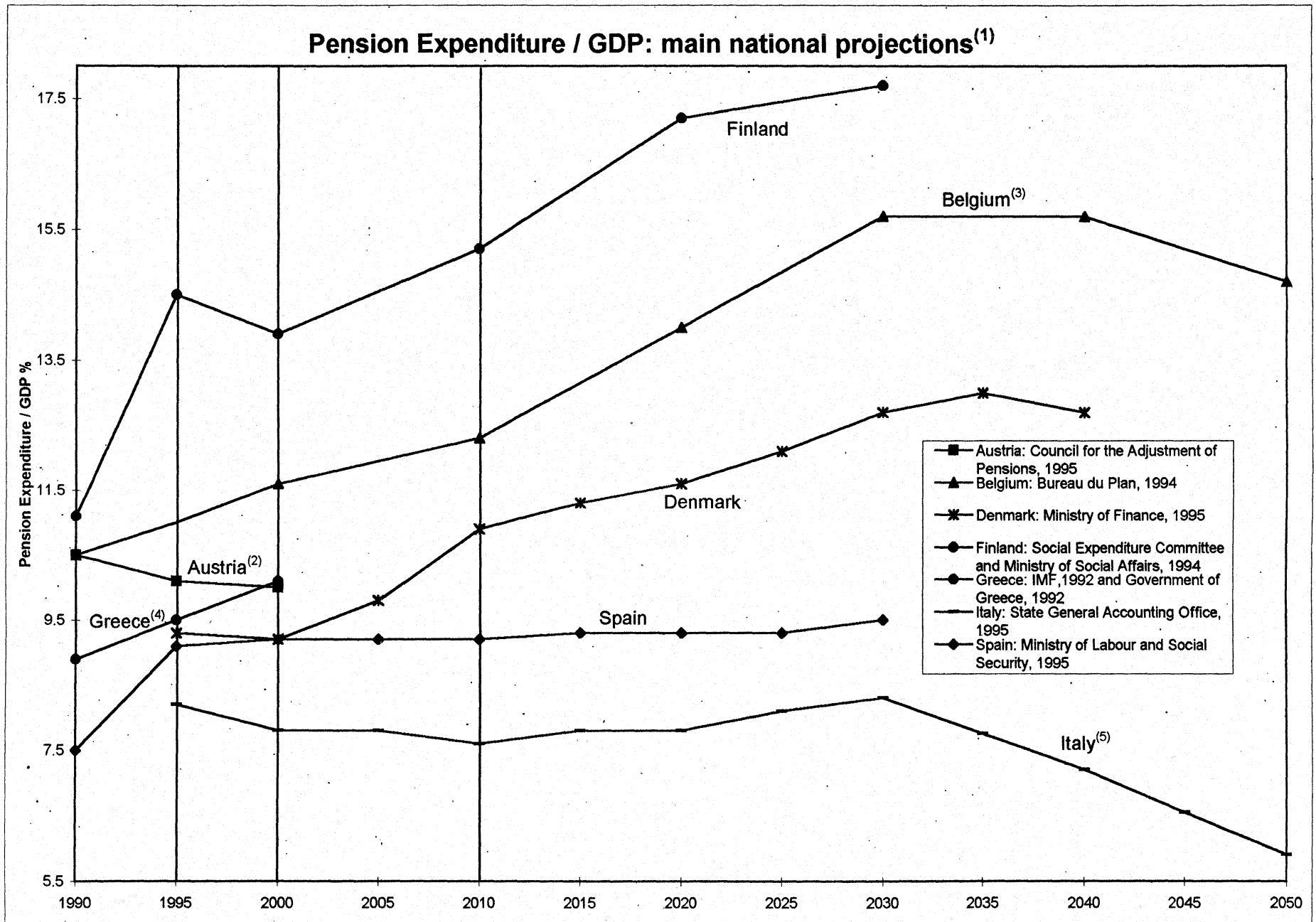
- a) As already mentioned, in the case of Portugal private institutions' projections are used. In the case of Austria and Greece, only medium term projections are presented, since long-term ones were not updated after recent major reforms.
- b) The data plotted for each country are not homogeneous in term of coverage of total pension expenditure. Any comparison concerning the level of the expenditure to GDP ratio should be very cautious. The charts mostly aim at allowing a comparison of the evolution of the expenditure ratio and of the ECR. The matter will be addressed in Section I.5 where the trends concerning these ratios will be applied to an estimate of present total public pension expenditure.
- c) Although all the projections reported in the Charts were produced in the period 1992-1995,³¹ the present position of some pension systems, in terms of ECR or expenditure to GDP ratio, may not coincide with that estimated for 1995 in the projections.³²
- d) The projections taken into consideration are based on the assumption of **unchanged policies** (some policy changes are however assumed in the projections concerning the Netherlands that refer to complex economic and social scenarios). As already mentioned, this approach may lead to some unrealistic outcomes, since policies will obviously adapt over time to new demographic and economic circumstances, but is surely helpful in identifying the dimension of required policy adjustment.

Charts 1 and 2 report **the most favourable scenarios** that can be envisaged for pension expenditure on the basis of the national projections surveyed in this Section. The first chart concerns the ratio of pension expenditure to GDP, the second the ECR.

More specifically, wherever more economic scenarios were taken into consideration, the most favourable have been considered in Charts 1 and 2. The effects of the least favourable scenarios are considered in Charts 3 and 4.

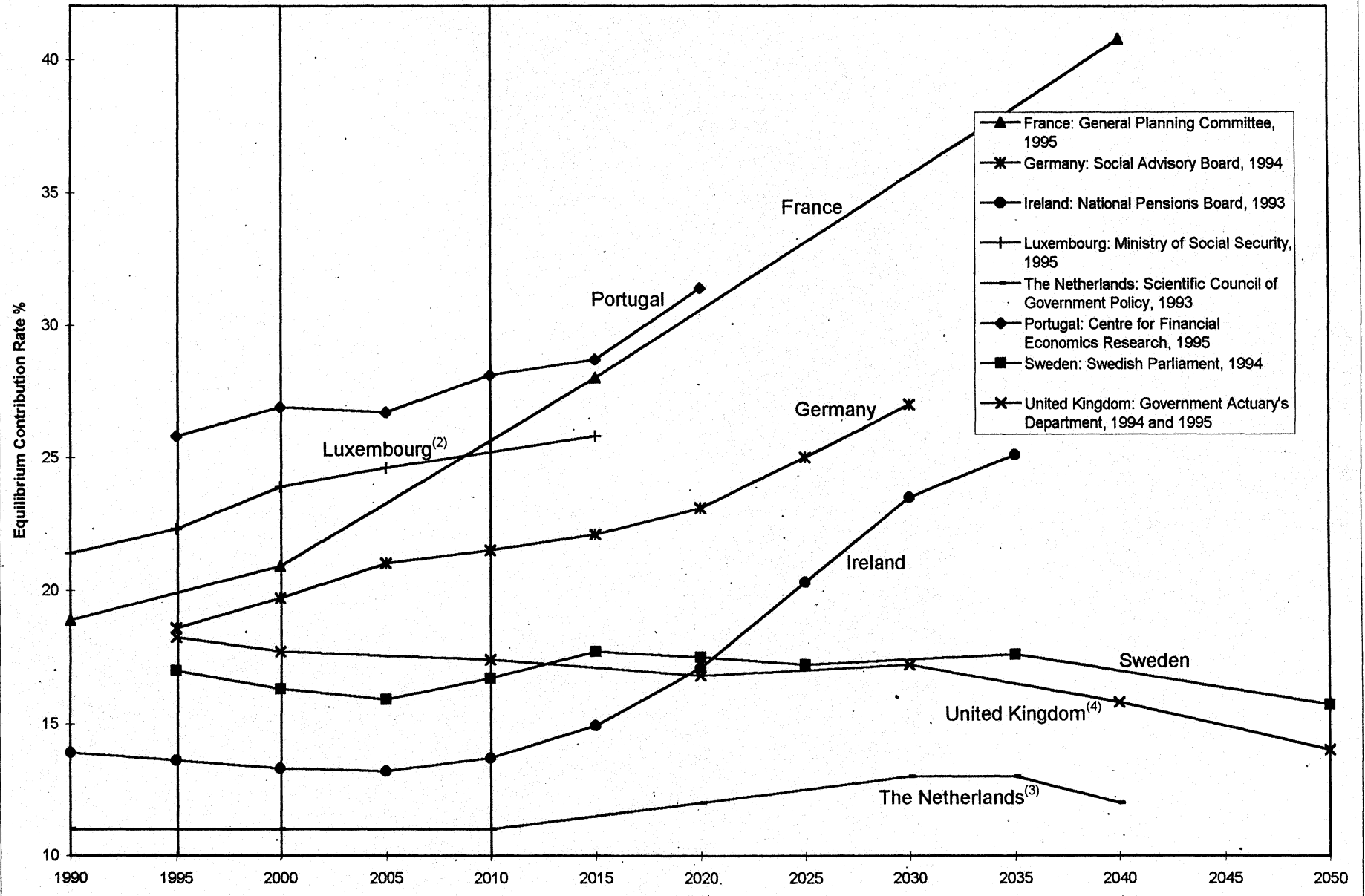
³¹ Estimates were published in 1992 for Greece, in 1993 for Ireland and the Netherlands, in 1994 for Belgium, Finland, Germany and Sweden, in 1995 for Austria, Denmark, France, Italy, Luxembourg, Portugal, Spain and UK.

³² The most extreme case is that of Finland. In 1991 the ratio of Finnish pension expenditure to GDP was projected to grow from 10.1 per cent in 1990 to 11.1 per cent in 2000 and to 13.3 in 2010. The recession of the early nineties affected the ratio in an unforeseen way: in 1994 the future evolution of expenditure was projected from a starting point close to 15 per cent of GDP. The actual expenditure was later estimated as 14 per cent of GDP.



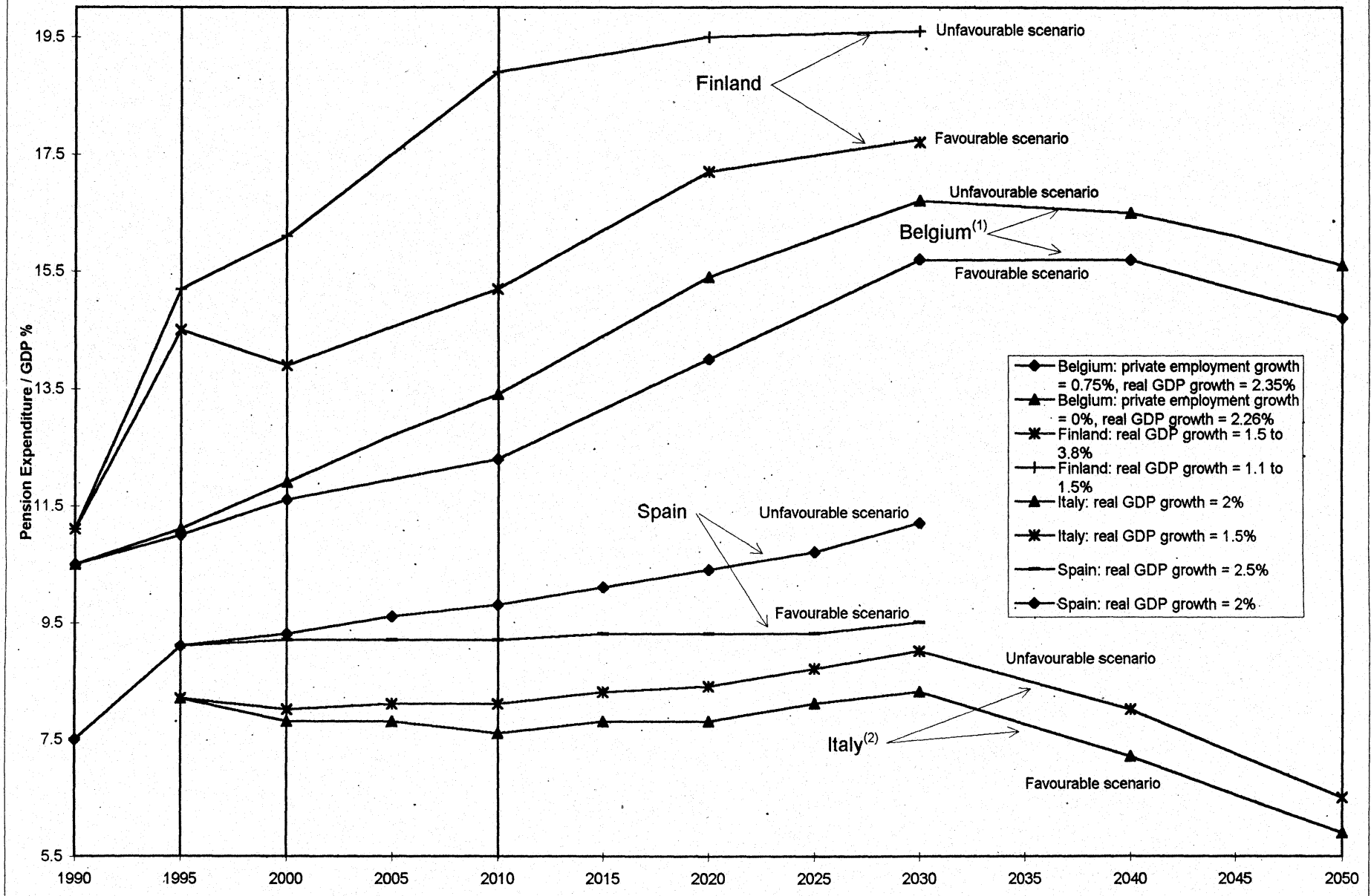
1) Wherever the projections consider more than one economic or demographic scenario, the most favourable one is considered. Wherever pensions are indexed both to price and wages dynamics, the former case is considered.
 2) The data attributed to the year 2000 actually refers to the year 1999.
 3) The data attributed to the year 1990 actually refers to the year 1991.
 4) Data attributed to the years 1990 and 2000 actually refer to the years 1993 and 1999.
 5) Data refer to the pension schemes for private sector employees, self-employed artisans and self-employed businessmen.

Equilibrium Contribution Rate: main national projections⁽¹⁾



1) Wherever the projections consider more than one economic or demographic scenario, the most favourable one is considered. Wherever pensions are indexed both to price and wages dynamics, the former case is considered.
 2) Data attributed to the years 1990, 1995, 2000, 2005 and 2015 actually refer to the years 1992, 1994, 1999, 2006 and 2013.
 3) The data attributed to the year 1990 actually refers to the year 1991.
 4) Data refer to budgeting years. The year considered in the axis is the first of the two calendar years jointly covered by each budgetary year.

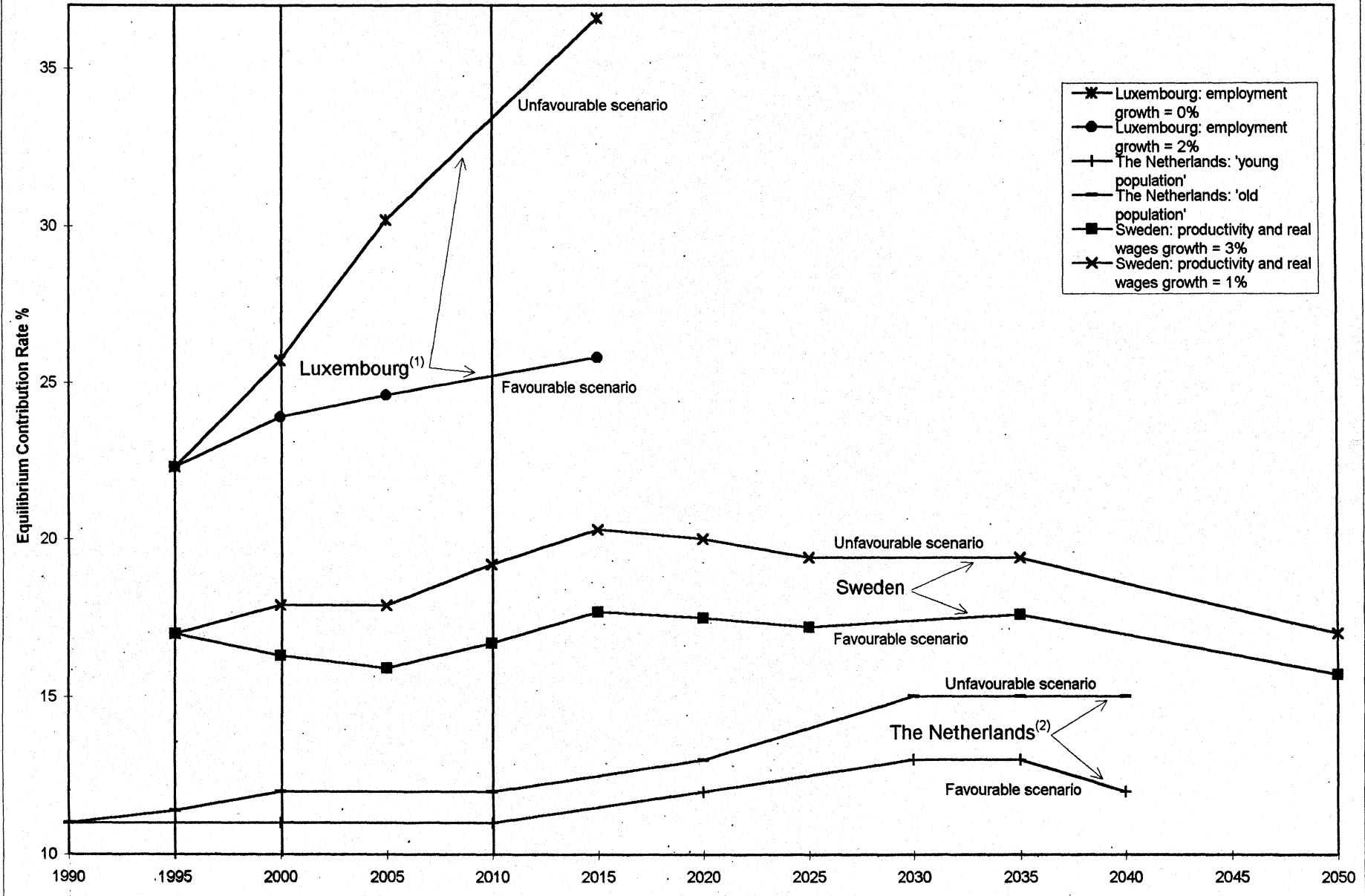
The effects of favourable and unfavourable economic scenarios on Pension Expenditure / GDP



1) The data attributed to the year 1990 actually refers to the year 1991.

2) Data refer to the pension schemes for private sector employees, self-employed artisans and self-employed businessmen.

The effects of favourable and unfavourable economic scenarios on Equilibrium Contribution Rate



1) Data attributed to the years 1990, 1995, 2000, 2005 and 2015 actually refer to the years 1992, 1994, 1999, 2006 and 2013.

2) In the case of The Netherlands, the favourable and unfavourable scenarios are based on different demographic assumptions. The data attributed to the year 1990 actually refers to the year 1991.

Wherever both price and wage indexation of benefits were taken into consideration, the former has been considered in Charts 1 and 2. The effects of wage indexation of benefits are examined in Chart 5.

All projections reported in Charts 1 and 2 include the effects of major recent pension reforms. The effects of some recent reforms on the ECR or the expenditure to GDP ratio are considered in Section I.4.4 and Charts 6 and 7a-7b.

I.4.1 The short-term: 1995-2000 - The prospects for European pension schemes in the next five years are rather mixed. In the favourable scenarios considered in Charts 1 and 2, the ratio of pension expenditure to GDP or to labour income is expected to decline in 4 countries: Finland, Italy, Sweden and the United Kingdom. Stability is projected for Austria, Denmark, Ireland, the Netherlands and Spain. An increase is expected in Belgium, France, Germany, Greece, Luxembourg and Portugal.

In several countries the dynamics of pension expenditure growth will be substantially influenced by the reforms implemented in the late eighties and early nineties (see Section I.4.4 and Charts 6 and 7a-7b). The decline in the ratio of pension expenditure to GDP or to labour income expected in Italy and Sweden can be ascribed to the reforms. In France, Germany and Greece the reforms will substantially reduce the increase in the ratios that would have otherwise occurred.

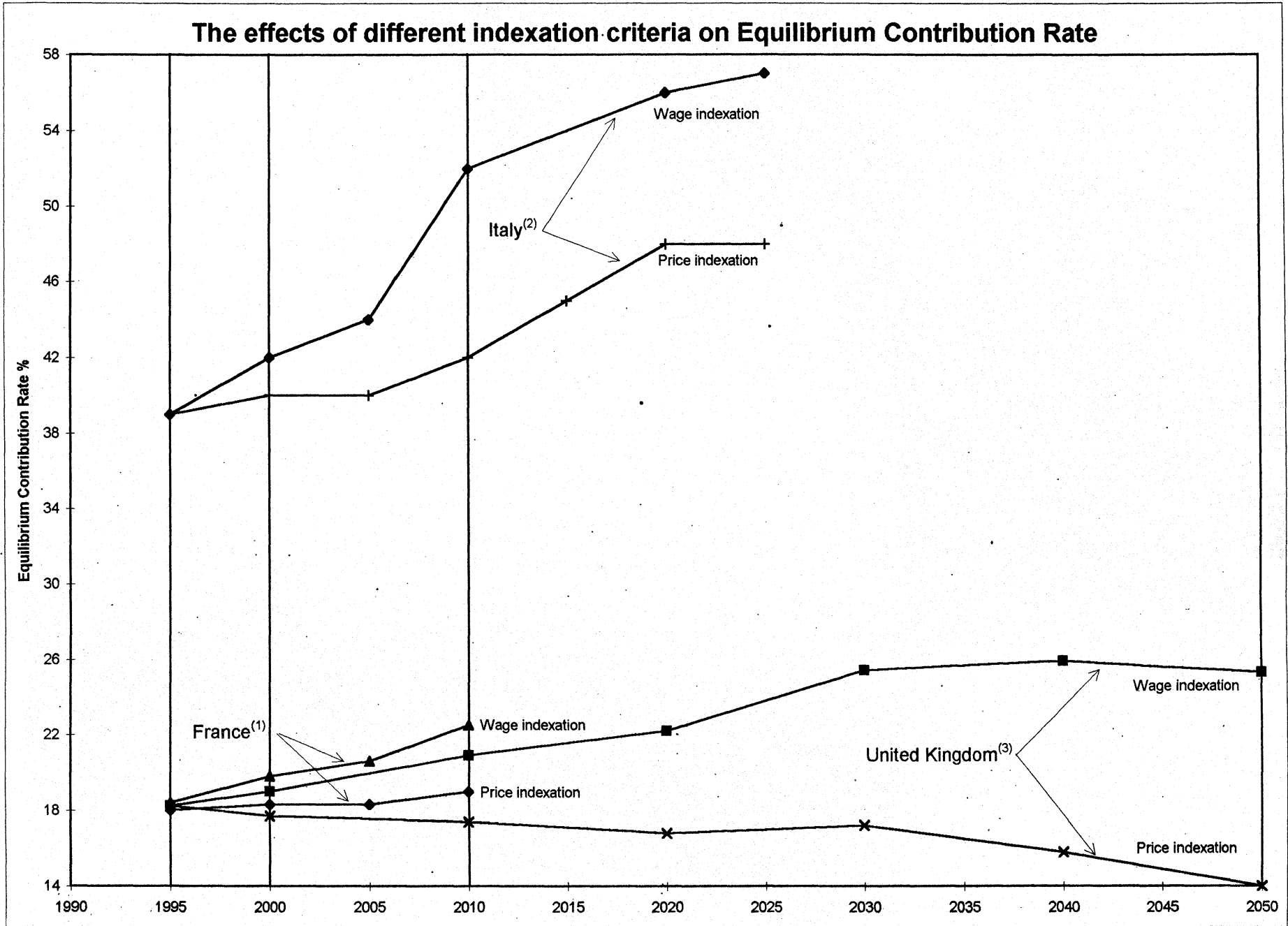
The outlook appears rather worse when the less favourable economic scenarios considered in some of the projections are taken into account (Charts 3 and 4). The ratio of pension expenditure to GDP or to labour income would increase also in Finland, the Netherlands and Sweden. There is also a sizeable worsening of the situation of Luxembourg.

The adjustment of benefits to wage rather than price dynamics would also contribute to the increase in the pension burden (Chart 5). Between 1995 and the year 2000 it would increase the ECR by about 2 percentage points in Italy³³ and by about 1.5 points in France³⁴ and the United Kingdom.

Considering that the pressures for budget consolidation are likely to prevent governments from offering discretionary increases to pensioners, in many countries the next five years are likely to represent a sort of '**breathing space**' in which the pension systems will not exert large pressures on public budgets. However considerable increases in the pension burden, measured either as ECR or as the ratio of expenditure to GDP, are likely to occur in six countries, in spite of the fact that three of them have already substantially reformed their pension schemes.

³³ This estimate refers to projections carried out by CER (1995) before the 1995 Reform. However, in the period 1995-2000 the effects on the ECR of different indexation criteria should not be substantially affected by the 1995 Reform.

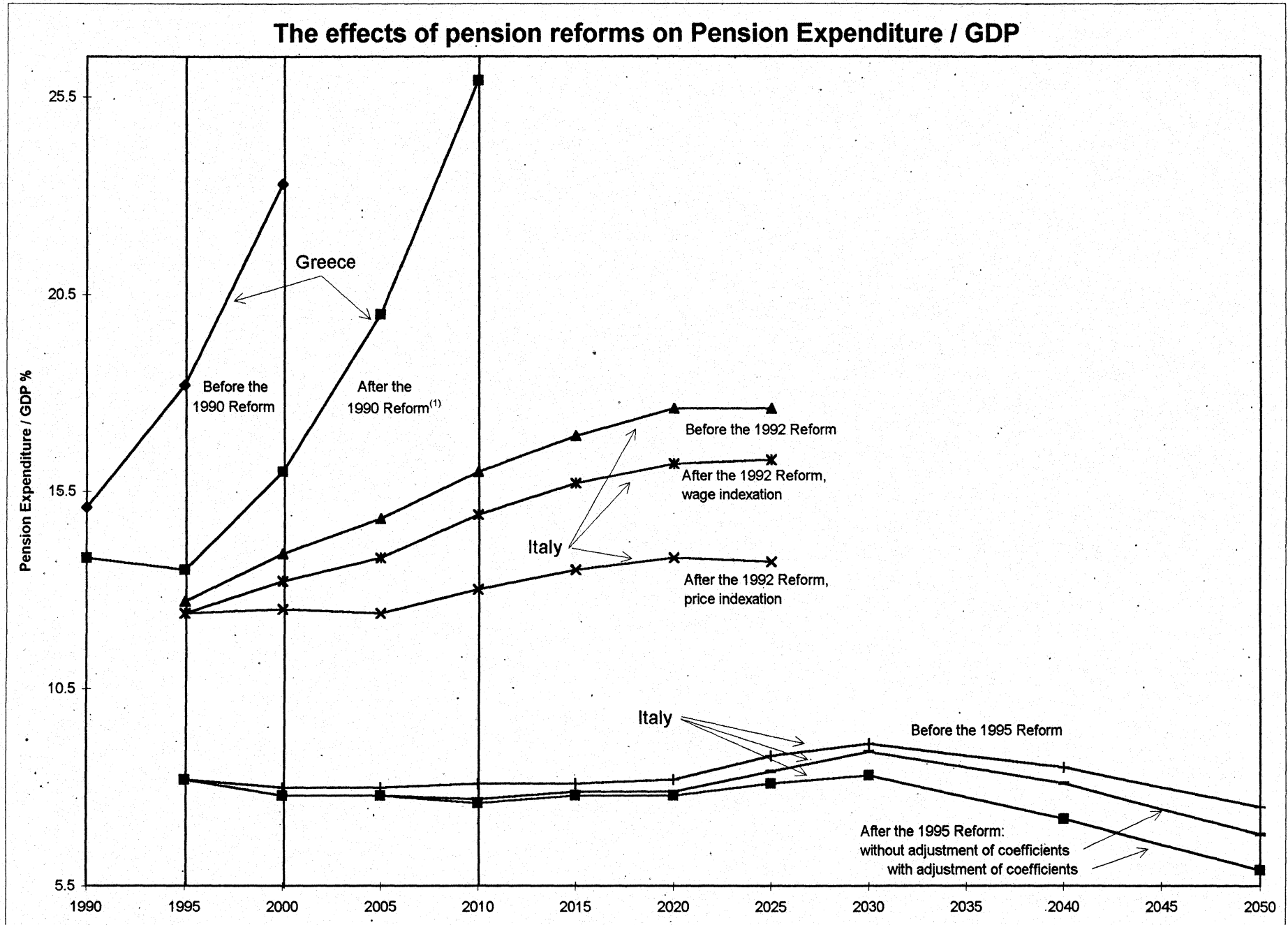
³⁴ This estimate is reported in Ruellan (1993).



1) As reported in Ruellan (1993).

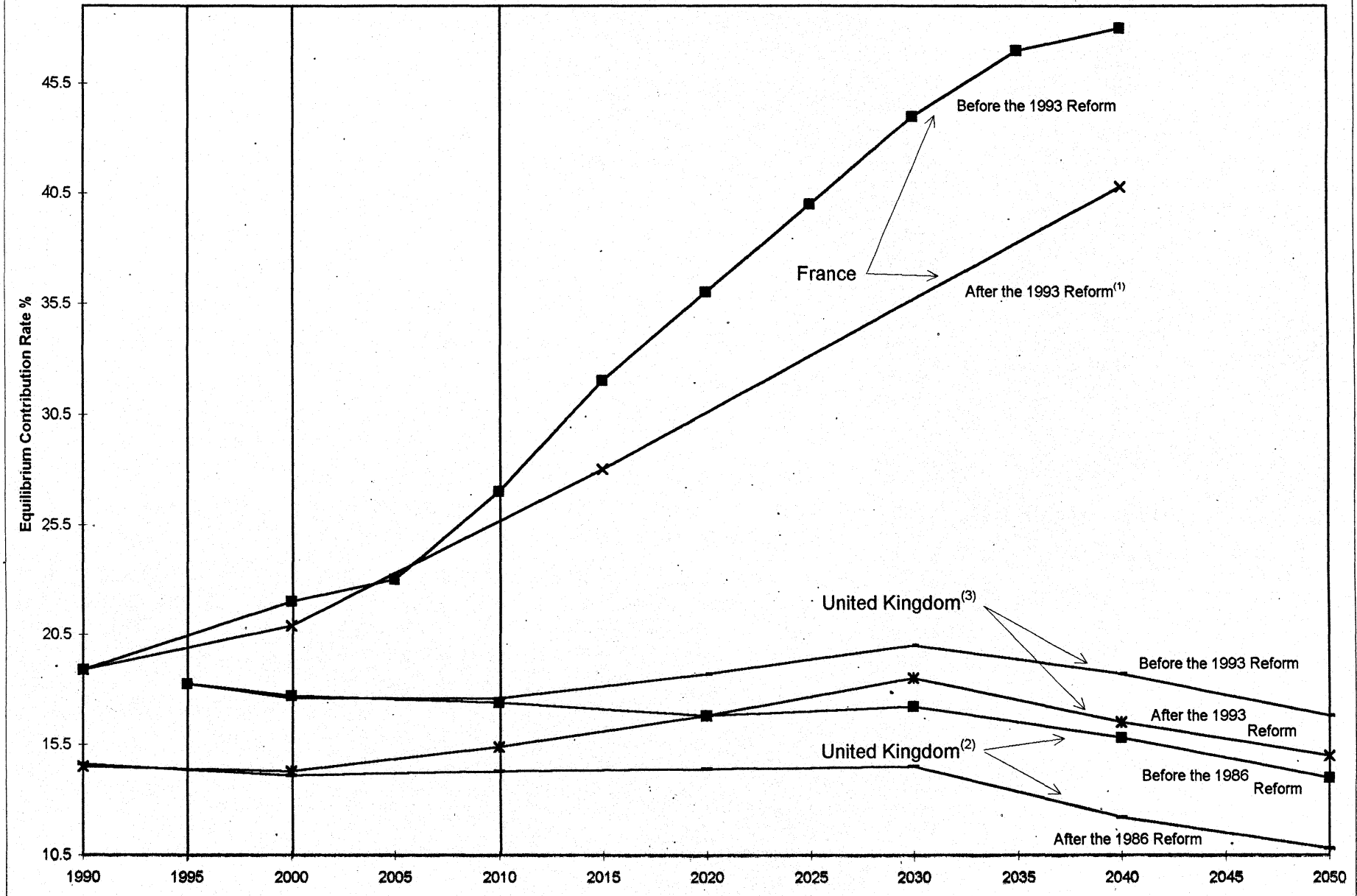
2) Data refer to projections carried out before the 1995 Reform (see Table II.9c, point 14).

3) Data refer to budgeting years. The year considered in the axis is the first of the two calendar years jointly covered by each budgetary year.



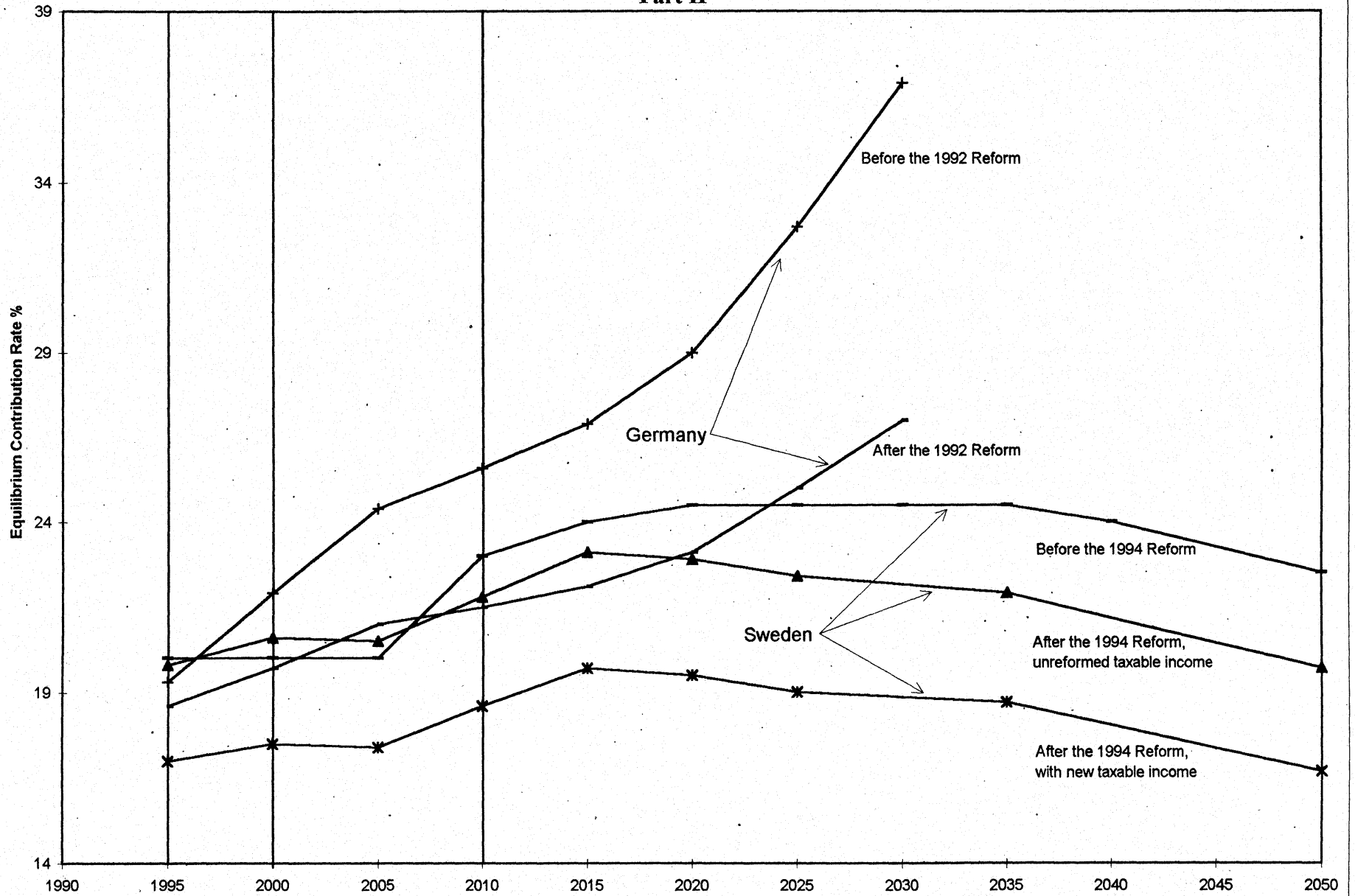
1) The data attributed to the year-1990 actually refers to the year 1992.

The effects of pension reforms on Equilibrium Contribution Rate Part I



1) In General Planning Committee (1995), data for the "After the 1993 Reform" scenario are reported only for the years 1990, 2000, 2015 and 2040. The "After the 1993 Reform" line is above the "Before the 1993 Reform" line because of the interpolation of the remaining data.
 2) Data attributed in this table to years 1990, 2000, 2010, 2020, 2030, 2040 and 2050 actually refer to years 1993-94, 2003-04, 2013-14, 2023-24, 2033-34, 2043-44 and 2053-54.
 3) Data refer to budgeting years. The year considered in the axis is the first of the two calendar years jointly covered by each budgetary year.

The effects of pension reforms on Equilibrium Contribution Rate Part II



I.4.2 The medium-term: 2000-2010 - The outlook for the pension systems gets worse in the next decade. Even under favourable economic assumptions and even assuming no discretionary adjustment of pensions to wage dynamics, the expenditure ratio and the ECR are expected to increase in most countries. Large increases in the ECR are expected in France (more than 3 points³⁵), Germany (about 2 percentage points), Luxembourg and Portugal (more than 1 point). Large increases in the expenditure ratio are projected for Belgium, Denmark and Finland. Austria is also likely to record a significant worsening of its situation.³⁶ The ECR is expected to record moderate increases in Ireland.

The burden represented by pension expenditure is expected to remain stable in the Netherlands, Spain and Sweden and to decline only in Italy and the United Kingdom.

Assuming less favourable economic assumptions, the growth of the ratio of pension expenditure to GDP or to labour income is substantially greater. The worsening of expenditure trends would be particularly relevant for Belgium, Finland and Luxembourg (Charts 3 and 4). Both Italy and Spain would record an increase in the expenditure to GDP ratio.

In a medium-term perspective, the link of benefits to price rather than wage dynamics might be questioned. Governments might increase pension levels in order to limit the decline in the ratio of pensioners' purchasing power to that of workers. The adjustment of pensions to wage dynamics, rather than price dynamics, in the course of the decade would add 2 points to British ECR and 1 point to French ECR (Chart 5).³⁷

I.4.3 The long-term: after 2010 - The situation of several European pension systems deteriorates sharply after 2010 when the "baby-boom" generation retires (Charts 1 and 2). Between 2010 and 2020 the ECR increases by about 5 points in France, 3 points in Ireland and Portugal, by 1 to 1.5 points in Germany and the Netherlands, by nearly 1 point in Sweden. In Luxembourg the ECR increases by about 0.5 points in the period 2010-2015. The ratio of pension expenditure to GDP is projected to rise by 2 percentage points in Finland, by about 1.5 in Belgium and by more than 0.5 point in Denmark. A limited increase is also expected in Italy and Spain.

³⁵ This estimate is based on the increase reported in General Planning Committee (1995) for the period 2000-2015 (7 points) in the "after the reform scenario" and the increases reported in the same document for the periods 2000-2010 (5 points) and 2010-2015 (5 points) in the "before the reform" scenario.

³⁶ In the case of Austria, where projections incorporating the 1993 reform are available only up to the year 1999, one can refer to the estimates carried out in Council of Economic and Social Affairs (1991) concerning the effects of some possible reform measures. The reforms actually introduced in 1993 were similar to those examined in the report.

³⁷ A substantial increase would occur also for the ECR of the Italian pension scheme for private sector employees. In order to provide an indication of the effects of wage indexation, Chart 5 reports some estimates produced before the 1995 reform.

The change in the pension expenditure trend is quite radical in Ireland, where the ageing process is relatively late. The ratio of pensioners to workers paying contributions, expected to remain stable up to 2010, increases sharply in the following decades. By the year 2035 its level nearly doubles.

A reduction in the ECR is expected only in the United Kingdom.

In the third decade of the next century the situation keeps deteriorating in most countries. The ECR rises by 6 points in Ireland, 4 points in Germany and 1 point in the Netherlands. The ratio of pension expenditure to GDP rises by about 1.5 points in Belgium, 1 point in Denmark and 0.5 points in Finland.

After the year 2030 the national trends are expected to diverge: in Belgium, Denmark, Italy, the Netherlands and the UK the incidence of pension expenditure is stable or declining; in France it keeps increasing. Over the period 2020-2040 the French ECR is expected to increase by 10 points.

In the period after the year 2010, the difference in the expenditure ratio and in the ECR between the favourable and unfavourable economic scenarios is projected to remain constant in Belgium, Italy, the Netherlands and Sweden. It is projected to decline in Finland. It ought to be considered that wherever pension entitlements and pension amounts are related to employment and contributory records, the benefits of a better economic performance in terms of expenditure to GDP ratio and of ECR are likely to be temporary. Higher employment and higher wage growth would eventually work through the system and determine more and higher pensions.³⁸

The wedge between price indexation and wage indexation scenarios is nearly stable in the projections for Italy, while it keeps increasing in those for the United Kingdom. This is due to the different rules applying to the two countries. In Italy most pensions are related to the earning career of workers, which means that a change from wage to price indexation of pensions (as that implemented in 1992) reduces the rate of growth of pension expenditure temporarily (until all living pensioners have retired after the change). Afterwards, expenditure growth resumes the pattern it would have had without the change. In the United Kingdom, basic pensions are unrelated to the wage level of workers. If they are adjusted only to price dynamics, their relative value declines asymptotically.

Box No. 5

THE ROLE OF PENSION INDEXATION.

As a rule, pensions are long-term benefits. Therefore, unless they are adjusted through time, even modest price and wage rises can substantially reduce their purchasing power, both in absolute terms and relative to that of active workers. Hence the need for regular adjustment,

³⁸ This point is stressed for U.S. Social Security by Steuerle and Bakija (1994). See also Delville *et al.* (1995), who present some simulations of changes in the rates of growth of employment and real wages. This topic is examined in Box 7.

either discretionary or automatic. The assumptions concerning pension adjustment are obviously very important in long-term projections: over many years even minor changes in adjustment rules produce large effects on the transfer ratio (see ILO, 1977).

Most PAYG schemes use one or more of the following three solutions:

- a) Evaluation by discretionary measures on the part of the authorities.
- b) Automatic revaluation to maintain the purchasing power of pensions by indexing them to prices.
- c) Automatic revaluation to maintain the ratio of pensions to wages by indexing the former to the latter.

Discretionary revaluation has the drawback of uncertainty. Neither pensioners nor workers can be sure of their future purchasing power. Thus this solution, generally used in the start-up stage of retirement systems, has been abandoned in most countries in favour of price and wage indexation (Ireland and Portugal are the only EU countries that have not introduced automatic indexation of public pensions). In PAYG systems the indexation mechanism is an essential part of the implicit social contract between the generation of active workers and that of pensioners (see Musgrave, 1981). It provides individuals with an insurance against future unexpected changes in inflation or income levels.

Wage and price dynamics represent, respectively, the higher and the lower term of reference for automatic adjustment mechanism. In principle, wage and price indexation just represent different ways of distributing pension expenditure through pensioners' lifetime: the same amount of total expenditure can be distributed either by paying to new retirees lower wage-adjusted pensions or by higher price-adjusted pensions. In a situation in which the rates of growth of real wages, employment and the number of pensioners change considerably over time, the shift from one to the other index may represent a way to adjust pension expenditure (and the implicit intergenerational contract) to the new economic and demographic circumstances.

In recent years in many countries the indexation mechanisms have been frequently adjusted to slowdowns in employment growth, population ageing and budgetary constraints (see Vording and Goudswaard, 1995). Some countries moved from wage to price indexation (France, Italy, United Kingdom). Several of those still retaining wage indexation moved from gross wage indexation to net wage indexation, in order to get the pensioners to share the burden of increases in contribution rates (Austria, Finland, Germany, the Netherlands). In Finland, where employment pensions are adjusted to an average of the price and the wage index, the weight of the former was increased from 50 to 80 per cent; the weight of the latter was reduced from 50 to 20 per cent. On several occasions the mechanisms were temporarily suspended or modified.

The Table below reports the indexation mechanisms existing in the EU Member States and the indexation assumptions underlying the projections considered in this Section.

Most projections are rather prudential. Wage indexation is assumed in the projections concerning the countries where it represents the legal arrangement, but also some countries where price indexation is the legal arrangement (Finland after the year 2000) or the normal arrangement (Ireland). Some projections concerning countries which have recently moved from wage to price indexation, project expenditure on the basis of both indexes (France, Italy, United Kingdom). It is considered that governments can provide additional adjustments in order to limit the reduction in the value of pensions in terms of workers' purchasing power.

In the countries in which pensions are related to the earning career of workers, a change from wage to price indexation of pensions reduces the rate of growth of pension expenditure temporarily (until all living pensioners have retired after the change). Afterwards, expenditure growth resumes the pattern it would have had without the change. In countries providing basic

pensions unrelated to the wage level of workers (Ireland, United Kingdom), the lack of wage adjustment determines a continuous decline in their relative value. This makes the assumption of price indexation of benefits rather less sustainable than in countries linking pensions to earning careers.

Country	Formal indexation	Assumption in projections considered in present Section
Austria	Net wages	Net wages
Belgium	Prices (minimum increase 2% per year)	Wages - 1.25%
Denmark	Wages	Wages
France	Prices	Prices and wages
Finland	Prices/Net Wages ⁽¹⁾	Prices/Net Wages ⁽²⁾
Germany	Net wages	Net wages
Greece	Wages (basic salaries of civil servants)	Wages
Ireland	...	Wages
Italy	Prices	Prices and wages
the Netherlands	Net Wages	Wages - 0.5%
Portugal	...	Prices
Spain	Prices
Sweden	Prices	Prices and wages
United Kingdom	Prices	Prices and wages

1) Basic pensions are adjusted to price dynamics. Occupational pensions are adjusted to the average of price and wage dynamics (from 1993 the wage index is computed net of employees' contributions to pension schemes).

2) Basic pensions are assumed to follow the wage-price index after the year 2000.

1.4.4 The effects of past reforms - Since the mid-eighties several pension schemes have been reformed in order to reduce pension expenditure growth.³⁹ Major reforms were introduced in Austria (1985, 1988, 1993), Germany (1989), Italy (1992 and 1995)⁴⁰, France (1993), Greece (1990 and 1992), Portugal (1993), Sweden (1994), the United Kingdom (1986, 1994).

- a) Benefit indexation rules were modified in Austria, Finland, France, Germany, Greece, Italy and the Netherlands. Austria and Germany shifted from gross wage dynamics to the dynamics of wages net of contributions as reference for the annual adjustment of pensions. In Austria pension indexation was also inversely related to unemployment levels. France and Italy turned from wage dynamics to price dynamics. Finland increased the weight attributed to price dynamics.
- b) Standard retirement age was raised in Germany, Greece, Italy (1992),⁴¹ Portugal and the United Kingdom.
- c) Replacement rates were reduced in Austria, Finland, France, Greece, Italy, Portugal and the United Kingdom. This outcome was achieved in several ways. In some countries (Austria, Finland, France, Italy, Portugal, United Kingdom) the

³⁹ For a description of recent reforms see European Commission (1993a, 1995a).

⁴⁰ A second major reform was decided by the Italian government in 1995. The draft bill was brought to Parliament in June 1995. See Bank of Italy (1995) and Peracchi and Rossi (1995).

⁴¹ The 1995 reform abolished standard retirement age and introduced an 8 year age bracket over which individuals decide when to retire and receive a pension actuarially related to life expectancy after retirement.

number of years considered in the assessment of the amount of earnings used in the computation of new pensions was increased; this reduced assessed earnings. In Austria, France, Portugal and the United Kingdom the percentage of assessed earnings paid for each contribution year was reduced. Measures reducing replacement rates were also taken in Denmark and the Netherlands.⁴²

- d) The contribution periods required for pension eligibility were increased in Greece.⁴³
- e) In Germany, Greece and Italy the functional relationship of pension to years of service was modified in order to provide an incentive to retire later.
- f) New rules concerning pension credits for years with limited or null contributions were introduced in Austria and Germany. In particular, pension credits for years spent in higher education were reduced.
- g) Public sector employees' special pension benefits were curtailed or abolished in Finland, Greece, Portugal and Italy.
- h) Eligibility criteria for disability benefits were tightened in Finland, Greece and the Netherlands.

The structure of the pension system was largely reformed in Italy (1995) and Sweden. In both countries the wage-related system of pension determination was replaced by a contributory system. Cost containment was just one of the objectives of the reforms, which also aimed at making the system more able to tolerate demographic change, more transparent in its distributive effects, less distortive in its effects on individuals' choices.

As shown in Charts 6 and 7a-7b, some pension systems have already adjusted to a considerable extent to the new demographic situation. In the UK, the 1986 reform was expected to reduce the ECR by about 1 point in 2010 and 4 points in 2030 and 2050; the 1994 reform will reduce it further by 0.2 points in 2010 and by nearly 3 points in 2030 and 2050. Under the assumption of price indexation of pensions, the two reforms are expected to keep the ECR firmly below its 1995 level.

The 1993 French reform is expected to reduce the ECR by 4 percentage points in the year 2015 and by 7 points in 2040. The 1989 German reform is projected to reduce the ECR by 4 points in 2010 and 10 in 2030. In both countries the reforms do not prevent substantial increases in the ECR.

⁴² In both countries the rules concerning additional income received by pensioners or their partners have been tightened. In Denmark pensions and minimum income guarantees have been made taxable. In the Netherlands entitlement to higher rate basic pensions has been restricted. See European Commission (1995a).

⁴³ The contribution period required for pension eligibility was increased also in Italy in 1992 (from 15 to 20 years). It was later reduced (to 5 years) by the 1995 Reform that abolished "minimum pensions" and related pensions to contributions paid over all working life. See Section II.9.

The recent Swedish reform is expected to reduce the ECR concerning old-age benefits by 3.0 percentage points in 1995, 4 in 2015, 5.5 in 2025 and 6 in 2050. The reduction is largely due to a change in the definition of taxable income. Under the old definition of taxable income, the effects of the reform on the benefit side will reduce the ECR by 1 percentage points in 2015, 2.5 in 2025 and 3 in 2050.

The 1992 Italian pension reform is expected to reduce pension expenditure by 3 per cent of GDP in the year 2010 and by 4 per cent in the year 2025. The 1995 reform is expected to reduce the expenditure of the schemes for private sector employees and self-employed artisans and businessmen by 0.5 points of GDP in 2010, 1 in 2030 and 1.5 in 2050. Under the assumptions of price indexation of pensions and of adjustment of pension coefficients to life expectancy changes, the expenditure ratio of these schemes at its 2030 peak will not substantially exceed the 1995 level.

The 1990 Greek reform shifted the increase in the expenditure ratio otherwise expected for the nineties by about 10 years.⁴⁴

In both the French and the Italian case, expenditure cuts largely depend on the shift from wage to price indexation. About two thirds of the effects of the 1993 French reform and of the Italian 1992 reform are due to the change in indexation.⁴⁵

1.4.5 Demographic and non-demographic factors - As mentioned in Section I.1.1, between 1960 and 1985 a large part of the expansion in pension expenditure in most Western countries was caused by the increase in the eligibility and transfer ratios. By comparing the expected trend of the old-age dependency ratio with those of the expenditure ratio or of the ECR, it is possible to evaluate the expected future joint effects of the two ratios.

Charts B1-B15 in Annex B plot the expected trend of the old-age dependency ratio and that expected for pension expenditure (in terms of GDP ratio or of the ECR).⁴⁶ Broadly speaking, an old-age dependency ratio line over the expenditure line points to a reduction in the eligibility and transfer ratios. This implies that restrictive reforms, counterbalancing the ageing trend, have already been implemented in the pension system. An old-age dependency ratio line close to the expenditure line points to stable eligibility and transfer ratios, and therefore to a mature pension system in which expenditure growth depends mostly on demographic change. An old-age dependency ratio line under the expenditure line points to an increase in the eligibility and transfer ratios. This implies that the effects

⁴⁴ No long term projections of the effects of the 1992 reform are available.

⁴⁵ See respectively Ruellan (1993) and CER (1995).

⁴⁶ Expenditure lines refer to the national projections considered in Charts 1-7 (i.e., the latest official projections). Wherever major reforms have been implemented, the expenditure trend preceeding the reform has also been plotted (all the relative data are reported in the Tables of Annex B). Expenditure lines concerning Italy refer to CER (1994). Old-age dependency lines usually refer to the projections considered in Charts 1-4; wherever these projections do not provide data concerning the dependency ratio, the old-age dependency lines refer to the most recent population projections reported in the Tables of Annex B.

of demographic changes will be increased by the improvements introduced in pension rules in the past or by the gradual increase in workers' contributory records.

In most EU countries the old-age dependency line is expected to lie above the expenditure line, particularly in the long-term. In several countries this tendency is due to the reforms implemented in recent years.

In Germany the 1989 reform has shifted the expenditure line firmly below the dependency line (Chart B6). Before the reform, the former line was projected slightly above the latter. In Italy, the reforms introduced in 1992 and 1995 shifted the expenditure lines firmly below the dependency line (Chart B9); this situation represents a radical departure from the trend of the previous decades.

As to the United Kingdom, in the scenario in which basic pensions are adjusted to price dynamics, the expenditure line is far below the dependency ratio line (Chart B15). The gap between the two lines gets wider and wider. In the scenario assuming wage indexation of basic pensions, the expenditure line is above the dependency line over the next decades. This is due to the gradual implementation of the SERPS original rules. Later on, the effects of the 1986 and the 1994 reforms move also this expenditure line substantially below the dependency line. Before the 1986 reform, in the wage indexation scenario, the expenditure line was above the dependency line.

In the next five years, the dependency line is expected to lie above the expenditure line also in Austria and Greece (Charts B1 and B7). In both countries, as mentioned in Section I.4.4, significant reforms have been implemented in the early nineties, shifting the expenditure lines downwards. The change has been particularly radical for Greece, where the expenditure line was previously expected to lie much above the dependency line. As already mentioned, available projections do not allow an assessment of the situation of the two countries in the long-term.

In Finland and Sweden the trends are similar. In the former, the dependency line is very close to the expenditure line of the baseline scenario up to the year 2010 (Chart B4). Thereafter it moves substantially above the expenditure lines corresponding to all economic scenarios. In Sweden the dependency line lies between the expenditure lines corresponding to the two alternative economic scenarios up to the year 2015. Then it moves upwards, while the expenditure line turns downwards.

In spite of the recent reforms, the expenditure line is still expected to be above the dependency line in France. The 1993 reform has, however, considerably reduced the gap between the two lines. Before their introduction, the gap was expected to grow progressively (Chart B5).

On the whole, the countries which have not introduced extensive reforms of their pensions systems are not in a much worst situation. This is probably due to the fact that reforms have been introduced in the countries where expenditure prospects were more alarming.

In Belgium the dependency line is always above the most favourable expenditure line and is above the most unfavourable one from about 2015 (Chart B2). This tendency depends on the projected increase in the activity ratio, the decline in the unemployment ratio and the reduction of the gradual transfer ratio after the year 2020. In the Netherlands both the 'young population' and the 'old population' dependency rate are always above the respective expenditure lines; the gap between the lines widens gradually over time. This reflects also the gap (0.5 per cent per annum) between the rate of growth of basic pensions and that of average wage, which is assumed in the projections of the Dutch Scientific Council of Government Policy.⁴⁷

In Ireland the two lines have similar long-term trends, but the expenditure line lies below the dependency line in the first quarter of the next century (Chart B8), reflecting the effects of the projected decline of the inactive and eligibility ratios and the projected stability of the transfer ratio at the beginning of the next century.⁴⁸ The dependency and expenditure lines have similar trends in the Danish projection, which also assumes constant transfer and eligibility ratios (Chart B3).

In Spain the dependency line is expected to remain above the expenditure lines (Chart B13). Two factors contribute to this trend: the expected decline in the transfer ratio and the expected substantial increase in the number of workers paying contributions to the pension system.

Luxembourg is in a rather different situation. The dependency ratio is close to the expenditure ratio corresponding to the most favourable economic scenario. It is substantially below the lines corresponding to the other scenarios.

Charts B1-B15 show clearly that in most countries present pension policies are quite different from those implemented in the previous decades. The phase of extension of coverage and improvement of benefits is over, although in a few countries past extensions and improvements are still affecting expenditure growth. In most countries only demographic trends are presently exerting an upward pressure on the expenditure to GDP ratio or the ECR. In several countries the effects of demographic trends will be partly offset by reforms aimed at restraining expenditure growth.

In spite of this change in policy, in most countries pension expenditure ratios are still expected to move upwards. Section I.5 will try to assess their effects on public sector budgets.

⁴⁷ In the case of the Netherlands the gap between pension and wage dynamics has a formal ground in a new law that came into force in 1992. The law, while reaffirming 'the principles of indexation to gross wages and the net link between minimum wage and public pension', discarded automatic adjustment of pensions to wage dynamics. It established that '(full) indexation can be discarded when the ratio of the number of benefit recipients to the number of the working population exceeds a specified percentage (82.6 per cent)'. See Vording (1995).

⁴⁸ The eligibility rate is expected to decline in spite of the 1986 extension of pension insurance to the self-employed (who will become eligible for insurance benefits in 1998).

I.4.6 Revisions and sensitivity analysis - As already pointed out, no attempt has been made to evaluate the reliability of the projections presented in the preceding sections. It has been considered that only national institutions have the institutional and statistical knowledge required to forecast pension expenditure.

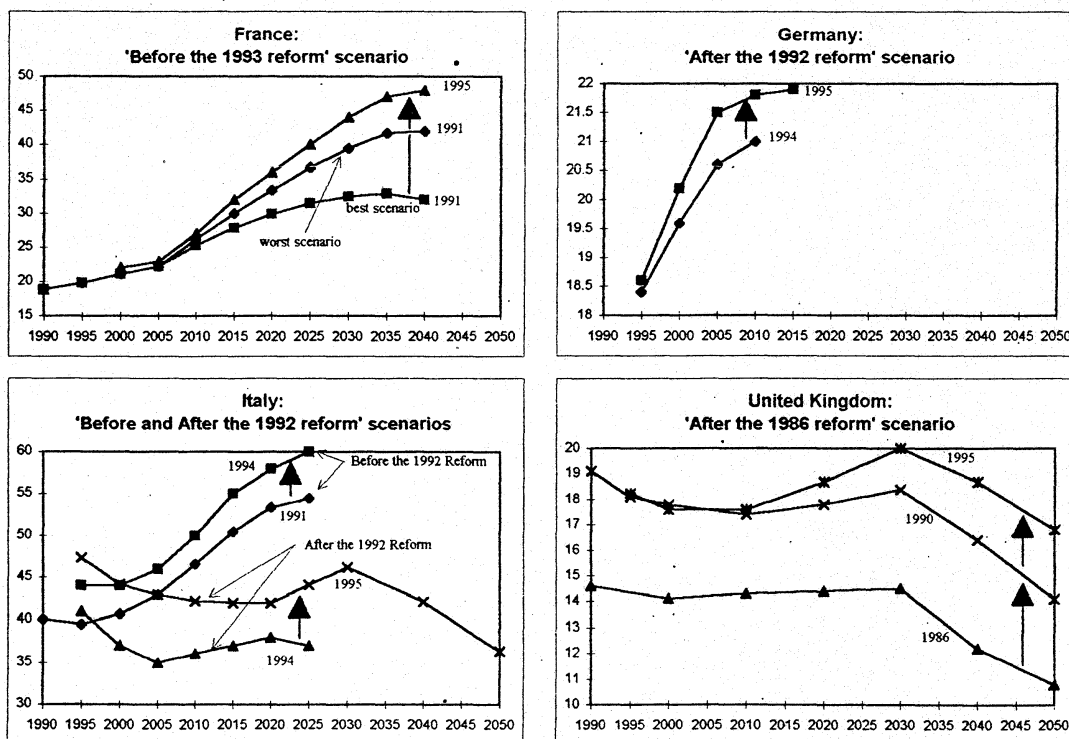
An indirect indicator of the reliability of projections is, however, provided by the adjustments implemented over time. Four examples of revision of estimates are presented in Box 6. In all of them the ECR has been revised upwards. Some changes have been quite substantial, especially considering the limited period of time over which they took place. Available evidence does not allow to infer that there is a consistent tendency to underestimate expenditure trends. However, it points to the need to carry out periodic revisions of estimates. It also points to the need to evaluate alternative economic and demographic scenarios, in order to have some estimates of the range of possible expenditure trends.

Box No. 6

REVISIONS OF PROJECTIONS: FOUR CASES

Section I.1 stressed the uncertainty concerning the parameters affecting pension expenditure dynamics and the difficulty of projecting pension expenditure over long periods. It also stressed the usefulness of periodic revisions of projections. This Box examines the revisions carried out in four countries in recent years (see Charts below).

Equilibrium Contribution Rates projected in different years



France - Government of France (1991) and General Planning Committee (1995) estimated the ECR of a fictional scheme representing all basic and supplementary pension schemes. In the first document the rates estimated for the year 2040 ranged from 30.9 to 41.9 per cent. In the

comparable scenario ("before the 1993 reform") of the second study the projected rate was 48 per cent.

Germany - Federal Government (1994, 1995) estimated the ECR (net of Government transfers) of the Statutory Pension Scheme. For the year 2008, the 1994 study (central scenario) projects a rate of 21.0 per cent; the 1995 study projects a rate of 21.8 per cent.

Italy - General Accounting Office (1991, 1994, 1995) estimated the ECR of the Private Sector Employees' Pension Fund. In the 1991 study, the ECR was expected to increase from 39.5 per cent in 1995 to 54.5 in 2025. On a comparable basis ("before the 1992 reform" scenario) in the second study it was expected to increase from 44 to 60 per cent over the same period. In the "after the 1992 reform" scenario, the latter study projected a decline in the ECR from 41 per cent in 1995 to 37 per cent in 2025. For the same scenario and the same period, the 1995 study projected a decline in the ECR from 47 to 44 per cent.

United Kingdom - Government Actuary's Department (1986, 1990, 1995) estimated the ECR of the National Insurance Pensions. The 1986 report (under the assumption of price indexation) projected a decline in the rate from 14.6 per cent in 1990 to 10.8 in 2050. In the following report the rate was expected to decline over the same period from 19.1 per cent to 14.1 per cent (from 17.7 to 13.0 per cent allowing for the effect of the Social Security Bill 1990). On a comparable basis ("before the 1994 reform" scenario), the last report expected the rate to decrease from 18.25 per cent in 1995 to 16.8 in 2050. Each new report analyses in detail the differences with the previous projections. The differences between the 1995 and the 1990 projections are attributed to the expected changes in the number of pensioners and contributors and to a revision in the benefit rate relative to earnings.

In all four examples presented, the ECR has been revised upwards. Some changes have been quite substantial, especially considering the limited period of time over which they took place.

Several of the national projections examined evaluate the effects of alternative economic scenarios; most of them do not include estimates of alternative demographic scenarios. As reported in Box 7, which presents some sensitivity analysis results included in two national studies, two points ought to be stressed: i) changes in demographic parameters tend to produce greater long-term effects than changes in economic parameters; ii) the effects of changes in economic parameters on the ECR tend to be temporary.

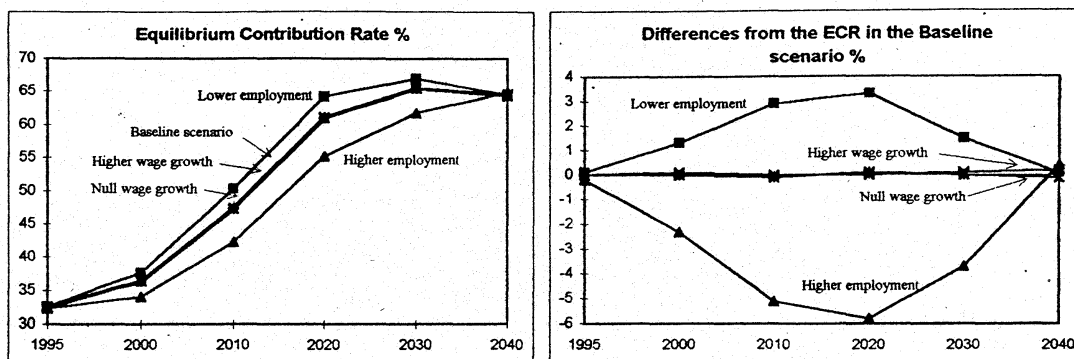
Box No. 7

SENSITIVITY ANALYSIS

As already pointed out, long-term projections are inevitably subject to wide margins of error. Demographic and economic parameters and retirement behaviour are quite difficult to predict over long periods. Sensitivity analysis, estimating the effects of different sets of assumptions, provides an indication of the range of possible expenditure trends. Several recent pension expenditure projections devote a section to sensitivity analysis. This Box briefly presents two of them.

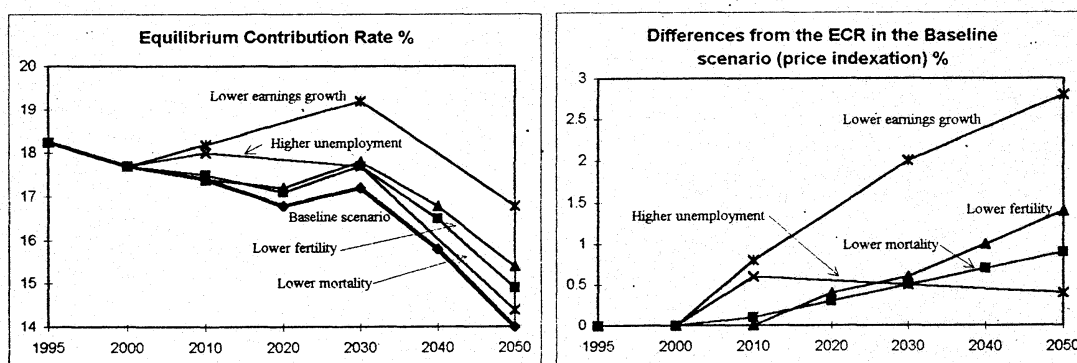
Delville *et al.* (1995), who project the pension expenditure of the Belgian schemes for public sector employees, consider alternative employment and earnings scenarios. In each variant, only one assumption is changed with respect to the baseline scenario. A 10 per cent increase (reduction) in employment determines a lower (higher) ECR; the difference with respect to the baseline scenario widens up to the year 2025 and declines thereafter (see Chart below). By the year 2040 the ECR in the lower (higher) employment scenario coincides with the baseline ECR. Almost no changes are expected when assuming a higher (lower) growth in real wages (1.75 per cent every two years instead of 1.5 per cent), since pensions are adjusted to wage dynamics.

Sensitivity Analysis in Belgium



Government Actuary's Department (1990, 1995) examines the effects of changes in demographic, employment and earnings parameters on UK National Insurance pension expenditure. In the scenario with price indexation of pensions, an increase in life expectancy (improvements are assumed to be twice those assumed in the baseline scenario) increases the ECR by 0.1 points in 2010 and 1.0 in 2050 (see Chart below). A reduction in fertility (1.7 children per woman, as against 1.9) has no effect in 2010 and increases the ECR by 1.7 points in 2050. An increase in the unemployment rate (by 2 per cent) raises the ECR by 0.6 points in 2010 and 0.5 in 2050. A reduction in the rate of growth of real earnings (by 0.5 per cent) increases the ECR by 0.8 points in 2010 and 3.4 in 2050. In the scenario with wage indexation of pensions, in which the baseline ECR is higher, the effects of the first three changes in assumption are also larger. On the contrary, the reduction in the rate of growth of earnings produces smaller effects (0.2 points in 2010 and 0.3 in 2050), since the loss in taxable earnings is largely offset by the reduction in pension adjustments.

Sensitivity Analysis in the United Kingdom



The effects of marginal changes in demographic and economic parameters over a 50-60 year period can be summarised as follows:

- An increase (decline) in life expectancy raises (reduces) the ratio of the number of pensioners to the number of workers and increases (reduces) the ECR. The effects build up gradually over a long period.
- An increase (decline) in fertility tends to raise (reduce) the number of contributors to the pension system and to reduce (increase) the ECR. Effects become relevant after about 20 years, when the flow of entrants in the labour market is affected.
- An increase (decline) in employment in a first phase reduces (raises) the ratio of the number of pensioners to the number of workers and reduces the (increases) ECR. If pension eligibility and the replacement ratio depend on contributory records, in a later stage the effects gradually decline.

- d) An increase (reduction) in the rate of growth of real wages in a first phase reduces (raises) the transfer ratio (average pension / average labour income) and reduces (increases) the ECR. If pensions are related to earnings records, in a later stage the effects gradually decline and may eventually disappear. If pensions are flat-rate benefits, constant in real terms, the effects keep building up over a long time.

I.5 THE EFFECTS ON PUBLIC BUDGETS: SOME TENTATIVE ESTIMATES

As already pointed out, the projections presented in the previous Section are not homogeneous in their coverage of pension expenditure. Therefore, although they provide some useful indications about the trends in future pension expenditure in the EU Member States, they do not provide an estimate of the impact of the future evolution of public pension schemes on general governments' accounts. This Section tries to fill this gap by applying each country's projected expenditure trend to an estimate of its 1995 ratio of total public pension expenditure to GDP.

More specifically, the expected values of the ratio of pension expenditure to GDP and of the ECR have been turned into an index based on a 1995 value of 1. Then the index has been multiplied by the ratio of public pension expenditure to GDP estimated for 1995. The latter data has been computed in different ways, according to the data available for each country (see Annex A2). Some of them are not fully satisfactory.

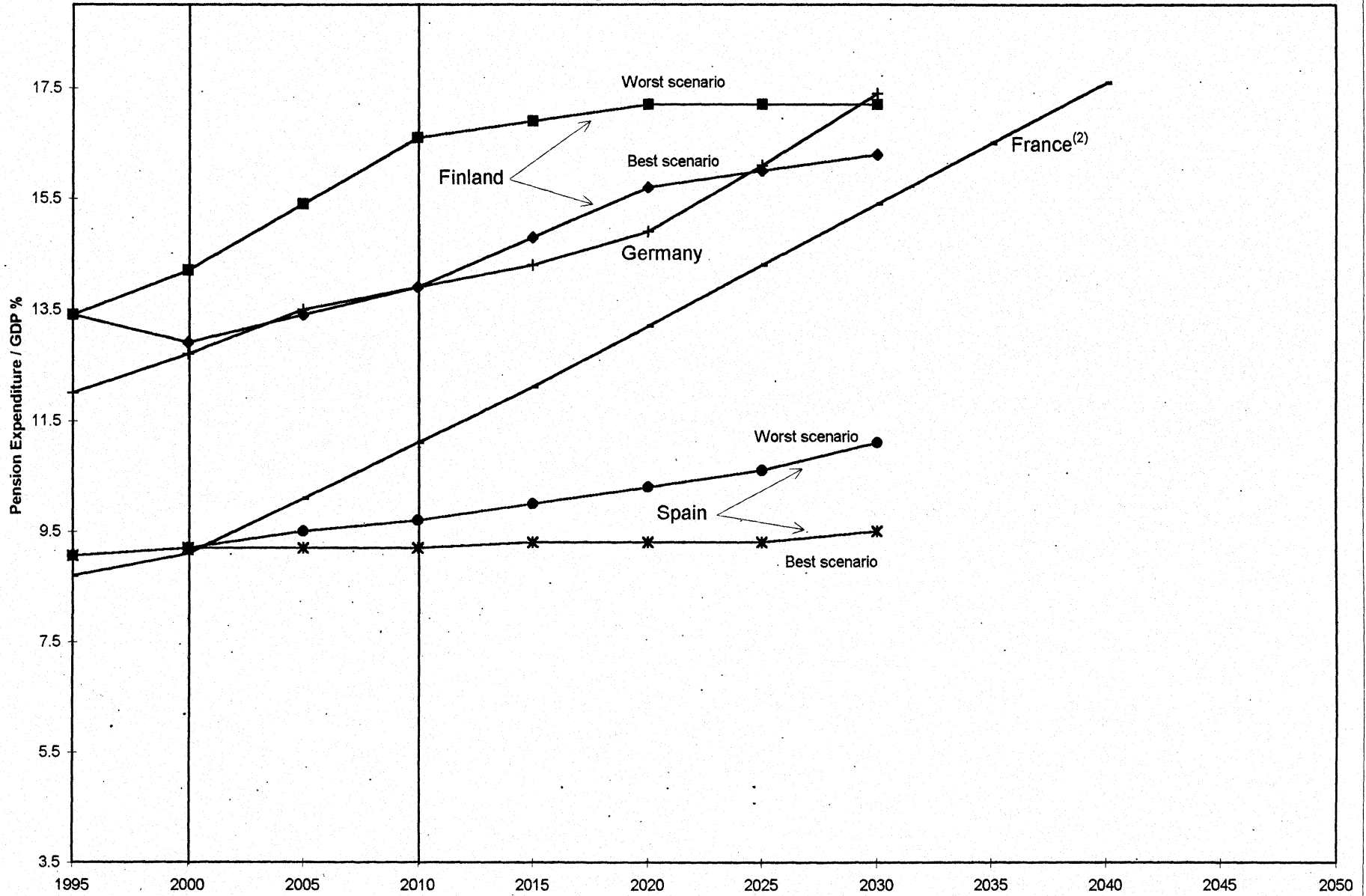
As in the Charts referred in Section I.4.5 and included in Annex B, wherever more scenarios were considered in the national projections, the most favourable and the least favourable are taken into consideration in order to provide a range for future pension expenditure growth. Individual country estimates are presented in Charts 8-11. The unweighted and weighted average of the ratios of pension expenditure to GDP in the 11 EU countries which produced projections up to the year 2030 are presented in Charts 12a-12b.

The data can be examined over three periods: the next five years, the period 2000-2010, the period after the year 2030.

- a) **Between 1995 and the year 2000**, the ratio of public pension expenditure to GDP might grow by 0.7 percentage points in Germany and Greece, nearly 0.4 points in France and 0.3 in Portugal. According to the different economic scenarios, the ratio would grow by 0.7 to 1.5 points in Luxembourg and by 0.5 to 0.7 points in Belgium. In Austria, Denmark, Ireland and Spain the expenditure ratio would be nearly stable; in the Netherlands it would be stable in the best scenario and increase by 0.6 points in the worst. In the United Kingdom it would either decline by 0.2 points (price indexation of basic pensions) or increase by 0.3 points (wage indexation of basic pensions). In Finland and Sweden the best and the worst economic scenarios respectively point to a decline in the expenditure ratio of 0.5 points and to an increase in the ratio of 0.6 - 0.8 points. In Italy the ratio would decline by 0.3 to 0.8 points.

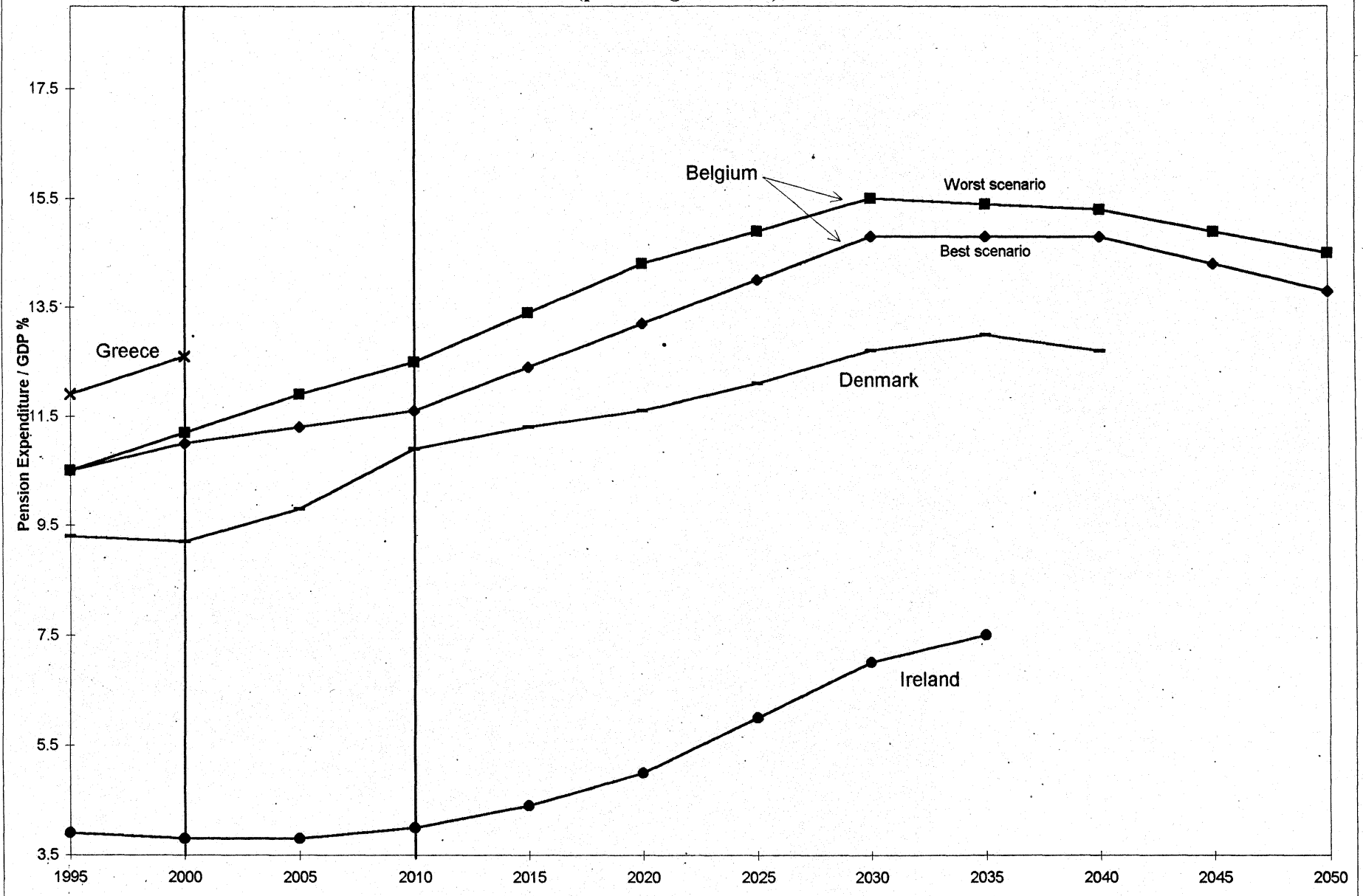
Under favourable economic scenarios and assuming no discretionary increases in pensions (particularly assuming no discretionary adjustment of pensions to wage dynamics), over the period 1995-2000 the unweighted average of the ratios of pension expenditure to GDP in the 15 countries considered will increase by about

Estimates of Total Public Pension Expenditure⁽¹⁾ - Part I
(percentage of GDP)



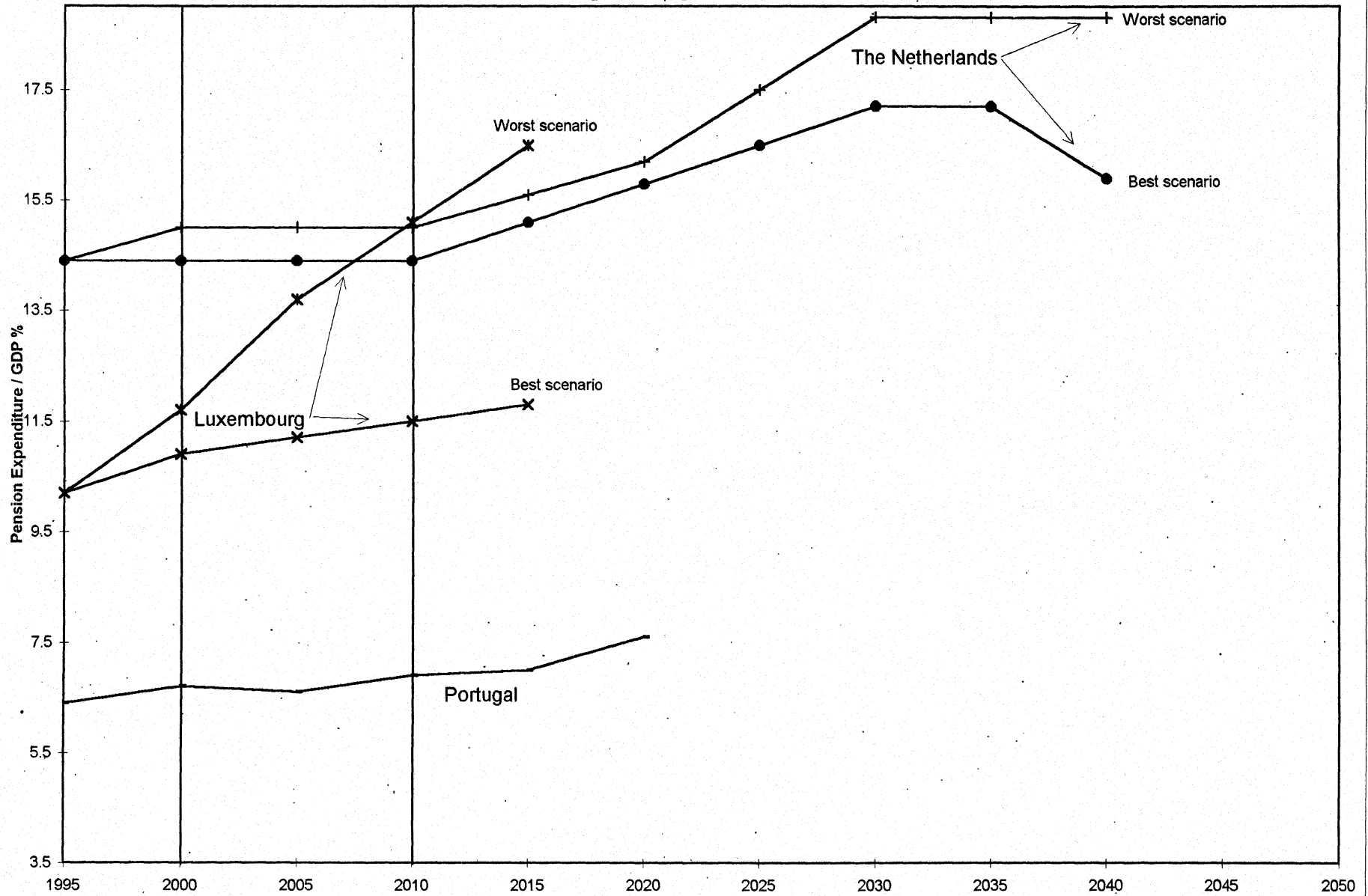
1) For these estimates see Annex A.
2) Data refer to the main pension schemes.

Estimates of Total Public Pension Expenditure⁽¹⁾ - Part II (percentage of GDP)



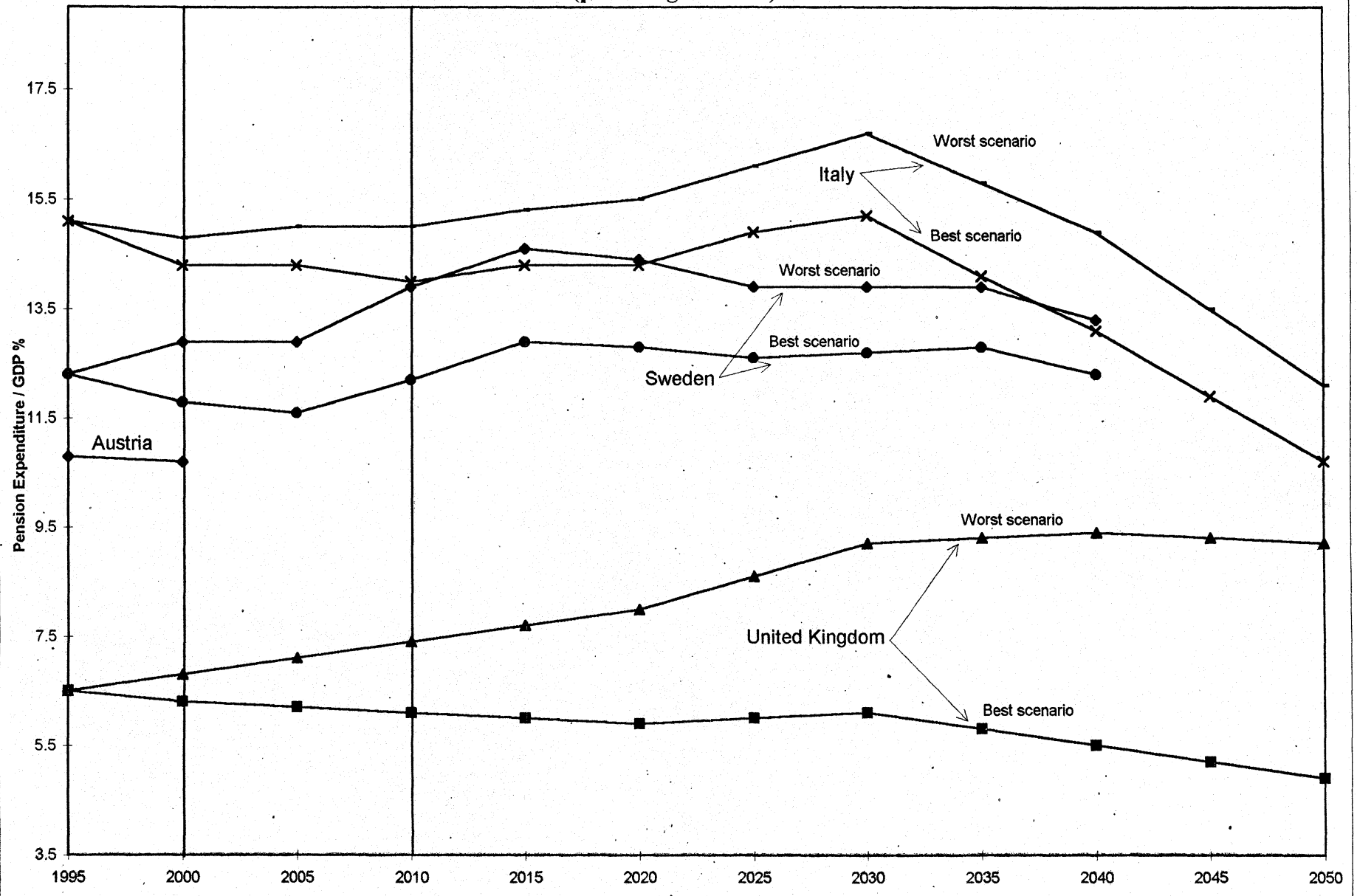
1) For these estimates see Annex A.

Estimates of Total Public Pension Expenditure⁽¹⁾ - Part III (percentage of GDP)

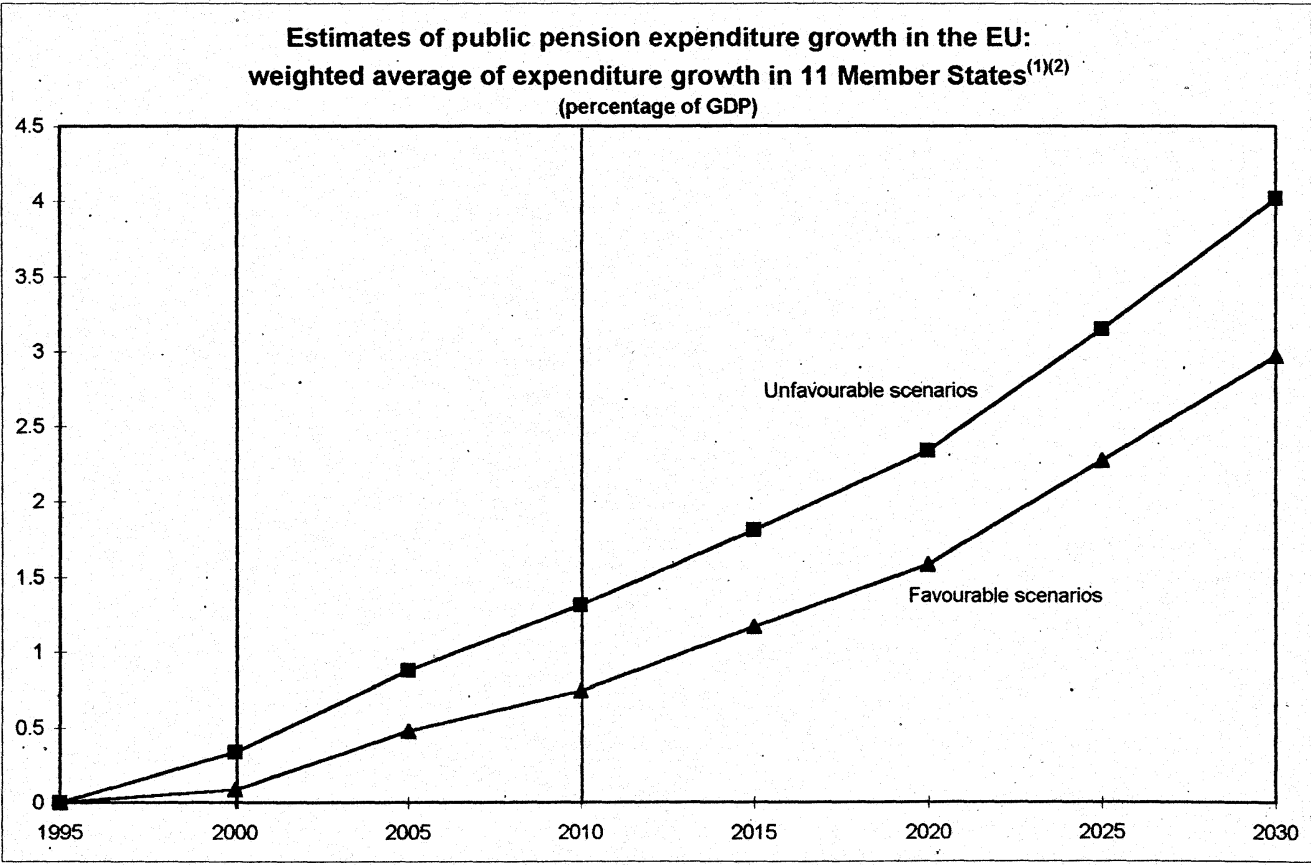
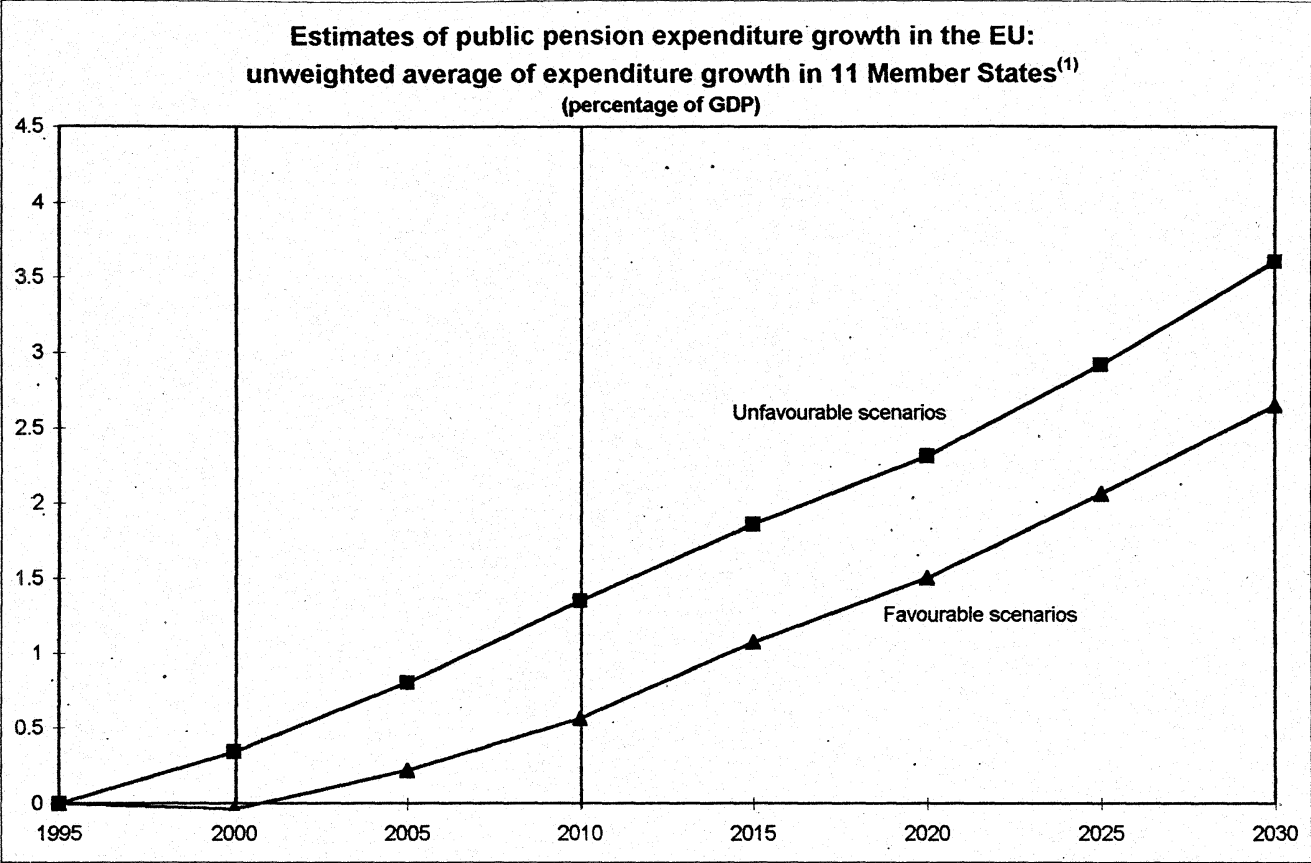


1) For these estimates see Annex A.

Estimates of Total Public Pension Expenditure⁽¹⁾ - Part IV (percentage of GDP)



1) For these estimates see Annex A.



1) Austria, Greece, Luxembourg and Portugal have not been considered, since no projections are available up to the year 2030.
2) Weights: 1995 GDP in units of Purchasing Power Standard. Source: European Commission (1995).

0.1 percentage points. The outlook would be rather worse if economic activity were to slow down markedly: under unfavourable scenarios, the unweighted average of the ratios of pension expenditure to GDP would increase by 0.4 percentage points. In the 11 countries for which projections are available up to the year 2030, the average of the ratios would be stable under favourable assumptions and increase by 0.3 under unfavourable assumptions (see Chart 12a).

- b) Expenditure growth would accelerate in the **period 2000-2010**. Over the decade, the expenditure to GDP ratio would grow by 2 percentage points in France, 1.7 points in Denmark, 1.2 in Germany, 0.2 in Ireland and Portugal. In Luxembourg expenditure growth would range between 0.6 and 3.4 points, in Finland between 1 and 2.4 points, in Belgium between 0.6 and 1.3 points, in Sweden between 0.4 and 1 points. In Spain the ratio would be nearly stable in the best scenario and increase by 0.5 points in the worst. In the United Kingdom the change in the expenditure ratio would range between a reduction of 0.2 percentage points and an increase of 0.6 point; in Italy between a 0.2 points reduction and a 0.6 points increase. In the Netherlands it would be stable.

Over the period 2000-2010, the unweighted average of pension expenditure to GDP ratios in the 13 countries for which projections up to the year 2010 are available will increase by about 0.5 percentage points. Under the least favourable economic scenarios and the scenarios assuming discretionary wage indexation of pension benefits, the increase would reach 1.2 percentage points. In the 11 countries for which projections are available up to the year 2010, the average of the ratios would increase by 0.6 percentage points under favourable assumptions and by 1.0 points under unfavourable assumptions (Chart 12a).

- c) **After the year 2010** expenditure pressure would rise substantially in most countries. The estimate for the period 2010-2030 is 4.3 points for France, 3.5 points for Germany, 3 to 3.2 points for Belgium, 0.6 to 2.4 points for Finland, 3 points for Ireland, 2.8 to 3.8 points for the Netherlands. Expenditure pressures would be more moderate in Denmark (1.8 points), Spain (0.3 to 1.4 percentage points of GDP), Italy (1.2 to 1.7 points) and Sweden (0 to 0.5 points), Portugal (0.7 point up to the year 2020) and the United Kingdom (0 points in the price indexation scenario, 1.8 in the wage indexation scenario). In Luxembourg the ratio would increase by 0.3 to 1.4 points in the period 2010-2015.

Over the whole period 2010-2030, the unweighted average of pension expenditure to GDP ratios in the 11 countries for which projections up to the year 2030 are available will increase by about 2.0 percentage points. Under the least favourable economic scenarios and the scenarios assuming discretionary wage indexation of pension benefits, the average would increase by 2.3 percentage points (Chart 12a).

- d) Under both favourable and unfavourable scenarios, the **GDP-weighted**⁴⁹ increase in the ratio is steeper than the unweighted, since some large countries project

⁴⁹ The weights are represented by 1995 GDP in units of Purchasing Power Standard.

relatively high increases in expenditure. In the 11 countries for which projections are available up to the year 2030, the average ratio would increase by 0.1-0.3 points over the period 1995-2000, 0.6-1.0 points over the period 2000-2010, 2.3-2.7 points over the period 2010-2030 (see Chart 12b).

I.6 SOME CONCLUSIONS

Before presenting the main general conclusions of the survey, three points must be recollected: a) *all projections have been taken at face value*; b) national projections largely differ in assumptions and in methodologies; this obviously hampers their comparability; it can nevertheless be argued that national institutions are likely to know best the scenarios most relevant for their own pension system; c) most projections apply over long periods exogenous demographic and economic scenarios to present pension rules (which are actually likely to be adjusted frequently) and present retirement behaviour (which can change over time and is not independent of the scenarios).

The conclusions, which are based on unchanged policy projections, are the following:

- a) *In the next 5 years*, expenditure pressures stemming from public pension systems, although non-negligible, are expected to be rather limited in most countries. The ratio of pension expenditure to GDP in EU 15 is expected to increase on average by 0.1 points (under favourable economic scenarios) and up to 0.4 points (under unfavourable scenarios).⁵⁰
- b) *In the first decade of the next century*, the outlook for the pension systems becomes worse. Even under favourable economic assumptions, the expenditure to GDP ratio is expected to increase in most countries. Over the period 2000-2010, the unweighted average of pension expenditure to GDP ratios in the 13 countries for which projections up to the year 2010 are available will increase by 0.5 percentage points (under favourable assumptions) and up to 1.2 percentage points (under unfavourable assumptions).
- c) *After the year 2010*, when the baby-boom generation retires, the situation of European pension systems deteriorates more sharply. The change in the pension expenditure trend is quite radical for the countries where the ageing process is relatively late (particularly in Ireland). Over the period 2010-2030, the unweighted average of pension expenditure to GDP ratios in the 11 countries for which projections up to the year 2030 are available will increase by 2.0 percentage points (under favourable assumptions) and up to 2.3 points (under unfavourable assumptions).⁵¹ In several countries expenditure pressures will peak in the period 2030-2040.
- d) *Over the whole period 1995-2030*, expenditure pressures will be relatively strong in several countries which have not yet substantially reformed their pension systems (Belgium, Denmark, Ireland Luxembourg, the Netherlands), but also in

⁵⁰ As to the United Kingdom, the favourable scenario envisages price indexation of basic pensions; the unfavourable scenario envisages wage indexation of basic pensions.

⁵¹ Charts 12a-12b refer to the 11 countries for which estimates are available up to the year 2030. They slightly differ from the data reported for the periods 1995-2000 and 1995-2010 in conclusions a) and b), which respectively refer to 15 and 13 countries.

some countries that have already introduced large reforms (Finland, France, Germany). Expenditure increases are expected to be fairly limited (under favourable economic scenarios) in Italy, Portugal, Spain Sweden and (in the case pensions were adjusted just to price dynamics) in the United Kingdom. In most of these countries pension reforms largely contributed in curtailing expenditure dynamics.

- e) *By the year 2030* in several countries (Belgium, Finland, France, Germany, Italy and the Netherlands) the ratio of pension expenditure to GDP might be in the range of 15 to 20 per cent. Expenditure would be lower in Denmark, Spain, Sweden (in the 10 to 15 per cent range), and in Ireland and the United Kingdom (below 10 per cent). Luxembourg and Portugal, for which projections are available up to the period 2015-2020, are likely to belong, respectively, to the first and the last group of countries.
- f) Over the last decade, several national projections have been revised. The ECR has generally been *revised upward*. Some changes have been quite substantial. Past revisions do not give any indication about future revision of present estimates. However, they point to the usefulness of carrying out regular reviews of projections and analysing past projection errors.
- g) In some countries the *wedge* between the most favourable and the most unfavourable expenditure scenarios is quite large. Both the assumptions concerning economic activity and employment and those concerning the adjustment of pensions play an important role. Alternative demographic scenarios are rarely taken into consideration; different mortality and fertility assumptions would further increase the range of possible long-term expenditure outcomes.
- h) In most countries present *pension policies* are quite different from those implemented in previous decades. The phase of extension of coverage and improvement of benefits is over, although in a few countries past extensions and improvements are still affecting expenditure growth. Since the mid-eighties several pension schemes have been reformed in order to reduce pension expenditure growth. Major reforms were introduced in Austria, Finland, Germany, Italy, France, Greece, Portugal, Sweden and the United Kingdom.
- i) In most countries only *demographic trends* presently increase the expenditure to GDP ratio (the exceptions being, the long-run, France, Ireland and Luxembourg). In several countries the effects of demographic trends will be partly offset by reforms aimed at restraining expenditure growth. These reforms have brought the expenditure line firmly below the old-age dependency ratio line. For this reason, the projections carried out by the IMF and the OECD in the eighties (based on constant transfer and eligibility ratios) have generally turned out more pessimistic than present national projections.
- j) Given the large expected changes in demographic structure, the preservation of present benefit levels and eligibility rules requires a substantial increase in the national resources devoted to the pension systems; *alternatively*, the stabilisation of pension expenditure requires further severe cuts in pension benefit levels and substantial restrictions in pension eligibility in several countries.

The national projections surveyed in this paper give an account of the pressure that pension expenditure will exert on EU Member States' public finances. They also give an account of the efforts of national authorities and researchers to develop forecasting models that provide more accurate, more frequent and longer-term projections of pension expenditure.

As already pointed out, the differences in approach, in the periods of reference, in coverage, and in economic and demographic assumptions, severely impede the *comparability* of national estimates. In order to develop internationally comparable projections of pension expenditure, common forecasting methodologies should be defined and economic and demographic assumptions should be harmonised.

PART II

COUNTRY PROJECTIONS

II.1 AUSTRIA

The Austrian pension system is run on a PAYG basis with pensions related to wages and length of contributory records. There are two main pension schemes (the ASVG⁵² for private sector employees and a few specific schemes run by the Federal government or by the States for public sector employees) and a number of smaller schemes for self-employed⁵³.

Between 1960 and 1988 pension payments rose from 9.5 per cent to 15 per cent of GDP. Expenditure growth was particularly high for old age pensions. The trebling of the share of old-age pensions to GDP in the period 1960-1985 can be attributed to a 78 per cent increase in the eligibility ratio, a 36 per cent increase in the transfer ratio, a 14 per cent increase in the dependency ratio and a 9 per cent increase in the inactive ratio.⁵⁴ In 1988 Austria recorded one of the highest ratios of pension expenditure to GDP among Western countries.

Demographic forecasts are rather worrying: the dependency ratio is already relatively high, while the birth rate is one of the lowest in Europe. In the private sector, the ratio of the number of pensions to the number of workers has increased from less than 50 per cent in 1972 to 56.6 per cent in 1982 and to 58 per cent in the early nineties.⁵⁵ Including

⁵² *Allgemeine Sozialversicherungsgesetz.*

⁵³ The Austrian pension system is described in Board of Austrian Social Security Institutions (1994). Detailed data concerning the system are presented in Board of Austrian Social Security Institutions (1993).

⁵⁴ See OECD (1989a).

⁵⁵ See Board of Austrian Social Security Institutions (1993).

the public sector, the ratio reached 62.3 per cent in 1988⁵⁶. The eligibility ratio rose from 70 per cent in 1960 to more than 100 per cent in the early nineties. Between 1970 and 1992 the average retirement age declined from 61.9 to 58.3 years for males and from 60.4 to 57.3 years for females, becoming one of the lowest among Western countries.

Pension expenditure is mostly financed by social security contributions. In order to cover the increase in expenditure the contribution rate for employees and employers rose from 11 per cent in 1960 to 22.8 per cent in 1988. Federal government transfers cover the gaps between contributions and pensions. Since 1993 these subsidies are limited within 33 per cent of total expenditures. In the late seventies federal transfers represented more than a third of total pension expenditure; in the following years their ratio to total expenditure declined to 20 per cent in 1994.⁵⁷

Some reforms were introduced in 1985 and in 1988. From 1985,

- a) the basis for new pensions was to be gradually changed from the average wages earned in the last five years at work to those earned in the last ten years; the assessment period was also increased in the event of early retirement;
- b) the annual adjustment of pensions to wage increases was to be scaled down by 0.1 per cent for each percentage point of unemployment.

In 1988,

- c) the assessment period in case of early retirement was further lengthened;
- d) pension credits for years spent in higher education were reduced.

The outlook for the Austrian pension system was extensively examined in 1991 by the Council of Economic and Social Affairs⁵⁸ in the Report "Social Security in Old-Age"⁵⁹. The resulting projection is based on the following assumptions: the fertility rate is stable at 1.56 from the year 1995, mortality rates decrease with life expectancy at birth rising from 72 to 75 years for males and from 78.6 to 80.9 years for females in the period 1989-2015, the net migration flow is stable at a level of 10.000 persons each year.

The Council projected an increase in the old age dependency ratio from 33 per cent in 1990 to 59 per cent in 2030 (Table II.1, point 1). Assuming a constant labour participation ratio, the ratio of pensions to workers was projected to remain stable up the year 2001 and then to rise to 69 per cent in 2010, 82 per cent in 2020, 102 per cent in 2030. Different projections were presented for the transfer ratio. Assuming a constant contribution rate levied on workers and employers and an increase in the share of expenditure financed by the Federal Government, the transfer ratio was projected to

⁵⁶ See Council of Economic and Social Affairs (1991).

⁵⁷ The role of the federal government in the financing of pension expenditure is examined in OECD (1994e).

⁵⁸ *Beirat für Wirtschafts- und Sozialfragen.*

⁵⁹ *Soziale Sicherung im Alter.*

remain stable at 47 per cent. Assuming that all the burden for the increase in expenditure is carried by employees, the transfer ratio was projected to rise from 47 to 54 per cent. In either case, the ratio of pension expenditure to taxable income (the contribution rate that would be required to finance all pension expenditure) was projected to remain stable up to the beginning of the new century (at about 31 per cent), and then to rise gradually up to 35 per cent in 2010, 43 per cent in 2020, 54 per cent in 2030. Accordingly, the ratio of pension expenditure to GDP was expected to grow from 11 to 19 per cent.

Two alternative scenarios involving higher employment were also considered by the Council of Economic and Social Affairs. One assumed higher inflows of workers, the other an increase in the participation ratio. In the latter scenario, the dependency ratio would reach a level of only 78 per cent in 2030. Maintaining the share of federal subsidies to GDP constant, pension expenditure would reach 14.5 per cent of GDP in 2030. The increase in the contribution rate would have been 10 points lower than in the case of invariant labour participation ratio.

The Council focused on two lines of reform:

- a) A change in the commitment of the Federal Budget in providing transfer to pension schemes.
- b) A switch from gross to net wages as a term of reference in the annual adjustment of pensions.

Under the assumptions of constant labour participation ratio and constant share of federal subsidies to GDP, these measures would reduce pension expenditures by 2 percentage points of GDP and the equilibrium contribution rate by 5 points.

In 1993 the pension system was reformed.⁶⁰ The following measures were taken:

- a) The switch from gross wages to wages net of contributions as reference for the annual adjustment of pensions.
- b) The introduction of new coefficients relating each year of contribution to the average pensionable wage; while previous coefficients still apply to males retiring at 60 and females retiring at 55, higher coefficients apply to workers retiring later.
- c) The calculation of pensions on the basis of the best 15 income years rather than of the last 10-15 years.
- d) The introduction of partial pensions for workers accepting shorter working hours.
- e) The introduction of pension credits for child-bearing periods.
- f) The introduction of new regulations for survivors' pensions.

⁶⁰ See Federal Ministry of Labour and Social Affairs (1993).

In 1995 the Council for the Adjustment of Pensions carried out some medium-term projections of the Austrian pension system taking the effects of the 1993 Reform into account. These projections are based on the assumptions of a yearly GDP real growth of 2.8 per cent in 1994, 3 per cent in 1995, and 2.7 per cent in the years 1996 to 1999. The dependency ratio, which declined from the year 1988 to 1993, will increase slightly; by the year 1999 it will have recovered its 1988 level. According to the Council, the share of pension expenditure to GDP will decline from 10.5 per cent in 1993 to 10 per cent in 1999 (Table II.1, point 2). This trend is mainly attributed to the increase in the number of contributors.

New economic projections point to lower GDP growth rates for the next five years.⁶¹ This change is likely to worsen the financial accounts of pension schemes and to lead to higher ratios of pension expenditure to GDP.

The new medium-term fiscal programme contains a large number of elements concerning consolidation with regard to pension expenditure. The main features are (see OECD 1995a):

- a) Public sector wage growth will be restricted, affecting the growth of pensions entitlements in the public sector. Pension contributions of public employees are to be raised.
- b) Pensions for public employees will be reduced to about 80 per cent of final salary, by changing the pension base to the average of the last five years' salary, gradually rising to fifteen years over the next ten years.
- c) Measures will be taken to increase the effective retirement age, including stricter controls on applications for early and invalidity pensions and cuts for pensions paid before standard retirement age. The pension contributions of the self-employed are to be raised.

⁶¹ The rate of growth of GDP in real terms was 2.7 per cent in 1994; 2.4 per cent is expected for 1995, 2.1 for 1996, 2.4 for the period 1997-2000 (data indicated by the Federal Ministry of Labour and Social Affairs in October 1995).

AUSTRIA

Table II.1

Social Security System ⁽¹⁾	1988	1990	1993	1995	2000	2005	2010	2015	2020	2025	2030
BEFORE THE 1993 REFORM											
1. Council of Economic and Social Affairs⁽²⁾, 1991											
Old-age Dependency Ratio ⁽³⁾ %		33		33	34	37	39	43	49	52	58
<u>Invariant Labour Participation Ratio</u>											
Dependency Ratio (Number of Pensions / Number of Workers) %	62.3	62.2		60.8	61.7	64.8	68.7	73.9	82.4	92.9	101.8
a) Invariant Workers Contribution Ratio											
Transfer Ratio (Average Pension / Average Taxable Income) %	46.9	47.1		46.6	46.6	47.1	47.4	47.3	47.4	47.5	47.6
Pension Expenditure / GDP %	10.7	10.8		10.7	11	11.8	12.7	13.8	15.5	17.6	19.4
Total Contribution Ratio %	31.3	30.3		30.1	30.5	32.6	35.1	37.9	42.7	48.6	53.5
Workers Contribution Ratio %	22.8	22.8		22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8
Government Contribution Ratio %	8.46	7.5		7.35	7.7	9.8	12.3	15.1	19.9	25.8	30.7
b) Constant federal subsidies / GDP											
Transfer Ratio (Average Pension / Average Taxable Income) %	46.9	47.1		46.6	46.6	47.6	48.6	49.2	50.7	52.6	54.1
Pension Expenditure / GDP %	10.4	10.8		10.7	11	11.8	12.6	13.5	15.1	16.9	18.4
Total Contribution Ratio %	31.3	30.3		30.1	30.5	32.6	35.2	38.1	43	49	53.9
Workers Contribution Ratio %	22.8	22.8		22.8	22.8	24.6	27.1	29.9	34.7	40.6	45.4
Government Contribution Ratio %	8.5	7.5		7.3	7.7	8	8.1	8.2	8.3	8.4	8.5
<u>Increasing Internal Labour Participation Ratio</u>											
Dependency Ratio (Number of Pensions / Number of Workers) %	62.3	62.2		60.8	61.6	63.7	65.6	68.5	72.7	76.2	78.2
Constant federal subsidies / GDP %											
Transfer Ratio (Average Pension / Average Taxable Income) %	46.9	47.1		46.6	46.6	46.9	47.1	47.3	48.2	49.8	50.7
Pension Expenditure / GDP %	10.7	10.8		10.7	11	11.4	11.8	12.3	13.1	14	14.4
Total Contribution Ratio %	31.3	30.3		30.1	30.4	31.1	32.9	34.5	36.9	39.4	41
Workers Contribution Ratio %	22.8	22.8		22.8	22.8	23.7	24.8	26.4	28.7	31.2	32.7
Government Contribution Ratio %	8.5	7.5		7.3	7.6	8.1	8.1	8.1	8.2	8.2	8.2
Effects of some possible reform measures											
<u>Constant Labour Participation Ratio</u>											
Dependency Ratio (Number of Pensions / Number of Workers) %	62.3	62.2		60.8	61.7	64.8	68.7	73.9	82.4	92.9	101.8
Constant federal subsidies / GDP %											
Transfer Ratio (Average Pension / Average Taxable Income) %	46.9	47.1		47	47	47	47	47	47	47	47
Pension Expenditure / GDP %	10.7	10.8		10.8	11.1	11.7	12.3	13.1	14.3	15.7	16.8
Total Contribution Ratio %	31.3	30.3		30.4	30.7	32.3	34.3	36.7	40.4	44.9	48.5
Workers Contribution Ratio %	22.8	22.8		22.8	22.8	24.3	26.2	28.6	32.2	36.6	40.1
Government Contribution Ratio %	8.5	7.5		7.6	7.9	8	8.1	8.1	8.2	8.3	8.4
AFTER THE 1993 REFORM											
2. Council for the Adjustment of Pensions⁽⁴⁾, 1995											
Dependency Ratio (only private sector) ⁽⁵⁾ %	60.4	59.3	58.9	59.5	60.6						
Pension Expenditure / GDP ⁽⁵⁾ %	10.8	10.5	10.5	10.1	10						

1) These projections take into account all the pension schemes for private sector employees (ASVG) and self-employed persons (GSVG, FSVG and BSVG), with the exception of the projections concerning the Dependency Ratio in section 1 where also the pension schemes for public sector employees are taken into consideration and the projections concerning the Transfer Ratio in section 1 where only the scheme for private sector employees (ASVG) is considered.

2) *Beirat für Wirtschafts- und Sozialfragen*.

3) Number of people aged 60 and over / Number of people between 15 and 59. As reported in the graph on page 51.

4) *Gutachten des Beirates für die Renten- und Pensionsanpassung*. Real GDP growth = 2.8% in 1994, 3.0% in 1995 and 2.7% up to 1999.

5) The data for the year 2000 actually refers to the year 1999.

II.2 BELGIUM

The Belgian pension system is based on three major PAYG schemes: the scheme for public employees, the scheme for private sector employees (the largest) and the compulsory pension scheme for the self-employed.⁶² Since 1969 these schemes are complemented by a system guaranteeing a minimum old-age pension. Income-related welfare benefits are supplied to all citizens who have reached the legal pensionable age.

In the past 20 years, pension expenditure has risen steadily (4.5 per cent per year at constant prices)⁶³ as a result of the widening of pension cover and the steep upgrading of pension benefits.⁶⁴ The pure demographic effects have been rather limited: 0.6 per cent per year.⁶⁵ In 1991 the share of the total pension expenditure on GDP was 10.5 per cent.⁶⁶

In recent years many different projections have been carried out in order to estimate the future trends of pension expenditure.⁶⁷ In 1989 the *Bureau du Plan* created the MALTESE⁶⁸ demographic-economic model to study long-term prospects of receipts and expenditure of the social security system within a global framework (see also Box 2 in Section I.1). This model is in fact a system of interconnected models based on four different sets of hypothesis:

- a) Demographic assumptions concerning fertility, life expectancy and migrations.
- b) Socio-demographic assumptions concerning participation rates, retirement rates and school attendance rates.
- c) Macroeconomic assumptions concerning the rates of growth of productivity and wages, employment trends, unemployment rates and interest rates.

⁶² The evolution of the Belgian pension system is examined in De Deken (1994).

⁶³ See OECD (1994f).

⁶⁴ OECD (1994f) estimated that the average annual growth rate of total pension expenditure was 10.4 per cent over the period 1970-75 and 5.2 per cent over the next five-year period, while the average annual growth of GDP was respectively 3.5 and 3 per cent.

⁶⁵ See OECD (1994f).

⁶⁶ Expenditure for the pensions of the *Régime Général*, central government and the program insuring a minimum income to elderly citizens was 8.7 per cent of GDP in 1980, 9.2 per cent in 1985, 8.7 in 1991 and 8.8 in 1995 (these data have been provided by the *Bureau du Plan* in October 1995; 1995 GDP as estimated by the European Commission).

⁶⁷ In addition to the studies quoted in the text, the prospects of the Belgian pension system have been examined in Defeyt (1987). The effects of population ageing on Belgian social security expenditure have been examined also in Dooghe (1991).

⁶⁸ Model for Analysis of Long Term Evolution of Social Expenditure; see Englert (1990 and 1992) and Festjens -Becquaert - Bogaert (1990).

- d) Social assumptions concerning transfers from central authority to pension schemes, contribution rates, adjustment rates of benefits to living standards.

Englert (1990) used the MALTESE model to project social security expenditure up to the year 2040. Projections were based on the following four sets of assumptions.⁶⁹

- a) Low fertility ratio, stable migration flows, small improvement in life expectancy.⁷⁰
- b) High decrease of participation rates for people aged 15 to 24, (due to an increase in school attendance rates), low increase in the participation rates of people aged 50 to 65.
- c) Yearly growth rate of productivity per worker of 2.25 per cent, constant sharing of value added between production factors, wage growth equal to productivity growth, employment growth rates of 0.75 per cent.⁷¹
- d) Constant contribution rates, 1 per cent yearly increase in real terms in social benefits and benefit ceilings.⁷²

Pension expenditure share on GDP was projected to remain stable at 11 per cent until 2000 and then to increase up to 18 per cent by 2040 (Table II.2a, point 1). This trend will depend mostly on the increase in the number of pensioners, which will be particularly marked after the turn of the century. The number of pensioners will rise mostly in the schemes for private sector employees.⁷³

A second forecasting model (the dynamic simulation model RHEASECU) was developed in the early nineties by IRES⁷⁴ and ADRAS.⁷⁵ This model involves a smaller number of exogenous variables. The main features of the model are the following:

- a) Productivity is positively, but not linearly, related to economic growth rate.
- b) The consumption ratio depends on income distribution, and increases with the share of social security transfers.
- c) Any worsening of the external budget and/or public finances implies the setting of measures limiting the increase in real incomes.

⁶⁹ Seven alternative scenarios were considered but were not examined in the paper.

⁷⁰ The total fertility rate gradually rises from 1.55 in 1995 to 1.8 in 2040. Life expectancy at birth increases by about 4 years in the period considered.

⁷¹ Except for the public sector where medium term plans are taken into account. Public employment is projected to decline by 0.75 per cent a year up to the year 2000.

⁷² This is a compromise between the Belgian policy-makers' behaviour of the last ten years (when practically no adjustment was granted) and the historical trends of the sixties and seventies.

⁷³ The dependency ratio was projected to rise from 52.7 per cent in 1987 to 54.7 in 2000 and to 96.6 per cent in 2040.

⁷⁴ *Institut de Recherches Economiques et Sociales*; see Boulanger *et al.* (1991).

⁷⁵ *Association pour le Développement et la Recherche Appliquée en Sciences Sociales.*

- d) Migratory flows follow the economic cycle.

In Boulanger *et al.* (1991) four scenarios are considered combining two hypotheses concerning GDP growth (respectively 2 and 2.8 per cent per year) and two sets of demographic hypotheses:

- a) Constant fertility rate (1.6 children per woman), small decrease in mortality (for men from 72.9 to 75.6 years, and for women from 78.6 to 82.6 years).
- b) Increasing fertility rate (from 1.6 to 2.4 children per woman), high decrease in mortality (for men from 72.9 to 84.5 years and for women from 78.6 to 88.3 years).

The share of pension expenditure on GDP is projected to increase from 9.4 per cent in 1988 to 12.2 in 2040 in the most favourable scenario and to 15.3 in the least favourable (Table II.2a, point 2). As the average pension is projected to increase more slowly than the average GDP pro capita, the increase in pension expenditure is again mainly due to the large increase in number of pensioners after the turn of the century.

Several measures aimed at reducing pension expenditure have been taken in recent years.⁷⁶

- a) In the summer of 1993 a "solidarity" deduction on early retirement pensions and the highest pensions was introduced.
- b) According to the *Global plan for unemployment, competitiveness and the social security system* approved in November 1993, a new method of calculating pensions will be introduced (the base period for calculating pensions will be longer and pensions for men and women will be harmonised).⁷⁷
- c) The age of early retirement was raised.

In 1994 Englert *et al.* presented new projections carried out with the MALTESE method. The main difference with the previous MALTESE projection concerns the demographic assumptions which are more favourable: total fertility rate is assumed stable at 1.85; between 1992 and 2050 life expectancy at birth increases by 9 years for men and 8 years for women. The Belgian population is therefore expected to be much higher than in the previous projection (10.5 million in the year 2040 as against 8.5). Two different economic scenarios were considered:

- a) Scenario A assumes a 0.75 per cent yearly growth in private employment up to about 2013, and a GDP growth of 2.35 per cent per year.
- b) Scenario B assumes constant private employment and an average GDP growth of 2.26 per cent.

⁷⁶ See OECD (1994f).

⁷⁷ See OECD (1995b).

In the two scenarios, existing pensions are indexed to prices and, partially, to real wage growth. More specifically, existing pensions are increased in real terms by 1 per cent, as against a 2.25 per cent yearly growth in real wages.⁷⁸ In scenario A pension expenditure would increase from 10.5 per cent of GDP in 1991 to 12.3 per cent by the year 2010 and to 14.7 in 2050.⁷⁹ In scenario B it would reach 13.4 per cent in 2010 and 15.6 in 2050. The ratio of the average pension to the average wage (31 per cent in 1991) would be nearly stable up to the year 2020 and then decline to 27 per cent in both scenario A and B by the year 2050 (Table II.2b, point 4).⁸⁰

Lambrecht *et al.* (1994) provide estimates of the pure effects of demographic change on pension expenditure.⁸¹ By considering the average pension paid to each age group, they estimate that between 1993 and 2050, demographic factors will increase expenditure in real terms by 59 per cent (Table II.2a, point 3). By comparing this increase with the projections of the MALTESE model (64 per cent in projection A and 73 per cent in projection B), they point out that expenditure pressures will be increased by some non-demographic factors (such as workers retiring with more complete careers and higher revenues, women acquiring right to a second individual pension, etc.).

In October 1995, Delville *et al.* of the Pension Administration⁸² published a report on the evolution of public employees' pensions until the year 2040. Nine scenarios are considered. The base scenario assumes unchanged legislation, constant employment,⁸³ 1.5 per cent real wage growth every second year, full pension indexation. In the base scenario, the ratio of pensioners to workers increases from 45 per cent in 1994 to 69 per cent in 2010 and 100 per cent in 2040 (Table II.2b, point 5). The equilibrium contribution rate would increase from 32.5 per cent in 1994 to 47.4 per cent in 2010 and 64.5 per cent in 2040. The increase in pension expenditure would be most rapid between 2003 and 2020. It would be caused by the large increase in the number of civil servants which occurred in the 1960s and 1970. Several policy changes are examined in the alternative scenarios. It is pointed out that an increase in employment does not reduce the long-term equilibrium contribution rate. The same conclusion applies to an increase in real wage growth, since pensions are adjusted to wage dynamics. Delville *et al.*

78 According to the pension indexation mechanism, existing pensions are adjusted to real wage dynamics with a 1.25 per cent yearly deduction.

79 These estimates refer to the paper as revised in October 1994.

80 According to OECD (1994f), Belgium will be faced with steeply rising pension expenditure and, "although the outlook is more or less similar in other OECD countries, the problem in Belgium is compounded by the initial marked imbalance of public finance. In this respect, the simulations of the *Bureau du Plan* show the crucial importance of making rapid progress in reducing the size of the debt so that the necessary room can be made to cope with the costs related to the ageing of the population."

81 Demographic projections were jointly produced by *Bureau du Plan* and *Institut National de Statistique*.

82 *Administration des Pensions*. Institution which has the main competences on the administration of pensions for the public sector. The study was carried out in collaboration with Siemens Nixdorf.

83 With the exception represented by employment in defence and education. In the latter sector, employment is assumed to be reduced according to the projected decline in the number of students.

suggest the need to search for policy solutions which combine several measures, including changes in indexation policies.

Table II.2a

BELGIUM I

Social Security System ⁽¹⁾	1987	1988	1991	1995	2000	2010	2020	2030	2040	2050
1. Englert (Bureau du Plan)⁽²⁾, 1990										
Dependency Ratio (Number of pensioners/Number of workers) %	52.7			53.5	54.7	59.9	73.1	90.3	96.6	
Average Pension / Average Wage %	33			32	32	32	32	31	31	
Equilibrium Contribution Rate %	15.2			16	16.6	18.2	22.2	26.6	28.5	
Pension Expenditure / GDP %	11			11	11	12	14	17	18	
2. Boulanger, Defeyt, Lambert (IRES)⁽³⁾, 1991										
Number of Pensioners (1988=100)										
Low growth scenario (real GDP growth = 2%)		100			116		145		155	
High growth scenario (real GDP growth = 3%)		100			118		158		193	
Average Pension (1988=100)										
Low GDP growth, constant fertility and a low decrease in mortality		100			110				250	
High GDP growth, constant fertility and a low decrease in mortality		100			125				350	
Low GDP growth, increasing fertility and a high decrease in mortality		100			105				250	
High GDP growth, increasing fertility and a high decrease in mortality		100			125				335	
Pension Expenditure / GDP %										
Low GDP growth, constant fertility and a low decrease in mortality		9.4							13.5	
High GDP growth, constant fertility and a low decrease in mortality		9.4							12.2	
Low GDP growth, increasing fertility and a high decrease in mortality		9.4							15.3	
High GDP growth, increasing fertility and a high decrease in mortality		9.4							14	
3. Lambrecht, Fasquelle and Weemaes (Bureau du Plan)⁽⁴⁾, 1994										
Old-age Dependency Ratio ⁽⁵⁾ %			39		42	47	57	69	71	70
Dependency Ratio (Number of pensioners/Number of workers) %			49		54	63	77	89	92	92
Equilibrium Contribution Rate %			15	16	17	20	24	28	29	29
Pension Expenditure (1993 = 100)			100		109	122	141	158	163	159

1) The Social Security System comprises all the contributory schemes for the employed and self-employed in both the private and the public sectors.

2) Yearly productivity growth = 2.25%, yearly employment growth = 0.75%.

3) *Institut de Recherches Economiques et Sociales de l'Université Catholique de Louvain.*

4) The data for the year 1991 actually refers to the year 1993.

5) Number of people aged 60 and over / Number of people between 20 and 59.

II.3 DENMARK

The Danish pension system has three pillars:

- a) the basic statutory scheme which provides a pension to all citizens;
- b) the supplementary occupational pension schemes - organised either in a statutory way or by collective agreements - which cover 80 per cent of wage earners and 60 per cent of the labour force (including the unemployed),⁸⁴
- c) individual old-age provisions, such as life insurance, capital pensions, rate pensions, etc.⁸⁵

In 1995 public pension expenditure to the elderly is estimated at 9.3 per cent of GDP, out of a total social expenditure to the elderly of 13.1 per cent of GDP.⁸⁶ Basic pensions represent the major outlay (4.5 per cent of GDP in 1991).

Demographic trends are worrying. Total fertility rate has fallen dramatically (from 2.6 in 1966 to 1.4 in 1983 with a partial recovery in the last years to 1.8.⁸⁷ Female life expectancy at age 60 increased from 17.9 years in 1946-50 to 21.5 years in 1992, while male life expectancy remained nearly constant. The old-age dependency ratio is expected to decline in the nineties and to rise at a moderate rate in the first part of the next decade. Thereafter, it is expected to rise considerably. According to the 1994 projections of Denmark's Statistical Department, the ratio⁸⁸ is likely to increase from 33.6 per cent in 1995 to 36.2 in 2005 and 49.5 in 2030.

Ministry of Finance (1995) stresses the uncertainty surrounding population projections; changes in the assumption concerning fertility rates and immigration flows have determined large changes in recent official Danish projections: in the 1984 projections, total population in the year 2025 was expected to be 1 million lower than in the 1994 projections. The dependency ratio was projected to be 10 percentage points above the level presently expected. The assumptions concerning fertility and immigration were revised again in the 1995 official projections: the total fertility rate was increased by 0.1 percentage points (to 1.9), immigration was assumed to be slightly higher.

⁸⁴ From the latest estimates of Ministry of Finance, as provided in September 1995.

⁸⁵ For a description of the system see Ministry of Economic Affairs (1994) and Jensen and Nielsen (1995a).

⁸⁶ These data were provided by the Ministry of Finance in September 1995.

⁸⁷ It should be stressed that so far no generation of Danish women has had a completed cohort fertility below 1.8 children. Furthermore, there are signs of modest increase in the completed cohort fertility of the younger generations. The low total fertility rate in the early 80s was a reflection of women's choice to postpone births and was therefore transitory in character.

⁸⁸ Defined as the ratio of the number of people aged 60 and over to the number of people aged 18 to 59.

Both Ministry of Finance (1995) and Jensen and Nielsen (1995a) point out that in the short to medium term Denmark will have a rather unique demographic 'breathing space': the increase in the elderly burden will not begin until the years 2005-2010.

The ratio of the number of pensions to the number of workers depends also on labour force participation rates and on average retirement rates. On both accounts prospects are unfavourable. By international standards, labour market participation rates in Denmark are now extremely high. Therefore, it is hard to envisage that the future ageing problem in Denmark could be countered by a higher employment rate. The average retirement age fell from 65 to about 63 over the decade 1980-1990.⁸⁹

Jensen and Nielsen (1995a) project the impact of demographic changes on total public expenditure for the elderly.⁹⁰ They consider three demographic scenarios, with total fertility rates equal to 1.5, 1.8 and 2.1 respectively.⁹¹ They also consider both wage and price indexation of old age benefits. In the latter case, the living standards of the elderly relying on public transfers lag behind those of wage earners by 1 per cent p.a.

The proportion of GNP needed to finance total outlays to the elderly is expected to fall from 1988 to 2000, irrespective of the indexation formulae in use. Moreover, if benefits are indexed to prices, there will be no rise in the expenditure rate over the whole projection period, no matter what the fertility assumption is. If benefits are linked to wage dynamics, the expenditure rate is likely to rise dramatically over the last 20 years of the projection period: from 11.8 in 2010 to 15.0/16.4 in 2030 (Table II.3, point 1). Jensen and Nielsen also consider the effects of a further two years advancement in the retirement age. In this scenario, the expenditure to GDP ratio is obviously higher: by 0.3 percentage points in 2010 and 0.4 points in 2030 in the case of price indexation; by 0.5 points in 2010 and by 1.0 points in 2030 in the case of wage indexation (Table II.3, point 1).

Similar projections are presented in Jensen and Nielsen (1995b). Two rates of productivity growth are considered in this paper. Irrespective of the indexation scheme and the productivity growth rate, the expenditure ratio is projected to fall up to year 2005. This reflects the pattern of the ageing process in Denmark. As in the previous projections, the trend in the ratio of expenditure to GDP largely depends on the indexation rule. If benefits were linked to prices, a 2 per cent productivity growth rate would allow a large reduction in the expenditure ratio (Table II.3, point 2.b).

An intermediate indexation arrangement, with transfers growing as wages and expenditure on social services growing one percentage point p.a. less than wages is also considered. This scenario has been examined with the aim of reconciling the potential

⁸⁹ See Jensen and Nielsen (1995a).

⁹⁰ These projections are based on population forecasts carried out by Denmark's Statistics Department in 1992.

⁹¹ The intermediate scenario, developed by Denmark's Statistics Department, assumes a recovery in fertility by 1995 (from 1.7 to 1.8), stable female life expectancy, and a minor increase in male life expectancy. In the other two scenarios, fertility reaches the new levels by the year 2005 and thereafter remains stable.

conflict between generational equity and economic efficiency. This solution would moderate the increase in the expenditure ratio. Up to the year 2010 the ratio would be below its 1993 level. In the following two decades it would increase by two percentage points (Table II.3, point 2.c).

To sum up, according to Jensen and Nielsen, with realistic productivity growth rates and indexation schemes, the underlying demographic structure tends to delineate a j-shaped expenditure profile: falling over the first 10-15 years (the "breathing space") and rising over the subsequent 20-25 years (when the "baby-boomers" reach pensionable age):

The implication of population ageing on Danish public finance have been extensively examined in Ministry of Finance (1995). The report, drafted by a group of experts from different ministries, is based on the demographic projections quoted above. Assuming "unchanged retirement pattern, unchanged public staff demand per elderly, and adjustment of public wages and transfers in line with the development of private labour market wages", that "implies that the development of the economic elderly burden mainly reflects the relation of the size of the population groups", and also assuming unchanged unemployment level from 1995 onwards, Ministry of Finance (1995, p. 7) estimates an increase in total public expenditure on elderly people from 13.1 per cent in 1995 to 15.1 in 2010 and 18.3 in 2030. Net of the taxes levied on public transfers to the elderly, the increase in the burden will reach 4 per cent of GDP.

The report considers the effects of some events that might affect expenditure pressures.

- a) If unemployment were to fall at the level indicated in the 1994 medium term economic survey, the elderly burden in the years 2005 and 2030 would be 1 point lower than in the baseline projection.
- b) If the average retirement age were to increase by 2 years, the elderly burden would be 1.5 points lower than in the baseline.
- c) If labour inputs in the production of services for the elderly were reduced by 1 per cent p.a. due to higher productivity, the burden would be 1.5 points lower than in the baseline.
- d) Each year of increase in average lifetime due to lower mortality of elderly people would add 0.7 points to the elderly burden.

These forecasts were updated on the basis of 1995 official population projections.⁹² The projection period was also prolonged to the year 2040. A smaller increase in total public expenditure for the elderly is predicted after the year 2010. The wedge between the projections reaches 0.5 percentage points of GDP by the year 2030.

Ministry of Finance also estimates the ratio of pension expenditure on elderly people. On the basis of 1994 population projections, the ratio is expected to increase from 9.3 per cent in 1995 to 10.9 in 2010 and 13 in 2030. On the basis of 1995 population

⁹² See Ministry of Finance (1995, Annex 3).

projections, the ratio would reach 12.7 per cent in 2030, 13 in 2035 and 12.7 in 2040 (Table II.3, point 3)⁹³.

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These data were provided by the Ministry of Finance in September 1995.

Table II.2b

BELGIUM II

Social Security System ⁽¹⁾	1987	1988	1991	1995	2000	2010	2020	2030	2040	2050
4. Englert, Fasquelle and Weemaes (<i>Bureau du Plan</i>)⁽²⁾, 1994										
Old-age Dependency Ratio ⁽³⁾ %			22.5		26.2	28.2	34.5	43.3	47.2	46.3
Dependency Ratio (Number of pensioners / Number of workers) %										
Private employment growth = 0.75% (GDP growth = 2.35%)			55		60.1	64.2	75.6	89.3	93.7	92.2
Private employment growth = 0% (GDP growth = 2.26%)			55		62.1	70.4	83.6	95.2	98.7	97.9
Average pension / Average wage %										
Private employment growth = 0.75% (GDP growth = 2.35%)			31		31.6	31.9	30.9	29.6	28.2	26.9
Private employment growth = 0% (GDP growth = 2.26%)			31		31.6	31.7	30.8	29.5	28.1	26.8
Equilibrium Contribution Rate %										
Private employment growth = 0.75% (GDP growth = 2.35%)			15.2		17	19.2	22.2	25.1	25.1	23.6
Private employment growth = 0% (GDP growth = 2.26%)			15.2		16.9	19.4	22.9	25.7	25.4	23.9
Pension expenditure / GDP %										
Private employment growth = 0.75% (GDP growth = 2.35%)			10.5		11.6	12.3	14	15.7	15.7	14.7
Private employment growth = 0% (GDP growth = 2.26%)			10.5		11.9	13.4	15.4	16.7	16.5	15.6
Pension Schemes for Public Sector Employees	1987	1988	1991	1995	2000	2010	2020	2030	2040	2050
5. Delville et al. (<i>Administration des Pensions</i>)⁽⁴⁾, 1995										
Baseline Scenario ⁽⁵⁾										
Dependency Ratio (Number of Pensioners / Number of Workers) %				45.6		69.4			100	
Equilibrium Contribution Rate ⁽⁶⁾ %				32.5	36.3	47.4	61	65.5	64.5	
Equilibrium Contribution Rate ⁽⁷⁾ in alternative scenarios:										
Lower employment (-10% after 10 years)				32.6	37.6	50.3	64.3	67	64.6	
Higher employment (+10% after 10 years)				32.3	34	42.3	55.2	61.8	64.9	
Higher wage growth (1.75% / 2 years)				32.5	36.4	47.4	61	65.6	64.7	
No wage growth				32.5	36.3	47.3	61.1	65.5	64.4	
No pension indexation				32.5	35	44	55.8	58.6	56.8	
Higher wage growth (1.75% yearly) and no pension indexation				32.5	33.3	39.9	49.3	50.3	48.1	
Higher retirement age (+ 2 years)				30.7	27.7	33.2	45.7	52.7	48.2	
Higher retirement age, higher employment (+10% after 10 years), higher wage growth (1.75% yearly) and no pensions indexation				30.6	23.7	25	34	38.9	36.8	

1) The Social Security System comprises all the contributory schemes for the employed and self-employed in both the private and the public sectors.

2) The data reported in the table are quoted from an updated version of the paper prepared in October 1994.

3) Number of people aged 65 and over / Number of people between 15 and 64.

4) All data refer to the public sector employees. Data attributed to the year 1995 actually refer to the year 1994.

5) Based on constant employment, a 1.5% wage growth every two years and wage indexation.

6) Computed as the ratio of total pension expenditure on total wage expenditure. (See Table p. 22).

7) Computed as the ratio of total pension expenditure on total wage expenditure. (See Tables pp. 31, 35, 38, 43, 46, 49, 53, 57).

DENMARK

Table II.3

Public Welfare System	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
1. Jensen and Nielsen, 1995a											
Old-age dependency ratio ⁽¹⁾ %	26	25	24	25	27	30	32	33	35		
Government expenditure for the elderly / GNP											
a) Wage indexation											
Low fertility scenario			11		11.8		14		16.4		
Medium fertility scenario	11.3		11		11.8		13.8		15.6		
High-fertility scenario			11		11.8		13.7		15		
b) Price indexation											
Low fertility scenario			9.8		9.5		10.2		10.8		
Medium fertility scenario	11.3		9.8		9.5		10		10.3		
High-fertility scenario			9.8		9.5		10		9.9		
Government expenditure for the elderly / GNP % in case of a further decrease in the retirement age											
a) Wage indexation											
Low fertility scenario			11.2		12.3		14.7		17.5		
Medium fertility scenario	11.3		21.3		12.3		14.4		16.6		
High-fertility scenario			11.2		12.3		14.3		15.9		
b) Price indexation											
Low fertility scenario			10		9.8		10.6		11.3		
Medium fertility scenario	11.3		10		9.8		10.4		10.7		
High-fertility scenario			10		9.8		10.3		10.3		
2. Jensen and Nielsen, 1995b											
Old-age social security implicit tax rate %											
a) Wage indexation		11	10.7	10.7	11.4	12.6	13.3	13.9	14.8		
b) Price indexation											
Labour productivity growth = 1%		11	10	9.5	9.7	10.1	10.1	10.1	10.3		
Labour productivity growth = 2%		11	9.3	8.5	8.2	8.2	7.8	7.4	7.1		
c) Compromise scenario (wage indexation for transfers; expenditure for social services growing as wages - 1 per cent p. a.)		11	10.4	10.3	10.8	11.8	12.2	12.6	13.2		
3. Ministry of Finance, 1995⁽²⁾											
a) 1994 Population Projection											
Old-age Dependency Ratio ⁽³⁾ %		33.6	33.5	36.2	40.6	42.3	43.9	46.5	49.5		
Government expenditure for the elderly / GDP %											
Before tax		13.1	13	13.7	15.1	15.7	16.2	17.2	18.3		
After tax		10.9		11.4					15.1		
Pension expenditure for the elderly / GDP %		9.3	9.2	9.8	10.9	11.4	11.7	12.3	13		
b) 1995 Population Projection											
Governm. expend. for the elderly / GDP % - Before Tax		13.1	13	13.7	15	15.6	16.1	16.9	17.8	18.4	18
Pension expenditure for the elderly / GDP %		9.3	9.2	9.8	10.9	11.3	11.6	12.1	12.7	13	12.7

1) Number of people aged 65 and over / Number of people between 20 and 64.

2) Integrated with data provided directly by the Ministry of Finance in September 1995

3) Number of people aged 60 and over / Number of people between 18 and 59.

55a

II.4 FINLAND

The Finnish pension system is based on two tiers: a) the National Pension Scheme (NPS) securing a basic flat-rate minimum pension to all elderly citizens and a means-tested component to low-income elderly, disabled and survivors; b) an earnings-related occupational pension scheme.⁹⁴

In 1994 employment pensions represented 68 per cent of total pension expenditure. The rise in the replacement ratio due to the maturing of employment pension schemes will increase this share and lower the share of basic pensions. It has been estimated that by the year 2000 employment pensions will represent 75 per cent of total pensions.⁹⁵

Falling birth rates since the 1970s and increased longevity have reduced the growth of the Finnish population and changed its age composition. This process has been more acute than in most other OECD countries. According to national projections⁹⁶, these trends are expected to continue over the next 35 years: the old-age dependency ratio is bound to increase substantially. The old-age dependency ratio is expected to increase from the actual 22 per cent to about 43 per cent in 2030, with a very high rise in the number of "old" pensioners (aged over 75 years) after the year 2020. Effects on pension expenditure will be relevant in the second part of the next decade, when people from the post-war "baby boom" generation enter the age bracket relevant for early retirement.⁹⁷

Furthermore, although the overall labour force participation ratio is relatively high in Finland, participation among men aged 55 to 64 currently ranks among the lowest in the OECD area and has declined fairly rapidly in recent years: nowadays nine out of ten retire before the statutory pensionable age of 65 and the average retirement age is 58 years in Finland.

The pressures on pension schemes might be reduced by an increase in employment. In spite of the high overall participation rate (reflecting a high full-time participation ratio among women),⁹⁸ domestic reserves of potential labour force are still relevant, since the unemployment rate reaches 17 per cent.

⁹⁴ For a description of the system see OECD (1992b, 1995c) and Central Pension Security Institute (1994). Detailed statistics concerning the pension system are reported in Central Pension Security Institute - Social Insurance Institution (1994).

⁹⁵ See Tuukkanen (1995a).

⁹⁶ See Ministry of Social Affairs and Health (1994).

⁶⁹ See OECD (1995c).

⁹⁸ See OECD (1992b).

In 1991 the Ministry of Social Affairs and Health⁹⁹ projected an increase in the share of pension benefits in GDP from 10,1 per cent in 1990 to 13,3 per cent in 2010 and 18,5 in 2030 (Table II.4, point 1). The sharp recession of the early 1990s negatively affected this outlook. After the steady increase of the 1980s, the share of public welfare expenditure in GDP rose dramatically by an additional 10 percentage points. Pension expenditure largely contributed to this trend: in 1994 it represented about 14 per cent of GDP. The increase in pension expenditure expected after the turn of the century has actually occurred in the early 1990s.

The high and rising pension burden is also related to a number of problems inherent in the functioning of the system, such as weak eligibility conditions, disincentives through welfare dependency, and the lack of incentives to control spending.¹⁰⁰

A number of reforms were considered in order to relieve future pressures. In 1992 two committees appointed within the Ministry of Social Affairs and Health made several reform proposals. One of the committees suggested that the average retirement age should be gradually increased from 58 to 61 years by 2020. The increase should be achieved through measures such as the abolition of the lower retirement age of the public sector employees and the reform of the early retirement schemes. Additional measures were proposed to contain the growth of future pension payments, notably by changing the indexation procedures of benefits. Proposals from the other committee, dealing with the funding issue, were essentially designed to smooth the increase in contribution rates by raising the funding rate up to 2010; after that, funds would be gradually depleted. The ratio of occupational pension benefits to the wage bill, expected to increase from 10 per cent in 1991 to 25 per cent in 2010 and 40 per cent in 2030, would have reached only 32 per cent. The proposals concerning the financing would have contributed in stabilising at 25 per cent the ratio of occupational pension contribution to the wage bill; the ratio was otherwise expected to increase from 17 per cent in 1990 to about 25 per cent in 2010 and over 35 per cent from 2030.¹⁰¹

Several of the proposed reforms have recently been introduced. The most significant measures are the following:

- a) public-sector pension benefits were reduced to the levels applying to private sector workers;
- b) effective in 1994, the minimum age for early disability retirement was raised from 55 to 58 years;
- c) the minimum age for entitlement to an unemployment pension was raised in several steps after 1986 from 55 to 60 years;
- d) other eligibility requirements were tightened with effect from 1994;

⁹⁹ As reported in OECD (1992b).

¹⁰⁰ See OECD (1995c).

¹⁰¹ See OECD (1992b).

- e) employees' contribution to employment pension schemes were introduced; pension indexation is to be based on the dynamics of prices and of wages net of contributions;
- f) in 1993 the old-age retirement age for public sector workers was raised from 63 to 65 years, the same age that applies in the private sector.

In spite of these reforms, future pension expenditure trends are still not reassuring. The latest report from the Committee on Social Expenditure of the Ministry of Social Affairs and Health evaluates the large potential cost pressures arising from the demographic shock.¹⁰² According to its projections¹⁰³, in the period 1994-2010 the share of pension expenditure on GDP will increase by 0.6 to 3.9 percentage points. It would reach 15.2 per cent in the rapid growth scenario, 17.3 per cent in the baseline scenario or 18.9 per cent in the slow growth scenario, depending on different assumptions concerning labour productivity, unemployment rate, real GDP growth and real wage growth (Table II.4, point 2).¹⁰⁴ By the year 2030 pension expenditure is expected to reach respectively 17.7 per cent, 18.8 per cent and 19.6 per cent. Over the period 1994-2030 it will increase by 3.1 to 4.6 percentage points.¹⁰⁵

Since the employment pension scheme is partly funded, contribution increases will not equal pension expenditure increases. The increase in the ratio of contributions to GDP will actually be less steep than the increase in the expenditure to GDP ratio. In the period 1994-2010 the contribution ratio will increase by 0.3 to 2.1 percentage points. Over the period 1994-2030 it will increase by 2.0 to 3.1 points.

OECD (1995c) assessed the long-term implications of welfare spending on Finland's fiscal position. While showing the unsustainable debt dynamics associated with the expansion of pension expenditure,¹⁰⁶ it concluded that the welfare system reforms implemented so far are largely insufficient to contain the rising trends in welfare expenditure.

¹⁰² See Ministry of Social Affairs and Health (1994).

¹⁰³ The projections carried out by the Committee are based on estimates of the ratio of pension expenditure to GDP in 1994 which were higher than the actual outcome (as indicated by the Government Institute for Economic Research in September 1995): 14.6 to 15 per cent (in the different scenarios) as against 14 per cent. The difference is due to the higher than expected GDP growth and to the 0.5 per cent cut in benefits indexation implemented in 1994.

¹⁰⁴ In the baseline scenario, average GDP growth in the period 1994-2030 is 1.8 per cent; the unemployment rate declines from 19 per cent in 1994 to 13.9 in the next decade and to 7.4 and 5.1 in the following two decades. In the rapid growth scenario, GDP growth is 0.5 per cent higher and unemployment declines to 8.9 per cent in the next decade and to 5.1 in the following two decades. In the slow growth scenario, GDP growth is 0.5 per cent lower than in the baseline; unemployment is 17.8 per cent in the next decade and 11.1 and 5.8 in the following two decades.

¹⁰⁵ As already pointed out, the projections are based on a ratio of pension expenditure to GDP in 1994 which was higher than the actual outcome.

¹⁰⁶ See OECD (1995c).

The Committee on Social Expenditure suggested some further changes in the Finnish pension system and estimated their effects in the event of immediate implementation. The following measures were considered:

- a) Increasing retirement age, either by increasing the minimum retirement age or by incentive measures (this measure would decrease social expenditure by 0.6 per cent of GDP in 2000 and by 2.1 per cent in 2030).
- b) Abolishing the adjustments of pension benefits to real wage increases (with effects respectively estimated at 0.3 and 1.4 per cent of GDP).
- c) Limiting the maximum of pensionable time between the pension contingency and retirement age (65) to 35 years instead of 40 years, (0.3 and 1.1 per cent).
- d) Basing the pensions on the whole wage history rather than on the last 4 years of employment (0.1 and 0.8 per cent).
- e) Lowering the annual accruing rate of pension rights from 1.5 per cent of reference wage to 1.25 (0.1 and 1.6 per cent).

These measures, in combination with further cuts in health care and social services expenditure, could reduce total future spending by around 2.5 per cent of GDP in the year 2000 and 6.5 per cent of GDP in 2030.¹⁰⁷

On 18 May 1995, the social partners reached an agreement on the reforms of the employment pension schemes and of the national pension scheme.¹⁰⁸ Parliament was expected to enact on the basis of the agreement; reforms were expected to take effect at the beginning of 1996. The main aspects of the reform concerning employment pension schemes are the following:

- a) The pensionable wage will be calculated on the basis of the last 10 years' earnings, instead of the present 4 years'.¹⁰⁹
- b) The indexation system of occupational pensions paid after the age of 65 will be modified; the present index (mean of the consumer price index - with 0.5 weight - and the wage index - 0.5 weight) will be substituted by a new index where the weight of the price component is 0.8 and the weight of the wage component is 0.2; increases in contributions paid by employees will be deducted from the wage component of the index.
- c) The pensions paid to workers taking early retirement will be lowered.

The main aspects of the reform concerning the national pension schemes are the following:

¹⁰⁷ The cost effects of the measures are calculated in the baseline scenario.

¹⁰⁸ The following part largely draws on Tuukkanen (1995b).

¹⁰⁹ Both the new ten-year rule for pensionable wage and the present four-year are applied to each separate job.

- d) All benefits will be means-tested (at present, there is a flat-rate component and a means-tested component). Pensioners presently receiving the means-tested part will not suffer any loss. Those receiving only the flat-rate part will lose part of the benefit. As the national pension is means-tested against the employment pension benefits, losses will depend on the amount of the latter. If the employment pension benefit is high enough, the pensioner will lose his/her national pension benefit totally. The reform will be implemented gradually: the adjustment of existing pensions will be achieved by suspending indexation.

In the long-term, the reforms are expected to reduce pension expenditure by about 2 percentage points of GDP. It is also expected to reduce from 2 percentage points to 0.6 points the increase in the employment contribution rate projected for 1996.

Table II.4

FINLAND

Statutory Pension System ⁽¹⁾	1990	1994	1995	2000	2005	2010	2015	2020	2025	2030	2035
1. Ministry of Social Affairs and Health⁽²⁾, 1991 Pension Benefits / GDP %	10.1			11.1		13.3		16.4		18.5	
2. Social Expenditure Committee⁽³⁾, Ministry of Social Affairs and Health, 1994											
a) Old-age Dependency Ratio ⁽⁴⁾ %	21		23	24	25	27	33	37		43	
b) Number of pensioners (000's) ⁽⁵⁾	1020		1074	1110	1190	1294	1394	1448	1469	1460	1410
c) Number of people of working age (000's) ⁽⁶⁾	3296		3335	3371	3376	3354	3218	3102	3006	2918	2862
d) Dependency Ratio (b/c) %	30.9		32.2	32.9	35.2	38.6	43.3	46.7	48.9	50	49.3
e) Transfer Ratio %	42.2		51.6	54.3	55.8	60.4	59.9	59.3	59.9	58.8	59
f) Total Pension Expenditure (bill FIM)	57.2		75.5	87.2	101	122	139	153	166	177	185
g) Wage bill (bill FIM) ⁽⁷⁾	228		233	265	290	319	352	368	384	404	426
h) Implicit equilibrium rate of taxation (f/g)	25.1		32.4	32.9	34.8	38.2	39.5	41.6	43.2	43.8	43.4
i) Pension Benefits / GDP %											
Baseline scenario (GDP growth = 1.2 to 2.7% ⁽⁸⁾)	11.1	14.8	14.9	15	15.7	17.3	17.8	18.1	18.6	18.8	
Rapid growth scenario (GDP growth = 1.5 to 3.8% ⁽⁸⁾)	11.1	14.6	14.5	13.9	14	15.2	16.5	17.2	17.6	17.7	
Slow growth scenario (GDP growth = 1.1 to 1.5% ⁽⁸⁾)	11.1	15	15.2	16.1	17	18.9	19.5	19.5	19.6	19.6	
j) Contributions / GDP %											
Baseline scenario (GDP growth = 1.2 to 2.7% ⁽⁸⁾)	13	14.8	17.3	16.1	16.2	16.6	16.9	16.8	17.2	17.4	
Rapid growth scenario (GDP growth = 1.5 to 3.8% ⁽⁸⁾)	13	14.7	16.8	15.2	17.8	15	15.8	16.2	16.5	16.7	
Slow growth scenario (GDP growth = 1.1 to 1.5% ⁽⁸⁾)	13	15.1	17.8	17.3	17.5	18	18.4	18.3	18.2	18.2	
3. Eurostat, 1995 Old-Age Dependency Ratio %			21.4	22	23	25.1	30.6	27.2			

1) Statutory Pension System comprises the National Pension Scheme and the private and public sectors occupational pension schemes.

2) As reported in OECD (1992b).

3) *Komiteanmietinto*.

4) Number of people aged 65 and over / Number of people between 20 and 64. As reported in the diagram 22 on page 70 of OECD (1995a). The data attributed to the year 1990 actually refers to the year 1992.

5) Recipients of National Pension in their own right.

6) Population from 16 to 64 years.

7) Including pensionable income of self-employed workers.

8) Data refer to years from 1996 onwards.

II.5 FRANCE

The French pension system comprises more than 500 PAYG schemes (about 120 basic schemes and about 400 supplementary ones).¹¹⁰ Contribution rates, retirement age, and formulae for calculating pensions may change substantially among the different schemes.

Private sector employees have a two-tier system: the first tier consists of the "general scheme" (*régime général*, which pays about a third of total pension benefits¹¹¹) and of the scheme for farm-employees; the second tier comprises many supplementary occupational schemes. For some groups of employees there is also a third tier; some companies and some supplementary schemes also provide optional supplementary schemes (*régimes surcomplémentaires*), which are usually funded. Self-employed workers are covered by an occupational basic pension scheme and sometimes also by a supplementary one. Public sector employees are covered by different "special schemes",¹¹² that provide a single pension corresponding both to basic and supplementary cover. Citizens aged 65 and over without adequate income are paid a pension by a special public fund.¹¹³ This fund also supplements pensions up to a minimum level.

The French pension system is characterised by a relatively high number of pensions paid. This is due to the low retirement age, to the two or three tier system, and to the limited contribution requirement for pension entitlement. "A retiree who has worked the required number of years receives on average a pension from 2.8 schemes, 1.5 from a basic scheme and 1.3 from a supplementary scheme." (OECD, 1994d, p. 81).

Pension expenditure has risen from 5 per cent of GDP in 1960 to more than 12 per cent in 1991.¹¹⁴ Up to the early 1980s expenditure growth was mainly due to Government's policy of uprating pensions.¹¹⁵ In the following decade it was mainly due to a large increase in the number of retirees.¹¹⁶ The lowering of retirement age from 65 to 60¹¹⁷,

¹¹⁰ For a description of the French pension system see Government of France (1991), André and Saillard (1994), and more concisely, OECD (1994d).

¹¹¹ Government of France (1991, p. 178).

¹¹² There are more than 100 special schemes, among which 78 are already closed (i.e., no new members are enrolled).

¹¹³ *Fonds de Solidarité Vieillesse*, constituted within the 1993 Reform. The '*minimum vieillesse*' (i.e., the minimum income for elderly citizens) was previously paid by the *Fonds National de Solidarité*.

¹¹⁴ See OECD (1994d).

¹¹⁵ In 1971 the maximum basic pension was raised from 40 to 50 per cent of referment income. From the same year referment income was calculated on the ten best-paid years rather than on the final ten years. The minimum pension was substantially raised in 1974 and 1981.

¹¹⁶ See OECD (1994d).

and the introduction of early retirement provisions for unemployed workers largely contributed to this trend. Government of France (1991) and General Planning Committee (1995) stress that by the early 1990s the average standard of living of retirees, having improved significantly during the 1970s and 1980s, had reached that of the workers.

In the 1980s and the early 1990s pension expenditure has been giving cause for concern both for the short term budgetary pressures and for the long-term prospects. It was widely recognised that contribution rates were already relatively high and that they could not be raised to much higher levels in order to fund the expected increase in expenditure. The outlook for the pension system and the reforms to be implemented have been the subject of debate for many years.¹¹⁸ Up to 1993, however, no major reform had been introduced. Efforts to reform the system have been hampered by its complexity.

Cost containment was achieved by modifying pension indexation: adjustments based on gross wages dynamics were first substituted with adjustments related to wages net of social insurance contributions (1982) and then to expected price dynamics (1987). In some years, due to an underestimation of inflation and to the lack of a catch-up rule, pensioners actually suffered purchasing-power losses.¹¹⁹

In 1991 the state and the prospects of the pension system were examined in a "White Paper" aimed at stimulating the debate on pension reform.¹²⁰ The document is based on long-term projections of total pension expenditure.¹²¹ The main indicator for evaluating the future of the pension system is the ratio of pension expenditure on gross earned income (i.e., the contribution rate that would cover all pension expenditure - about 19 per cent in 1990). Eight different projections are considered depending on assumptions concerning demography, the participation rate of older workers and the unemployment rate.¹²²

- a) Demography¹²³. Two scenarios are considered: a) the total fertility rate remains stable at its current level (1.8 children per woman); b) the total fertility rate gradually reaches 2.1. In both cases mortality keeps declining up to the year 2000 and then stabilises and there is no net migration. Over the whole period 1990-2040,

117 The retirement age was lowered in 1983 for private employees, in 1984 for independent tradesmen and shopkeepers, and in the following years for farmers.

118 See Saint-Etienne (1988), Verniere (1990a, 1990b), Cazes et al. (1992), Andréé and Saillard (1994).

119 See OECD (1992a).

120 See Government of France (1991). The *Livre blanc sur les retraites* was drafted by a working group coordinated by the *Commissariat Général du Plan* and involving several ministries.

121 The projections were based on the MARGARET model developed at the *Direction de la Prévision* of Ministry of Finance. See Verniere (1990a, 1990b).

122 In all scenarios real wage growth is assumed to be at a level of 2%.

123 The demographic projections of the White Paper refer to the estimates produced by INSEE (*Institut National de la Statistique et des Études Économiques*) in 1986.

in the first scenario the ratio of population aged 60 and over to population aged between 15 and 59 increases from 31.4 to 55.3 per cent. In the second it increases to 47.5 per cent.

- b) Participation rate. The rate concerning citizens aged between 55 and 64 is supposed to be stable up to 2010 and then either a) stable again or b) gradually increasing towards the 1975 level.
- c) Unemployment rate. Two scenarios are considered: a) the unemployment rate declines from 9.2 per cent to 8 per cent in period 2005-2010 and to 6 per cent after 2030, b) it declines faster to 4.5 per cent in 2005-2010 and 3 per cent from 2030.

As to the transfer ratio, since new pensioners are retiring with longer contribution periods and can claim higher benefits than can older pensioners, it is assumed that it will keep increasing up to the year 2040. The ratio of average expenditure per inactive citizen aged 60 or over to average gross income per worker contributing to the system increases from 41 per cent in 1990, to 48 per cent in 2010 and 54 per cent in 2040 (Table II.5a, point 1). Therefore pensioners' living standards are going to overcome workers' standards. Even within a favourable economic and demographic scenario and starting from the actual global parity of workers' and pensioners' living standards, the net transfer ratio in the most extreme case would end up providing pensioners with an average purchasing power nearly double that of the workers.¹²⁴

In all scenarios the contribution rate that would fully fund pension expenditure increases by about 3 points up to the year 2005. Afterwards, with the baby boom generation gradually retiring, the contribution rate increases much faster and the scenarios diverge noticeably. In 2015 the rate ranges between 27 and 30 per cent. In 2040 it ranges between 31 and 42 per cent. Both the dependency and the transfer ratios contribute to raising expenditure. Even in the most favourable circumstances, pension expenditure would put enormous pressures on social contributions or general taxation.

The following changes are suggested for the general scheme.

- a) Pensions should be adjusted to price dynamics or to the dynamics of wages net of social security contributions.
- b) Pensions should be calculated on the basis of the average of the 25 best annual salaries.
- c) The number of years required for the payment of a full pension should be gradually raised from 37.5 to 41-42 years.

According to the White Paper, the indexation of pension to price dynamics and the other changes considered would have allowed the equilibrium contribution rate to remain stable up to 2010, rather than increasing by 7.5 percentage points.¹²⁵

¹²⁴ According to Government of France (1991, p. 109) "the equity between the generations would no longer be assured".

¹²⁵ See table F, p. 160.

In July 1993 some reforms were decided following the guidelines indicated in the White Paper. The reforms aimed at "preserving the fundamental rights of the individuals insured and the solidarity mechanisms, and at guaranteeing the equity between the generations called to share the strain of old-age insurance expenditure"¹²⁶. The reform mainly affected the basic pension schemes (accounting for 42 per cent of total pension expenditure in 1992).¹²⁷

- a) Pension adjustments are to be based on price dynamics rather than on wage dynamics.¹²⁸
- b) Basic pensions are to be calculated on the 25 best-paid years. The transition from 10 to 25 years will take place gradually up to the year 2007. This reform will link more closely contributions and benefits.
- c) The number of years required for the payment of a full pension is to be gradually raised from 37.5 to 40.
- d) A new *Fonds de Solidarité Vieillesse* was created in order to transfer from the pension schemes to the central Government the responsibility for welfare pension expenditure.

In 1993 the Actuarial of the CNAV¹²⁹ carried out some projections of the consequences of the reform on pension expenditure.¹³⁰ Two different economic scenarios were considered, a favourable one and an unfavourable one. In the first, the equilibrium contribution rate was projected to increase from around 18 per cent at the moment of the reform, to 24.5 per cent in 2010 if the reform was not considered, 22.5 per cent if the reform measures were considered but not the price indexation of pensions, and to 19 per cent if price indexation was also considered (Table II.5, point 2). In the unfavourable economic scenario, the projected rates for 2010 were respectively 28.3, 26 and 23.2 per cent. Price-indexation accounts of most of the reduction in expenditure. The rise of expenditure is particularly high between 2005 and 2010. The comparison between the projections in the two scenarios shows how economic growth influences the ratio of pension expenditure to GDP.

In 1995 the General Planning Committee¹³¹ updated the 1991 projections of the White Paper taking the effects of the 1993 Reform into consideration. The new projections are based on rather less optimistic assumptions than those of the White Paper.

¹²⁶ As reported in *Commissariat Général du Plan* (1995, p. 11).

¹²⁷ OECD (1994d).

¹²⁸ Pensions were actually indexed to prices since 1987. Wage indexation was suspended on a yearly basis.

¹²⁹ *Caisse Nationale pour l'Assurance Vieillesse*.

¹³⁰ See Ruellan (1993).

¹³¹ *Commissariat Général du Plan*. The study was carried out by an inter-administrative working group chaired by Raoul Briet.

- a) Demography. The new demographic projections carried out by INSEE in 1992 (on the basis of the 1990 census) are much more alarming than the older ones. The following scenarios are considered: a) total fertility rate remains stable at its current level (1.8); b) total fertility rate gradually decreases to 1.5. In both scenarios the mortality rate keeps declining until 2050; a net inflow of 50,000 persons per year is also projected. In the first scenario, the old-age dependency ratio increases from 31 per cent in 1990 to 39 in 2010 and to 63 in 2040.
- b) Participation rate. Three scenarios are considered: a) the participation rate continues to decline (this assumption is included in the "main scenario"); b) a further increase in women participation rates is allowed (leading to a higher participation ratio than in the main scenario); c) a further decrease in the participation rate of young generations is allowed (leading to a lower participation ratio than in the main scenario).
- c) Macroeconomic scenarios. Several different scenarios are considered on the basis of different assumptions concerning the unemployment rate and productivity growth. The "main scenario" assumes a constant total factors productivity growth of 1.5 per cent and a small decrease in the unemployment rate to the "structural rate" assumed at 8.5 per cent.

If the effects of the 1993 Reform are not taken into consideration, in the main scenario the equilibrium contribution rate would increase from 18.9 per cent in 1990 to 32 per cent in 2020 and 48 per cent in 2040. In the final year the rate would be 6 per cent higher than in the most pessimistic scenario of the 1993 White Paper. This is due to a greater increase in the dependency ratio: the ratio based on the most unfavourable scenario of the White Paper is similar to that based on the most favourable scenario of the new projections. The gross transfer ratio would not change. Because of the increase in the equilibrium contribution rate, the net transfer ratio would increase from 40.6 per cent in 1990 to 104.3 per cent in 2040 (as against 90.7 per cent predicted in the White Paper).

The 1993 Reform improves the financial situation of the *Régime Général*. According to General Planning Committee (1995), under the macroeconomic assumptions of the White Paper, price indexation and the new rules for the assessment of pensions are expected to reduce pension expenditure by 26 per cent in the year 2010. The transfer of part of total outlays from the *Régime Général* to the State accounts (through the constitution of the '*Fonds de Solidarité Vieillesse*') is expected to decrease the burden by a further six percentage points.¹³² Taking the updated macroeconomic scenario into consideration, the reform would maintain the financial deficit of the *Régime Général* stable up to the year 2005.¹³³

¹³² In 2010 the reduction in the outlays of the *Régime Général* is estimated as 202 billion of 1993 Francs, of which 17.8 per cent is attained through the new pension calculation rules, 63.4 through price indexation and 18.8 per cent through the institution of the '*Fonds de Solidarité Vieillesse*'. See General Planning Committee (1995), Table 37, p. 129.

¹³³ The deficit, expressed in terms of the total taxable wages, is estimated as 1.7 per cent in 1993, 0.9 per cent in 2005 and 4.3 per cent 2015. See Government of France (1991), p. 132.

If the fictional single pension scheme representing all basic and supplementary French pension schemes is taken into consideration, the equilibrium contribution rate would be decreased by the reform by 4 percentage points in 2015 and 7.2 percentage points in 2040. The increase in the dependency ratio is not expected to be affected by the reform, since very limited effects are expected on the choice of retirement age. The reform reduces only the tendential increase in the transfer ratio. The ratio of average expenditure per inactive citizen aged 60 and over to average income per worker paying contributions to the system is estimated to rise from 40.6 per cent in 1990 to 46.1 per cent in 2040. By the year 2040, the equilibrium contribution rate would increase by more than 20 points, reaching 40.8 per cent. In spite of the improvements due to the reform measures, by the year 2040 the equilibrium contribution rate would still be very high (p. 76). The ratio of pensioners' incomes, considered to be equitable in the early 1990s, would become "inequitable" (p. 77).

The General Planning Committee has also carried out some projections on the basis of an hypothetical extension of the 1993 reforms to all the schemes. The equilibrium contribution rate is expected to increase by 5 percentage points by 2015 and 14 points by the year 2040 (which is respectively 4 and 6 points less than in the main scenario considered above). In this case the net transfer ratio would increase much less than in the previous case. It would remain constant until 2015; thereafter, it would increase up to 57.2 per cent by the year 2040.

OECD (1995, p. 41) estimates that the 1993 Reform would keep the general pension scheme close to balance until 2010. Thereafter the increase in the number of the elderly and the fall in the working age population would lead to a "rapid erosion of the financial soundness of the pension system": without further measures it could move from close to balance in 2010 to a deficit of 4 per cent of GDP in 2030 (Table II.5b, point 4). OECD considers several policy options that could limit the rise in the future deficit of the pension system. More specifically, the following 3 measures could reduce the deficit of the pension system by 3.8 percentage points of GDP:

- a) An increase in retirement age by 5 years.
- b) An increase in the contribution rates by 3 percentage points on top of the current rates.
- c) A decrease in the transfer ratio by more than 10 per cent.¹³⁴

Both the General Planning Committee (1995) and OECD (1995) focus on the difference between the private sector pension schemes (the *Régime Général* and some other minor schemes) and the special old-age pension schemes which have not yet been reformed. The cost of the latter schemes, which apply to civil servants and to employees of most state-owned companies, is increasing fast. This also raises problems of fairness - particularly as private sector employees will see the rate of return on their pensions

¹³⁴ Levy (1995a) examines the possibility of increasing the role of funded pension schemes in France. He points out that the "increasing use of life insurance instruments and company-sponsored funds in France suggests that French households may be inclined to a greater reliance on financial savings as a source of retirement income". OECD (1995) also stresses this point.

decline between now and 2014. The General Planning Committee (1995, p. 147) points to "an intra-generational iniquity between private sector employees, who will have a moderate progression in their average pension, and the pensioners of the special schemes, who will continue to have important progressions in their average pensions".

FRANCE I ⁽¹⁾

	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
1. Government of France (<i>Livre Blanc</i>)⁽²⁾, 1991											
Old-age Dependency Ratio ⁽³⁾ %											
Low fertility scenario (TFR=1.8)	31.4	33.1	33.7	33.9	37.7		45.6				55.3
High fertility scenario (TFR=2.1)	31.4	33.1	33.7	33.6	37		43.3				47.5
Equilibrium Contribution Rate (Pension Expenditure / Gross Earned Income) %											
a) Low fertility scenario (TFR=1.8)											
Stable participation rate 55-64 and small unemployment decrease ⁽⁴⁾	18.9	19.8	21.1	22.2	26.2	30	33.4	36.7	39.4	41.7	41.9
Stable participation rate 55-64 and large unemployment decrease ⁽⁴⁾	18.9	19.6	20.7	21.5	25.1	28.9	32.1	35.4	38	40.3	40.5
Rising participation rate 55-64 ⁽⁵⁾ and small unemployment decrease ⁽⁴⁾	18.9	19.8	21.1	22.2	25.5	28.4	31	33.3	35.1	36.4	36.3
Rising participation rate 55-64 ⁽⁵⁾ and large unemployment decrease ⁽⁴⁾	18.9	19.6	20.7	21.5	24.4	27.5	29.9	32.2	33.9	35.2	35.1
b) High fertility scenario (TFR=2.1)											
Stable participation rate 55-64 and small unemployment decrease ⁽⁴⁾	18.9	19.8	21.1	22.2	26	29.4	32.2	34.6	36.4	37.6	36.7
Stable participation rate 55-64 and large unemployment decrease ⁽⁴⁾	18.9	19.6	20.7	21.5	25	28.4	31	33.4	35.1	36.2	35.4
Rising participation rate 55-64 ⁽⁵⁾ and small unemployment decrease ⁽⁴⁾	18.9	19.8	21.1	22.2	25.3	27.9	29.9	31.5	32.5	33	32
Rising participation rate 55-64 ⁽⁵⁾ and large unemployment decrease ⁽⁴⁾	18.9	19.6	20.7	21.5	24.3	26.9	28.9	30.5	31.4	31.9	30.9
Scenario with low fertility, stable participation rate 55-64 and large unemployment decrease											
Dependency Ratio ⁽⁶⁾ %	46.5		47	47	52		62.3				74.9
Implicit Gross Transfer Ratio ⁽⁷⁾ %	40.6		43.9		48.2		51.6		53.2		54
Implicit Net Transfer Ratio ⁽⁸⁾ %	50.1		55.3		64.9		76.1		85.9		90.7
2. National Old-Age Insurance Fund (CNAV)⁽⁹⁾, 1993											
a) Before the 1993 Reform											
Equilibrium Contribution Rate ⁽¹⁰⁾ %											
Employment growth = 1% p.a., real wage growth = 1,5 % p.a.		18.5	20.2	21.6	24.5						
Employment growth = 0% p.a., real wage growth = 1 % p.a.		18.3	21.1	23.8	28.3						
b) After the 1993 Reform											
Equilibrium Contribution Rate ⁽¹⁰⁾ %											
Employment growth = 1% p.a., real wage growth = 1,5 % p.a., wage-indexation		18.4	19.8	20.6	22.5						
Employment growth = 1% p.a., real wage growth = 1,5 % p.a., price-indexation		18	18.3	18.3	19						
Employment growth = 0% p.a., real wage growth = 1 % p.a., wage-indexation		18.3	20.6	22.6	26						
Employment growth = 0% p.a., real wage growth = 1 % p.a., price-indexation		18	19.5	20.8	23.2						

1) Government of France (1991) refers to a fictional single pension scheme representing all basic and supplementary French pension schemes.

National Old-Age Insurance Fund (1993) refers to the *Régime Général*. This scheme does not comprise the public sector employees and some other special categories (as the self-employed workers).

2) Total gross wage growth = 2% p.a.

3) Number of people aged 60 and over / Number of people between 15 and 59. Computed from Tableau 1, page 77. The data concerning 1995 have been reported from Eurostat (1994).

4) Small unemployment decrease: Unemployment rate down from 9.2 per cent to 8 per cent in 2005-2010 and 6 per cent from 2030.

Large unemployment decrease: Unemployment rate down from 9.2 per cent to 4.5 per cent in 2005-2010 and 3 per cent from 2030.

5) Participation Rate of 55-64: stable up to 2005 and rising gradually to 1975 level between 2005 and 2040.

6) Number of inactives aged 60 and over / Number of contributors.

7) Ratio of average expenditure per inactive citizen aged 60 and over to average income per worker paying contributions to the system. Calculated from Table 12 assuming that the value for 1990 = Equilibrium Contribution Rate₁₉₉₀ / Dependency Ratio₁₉₉₀.

8) Ratio of average expenditure per inactive citizen aged 60 and over to average income per worker net of contributions. Calculated from the Implicit Gross Transfer Ratio and the Equilibrium Contribution Rate.

9) *Caisse Nationale pour l'Assurance Vieillesse*. The data are reported in Ruellan (1993).

10) Computed by dividing pension expenditure in 1995 (MDF 290.0) by value of 1 point of contribution in 1995 (MDF 15.7). Other data computed by adding to 18.5 per cent the increase in the contribution rate required to finance expenditure.

Table II.5b

FRANCE II

	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
3. General Planning Committee⁽¹⁾, 1995											
Old-Age Dependency Ratio ⁽²⁾ %	31	33	34	34	39	43	47	52	57	61	63
a) Before the 1993 Reform											
Dependency Ratio ⁽³⁾ %	46.5		49.2	49.6	55.7	62.1	68.7	74.9	82.6	87.7	88.6
Implicit Gross Transfer Ratio ⁽⁴⁾ %	40.6		44.7	46.4	48.5	51.5	52.4	53.4	53.3	53.6	54.2
Implicit Net Transfer Ratio ⁽⁵⁾ %	50.1		57.3	60.3	66.4	75.7	81.8	89	95.1	101.2	104.3
Equilibrium Contribution Rate %	18.9		22	23	27	32	36	40	44	47	48
b) After the 1993 Reform on Régime Général											
Dependency Ratio ⁽³⁾ %	46.5		49.2			62.1					88.5
Implicit Gross Transfer Ratio ⁽⁴⁾ %	40.6		42.5			45.1					46.1
Implicit Net Transfer Ratio ⁽⁵⁾ %	50.1		53.7			62.6					77.9
Equilibrium Contribution Rate %	18.9		20.9			28					40.8
Scenario: extension of 1993 Reform to all schemes											
Dependency Ratio ⁽³⁾ %	46.5		49.3			62.2					88.4
Implicit Gross Transfer Ratio ⁽⁴⁾ %	40.6		40.2			38.6					38
Implicit Net Transfer Ratio ⁽⁵⁾ %	50.1		50.1			50.8					57.2
Equilibrium Contribution Rate %	18.9		19.8			24					33.6

1) *Commissariat Général du Plan*. Data refer to a fictional single pension scheme representing all basic and supplementary French pension schemes. Data reported in this table refer to the main scenario of the study. (Small unemployment decrease, decreasing total participation rate and TFR=1.8).

2) Number of people aged 60 and over / Number of people between 15 and 59. Based on the main scenario (TFR=1.8, decreasing mortality and yearly migrations inflow of 50,000.)

3) Number of inactives aged 60 and over / Number of contributors. Calculated as Equilibrium Contribution Ratio / Gross Transfer Ratio (as defined in footnote 4).

4) Average Pension / Average Gross Income per worker paying contributions to the system. Calculated from Tables 20 and 21 assuming, as in Table 7 of Government of France (1991), that the Dependency Ratio in 1990 is 46.5%.

5) Average Pension / Average Income per worker net of contributions. Calculated from the Implicit Gross Transfer Ratio and the Equilibrium Contribution Rate.

II.6 GERMANY

The German pension system is based on two pillars: the schemes providing basic PAYG pensions to all employees and some self-employed workers, and the occupational schemes providing supplementary pensions to some employees.¹³⁵ Most basic pensions are paid by the "statutory pension insurance", which is by far the most important old-age scheme,¹³⁶ and by the pension scheme for civil servants.

During the eighties the ratio of pension expenditure to GDP declined. The outlook for the German pension system was, however, rather less reassuring.¹³⁷

- a) Retirement age was declining.¹³⁸ The labour participation rate of the 60 to 65 year old men accordingly declined from 72 per cent in 1970 to 33 per cent in 1986.¹³⁹
- b) Life expectancy was increasing. Between 1970-1972 and 1984-1986 life expectancy for 60 year old men and women increased respectively by 1.8 and 2.5 years. Further gains were expected for the following years.
- c) The fertility rate had declined significantly. In 1992 the total fertility rate was down to 1.3.¹⁴⁰

These changes were expected to determine a considerable increase both in the old-age dependency ratio and in the ratio of the number of pensioners to the number of workers: the first was projected to increase from 36 per cent in 1990 to 79 per cent in 2030, the second from 59 to 118 per cent.¹⁴¹ The benefit ratio was also expected to increase. The contribution rate required to cover expenditure was projected to rise from 22.8 per cent in 1990 to 28.7 in 2010. The workers' contribution rate was projected to rise from 18.5 to 24.5 per cent.

135 For a description of the system see Schmäl (1992a), Mayer (1994). For a survey of its recent development see *Deutsche Bundesbank* (1995). For a description of the state and the prospects of West German pension system in the early eighties see Hauser (1982).

136 The statutory pension insurance covers approximately 80 per cent of employees and 70 per cent of expenditure spent on old-age protection.

137 See Federal Ministry of Labour and Social Affairs (1989) and OECD (1989b).

138 While out of the generation born in 1905 3/5 of the males and 2/5 of the females had retired at 65 or over, in the generation born in 1920 only 1/3 of both males and females retired at 65 or over. In just 15 years the normal retirement age of 65 years had become an exception.

139 More generally the labour participation rate of men between 15 and 65 years decreased from 90 per cent in 1970 to 79 per cent in 1986; longer education periods also contributed to this decline. On the contrary, the labour participation rate of women increased from 47 per cent in 1970 to 51 per cent in 1986. It did not reach the levels of France (55 per cent) or the United Kingdom (61 per cent).

140 See European Commission (1994a).

141 See Federal Ministry of Labour and Social Affairs (1989).

The longer term outlook was even more worrying. After 2015 the contribution rate of employers and employees was projected to rise steeply, reaching 28 per cent in 2020 and 36 per cent by the year 2030.¹⁴²

In 1989, in order to restrain expenditure growth, the Government enacted the "1992 Pension Reform Act."¹⁴³ The reform, that was agreed upon by the main opposition party (the SPD), maintained the fundamental features of the German pension system, particularly the payment of PAYG pension related to lifetime earnings and indexed to wages.¹⁴⁴ The reform aimed at spreading the burden of ageing in a "balanced" manner between the workers contributing to the system, the federal state and the retirees. The major changes introduced by the act are the following:

- a) A shift from gross wage dynamics to the dynamics of wages net of contributions and taxes as a reference for pension adjustments; this measure aimed at ensuring a stable relationship between the standard wage and standard pension.
- b) The gradual increase (between the years 2001 and 2012) in the standard retirement age from 63 for men and 60 for women to 65 for both men and women.
- c) The abolition of the present flexible retirement-age schemes¹⁴⁵ and the introduction of a new scheme allowing retirement from age 62 with a penalty on the amount of pension paid (0.3 per cent for each month of anticipated retirement with respect to the standard age of 65); in case retirement takes place after the standard age, the pension is increased by 0.5 per cent for each month, up to a limit of 2 years.¹⁴⁶
- d) The introduction of a so-called "self regulating mechanism": each year the contribution rate is to be set at a level that ensures a cash reserve equal to one month pension expenditure; federal subsidies are to be linked to average net earnings per worker and the contribution rate applying to workers.
- d) The introduction of new rules concerning pension credits for years with limited or null contributions; pension credits for years spent in higher education have been reduced.
- e) The upgrading of pensions for low-income earners.

The reform was expected to reduce the projected total equilibrium contribution rate by about three percentage points: the rate was expected to rise from 23.1 per cent in 1990 to less than 26 per cent in 2010 (Table II.6a, point 1). The contribution rate of employers

¹⁴² See Social Council (1994) and the projections reported in *Deutsche Bundesbank* (1995).

¹⁴³ For a survey of the main reform proposals formulated in the second part of the eighties see Mayer (1994).

¹⁴⁴ See Mayer (1994).

¹⁴⁵ Early retirement was allowed from the age of 60 for women with 15 years of insurance (among them 10 years were to be included in the last 20 years) and from the age of 63 for men and women with 35 years of insurance). The process will start in 2001 and will be completed in 2012 for women and 2006 for men.

¹⁴⁶ Schmähl (1992a) notices that these coefficients are below the rate of an actuarial fair calculation. They do not represent an effective incentive to postpone retirement.

and employees was projected to rise to 21.4 per cent by the year 2010.¹⁴⁷ The longer term outlook also improved considerably, with the latter rate reaching 22.8 in 2020 and 26.9 in 2030.¹⁴⁸

Pension expenditure has also been largely influenced by the Unification of the country.¹⁴⁹ As Schmähl (1992, p. 36) noted, "The old-age pension schemes of the former GDR and Federal Republic fundamentally diverged in view of their conception and objectives, their position in the overall economic process and above all in income redistribution, their organisational structure, the coverage, the level and structure of benefits as well as in financing."

After unification, homogeneity was rapidly reached by extending to Eastern Germany the fundamental principles of the West-German old-age pension schemes. In 1990 and 1991 the Eastern pensions were repeatedly revalued. The increases aimed at adapting the living conditions in East and West Germany. A target value was fixed: after 45 years of service an "average earner" should receive 70 per cent of the average net earnings of all the insured. Within a year, the East German pensions were on average increased by about 60 per cent. From the beginning of 1992 the West German pension law was extended to East Germany; most of the regulations of the "1992 Pension Reform Act" coming into force for both parts of Germany. The extension implied some important improvements in Eastern pensions: most widows' pensions were raised from 25 to 60 per cent of the pension of the deceased spouse; retirement ages were lowered; the possibilities of claiming invalidity pensions were improved.

Because of these changes East German pension expenditure increased considerably and required large transfers from West German pension schemes.¹⁵⁰ According to Federal Government of Germany (1994), the balance of the pension expenditures in the new Länder will get more and more negative and will have to be covered by the surplus of the Western Länder.

In 1994 the Social Council updated its 1989 projections covering the period up to the year 2030. If no new measure is taken, the contribution rate of employers and employees will reach 27 per cent by the year 2030 (Table II.6b, point 2). Federal contributions, currently linked to the increases in the contribution rates of the employers and employees, will also rise considerably.¹⁵¹

147 See Federal Ministry of Labour and Social Affairs (1989).

148 See Social Council (1994).

149 The financial situation of German pension schemes in the years before and after the Unification is examined in *Deutsche Bundesbank* (1991 and 1995).

150 According to Schmähl (1992b), in 1992 more than 45 per cent of the East German pensions were financed through the West German contribution revenue. The transfers represented about 10 per cent of contributory revenues raised in West Germany.

151 According to the projections presented in Börsch-Supan (1995), if the net benefit ratio is fixed at the current 72 per cent, the workers' contribution rate would reach 34 per cent in 2030.

The burden of civil service pensions is also growing rapidly.¹⁵² In spite of the changes implemented by the 1992 Reform¹⁵³, assuming constant employment in the civil service, the number of these pensions will increase from under 0.8 million to over 1.2 million by the year 2030.¹⁵⁴

New medium-term projections concerning the whole country were carried out in 1994 by the German government.¹⁵⁵ Different assumptions concerning labour participation and the rate of growth of income were taken into account with minor effects on the projected increases in the contribution rate. In the Medium Scenario, the employers plus employees' contribution rate was projected to increase gradually from 18.4 per cent in 1995 to 19.6 in 2000 and 21 per cent in 2008 (Table II.6b, point 4).

In 1995 the Government updated the projections, and prolonged the projection period to the year 2009. The ensuing contribution rate of the employers and employees was estimated slightly higher, starting from 18.6 per cent in 1995 to 20.2 per cent in 2000 and 21.9 in 2009 (Table II.6b, point 5).

Deutsche Bundesbank (1995) draws attention to the matter of the sustainability of future increases in the contribution rate and in the related federal subsidies. On the one hand, tax rates are already relatively high: total social contribution rate is higher than 39 per cent of eligible earnings and the share of all the social contributions and taxes to GDP is about 44.5 per cent. On the other, the costs of unification have had a negative effect on public finance. "Given this situation, it appears likely that the present pension insurance system cannot be maintained in the long run unless further perceptible adjustments are made".¹⁵⁶ A "continuation of the reform of the pension insurance system and - analogously - the civil service pension scheme" should therefore be considered.

152 See *Deutsche Bundesbank* (1995).

153 Pensions required from 2001 onwards before the age of 65 will be reduced.

154 The increase is largely due to increases in staff levels which occurred in the seventies.

155 See Federal Government of Germany (1994).

156 *Deutsche Bundesbank* (1995), pp. 29-30. The same document provides a brief summary of recent reform proposals.

Table II.6a

GERMANY I

Statutory Pension Insurance Scheme ⁽¹⁾	1990	1995	2000	2005	2008	2009	2010	2015	2020	2025	2030
BEFORE THE UNIFICATION											
1. Social Advisory Board⁽²⁾, 1989											
Old-age Dependency Ratio ⁽³⁾ %	36	38	44	47			48	51	57	67	79
a) Before the 1992 Reform											
Equilibrium Contribution Rate %	22.8	24.4	26.3	28			28.7				
Employers + Employees Contribution Rate %	18.5	20.1	22	23.8			24.5	25.5	28.1	31.9	36.4
Government Contribution Rate %	4.3	4.3	4.3	4.2			4.2				
b) After the 1992 Reform											
Dependency Ratio (Number of pensions / Number of workers) %	59	64	71	77			80	84	92	103	118
Total Contribution Rate %	23.1	23.6	25.2	26.3			25.8				
Workers Contribution Rate %	18.7	19	20.3	21.2			21.4	21.6	22.8	24.7	26.9
Government Contribution Rate %	4.4	4.6	4.9	5.1			4.4				
Gross Benefit Ratio ⁽⁴⁾ %	51	49.7	48.7	47.9			47.1				
Net Benefit Ratio ⁽⁵⁾ %	70.1	70.6	70.6	70.4			70.5				

1) This scheme covers all private sector employees and some self-employed workers.

2) *Gutachten des Sozialbeirats zum Rentenreformgesetz 1992*. The main results have been reported in Social Advisory Board (1989) and Federal Ministry of Labour and Social Affairs (1989). Yearly wage growth = 3% from 1993; employment growth: from 1990 to 1995 0.5% p.a.; from 1996 to 2004 -0.1% p.a.; from 2005 to 2013 constant; from 2014 decreasing.

3) Number of People over 60 / Number of people between 20 and 59.

4) Average Gross Pension / Average taxable Labour Income.

5) Average Net Pension / Average taxable Labour Income.

GERMANY II

Statutory Pension Insurance Scheme ⁽¹⁾	1990	1995	2000	2005	2008	2009	2010	2015	2020	2025	2030
AFTER THE UNIFICATION											
1. Eurostat, 1994											
Old-Age Dependency Ratio ⁽²⁾ %		37	43	45			47	50	55		
2. Social Advisory Board⁽³⁾, 1994											
Employers + Employees Contribution Rate %											
a) without the 1992 Reform		19.3	21.9	24.4			25.6	26.9	29	32.7	36.9
b) with the 1992 Reform		18.6	19.7	21			21.5	22.1	23.1	25	27
3. Axel Boersch-Supan, 1994											
Contribution rate (benefit ratio fixed) ⁽⁴⁾ %	19	20	22	23.5			25	26.5	28	31	34
Benefit ratio (contribution rate fixed) ⁽⁴⁾ %	72	69	63	58			55	52	49	44	41
Pension Gap (Benefit and contribution rates fixed) ⁽⁴⁾ bn DM	0	8	24	43			60	79	98		138
4. Federal Government⁽⁵⁾, 1994											
Employers + Employees Contribution Rate ⁽⁶⁾ %											
a) Low labour participation (0.3% yearly growth)		18.4	19.7	20.9	21.3						
b) Medium labour participation (0.5% yearly growth)		18.4	19.6	20.6	21						
c) High labour participation (0.7% yearly growth)		18.4	19.5	20.4	20.5						
7. Federal Government⁽⁷⁾, 1995											
Employers + Employees Contribution Rate ⁽⁶⁾ %											
a) Low labour participation (0.3% yearly growth)		18.6	20.3	21.7	22.1	22.2					
b) Medium labour participation (0.5% yearly growth)		18.6	20.2	21.5	21.8	21.9					
c) High labour participation (0.7% yearly growth)		18.6	20.1	21.3	21.5	21.6					

1) This scheme covers all private sector employees and some self-employed workers.

2) Number of People over 60 / Number of people between 20 and 59.

3) *Gutachten des Sozialbeirats zum Rentenversicherungsbericht 1994*. Annual rate growth of wage in old Länder = 3.7% from 1995 to 1998 and 3% thereafter; in the new ones 100% of average income of old Länder will be reached by the year 2010. Yearly employment growth gradually decreasing up to the year 2005; thereafter constant up to the year 2019; thereafter constant employment ratio.

4) As reported in the graphs on page 24.

5) *Rentenversicherungsbericht der Bundesregierung*, 21/07/94.

6) Annual rate growth of wage in old Länder = 3%; in the new ones 95% of average income of old Länder will be reached by the year 2005.

7) *Rentenversicherungsbericht der Bundesregierung*, July 1995.

II.7 GREECE

Pensions are provided by a large number of social insurance institutions that often have different rules. IKA, which provides the pensions of most private employees, and OGA, which caters for farmers, are the most important. Public employees have their own schemes with specific rules.¹⁵⁷

Pension expenditure grew from 5 per cent of GDP in the early sixties to nearly 8 per cent in the late seventies.¹⁵⁸ The path of growth accelerated in the eighties: between 1980 and 1989 its share of GDP rose from 7.8 to 15.1 per cent. In this period the growth was due to a 50 per cent increase in the number of pensioners and a 50 per cent increase in the average pension.¹⁵⁹ Given a 2.2 per cent yearly increase in the population aged 65 and over, it was tentatively estimated that, under the existing rules, in the 1990s the pension to GDP ratio would have risen at an annual rate of 0.3 to 0.4 percentage points.¹⁶⁰

The sources of this critical situation were numerous:¹⁶¹

- a) Eligibility requirements for pension entitlement were generous¹⁶² and there was an incentive to retire early.¹⁶³
- b) In most cases pensions were close to the level of the last salary; public sector employees' pension were often above that level,¹⁶⁴ most pensions were indexed to wages.
- c) Disability benefits and early old-age benefits on "dangerous and unhealthy occupations" were widely granted.

¹⁵⁷ For a description of the system see IMF (1992).

¹⁵⁸ All data reported in this paragraph refer to GDP levels estimated before the 1994 revision of Greek National Accounts. The revision raised the GDP estimate for 1988 by about 20 per cent.

¹⁵⁹ See OECD (1990a), which refers to estimates of Ministry of Health, Welfare, and Social Insurance and OECD.

¹⁶⁰ See OECD (1990a).

¹⁶¹ See European Commission (1992a) and OECD (1993a).

¹⁶² Although for the majority of the insured population the standard retirement age was 65 for men and 60 for women (65 for men and women in the farmers' scheme), there were several relevant exceptions: private employees could retire at 58 if they reached a contribution period of at least 35 years; civil servants could retire with 25 years of service (15 years for married women) irrespective of age.

¹⁶³ Private employees could obtain a "minimum pension" with a contribution period of 13 years, which was only ten per cent lower than the average pension; there were no restrictions on regular employment of public sector pensioners.

¹⁶⁴ This, in the private sector, was due to the fact that pensions were based on earnings received in the last one or two years before retirement; this provided an incentive to pay salary increases at the end of the career.

Some projections on pension expenditure have been provided by IMF (1992), relying on World Bank demographic projections and on expenditure estimates carried out by the Ministry of Health, Welfare and Social Insurance (Table II.7). It should be noted that the projections are not directly comparable as they are based on different definitions of the social security system, different methodologies and different macroeconomic assumptions.

World Bank population projections assume a recovery in the fertility rate to replacement level by 2030. In spite of the recovery, the ratio of population aged 65 and over relative to population aged 15-64 is expected to rise from 21 per cent in 1990 to 32 per cent in 2010, 43 per cent in 2030 and 53 per cent in 2050.

IMF (1992) estimated that, under the rules existing before the 1990 reform and under a constant transfer ratio, demography was going to raise the share of pension expenditure in GDP to 21 per cent in 2010, 29 per cent in 2030 and 34 per cent in 2050.¹⁶⁵ The growth of expenditure would have been even greater had the expected increase in the transfer ratio been taken into account. Expenditure would have reached 23 of GDP by the year 2000.

A first set of measures aimed at restoring the viability of the system was adopted in 1990.¹⁶⁶

- a) The contribution periods required for pension eligibility were increased.
- b) Eligibility criteria for disability were tightened and benefit entitlements curtailed.
- c) The minimum pensionable age was increased for public employees.
- d) The functional relationship of pension to years of service was modified for younger workers in order to provide an incentive to civil servants to retire later.¹⁶⁷
- e) Employees' pensions were indexed to public sector wages (that the government intended to control strictly), rather than to private sector ones (which are objects of collective bargaining)
- f) Private sector pensions were to be calculated on the basis of the last 5 (rather than 2) years of earnings.

After the 1990 Reform, the short term outlook was much more favourable. The decline in the transfer ratio was expected to offset the deterioration of the dependency ratio for some years. However, from the late nineties, the transfer ratio recovers its rising pattern. By the year 2010 it reaches the level previously expected for the year 2000. Pension expenditure reaches 16 per cent of GDP by the year 2000 and 26 per cent in 2010.

¹⁶⁵ These projections refer to GDP levels estimated before the 1994 revision of Greek National Accounts.

¹⁶⁶ Law 1902/90. See OECD (1991a).

¹⁶⁷ The previous rule attributing 1/35 of last salary for each year of service has been substituted with a rule attributing 1/50 of last salary for each of the first 25 years, 2/50 for each of the following 5 years, and 3/50 for each year between 30 and 35.

A second package of measures was passed in 1992. In order not to penalise workers close to retirement age, most of the measures affecting the expenditure side were to be phased in gradually from 1993 to 2007.¹⁶⁸ As with the 1990 reform bill, the short term cash problems of the social security system were attacked primarily with increases in contributions. The contributions increase were particularly marked for funds for the self-employed. The main measures concerning benefits were the following:

- a) Minimum service requirements and minimum age for pension disbursement were gradually raised for public employees.
- b) Private employees replacement rates were gradually reduced by about 10 percentage points over ten years; minimum pensions were reduced for those retiring before the standard age limits.
- c) To reduce the incentive for early retirement a 1 per cent premium on replacement rate was introduced for contribution years in excess of 15, for minimum pension recipients.
- d) The age of awarding a "welfare pension" to uninsured citizens, was reduced from 68 to 65 years.

New entrants into the labour force became subject to new uniform rules:

- a) Standard old-age limits of 65 for men and women.
- b) Early retirement at 60 with a reduced pension.
- c) Maximum replacement rate of 80 per cent of last five years of earnings for those with 35 years of work.
- d) Minimum contribution period of 15 years.
- e) Lower minimum pension.
- f) Restrictions on pensioners' employment and survivors' pensions.

According to projections carried out for the period 1994-1999 by the Ministry of Health, Welfare and Social Insurance, public expenditure on pensions (net of expenditure for public sector employees' pension, 2.4 per cent of GDP in 1994) should rise from 8.9 per cent of GDP in 1993 to 10.1 per cent in 1999.¹⁶⁹ Expenditure growth would be accelerated by a considerable increase in the number of pensions paid (3.4 to 4.2 per cent per year). The same document stresses the need for new measures aimed at correcting long-term imbalances.

¹⁶⁸ Law 2084/1992. See OECD (1993a).

¹⁶⁹ In 1994 Greek 1988 GDP was revised upward by about 20 per cent. The estimates concerning the following years were revised accordingly.

Table II.7

GREECE

Social Security System ⁽¹⁾	1990	1992	1993	1995	1999	2000	2005	2010	2020	2030	2040	2050
BEFORE THE 1990 REFORM												
Old-Age Dependency Ratio ⁽²⁾ %	21.2	22.4		24.2		27.7	31	32.3	36.8	42.9	50.3	54.1
Dependency Ratios:												
Elderly / Workers ⁽³⁾ %	35.3	37.2		40		45	49.5	52.1	60.6	71.9	84	89.3
Pensioners / Contributors %	45	47.6	48.7	50.5	55.1	55.6						
a) Pure Demographic Effects												
Benefit Ratio ⁽⁴⁾ %	33.5			33.5		33.5	33.5	33.5	33.5	33.5	33.5	33.5
Pension Expenditure / GDP %	15.1			16.9		18.6	19.6	20.9	24.3	29.1	33.5	34.2
b) Increasing Benefit Entitlements ⁽⁵⁾												
Benefit Ratio ⁽⁴⁾ %	34	34	35	36	41	42						
Pension Expenditure / GDP %	15.1	16.3	16.9	18.2	22.3	23.3						
AFTER THE 1990 REFORM												
Increasing Benefit Entitlements ⁽⁶⁾												
Dependency Ratio ⁽³⁾ %		47.5	48.7	50.5	55.1	55.6	58.3	62.4				
Benefit Ratio ⁽⁴⁾ %		29	28	27	28	29	34	41				
Pension Expenditure / GDP %		13.8	13.7	13.5	15.5	16	20	25.9				
AFTER THE 1992 REFORM												
Pension Expenditure / GDP ⁽⁷⁾ %			8.9	9.5	10.1							

1) The Social Security System comprises the schemes for public and private employees and for self-employed workers.

2) Number of people aged 65 and over / Number of people between 15 and 64.

3) Number of people aged 65 and over / Number of Labour Market participants.

4) Average Pension / Per Capita GDP.

5) Assuming a real GDP growth of 1.8% in 1991, 2.5% from 1992 to 1995 and 2.7% up to 2000. See Tables 6 and 7 of Annex I of IMF(1992).

6) Assuming a real GDP growth of 2.5% from 1992 to 1995 and 2.7% up to 2010. See Tables 8 and 9 of Annex I of IMF(1992).

7) Excluding public sector employees' pensions. Based on new GDP estimates and the following assumptions: Real wage growth: 1.7% in 1994 and from 1995 to 1999 gradually increasing from 0.9% to 2.2; employment growth: gradually increasing from 0.3% in 1994 to 1.4% in 1999.

Source: IMF (1992) for projections "Before and after the 1990 Reform" and Ministry of Health, Welfare and Social Insurance for projections "After the 1992 Reform".

II.8 IRELAND

The state runs a contributory pension scheme ("social insurance") and a means-tested non-contributory scheme ("social assistance").¹⁷⁰ Both schemes provide, on a flat-rate basis, old-age and survivors benefits. The insurance scheme also pays invalidity benefits. A corresponding benefit, the disabled persons maintenance allowance, is provided for on a means-tested basis under the Health Acts. All public sector employees and nearly 40 per cent of private workers are also covered by occupational pension schemes.¹⁷¹

In 1990, social insurance and social assistance pension expenditure amounted respectively to 3.1 and 1.3 per cent of GDP. In 1991 Ireland was the EU country with the lowest ratio of old-age pension expenditure on GDP (5.0 per cent).¹⁷² Two features differentiate the Irish pension system from those of the other EU countries:

- a) Ireland is the only country (apart from Portugal) that has not introduced automatic indexation of public pensions. Although in the long run benefits have been raised broadly in line with increases in prices, the lack of indexation brings uncertainty to pensioners. According to OECD (1994c, p. 73) there is "an unwillingness to remove pension increases in social welfare benefits from the political arena."
- b) Ireland is the only country that does not have a national income-related pension scheme.

The link between contributions and benefits is rather weak. Insurance and assistance pensions do not differ significantly. Within the insurance scheme, "in certain cases pension payments are still significantly out of proportion to periods of insurance completed, while in other cases insured persons may fail to qualify for any pension payment, despite having being insured for considerable periods."¹⁷³

The problems of the public and the private pension schemes were addressed by the Government in 1986 with the establishment of the National Pensions Board, that was given the task of submitting proposals on both grounds. In 1990 the Pension Act was passed by Parliament; most of its provisions came into force on 1 January 1991. The Act introduced minimum funding standards and rules concerning the disclosure of information and the protection of the rights of workers who change employment; it also provided the equal treatment of men and women and established the Pensions Board.

¹⁷⁰ The Irish pension system is examined in National Pension Board (1993) and in OECD (1994c).

¹⁷¹ The number of persons covered by occupational pension schemes have been growing from the 1960s. The assets of private-sector occupational schemes have been estimated to have grown from 6 per cent of GDP in 1975 to 38 per cent in 1989. "In a short period of time, therefore, Irish pension funds have grown from relative insignificance to a position where they are a major depository of savings and an important source of investment capital." OECD (1994c, p. 16).

¹⁷² See European Commission (1993a).

¹⁷³ National Pension Board (1993, p. 159).

The Board is responsible for regulating occupational pension schemes and for setting administration standards for them.

The reform of the public pension schemes has been addressed by the National Pension Board in 1993 in its Final Report.

The Report provides estimates of public pension expenditure up to the year 2035 (Table II.8). Estimates are based on a projection of Irish population that assumes a decline in the birth rate, some improvement in life expectancy and a marked decline in outward migration flows. The number of persons of retirement age is expected to increase slowly over up to the year 2006 and then increase steadily over the following 30 years. The old-age dependency ratio is projected to increase from 18.6 per cent in 1990 to 20.1 in 2010, 26.4 in 2020 and 33.6 in 2030.

The flow of new old-age pensions basically depends on the number of people reaching 65 years of age.¹⁷⁴ The Report projects the number of pensions paid up to the year 2035 specifying the numbers of social insurance and social assistance pensions. It predicts a gradual shift from the latter to the former scheme.

The number of insured people is projected assuming a constant age-specific unemployment rate. The number of new entrants into the labour market is estimated by applying the 1987 ratios of insured population to total population in the 16-23 age range. The number of social insurance contributors is expected to peak in 2015 and then to decline to a level close to the present level by the year 2035.

The ratio of pensioners to workers is projected to remain stable up to 2010, and then to rise abruptly from 33 per cent to 41 per cent in 2020 and 61 per cent in 2035. The increase reflects the extension of pension insurance to self-employed workers and, to a larger extent, the ageing process. Assuming a constant transfer ratio (based on the implicit assumption of raising pensions in line with wages),¹⁷⁵ the ratio of pension expenditure to taxable income is more or less constant up to 2010 (on a 13-14 per cent level), and then reaches 17 per cent in 2020 and 25 per cent in 2035.

The National Pension Board does not propose fundamental changes in the structure of the pension system. Although it recognises that "ideally, the aim of the national pension system should be to provide pension benefits which maintain a reasonable relationship with previous income levels, so that established standard of living can be maintained" and that "it is highly unlikely that the present system ... will ever achieve the completeness and the level of coverage which this aim requires" (p. 21), the Board does not propose the introduction of income-related pensions. It considers that full earnings-related pensions would be payable when the dependency ratio would be much higher than the present one, and that current and future job creation might be endangered by the reform.

¹⁷⁴ The model allows for the fact that some people retire later than 65.

¹⁷⁵ Benefit projections are based on the rates of payment current at July 1990 (p. 247). Contribution projections are based on current earnings level.

The major proposals are the following.

- a) The amount paid by the assistance scheme should be raised to the level paid by the insurance scheme, since the non-means-testing of the latter benefits provides "sufficient recognition of the contributory principle underlying social security" (p. 11). Widow's and invalidity pensions should be raised to the level of insurance old-age pensions. Disability Assistance under the Social Welfare Acts should be introduced.
- b) The real value of benefits should be maintained. There is no proposal concerning the introduction of an indexation rule.
- c) The minimum contributions required for old-age and retirement pensions within the insurance scheme should be raised from 3 to 10 years.
- d) The amount of pension paid by the insurance scheme to each individual should be determined with a new formula that relates more strictly the amount paid to the number of years of contribution.
- e) A standard pensionable age of 65 for all pensions should be introduced. Changes in retirement age should be considered in the future in the light of changes in the labour market.
- f) Individuals deferring retirement beyond age 66 should be paid higher benefits on actuarial basis (a 5 to 7 per cent increase for each year of deferment).
- g) Social insurance should be extended to new entrants to public sector employment. "In time, this would result in all employees in both the private and the public sectors having the same range of pension cover under social insurance and contributing on the same basis to the costs involved." (p. 9).
- h) An actuarial review of projected long-term costs should be carried out every five years.¹⁷⁶ Contribution rates should be fixed well in advance¹⁷⁷ and gradually raised to finance the increase in expenditure.

¹⁷⁶ National Pension Board (1993, p. 174) points to the uncertainty concerning the levels of emigration and long term unemployment.

¹⁷⁷ Any excess contributions should be deposited in a separate account with the exchequer. When pension payments exceed contributions, these funds will be drawn down.

Table II.8

IRELAND

Social Insurance and Social Assistance Pensions ⁽¹⁾	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035
National Pensions Board, 1993										
a) Old-age Dependency Ratio ⁽²⁾ %	18.6		18.1		20.1		26.4		31.7	33.6
b) Number of pensioners (000's)	377	386	391	396	419	460	514	582	645	679
c) Number of social insurance contributors (000's)	1114	1142	1189	1230	1259	1264	1239	1183	1133	1106
d) Dependency Ratio (b/c) %	33.8	33.8	32.9	32.2	33.3	36.4	41.5	49.2	56.9	61.4
e) Transfer Ratio ⁽³⁾ %	41.1	40.4	40.6	41.1	41	40.9	41.3	41.3	41.3	40.9
f) Total Pension Expenditure (mill £ - constant prices)	1196	1364	1391	1425	1512	1656	1857	2102	2320	2423
g) Taxable Income ⁽⁴⁾ (mill £ - constant prices)	8604	9998	10431	10779	11073	11127	10840	10343	9861	9644
h) Implicit equilibrium rate of taxation (f/g)	13.9	13.6	13.3	13.2	13.7	14.9	17.1	20.3	23.5	25.1

1) Occupational Pension Schemes are not considered in this table.

2) Number of people aged 65 and over / Number of people between 16 and 64. Data attributed to the years 1990, 2000, 2010, 2020, 2030, 2035 actually refer to the years 1991, 2001, 2011, 2021, 2031, 2036.

3) Average Pension / Average Taxable Income per Worker (Employees plus Self-Employed).

4) Income of Employees and Self-Employed. Taxable Income computed as (estimated contributions in million £) * (1/contribution rate). See Table 9 of National Pensions Board (1993).

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II.9 ITALY

The public pension system covers dependent and self-employed workers.¹⁷⁸ It consists of several schemes, mostly run on PAYG basis. The National Social Security Institute¹⁷⁹ is the major public agency acting in the pension area. It administers nearly 70 per cent of total pension expenditure and provides old age, disability and survivors pensions to private sector employees and to most self-employed workers.¹⁸⁰ About 25 per cent of total pension expenditure is administered directly by the state, which provides pensions to public sector employees, to work-disabled citizens and to war related disabled and survivors.

Public pension expenditure rose from 5.0 per cent of GDP in 1960 to 7.5 per cent in 1970, 10.2 per cent in 1980 and 15.5 per cent in 1994, far outstripping the growth in other kinds of social spending, which increased from 5.1 to 6.7, 6.7 and then 7.3 per cent.

The number of pensions paid in Italy rose from 7.5 million in 1960 to 12.5 in 1970, 16.5 million in 1980 and over 19 million in 1990. The growth in the number of pensions paid can be ascribed to employment trends, lower death rates and the effects of reforms. The most noteworthy of these reforms were the extension of social security to the self-employed and to needy elderly or disabled persons and the introduction of seniority pensions.¹⁸¹ Another factor in the increase was the easing of eligibility requirements for certain benefits, namely the social insurance disability pensions in the sixties and seventies and the welfare disability pensions in the eighties.¹⁸² The average pension rose from 28 per cent of average gross earnings of employees to 36 per cent in 1990. This rise stems from the increase in the average number of contribution years and the steady improvement of the rules governing both initial pension awards and indexation.¹⁸³ Finally, there has been a steady relative increase in the numbers of retirees entitled to

¹⁷⁸ For a description of the system and its prospects see Franco and Frasca (1992) and Canziani and Demekas (1995).

¹⁷⁹ *Istituto Nazionale per la Previdenza Sociale - INPS.*

¹⁸⁰ The National Social Security Institute also provides welfare benefits for elderly citizens. Its expenditures are covered by social security contributions and by state transfers.

¹⁸¹ Seniority pensions enable private sector workers to retire at any age provided they have paid contributions for 35 years. Public sector workers already had special rules allowing them to retire with 20 to 25 years of contribution.

¹⁸² The expansion of the number of beneficiaries was further spurred in the eighties by early retirement programmes for economically ailing firms and industries in which labour demand contracted significantly.

¹⁸³ In the later eighties the rise was accentuated by measures raising old age welfare benefits and the minimum social security retirement benefit for low-income workers, increasing the minimum level of the pensions paid to the self-employed to the level granted to employees and redetermining the level of earlier pension awards.

larger pensions (civil servants, for instance) and a reduction in groups with comparatively small benefits (self-employed farm workers and the recipients of old age welfare pensions).

Demographic prospects are rather worrying because of the present low fertility rates. Assuming constant fertility rates, a further increase in life expectancy and no net migration, the ratio of population aged 60 and over relative to population aged 20-59 would rise from 37 per cent in 1990 to 51 per cent in 2010 and 59 per cent in 2030 (Table II.9c, point 16).

The need to reform the Italian pension system was recognised in the late seventies. In 1981 it was stressed in a Ministry of Treasury Report, which also outlined some reform guidelines. The first long-term forecast of Italian pension expenditure carried out in the same years pointed to substantial increases in the ratio of pension expenditure to GDP.¹⁸⁴

Several new projections were carried out in the second half of the eighties. The forecasting methodology was also gradually improved. However, for some time there was no agreement on expenditure trends. Franco and Morcaldo (1986) projected a large rise in the Employee Pension Fund equilibrium contribution rate, while Alvaro, Ricci and Pedullà (1987), National Social Security Institute (1989) and the State General Accounting Office (1988) projected a limited increase.¹⁸⁵ According to the latter projections, the pension system was already approaching maturity and the ageing process could be partially offset by a large increase in female labour force participation. It was therefore argued that the need for corrective measures was limited.

Despite the many reform proposals put forward by successive Ministers for Labour and Social Security, no major reform was implemented. Pension benefits were actually increased, particularly for self-employed workers (in 1990).

In the early nineties it became gradually apparent that this optimistic view was not consistent with actual expenditure trends. All projections concurred on the seriousness of the situation. Both the National Social Security Institute (1991) and the State General Accounting Office (1991) pointed to alarming trends.

Later projections, carried out after the 1992 pension reform presented even more worrying pre-reform expenditure trends. According to the National Social Security Institute (1993), the equilibrium contribution rate of the Private Sector Employees' Pension Scheme was projected to rise from 42 per cent in 1992 to 54 per cent in 2010 (Table II.9a, point 1). The State General Accounting Office (1994) put the rate at 50 per cent in 2010 and 60 per cent in 2025 (Table II.9a, point 2). According to State Accounting Office estimates, the equilibrium rate for public sector employees' schemes would have risen from 40 per cent in 1994 to 73 per cent in 2010. The equilibrium rates for the principal categories of self-employed workers would also have risen significantly, because of the demographic trends and the reforms that went into effect in 1990. The

¹⁸⁴ See Morcaldo (1977) and Ministry of the Treasury (1981).

¹⁸⁵ On this debate see Castellino (1986) and Gronchi (1989).

National Social Security Institute (1991) estimated that the rate for artisans would rise from 11 per cent in 1990 to 27 per cent in 2010, and for shopkeepers and other businessmen from 11 to 22 per cent.

The pension system was extensively reformed in 1992, under the pressure of the exchange rate crisis and the urgent need to curb the deficit. The main features of the reform, which aimed at limiting the public pension expenditure to GDP ratio at its 1992 level, were the following:¹⁸⁶

- a) The age of retirement was raised (over ten years) from 55 to 60 for women and from 60 to 65 for men in private employment.
- b) The reference period for calculating pensionable earnings was lengthened (over ten years) from 5 to 10 years; for younger workers it was extended to the whole working life; past earnings were to be revalued at a rate equal to the rise in the cost of living plus one percentage point.
- c) The minimum number of years of contributions giving entitlement to an old-age pension was raised (over ten years) from 15 to 20.
- d) The reference index for pension benefits indexation was changed from wages to prices; government was allowed to introduce discretionary additional adjustments through the Budget.
- e) The minimum number of years of contributions required for public sector employees to be entitled to a seniority pension was gradually raised to 35 (i.e. to the requirement already in effect for private sector workers' seniority pensions).

In order to restrain public expenditure in the short term, in 1992 and in the two following years the adjustment of pensions to price dynamics was limited, the disbursement of new seniority pensions was curtailed and the gradual increase in retirement age was accelerated.

The 1992 reform substantially changed the outlook for pension expenditure. The National Social Security Institute (1993) projected a decline in the equilibrium contribution rate for the Private Sector Employees' Pension Scheme (from 42 per cent in 1992 to 40 per cent in 2010 - Table II.9a, point 1). The State General Accounting Office (1994) expected it to change from 41 per cent in 1995 to 36 per cent in 2010 and 37 in 2025 (Table II.9a, point 2). According to the latter institution, in spite of the reform, the equilibrium contribution rate for public sector employees' schemes would still increase (from 42 per cent in 1994 to 46 per cent in 2010 - Table II.9b, point 5). The equilibrium rates for the principal categories of self-employed workers were expected to more than double by the year 2010 (Tables II.9b, points 6 and 8; II.9c, point 11).¹⁸⁷ The GDP ratio

¹⁸⁶ The reform is examined in Franco (1993).

¹⁸⁷ The increase projected by National Social Security Institute (1993) was actually higher than that projected in National Social Security Institute (1991) before the reform was implemented.

of the total expenditure of the main public pension schemes was expected to decline slightly up to the year 2005 and then to increase gradually.¹⁸⁸

The National Social Security Institute (1993) and the State General Accounting Office (1994) projected expenditure also on the assumption of discretionary adjustment of pensions to wage dynamics. It was considered that expenditure savings produced by the shift from wage to price indexation were not certain, since discretionary adjustments to real wage dynamics could be granted through the yearly budgets.¹⁸⁹ Assuming wage indexation of pension benefits, the equilibrium contribution rate for the Private Sector Employees' Pension Scheme would rise to 46 per cent by the year 2010 and to 54 per cent by the year 2025 (Table II.9a, point 2).

In 1995 both institutions released more unfavourable projections. In spite of the 1992 reform, according to the National Social Security Institute,¹⁹⁰ the equilibrium contribution rate for the Private Sector Employees' Pension Scheme would remain stable at its 1995 level (49 per cent - Table II.9a, point 3). According to State General Accounting Office (1995) it would decline from 47 per cent in 1995 to 42 per cent in the period 2010-2020 and then increase to 46 per cent in 2030 (Table II.9a, point 4). The equilibrium contribution rates of the schemes of self-employed workers were also revised upward (Tables II.9b, points 7 and 9; II.9c, point 12).

These expenditure prospects and the high level of equilibrium contribution rates pointed to the need for a new major reform.¹⁹¹ It was also recognised that seniority pensions were excessively reducing the effects of the increase in standard retirement age. The reform was introduced in mid-1995. It aimed at cutting pension expenditure over the coming decade, thereby contributing to budgetary consolidation.¹⁹² It also aimed at increasing the incentive to supply labour (by linking pensions to individual contributions) and changing the distributive effects of pension expenditure (by removing the relatively favourable treatment previously granted to workers with short or dynamic careers).

The main features of the reform are the following:¹⁹³

- a) Old-age pension will be related to the contributions paid over the whole working life (capitalised at the rate of growth of GDP) and to retirement age (i.e., to life expectancy).¹⁹⁴

¹⁸⁸ This profile is obtained by summing up the expenditure to GDP ratios estimated by the State General Accounting Office for the pensions of public sector employees and by the National Social Security Institute for the pensions of private sector employees and the self-employed.

¹⁸⁹ See State General Accounting Office (1994, p. 24).

¹⁹⁰ As reported in Senate of Italy (1995).

¹⁹¹ See Castellino (1995), CER (1994), IRS (1995) and Padoa-Schioppa (1995).

¹⁹² Most expenditure cuts are achieved through the tightening of the eligibility conditions for seniority and survivors pensions.

¹⁹³ The reform is examined in Bank of Italy (1995) and IRS (1995).

- b) Workers will be allowed to choose their retirement age between 57 and 65 years. Pensions will be related to average life expectancy at the age of retirement.
- c) Seniority pensions will be gradually abolished.
- d) The minimum number of years of contributions required for an old-age pension is reduced from 17 to 5. The supplementation of old-age pension up to a set minimum level will be abolished. Welfare pensions for elderly citizens are to be reformed from 1996.
- e) New measures are introduced to provide greater incentives for the development of supplementary pension schemes.

The long-term effects of the reforms have been examined in State General Accounting Office (1995a, 1995b).¹⁹⁵ The results depend on the assumptions concerning GDP growth and the adjustments to demographic changes of the coefficient relating pensions to capitalised contributions. These adjustments, which can be implemented every ten years, are not automatic. Without adjustments (and assuming 2 per cent real GDP growth), the equilibrium contribution rate for the Private Sector Employees' Pension Scheme would decline from 47 per cent in 1995 to 40 per cent in 2010, then rise to 48 per cent in 2030, and decline again afterwards (Table II.9a, point 4). As compared to pre-reform legislation, the rate would be lower up to the year 2022, then it would be higher up to year 2047. The implementation of the adjustments would substantially affect the equilibrium contribution rate after 2020. The rate would peak at 45 per cent about 2030 and would always be lower than the pre-reform rate. Smaller (greater) GDP growth rates would increase (reduce) the equilibrium contribution rate; they would also increase (reduce) the financial effects of the reform as against pre-reform legislation.¹⁹⁶

The effects of the reform on the equilibrium contribution rate of self-employed workers would be much bigger (Tables II.9b, point 10; II.9c, point 13). A substantial part of the increase in the transfer ratio that would have been determined by the 1990 reform would not take place.

The GDP ratio of pensions paid to private sector employees and to self-employed artisans, shopkeepers and other businessmen (8.2 per cent in 1995¹⁹⁷) would decline up to the year 2010 (by about 0.5 percentage points). It would then increase to 8.9 per-

¹⁹⁴ The amount paid to each pensioner will be calculated by multiplying capitalised contributions by a coefficient ranging from 4.7 % (for those retiring at 57 years of age) and 6.1 % (for those retiring at 65 years of age). Coefficients can be revised every ten years taking two elements into account: changes in demographic prospects; a comparison of the rates of growth of GDP and earnings assessed for social security contributions).

¹⁹⁵ These projections do not consider the effects of some measures that will increase expenditure (e.g., the adjustment to wage dynamics of a part of each pension from the year 2009). No projection taking into consideration the adjustment of pension to wage dynamics has been presented.

¹⁹⁶ According to Bank of Italy (1995), which takes a critical view of the long term financial effects of the 1995 reform, the reform reduces the ratio of the Private Sector Employees' Pension Scheme expenditure to GDP, as against pre-reform legislation, only if yearly GDP real growth is not greater than 1.5 per cent.

¹⁹⁷ In 1995 these pension schemes represented about 55 per cent of total public pension expenditure.

cent by the year 2030 in the scenario without adjustment of coefficients and to 8.3 per cent in the scenario with adjustment (Table II.9c, point 15).¹⁹⁸ The expenditure reduction with respect to pre-reform trends would amount to 0.4-0.5 per cent of GDP in 2010 and to 0.2-0.8 points in 2030.

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Assuming lower GDP growth (1.5 per cent p.a.), the expenditure to GDP ratio would be higher: in the scenario with adjustment of coefficients the ratio would remain stable up to the year 2010 and increase to 9.0 per cent by the year 2030.

ITALY I

Table II.9a

Private Sector Employees' Pension Scheme	1992	1994	1995	2000	2005	2010	2015	2020	2025	2030	2040	2050
1. National Social Security Institute⁽¹⁾, 1993												
Before 1992 Reform: Dependency Ratio %	86		87	88	90	94						
Transfer Ratio %	49		53	56	58	59						
Equilibrium Contribution Rate %	42		46	48	50	54						
Pension Expenditure / GDP %	7.7		7.9	8.3	8.6	9.2						
After 1992 Reform ⁽²⁾ : Dependency Ratio %	86		86	82	81	84						
Transfer Ratio %	49		51/51	51/55	50/57	49/58						
Equilibrium Contribution Rate %	42		43/44	41/44	39/44	40/47						
Pension Expenditure / GDP %	7.7		7.4/7.5	7.0/7.5	6.7/7.6	6.8/8.0						
2. State General Accounting Office⁽³⁾, 1994												
Before 1992 Reform: Equilibrium Contribution Rate %			44	44	46	50	55	58	60			
Pension Expenditure / GDP %			7.8	7.8	8.2	8.8	9.4	9.9	10.1			
After 1992 Reform ⁽²⁾ : Equilibrium Contribution Rate %			41/42	37/40	35/42	36/46	37/50	38/53	37/54			
Pension Expenditure / GDP %			7.4/7.4	6.7/7.2	6.2/7.4	6.2/8.0	6.4/8.6	6.4/9.0	6.3/9.2			
3. National Social Security Institute⁽⁴⁾, 1995												
Before 1995 Reform: Equilibrium Contribution Rate %		47.2	49.4	48.1	46.9	47.8	48.8	49.1	49.1	48.8		
Pension Expenditure / GDP %			7.8	7.3	7.1	7.3	7.4	7.5	7.5	7.4		
4. State General Accounting Office⁽⁵⁾, 1995												
Before 1995 Reform: Dependency Ratio %			94.5	91.3	90.9	91.4	92.5	94.4	100.2	106.2	103.7	94.5
Transfer Ratio %			50	48.4	47.3	46.2	45.4	44.5	44.1	43.5	40.6	38.4
Equilibrium Contribution Rate %			47.3	44.2	43	42.2	42	42	44.1	46.2	42.1	36.3
Pension Expenditure / GDP %			7.3	6.9	6.7	6.6	6.5	6.5	6.9	7.2	6.6	5.6
After 1995 Reform, without adjustment of coefficients ⁽⁶⁾ :												
Dependency Ratio %			94.5	90.2	89.1	88.1	89.9	91.8	98.9	104.3	102.3	91.1
Transfer Ratio %			50	48	46.9	45.7	45.8	45.4	45.6	45.7	42.7	39.5
Equilibrium Contribution Rate %			47.3	43.3	41.8	40.3	41.2	41.7	44.4	47.7	43.7	36
Pension Expenditure / GDP %			7.3	6.7	6.5	6.3	6.4	6.5	6.9	7.4	6.8	5.6
After 1995 Reform, with adjustment of coefficients ⁽⁶⁾ :												
Dependency Ratio %			94.5	90.2	89.1	88.1	89.9	91.8	98.9	104.3	102.3	91.1
Transfer Ratio %			50	48	46.9	45.6	45.4	44.5	43.9	42.9	38.8	34.5
Equilibrium Contribution Rate %			47.3	43.3	41.8	40.2	40.9	40.8	42.7	44.7	39.5	31.4
Pension Expenditure / GDP %			7.3	6.7	6.5	6.2	6.3	6.3	6.6	7	6.1	4.9

1) INPS (Istituto Nazionale per la Previdenza Sociale). Real GDP growth = 2%; real wage growth = 1.5%; employment growth = 0.6%, 0.4%.

2) The 1992 Reform introduced price-indexation of pensions. Discretionary adjustments to wage dynamics can be implemented with the Budget. Where two data are presented: the left assumes price indexation of pensions, the right assumes wage indexation.

3) Ragioneria Generale dello Stato. Real GDP growth and real wage growth = 1.8%, 2.6%; employment growth = 0%.

4) INPS (Istituto Nazionale per la Previdenza Sociale). Real GDP growth = 2%, 1.7%, 1.5%; real wage growth = 1.6%, 1.5%; employment growth = 0.4%, 0.2%, 0%.

5) Ragioneria Generale dello Stato. Real GDP growth and real wage growth = 2.0%; employment = 0%.

6) Pensions will be calculated by multiplying capitalized contributions by age-coefficients. Coefficients can be revised every ten years taking demographic projections into account.

ITALY II

Central Govern. and Local Authorities Employees	1992	1994	1995	2000	2005	2010	2015	2020	2025	2030	2040	2050
5. State General Accounting Office⁽⁷⁾, 1994												
Before 1992 Reform: Equilibrium Contribution Rate %		43	47	58	65	73						
Pension Expenditure / GDP %		3.3	3.6	4.3	4.9	5.6						
After 1992 Reform ⁽²⁾ : Equilibrium Contribution Rate %		42	46	49/51	48/53	46/55						
Pension Expenditure / GDP %		3.3	3.5	3.6/3.8	3.5/3.9	3.5/4.2						
Self-employed Farmers												
6. National Social Security Institute⁽⁸⁾, 1993												
After 1992 Reform ⁽²⁾ : Equilibrium Contribution Rate %	108		112/113	111/120	110/125	111/131						
Pension Expenditure / GDP %	0.9		0.9/0.9	0.8/0.9	0.8/0.9	0.7/0.9						
7. National Social Security Institute⁽⁹⁾, 1995												
Before 1995 Reform: Equilibrium Contribution Rate %		133		147		147		120		104		
Self-employed Artisans												
8. National Social Security Institute⁽¹⁰⁾, 1993												
After 1992 Reform ⁽²⁾ : Equilibrium Contribution Rate %	13		13	18/19	24/26	30/34						
Pension Expenditure / GDP %	0.4		0.5	0.6/0.6	0.8/0.9	1.0/1.1						
9. National Social Security Institute⁽¹¹⁾, 1995												
Before 1995 Reform: Equilibrium Contribution Rate %		15		21		32		39		43		
10. State General Accounting Office⁽¹²⁾, 1995												
Before 1995 Reform: Dependency Ratio %			49.7	56.2	62.5	68.4	73.8	79.6	85.1	89	93.4	93.6
Transfer Ratio %			33.7	38.5	41.2	42.2	42.4	42.2	41.6	40.6	38.8	37.4
Equilibrium Contribution Rate %			16.8	21.6	25.7	28.9	31.3	33.6	35.4	36.2	36.2	35
Pension Expenditure / GDP %			0.5	0.6	0.7	0.8	0.9	0.9	1	1	1	1
After 1995 Reform, with adjustment of coefficients:												
Dependency Ratio %			49.5	55	61.7	67.5	72.8	78.3	83.8	87.6	91.2	91.3
Transfer Ratio %			33.6	37.3	39.7	39.9	38.8	36.2	33	29.6	23.9	20.6
Equilibrium Contribution Rate %			16.6	20.5	24.5	26.9	28.3	28.3	27.7	26	21.8	18.8
Pension Expenditure / GDP %			0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.7	0.6	0.5

7) Ragioneria Generale dello Stato. Real wage growth = 1.0%.

8) INPS (Istituto Nazionale per la Previdenza Sociale). Real income growth = 2%; employment growth = -1.5%.

9) INPS (Istituto Nazionale per la Previdenza Sociale). Real income growth = 2%, 1.7%, 1.5%; employment growth = -1.5%.

10) INPS (Istituto Nazionale per la Previdenza Sociale). Real income growth = 2.0%; employment growth = 0%.

11) INPS (Istituto Nazionale per la Previdenza Sociale). Real income growth = 1.9%, 1.7%, 1.5%; employment growth = 0%.

12) Ragioneria Generale dello Stato. Real income growth = 2.0%; employment growth = 0%.

ITALY III

Table II.9c

Other self-employed Businessmen	1992	1994	1995	2000	2005	2010	2015	2020	2025	2030	2040	2050
11. National Social Security Institute⁽¹⁰⁾, 1993												
After 1992 Reform ⁽²⁾ : Equilibrium Contribution Rate %	12		12	17/18	22/24	27/30						
Pension Expenditure / GDP %	0.3		0.4	0.5/0.5	0.7/0.7	0.8/0.9						
12. National Social Security Institute⁽¹¹⁾, 1995												
Before 1995 Reform: Equilibrium Contribution Rate %		13		20		31		40		44		
13. State General Accounting Office⁽¹²⁾, 1995												
Before 1995 Reform: Dependency Ratio %			50.4	57.2	62.4	66.5	69.9	74	79	83.6	88.5	89.7
Transfer Ratio %			28.8	33.9	37.4	39.2	40.4	41.3	41.6	41.5	40	38.6
Equilibrium Contribution Rate %			14.5	19.4	23.3	26.1	28.2	30.5	32.9	34.6	35.4	34.6
Pension Expenditure / GDP %			0.4	0.5	0.6	0.7	0.7	0.8	0.9	0.9	0.9	0.9
After 1995 Reform, with adjustment of coefficients:												
Dependency Ratio %			50.3	56.1	61.7	65.6	68.9	72.6	77.3	81.9	86.3	87.5
Transfer Ratio %			28.8	33	35.8	36.6	36.3	34.6	32.2	29.3	24.2	21.2
Equilibrium Contribution Rate %			14.5	18.5	22.1	24	25	25.1	24.9	24	20.9	18.5
Pension Expenditure / GDP %			0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.5
Total Expenditure of Main Pension Schemes	1992	1994	1995	2000	2005	2010	2015	2020	2025	2030	2040	2050
14. CER⁽¹³⁾, 1995 (All main schemes)												
Before 1992 Reform: Equilibrium Contribution Rate %			40	45	48	53	57	61	63			
Pension Expenditure / GDP %			12.7	13.9	14.8	16.0	16.9	17.6	17.6			
After 1992 Reform ⁽²⁾ : Equilibrium Contribution Rate %			39	40/42	40/44	42/52	45/...	48/56	48/57			
Pension Expenditure / GDP %			12.4	12.5/13.2	12.4/13.8	13.0/14.9	13.5/15.7	13.8/16.2	13.7/16.3			
15. State General Accounting Office⁽⁵⁾⁽¹²⁾, 1995 (Private Employees and Self-Employed Artisans Businessmen)												
Pension Expenditure / GDP %:												
Before 1995 Reform			8.2	8	8	8.1	8.1	8.2	8.8	9.1	8.5	7.5
After 1995 Reform:												
a) without adjustment of coefficients			8.2	7.8	7.8	7.7	7.9	7.9	8.4	8.9	8.1	6.8
b) with adjustment of coefficients												
GDP and wage growth = 2%			8.2	7.8	7.8	7.6	7.8	7.8	8.1	8.3	7.2	5.9
GDP and wage growth = 1.5%			8.2	8	8.1	8.1	8.3	8.4	8.7	9	8	6.5
Old-Age Dependency Ratio	1992	1994	1995	2000	2005	2010	2015	2020	2025	2030	2040	2050
16. National Statistical Office + Institute for Research on Population⁽¹⁴⁾												
People aged 60 and over / People between 15 and 59			39.3	43	45.6	50.7		58.6		77.2	90.8	
People aged 65 and over / People between 15 and 64			26.6	29.3	32.6	34.3		39.6		50.1	64.5	

13) *Centro Europa Ricerche*.

14) ISTAT (*Istituto Nazionale di Statistica*) and IRP (*Istituto di Ricerche sulla Popolazione*). As reported in Gesano (1993).

II.10 LUXEMBOURG

The Luxembourg pension system is based on two main pillars:¹⁹⁹

- a) The contributory pension system which covers all private sector employees and self-employed workers; it comprises the AVI (*Établissement d'Assurance contre la Vieillesse et l'Invalidité*) covering manual workers, the CPEP (*Caisse de Pension des Employés Privés*) insuring private sector clerical workers and self-employed workers exercising an intellectual activity, the CPACI (*Caisse de Pension des Artisans, Commerçants et Industriels*) covering businessmen and artisans, and the CPA (*Caisse de Pension Agricole*) insuring farmers.
- b) The non-contributory pension schemes covering all public sector employees.

Pensions are granted to all workers aged 65 and over meeting some requirements. There are also some non-compulsory schemes: insured workers who have left employment can pay contributions in order to increase their contributory record (*assurance continuée*); workers can also buy complementary insurance (*assurance complémentaire*). In 1986 a guaranteed minimum income for all the elderly (over 60) was introduced.

Pension expenditure represents almost 50 per cent of total social security outlays. The share of pension expenditure on GDP rose from 7.5 per cent in 1970 to 10.4 per cent in 1994. The increase was due to demographic changes, the maturation of the schemes, the extensive use of early-retirement benefits (especially in the iron and steel industry) and to various reforms which raised the level of benefits²⁰⁰.

Over the period 1980-1994, in spite of a 38 per cent increase in the number of pensions paid by the contributory schemes, the ratio of pensioners to workers decreased from 48.6 to 47.5 per cent. In the public sector the ratio of pensioners to workers decreased from 61.4 to 55.7 per cent. The decline in the ratios is due to the substantial increase in employment: 40 per cent in the private sector, 35 per cent in the public sector.²⁰¹ The increase in the activity rate of women largely contributed to these trends.

The outlook for the Luxembourg pension system was examined in 1995 by a working group including representatives of several public institutions. A Report covering both the contributory and non-contributory schemes was published by the Ministry of Social

¹⁹⁹ The evolution and the present structure of the Luxembourg pension system are extensively described in General Inspectorate for Social Security (1994, 1995).

²⁰⁰ According to General Inspectorate for Social Security (1994), over the period 1985-1994 the average pension increased by 79.4 per cent. One fourth of the increase (19.4 per cent) can be attributed to reforms and discretionary adjustments of pension benefits.

²⁰¹ See General Inspectorate of Social Security (1994).

Security. Projections were carried out up to the year 2015 for the private sector schemes and up to the year 2030 for the public sector ones.

The number of pensions is projected on the basis of the rate of growth experienced over the period 1992-1995. Up to the year 2015 the number of pensions is expected to increase at a yearly rate of about 2.3 per cent in the private sector and 1 per cent in the public sector. Pensions are assumed to be fully adjusted to wage dynamics. Different employment scenarios are considered. As to the private sector, the following annual growth rates are taken into consideration: 0, 1, 1.6, 2 per cent. As to the public sector, only the 0, 1 and 2 per cent rates are considered.

Assuming constant employment, in the private sector the dependency ratio would rise from 48.4 per cent in 1994 to 76.3 per cent in 2015 (Table II.10, point 1). The transfer ratio is also expected to increase. The equilibrium contribution rate, calculated as the ratio of pension expenditure to total taxable income²⁰², would rise from 22.3 per cent in 1994 to 36.6 per cent in 2013. In the most favourable case (2 per cent employment growth), the dependency ratio would reach 51.5 per cent in 2015; the equilibrium contribution rate would reach 25.8 per cent by the year 2013.

In the public sector, under the constant employment assumption, the dependency ratio would rise from 54.1 per cent in 1994 to 65.1 per cent in 2015 and 77.1 in 2030 (Table II.10, point 2). The equilibrium contribution rate (calculated as the ratio of pension expenditure to total labour income) would rise from 40.6 to 51.3 and 63.5 per cent. The transfer ratio would increase from 75 per cent in 1994 to 78.8 in 2015 and 82.4 in 2030. Assuming 2 per cent employment growth, the dependency ratio would decline to 44.5 per cent in 2015 and to 43.8 per cent in 2030. The equilibrium contribution rate would decline to 36.9 and 37.1 per cent.

In order to compare the equilibrium contribution rates in the two sectors, public sector pension expenditure must be divided by public sector wages up to the private sector ceiling (*plafond*). In 1994 the public sector contribution rate was 44.3 per cent as against 23.6 per cent for the private sector. In spite of the greater increases projected for the private sector rate, it would remain below the public sector one over the whole projection period.

²⁰²

Private sector wage income is subjected to social security contributions up to a certain level (*plafond*). Total taxable income represents 91.6 per cent of total wage income.

LUXEMBOURG

Private Sector Employees and Self-Employed (Contributory Schemes)	1992	1994	1999	2000	2005	2006	2010	2013	2015	2020	2025	2030
1. Ministry of Social Security, 1995												
a) Constant employment scenario												
Dependency Ratio ⁽¹⁾ %		48.4		54.3			69.1		76.3			
Equilibrium Contribution Rate ⁽²⁾ %	21.4	22.3	25.7			30.2		36.6				
Transfer Ratio %		46.1										
b) Low employment scenario (1% yearly)												
Dependency Ratio ⁽¹⁾ %		48.4		54.3			62.6		62.5			
Equilibrium Contribution Rate ⁽²⁾ %	21.4	22.3	24.7			27.1		30.6				
c) Medium employment scenario (1.6% yearly)												
Dependency Ratio ⁽¹⁾ %		48.4		49.5			54.4		55.6			
Equilibrium Contribution Rate ⁽²⁾ %	21.4	22.3	23.9			25.3		27.6				
d) High employment scenario (2% yearly)												
Dependency Ratio ⁽¹⁾ %		48.4		49.5			51.8		51.5			
Equilibrium Contribution Rate ⁽²⁾ %	21.4	22.3	23.9			24.6		25.8				
Public Sector Employees (Non-Contributory Schemes)	1992	1994	1999	2000	2005	2006	2010	2013	2015	2020	2025	2030
2. Ministry of Social Security, 1995												
a) Constant employment scenario												
Dependency Ratio ⁽³⁾ %		54.1		55	56.7		60.1		65.1	70.1	74.2	77.1
Equilibrium Contribution Rate (total wages) ⁽⁴⁾ %		40.6		41	42.4		45.7		51.3	57.1	61	63.5
Transfer Ratio %		75		74.5	74.8		76		78.8	81.5	82.2	82.4
Equilibrium Contribution Rate (total wages up to the private sector plafond) ⁽⁵⁾ %		44.3		44.8	46.3		49.9		56			
b) Low employment scenario (1% yearly)												
Dependency Ratio ⁽³⁾ %		54.1		52	51.1		51.6		53.6	55.8	56.9	57.8
Equilibrium Contribution Rate (total wages) ⁽⁴⁾ %		40.6		39.4	39.2		40.6		43.5	46.2	47.4	48.2
Transfer Ratio %		75		75.8	76.7		78.7		81.2	82.8	83.3	83.4
Equilibrium Contribution Rate (total wages up to the private sector plafond) ⁽⁵⁾ %		44.3		42.9	42.7		44.2		47.3			
c) High employment scenario (2% yearly)												
Dependency Ratio ⁽³⁾ %		54.1		49.1	46.1		44.7		44.5	44.6	44	43.8
Equilibrium Contribution Rate (total wages) ⁽⁴⁾ %		40.6		37.8	36.2		36		36.9	37.5	37.2	37.1
Transfer Ratio %		75		77	78.5		80.5		82.9	84.1	84.5	84.7
Equilibrium Contribution Rate (total wages up to the private sector plafond) ⁽⁵⁾ %		44.3		41.2	39.4		39.1		40.1			

1) Number of Pensioners / Number of Contributors.

2) Pension Expenditure / Taxable Income.

3) Number of Pensioners / Number of public employees.

4) Pension Expenditure / Wages of public sector employees.

5) Pension Expenditure / Wages of the public sector employees up to the private sector plafond.

II.11 THE NETHERLANDS

The Dutch old-age pension system is based on two pillars: a public PAYG universal scheme (AOW²⁰³) providing a flat-rate benefit for all residents and a group of industry and company funded schemes, formed by the occupational or supplementary pensions.²⁰⁴ In both cases retirement age is 65 and survivors' benefits are also provided. In 1987 pensions paid were respectively 6.3 and 3.9 per cent of net national income, up from 4.7 and 2.2 per cent in 1970 (Huijser, 1990).

A very peculiar feature of the Dutch pension system is the large expenditure on disability benefits. All residents in the Netherlands are covered against disability²⁰⁵ and in the last few decades disability pension expenditure has represented one of the main sources of concern and one of the main focuses of policy action. Between 1970 and 1990 the number of disabled workers quadrupled. In 1990 they corresponded to 14 per cent of the labour force and expenditure was nearly 5 per cent of GDP. The relatively large recourse to disability benefits depends on the generous eligibility conditions, on their attractiveness as a form of early retirement, on their extensive use as a substitute for unemployment benefits to which they may be preferred both for financial and psychological reasons.²⁰⁶ In the Dutch disability scheme, in comparison with the Belgian and the German ones, "the number of new entrants (as a percentage of those who work) is twice as high, new entrants are younger, are less likely to leave the system and psychological diseases are much more frequent".²⁰⁷

Most of the corrective measures discussed or implemented in the area of pension expenditure in last decade regards disability benefits. From the second half of the eighties, in order to reduce expenditure; the eligibility requirements were tightened, maximum benefits being cut from 80 to 70 per cent of final wage. In the same period, the automatic indexation of all public pensions was also suspended and eventually replaced by a new system allowing the government to take account of special circumstances.²⁰⁸

In 1986 the Committee on the Financing of Pension Schemes²⁰⁹ was appointed with the aim of formulating proposals that could reduce the effects of ageing on basic pension

203. *Algemene Ouderdoms Wet - AOW.*

204. The main features of the system are outlined in Huijser (1990), Nelissen (1994) and Besseling (1994). For a brief survey of its evolution see Verbon (1988)

205. See European Commission (1992b) and OECD (1991c).

206. See OECD (1991c).

207. See European Commission (1992b).

208. See European Commission (1993a).

209. *Commissie Financiering Oudedagsvoorziening.*

expenditure. In its 1987 report the committee projected an increase of the dependency ratio from 19.8 per cent in 1985 to 25.8 and 25.3 per cent in the year 2010 respectively in the medium and high fertility scenarios and to 44.4 or 41.4 per cent in 2030 (Table II.11a, point 1). The increase in the ratio of pension expenditure to assessable income was not expected to be very alarming: depending on the favourable or unfavourable demographic and macroeconomic scenarios, the ratio would have changed from 11.6 per cent in 1985 to a range between 9.7 and 13.1 per cent in 2010 and a range between 12.3 and 15.3 per cent in 2030. No action was therefore taken.²¹⁰

In 1991 the government produced a Memorandum on pensions that focused on the supplementary schemes. The Memorandum suggested a shift from final-pay benefits to benefits related to the average wage earned during the whole working life. The latter type of benefits would have been less regressive in the redistribution of income. Neither employers nor workers' representatives were inclined to accept the proposal.²¹¹

The matter of the prospects of the Dutch pension system was raised again in 1993 by the Scientific Council of Government Policy (WRR).²¹² The WRR used two scenarios developed by the Central Planning Bureau (CBP) and added to each of them two different sets of assumptions concerning demographic evolution: "young population" and "old population". In the first set of assumptions, total fertility rate is 2, average expected life for men is 74, and immigration is high. In the second, fertility is 1.6, life expectancy is 76, and immigration is low.

The two scenarios were respectively denominated "Global Shift" (GS) and "European Renaissance" (ER). The first scenario implies an economic stagnation of the Netherlands. The pension system is left unchanged, and "by around the year 2005 there is more than one benefit claimant per employed person. The rising collective burden reinforces the lack of labour market stimuli and creates an inflationary environment."²¹³ When the situation gets very critical the pension system is eventually reformed. The ER scenario assumes rapid economic growth. It envisages the implementation of policies aimed at increasing financial incentives and the pressure to accept suitable employment. Pension schemes are rapidly reformed. In the GS scenario the ratio of total pension expenditure to earned income rises from 19 per cent in 1990 to 28-31 per cent in 2010. In the ER in the latter year it reaches 25 per cent (Table II.11a, point 3).

The WRR recommended the government to announce reform measures to be implemented from the year 2010 onwards.

²¹⁰ According to Dekkers *et al.* (1994, p. 71), this optimistic conclusion was based on the "assumption that the AOW benefit level was not linked to the wealth-position of the working population. This assumption was inconsistent with the then still valid Law on Linkage (*Koppelingswet*)."

²¹¹ See Dekker *et al.* (1994).

²¹² *De Wetenschappelijke Raad voor het Regeringsbeleid.*

²¹³ Besseling (1994, p. 45).

According to Huijser (1990), the growth of basic pension expenditure could be rather larger.²¹⁴ If pension rules remain unchanged, the premium percentage will have to be raised from 11.9 per cent in 1990 to 14.1 per cent in 2010 and to nearly 20 per cent in 2025 (Table II.11a, point 2).

Similar outcomes are reached by Dekkers *et al.* (1994) and by Nelissen (1994), by means of the NEDYMAS microsimulation model developed at the University of Tilburg (see Box 4).²¹⁵ Starting from a representative sample of the population, the model creates a fictitious panel in which individual histories are projected. The model provides projections concerning the basic and the supplementary pension schemes. In Dekkers *et al.* (1994) the contribution rates required to finance the schemes are projected up to the year 2060. Under existing retirement rules, the rate required to finance the basic system would reach 14.3 per cent in 2000, 18.4 in 2020, 21.6 in 2040 and 22.8 in 2060 (Table II.11a, point 4). The effects of several policy measures are also considered.

In spite of their funded nature, the complementary pension schemes are also likely to be negatively influenced by the ageing process. The problems stem from the defined benefit nature of the schemes and "from too low contributions in the past compared with the current pension claims".²¹⁶ Additional reserves will have to be formed by raising contributions. According to Huijser (1990), the ratio of the schemes' pension expenditure to total wages should remain stable up to the year 2000 and then increase substantially in the following decades (Table II.11b). The ratio of the premiums paid to the schemes to total wages should increase accordingly. Dekkers *et al.* project a substantial increase of the contribution rate after the year 2020.

²¹⁴ The projections by Huijser are based on a model made up of five demographic and economic sub-models. Two scenarios are considered: a) a basic scenario assuming labour productivity growth = 1.5 per cent, inflation = 3 per cent, capital market interest rate = 4 per cent, unemployment rate = 5 per cent; b) a stationary scenario assuming stable labour productivity and price levels and interest and unemployment rates as in the basic scenario. Table II.11 reports only the basic scenario.

²¹⁵ Starting from a representative sample of the Dutch population, the model creates a fictitious panel in which individual life histories are simulated. The model considers 320 characteristics of the individuals and adjusts them in every period of the simulation. See Dekkers *et al.* (1994) and Nelissen (1994).

²¹⁶ Dekkers *et al.* (1994), p. 70.

Table II.11a

THE NETHERLANDS I

Basic Pension Scheme (AOW) ⁽¹⁾	1985	1990	1991	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045
1. Committee on the Financing of Pension Schemes, 1987														
Dependency Ratio ⁽²⁾ %														
Medium demographic scenario	19.8						25.8					44.4		
High demographic scenario	19.8						25.3					41.4		
Pension Expenditure / Assessable Income %														
High fertility and high economic growth	11.6						9.7					12.3		
Medium fertility and high economic growth	11.6						10					13.4		
High fertility and low economic growth	11.6						12.8					14.8		
Medium fertility and low economic growth	11.6						13.1					15.3		
2. Huijser⁽³⁾, 1990														
a) Pension Expenditure / NNI ⁽⁴⁾ %		6.3		6.4	6.6	6.9	7.5	8.6	9.5	10.5				
b) Pension Expenditure / Total Wages %		11.9		12.1	12.5	13.1	14.1	16.2	18	19.9				
c) Benefit Ratio ⁽⁵⁾ %		41.9			40.2		39.9		38.1	37.3				
d) Dependency Ratio ⁽⁶⁾ %		28.4			31.1		35.3		47.2	53.4				
3. Scientific Council of Government Policy (WRR)⁽⁷⁾, 1993														
Old-Age Dependency Ratio ⁽⁸⁾ %														
'Young Population'			18.7				20.6					32.6		
'Old Population'			18.7				23					43		
Pension Expenditure / Earned Income %														
a) No adjustment scenario ('Global Shift')														
'Young Population'				11		11	11		12		13	13	12	
'Old Population'				11		12	12		13		15	15	15	
b) Scenario with pension reform ('European Renaissance')														
'Young Population'				.11		10	10		11		12	12	11	
'Old Population'				11		11	11		12		14	14	14	
4. Dekkers - Nelissen - Verbon, 1994														
Contribution Rate %					14.3	14.9	15.5	17.1	18.4	19.7	20	20.4	21.6	21.8

1) *Algemene Ouderdoms Wet*. This scheme covers all residents.

2) Number of elderly (65 and over) / Population of working age (between 20 and 64).

3) Projections according to 'Basic Scenario': inflation rate 3%, rate wage increase 4.5%, capital market interest rate 6%, actuarial real rate of interest 4%.

4) Computed from b) assuming total wages / NNI (National Net Income) ratio constant at 1990 level.

5) Average Pension / Average Wage. Computed from b) and d).

6) Number of pensions / Number of persons liable to payment of premium.

7) *Wetenschappelijke Raad voor het Regeringsbeleid*.

8) Number of people aged 65 and over / Number of people between 15 and 64.

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Table II.11b

THE NETHERLANDS II

Supplementary Pension Schemes ⁽¹⁾	1985	1990	1991	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045
1. Huijser⁽²⁾, 1990														
a) Pension Expenditure / Total Wages		6.4		6.3	6.3	6.8	7.6	9.4	11.2	13.3				
b) Premiums / Total Wages		6.8		6.7	6.9	7.6	8.7	10.3	10.9	12				
2. Scientific Council of Government Policy (WRR)⁽³⁾, 1993														
Old-Age Dependency Ratio ⁽⁴⁾ %														
'Young Population'			18.7				20.6					32.6		
'Old Population'			18.7				23					43		
Premiums / Earned Income %														
a) No adjustment scenario ('Global Shift')														
'Young Population'		8	8		11		17		5		3	2	2	
'Old Population'		8	8		11		19		4		2	0	6	
b) Scenario with pension reform ('European Renaissance')														
'Young Population'			8		10		15		16		16	17	17	
'Old Population'			8		10		14		17		18	18	19	
3. Dekkers - Nelissen - Verbon, 1994														
Contribution Rate					12.7	12.4	13.5	12.4	12.9	13.9	16		16.9	
Basic + Supplementary Pension Schemes	1985	1990	1991	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045
1. Nelissen, 1994														
Contributions / Total Wages ⁽⁵⁾ %				17.9	17.8	19.1	20.1	19.2	20.9	22.4	23.5		25.2	26

1) These schemes cover the vast majority of private sector employees and the civil servants.

2) Projections according to 'Basic Scenario': inflation rate 3%, rate wage increase 4.5%, capital market interest rate 6%, actuarial real rate of interest 4%.

3) *Wetenschappelijke Raad voor het Regeringsbeleid*.

4) Number of people aged 65 and over / Number of people between 15 and 64.

5) Data refer to 5 years brackets (e.g., data reported here for 1995 actually refers to 1995-2000).

II.12 PORTUGAL

In the last two decades the Portuguese pension system underwent substantial changes.²¹⁷ Several important reforms were implemented. Between 1976 and 1984 many different schemes were integrated into three main schemes:

- a) The Social Security pension scheme (IGFSS) which comprises the contributory General Pension Scheme for private employees and self-employed, the Agricultural Special Scheme and the non-contributory scheme which provides means-tested benefits to all elderly citizens not covered by the contributory schemes.²¹⁸
- b) The public employees scheme.²¹⁹
- c) The bank employees scheme.

Since the mid-1980s, real pension expenditure per beneficiary far outstripped real wage increases.²²⁰ According to OECD (1993b) "the sharp increase in spending per beneficiary reflects improved generosity (a fourteenth month of pension payments was added) and a structural shift from low pensions in agriculture to higher pensions in the non-agricultural sector. Due to favourable demographic developments and strong revenue growth, it has been possible so far to finance the Social Security system without an increase in contribution rates". Between 1985 and 1991 the ratio of pension expenditure to GDP increased by about 1.5 points, reaching 9 per cent of GDP.²²¹

According to Borges and de Lucena (1988), in the late eighties the pension system was far from mature. The number of pensions was expected to rise because a higher percentage of citizens was going to be eligible for retirement pensions. New pensioners were going to retire with longer contributory records, thereby increasing the average pension.²²² In the absence of a formal indexation mechanism, however the future level of the average pension appeared rather uncertain.

²¹⁷ For a description of the system see Borges and de Lucena (1988), Lopes Ribeiro Mendez (1992) and Instituto de Seguros de Portugal (1995).

²¹⁸ *Regime Geral, Regime Especial Agrícola and Regime Não Contributivo*. In the general scheme some special professional groups of private employees have special conditions concerning contribution rates (e.g. football players, priests, actors, etc.); these are often not considered in the projections. The Agricultural Special Schemes was closed in 1986 (no new workers were admitted).

²¹⁹ *Caixa Geral de Aposentações*. Since September 1993, new public employees are covered by the general regime.

²²⁰ Between 1985 and 1991 real average old-age pension increased by about 100 per cent, while real compensation per employee increased by less than 20 per cent (see OECD, 1993b, p. 35).

²²¹ See OECD (1993b).

²²² See Borges and de Lucena (1988).

Borges and de Lucena (1988) projected Portuguese social security expenditure up to the year 2050 by integrating a demographic model, a general equilibrium economic model and a financial model of social security. According to their projections, which are largely referred in OECD (1993b), in the present decade the financial situation of the pension system appears sustainable. The demographic conditions would not deteriorate and strong real wage growth could lead to fast revenue increases. Long term projections are less reassuring: from the year 2000 onwards the pure demographic dependency ratio will increase significantly. The maturation of the pension schemes will also add to pension expenditure dynamics. Even assuming price-indexation of pension benefits, a substantial acceleration in spending growth will occur.

According to the Borges and de Lucena baseline scenario, the ratio of pension expenditure to GDP should increase from 6 per cent in 1987 to 7 per cent in 2010, 8 per cent in 2020 and 13 per cent in 2050 (Table II.12, point 1). Pension expenditure dynamics will be accelerated by an increase in the ratio of average pension to average wage. The ratio of pension expenditure to total social security expenditure would gradually rise from 60 per cent to 80 per cent.

Pension expenditure dynamics will also be influenced by the sharp demographic changes occurring in the latter decades: the total fertility ratio dropped from 3.1 in 1960 and 2.8 in 1970 to 2.2 in 1980 and 1.5 in 1990.²²³ Demographic projections of the old-age dependency ratio are provided by Lopes Ribeiro Mendes (1992). Three scenarios are considered: a baseline scenario, a high ageing scenario and a recuperation scenario. The dependency ratio is projected to increase from 20 per cent in 1990 to 23.5 per cent in 2010 and 25-26.5 in 2020 (Table II.12, point 2). The ratio of pensioners to contributors is expected to increase at a slightly reduced rate; by the year 2020 it should range between 65 and 67 per cent, as against 53 per cent in 1990.

New expenditure estimates were carried out in Portuguese Federation of Insurance Companies (1994); they were not forecasts, but theoretical exercises aimed at showing the effects of social, demographic and economic changes on old-age pensions. Two fertility scenarios are considered, both involving a recovery in total fertility ratio up to 2010. In the first scenario the total fertility ratio reaches 2.1, in the second it reaches 1.7. Accordingly, the old-age dependency ratio is projected to increase from 23 per cent in 1990 to 27 per cent in 2010, 35 - 37 per cent in 2030 and 42 - 50 per cent in 2050 (Table II.12, point 3). The ratio of pensioners to workers is expected to increase from 40 to, respectively, 50, 60 and 80 per cent. The ratio of pensioners to workers actually contributing to finance the pension system is expected to converge gradually to the ratio of pensioners to workers. The maturing of the system would also contribute to expenditure dynamics by raising the average pension to average wage ratio (Chart 18). The transfer ratio would increase from 27 per cent in 1990 to 52 per cent in 2010 and 65 per cent in 2030; it would then decline to 61 per cent by the year 2050. The equilibrium contribution rate is projected to rise from 13 per cent in 1990, to 27 per cent in 2010, 47 in 2030 and 49 in 2050.

²²³ See European Commission (1994a).

In 1993 several reforms were introduced in the Portuguese pensions system.²²⁴

- a) The retirement age was gradually raised for women from 62 to 65 years. Every year the retirement age for women is raised by 6 months.
- b) The formula for calculating pension payments was modified: the number of years considered in the assessment of pensionable earnings was increased from the best 5 years out of the last 10 to the best 10 years out of the last 15; average earnings are to be calculated on the basis of 14 salaries rather than 12; a minimum period of contributions of 120 days per year is to be taken into consideration; the accrual rate per year of contribution was reduced from 2.2 per cent to 2 per cent; earnings serving as the basis for calculation are to be indexed to prices (previously they were not adjusted).
- c) The public sector employees' special pension benefits were abolished in September 1993. New public employees will be covered by the general regime.²²⁵

The effects of these reforms were taken into consideration by the projections carried out in 1995 by the Centre for Financial Economics Research²²⁶ (a research institute associated to the Lisbon Technical University).²²⁷ The projections are based on recent official demographic forecasts, on the assumption that the ratio between the number of pensioners and the total population of each age and sex group (i.e., the eligibility ratio) remains constant, and on the assumption that the benefit ratio is constant over the projection period.

Demographic changes would raise the ratio of the number of pensioners to the number of workers from 56 per cent in 1995 to 61 per cent in 2010 and 69 per cent in 2020. The equilibrium contribution rate would increase from 25.8 per cent in 1995 to 28.1 per cent in 2010 and 31.4 per cent in 2020.

²²⁴ On the revenue side, the self-employed contribution rate was raised significantly.

²²⁵ This scheme was significantly more favourable than the general scheme in terms of contribution rates and benefits; therefore in 1993, it was modified in line with the general scheme.

²²⁶ *Centro de Investigação sobre Economia Financeira.*

²²⁷ The projections are endorsed by the Ministry of Finance, which has also financed them.

PORTUGAL

Table II.12

Social Security System ⁽¹⁾	1987	1990	1995	2000	2005	2010	2015	2020	2030	2040	2050
1. Borges and Lucena⁽²⁾, 1988											
Old-age Dependency Ratio ⁽³⁾ %	20							25			45
Pension expenditure / GDP %	6					7		8			13
Equilibrium Contribution Rate % (for total social security expenditure)	35							41			53
2. Lopes Ribeiro Mendes, 1992											
Old-age Dependency Ratio ⁽³⁾ %											
Baseline scenario		19.7	21.1	22.5	23.5	23.6	24.5	26.1			
High ageing scenario		19.7	21.1	22.4	23.4	23.7	24.7	26.6			
Recuperation scenario		19.7	21.1	22.5	23.5	23.7	24.4	25			
Dependency Ratio (Pensioners / Contributors) %											
Baseline scenario		53.5		55.7		67		66.6			
High ageing scenario		53.5		55.7		67.3		67.5			
Recuperation scenario		53.5		55.7		67.1		65.6			
3. Portuguese Federation of Insurance Companies⁽⁴⁾, 1994											
Old-age Dependency Ratio ⁽⁵⁾ %											
High fertility (TFR = 2.1)		23		25		27		29	35	41	42
Low fertility (TFR = 1.7)		23		25		27		30	37	46	50
Dependency Ratio (Pensioners / Workers) ⁽⁶⁾ %		41	48	46	47	51	54	60	71	84	80
Dependency Ratio (Pensioners / Contributors) ⁽⁶⁾ %		48	55	51	49	52	55	61	72	85	80
Equilibrium Contribution Rate ⁽⁶⁾ %		13	17	20	24	27	32	37	47	53	49
Pension expenditure in real terms ⁽⁶⁾ (1990=100)		100	160	210	280	320	360	390	440	500	620
Implicit Transfer Ratio ⁽⁷⁾ %		27	31	39	49	52	58	61	65	62	61
4. Centre for Financial Economics Research, 1995											
Old-age Dependency Ratio ⁽³⁾ %			21.9	22.7	24	24.7	25.9	27.5			
Dependency Ratio (Pensioners / Contributors) %			56.4	56.4	58.3	61.4	64.8	68.6			
Equilibrium Contribution Rate ⁽⁸⁾ %			25.8	26.9	26.7	28.1	28.7	31.4			

1) Projections 1. and 3. cover the contributory general regime for employed and self-employed workers and the agricultural regime; they do not cover the special regime for public employees and bank employees and the non-contributory schemes. Projection 2. covers also the non-contributory pension schemes.

2) These figures are based on the Baseline Scenario. As reported in the charts 2, 4 and 5.

3) Number of people aged 65 and over / Number of people between 15 and 64.

4) *Associação Portuguesa de Seguradores*. As reported in the charts 4,14 and 16.

5) Number of people aged 65 and over / Number of people between 20 and 64.

6) Based on the 'High Fertility' scenario.

7) Based on the Pensioners / Contributors Ratio and the Equilibrium Contribution Rate.

8) Average pension dynamics = wage dynamics.

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II.13 SPAIN

The Spanish pension system comprises a general scheme which covers employees in industry and services and several special schemes covering public sector employees, some groups of private sector employees (rural workers, miners, fishermen, etc.) and self-employed workers. A non-contributory scheme introduced in 1990 provides a uniform pension to poor elderly and disabled residents.²²⁸

During the seventies pension expenditure rose substantially due both to the broadening of eligibility criteria and the ageing of the population.²²⁹ Between 1980 and 1985 it increased by 6.35 per cent p.a. in real terms; its share on GDP increased from 5.6 to 7.5 per cent. This tendency was due to the substantial increase in the number of pensions (largely determined by the expansion in the number of invalidity pensions²³⁰) and the increase in the average pension (due to the substitution of old pension with new richer ones and to reforms improving some specific benefits).

Some measures aimed at reducing pension expenditure were taken in 1984 and 1985.

- a) In 1984 the eligibility requirements for invalidity pensions were tightened.
- b) In 1985 a minimum period of 15 years of contribution was introduced to qualify for an old-age pension; the formula for the calculation of pensions was modified: pensions were to be calculated on the basis of earnings over the last 10 years rather than over the last 5.

In the following years, under strong social pressures the government significantly increased minimum pensions. Lower pensions were also increased above the inflation rate. Between 1988 and 1993, the average pension rose from 82 to 95 per cent of the minimum wage.²³¹ In 1990 a new non-contributory pension system providing welfare benefits was introduced. In 1993 some special schemes were incorporated in the Social Security contributory pension schemes. Over the period 1985-1990 real pension expenditure increased by 5.4 per cent p.a.; the expenditure to GDP ratio remained stable at 7.5 per cent. In the following five years real pension expenditure increased by 5.3 per cent p.a.; the GDP rose to 9.1 per cent in 1995.²³²

²²⁸ For a description of the Spanish pension system see Ministry of Labour and Social Security (1995) and Levy (1995b). The debate on pension reform is examined in Herce and Pérez-Díaz (1995b).

²²⁹ OECD (1988b) reported the ratio of expenditure to GDP as 3.2 per cent in 1970 and 7.3 per cent in 1980.

²³⁰ The average yearly increase in the number of all pensions over the period 1980-1985 was 4.2 per cent, while the average increment in the number of invalidity pensions was 7.3 per cent (Ministry of Labour and Social Security, 1995, p. 49).

²³¹ See European Commission (1994a). As reported in Ministry of Labour and Social Security (1995, p. 55), in the last ten years the average pension increased by about 2.5 percentage points per year in real terms.

²³² See Ministry of Labour and Social Security (1995, p. 39).

Spain, which is presently one of the European countries with the youngest population, will face a strong ageing process. According to the projections carried out by the National Statistical Office²³³ (Census of 1991), the old-age dependency ratio (population aged 65 and over / population aged 20-64) would increase from 23.7 per cent in 1991 to 25.2 per cent in 1995, 28.4 in 2010 and 32.4 in 2020.²³⁴ In recent years this trend has determined some concern about the long-term perspectives of the Spanish pension system. Several projections have been carried out by academics and private institutions; in 1995 the Ministry for Labour and Social Security produced official forecasts.

Sanchez Alvarez (1992),²³⁵ assuming a constant eligibility ratio, estimates that the number of pensioners would increase by nearly 50 per cent by the year 2020 and by nearly 100 per cent by the year 2040. Assuming a GDP growth rate of 2 per cent, he also projects the ratio of pension expenditure to GDP under different assumptions concerning the increase in the average amount of each pension (Table II.13a, point 1). Assuming also constant employment ratios, Sanchez Alvarez projects the pensioners to workers ratio to increase by 40 per cent by the year 2020 and by nearly 120 per cent by the year 2040. Assuming a constant transfer ratio, the same trend would apply to the equilibrium contribution rate. If the employment ratio recovered its 1960s level, in 2020 the ratio of pensioners to workers would be slightly below its 1990 level; in 2040 it would be 45 per cent higher. If the total fertility rate remained at its 1990 level (1.4), the ratio of pensioners to workers would rise by 45 per cent in 2020 and by more than 150 per cent in 2040.

According to Sanchez Alvarez, some non-demographic factors will also influence pension expenditure growth. First of all, some Spanish pension schemes are not yet totally mature. New pensioners will retire with longer contributory periods. Secondly, although pensions are indexed to prices, increases in real terms should not be ruled out. The transfer ratio is therefore likely to increase, as has been the case in the last decade.²³⁶

Bengochea and Errasti's projections (1994) are based on slightly more favourable assumptions on fertility rates.²³⁷ Assuming constant eligibility and employment ratios, the

²³³ INE, *Censo de 1991*.

²³⁴ The total fertility rate is assumed to remain stable at 1.13 over the whole projection period. Life expectancy at birth is expected to increase from 76.94 years in 1990 to 78.58 in 2005.

²³⁵ According to Sanchez Alvarez, even assuming a recovery in the total fertility ratio from 1.4 to 1.8, the old-age dependency ratio (computed as population aged 65 and over / population aged 15-64) will increase from 20.6 per cent in 1990 to 28.6 in 2030 and 46.1 per cent in 2050. A large part of the total increase in the ratio will occur in the period 2020-2045, due to the retirement of the 'baby-boom' generation of the sixties. The "baby-boom" took place in Spain some 10-15 years after than in the rest of Europe.

²³⁶ In the years from 1982 to 1990 real pensions increased at a higher rate than real wages.

²³⁷ In the low fertility scenario, total fertility rate gradually increases from 1.46 in 1995 to 2.08 in 2050: the old-age dependency ratio increases from 21 per cent in 1995 to 54 per cent in 2050. In the high fertility scenario total fertility ratio increases from 1.55 in 1995 to 2.10 in 2020: the old-age dependency ratio increases from 21 per cent to 49 per cent. These data are not directly comparable with those of Sanchez Alvarez as the denominator is different.

dependency ratio, calculated as the ratio of pensioners to workers, will rise from 26 per cent in 1995 to 69 per cent in 2040 (Table II.13a, point 2). Assuming that the transfer ratio is also constant, the ratio of pension expenditure to total labour gross income would increase from 16 to 40 per cent. Bengochea and Errasti also consider a more favourable economic scenario with a higher employment rate and a higher retirement age: the share of pension expenditure to total labour gross income would then increase at a much lower growth, reaching 38 per cent by the year 2040.

Barea Tejeiro and Fernandez Moreno (1994) provide similar demographic projections. The ratio of real pension expenditure to the number of contributors would increase by nearly 30 per cent between 1991 and 2011 and by 50 per cent between 1991 and 2026 (Table II.13a, point 3).

In 1995 Herce carried out some new projections of the socio-economic consequences of the ageing of the population up to the year 2051. According to his medium scenario, which considers a gradual increase in the total fertility ratio up to 1.8 in the year 2026, the old-age dependency ratio is expected to rise from 21.2 per cent in 1991 to 34.2 per cent in 2026 and 50 per cent by the year 2051 (Table II.13a, point 4). Assuming constant real average benefits, the whole social expenditure for the elderly would double; according to Herce, this increase represents the lower bound of expenditure growth, as it is very likely that real per capita benefits will increase.

Levy (1995b) estimates the long-term financial prospects of the pension system assuming a constant transfer ratio. The ratio of old-age to working-age population is estimated to rise from 25 per cent in 1995 to more than 60 per cent in 2050. The dependency ratio is projected to double over the same period, increasing from 49 per cent in 1995 to 109 per cent in 2050. Assuming price indexation of pensions and a five year gradual increase in the number of years of contribution required for pension eligibility, pension expenditure would increase from 8.5 per cent of GDP in 1995 to 17.6 per cent by the year 2050 (Table II.13b, point 5).²³⁸

A parliamentary commission, including representatives of the four main Spanish political parties was set up in 1994 in order to draft a proposal for reforming the social security system. Early in 1995 a broad agreement on the reform was reached (the "Toledo Pact").²³⁹ The draft proposal was later endorsed by all other political parties in Parliament. The Commission stresses the future viability of the present PAYG pension system. Radical changes are considered unnecessary and undesirable. A number of reforms should adjust the current system to new economic and demographic circumstances. The Commission proposes the following changes:

- a) Strengthening the distinction between the funding of insurance and welfare pensions.

²³⁸ Levy (1995b) also considers a scenario of gradual increase in the participation rate for most age brackets and higher employment. In this scenario the dependency ratio declines by one seventh. The share of pensions to GDP does not exceed 16.5 per cent at the peak of the dependency ratio (around 2040).

²³⁹ The *Pacto de Toledo* is examined in Ministry for Labour and Social Security (1995).

- b) A gradual integration of the special pension regimes into the two main regimes for employees and self-employed.
- c) Strengthening the link between contributions and individual benefits.

According to the Commission, the indexation of pensions to price increases and the 65 year standard retirement age should be retained; social security contributions should be lowered; some welfare benefits should be improved. The public pension system should balance through the economic cycle; a reserve fund should be set up in order to allow for deficits in cyclical downturns. The state and the prospects of the public pension system should be assessed in detail every five years. Private pension schemes should supplement the public schemes on a voluntary basis.

In 1995 the Ministry for Labour and Social Security produced detailed projections concerning the perspectives of the Spanish social security system. Pension expenditure is forecast up to the year 2030. The projections are based on demographic forecasts carried out by the National Statistical Office (see above).

Different methodologies are utilised for the period 1995-2010 and the period 2010-2030. As to the former period, the number of pensions is projected on the basis of the probability of surviving of existing pensioners and the flow of new pensions resulting from actual workers. Old-age, invalidity and survivors' pensions are projected separately. In the following period, the number of pensions is estimated by means of a multiple regression. Pensions are expected to increase from 7.0 million in 1995 to 8.4 in 2010 and 10.6 in 2030. The growth in the number of pensioners will be rather limited in the period 2000-2005 because the new retired will be people born around the years of the civil war. It will accelerate thereafter, when the baby-boom generation reaches retirement age.

The number of contributors is projected to increase from 12.4 million in 1995 to 14.8 in 2010 and 17.6 in 2030: this is due to an increase in the activity rate in the 20-64 year bracket (from 66 to 70 per cent over the period 1995-2010) and a decline in the unemployment rate (from 22.7 to 15.8 over the same period).²⁴⁰ In spite of the increase in the number of pensions, the dependency ratio is expected to rise moderately from 56.7 per cent in 1995 to 57.1 in 2010 and to 60.3 in 2030.

Taking into account the price indexation arrangement, and considering the 'substitution effect' (new pensions are on average higher than the pensions they replace²⁴¹), the average pension is expected to increase by 27 per cent in real terms up to the year 2010, and by 70 per cent by the year 2030. In spite of that, as per capita GDP is assumed to increase faster, the transfer ratio (calculated as the average pension on per capita GDP) would decrease: from 50 per cent in 1995 to 40 per cent in 2020 under the less favourable assumption of a 2 per cent yearly GDP growth.

²⁴⁰ Compared to other European countries, Spain has a very high level of unemployment (24 per cent in 1994) and a low participation rate. See Levy (1995b).

²⁴¹ See, for instance, the data reported in Ministry of Labour and Social Security (1995, pp. 135, 152, 157).

As a result, the share of pension expenditure on GDP would rise from 9.1 per cent in 1995 to 9.8 per cent in 2010 and to 11.2 per cent in 2030. Assuming a real GDP yearly growth of 2.5 per cent, the increase in the ratio would be extremely limited (9.2 per cent in 2010 and 9.5 in 2030).

Ministry for Labour and Social Security (1995) also examines the effects of some possible reforms. If pensions were revaluated at a yearly rate one percentage point below price dynamics, pension expenditure on GDP would be reduced by 1.3 percentage points in 2010 and 3.2 in 2030. A 2 year increase in retirement age would decrease the expenditure to GDP ratio by about half a point by the year 2030. A similar reduction is projected for the introduction of a uniform accrual rate for the calculation of pensions. The lengthening of the period considered for determining the pension is expected to decrease the expenditure ratio by 0.2 points of GDP. The reform in the calculation of invalidity pensions would decrease it by 0.3 points. Finally, the reduction of invalidity rate would reduce the share of pension expenditure on GDP by 0.15 percentage points.

The Report (p. 13) concludes that a set of measures which would increase contributory revenues, strengthen the link between contributions and benefits and separate the financing of social security and welfare pensions, could ensure the viability of the security system.

The prospects of the Spanish pension system have been examined also in Herce and Pérez-Díaz (1995b). Pension expenditure is forecast up to the year 2025; in the baseline scenario real GDP and employment are assumed to grow respectively at 2.5 and 1.0 per cent p.a.²⁴² The number of pensions is expected to increase by 54 per cent, as against a 39 per cent increase in the number of insured workers.²⁴³ The average pension is projected to increase by 44 per cent in real terms, as against a 108 per cent increase in per capita GDP. The increase in the dependency ratio is offset by the decline of the transfer ratio. The ratio of pension expenditure to GDP increases from 9.6 per cent in 1995 to 9.9 per cent in the year 2000; thereafter it remains stable. The ratio of contributory revenue to GDP is projected to decline from 7.4 per cent in 1995 to 6.4 per cent in 2025. This decline determines an increase in the deficit of pension schemes. Herce and Pérez-Díaz stress that the gap between pensions and contributions will increase more dramatically after 2025, with the retirement of the baby-boomers.

Two alternative employment scenarios are considered. A 1.7 per cent yearly growth in employment would allow the deficit to remain constant; a 0.5 per cent yearly rate would increase the deficit by 1.2 additional points. Five reform measures are evaluated. Three of them are similar to those considered in Ministry for Labour and Social Security (1995): the lengthening of the period considered for determining the pensions, the

²⁴² The projections are based on demographic forecasts carried out in 1994 by the *Instituto de Demografía*.

²⁴³ The number of pensions is projected on the basis of the probability of surviving of existing pensioners and the flow of new pensions. The ratio of new pensions to population for each age class is assumed to be constant over time at present levels.

increase in standard retirement age, the cut of pension indexation. The two other measures involve a lowering of the accrual rate and an increase in the discount rate applied to early retirement pensions.

Table II.13a

SPAIN I

Social Security System	1990	1991	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
1. Sanchez Alvarez, 1992														
Old-age Dependency Ratio ⁽¹⁾ %	20.6			24.6		26.2		28.6		35.7		44.9		46.1
Pension Expenditure in real terms (1990=100)														
Average real pension growth = 0	100		112	122	128	134	141	148	160	174	188	198	202	193
Average real pension growth = 1	100			135		164		200		259		326	349	393
Average real pension growth = 2	100			149		199		268		385		533	599	
Pension Expenditure / GDP ⁽²⁾ (1990=100)														
GDP growth = 2%, average real pension growth = 0	100			100		90		82		79		74	68	
GDP growth = 2%, average real pension growth = 1	100			111		110		110		117		121	117	
GDP growth = 2%, average real pension growth = 2	100			122		134		148		174		198	202	
Dependency Ratio (Pensioners / Workers) %	100		107	113	118	124	132	141	155	174	196	217		221
2. Bengochea and Errasti, 1994														
Old-age Dependency Ratio ⁽³⁾ %														
Low fertility			21	24		26		29		39		59		54
High fertility			21	24		26		29		37		46		49
Dependency Ratio (Pensioners / Workers) ⁽⁴⁾ %			26	31		34		38		51		69		
Pension Expenditure / Total labour gross income ⁽⁵⁾ %			16	19		21		24		32		40		
3. Barea Tejeiro and Fernandez Moreno⁽⁶⁾, 1994														
Old-age Dependency Ratio ⁽⁷⁾ %		20.6				27			33.4					
Real Pension Expenditure / Contributors ⁽⁸⁾ (1991=100)		100				129			150					
4. Herce, 1995														
Old-Age Dependency Ratio ⁽⁹⁾ %		21.2	23	25.2	26.1	27.4	29.2	31	34.2	38	42	48	52	50
Dependency Ratio (Pensioners / Contributors) ⁽¹⁰⁾ %	49	50		60		70		81						
Real Social Expenditure for the elderly (1991=100) ⁽¹¹⁾		100		125		135		151		175		201		196

1) Number of People aged 65 and over / Number of people between 16 and 64. These figures are based on the medium fertility scenario.

2) Assuming constant eligibility and employment ratios and a 1.8 total fertility ratio.

3) Number of people aged 65 and over / Number of people between 20 and 64.

4) Assuming constant activity and employment ratios. Data attributed to 1995 actually refer to 1993.

5) Assuming a constant average pension to labour income ratio. See esquema 5, p. 164.

6) Data attributed to the years 2010 and 2025 actually refer to the years 2011 and 2026.

7) Number of people aged 65 and over / Number of people between 14 and 64.

8) Computed assuming pension expenditure per member of each age bracket constant at 1991 level.

9) Number of people aged 65 and over / Number of people between 16 and 64. These figures are based on the medium fertility scenario of the Instituto de Demografía, with a gradual increase of TFR up to 1.8 in the year 2026.

Data attributed to the years 2000, 2005, 2010, 2015, 2020, 2025, 2030, 2035, 2040, 2045, 2050 actually refer to the years 2001, 2006, 2011, 2016, 2021, 2026, 2031, 2036, 2041, 2046, 2051.

10) Data attributed to the years 2000, 2010, 2020 actually refer to the years 2002, 2012, 2022.

11) Data attributed to the years 2000, 2010, 2020, 2030, 2040, 2050 actually refer to the years 2001, 2011, 2021, 2031, 2041, 2051.

SPAIN II

Social Security System	1990	1991	1994	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
5. Levy, 1995															
a) Baseline Scenario															
Dependency Ratio ⁽¹⁾ %				49	53		61		73		94		112		109
Pension Expenditure / GDP ⁽²⁾				8.5	8.8		9.8		11.9		15.3		18.6		17.6
Equilibrium Contribution Rate growth				100	100		120		140		180		220		210
b) Higher employment and participation rate															
Dependency Ratio ⁽¹⁾ %				49	51		57		67		86		100		96
Pension Expenditure / GDP ⁽²⁾				8.5	8.3		9.1		10.9		13.9		16.5		15.4
Equilibrium Contribution Rate growth				100	100		110		130		160		190		180
c) Partial prefunded pension system															
Equilibrium Contribution Rate growth				100	100		110		140		150		150		150
6. Ministry of Labour and Social Security⁽³⁾, 1995															
Old-Age Dependency Ratio ⁽⁴⁾ %		23.7		25.2	27.1	27.4	28.4	30.3	32.4						
Number of Pensions (1995=100)				100	108	113	119	126	133	141	150				
Number of Contributors (1995=100)				100	109	114	119	124	129	135	141				
Dependency Ratio ⁽⁵⁾ %	49.4	50.2	57.3	56.7	56.1	56.4	57.1	58	58.7	59.4	60.3				
Average yearly Pension (1995=100)				100	109	118	127	136	146	157	170				
Per Capita GDP (1995=100)															
Low growth scenario ⁽³⁾				100	114	126	141	159	181						
High growth scenario ⁽³⁾				100	116	132	151	174	203						
Average Pension / Per Capita GDP ⁽⁶⁾ %															
Low growth scenario ⁽³⁾	47.3			50.5	48.1	46.9	45.1	42.9	40.5						
High growth scenario ⁽³⁾				50.5	47.4	45.1	42.3	39.3	36.2						
Pension Expenditure yearly growth %	12.3			10.5	6.8	5.8	5.8	5.9	5.8	5.9	6.1				
effects of -increase in number of pensions	2.8			2.6	1.6	1	1.1	1.2	1.1	1.1	1.2				
-indexation	7.1			5.2	3.1	3	3	3	3	3	3				
-other factors	2			2.3	1.9	1.7	1.6	1.6	1.6	1.7	1.8				
Pension Expenditure / GDP %															
Low growth scenario ⁽³⁾	7.5		8.8	9.1	9.3	9.6	9.8	10.1	10.4	10.7	11.2				
High growth scenario ⁽³⁾	7.5		8.8	9.1	9.2	9.2	9.2	9.3	9.3	9.3	9.5				
Sensitivity Analysis - Effects on Expend. / GDP ⁽⁷⁾ %:															
a) Price indexation + 1% per year			0		+0.5		+1.6		+2.8		+4.4				
b) Price indexation - 1% per year			0		-0.4		-1.3		-2.2		-3.2				
c) Higher retirement age (+ 2 years)			0		-0.32	-0.18	-0.27	-0.4	-0.49		-0.54				
d) Lower invalidity rate			0		0		-0.08		-0.15		-0.15				
e) Uniform accrual rate			0		-0.13	-0.24	-0.33	-0.43	-0.52		-0.58				
f) Longer reference contribution period			0		-0.02	-0.06	-0.09	-0.12	-0.16		-0.19				
g) Invalidity pensions related to contributory record			0		-0.06	-0.12	-0.16	-0.21	-0.26		-0.28				

1) Ratio of pensioners to workers.

2) Growth of the average contribution rate to finance pensions assuming year 1995 as base year.

3) Real GDP growth = 3.7 % in 1996, 4.0% in 1997 and 2.0% (low growth scenario) or 2.5% (high growth scenario) yearly from the year 1998 onwards. Employment growth = 2.4% in 1996, 2.9% in 1997, 2.0% in 1998 and 0.9% yearly from 1999 onwards.

4) Number of People aged 65 and over / Number of People aged between 20 and 64.

5) Number of Pensioners / Number of Contributors. The number of contributors has been calculated from the tables pp. 90 and 102.

6) Average pension = Total Pension Expenditure / Total Number of Pensioners. Per capita GDP = GDP (as indicated in the Report) / Population (as indicated in EUROSTAT, 1995).

7) Low growth scenario.

SPAIN III

Social Security System	1990	1991	1994	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
7. Herce and Pérez-Díaz, 1995															
Old-Age Dependency Ratio ⁽¹⁾ %				22.5	24.8	25.7	27	28.7	30.4	33.4					
Number of Pensions (1995=100)				100	111	118	126	134	143	154					
Number of Contributors (1995=100)				100	108	114	120	126	132	139					
Dependency Ratio ⁽²⁾ %				57.8	59.3	60.1	60.1	61.7	62.7	64.1					
Average yearly Pension (1995=100)				100	108	115	122	129	136	144					
Per Capita GDP (1995=100)				100	114	127	142	160	182	208					
Average Pension / Per Capita GDP ⁽³⁾ %				54.2	51.4	49	46.6	43.7	40.7	37.6					
Pension Expenditure / GDP %				9.6	9.9	9.9	9.9	9.9	9.9	9.9					
Contributions to Pension Schemes / GDP %				7.4	7.3	7.2	7	6.8	6.6	6.4					
Deficit of the Pension Schemes / GDP %				2.2	2.6	2.7	2.9	3.1	3.3	3.5					
Effects of different empl. scenarios on Exp. / GDP %:															
a) Employment growth = 1.7 % p.a.				0	0	-0.29	-0.57	-0.85	-1.12	-1.4					
b) Employment growth = 0.5 % p.a.				0	0	+0.21	+0.43	+0.66	+0.9	+1.17					
Effects of reforms on Expenditure / GDP %:															
a) Lower accrual rates ⁽⁴⁾				0	0	-0.23	-0.29	-0.31	-0.36	-0.4					
b) Longer reference contribution period ⁽⁵⁾				0	0	-0.1	-0.21	-0.3	-0.39	-0.46					
c) Higher retirement age (+ 3 years)				0	0	-0.25	-0.46	-0.58	-0.69	-0.77					
d) Higher discount rate for early retirement pensions ⁽⁶⁾				0	0	-0.06	-0.09	-0.12	-0.15	-0.16					
e) Price indexation - 0.5% per year				0	-0.24	-0.51	-0.8	-1.11	-1.42	-1.74					

1) Number of People aged 65 and over / Number of People aged between 15 and 64. See Table 2.1.

2) Number of Pensions / Number of Contributors. As calculated from Table 2.3.

3) Average pension = Total Pension Expenditure / Total Number of Pensions. (See Tables 2.3 and 2.4). Per capita GDP = GDP (as calculated from Table 2.4) / Population (as indicated in Table 2.1).

From the year 2005 real GDP is assumed to grow at a yearly rate of 2.5% (with employment and productivity respectively growing at 1% p.a. and 1.5% p.a.).

4) From (4%*15 years+2%*20 years) = 100 % to (3.3%*15 years+1.6%*25 years) = 90%.

5) From last 8 years to last 15 years in 2001 and last 25 years in 2010.

6) From 8% to 10% per year.

II.14 SWEDEN

The Swedish pension system has two main components: the national basic pension scheme, providing a universal flat-rate pension, and the compulsory Supplementary pension schemes (ATP), providing an earning-related pension.²⁴⁴ Both schemes provide old-age, disability, and survivors' pensions. Pension credits earned and pensions are expressed in terms of "base amounts" which are increased in line with inflation.²⁴⁵ The standard retirement age is 65.

In 1990 the ratio of public expenditure for old-age and survivors to GDP was 11.9 per cent, compared with a EC average of 9.2 per cent and an average of 7.5 per cent for the non-EC OECD countries.²⁴⁶ The relatively high level of expenditure was related to the age structure of the Swedish population: in 1990 17.8 per cent was 65 or older compared to an OECD average of 13.5 per cent.²⁴⁷ The share of old people on total population was stable during the eighties and is expected to rise only after the year 2010, when the generation born in the forties will retire.

During the eighties a growing awareness of the need to adapt the pension system to new demographic and economic conditions led to the setting up of a public commission on pensions. The work of the commission resulted in the reform of survivors' pensions: from 1990 ATP widows' pensions have been gradually phased out; they have been replaced by an "adjustment pension" paid for a year after the death of the partner.

In 1990 the Ministry of Finance carried out some pension expenditure projections on the basis of three different scenarios (Table II.14, point 1).²⁴⁸ Within the "basic scenario", where a 2 per cent yearly growth in productivity and real wages is assumed, the share of pension expenditure to GDP falls from the initial 11 per cent in 1990 to 10 per cent in 2000 and 10.9 in 2025. Considering the new measures and the same economic assumptions ("main scenario"), the situation is a little bit worse. The most worrying case would be that of a "low growth scenario" (with a 1 per cent yearly growth in productivity and real wages), where the share would remain constant until 2000 and then rise to 14.9 per cent by the year 2025.

Two years later the Ministry of Finance updated its projections in the new Medium-Term Survey of the Swedish Economy. It estimated that total old-age pension expenditure in

²⁴⁴ For a description of the Swedish pension system see OECD (1991b) and Ministry of Health and Social Affairs (1994).

²⁴⁵ In 1994 the "base amount" was SEK 35,200 (per cent of Swedish per capita GDP).

²⁴⁶ See OECD (1994a). The data concerning the two groups of countries are not fully comparable.

²⁴⁷ See OECD (1994b).

²⁴⁸ See OECD (1991b).

real terms would increase by 25 per cent in the period 1990-2005 and by 112 per cent over the period up to 2025. Up to the year 2005 the increase in expenditure would be mostly due to rising average real benefits; thereafter the number of pensioners was also expected to rise considerably.

The need for reform stems from financial, distributive and efficiency reasons:

- a) The maturing of ATP schemes is reducing the financial soundness of the system. In the past few years this tendency has been compounded by the effects of low economic growth on contributions.²⁴⁹ Despite several increases in contribution rates, between 1983 and 1992 the ratio of ATP's assets to pension expenditure gradually declined from 6.8 to 5.1.²⁵⁰
- b) The relation between contributions and expected pension is "vague and unclear". It raises problems of horizontal equity, as people having paid similar contributions during their working lives can receive very different amounts of pension. As to vertical equity, while the basic pension scheme is progressive in terms of life-time income, the supplementary pension is regressive.²⁵¹
- c) The weak link between contributions and benefits may also have negative effects on labour supply, since "the present pension contributions are ... to be regarded as a tax to a large degree".²⁵²

A special working group on pensions was set up in 1991 with the aim of outlining a radical reform of the pension system. The proposals of the working group were endorsed by the *Riksdag* in June 1994. The reform will come into effect in stages, starting from January 1 1997. It aims at making the system more able to tolerate demographic changes and fluctuations in economic growth, more transparent in its distributive effects, less distortive in its effects on individuals' choices.

The guidelines of the reform are the following:

- a) The present two-tier old-age system is to be gradually replaced by a single system providing two joint benefits: a PAYG pension and a funded pension, respectively financed by a 16.5 and a 2 per cent contributions on earnings.²⁵³
- b) Both benefits will be strictly related to the individual's lifetime contributions to the pension system. Contributions for the PAYG benefits will be updated each year

²⁴⁹ According to Ministry of Health and Social Affairs (1994, p. 31), "In the recent years, the share of aggregate wages accounted for by pensions has dramatically increased from 24.5 to 30 per cent. Unemployment accounts for a large part of this increase."

²⁵⁰ See National Social Insurance Board (1994).

²⁵¹ See OECD (1994b).

²⁵² Ministry of Health and Social Affairs (1994, p. 12).

²⁵³ A more radical shift towards funding was discarded mainly because it would have forced one generation to pay twice over (see Könberg 1994).

with a wage index; contributions for the funded pension will be invested into a fund chosen by the individual.

- c) There is no general retirement age. Individuals will be allowed to retire from 61 years of age onwards. The pension will be based on actuarial principles.
- d) Two built-in mechanisms will adjust pension expenditure to changes in expected life (through the formula determining the amount to be paid to each new pensioner) and to the economic cycle (through the indexation of pensions). As to the latter aspect, the present price index will be substituted with the so-called "economic adjustment index". Pensions will be adjusted to price changes with a reduction or an addition of a number of percentage units related to the difference between the actual growth of real wages and a certain norm value.
- e) A minimum pension will be guaranteed.

The effects of the reform on Swedish pension expenditure have been examined in Swedish Parliament (1994). Before the reform, the ratio of old-age pension expenditure to taxable income (presently 19.8 per cent) was expected to remain stable up to 2005 and then to rise gradually for the following 20 years (Table II.14, point 3) reaching a peak at about 24.5 per cent. The reform measures concerning pension benefits are expected to reduce the ratio by about 1 point in the year 2015, by 2.5 point in the year 2025 and by 3 points in the year 2050.²⁵⁴ About one fifth of the reduction in the ratio of pension expenditure to taxable income can be attributed to the change in indexation. The reform is also expected to increase the amount of taxable income: this should reduce the ratio of old-age expenditure to taxable income by about 3 percentage points.

In the main macroeconomic scenario considered in Swedish Parliament (1994), taking the effects on taxable income into account, after the reform the ratio of old-age expenditure to taxable income should increase from 17 per cent in 1995 to 19.7 in 2015 and then decline to 16.7 in 2050. In the Low Growth and the High Growth scenarios, in 2015 the ratio would respectively reach 20.3 and 17.7 percentage points).

In November 1994 a package of new consolidation measures was taken by the incoming Government. It was supplemented by further measures in the Draft Budget Bill for 1995/96. Limits are envisaged for early retirement pensions and pension indexation will be restricted. As reported in OECD (1995e), these measures would reduce Swedish public spendings by 16.5 billion 1994 SKr.

²⁵⁴ In Table II.14, point 3, compare the line "Before the Reform" with the line "After the reform (with unreformed Taxable Income and economic adjustment index)". In order to outline the effects of the changes in the indexation mechanism, compare the latter line with the line "After the reform (with unreformed Taxable Income and price indexation)".

Table II.14

SWEDEN

National Pension System ⁽¹⁾	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2050
1. Ministry of Finance⁽²⁾, 1990												
Pension Expenditure / GDP %												
Basic Scenario (Expenditure trend, no new measures) ⁽³⁾	11		10					10.9				
Main Scenario ("most likely" scenario) ⁽³⁾	11		10.1					11.3				
Low Growth Scenario ⁽⁴⁾	11		11.1					14.9				
2. Ministry of Finance⁽⁵⁾, 1992												
Old-Age Dependency Ratio ⁽⁶⁾ %	31			29.5				36.1				
Total Old-Age Pension Expenditure in real terms (1990=100)	100	109	115	125	151	178	197	212				
Percentage of real pension expenditure growth in the previous 5 years due to:												
Change in the number of pensioners		15	-27	11	48	56	41	32				
Change in the average pension in real terms		85	127	89	52	44	59	68				
3. Swedish Parliament⁽⁷⁾, 1994												
Old-age Pension Expenditure / Taxable Income %												
Before the Reform ⁽⁸⁾		19.8		19.8		23.8		24.5		24.6		22.3
After the Reform ⁽⁸⁾ (with unreformed Taxable Income and price indexation)		19.8	20.6	20.5	21.8	23.1	22.9	22.4		21.9		19.7
After the reform ⁽⁸⁾ (with unreformed Taxable Income and "economic adjustment index")		19.8	20.6	20.3	21.6	22.9	22.6	22.1		21.8		19.1
After the Reform ⁽⁸⁾ (with new Taxable income and "econ. adj ind")												
Main Scenario ⁽⁸⁾		17	17.5	17.4	18.6	19.7	19.4	19		18.7		16.4
Low Growth Scenario ⁽⁹⁾		17	17.9	17.9	19.2	20.3	20	19.4		19.4		17
High Growth Scenario ⁽¹⁰⁾		17	16.3	15.9	16.7	17.7	17.5	17.2		17.6		15.7
Total Public Pension Expenditure / Taxable Income												
After the Reform ⁽⁸⁾ (with unreformed Taxable Income)		29.7	30.3	29	30	31.4	29	30.8		30.1		27.7
After the Reform ⁽⁸⁾ (with new Taxable Income)		25.5	25.8	25.1	25.6	25.8	24.7	23.8		22.9		20.7
4. Eurostat, 1995												
Old-Age Dependency Ratio ⁽⁶⁾ %		27.4	26.8	26.5	28	31.3	33					

1) It includes the National Basic Pension Scheme and the National Supplementary Scheme for employees.

2) "The Medium-Term Survey of the Swedish Economy". As quoted in OECD (1991).

3) 2% yearly growth in productivity and real wages.

4) 1% yearly growth in productivity and real wages.

5) "The Medium-Term Survey of the Swedish Economy".

6) Number of people aged over 64 years / Number of people between 14 and 64.

7) "Pension Reform".

8) 1.5% yearly growth in productivity and real wages.

9) 1% yearly growth in productivity and real wages.

10) 3% yearly growth in productivity and real wages.

II.15 UNITED KINGDOM

The British old-age pension system is based on two main tiers:²⁵⁵

- a) A contributory tier which, when a certain number of contributions have been paid, provides a basic flat rate pension and an additional earnings-related pension (SERPS)²⁵⁶ to men over 65 and women over 60 who have retired or can be considered as having retired from work.
- b) A non-contributory tier, providing a retirement pension for people aged 80 or over who do not receive a National Insurance retirement pension or whose pension is less than a prescribed amount, and an income-related Supplementary Pension payable to people over pensionable age.

Furthermore, there are several occupational pension schemes set up by employers: they are operated separately under trust law. The Government imposes certain rules and requirements on such schemes, particularly on those under which employees may be contracted out of the earnings-related pension scheme.

According to Secretary of State for Social Security (1985), the main cause of pension expenditure growth in the United Kingdom has been the increase in the real value of benefits: "since 1949 the basic National Insurance pension has increased to two and a half times its original value in real terms and, although the period of greatest growth was during the 1960s, real growth has continued, the basic pension increasing from 20 per cent of average take-home pay after the war to 33 per cent (single person) or 50 per cent (married couple) in 1985. In the overall position (considering all the pensioner's income) pensioners have, on average, 70 per cent of the total personal disposable income of non-pensioners, compared with only 40 per cent in 1951."²⁵⁷ Higher spending on pensions is also due to the large increase in the numbers of retirement pensions (they have more than doubled from 4.1 million in 1949 to 9.3 million in 1984).²⁵⁸

In 1993 total social expenditure for old-age, survivors and disability benefits represented 14.2 per cent of GDP (Eurostat, 1995 - see Annex A), as against 10.7 per cent in 1980 and 11.9 in 1985.

In 1984²⁵⁹ the Government Actuary's Department projected an increase in the dependency ratio from 44 per cent in 1984 to 45 per cent in 2005 and to 56 per cent in

²⁵⁵ The main features of the UK pension system are examined in Department of Social Security (1993), in OECD (1994g) and in Dilnot *et al.* (1994).

²⁵⁶ Under certain conditions insured individuals can contract out of SERPS.

²⁵⁷ Secretary of State for Social Security (1985a, p.3).

²⁵⁸ Secretary of State for Social Security (1985b, p.28).

²⁵⁹ The Beveridge Report in 1942 presented long-term (30 years) estimates of social expenditure in the UK. A comparison of these estimates and the actual outcomes is carried out in Dilnot *et al.* (1984).

2025 (Table II.15a, point 1).²⁶⁰ Under the assumption of wage indexation of flat-rate pensions, the benefit ratio was also projected to increase due to the maturing of SERPS. This would involve a rise of the equilibrium contribution rate concerning benefits payable to people over minimum pensionable age²⁶¹ from 12.5 per cent in 1984 to 14.3 per cent in 2005 and to 19.9 per cent in 2025. Under the assumption of price indexation of flat-rate pensions, the benefit ratio was projected to decline. In this case the effects of the maturing of SERPS were offset by the continuous decline in the value of basic pensions as against average wage. The equilibrium contribution rate would decline to 11.9 per cent in 2005 and then reach 14.7 per cent in 2025.

New projections were carried out by the Government Actuary in 1986 (Table II.15a, point 2). The estimates concerning the ECR were not directly comparable with the previous ones, because they also took the benefits to those under pensionable age into account. Under the assumption of price indexation of basic pensions, the ECR (14.5 per cent in 1993) was expected to decline to 14.3 per cent by the year 2003, and then to rise to 15.4 by the year 2013 and to 18.5 by the year 2033. Thereafter the ECR would decline to 15.0 per cent by the year 2053. Under the assumption of wage indexation, the ECR was projected to rise continuously up to the year 2033, reaching 27.3 percentage points.

The 1986 Social Security Bill introduced several measures aimed at avoiding the increases in contribution rates which might otherwise have become necessary, even with price indexation of benefits. The main changes were the following:

- a) The ultimate target for additional pension was reduced from 25 per cent to 20 per cent of relevant earnings, the reduction being phased in from the year 2000 onwards.
- b) Instead of being based on the average of the best 20 years revalued earnings, the additional pension is to be based on revalued earnings averaged over working life.
- c) From April 2000, additional pensions paid to widows or widowers will be one half instead of the whole of the pension which would have been payable to the deceased contributor.
- d) Arrangements for contracting out of SERPS were also extended.

The reform was expected to substantially reduce the projected values of the ECR. According to the Government Actuary's 1986 projections (Table II.15a, point 2), under the assumption of price indexation of flat-rate pensions, the contribution rate would decline from 14.6 per cent in 1993 to 14.3 per cent in 2013; it would reach 14.5 in 2033 and thereafter decline to 10.8 in 2053. Under the assumption of wage indexation, the

²⁶⁰ These estimates were carried out under the assumptions of an annual increase in real earnings of approximately 1.5 per cent, and a rate of unemployment of 6 per cent. Population projections were based on 1981 data.

²⁶¹ The equilibrium contribution rate for benefits paid to pensioners over pensionable age was estimated in 12.5 per cent. The gap between this rate and the actual (Class I) standard contribution rate of 17.65 per cent was largely due to the benefit paid to pensioners below pensionable age.

reform was expected to reduce the ECR by 4 percentage points from the year 2030 onwards.

In 1990 the Government Actuary carried out some new projections to establish the rates of contribution likely to be required up to the year 2050 to meet the cost of the benefits provided for under the National Insurance Scheme. The population over pensionable age was expected to remain broadly constant over the period up to 2000; thereafter, the number of the elderly was expected to increase gradually up to 40 per cent in 2030 (Table II.15a, point 3). The working age population was expected to remain relatively stable.²⁶² As a result a significant deterioration in the dependency ratio was projected.

Over the period 1990-2000, the ratio of the number of basic retirement pensioners to the number of contributors was expected to decrease from 48 to 47 per cent. Thereafter it would gradually increase, reaching 64 per cent by the year 2030. Pension expenditure would also be boosted by the gradual build-up of earnings-related pensions.²⁶³ On the basis of pension upratings in line with prices, the increasing cost of the earnings-related pensions would be offset by the gradual decline in the flat-rate pension in relation to earnings. The total proportion of basic and additional pensions at award to average earnings was expected to decline from 1995 onwards, reaching 30 per cent for men and 35 for women in 2010 and respectively 19 and 26 per cent in 2050. The equilibrium contribution rate would be rather stable up to 2030 and would decline afterwards.

With pensions indexed to earnings, there would be no offset to the factors leading to higher contribution rates (the proportion of the total pension to pre-retirement earnings would in this case increase for both men and women) and the required rates of contribution would rise steadily from 19 per cent in 1990 to over 21 per cent by the year 2010 and 26 per cent by the year 2030.

New long-term projections of pension expenditure were presented in Government Actuary (1994 and 1995).²⁶⁴ The latter document is the Third Quinquennial Review²⁶⁵ of the long-term prospects of the British pension system. The documents point to two main factors liable to produce a significant increase in the contribution rates required to

262 This projection is based on the assumption that the total fertility rate reaches 2.0 in the long-term.

263 Earnings are assumed to grow at a rate 1.5 per cent higher than prices. Unemployment is assumed stable at a rate of 5 per cent.

264 The Reports by the Government Actuary stresses the unavoidable uncertainty of long term projections. The main points of uncertainty are the following: fertility and mortality rates, unemployment rates, the rate of growth in real earnings, the number of workers contracting out of SERPS.

265 The purpose of the quinquennial Reviews is "to establish the rates of contribution likely to be required in future years to meet the cost of the benefits provided for under the National Insurance Scheme". In calculating the projected rates for the future, no allowance has been made for the possible payment of any Treasury grant into the National Insurance Fund. (The Social Security Act 1993 introduced the "Treasury grant" to enable the payment into the National Insurance Fund of money provided by Parliament. The grant is subject to a maximum of 17 per cent of benefit expenditure in future years.)

finance expenditure: the relationship between numbers of contributors and numbers of pensioners and the relationship between average earnings levels and benefit rates.

Due to the increasing numbers of people over pensionable age and to the stable and then decreasing numbers of people of working age, the dependency ratio projected on the basis of updated demographic assumptions increases from 48.5 per cent in 2000 to 60 per cent in 2020 and to 76.7 per cent in 2040. In forty years the ratio is therefore projected to increase by 58.1 per cent (over the same period the demographic old-age dependency ratio increases by 66.6 per cent).²⁶⁶

As to the transfer ratio, under the assumption of price indexation of benefits, the pension at award (for men and women on average earnings) as a percentage of earnings before retirement would decrease from 33 and 36 per cent in 1995, respectively for men and women, to 28 and 31 per cent in 2020 and to 22 and 27 per cent by the year 2040. These projections are broadly consistent with those of the Second Quinquennial Review (1990).²⁶⁷

As a result, the contribution rate would fluctuate over a narrow range (around 18 per cent) until 2020, as the growing cost of SERPS and the increase in the number of pensioners is broadly offset by the continuous fall in the level of flat-rate benefits relative to earnings. It would then reach a peak in the year 2030. It would later decline following the improvement in the old-age dependency ratio and the continuous decline in the level of both pensions. The 2030 peak was expected to be nearly 2 percentage points higher than current contribution rate; it was also about 1.5 per cent higher than the estimate carried out in 1990.

New changes in pension rules were introduced with the 1995 Pensions Act.²⁶⁸

- a) Female state pensionable age will increase from 60 to 65. The increase will be phased in between 2010 and 2020. It will affect basic and earnings-related pensions.
- b) The calculation of the earnings factors used to derive SERPS entitlements is to be amended from April 2000 onwards: the lower earnings limit in each financial year will be deducted from the relevant earnings before revaluation to retirement age (instead of deducting it from the revalued earnings factor).²⁶⁹
- c) Contributors will no longer accrue any SERPS entitlement in respect of contracted-out earnings from 1997.

²⁶⁶ It was assumed that the total period fertility rate would rise gradually from the actual 1.8 children per woman to 1.9 by the end of the century and remain at that level thereafter.

²⁶⁷ Both the basic pension and the earnings-related pension (from the year 2000) would decline as a percentage of earnings before retirement. These projections were carried out on the assumption of a growth in real earnings of 1.5 per cent a year.

²⁶⁸ The reforms are described in Government Actuary's (1994).

²⁶⁹ Since revalued earnings are greater than earnings before revaluation, this measure will decrease the pension amount.

The effects of the 1995 Reform are analysed in Government Actuary (1994 and 1995). The change in female retirement age is expected to increase the number of contributors to the pension scheme (by 0.8 millions in 2020 and 2030 and by 0.6 - 0.7 millions in 2040 and 2050) and to reduce the number of pensioners (by 0.1 millions in 2010, 1.1 in 2020, 2.2 in 2030, 1.7 in 2040 and 1.9 in 2050²⁷⁰). The improvement in the ratio of basic pensioners to contributors is quite substantial: while under existing legislation the ratio was projected to rise from 48 per cent in the year 2000 to 60 per cent in 2020 and 77 per cent in 2040, after the introduction of the new rules it is projected to reach 50 per cent in 2020 and 67 per cent in 2040 (Table II.15b, point 4).²⁷¹

The average amount paid to basic pensioners will increase, as females are likely to retire with longer contributory records. Therefore, in the year 2020, in spite of a 23 per cent reduction in the number of basic pensioners, the reform is expected to reduce basic pension expenditure by about 10 per cent.

The changes introduced in SERPS rules will reduce the ratio of the average earnings-related pension to average earnings and strengthen the effects of the increase in retirement age. Altogether, the reform is expected to reduce SERPS expenditure by about 25 per cent in 2020 and by more than 45 per cent in 2040.

Under the assumption of price indexation of pensions, the contribution rate will decline from 18.2 per cent in 1995 to 16.8 per cent in 2020 and 14 per cent in 2050. The increase in the old-age dependency ratio will be fully offset by the reduction in the eligibility and transfer ratios. The 1.5 per cent yearly gap between earnings and basic pension dynamics will reduce the ratio of the latter to average male earnings from 16 per cent in 1995 to 11 per cent in 2020 and 7 per cent in 2050.²⁷²

With pensions indexed to earnings, the reform is also expected to reduce the equilibrium contribution rate by nearly 3 percentage points from 2030 onwards. The required rates of contribution would rise steadily from 18.25 per cent to 22.2 per cent in 2020 and 25.3 per cent in 2050.

270 These estimates refer to basic pensions.

271 Because of the increase in female retirement age, the old-age dependency ratio would increase: from 30.1 per cent in 1994 to 41.5 per cent in 2050, as against 49.4 per cent under previous legislation.

272 The latest Department of Social Security (1995) projections estimate that between 1994 and the year 2000 old-age pension expenditure will increase in real terms by 12 per cent (Table II.15b, point 5). These projections are based on the same demographic assumptions referred to in Government Actuary's Department (1990), on the assumption of GDP real growth of 2 per cent per year and on unemployment remaining at around 2.4 million throughout the period.

UNITED KINGDOM I

National Insurance Pensions ⁽¹⁾	1984	1990	1994	1995	2000	2005	2010	2015	2020	2025	2030	2040	2050
1. Government Actuary's Department⁽²⁾⁽³⁾, 1984													
Old-age dependency ratio ⁽⁴⁾ %	30			30		29		32		37			
Dependency Ratio ⁽⁵⁾ %	44			45		45		50		56			
Equilibrium Contribution Rate % (for benefits payable to people over minimum pension age)													
Price indexation of flat-rate pensions	12.5			11.9		11.9		13.3		14.7			
Wage indexation of flat-rate pensions	12.5			13.3		14.3		17		19.9			
2. Government Actuary's Department⁽²⁾⁽⁶⁾, 1986													
Equilibrium Contribution Rate %													
Before the 1986 Reform													
Price indexation of basic pensions		14.5			14.3		15.4		16.8		18.5	16.5	15
Wage indexation of basic pensions		15.8			17		20		23.4		27.3	25.3	24.2
After the 1986 Reform ⁽⁷⁾													
Price indexation of basic pensions		14.6			14.1		14.3		14.4		14.5	12.2	10.8
Wage indexation of basic pensions		15.9			17		18.9		20.9		23.2	21	20
3. Government Actuary's Department⁽²⁾⁽⁸⁾, 1990													
Men's Transfer Ratio ⁽⁹⁾ %													
Price indexation of basic pensions		28			35		30		28		25	22	19
Wage indexation of basic pensions		28			37		34		34		33	32	32
Women's Transfer Ratio ⁽⁹⁾ %													
Price indexation of basic pensions		35			40		35		33		30	28	26
Wage indexation of basic pensions		35			43		40		40		39	39	39
Old-Age Dependency Ratio ⁽⁴⁾ %		30			30		31		35		42	42	38
Dependency Ratio ⁽¹⁰⁾ %		48			47		50		55		64	63	59
Equilibrium Contribution Rate ⁽¹¹⁾ %													
Price indexation of flat-rate pensions		19.1		18.1	17.8		17.4		17.8		18.4	16.4	14.1
Wage indexation of flat-rate pensions		19.1		19.2	19.9		21.3		23.5		26.4	25.8	24.5

1) National Insurance includes the universal basic pension scheme and the State Earnings-Related Pension Scheme (SERPS). Pensions contracted out of SERPS are not considered.

2) Data refer to budgeting years. The year considered in the headlines is the first of the two calendar years jointly covered by each budgetary year. All projections carried out by the Government Actuary are based on a 1.5% yearly real earnings growth.

3) "Population and Pension Costs".

4) Number of men aged 65 and over + Number of women aged 60 and over / Number of men between 16 and 64 + Number of women between 16 and 59.

5) Number of Pensioners / Number of contributors.

6) "Government Actuary's Report on Social Security Bill 1986". Data attributed in this table to years 1990, 2000, 2010, 2020, 2030, 2040 and 2050 actually refer to years 1993-94, 2003-04, 2013-14, 2023-24, 2033-34, 2043-44 and 2053-54.

7) Based on the assumption that 0.5 million additional workers will ultimately contract out.

8) "National Insurance Fund Long-Term Financial Estimates".

9) Pensions at award for men/women on average earnings as a percentage of earnings before retirement on the assumption of a growth in real earnings of 1.5% a year.

10) Number of basic retirement pensioners / Number of contributors. Calculated from Tables 10 and 12 of the Report.

11) The rates shown are the main Class 1 joint employee/employer contributions for National Insurance (i.e. excluding NHS contributions).

UNITED KINGDOM II

National Insurance Pensions ⁽¹⁾	1984	1990	1994	1995	2000	2005	2010	2015	2020	2025	2030	2040	2050
4. Government Actuary's Department⁽²⁾, 1994⁽³⁾ and 1995⁽⁴⁾													
a) Before the 1994 Reform													
Men's Transfer Ratio ⁽⁵⁾ %													
Price indexation of basic pensions (percentage of basic pension)				33 (15)	34 (14)		30 (12)		28 (10)		25 (9)	22 (8)	19 (7)
Wage indexation of basic pensions (percentage of basic pension)				33 (15)	35 (15)		33 (15)		32 (15)		32 (15)	31 (15)	31 (15)
Women's Transfer Ratio ⁽⁵⁾ %													
Price indexation of basic pensions (percentage of basic pension)				36 (21)	37 (20)		33 (17)		31 (15)		29 (13)	27 (11)	25 (9)
Wage indexation of basic pensions (percentage of basic pension)				37 (21)	39 (21)		37 (21)		37 (21)		36 (21)	36 (21)	36 (21)
Old-Age Dependency Ratio ⁽⁶⁾ %			30.1		29.9		32.3		37.7		46.9	49.8	49.4
Dependency Ratio ⁽⁷⁾ %					48.5		52.1		60		73.2	76.7	75.7
Equilibrium Contribution Rate ⁽⁸⁾ %													
Price indexation of flat-rate pensions				18.25	17.6		17.6		18.7		20	18.7	16.8
Wage indexation of flat-rate pensions				18.25	18.8		20.9		24.2		28.1	28.7	28.2
b) After the 1994 Reform													
Old-Age Dependency Ratio ⁽⁹⁾ %			24.4		24.3		25.3		30.2		37.6	42.1	40.7
Dependency Ratio ⁽⁷⁾ %					48		51		50		61	67	65
Equilibrium Contribution Rate ⁽⁸⁾ %													
Price indexation of flat-rate pensions					17.7		17.4		16.8		17.2	15.8	14
Wage indexation of flat-rate pensions					19.0		20.9		22.2		25.4	25.9	25.3
5. Department of Social Security⁽²⁾, 1995													
Old-age Pension Expenditure in real terms			100		112								

1) National Insurance includes the universal basic pension scheme and the State Earnings-Related Pension Scheme (SERPS). Pensions contracted out of SERPS are not considered.

2) Data refer to budgeting years. The year considered in the headlines is the first of the two calendar years jointly covered by each budgetary year. All projections carried out by the Government Actuary are based on a 1.5% yearly real earnings growth.

3) "Pensions Bill 1994. Report by the Government Actuary on the Financial Provisions of the Bill on the National Insurance Fund."

4) "National Insurance Fund Long Term Financial Estimates" (Report by the Government Actuary on the Third Quinquennial Review under Section 137 of the Social Security Act 1975).

5) Pensions at award for men/women on average earnings as a percentage of earnings before retirement on the assumption of a growth in real earnings of 1.5% a year.

6) Number of men aged 65 and over + Number of women aged 60 and over / Number of men between 16 and 64 + Number of women between 16 and 59. Data attributed to the year 1994 actually refers to the year 1992.

7) Number of basic retirement pensioners / Number of contributors. For the 1990 projection, data are calculated from Appendix D and E of the 1994 Report.

8) The rates shown are the main Class 1 joint employee/employer contributions for National Insurance (i.e. excluding NHS contributions).

9) Number of people aged 65 and over / Number of people between 16 and 64. Calculated from Table C1 (Appendix C).

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ANNEX A

DATA ON PENSION EXPENDITURE IN THE EUROPEAN
UNION MEMBER STATES

The data on social protection expenditure in the EU Member States are drawn up by Eurostat according to the European System of Integrated Social Protection Statistics (ESSPROS).

Benefits in cash and in kind to households are classified in 11 categories according to their different functions (or social risk): sickness; invalidity/disability; occupational accidents and disease; old-age; survivors; maternity; family; placement/vocational guidance/resettlement; unemployment; housing; miscellaneous. Benefits are also classified by group of schemes (basic, supplementary, means-tested) and by types (e.g., pensions, lump-sum payments).

Public pension expenditure is included in the old-age, survivors and invalidity/disability categories.

- a) "*Old-age* is defined as the state of having reached a certain minimum age, beyond which, as a rule, one's main occupation may cease" (Eurostat, 1992a, p. 9).
- b) "A *survivor's* benefit is a benefit granted on the basis of a derived right, i.e. a right originally acquired by another person whose death is a condition for granting the benefit" (Eurostat, 1993, p. 9).
- c) "*Invalidity/disability* (physical or mental) is the inability to engage in any activity to a minimum prescribed extent, or to lead a normal life" (Eurostat, 1992b, p. 9).

In most countries public pensions represent most of the expenditure included in these categories, that also include: public cash benefits that are not pensions, public benefits in kind, pensions and other benefits paid by private institutions.

Eurostat's statistics concerning total social expenditure for old-age, survivors and disability functions are available up to the year 1993.²⁷³ More detailed statistics, allowing the identification of public pension expenditure are presently available only up to 1988 for old-age pensions and up to 1990 for survivors and disability pensions.²⁷⁴

A1 - Social expenditure for old-age, survivors and invalidity/disability in 1980-1993

Table A1 reports the GDP ratio of social expenditure for old-age, survivors and invalidity/disability in the period 1980-1993. The weighted ratio for the 12 Member States increased from 12.2 per cent in 1980 to 13.4 in 1983. Thereafter, it remained rather stable up to 1990, then increased, reaching 14.7 per cent in 1993.

Between 1980 and 1993 the expenditure ratio expanded in every country: the lowest increases were recorded in Ireland (0.2 per cent) and Germany (0.3 per cent); the highest in Greece (4.8 per cent) and Italy (5.9 per cent). Most countries with higher than average expenditure ratios in 1980 recorded relatively low increases in the following years. Countries with lower than average ratios usually recorded high increases. The main exception to this convergence trend were represented by Ireland and the Netherlands.

The increase in expenditure is mostly due to the old-age function (Table A2): the weighed average for the 12 EU countries increased from 8.0 per cent in 1980 to 10.1 per cent in 1993. Survivors' expenditure remained basically stable (from 2.1 per cent in 1980 to 2.2 in 1993 - Table A3). Invalidity/disability expenditure increased in most countries: the weighted average expanded from 2.1 per cent in 1980 to 2.5 in 1993 (Table A4). In the United Kingdom its GDP ratio increased by 1.3 points, in Greece by 0.6 points.

A2. Estimates of 1995 ratio of total public pension expenditure to GDP.

The following estimates of the ratio of public pension expenditure to GDP have been used in Section 6:

Austria: 10.8 per cent. As indicated by the Federal Ministry of Labour and Social Affairs in October 1995. This estimate does not include pension expenditure for public sector employees.

Belgium: 10.5 per cent. It is the ratio reported for 1991 in Englert *et al.* (1994).

Denmark: 9.3 per cent. As indicated by the Ministry of Finance in September 1995.

Finland: 13.4 per cent. As indicated by the Government Institute for Economic Research in September 1995.

²⁷³ The data concerning social expenditure and GDP in 1993 are reported in Eurostat (1995). In the case of Finland the data actually refer to 1992.

²⁷⁴ See Eurostat (1992a, 1992b, 1993).

Table A1

Old-age, Survivors' and Invalidation/Disability Social Expenditure /GDP														
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
B	13.6	14.5	14.7	15.3	14.9	14.7	14.7	14.4	14.1	13.6	13.7	13.8	13.5	14.3
DK	12.3	12.6	12.7	12.7	12.4	12.3	12.1	12.3	12.7	13.2	13.1	13.3	13.5	13.8
D	14.4	14.6	14.9	14.5	14.4	14.3	14	14.1	14	13.7	13.3	13.7	14.1	14.7
GR	7	7.8	10	10.2	11	11.6	11.7	12.1	11.9	12.1	12.3	12	11.5	11.8
E	8.5	9.2	9.4	9.6	9.8	10.1	9.9	9.8	9.8	9.9	10.1	10.3	10.7	11.2
FIN											12.5	14.6	16.1	
F	12	12.5	13.1	13.7	13.8	14.1	13.9	13.7	13.6	13.3	13.3	13.5	13.8	14.4
IRL	6.9	7	7.6	7.8	7.6	7.5	7.5	7.3	7.1	6.6	7	7.2	7.2	7.1
I	11.3	12.4	12.8	13.9	13.5	14	14.3	14.5	14.5	14.8	15.2	15.6	16.8	17.2
L	15.3	16	15.5	15.5	15	14.9	14.3	15.1	15.1	14.5	14.7	16.1	16.3	17.1
NL	16.5	16.8	17.5	17.4	16.9	16.8	16.9	17.6	17.6	17.4	18.5	18.6	18.9	19.1
P	6.1	6.6	6.5	7	6.8	6.7	7	7.5	7.6	7.4	7.9	8.2	8.4	9
UK	10.7	11.6	11.6	11.8	12	11.9	11.9	11.9	11.1	11.3	11.8	13	13.7	14.2
EUR 12	12.2	12.8	13.2	13.5	13.4	13.5	13.4	13.6	13.3	13.1	13.3	13.7	14.2	14.7

Table A2

Old-age Social Expenditure / GDP														
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
B	7.6	8.3	8.4	8.7	8.5	8.4	8.5	8.4	8.5	8.2	8.4	8.6	8.9	9.1
DK	9.8	10.1	10.2	10.2	10.1	10	9.9	10	10.2	10.6	10.6	10.7	10.8	11
D	8	8.1	8.3	8.1	8	8	7.9	8	8.1	8	7.8	8.3	8.7	9.1
GR	5.2	5.7	7.2	7.2	7.8	8.2	8.4	8.7	8.5	8.6	8.9	8.9	8.3	8.6
E	5.4	5.8	6	6.2	6.3	6.5	6.5	6.4	6.3	6.3	6.5	6.7	6.9	7.1
FIN											8	9.2	10	
F	8.5	8.9	9.3	9.8	10	10.3	10	9.9	9.9	9.7	9.7	9.9	10.1	10.7
IRL	4.4	4.5	4.8	4.8	4.7	4.6	4.6	4.6	4.4	4.1	4.4	4.6	4.5	4.5
I	8.3	9	9.4	10.3	9.9	10.3	10.5	10.6	10.6	10.8	11.2	11.6	12.5	12.8
L											8	8.6	8.9	9.4
NL	8.1	8.2	8.6	8.6	8.4	8.5	8.7	9.2	9.3	9.2	9.8	9.8	10	10.2
P	3.8	4	3.7	4.1	4	3.9	4.2	4.6	4.7	4.6	5	5.1	5.2	5.7
UK	8.4	9.2	9.2	9.3	9.5	9.4	9.5	9.4	8.7	8.7	9.1	9.8	10.4	10.7
EUR 12	8	8.5	8.7	9	8.9	9.1	9	9.1	9	8.9	9	9.3	9.8	10

Table A3

Survivors' Social Expenditure /GDP														
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
B	3.4	3.6	3.6	3.7	3.6	3.5	3.4	3.3	3.1	3	3	2.9	2.6	2.8
DK	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0
D	3.9	3.9	3.9	3.8	3.8	3.7	3.6	3.6	3.5	3.3	3.2	2.9	3	3
GR	0.9	1	1.3	1.4	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.6	1.6	1.6
E	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	2	2	2.1	2.2
FIN											1	1.2	1.3	
F	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2	2	2	2	2.1
IRL	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.3	1.3	1.3	1.3	1.3
I	1.7	1.9	2.1	2.2	2.1	2.2	2.2	2.3	2.3	2.3	2.4	2.5	2.7	2.7
L											3.7	4.3	4.2	4.4
NL	1.4	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.5	1.5	1.7	1.7	1.7	1.7
P	0.8	0.9	0.9	1	1	1	1	1	1	1	1	1.1	1.2	1.3
UK	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.3
EUR 12	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2	2	2	2.1	2.2

Table A4

Invalidity/Disability Social Expenditure /GDP														
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
B	2.5	2.6	2.7	2.9	2.8	2.8	2.8	2.6	2.5	2.4	2.3	2.3	2	2.4
DK	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.3	2.5	2.5	2.5	2.6	2.6	2.7
D	2.5	2.6	2.7	2.6	2.6	2.6	2.5	2.5	2.4	2.3	2.3	2.4	2.4	2.6
GR	0.9	1.1	1.4	1.6	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.6	1.5	1.5
E	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.7	1.6	1.6	1.7	1.8
FIN											3.6	4.2	4.7	
F	1.5	1.5	1.6	1.7	1.6	1.6	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.7
IRL	1.2	1.1	1.3	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.3	1.3	1.4	1.4
I	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.6	1.5	1.6	1.6	1.5	1.6	1.7
L	3.3	3.4	3.3	3.4	3.3	3.3	3.1	3.2	3.2	3	3.1	3.1	3.2	3.3
NL	7	7.1	7.3	7.3	7.1	6.8	6.7	7	6.9	6.7	7	7.1	7.2	7.2
P	1.6	1.7	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2
UK	1.8	1.9	2	2	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.9	2.9	3.1
EUR 12	2.1	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.5

France: 8.7 per cent. In General Planning Committee (1995, p. 94) the 1993 pension expenditure of the main schemes (*Régime général, Fonctionnaires civils, CNRACL, SNCF, ARRCO, AGIRC, Exploitants agricoles*) is reported as FF 618,9 billion.

Germany: 12.0 per cent. In Federal Ministry of Labour and Social Affairs (1994, p. 36), the share of pension expenditure to GDP in 1993 (West+East) is estimated at 12.0 per cent of GDP (General System = 10.1 per cent; Special Systems for Farmers and the Professions = 0.3; Civil Service Pensions = 1.6 per cent).

Greece: 11.9 per cent. Pensions (primary and supplementary) of IKA, OGA, and other institutions (excluding Civil Servants' pensions) represents 9.5 per cent of GDP (as estimated by the Ministry of Public Health, Welfare and Social Insurance); Civil Servants' pensions represent 2.4 per cent of GDP (as estimated in the Budget of the Government).

Ireland: 3.9 per cent. As indicated by the National Pensions Board in January 1996, estimated total expenditure in 1995 on pension benefits (as categorised in table 7 of the National Pensions Board Final Report) was £1.494 billion. Provisional out-turn for GDP in 1995 (consistent with Budget 1996) was £38.3 billion.

Italy: 15.1 per cent. It is the 1994 ratio of total public expenditure for old-age, survivors and disability pensions to GDP. Source: Ministry of Budget and Economic Planning (1995).

Luxembourg: 10.2 per cent. In Ministry of Social Security (1995), 1994 pension expenditure by contributory schemes is reported as LFR 44.7 billion; pension expenditure by non-contributory schemes is reported as LFR 14.1 billion.

The Netherlands: 14.4 per cent. In 1993 total social expenditure on old-age, survivors and disability represented 19.1 per cent of GDP (Eurostat, 1995). The share of public pensions on total social expenditure has been computed assuming that it remained constant on the 1988-1990 level. The following data has been considered: a) In 1988 public pensions represented 84 of total social expenditure for old-age (Eurostat, 1992a); b) in 1990 public pensions represented 80 per cent of total social expenditure for survivors (Eurostat, 1993); c) in the same year public pensions represented 63 per cent of total social expenditure for disability.

Portugal: 6.4 per cent. In Centre for Financial Economics Research (1995) total pension expenditure in 1995 is estimates as 1018 billion ESC.

Spain: 9.1 per cent. In Ministry of Labour and Social Security (1995, p. 38) 1995 pension expenditure is reported as PTA 6220 billion (9.06 per cent of GDP).

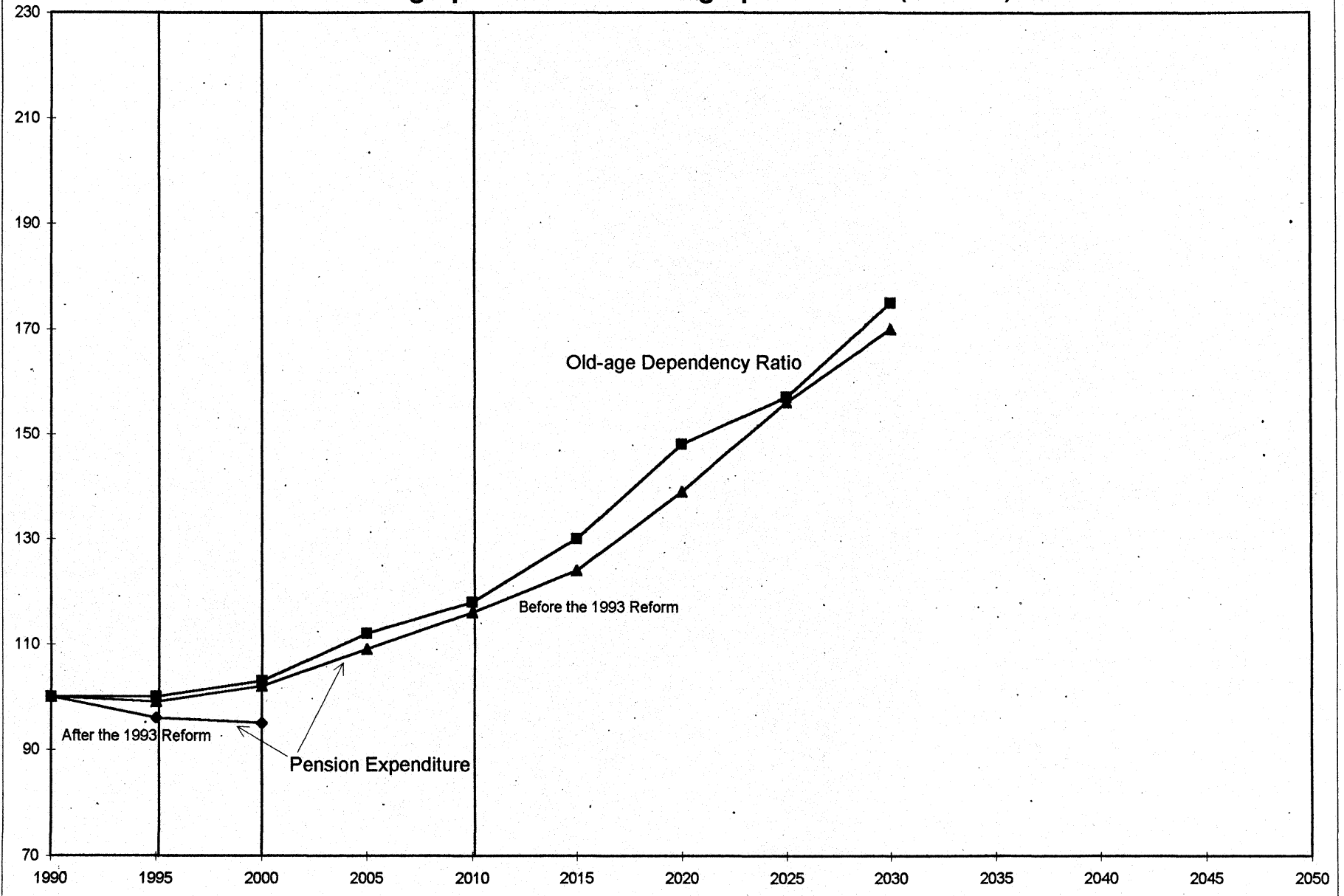
Sweden: 12.3 per cent. Public pension expenditure in 1995 is estimated in Swedish Parliament (1994, p. 81, Table 4.7) in 198.2 billion SK. In European Commission (1995b), Swedish 1995 GDP is estimated in 1616 billion SK.

United Kingdom: 6.5 per cent. As indicated by the Department of Social Security in October 1995, total expenditure on basic and earnings related pension, widow's pension and income support to pensioners is expected to amount to 34.7 billion £ (5.0 per cent of GDP, assuming GDP growth of 3.25 % from 1994 to 1995). In 1988 expenditure on old-age and survivors pensions for civil servants amounted to 1.5 per cent of GDP (Eurostat, 1992a, 1993).

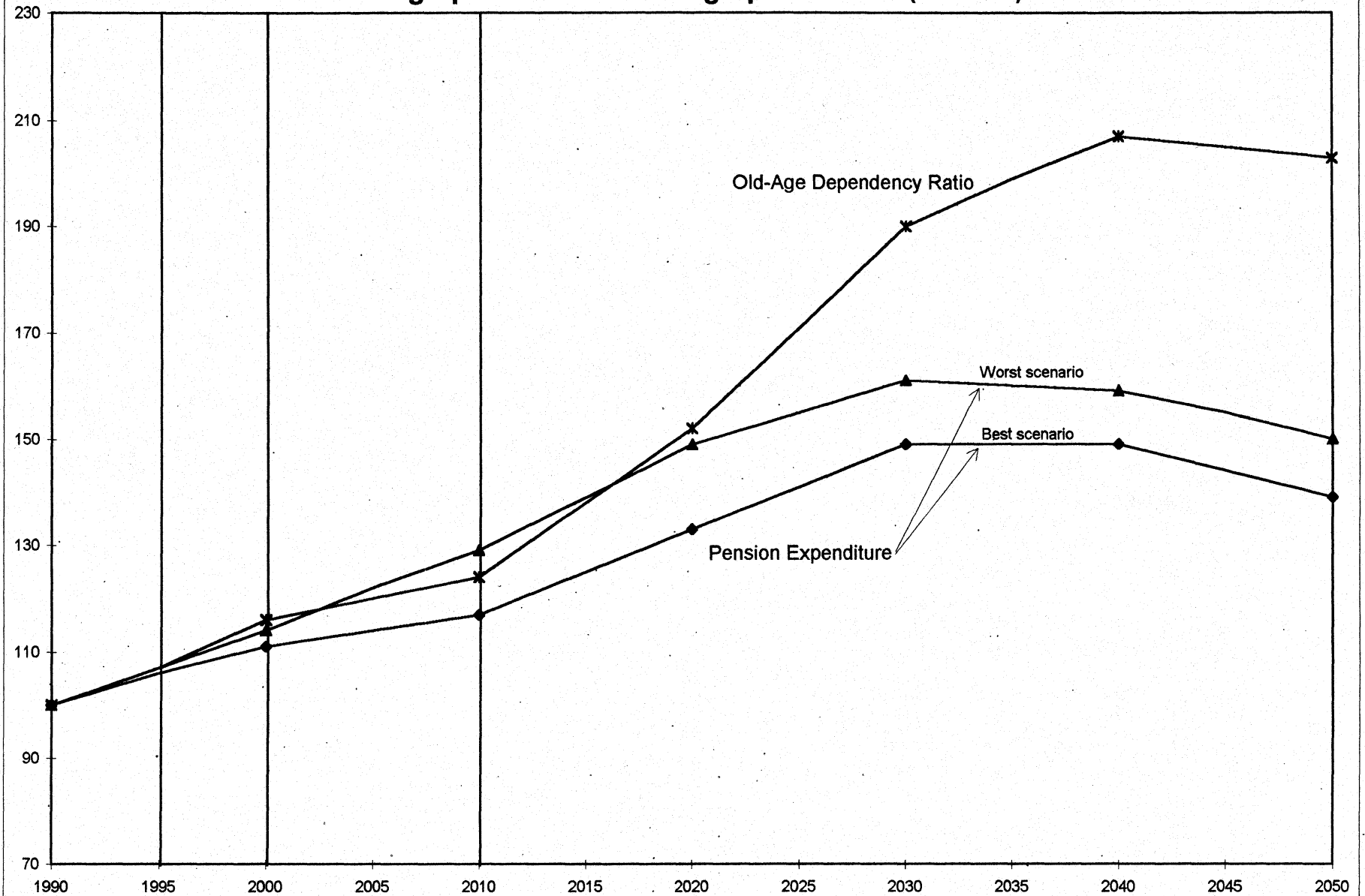
ANNEX B**PENSION EXPENDITURE DYNAMICS: CHARTS ON DEMOGRAPHIC
AND NON-DEMOGRAPHIC FACTORS**

- B1. Austria**
- B2. Belgium**
- B3. Denmark**
- B4. Finland**
- B5. France**
- B6. Germany**
- B7. Greece**
- B8. Ireland**
- B9. Italy**
- B10. Luxembourg**
- B11. The Netherlands**
- B12. Portugal**
- B13. Spain**
- B14. Sweden**
- B15. United Kingdom**

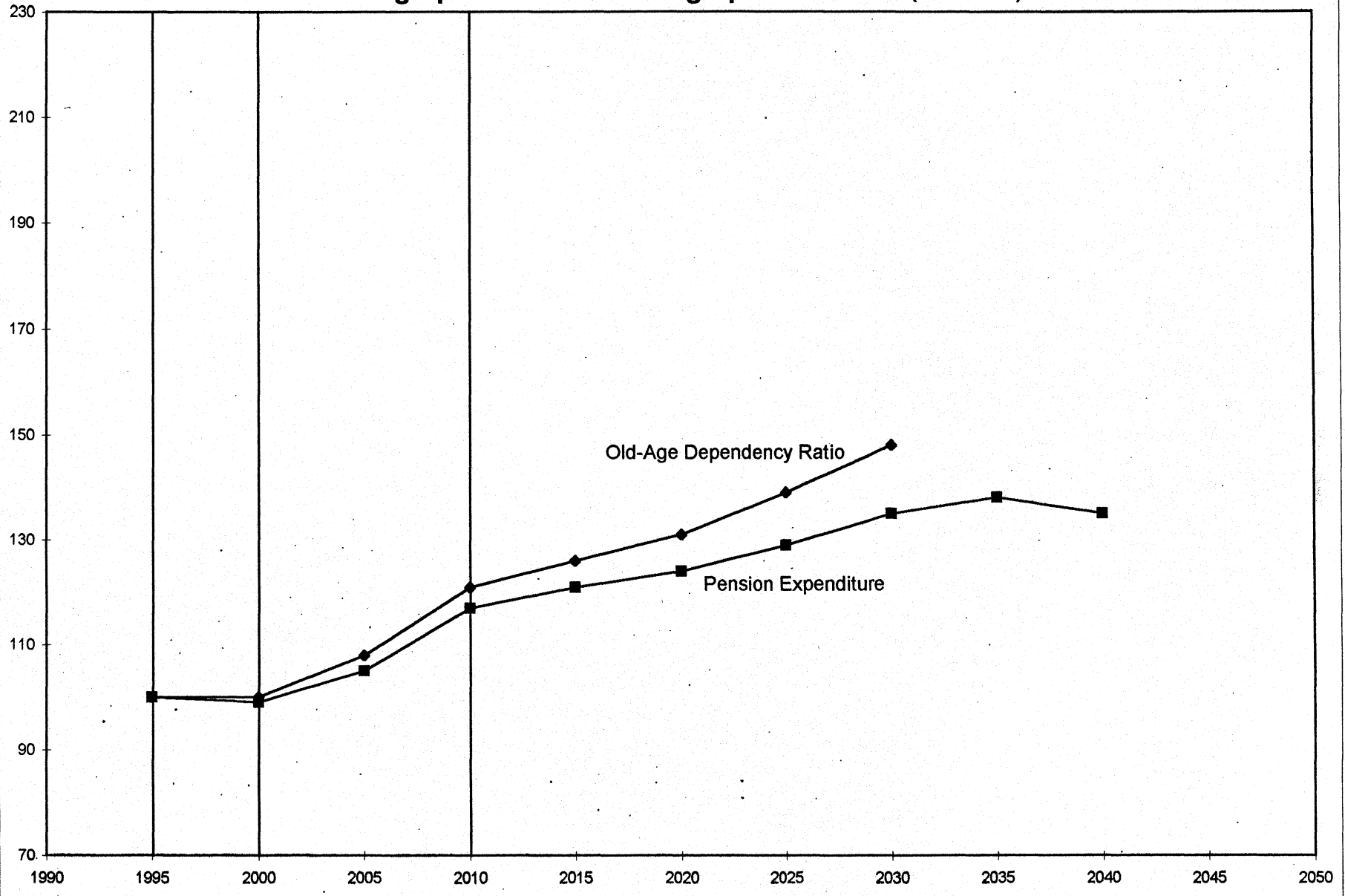
**Pension expenditure growth in Austria:
demographic and non-demographic factors (1990=100)**



**Pension expenditure growth in Belgium:
demographic and non-demographic factors (1990=100)**

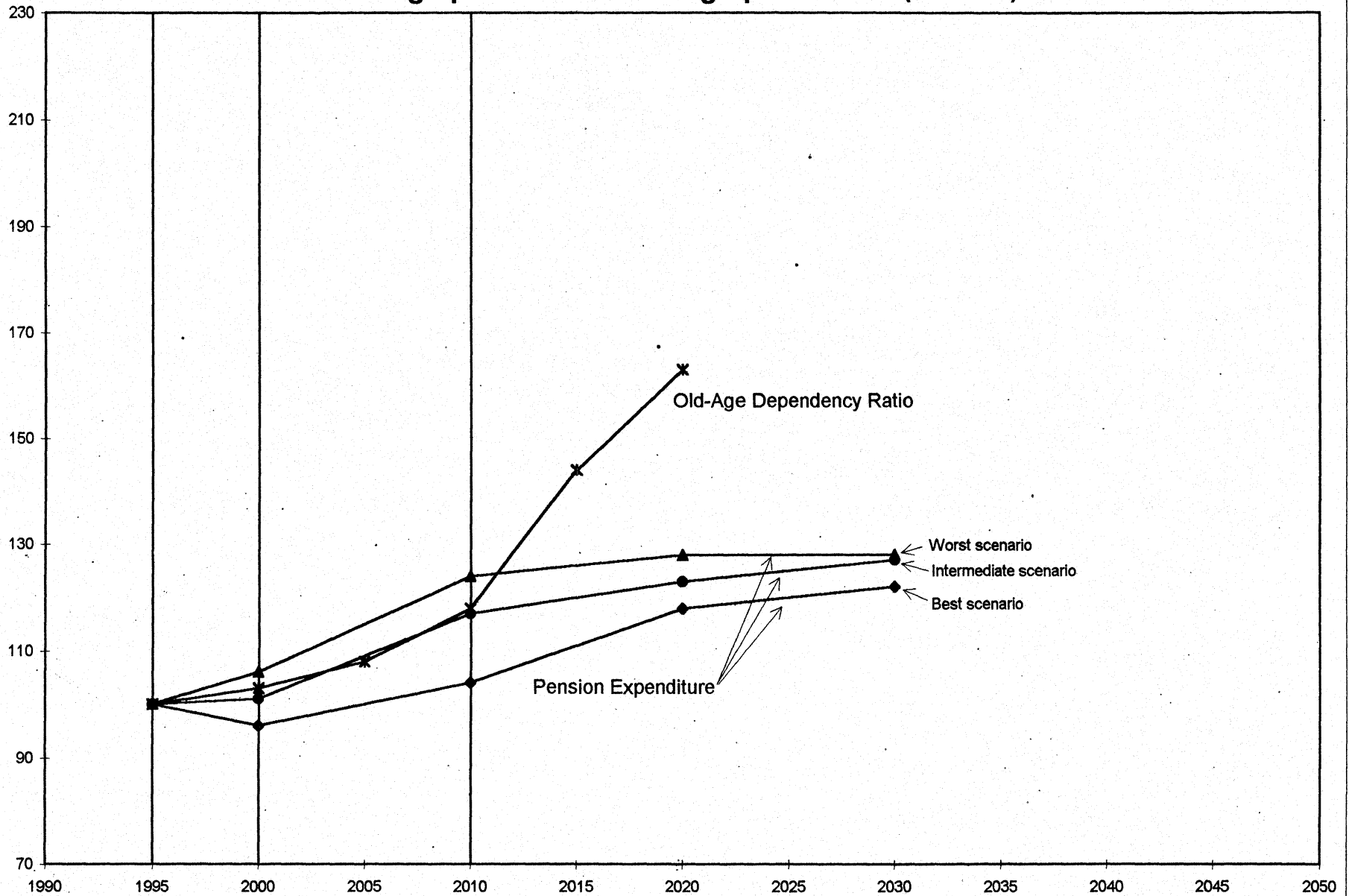


Pension expenditure growth in Denmark: demographic and non-demographic factors⁽¹⁾ (1995=100)

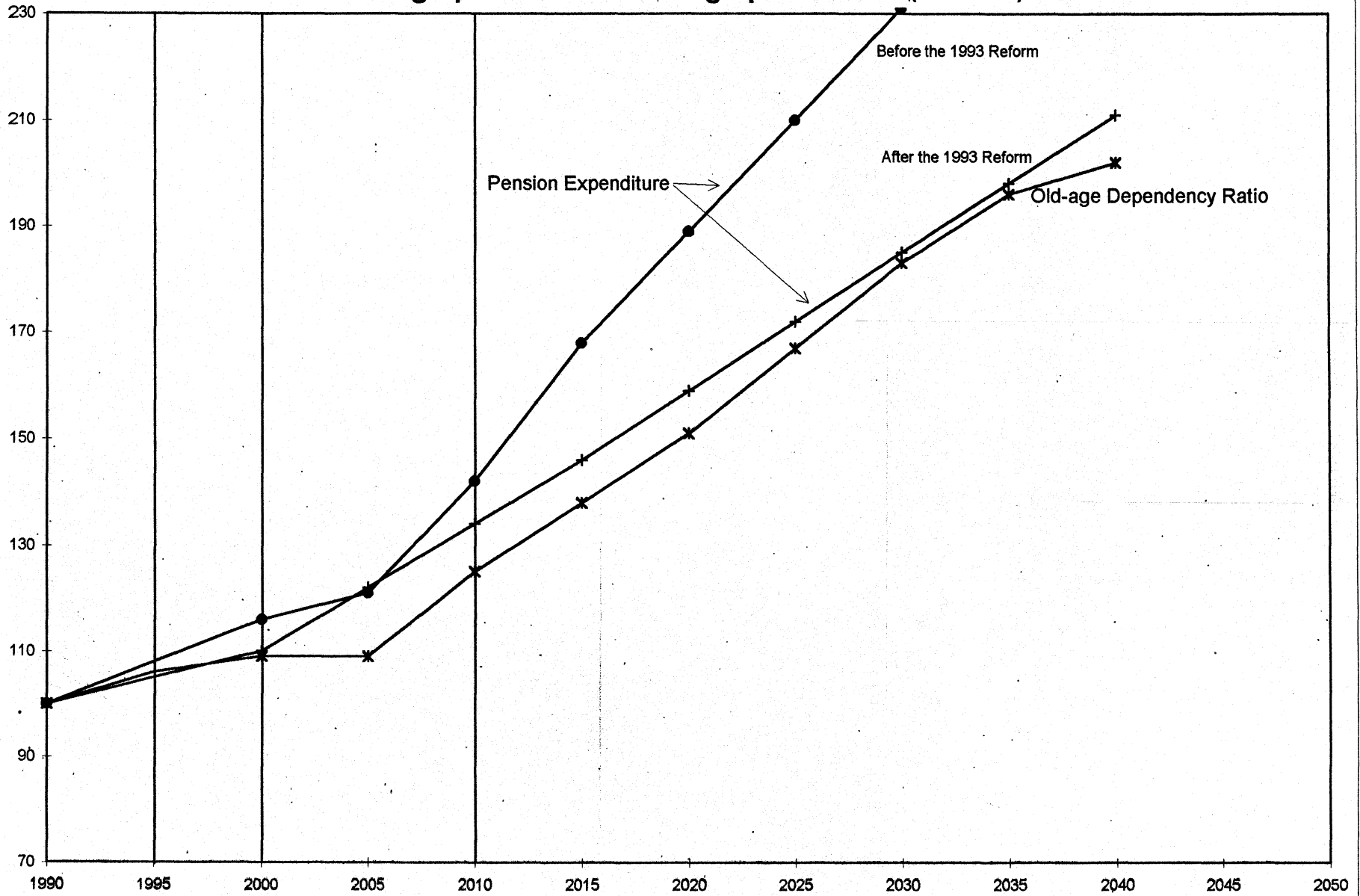


1) The Chart refers to the 1994 population projection carried out by Denmark's Statistics Department and to the estimates of pension expenditure carried out by the Ministry of Finance on the basis of the 1995 demographic projection.

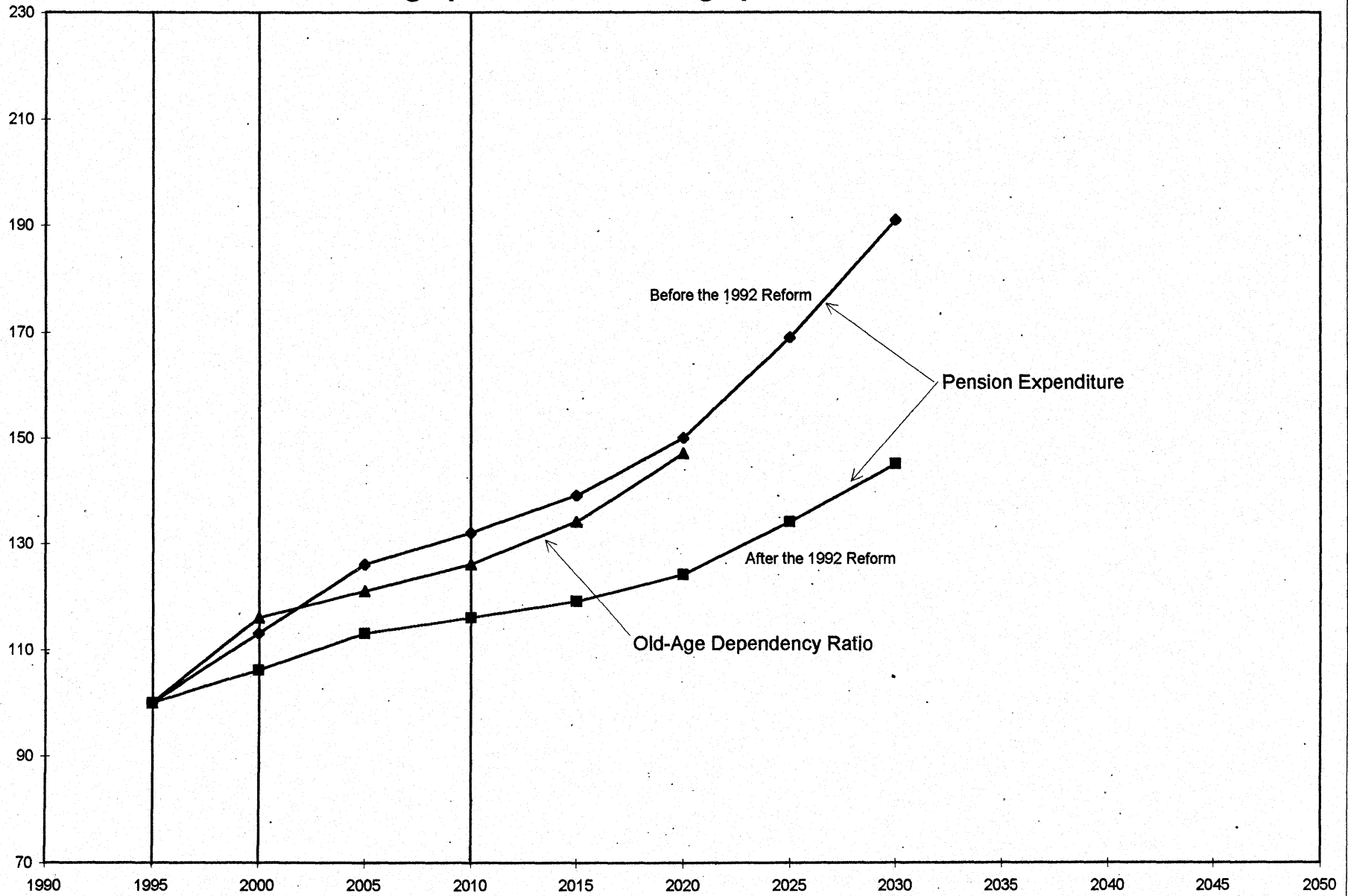
**Pension expenditure growth in Finland:
demographic and non-demographic factors (1995=100)**



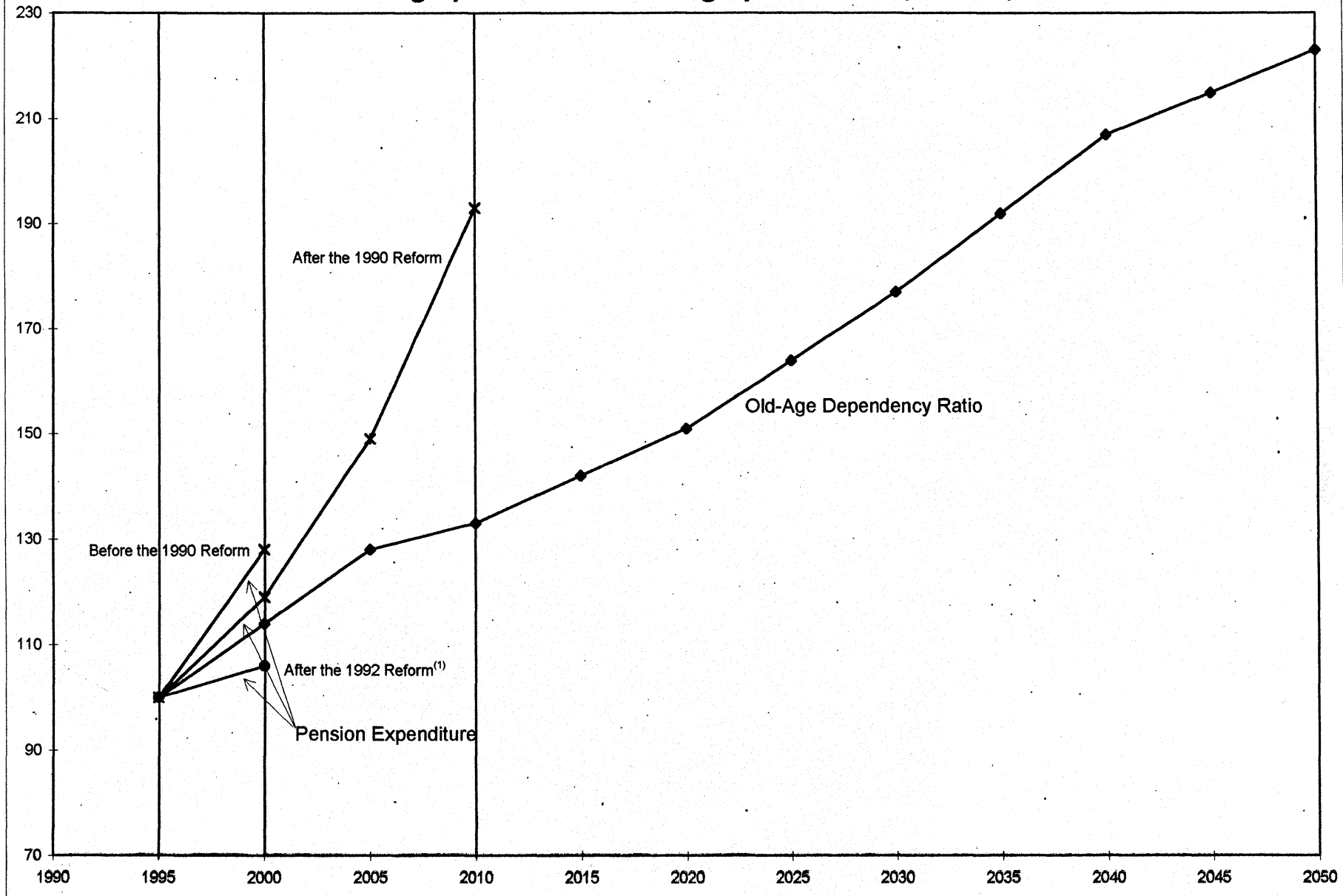
**Pension Expenditure growth in France:
demographic and non-demographic factors (1990=100)**



**Pension expenditure growth in Germany:
demographic and non-demographic factors (1995=100)**

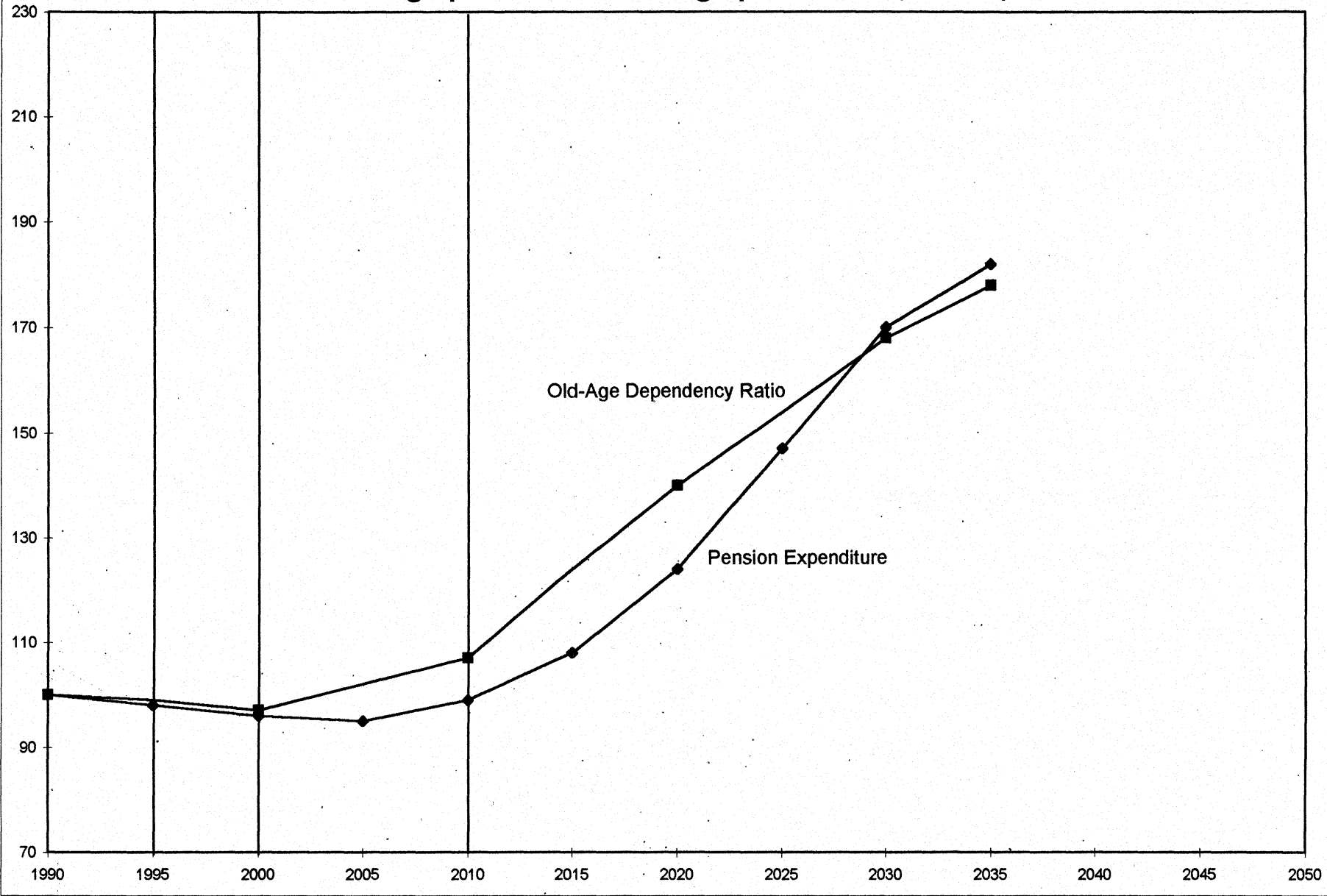


Pension expenditure growth in Greece: demographic and non-demographic factors (1995=100)

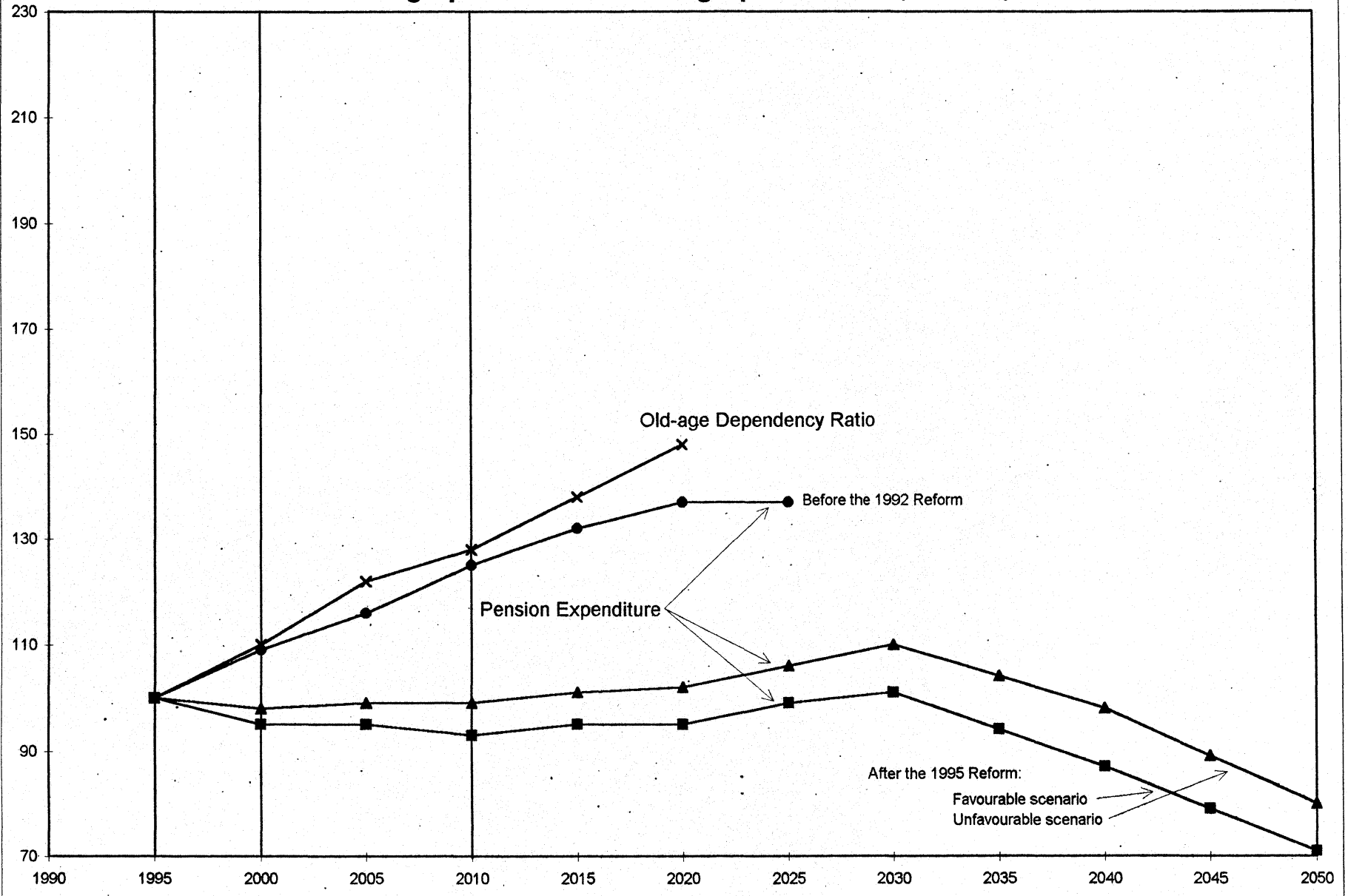


1) The second data of the line 'Pension Expenditure - After the 1992 Reform' actually refers to the year 1999. See Table II.7.

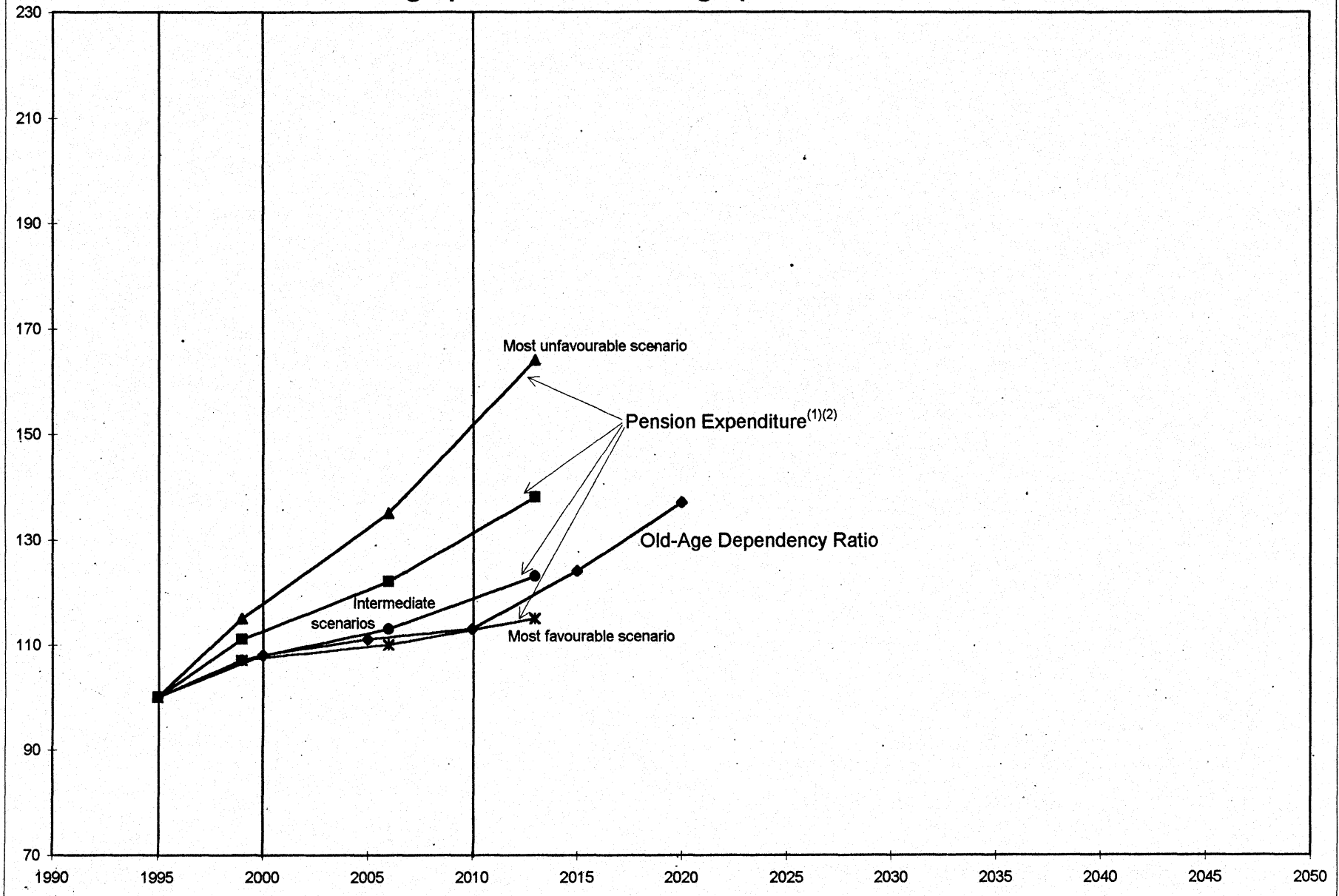
**Pension expenditure growth in Ireland:
demographic and non-demographic factors (1990=100)**



**Pension expenditure growth in Italy:
demographic and non-demographic factors (1995=100)**

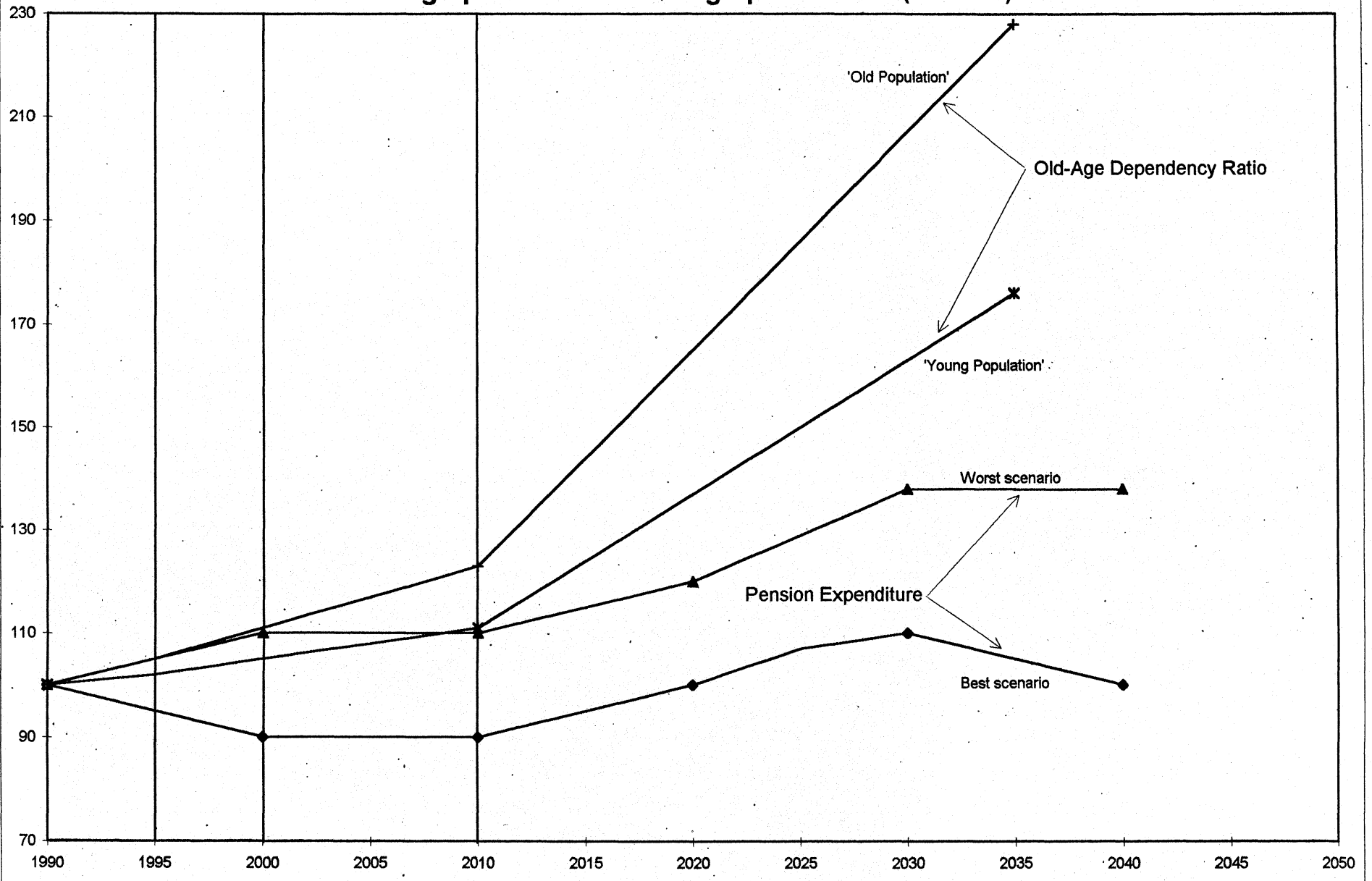


Pension expenditure in Luxembourg: demographic and non-demographic factors (1995=100)

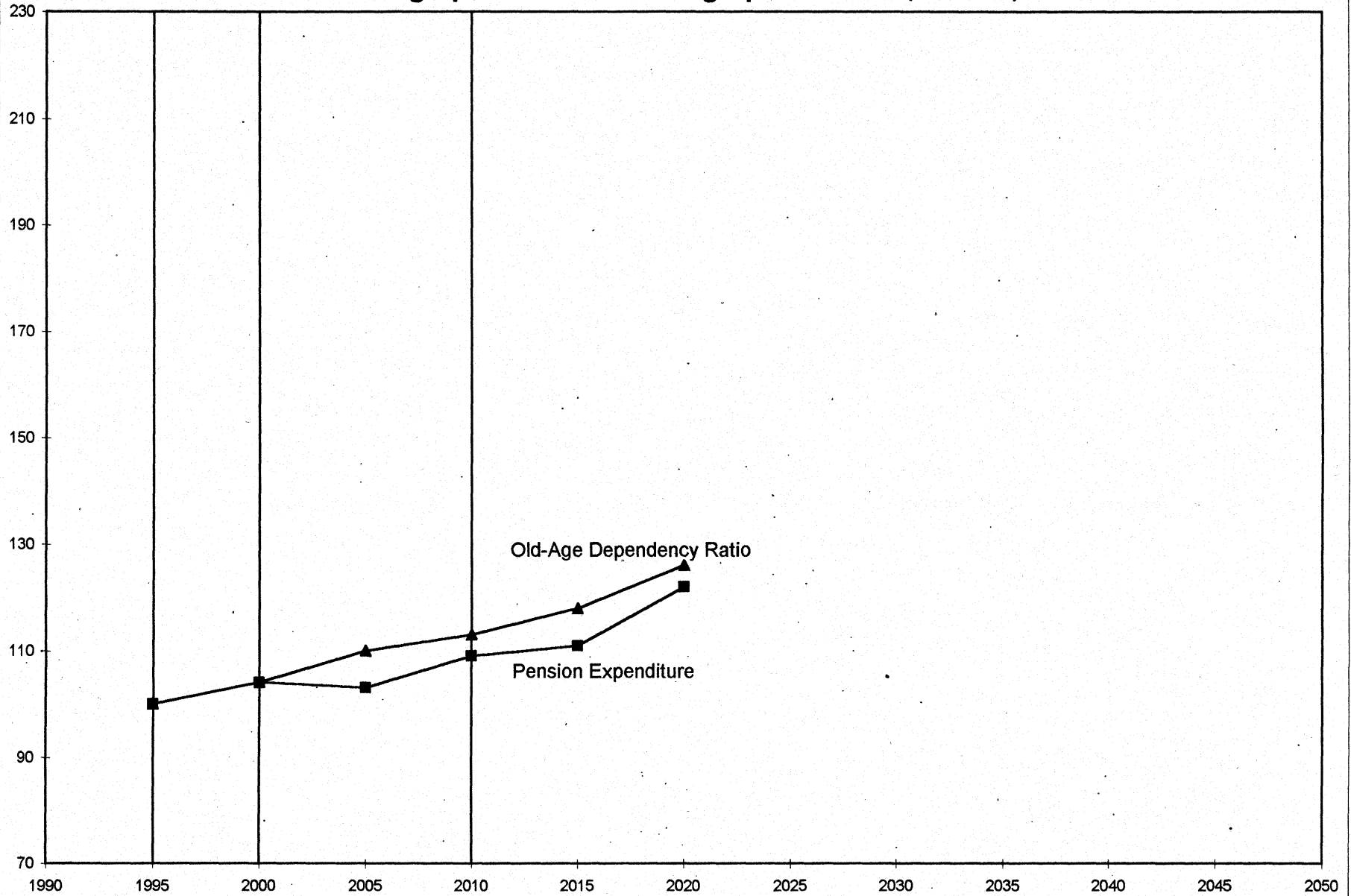


1) Datas actually refer to the private sector employees and self-employed pension expenditure.
 2) The first datas of the four lines 'Pension Expenditure' actually refer to the year 1994. See Table II.10.

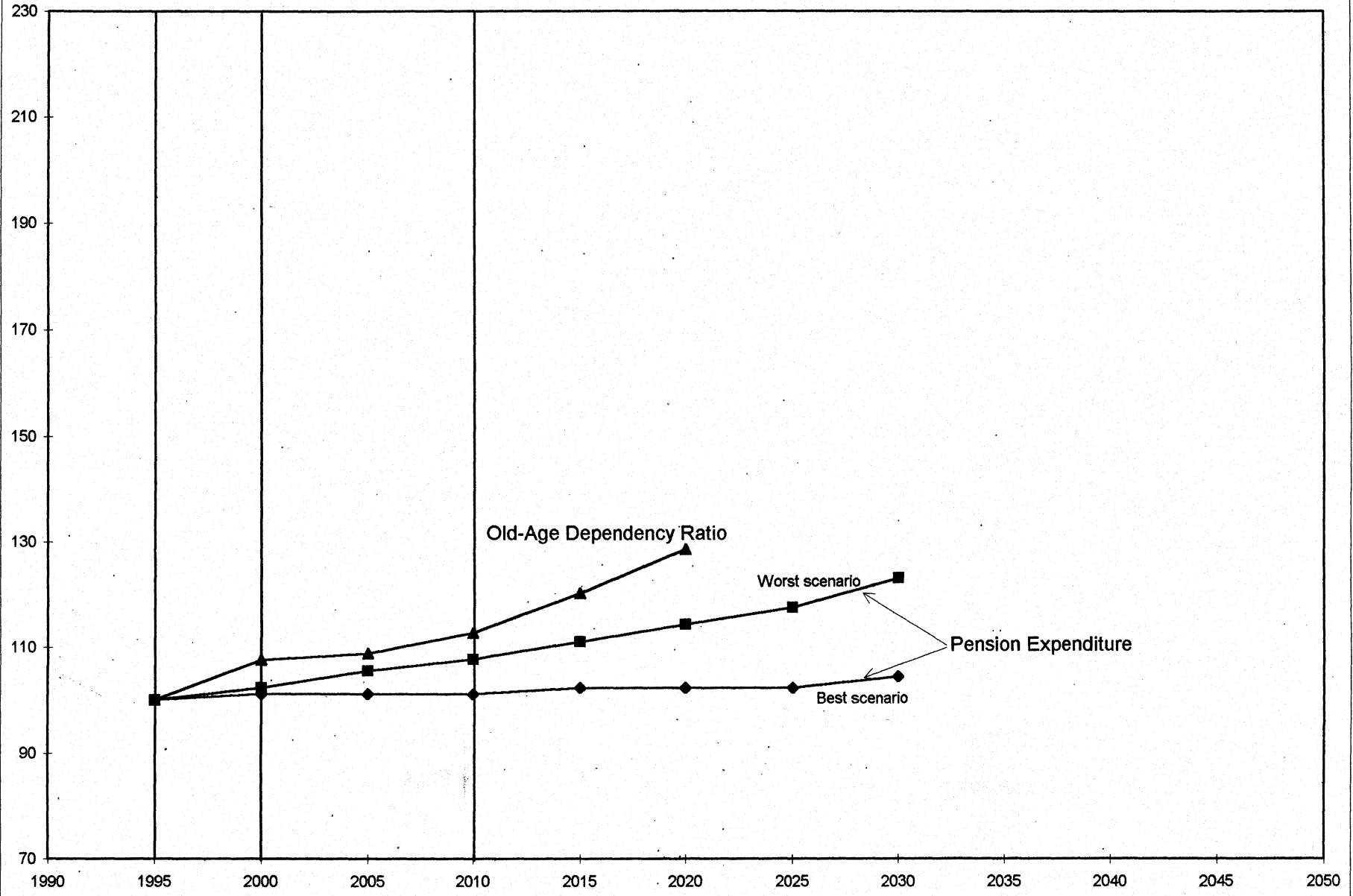
**Pension expenditure growth in The Netherlands:
demographic and non-demographic factors (1990=100)**



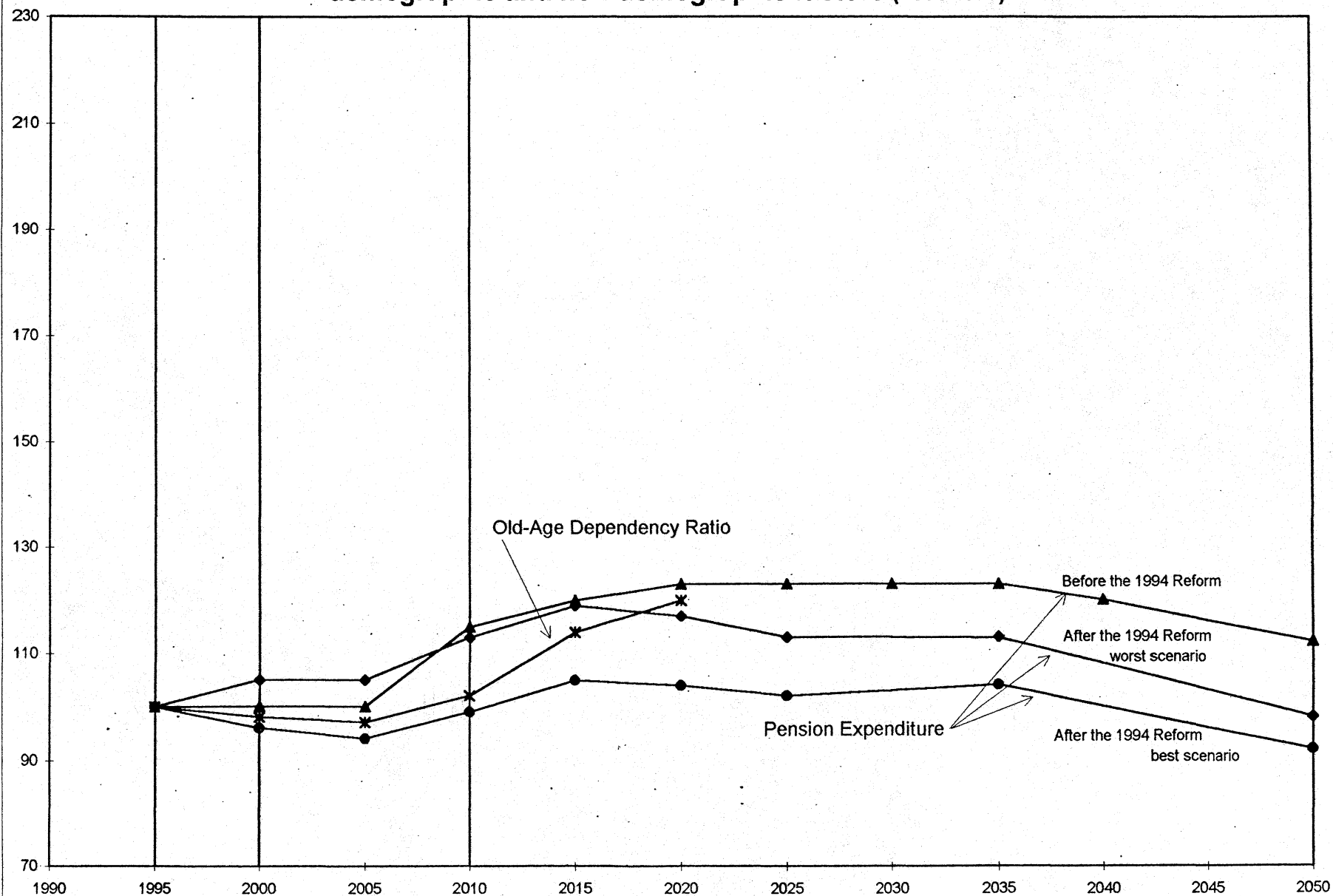
**Pension expenditure growth in Portugal:
demographic and non-demographic factors (1995=100)**



**Pension expenditure growth in Spain:
demographic and non-demographic factors (1995=100)**



**Pension expenditure growth in Sweden:
demographic and non-demographic factors (1995=100)**



**Pension expenditure growth in the United Kingdom:
demographic and non-demographic factors (1995=100)**

