

CONTRIBUTIONS TO ECONOMICS

Birgit Mattil

Pension Systems

Sustainability
and Distributional Effects
in Germany
and the United Kingdom



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Pension Systems



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Birgit Mattil

Pension Systems

Sustainability and Distributional Effects
in Germany and the United Kingdom

With 41 Figures and 56 Tables

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Birgit Mattil

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List of abbreviations

D	(Federal Republic of) Germany
EPC	Economic Policy Committee of the European Commission
EU	European Union
EUR, €	Euro
GB	Great Britain
GBP, £	British Pound
GDP	Gross Domestic Product
GRV	Gesetzliche Rentenversicherung (Statutory Pension Insurance, Germany)
ILO	International Labour Organisation
MIG	Minimum Income Guarantee (UK)
NI	National Insurance (UK)
NIC	National Insurance contributions (UK)
OECD	Organisation of Economic Co-operation and Development
OMC	Open Method of Co-ordination
PPP	Purchasing Power Parity
SERPS	State Earnings-related Pension Scheme (UK)
SSP	State Second Pension (UK)
UN	United Nations
UK	United Kingdom of Great Britain and Northern Ireland

1 Introduction

Throughout the 1990s, public and scientific discussion about the future of the Western European welfare state model intensified considerably. There were a number of reasons for the emerging discussion, resulting from developments both in economic theory and reality. Among the major influencing factors on the social policy debate are trends towards neoliberal economic theory, globalisation, European integration, more flexible employment patterns, ageing populations and changing family patterns.¹

After a period of predominance of Keynesian ideas in public policy, neoliberal theory became more popular during the 1980s and has prevailed in politics of the developed world at the latest from the 1990s.² This shift in theoretical concepts evoked an increasing confidence in the forces of free markets, believed to lead to improvements in efficiency and thus economic growth. The traditional European welfare states were considered to reduce incentives to work and to hinder free competition in large parts of the national economies. Furthermore, international trade was increasing due to technological progress, the globalisation of markets and the emergence of a global capital market. These developments had a major impact on the discussion about social security systems insofar as the globalisation of markets for goods and services put pressure on labour costs in the developed economies, now competing with production sites all over the planet. Since the scope of the welfare state affects labour costs directly through taxation and social security contributions, national governments came under pressure to reduce non-wage labour costs by cutting social benefits.

Due to globalisation, the mobility of labour increased considerably and shifts between employment and self-employment became more common and more frequent during working life. Traditional working patterns have been overcome, so that conventional labour market oriented social security systems – and specifically pension systems – are challenged to effectively provide social security. Changing family patterns have similar effects, since social systems were built to protect the stable one-earner-family. Hence, social insurance schemes have problems covering people effectively in the event of changing family structures due to divorce, remarriage etc. The mentioned changes in employment statuses and lifestyles affect pension systems to a large extent, because entitlements to old-age pensions are – at least in a contribution-based system – earned over a whole working life.

¹ These economic and societal trends will be analysed in detail in section 4.2.

² For a deeper overview of different economic theories' attitude towards the welfare state, see Barr (1992).

However, old-age income may be insufficient for a decent standard of living if parts of the working life are ‘missing’ for the contribution record without compensation in old age by the partner’s income or private pension provision.

While these changes challenge the ability of pension systems to provide adequate old-age pensions for certain groups of people, there are other – macroeconomic – developments that threaten the future affordability of the entire pension system.³ This is especially true for the demographic trends – increasing life expectancy and shrinking birth rates – that lead to population ageing in the majority of developed countries, peaking with the ‘baby boomers’ reaching old age (2010–30). From the early 1990s, future financial problems of public pension schemes in industrialised countries have become central topics of international comparative research. In 1994, the World Bank published a volume on the ‘old age crisis’⁴ and thereby gave rise to a range of analyses on the effects of population ageing on the finances of pension schemes and state budgets, especially of European countries.⁵

Apart from the scientific discussion, governments have been subject to political pressure to cut social expenditure. The member states of the European Union had to fulfil the ‘Maastricht’ criteria on public debt to qualify for monetary union, followed by the criteria of the Stability and Growth Pact.⁶ These financial restrictions, along with global competition on labour costs and the prospects of demographic change⁷, have resulted in major reforms of social security in general, but in particular of public pension schemes. However, the significant political effort needed to reform the welfare state, implying general reductions in social benefits at least for parts of the population, induced many governments to postpone necessary reforms as long as possible. Consequently, the discussion about further reforms needed for long-term sustainability of the pension systems is going on and has been prompted by major international organisations such as the Organisation for Economic Co-operation and Development (OECD), the World Bank and the European Commission⁸. Since the consequences of population ageing will be wit-

³ In 2001, total pension expenditure in EU countries amounted on average to 12.5% of GDP; cf. Abramovici (2004).

⁴ World Bank (1994).

⁵ To mention only a selection of research in this field, see Bucerius (2003), Creedy (1998), European Central Bank (2003), Fehr (2000), Hirte (2001), Kohl and O’Brien (1998), Werding and Blau (2000).

⁶ In terms of public finance, there is the requirement for public debt not to exceed 60% of GDP and to run budget deficits below 3% of GDP. The United Kingdom is not participating in the EMU, but the performance of the neighbour countries in terms of public finance can be considered to have effects on British fiscal policy.

⁷ Demographic trends lead to increasing numbers of pensioners faced by a shrinking working population. For detail, see section 4.2 below.

⁸ E.g., see OECD (1998), Dang et al. (2001), Economic Policy Committee (2001). The definition of objectives of pension systems for this study is based on the works of the European Commission in the context of the ‘Open Method of Co-ordination’; see section 2.4.1.

nessed soon, it is argued that there is a “limited window of opportunity”⁹ to re-structure old-age security.

1.1 Central motivation for the study

Since the main purpose of most of recent pension reforms has been to cut public expenditure and to establish financially sustainable pension systems, there was only limited effort to consider the reforms’ distributional effects in the long run.¹⁰ This is surprising in a policy field that deals essentially with the redistribution of income over time and among individuals of the same and of different generations.¹¹ It is important to consider distributional results of pension systems and thus distributional effects of pension reforms when evaluating reform proposals.

This study brings together theoretical, institutional and empirical analyses for a comprehensive picture of the operation of pension systems. It examines how their structures affect the level of old-age income compared to previous labour income as well as the distribution of income among pensioners and between pensioners and people of working age. In order to derive an educated guess about distributional effects of pension systems, two fundamentally different pension systems and their outcomes in terms of old-age income inequality are analysed in detail on the basis of the established theoretical framework: the pension systems of Germany and the United Kingdom. The selection of countries was driven by considerations concerning financing structures, the public/private mix, financial prospects, available income data sources and the frequently found judgement in comparative research that the British pension system is financially sustainable – in contrast to the majority of the other pension systems in Europe.¹² This exclusive focus on financial sustainability – and thus on the input factors of the system – without consideration of the outcome in terms of old-age income misses an important point. Who would try to evaluate an investment without taking into account its estimated return? Therefore, it is necessary to put the two pictures together: costs of the pension system on the one side and the well-being of pensioners on the other side.¹³

It is not the intention of this work to provide a detailed institutional comparison of the German and the British pension systems¹⁴, but to contrast essential structural differences that seem to translate into different outcomes, both in income distribution and financial sustainability. The analysis is based on clearly defined cri-

⁹ Council of the European Union (2003), p 6.

¹⁰ Analyses of the effects of pension reforms on income distribution were inter alia conducted by Yamada (2002), Hirte (2003), Hirvonen (1989), Fehr and Jess (2001).

¹¹ See section 2.3.

¹² E.g., see European Commission (2000b), p 133.

¹³ Cf. Hauser (1995b), p 3.

¹⁴ Comparisons of these pension systems have been conducted by a number of studies; e.g. see Deutsches Institut für Altersvorsorge (1999), Döring (2002), Hughes and Stewart (2000), Verband Deutscher Rentenversicherungsträger (2004).

teria and a theoretical framework, but it is not founded on a microeconomic simulation model. Such modelling is beyond the scope of this study.¹⁵

The aim is to evaluate pension reform proposals with regard to their ability to achieve financially sustainable system structures while simultaneously providing a fair share of welfare among the elderly and between them and future generations. There is room for improvement in each pension system and both countries can learn from each other's experiences. Given the above-mentioned economic and societal trends, it is evident that these challenges require adjustments of social security. The research work at hand aims at providing a comprehensive framework – both theoretical and empirical – for evaluating current proposals of pension reforms. The results are also applicable to the pension systems of other developed countries, particularly in Europe.

1.2 Outline

The study proceeds as described in the following. Chapter 2 introduces central terms and expressions and provides a definition of key objectives of pension systems. Objectives and especially their implementation in pension regulations depend on normative judgements about how limited resources should be distributed among individuals, i.e. which distribution is perceived just.¹⁶ It is essential especially in comparative research to be precise about the underlying normative foundations.¹⁷ The definition of tangible objectives is based on the commonly agreed agenda of the European Union, because this can be considered valid for both countries studied. A selection of key objectives is used as a benchmark for the theoretical and empirical analyses.

Chapter 3 explores the theoretical foundations of pension policy with an emphasis on sustainability and distributional effects. This theoretical part deals with general considerations about pension policy and is therefore independent of the specific pension systems studied later on. Exogenous risk factors that affect the functioning of pension systems and structural parameters that allow the system to achieve its objectives best, given the external influences, are at the core of the analysis. The most important structural parameter with major impact on the ability of the system to counterbalance exogenous shocks is the financing mechanism, i.e. pay-as-you-go financing or funding. Furthermore, the calculation of benefits, the scope of compulsory pension insurance, the sources of financing and the choice of public or private provision determine a pension system's distributional effects. The analysis leads to the definition of three prototypes of pension schemes with different systemic structures as benchmark schemes in terms of their sustainability

¹⁵ This would require further major research, in particular because of the comparative approach. As an example for such modelling concerning the German pension system, see Krupp et al. (1981).

¹⁶ Cf. Barr (1998), p 11.

¹⁷ Cf. Hauser (1991), p 200.

and distributional impact. Finally, a mix of these prototypes is suggested for achieving the formulated pension system objectives best.

Subsequent to the theoretical examination of the operation of pension systems, chapter 4 introduces the applied part of the study. This chapter outlines macroeconomic developments experienced by Germany and the United Kingdom since 1980 and defines several continuing societal and economic trends that are challenging the performance of pension systems. These developments have been the framework for past pension policies and will influence the pension reform options in the future.

Chapter 5 provides an overview of the institutional arrangements concerning old-age pensions in Germany and the United Kingdom, a prerequisite for evaluating the outcomes of the systems later on. The institutional presentation focuses on the structural elements identified in chapter 3 as being important for the analysis of the pension systems' sustainability and distributional effects. At the end of the chapter, a number of hypotheses are formulated concerning the projected performance of both pension systems in terms of sustainability and income distribution. This is essential before moving to the empirical analysis, since the empirical results on income levels and income distribution have to be examined in the context of the underlying systemic structures, reflecting at least partly national priorities concerning conflicting pension objectives.

Empirical results regarding the past development of the elderly's income situation are shown in chapter 6 from a comparative perspective. The calculations are based on the Cross-national Equivalent File (CNEF), containing comparable household income data from Germany and Great Britain.¹⁸ The analysis focuses on the development of income levels and income distribution among the elderly and in comparison to the situation of the remainder of the population. A part of the calculations uses the panel structure of the data to compare income in old age with income before retirement on the individual level to examine whether the personal living standard is maintained after retirement. The chapter concludes with an evaluation of both pension systems' ability to achieve the formulated objectives with regard to income adequacy and income distribution.

Chapter 7 focuses on the future perspectives of the German and the UK pension system in terms of sustainability and projected outcomes in income distribution. Based on forecasts about future pension expenditure conducted *inter alia* by the European Union and the OECD¹⁹, risks for the sustainability and the distributional equity of the national pension systems are identified, respective to the definition of objectives in chapter 2. Drawing on the findings of chapter 6 and the first part of chapter 7, a number of reform options for the German and the UK pension system

¹⁸ Consequently, in contrast to the rest of the study, the results can only represent the situation in the United Kingdom excluding Northern Ireland. However, it can be assumed that the exclusion of Northern Ireland does not have a significant impact on the results that focus rather on trends over time than on single figures.

¹⁹ I.e. Economic Policy Committee (2001), Council of the European Union (2003), Dang et al. (2001), World Bank (1994).

are introduced and evaluated in terms of their effects on sustainability and income distribution.

The study concludes with some final remarks about prospects of the pension reform debate in Europe and further research required in this field.

2 Objectives of pension systems

An evaluation of pension policies – especially in a comparative research design – requires a clearly defined set of objectives as benchmark for the performance of the implemented systems. Therefore it is necessary to introduce some essential terms and definitions as well as disclose the criteria of evaluation on which the analysis relies.

This chapter begins with answering the fundamental questions ‘what is a pension system?’ and ‘why do we need a pension system?’. Subsequently, section 2.3 focuses on further terms of central importance for this study, i.e. the different approaches to distributional justice and the concept of sustainability. These thoughts lead directly to the requirement of formulating tangible objectives of pension systems. Since targets need to be valid for both the German and the UK pension system, the formulation refers to the commonly agreed objectives within the EU Treaty and to the ‘Open Method of Co-ordination’ in the field of pensions.

2.1 Pension system – a definition

A pension system may be defined as the total of arrangements that pay income in old age. Still, it is arguable which types of arrangements are considered part of the pension system. The definition underlying the present study is essential for both the theoretical and the applied parts. Table 2.1 lists the main components of pension systems and how the different terms will be used in the remainder. The various elements will be explained in detail in chapter 3. At this stage, the focus is on understanding the different scope of the terms used.

The *public pension system* is at the core of the pension system. It consists of one or several old-age insurance schemes with compulsory participation for a part of the population or even the entire population. The scheme(s) is/are usually administered by public institutions. Public pension schemes often provide insurance not only for age-induced exit of the labour market, but also for the case of invalidity and for surviving dependants if the insured person deceases. These individual risks related to old age will be treated in detail in the following section.

Besides obligatory participation in the public pension system, there may be further compulsory elements of old-age insurance. These are normally not administered by state institutions but by private investment firms or insurance companies and can be derived from occupational or private pension scheme arrangements. Occupational pension schemes are all kinds of pension schemes that are connected

Table 2.1. Pension system: essential terms

	Components
Public pension system	Mandatory public old-age insurance for the entire/a part of the population (several parallel schemes possible)
Mandatory pension system	Public pension system + compulsory parts of occupational/personal pension schemes
Pension system	Mandatory pension system + voluntary parts of occupational/personal pension schemes which fulfil certain legal requirements to be state-subsidised by tax relief or direct grants
Pension provision	Pension system + other forms of savings and insurances + owner-occupied housing
Old-age income (Pension income)	Income from pension provisions (including saved rent due to owner-occupied housing) + income support from subsidiary systems + other social benefits + private transfers

Source: own illustration.

to employment, financed either by the employers' or by the employees' contributions or a combination of both. The total of mandatory elements of pension insurance is called the statutory or *mandatory pension system*. When comparing contributions to and payments from different pension systems, it is essential to consider all parts of the mandatory pension system and not only the public pension scheme(s).

In addition to compulsory parts of pension insurance, there are often incentives for additional pension provisions in the form of public grants or tax relief for such investment products that fulfil specific legal requirements. The entirety of legally defined pension provision will be considered the *pension system*.

There are also investments that are not pension provisions in the narrow sense of a legal definition, but that are nevertheless part of an individual's provision for his/her old age. They are difficult to distinguish from private pension provision in the narrow sense. Along with investments into the pension system, total savings and investments meant for living in old age – also in the form of owner-occupied housing – form the personal *pension provision*.

All these terms refer to the situation before retirement and focus on how individuals prepare for old age. Taking a pensioners' view, it is important to define which parts of his/her income is considered *old-age income* for the empirical analysis. In addition to all payments from all types of earlier defined pension provision as well as saved rental expenses due to owner-occupied housing, means-tested public benefits from the subsidiary systems are taken into account. It is necessary to include these transfers, because they are part of personal net income. In-

dividuals have knowledge of the institutional arrangements of the welfare state and may consider these benefits in their old-age income planning.¹

Details about the institutional characteristics of pension systems with application to Germany and Great Britain will be studied in chapter 5.

2.2 Individual risks faced in old age

Article 25 (1) of the Universal Declaration of Human Rights² resumes the responsibilities of states for their citizens in terms of social security:

“Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing, medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.”

Old age is explicitly named as a state of risk for individual security. The general intention of social security is to provide people with a safety net in the event of individual shocks that endanger their ability to earn their living, predominantly by personal activity on the labour market. The social security system provides insurance to individuals against risks that may not be covered by private insurance either because actuarial insurance is impossible or because individuals are not willing to insure against such risks.³

For the analysis of how social security of pensioners is achieved best, i.e. the central question of this study, it is necessary to define the risks people are exposed to in old age. Risks are defined as the financial effect of shocks experienced. There are individual risks and global (macroeconomic and social) risks. Individual risks can usually be covered by actuarial insurance since the average risk is calculable for the total of participants; they do not challenge the social insurance system on the whole.⁴ In contrast, the occurrence of global – macroeconomic and social – shocks, may cause serious imbalances for the entire social security system; such risks cannot be entirely covered by actuarial insurance.⁵ The latter type of risks are profoundly analysed in section 3.1 while the present section focuses on individual risks for well-being in old age.

Individual risks may arise from immediate financial shocks or from health or psychological shocks that translate to financial shocks. It is assumed that health

¹ See section 5.1.

² Universal Declaration of Human Rights by the General Assembly of the United Nations on 10.12.1948.

³ However, some uncertainty is necessary in a market economy for giving people incentives to compete; cf. Hauser (1988), p 148. See Barr (1998), pp 188f for a justification of social insurance.

⁴ Cf. Lampert (1998), pp 225f.

⁵ Actuarial insurance can cope with individual shocks but not with common or systemic shocks; cf. Barr (1998), pp 114f.

risks, including the risk of needing long-term care, are covered either by the social security system or by private insurance. Therefore, health and psychological shocks only cause individual risk if insurance is incomplete and these shocks translate to financial shocks.

In general, the individual risk in old age is an inadequate old-age income due to either insufficient old-age provision earlier in life or to unpredictable changes in life circumstances such as the death of the household's main earner. Inadequate old-age income as a result of insufficient pension provisions can have different causes. Either a person was not able to provide sufficiently for her old age because of incapacity to work or due to unpaid work (e.g. raising children) or the person underestimated the required provision, since there is uncertainty about the further individual life expectancy after retirement. The latter is called the risk of longevity, i.e. the risk that life lasts longer than expected and hence the provided savings do not suffice for maintaining an appropriate living standard until the end of life.

Insufficient financial resources may lead to poverty and social exclusion, which in turn presumably reduces the quality of life. To prevent such exclusion, the elderly must not only have a personal claim to the means to survive (subsistence insurance),⁶ but also have to have the opportunity to participate in social life and to decide about their desired way of living. Apart from security needs concerning an individual himself/herself, there is also this need for closely related persons, especially for the dependants in the event of the main earner's death.

In the remainder of the study, the focus will be on two sorts of risk: the risk of an insufficient replacement rate of working-age income by old-age income and the risk of longevity.

2.3 Basic principles: equitable distribution and sustainability

Hauser (1995b, p 1) states that social security in old age requires the provision of an adequate income for the elderly, adequate health insurance and sufficient security in case of long-term caring needs. This is in accordance with the individual risks discussed above and gives a first hint about the objectives of pension policies. Other authors add social security of women as a further self-standing objective.⁷ Health insurance and long-term care insurance can be provided within or outside the pension system. The present study focuses on the provision of an adequate income by the mandatory pension system (see 2.1). Two questions emerge immediately and have to be answered in the remainder of the study: 'What income level is adequate?' and 'How can it be provided efficiently?'

Answers to these central questions require distributive judgements, since the 'right' way of providing pension income can only be identified if there is a con-

⁶ This is a general human right that is guaranteed by social security in the industrialised countries; cf. Universal Declaration of Human Rights, Article 25 (1), as quoted above.

⁷ E.g., see Ahrens and Hubert (1994), p 3.

sensus about how resources are distributed equitably, where equity does not necessarily mean equality.⁸ Distributive judgements certainly depend on ethic values and the history of social security in the respective country. However, the evaluation of the analytical results needs a precise definition of the underlying normative judgements on social justice.⁹

Distributional equity has two dimensions, intragenerational and intergenerational equity. Intragenerational equity refers to a just distribution of resources among individuals that belong to the same generation, while intergenerational equity relates to the distribution between generations. In the context of pension policy, it is useful to distinguish between the young generation (not yet participating in the labour market), the working-age generation and the generation of pensioners, each comprising about 30 birth cohorts of people. Aspects of intragenerational and intergenerational equity within pension systems as well as their sub-targets are presented in the following.

A paramount principle of pension policies, closely linked to the aim of providing an adequate old-age income, must be the sustainability of the pension system. Financial sustainability is closely tied to intergenerational justice, since a collapsing system cannot serve future generations of pensioners.

2.3.1 Intragenerational justice

A major function of pension systems is to smooth income flows of individuals over their lifetime, i.e. intertemporal redistribution on the personal level. People of working age are obliged to contribute to pension schemes either by tax payments or by contributions or both in order to shift income into the future. The underlying objective is to enable people to reallocate consumption over their lifetime,¹⁰ assuming that they tend to underestimate their individual longevity risk (see 2.2). Obliging people to save for their old age does not only lead to an improvement of intertemporal welfare of individuals, but also reduces the financial risks for the public budget, because the number of potential subsistence benefit claimants decreases.¹¹ This intrapersonal reallocation of income is not primarily subject to redistributive judgements. It is more a question of efficiency in terms of techniques

⁸ Barr (1998), chapter 3, provides a comprehensive overview of major political theories concerning social justice and the role of the state.

⁹ Döring (1998), p 215 argues for Germany that the missing discussion of the normative basis has hindered compromises in social policy in the last decades, leading to the present patched social security system.

¹⁰ Cf. Barr (1998), p 10.

¹¹ If people buy less insurance (here: pension provision) than socially efficient and the external costs of non-insurance fall upon the taxpayer, there is a strong reason for compulsory insurance; see Barr (1998), pp 188f.

and types applied for saving, the scope of mandatory pension provision and the realised rate of return¹², studied in chapter 3.

Besides intrapersonal income-smoothing, a pension system inevitably redistributes income among participants of the same generation.¹³ The question is how redistribution is implemented, i.e. what constitutes equity within a pension system.¹⁴

When analysing intragenerationally redistributive effects of pension systems, it is necessary to separate two functions of such systems that may be denominated as the insurance function and the pension provision function. Different individual risks lead to a “natural” redistribution of benefits, e.g. due to different mortality risk. This is the result of insurance that pools individual risks on a group level and cannot be interpreted per se as a part of social redistribution, motivated by social solidarity.¹⁵ However, it is a distributional judgement which elements are included in the pension insurance. Differences in mortality of men and women and the existence of dependants could be treated as additional risk components and could then be reflected in a differentiation of insurance premiums. It is a means of social redistribution in favour of families and women if these two elements are included in the benefit catalogue without price differentiation.

Apart from that, most public pension schemes cover the risk of early retirement because of working incapacity. Income redistribution resulting from this insurance element of pension systems is excluded from the following considerations on intragenerational equity, because it is not interpreted as part of social redistribution.¹⁶

There are two dominating directions in the pursuit of intragenerational equity, horizontal and vertical equity. These are concepts of relative equality, not of absolute equality.¹⁷ Horizontal equity requires that individuals in similar circumstances are treated similarly.¹⁸ The concept is most frequently used in the context of income taxation. With regard to pension policy, it means that people who have paid the same total contributions (including interest) during their lifetime should receive the same pension benefit after retirement. Consequently, horizontal equity in a pension system demands actuarial benefit calculation. If pension entitlements are only based on contributions paid from individual labour income, the pension sys-

¹² If the realised rate of return on the pension provision depends on the socio-economic background of a person, the distribution of realised interest affects intragenerational justice.

¹³ Cf. Davies (2000), p 109.

¹⁴ However, the ways of redistribution of a pension system are not always explicit and not entirely subject to control. Cf. Davies (2000), p 111.

¹⁵ Cf. Rechmann (2001), p 49. If the negative correlation of mortality and income level is considered, different mortality leads to a redistribution from poor to rich; cf. Rechmann (2001), p 50. However, low-income participants tend to receive more disability and survivors' benefits; cf. Gillion et al. (2000), p 292.

¹⁶ Still, these elements of pension systems lead to intragenerational redistribution of income implied in every insurance.

¹⁷ Cf. Becker and Hauser (2004), p 17.

¹⁸ Cf. Pearce (1992), p 188.

tem can only provide an adequate pension income to those individuals who are able to participate in the labour market. Obviously, pension systems need additional principles and cannot function solely on the basis of horizontal equity if they aim at providing pension benefits to each old person.

The second approach is vertical equity. It claims to treat individuals according to their needs. The concept implies income redistribution as an expression of social solidarity. Within a pension system, intragenerational vertical redistribution is carried out in particular from rich to poor, i.e. from individuals with high contributions (high income) to those with lower contribution records (low income), to provide the latter with relatively more pension income than in an actuarial system. Other means of vertical equity are often effected by assigning pension entitlements without contribution payments as a reward for unpaid but socially desirable activity such as educating children, caring for family members or military service.

Since it is difficult to measure individual needs, the principle of vertical equity is mainly pursued to prevent poverty, either within the public pension system or through a subsidiary subsistence benefit. Income redistribution for social solidarity reasons within a pension scheme is only possible if it is a public pension scheme or if there are public subsidies, because private actuarial schemes are not able to provide for other than risk-related redistribution.¹⁹ It is contentious if income transfers for reasons of social justice should be carried out within a pension scheme, since social solidarity concerns the entire society and should be financed by the public budget, i.e. by general taxation. Consequently, if the public pension system does not cover the whole society, social redistribution is only effected between the participating parts of the population.²⁰ This problem only arises in non-universal public pension schemes based on contributions; universal tax-financed schemes do not face this conflict.²¹

The principles of horizontal and vertical equity may only gradually be pursued at the same time; they are naturally conflicting.²² It depends on normative judgments which balance between these two principles is considered just. This is a crucial question for the acceptance and credibility of a pension system and thus determines sustainability in a broader sense (see 2.3.3). A considerable degree of horizontal equity is important for setting incentives for individual effort in a market economy.²³ On the other hand, market failure to reward all activities in accordance with societal valuation requires elements of income redistribution towards vertical equity.

Major objectives of pension policies are derived from the aim of intragenerational justice, i.e. gender equality and preventing poverty. However, these and other objectives do also have an intergenerational dimension in so far as the actu-

¹⁹ An exemption may be unisex benefits. See Barr (1998), p 194.

²⁰ Döring (1998), p 254 argues that it is not justified that social redistribution takes place through the German public pension scheme and hence does not concern the entirety of taxpayers.

²¹ See section 3.2.

²² Cf. Barr (1998), p 11.

²³ Cf. Döring (1998), p 218.

ally perceived success differs between generations. E.g., the aim of preventing old-age poverty implies decisions on intergenerational equity because resources used for the current generation will not be available to future generations. Section 2.4 discusses such specific objectives in detail.

There may be intragenerational redistribution of income between different age cohorts belonging to the same generation. Such inter-cohort redistribution can be the result of differing conditions prevailing at the time of retirement such as changes in macroeconomic conditions or a modified adjustment rule for pension benefits.²⁴

The examination of intragenerational redistribution translates to a cross-sectional design of analysis. Chapter 6 contains this kind of analysis based on microeconomic income data, studying intragenerational as well as intergenerational income distribution.

2.3.2 Intergenerational justice

In contrast to intragenerational income distribution, the concept of intergenerational equity has only recently received major interest in economic research and in politics.²⁵ The topic emerged in the context of the (environmental) sustainability discussion (see 2.3.3) and research works about the financial effects of demographic ageing in developed economies.²⁶ Until now, there does not exist a commonly accepted normative definition of intergenerational justice.²⁷ One definition could be that intergenerational equity is achieved if future generations have the opportunity to live at a comparable or better standard of living as the preceding generations.²⁸ However, it is difficult to compare opportunities across generations, since they live under different historical circumstances.²⁹

For evaluating intergenerational justice, all transfers between generations would have to be taken into account. As mentioned above, it is assumed that three generations, containing about 30 birth cohorts each, are living at the same time, the young, the middle-aged and the old generation. Intergenerational justice can be investigated in two ways: the distributional justice of transfers at one point in time between individuals belonging to different generations (cross-sectional approach) and the total transfers between subsequent generations over their entire lifetime (longitudinal approach).³⁰ For a comprehensive evaluation of intergenerational

²⁴ See chapter 3 for an analysis of effects exerted by such risk factors.

²⁵ Cf. Tennstedt (2004) for an analysis of the history of the expression 'intergenerational justice' ('Generationengerechtigkeit') in Germany. The topic is often discussed as the 'generation contract' in the German language area.

²⁶ See sections 4.2.1 and 7.1.

²⁷ Cf. Hauser (2004), p 98.

²⁸ This approach complies with the definition of sustainability (see section 2.3.3) and is formulated in a similar form by Tremmel (2003), p 35 and Rürup (2004), p 42.

²⁹ Cf. Nullmeier (2004), p 73.

³⁰ Cf. Becker and Hauser (2004), pp 24f.

justice the second approach would be appropriate, but a cross-sectional analysis of income distribution reflects important information about intergenerational relations at a given point in time. Transfers between generations are not only monetary transfers from public and private pension schemes, but also other monetary and non-monetary transfers.³¹ Even if the pension system was a net transfer from the current younger to the older generation, most of the other monetary transfers have the opposite direction.³² Therefore, since this analysis is restricted to the pension system, it can only cover a fraction of the overall intergenerational distribution of resources.

Several authors state that the recent discussion about intergenerational justice increasingly narrows on pseudo-accurate calculations about economic equality of age cohorts with regard to certain fields of public policy, e.g. fiscal sustainability.³³ If applied to pension policies, intergenerational justice requires equity of contributors/tax-payers and pensioners or present and future pensioners. Currently, a major concern is an equitable sharing of the financial burden of demographic ageing among the participating generations. Rürup (2004, pp. 41f) summarizes the most popular methods for evaluating intergenerational justice in public pension schemes formally – Generational Accounting³⁴ and the concepts of implicit tax rates or implicit return³⁵ – and concludes that these methods are inadequate to reflect intergenerational justice on the whole.³⁶ These methods usually focus on fi-

³¹ Monetary transfers are inter alia inheritances, alimony payments etc. but there are also the existing infrastructure and invaluable achievements of the old generation that may be entitled the ‘social infrastructure’, including the formation of human capital, the internal democratic political structure and international political networks; cf. Davies (2000), pp 119f.

³² Schmähl (2004), p 80 shows that the present old generation transfers about 36% of total monetary transfers to the middle-aged and about 15% to the young, compared to about 8% of total transfers in the opposite direction in favour of the elderly. The results are based on the ‘Alterssurvey’ (old-age survey) 1996.

³³ E.g., see Hauser (2004), p 94 and Nullmeier (2004), p 66.

³⁴ Generational Accounting is a method of calculating and comparing the discounted average positive and negative income transfers induced by the present public policy for present and future generations. Major works in this field have been Deutsche Bundesbank (1997), Raffelhüschen and Walliser (1997), European Commission (1999a), Bonin (2001) and Deutsche Bundesbank (2001). When applied to pension policy, there are generational accounts for contributions and future benefits of the public pension scheme that allow to judge the effects on sustainability of a pension reform; cf. Rürup (2004), p 41.

³⁵ Implicit tax rates estimate the average reduction in the return of public pension schemes compared to alternative investments for an average participant of a generation/cohort, implicit return is the average return of the pension scheme for a generation; cf. Rürup (2004), p 41. Selected works on these subjects are Bravo (2000), Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2003), pp 323ff and Fehr (2004).

³⁶ Other authors agree on the incapacity of these concepts to examine intergenerational justice; cf. Schmähl (2004), pp 78f; Bomsdorf (2004), p 89.

nancial sustainability and draw the conclusion that the older generation is better off than the younger,³⁷ meaning that there is no intergenerational justice.

A number of papers argue that intergenerational justice cannot be explained by economic theory and is thus not a properly defined objective of pension policies.³⁸ A usable definition of intergenerational justice – that will be used for this study – encompasses the principle that all living and future generations shall participate in the general economic wealth.³⁹ This definition covers the two intergenerational dimensions mentioned above: different generations living at the same time and the sequence of generations over time. Relating this approach to intergenerational justice, financial burdens of societal change should be equitably shared by all generations. With respect to current challenges of pension policy, this consideration implies that both contributors/tax-payers and pensioners have to bear a part of the financial consequences of ageing to guarantee the long-term sustainability of the system, without neglecting the fundamental claim of pensioners to participate in economic growth. The latter may be realised by an uprating rule of pension benefits based on the growth rate of nominal earnings.⁴⁰ The analysis of intergenerational justice will concentrate on these requirements.

Nevertheless, the relative size of generations can change – according to the applied definition of generations – with a change in the effective retirement age, because it shifts the frontier between the working population and the pensioners. This aspect is crucial for the analysis of intergenerational justice and financial sustainability and so it is at the core of many recent pension reform proposals.⁴¹

When it comes to the evaluation of intergenerational justice and sustainability, global economic figures have to be considered along with the personal distribution of income. In addition to some information about relevant macroeconomic trends in the past given in Chapter 4 and income figures presented in Chapter 6, Chapter 7 will deal with projections for the future development of economic indicators that affect pension policies, especially to evaluate intergenerational justice and sustainability.

2.3.3 Sustainability

The concept of sustainability was introduced by environmental economists in the 1980s. They postulated that the living generations should not employ more renewable natural resources than their capacity to regenerate; non-renewable resources should only be used if technological progress would allow substituting the respective natural resources in the future.⁴² The so-called *Brundtland Commission on Environment and Development* defined sustainable development as to “ensure that

³⁷ Cf. Nullmeier (2004), p 68.

³⁸ E.g., see Agulnik and Barr (2000), p 73; Schmähl (2004), p 82; Rürup (2004), p 42.

³⁹ Cf. Bäcker (2004), p 16.

⁴⁰ See section 3.2.2.1.

⁴¹ See section 7.2.

⁴² Cf. Pearce (1992), p 417.

it meets the needs of the present without compromising the ability of future generations to meet their own needs.”⁴³

In the early 1990s, the concept of sustainability was applied to public finance. Public policies were analysed with respect to their “fiscal sustainability” in the context of ageing.⁴⁴ Different approaches to define fiscal sustainability emerged in the scientific discourse. One direction of research is the earlier mentioned Generational Accounting, a method of comparing tax burdens intergenerationally (see 2.3.2). Research by institutions of the European Union employs the criteria of the Stability and Growth Pact to evaluate the sustainability of public finance.⁴⁵ Other research focuses on public pension expenditure or total pension expenditure as a proportion of GDP today compared to projections for the future development.⁴⁶

Sustainability can be defined in a narrow or in a broad sense. In the narrow sense, sustainability is achieved if a pension system will remain affordable in the future. For an analysis of financial sustainability, total pension expenditure would have to be taken into account, but it is difficult in practice to separate non-public pension income from other investment income in old age.

However, not only financial problems may lead to a breakdown of pension systems, but also the lack of general acceptance and credibility among the population, which can be denominated as its sustainability in a broader sense, or political sustainability.⁴⁷ If members of the working-age population do not perceive the existing mandatory pension system, especially the public pension scheme(s), as just and capable of providing adequate pensions, they will try to avoid participation in the system.⁴⁸ This can be achieved either by leaving the official labour market or by creating forms of employment that do not require participation in the public system.⁴⁹ Sustainability in the broader sense comprises these non-monetary aspects of systemic stability in addition to the earlier discussed financial factors. However, it can be assumed that financial prospects (i.e. sustainability in the narrow sense) interfere with credibility and acceptance of the pension system. Sustainability in the broader sense is closely linked to the perception of distributional equity, since this perception depends on the accepted level of redistribution of incomes within and between generations.

2.3.4 Dependencies between principles

It has already been mentioned on various occasions that dependencies and conflicts do exist between the postulated principles. It is a normative, political task to

⁴³ World Commission on Environment and Development (1987), p 8.

⁴⁴ E.g., see Economic Policy Committee (2001).

⁴⁵ Cf. Economic Policy Committee (2001), p 66.

⁴⁶ E.g., see Abramovici (2003), OECD (1998).

⁴⁷ Cf. Schmähl (2004), p 82.

⁴⁸ Rawls (1973), p 6 considers the justice of institutions a crucial factor for their viability.

⁴⁹ If there exists a tax-financed public pension system, people can only evade by leaving the country or cheating with tax declaration.

decide about the weights attached to conflicting objectives.⁵⁰ However, it is crucial to have a sound knowledge of the existing conflicts as a basis for discussion and decision.

Major conflicts emerge from the pursuit of horizontal and vertical equity at a time.⁵¹ It is evident that these differing approaches lead to significantly different results. Hence, the structure of a pension system reveals the predominant concept at the time of its creation. Universal, tax-financed pension systems with a guaranteed minimum pension attach more weight to the principle of vertical equity, while contribution-financed pension systems with prevailing actuarial elements give priority to horizontal equity.⁵²

Interdependencies between intragenerational and intergenerational justice exist if members of a generation are inequitably charged with measures to restore intergenerational equity or sustainability.⁵³

Normative judgements are changing over time. They are subject to important influences in the form of changing culture and experiences made in other countries. Apart from this, there are also changes in the composition of society (a current example being ageing populations) and the impact of major technological change, influencing accustomed ways of living. All these developments may lead to a shift in priority of different objectives of pension systems. European Integration has provoked an intense discussion about aims and methods of pension policies throughout Europe. The commonly defined objectives provide a sound basis for a comparative analysis of different pension systems; they will be specified in the remainder of this chapter.

2.4 Stipulation of tangible objectives

The definition of objectives to be pursued through a pension system is crucial for the analysis of its structure, carried out in chapter 3. Since the theoretical results are applied to the pension systems of two different countries, the set of objectives must fit to both of them. The analysis has to be based on objectified, commonly agreed rules, which is the legal framework of the European Union.⁵⁴ However, a number of the formulated targets overlap and others are beyond the scope of this study. Therefore, they will be condensed to some major, well-defined objectives in the final section of this chapter.

⁵⁰ Cf. Becker and Hauser (2004), p 29.

⁵¹ Cf. Becker and Hauser (2004), p 28.

⁵² For more detail about structural elements of pension systems, see section 3.2.

⁵³ Cf. Becker and Hauser (2004), p 30.

⁵⁴ Hauser (1991), pp 199f explains the crucial importance of defining criteria in a cross-national comparison of social security systems.

2.4.1 Objectives set by the European Union

Social policy has never been the focus of European unification; the process of harmonisation was restricted to those parts of this policy field that might get in conflict with the principles of the common market. The *Treaty establishing European Community*⁵⁵ does not specify objectives of pension systems. However, it includes several statements about social security in general. These are expressed in a rather vague way. Article 2 states that one of the tasks of the European Community is to “promote [...] a high level of employment and of social protection”. Article 136 of the chapter on social provisions adds the “promotion of [...] improved living and working conditions, proper social protection [...] and the combating of social exclusion”. The Council has to act unanimously in the area of social security (Article 137, paragraph 3) and the European Commission should “encourage co-operation between the Member States and facilitate the co-ordination of their action in all social policy fields [...], particularly in matters relating to [...] social security” (Article 140).

The Treaty leaves the competence for social policy without external links – i.e. regulation which does not conflict with other parts of the European legislation – with the Member States. Thus, the Commission cannot take direct legislative initiative in the field of social security; its action is limited to communications and recommendations.⁵⁶ A different approach has been pursued by the Commission in recent years, namely the so-called ‘Open Method of Co-ordination’ (OMC), which was first applied to the process in the field of social inclusion in 2000.⁵⁷ The draft for a future EU constitution, which was agreed upon by the European Council in June 2004, contains some additional elements of social policy⁵⁸ and introduces the Open Method of Co-ordination as an official legal process⁵⁹.

The co-ordination process focussing on the sustainability of pension systems began with the submission of a European Commission Communication in October 2000.⁶⁰ The Commission reported on the demographic challenges the pension systems of the Member States would have to deal with in the decades to come and proposed a reform strategy based on eleven major objectives (see below).

After the common agreement on objectives, these had to be translated into national policy strategies. The Member States’ progress is then monitored regularly

⁵⁵ European Community (1997).

⁵⁶ Although these means have no immediate binding effect, they may exert considerable political pressure on Member States’ policies.

⁵⁷ The method had already been adopted for the area of employment policy within the ‘Luxembourg process’ in 1997, but had not yet been denominated as OMC; cf. Casey (2003), p 89.

⁵⁸ The Union’s social policy objectives include social progress, combat against social exclusion and discrimination (inter alia because of age), promotion of social justice and protection, equality between women and men and solidarity between generations; see Council of the European Union (2004), Article I–3.3.

⁵⁹ Council of the European Union (2004), Article III–107.

⁶⁰ European Commission (2000a).

on the basis of commonly agreed indicators.⁶¹ The first national strategy reports of the 15 old member states were delivered in September 2002, and a joint report on the national strategies was approved in March 2003.⁶² At the same time, a broad discussion about the definition of common indicators has been in progress among the Member States and on the European Union's level.⁶³ An update about the national progress in pension policies is to be delivered regularly.⁶⁴

Apart from public pension schemes, the European Commission is becoming more active in the field of occupational pensions.⁶⁵ The aim is to render these pension schemes more flexible in terms of contributions and benefit payment and thus to prevent them from being an obstacle for cross-border (labour market) mobility. However, it has to be taken into consideration that employers contribute to occupational pension schemes in order to bind their employees to the company.⁶⁶

The eleven agreed objectives of the OMC are grouped under three headings: adequacy of pensions, financial sustainability and modernisation of pension systems, as shown in Table 2.2. Most of the objectives have already been translated into the form of quantitative indicators that enable a comparative study of the respective target; the agreed indicators for the National Strategy Reports in the field of pensions 2005 are listed in Table A.1 in the Appendix.

However, some of these objectives overlap and the analyses performed in this study have to focus on a condensed number of more precisely formulated targets. Namely, objective 9 (adaptation to flexible labour markets) can be considered a part of objective 2 (enabling to maintain living standards). Objectives 1 (preventing social exclusion) and 10 (equality of women and men) concern intragenerational solidarity, which is also contained in objective 3 (promoting solidarity). To give more structure to these targets for the following analyses, the solidarity objective 3 will be reduced to intergenerational solidarity and the analysis of intragenerational justice will be restricted to the context of preventing social exclusion and the context of gender equality, which are treated separately. Furthermore, objective 7 (adjust benefits and contributions equitably) is primarily a matter of intergenerational justice, but also of intragenerational distribution.

Financial sustainability will be studied as one global target, comprising objectives 4–6. Objective 8 (security of private provision) will not be treated as an independent objective, but as a condition both for objective 2 and for the aim of financial sustainability.

⁶¹ See Council of the European Union (2001), p 3.

⁶² Council of the European Union (2003).

⁶³ As a basis for discussion, the Commission published a report in 2001: European Commission (2001). The Indicators Sub-Group of the Social Protection Committee is occupied with the task of developing adequate indicators; see Stanton (2002), Stanton (2003).

⁶⁴ The new member states submitted their first strategy reports in 2004 and a second common round of reports for all 25 member states has been due in July 2005.

⁶⁵ E.g., see European Commission (1999b), European Commission (2003).

⁶⁶ Cf. World Bank (1994), p 37.

Table 2.2. Objectives of the Open Method of Co-ordination in the field of pensions

Group I	Adequacy (of pensions)
Objective 1	<u>Preventing social exclusion</u> <ul style="list-style-type: none"> - prevent old-age poverty - let the elderly share in the economic well-being of their country - give the elderly the opportunity to actively participate in public, social and cultural life
Objective 2	<u>Enabling people to maintain living standards</u> <ul style="list-style-type: none"> - provide general access to (public and private) pension arrangements that - enable individuals to provide for sufficient old-age income to maintain their living standard after retirement
Objective 3	<u>Promoting solidarity</u> <ul style="list-style-type: none"> - between generations - among the elderly - consider inequalities due to ageing populations
Group II	Financial sustainability of pension systems
Objective 4	<u>Raise employment levels</u> <ul style="list-style-type: none"> - activate especially women and older workers (European Employment Strategy)
Objective 5	<u>Extend working lives</u> <ul style="list-style-type: none"> - improve incentives for a longer working life in the entire social security system - reduce incentives for early retirement and encourage to work beyond the statutory retirement age - facilitate gradual retirement
Objective 6	<u>Making pension systems sustainable in a context of sound public finances</u> <ul style="list-style-type: none"> - sustainable pension systems are crucial for the overall sustainability of public finances - reform pension systems to contribute to sound public finances
Objective 7	<u>Adjust benefits and contributions in a balanced way</u> <ul style="list-style-type: none"> - share the financial burden of pensions due to ageing populations equitably between contributors and beneficiaries
Objective 8	<u>Ensure that the private pension provision is adequate and financially sound</u> <ul style="list-style-type: none"> - provide appropriate regulatory frameworks for private and public funded pension schemes

Table 2.2. continued

Group III	Modernisation of pension systems: responding to changing needs
Objective 9	<u>Adapt to more flexible employment and career patterns</u> - institutional arrangements of public and occupational pension schemes shall not penalise self-employment and labour-market mobility within and across EU Member States
Objective 10	<u>Meet the aspirations for greater equality of women and men</u> - review gender equality of pension regulations in consideration of obligations under EU law
Objective 11	<u>Demonstrate the ability of pension systems to meet the challenges</u> - improve transparency and reliability of pension systems so that citizens can continue to have confidence in them

Source: Council of the European Union (2003).

Although objective 11 is an important element of political sustainability, it is beyond the scope of the applied research design to study this aspect in the theoretical or in the empirical analysis. However, transparency considerations are essential in the event of pension reforms and will be included in the assessment of reform proposals in section 7.2.

According to previous explanations, the following section defines the condensed number of targets more precisely.

2.4.2 Key objectives

The following five key objectives constitute the evaluation basis for the remainder of the study. Theoretical, institutional and empirical analyses focus on these aspects with different perspectives. Furthermore, they are the evaluation criteria of national pension policies and reform proposals. Due to the research design based on the analysis of incomes and macroeconomic aspects, the study refrains from a comprehensive approach to personal well-being that would require elements of personal health and life satisfaction. Household-size adjusted income is used as a proxy for personal welfare, taking into account that this approach leaves a number of important – but non-quantifiable – facets unconsidered.⁶⁷

2.4.2.1 Preventing poverty

Preventing poverty among the elderly – defined as people aged 65 and over – is a major objective of pension systems, but also a general objective of social policy. The applied poverty concept is based on the definition of a minimum income relative to the prevailing societal and cultural circumstances. Individuals receiving

⁶⁷ See section 6.1.

less than this minimum income are at risk of social exclusion. Consequently, the empirical analysis of poverty refers to a relative poverty line.⁶⁸ A pension system's ability to prevent old-age poverty has to be evaluated compared to other pension systems and to the population on the whole. A further indication is the long-term tendency towards increasing or decreasing poverty rates among the elderly.

2.4.2.2 Securing a decent standard of living

People who are capable of participating in the labour market should have the opportunity to build up sufficient pension provisions during their working life by contributing to public and/or private pension schemes. Pension systems should provide an appropriate regulatory framework to enable individuals to maintain their standard of living after retirement. For maintaining the living standard in old age, less net income is required than during working life, since there are usually less family obligations and work-related expenditure, lower taxes and less private saving.⁶⁹ A comparison between the income levels of the elderly and the rest of the population can be a first indicator for the average relative living standard of pensioners. Individual replacement rates of old-age income in relation to pre-retirement income would be an appropriate measurement for evaluating the ability to maintain one's living standard from an individual perspective. Such a calculation should consider total old-age income, reflecting the entire pension provision and savings infrastructure. However, this approach does not account for the contribution of different mandatory or voluntary pension schemes to overall income replacement. Furthermore, existing income data have some shortcomings in terms of calculating such income ratios.⁷⁰

In addition to income replacement rates shortly after retirement, the ability of maintaining the personal standard of living in the long run is of major importance. This question relates to the risk of longevity (see 2.2). The development of pension income in the long run depends on existing uprating rules for pension schemes and on the rate of return on other assets.

For all of the previously mentioned approaches, it is necessary to consider not only average income levels and replacement rates, but also the inequality in income distribution to reflect the whole spectrum of realised living standards of the elderly. In this regard, average numbers are of restricted explanatory power. Moreover, pension systems need to adapt to societal changes such as more flexible family and employment patterns.⁷¹ This is necessary for retaining their capacity of enabling participants to maintain their living standard after retirement.

⁶⁸ See section 6.1.3.

⁶⁹ Cf. Council of the European Union (2003), p 31 and Pensions Commission (2004), p 134. The Pensions Commission comes to the result that a person with average earnings who saved 10% of her gross income during working life may maintain the same level of consumption after retirement with a gross replacement rate of 77%.

⁷⁰ See section 6.6.2.

⁷¹ For more detail, see section 4.2.

2.4.2.3 Equality of women and men

The evaluation of equality of women and men within a pension system concerns the system's ability to cover both women and men and enable every person irrespective of the gender to provide sufficiently for his/her old age.⁷² It is fundamental whether (married) women are able to build up their own pension entitlements or whether they rely on the provisions of their husbands.⁷³ Given the increasing number of divorces, it is crucial for preventing female old-age poverty that, in the event of divorce, women do not lose their half of the pension rights accumulated by both partners during marriage. Since women still assume the majority of family work – such as raising children, caring for elderly dependants and keeping the house – they are at risk of insufficient own pension entitlements within all pension schemes based on paid employment.⁷⁴

In this study, conclusions about the (in)equal treatment of women and men will be derived from the comparative development of income levels of elderly women and men over the past decades and their probable trends in the future after a number of implemented pension reforms affecting gender equality.

2.4.2.4 Intergenerational justice

The evaluation of intergenerational justice concentrates on the ability of pension systems to share the financial burden of population ageing equitably between the living and future generations. This is in particular a question of charging both contributors/taxpayers and beneficiaries with increasing costs of pensions. It has to be taken into account that the size of these two parties is determined by the retirement age.

The second aspect of intergenerational justice, i.e. the participation of all generations in economic welfare,⁷⁵ is related to the objective of enabling individuals to maintain a decent living standard after retirement (see above). It requires the relative stability of old-age incomes compared to the incomes of the working-age population, which can be achieved by appropriate uprating rules for pension schemes.

2.4.2.5 Financial sustainability

Projections of financial sustainability are subject to more or less reliable estimates about a number of major influencing factors concerning economic and societal

⁷² Rechmann (2001), p 43 makes a distinction between the systemic procedures and their results with regard to equal treatment of women and men.

⁷³ Rolf and Wagner (1992) postulate a fully independent old-age provision for women.

⁷⁴ Pension systems already foresee a splitting of pension rights in the case of divorce.

⁷⁵ Therefore, the developments of income levels and income distribution over time have to be analysed in the context of macroeconomic performance (see section 4.1 in connection with section 6.2.).

development. Therefore, future sustainability can only be evaluated approximately.

A strict criterion for financial sustainability would be to keep pension expenditure or even total old age-related expenditure (including subsidiary benefits) as a proportion of GDP on a constant level. However, given the prospects of population ageing, a constant relative level of pension expenditure would necessarily translate to a significant reduction in expenditure per pensioner unless effective retirement is postponed. In return, the shrinking young and middle-aged population would benefit from an increasing share per head of economic welfare. Obviously, this approach conflicts with the objective of intergenerational justice. On the other hand, the approach to keep pension expenditure per pensioner at a constant level seems unjust towards the younger generation, given the changing ratio of pensioners to working-age persons.⁷⁶

Obviously, the financial sustainability of a pension system depends on the accepted level of old age-related spending. Contributors and taxpayers decide on their willingness to support the elderly generation. Thus, sustainability is immediately linked to intergenerational justice. Since the analysis of intergenerational justice came to the result that a sharing of the financial burden of ageing among the living (and future) generations can be considered just, the sustainability criterion must be situated in between the above mentioned borderline cases. However, it is impossible to judge the effective financial sustainability of a pension system.

Therefore, a usable definition has to recur to a concept of theoretical economic sustainability. A pension system will be considered financially sustainable if the average net income of the working population and the average old-age income develop similarly in the long run, i.e. over a time period of 30–50 years. More precisely, if national income is increasing, both the working-age population (and their children) and the elderly should participate in this growth in economic resources.⁷⁷ Due to population ageing, fluctuations in this relation may occur, but these tendencies should be evened out over a longer period of time.

Such a criterion is needed for an evaluation of sustainability, but it cannot be considered a sufficient condition. Even if a pension system fails this requirement, it will not necessarily collapse in reality.⁷⁸ In return, if the formulated sustainability criterion is fulfilled, the system may still be politically unsustainable because taxpayers and contributors refuse to pay the required part of their income to the elderly.

The analysis of financial sustainability refers to projections of public pension expenditure by *Eurostat* and other organisations.⁷⁹ It focuses on the financial sustainability of public pension systems and not on the entire system including pri-

⁷⁶ The demographic developments are analysed in detail in section 4.2.1.

⁷⁷ However, problems may arise if there is no growth in national income in the long run. See section 3.1.1 for an analysis of macroeconomic risks that affect old-age security.

⁷⁸ It has to be taken into account that old age-related expenditure has increased significantly in EU countries since the 1970s without raising concern until the mid 1990s. Cf. also Economic Policy Committee (2001), p 67.

⁷⁹ See section 7.1.

vate pension schemes, because the sustainability of pension promises given by private sector firms cannot be evaluated properly due to limited data availability. However, total contribution and expenditure figures of the pension system would have to be considered for projecting the probable relative development of net incomes of the working-age population and the elderly.

The discussion of appropriate objectives of pension systems has shown that it is possible to define such aims in general, without referring to a specific pension system. However, it has to be considered for the remainder of the study that the formulated objectives depend on normative judgements that are indispensable for an evaluation of different pension systems. Although the targets may be arguable in some points, they provide a firm basis of analysis. The objectives one to four concern the distributional effects – intergenerational, intragenerational and intrapersonal – of pension systems on the whole, whereas financial sustainability relates to the financial ability to maintain pension systems and in particular public pension schemes.

3 Determining factors for sustainability and distributional effects of pension systems

The preceding chapter has focused on the major objectives of pension policies, in other words on the question ‘what are pension systems aiming for?’. The present chapter takes a step forward and asks how these objectives may be achieved under the assumption that informal old-age security (provided within the family) is not sufficiently available to the majority of retired people.

This analysis is a partial analysis of old-age security in a small open economy within the framework of an existing social security system that provides insurance against the most important social risks by social security schemes, i.e. unemployment, illness, long-term care and working incapacity, and ensures a socio-economic subsistence income. The assumed extent of insurance is described briefly. All individuals are obliged to have fundamental *health insurance* and *long-term care insurance*. People who have no means to afford the premiums themselves and have no relatives who are legally obliged to support them receive public subsidies to their contributions. The compulsory long-term care insurance covers the costs of nursing care and – if necessary – grants for the accommodation in a nursing home in case people are in need of long-term care, especially in old age. *Unemployment insurance* is compulsory for all gainfully employed people including the self-employed. It is publicly organised and based on contributions, calculated as a fixed percentage of earnings. In case of unemployment, it pays a benefit that replaces about two thirds of former net earnings. The duration of payment depends on the insurance period before becoming unemployed, but does not exceed one calendar year. Furthermore, gainfully employed people are obliged to be covered by *working incapacity insurance*, financed by contributions as a percentage of earnings. In case of long-term incapacity, the insurance pays an incapacity pension until retirement age at the level of the old-age pension a person of the same age and profession is on average entitled to after a representative working life. All social security schemes also cover the contribution payments to the other schemes during the period of benefit receipt.¹ Subsidiary to this social security system, there exists a *final safety net* in the form of a means-tested social assistance. This tax-financed element provides a socio-economic subsistence benefit to those people who have insufficient resources available on the household level to make their living and are at risk of social exclusion.

¹ Thus, they also pay contributions to a compulsory pension insurance if such insurance is installed.

Since the major individual risks for well-being other than longevity² are assumed to be covered by the above mentioned insurance schemes, the following analysis focuses on macroeconomic and social risk factors that determine the capacity of individuals and groups of individuals to provide for their old age. As explained above, risks are the financial effects of shocks, in this case macroeconomic and social shocks or risk factors. The existence of these risk factors will show the necessity of a public involvement in the field of pensions, i.e. the need for a legally established pension system. These macroeconomic and social risk factors are considered exogenous, meaning that the influences of the existing pension system on these macroeconomic and social figures are not taken into account for the analysis, initially.³ Although this approach neglects certain interdependencies between economy and society on the one hand and old-age security on the other hand, it is more suitable for deriving the key external influences on the various types of pension provisions. Moreover, this single-directional approach allows defining system parameters to counterbalance the effects of the exogenous factors on old-age security, carried out in section 3.2. The choice of the finance mechanism – pay-as-you-go method or funding – determines the risks that apply to the participants of a pension scheme. The design of other system elements and their combination with a method of finance and among each other have a major impact on the ability of a pension system to diminish immanent risks and to achieve an equitable risk allocation among the population. Although it is based on the defined macroeconomic and social risk factors, the analysis is not limited to a macroeconomic view of the resulting risks and possible counterbalancing measures, but also considers their implications on individual old-age security as required by the objectives established in section 2.4.2.

Based on the results of section 3.1 and 3.2, the remainder of the chapter derives three prototypes of benchmark pension systems with different combinations of the system elements to conclude with a presentation of a desirable mix of the introduced prototypes. A combined system is supposed to perform better with regard to the prevailing global and individual risks and therefore is presumably more successful in achieving the formulated objectives.

3.1 Exogenous risk factors

Basically, pension provision is a transfer of individual consumption opportunities from working age to old age. During working age, the supply of labour allows earning income. In old age, people are less productive and have only minor income opportunities. Consequently, income flows are shifted from working age to

² The mentioned individual risks result in a risk for well-being in case of non-insurance, because they endanger the personal capacity to earn one's living on the labour market; see section 2.2.

³ The descriptive approach is not appropriate for showing interdependencies with the tax and transfer system. Cf. Hauser (1991), p 92.

old age to maximise lifetime utility by equalising consumption opportunities over the lifecycle. However, the risks arising from exogenous factors threaten an individual's capacity to provide for an adequate old-age income and suggest that these risks can be better dealt with through an insurance system with public involvement instead of individual provision. On the aggregate level, the resulting risks concern the financial sustainability of implemented pension systems.

Exogenous factors involving risks for old-age provision can be either of macroeconomic nature arising from the economic environment or social factors in the form of political and social developments. In general, risks arising for old-age security from macroeconomic and social factors are unexpected fluctuations and shocks of these factors. All exogenous factors studied in this section have in common that they concern a large number of individuals simultaneously, challenging the insurability of an adequate old-age income.⁴ This correlation of risks renders risk pooling across a large number of individuals useless, since it would require intertemporal risk sharing instead of interpersonal risk sharing within one period of time.⁵ Consequently, private (actuarial) insurance is not able to cover individuals against these risks and the state is required to provide a framework for securing old-age income provisions, i.e. to reduce uncertainty⁶. Otherwise, the imperfect information of people leads to inefficient pension planning. Uncertainty is aggravated by the long-term character of pension provision contracts.⁷ E.g., if investment returns are lower than expected, people do not provide sufficiently for their old age and receive less pension income than they planned for. In contrast, if expectations are exceeded, people receive more old-age income than required at the cost of too high contributions during working life. In other words, they would have realised an inefficiently low consumption level during their working age. In either case, uncertainty leads to efficiency losses in pension provisions. These can be reduced by social insurance, since this type of insurance can deal with the correlation of risks across individuals and moral hazard problems that private insurance cannot. This is because it allows intertemporal smoothing through public debt management.⁸ The same reasoning applies to the studied social risks.

The diverse sources of risk need to be specified in order to derive adequate system structures to reduce these risks. Therefore, the remainder of section 3.1 studies the different categories of risk factors in detail before proceeding to the analysis of pension system parameters in section 3.2.

⁴ Cf. Hauser (1988), p 166.

⁵ Cf. Eisen (2004), pp 82f. See also Shiller (2003), chapter 12.

⁶ Cf. Hauser (1988), p 148 who argues that the reduction of uncertainty is a major target of public policy, especially in social security.

⁷ Cf. Barr (1998), p 192. Turner (2003), p 18 argues that there are also psychological barriers to thinking about such far off events.

⁸ Bohn (1999), p 29 shows that only the government is able to achieve an efficient risk sharing between living and future generations.

3.1.1 Macroeconomic risk factors

This section provides an overview of the macroeconomic factors most relevant to old-age provision and specifies their impact.

The macroeconomic environment is reflected in the *development of real national income*⁹ and its components, which involve a number of risks for efficient individual old-age planning. In fact, the analysis refers to the *development of GDP* instead of national income, although national income is a more adequate measure, because it reflects incomes from employment and investments. However, it is assumed for the analysis that gross investments represent a constant proportion of GDP. In that case, the developments of national income and of GDP are equal and are subject to the same unpredictable fluctuations.¹⁰

First of all, the GDP determines the total output available for consumption of all inhabitants of the country in the respective year. Old-age incomes have to be paid out of current GDP, and the larger the pensioners' share of GDP, the smaller the consumption opportunities of the remainder of the population.¹¹ This is an important fact that cannot be overcome by any form of pension provision except for income flows from abroad. The crucial question with respect to old-age security is the repartition of GDP among diverse age groups of the population. As explained earlier (see 2.3.2), the intergenerational distribution of economic resources depends on prevailing social values, but it is also contingent on the relative size of the different generations alive. Changes in the demographic structure are a social risk that will be studied in section 3.1.2. The risks arising from the development of GDP are fluctuations and negative shocks which have an impact on the resources available for distribution including pensions. Therefore, old-age provision dependent on the development of the national GDP bears the risk that the GDP fluctuates and grows less than expected.

Some figures related to GDP have a further, specific relation to old-age security, i.e. total wages and capital incomes. Uncertainty about the long-term *development of wages* exerts a risk on old-age security if a decent old-age income is defined in terms of the pensioners' relative income position in comparison to the incomes of the working-age population. Total wages depend on the number of employed people, their working hours and their productivity. Therefore, *unemployment* involves major risks on the macroeconomic level, because a reduced number of employed people produce less output at given levels of working hours and productivity. With a reduced GDP, there are fewer resources for repartition among the population. Furthermore, with public unemployment insurance, increasing unemployment leads to higher public expenditure in this field and puts pressure on other social expenditure, including that for pensioners. On the indi-

⁹ The issue of price inflation will be addressed later.

¹⁰ GDP is the more reliable aggregate measure for the applied part of the study, because the official definition of national income has been changed in 1996.

¹¹ The condition that all social expenditure has to be covered by the national income of the current period has already been formulated by Mackenroth (1952), p 43, quoted by Lampert (1998), p 232.

vidual level, unemployed people are covered by unemployment insurance. However, major risks for individual well-being due to unemployment arise after long spells of unemployment, i.e. when the period covered by insurance is exceeded. In that case, people are at risk of not being capable to provide for their old age, leading to gaps in the contribution history of pension insurance and lower than expected pension income. This problem applies even more to people who are incapable to participate in the labour market initially. They are not covered by incapacity insurance and have to rely on public subsistence benefits throughout their lives if they do not receive sufficient private transfers by persons who care for them.

Capital incomes reflect the *return on investments*, which is crucial for every type of pension provision that is based on the accumulation of capital.¹² In a closed economy, the rate of return depends on the investment opportunities in the national economy and thus on the general economic performance of the home country. The rate of return on low-risk investments such as long-term government bonds determines the reference interest rate. Other types of investments may yield a higher expected return, but at the risk of a higher volatility of return. Beside this risk of return volatility, there exists the risk of absolute capital losses, which is denominated as investment failure risk. These risks apply to all funded elements of pension provision. The reference interest rate is subject to uncertainty, because it is influenced by monetary policy in reaction to macroeconomic conditions. The volatility of the rate of return on other than low-risk investments can be reduced by diversification of investments, but returns are uncertain and subject to a remaining investment failure risk. In an open economy, investments can also be placed abroad. Then the rate of return is exposed to considerable risks resulting from macroeconomic and social developments in the respective foreign country, which may be less predictable than in the home country.¹³ Furthermore, there is an exchange rate risk if investments are held in non-domestic currency. Returns on foreign investments may therefore be more volatile than those from national investments. The three risks taken together – volatility of return, investment failure and exchange rate fluctuations – may be summarised as investment risks. With regard to old-age security, if the realised rate of return is lower than projected for the pension calculations due to one of these sources of risk, old-age income will not attain the targeted replacement rate.

So far, the analysis has ignored the existence of changes in *price levels*, usually in the form of price inflation. Although this approach is suited to show the main influences of macroeconomic factors on pension provision, it is real GDP, real wages and the real rates of return that matter. Since pension provisions aim at equalising consumption opportunities over lifetime, changes in price levels have a considerable impact on the effective consumption opportunities in old age. A certain exemption to this rule is old-age provision in the form of real estate. People

¹² Since the accumulation of capital is necessary for economic growth, it is important for all types of pension systems.

¹³ Cf. Hauser (1988), p 171.

living in their own dwelling practice a sort of hedging against fluctuations in housing price levels.¹⁴

Price inflation devaluates contribution payments during working life and pension payments throughout old age. If pension payments are fixed at a certain (nominal) amount and price levels tend to increase, pensions are decreasing in real terms over time.

3.1.2 Social risk factors

Besides the analysed macroeconomic factors, there are a number of social risk factors that challenge individual old-age provision. These are in particular demographic and political shocks and considerable changes as well as the event of catastrophes. These exogenous risk factors may have an immediate influence on financial old-age planning or affect the macroeconomic environment and thus exert an indirect effect on pension provision.

The underlying *demographic structure* of the population has major implications for both the output level and its repartition and therefore challenge old-age security. The development of the demographic structure is determined by birth rates, average life expectancy and migration flows. Birth rates above the replacement level¹⁵ lead to an increase in population numbers and thus to a reduction in the average age of society, rates below this level have opposite implications. The effect of migration on the population structure depends on the age structure of emigrants and immigrants and the net migration numbers. The remainder of the theoretical analysis will therefore abstain from migration¹⁶ and focus on the effects of changes in birth rates and life expectancy on population size and composition. At first glance, changes in birth rates and life expectancy may not be seen as a source of risk, since their development can be foreseen in advance. However, given the long time horizon of pension planning, changes in these figures can be considered as shocks for the individual's capacity to provide for an adequate old-age income.

Changes in the average life expectancy have a twofold impact on the population structure: in case of growing life expectancy, total population increases and the age structure shifts towards a higher average age.¹⁷

The output level of the economy is determined by the number of productive persons, i.e. those persons who contribute to the GDP. The demographic structure of the population determines the relation between working-age people who are potentially productive persons and those parts of the population who are too young

¹⁴ Cf. Pensions Commission (2004), p 192. However, hedging is limited, since it does not cover e.g. changes in energy prices.

¹⁵ For population replacement, the birth rate must be equal to 2.1 children per woman; see section 4.2.1.

¹⁶ Migration can be influenced by politics and may thus be considered a part of political risk factors.

¹⁷ For an overview of the demographic trends in the studied countries in the past and projections for the future, see section 4.2.1.

or too old to participate in the labour market. This relation is expressed in age dependency ratios. The total age dependency ratio is the ratio between people under or over working age to those of working age. Old-age dependency reflects only the number of people over working age relative to those of working age. The higher these ratios, the higher the proportion of the population who consumes part of the GDP without participating in its production. Obviously, the borders of working age, i.e. the average labour market entry and retirement ages, are of significant importance for the determination of age dependency ratios. Furthermore, effective economic dependency is determined by employment rates among the members of the working-age population and is therefore closely related to unemployment rates (see 3.1.1).¹⁸

The age composition of the population has a major impact on the available output per capita. If the relative number of productive people declines, meaning that the economic dependency ratio increases, then output per capita decreases at a given productivity level and conflicts about the distribution of economic resources may arise. Retired people are exposed to a twofold 'demographic risk'. First, they depend on the size of the productive population and on the workers' attitude towards income repartition between the living generations, i.e. the working-age population, their children and the elderly. Second, if the development of average life expectancy is uncertain, a correct estimation of required resources in old age is impossible.

Public policy influences all types of pension provision insofar as it affects all macroeconomic figures analysed in section 3.1.1 through legislation. Additionally, fiscal policy determines the net income replacement rate achieved in old age. These effects touch both privately and publicly provided insurance. E.g., if tax legislation is changed, political risks occur in terms of altered conditions for old-age security, raising the risk of an inadequate replacement rate. Public pension schemes can be changed immediately and are therefore exposed to considerable political risks. Pension reforms may occur due to changes in societal values relating to the elderly or as a result of financial pressure.¹⁹ Public policy may also affect certain determining factors of effective economic dependency ratios, namely the average labour market entry and exit ages and thus the size of the working-age population as well as effective employment rates.

Furthermore, reliable policy resulting in macroeconomic stability is a prerequisite for encouraging voluntary pension provision, since it gives the people an impression of security.²⁰ In contrast, considerable economic instability and uncertainty about economic prospects make it difficult for individuals to estimate the means necessary to meet their needs in the future. Insufficient old-age provision may in turn cause considerable political risks insofar as the demand for public subsistence benefits may increase significantly.

¹⁸ Apart from relative numbers of the population subgroups and employment opportunities, the productivity of the active population is of crucial importance for the effective economic dependency and the output level.

¹⁹ See section 4.2.2 for such pressure on the studied pension systems.

²⁰ Cf. World Bank (1994), p 74.

Catastrophes caused by man or nature such as wars, earthquakes, floods and epidemics may damage wealth and/or people. They usually touch a part of the population, inducing intragenerational as well as intergenerational redistribution of resources. Catastrophes can result in the total loss of accumulated old-age provisions of a part of the population. Moreover, there are the risks of damages to health, of wealth and property losses and of a reduction in natural resources.²¹ These risks are highly correlated on the individual level and unpredictable in their effect on the whole population. Consequently, public grants may be the only means to compensate individuals for their loss in pension provision.²²

3.1.3 Summary

This section has introduced the various exogenous factors exerting risk on old-age security. Table 3.1 summarises the sources of risk and their major effects. Apart from the immediate influences of these macroeconomic and social risk factors on old-age security, these may also have an impact on the financing of the earlier mentioned schemes of social security. E.g., if the average health status of the population deteriorates due to population ageing or environmental influences, contribution rates to health insurance and long-term care insurance rise and leave less disposable income for pension provision.

It has been shown that exogenous factors cause uncertainty for individual old-age provision, since it is impossible to perfectly predict their development, in particular in the long run. Due to imperfect information and the fact that macroeconomic and social influences touch the whole population, private actuarial insurance is not able to completely cover these risks.²³ Public involvement in old-age security is therefore desirable, because it can cover the entire population as the largest possible collective of interpersonal risk sharing and allows intertemporal smoothing. Additionally, if people underestimate their needs in old age owing to wrong expectations about general economic prospects and life expectancy, they risk becoming a burden for society in that they require public subsistence benefits.²⁴

This line of reasoning points to the following conclusions. Firstly, there exist macroeconomic and social risk factors that have an impact on old-age security insofar as they may cause inadequate old-age income as a result of wrong projections for pension provision on an individual level. Secondly, some of the risks may not be insurable by actuarial insurance, because their average value is unknown. In the absence of private insurance, these risks have to be entirely borne by the individual and thus determine the intragenerational and intergenerational

²¹ Cf. Hauser (1988), p 164.

²² Historically, financial damages caused by catastrophes have usually been compensated by public payments based on tax-financed ad hoc programmes; cf. Hauser (1988), p 172.

²³ Cf. Barr (1998), p 121. For an analysis of risks insurable and uninsurable by actuarial insurance, cf. Eisen (1988).

²⁴ Cf. Barr (1998), pp 188f.

Table 3.1. Exogenous risk factors affecting old-age security

Risk factor ^a	Affected elements of old-age security
Real GDP	Amount of GDP spent on old-age incomes
Real wages	Required replacement income considered adequate
Employment rate	Economic dependency ratio
Consumer prices	Appropriate pension provision (contribution rate) Post-retirement period: nominally fixed benefits devalue over time
Return on investments	Return on pension provisions in the form of capital Appropriate pension provision (contribution rate)
Investment failure	Replacement rate of pension income
Exchange rate	Real return on pension provisions invested abroad Appropriate pension provision (contribution rate)
Birth rate	Age dependency ratio Per capita share of GDP for old-age incomes
Life expectancy	Age dependency ratio Appropriate pension provision (contribution rate)
Political conditions	Taxation: net old-age income, net replacement rate, relative return of different types of pension provisions Effects on macroeconomic and demographic factors
Catastrophes	Loss of accumulated pension provisions Change of age dependency ratio due to population losses

^a The risk is a change in the respective risk factor compared to the expected value.
Source: own illustration.

(re)distribution of income. This leads to the conclusion that, thirdly, some risks have to be insured by the state to comply with the defined objectives of pension systems.²⁵ These conclusions direct to the following section, which focuses on a number of strategies in pension policy to cope with the risks exerted by the exogenous factors as well as individual risks in old age.²⁶

²⁵ See section 2.4.2.

²⁶ The major individual risks for well-being in working age are by definition covered by social security schemes. Only long-term unemployment and invalidity throughout the entire working age are not covered by insurance.

3.2 System parameters to counterbalance the effects of exogenous risk factors

Given the exogenous risk factors described above, the issue at hand is how their effects might be reduced and the arising risks most efficiently and equitably shared among the population, more precisely between living and future generations and between groups of individuals within generations. It has been pointed out that a certain public involvement is necessary to provide old-age security, i.e. to counterbalance the effects of external factors that endanger the compliance with the formulated objectives of pension systems. The objectives to prevent poverty, to secure a decent standard of living, to treat men and women equally and to aim at intergenerational justice concern the distributional effects of pension systems on the whole, whereas financial sustainability relates in particular to the financial ability to maintain publicly provided components of the pension system.²⁷

This section analyses the most important parameters of pension systems in relation to their ability to reduce the impact of the existing exogenous factors. The fundamental decision with regard to the system composition concerns the financing mechanism of pension provision, which may be either the pay-as-you-go method or the accumulation of funds (funding). This central structural decision determines which of the exogenous factors apply to the pension scheme and to what extent. A comparative analysis of the functioning of these methods is provided in section 3.2.1. Further crucial decisions in the system design relate to the envisaged pension level of compulsory old-age insurance, public or private provision, sources of financing and benefit calculation rules. The choice is not independent, neither with regard to the financing method nor to the other elements, since some combinations of structural elements are impossible.

In order to derive meaningful results for the capacity of the studied system parameters to reduce the derived exogenous risk factors, it is assumed that there is full coverage, i.e. the entire population is covered by the established pension system. The reason for this assumption is that only a universal scheme can theoretically achieve the established objectives of pension systems (see 2.4.2) for the entire population. Furthermore, there exists a social security system as described above that covers individual risks that would threaten an individual's capacity to contribute to the pension system in case of occurrence.²⁸ Besides, insurance normally is the more efficient the larger the pool of risks. This is because average individual risks such as longevity can be calculated more exactly within a larger pool of risks and because the administration cost per individual diminishes with the number of participants due to economies of scale.²⁹

²⁷ The redistribution of income through a pension system has an intrapersonal (intertemporal), an intragenerational, and an intergenerational dimension; cf. sections 2.3 and 2.4.

²⁸ Only those with lifelong working incapacity may not be covered by a pension scheme that requires contribution payments; see section 3.2.2.3.

²⁹ Eisen (1994) finds for the German life insurance sector that beyond a minimum size, it is not necessarily the case that a larger risk pool leads to more efficient insurance.

3.2.1 Method of finance: pay-as-you-go financing versus funding

A large part of the recent scientific discourse on pensions has focused on the advantages and disadvantages of the two choices concerning the financing mechanism of a pension scheme, namely the choice of pay-as-you-go financing versus capital accumulation (funding).³⁰ This choice is fundamental to the overall design of pension provision and determines which exogenous factors affect the pension scheme.

The mechanisms will be described in the following on the basis of an overlapping generations model, developed by Samuelson (1958).³¹ The model considers three generations living at a time of which two participate in the pension system: the working population and the retirees. The working population contributes to a pension scheme, whereas the pensioners receive pension benefits. The working population in period 1 ($t=1$) is retired in period 2 ($t=2$), the pensioners of period 1 have died until period 2 and there is a new generation of contributors. Accordingly, successive generations overlap in one period. There is no change in status within a period. The model assumes that there are no external influences on the pension system or the economy, that all individuals of one generation are identical, that the pension scheme covers all individuals and that wages and interest rates are given exogenously. Individuals do not intend to bequest anything to their heirs.

Figure 3.1 provides an overview of the fundamental idea of both financing mechanisms. It shows that monetary flows are within one period between generations in a pay-as-you-go scheme, in contrast to intertemporal monetary flows within one generation in a funded scheme.

In a *pay-as-you-go pension scheme*, contributions are paid out immediately as benefits to the pension recipients of the same period. Each generation pays the pensions of the preceding generation. There is no storing of funds; in a period of time, the contributions received by the pension scheme must be equal to the pension benefits paid.³²

This leads to the basic equation

$$c_t w_t E_t = p_t R_t \quad (3.1)$$

where the contribution receipts of a period are determined by the contribution rate c as a proportion of w , the average wage of a worker, and the number of workers E . Pension expenditure is the average pension p times the number of retirees R .

³⁰ The (re-)examination of funded pensions supposedly has been related to the projected demographic change and the resulting problems for the prevailing pay-as-you-go pension schemes. E.g., see Creedy (1998), Breyer (2000) and Lassila and Valkonen (2001).

³¹ The description is based on Breyer (1990), pp 6, 15–37 and Fasshauer (2001), pp 634–641.

³² In practice, there may be a modest contingency reserve maintained to avoid liquidity problems.

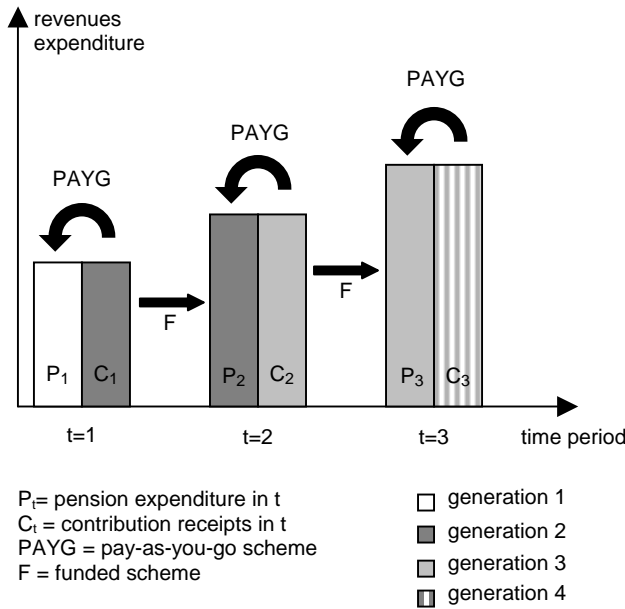


Figure 3.1. Monetary flows in a pay-as-you-go and in a funded pension scheme according to an overlapping generations model

The figure assumes that wage growth equals the interest rate on capital over one time period.

Source: own illustration.

Accordingly, the average pension benefit received by today’s pensioners depends on the contribution rate and the average wage of today, as well as the workforce growth g from period $t-1$ until t :

$$p_t = c_t w_t g_t \tag{3.2}$$

$$\text{where } g_t = \frac{E_t - R_t}{R_t} + 1 \text{ since } R_t = E_{t-1}$$

In a *funded pension scheme*, contributions are paid into individual accounts or a common fund. The funds accumulate and earn interests at the exogenously given rate r . Each generation provides for their own income and is at first glance independent of preceding and following generations. The basic equation has the form

$$c_t w_t E_t (1+r_{t+1}) = p_{t+1} R_{t+1} \tag{3.3}$$

$$\text{where } E_t = R_{t+1}$$

The pension received today therefore is determined by

$$p_t = c_{t-1} w_{t-1} (1+r_t) \quad (3.4)$$

Accordingly, pension benefits depend on paid contributions as a fraction of the earned wage – both figures of the previous period – and the interest rate r .

A comparison of the factors determining the current pension payment shows the fundamental differences of the financing mechanisms in terms of existing risks³³ and how these risks are shared among contributors and pensioners.

In a *pay-as-you-go scheme*, the pensioner relies on the promise of the subsequent generation to pay him/her a pension until death. This promise is derived from his/her contribution to the payment of pensions to the preceding generation.³⁴ Only the first generation receives pension payments without having contributed, i.e. an intergenerational transfer of income. The value of the pension promise naturally depends on the current output earned by the younger generation, i.e. current contribution rate and current average wage, multiplied with the number of contributors.

The main risks inherent to a pay-as-you-go scheme are arising from a change in the ratio of contributors to pensioners and political risks³⁵. The ratio of contributors to pensioners is determined by the relative size of the two generations involved. Demographic risk in a pay-as-you-go scheme means in particular the effect of a shrinking population, because such development leads to a rise in the dependency ratio between contributors and pensioners: if $g < 1$, a higher contribution rate c is required at a given average wage w . In general, the higher the population growth g , the lower the contribution rate c necessary for achieving a targeted pension level relative to the average wage (p_t / w_t). Furthermore, the number of contributors is determined by the employment rate of the population, which depends on the size of the working-age population – determined by the effective average labour market entry and exit ages – and the proportion of employed people among those of working age. Unemployment causes problems both on the macroeconomic and the microeconomic level. Unemployed people do not contribute to total output and may not pay contributions to the pension scheme either, if the insured period of time (max. one calendar year) is exceeded. Therefore, large numbers of unemployed cause financial problems for a pay-as-you-go system. On the individual level, spells of long-term unemployment lead to gaps in the contribution history and may result in an inadequate replacement rate. People with long-term working incapacity do also reduce the potential total output.

³³ Risks exerted by the exogenous factors studied above (section 3.1).

³⁴ Barr (2000), p 33 argues that pay-as-you-go financing and funding are “simply different ways of organizing claims on future output”. While funding aims at building up money reserves for buying future output, pay-as-you-go financing gives participants a promise on future production.

³⁵ Governments may change the rules of benefit calculation and thus the risk sharing between pensioners and contributors; cf. section 3.2.2.1.

Since there is no accumulation of funds, there is no investment risk. It depends on the benefit calculation rules to what extent price inflation risk applies; an issue that will be addressed later (see 3.2.2.1).

The occurrence of catastrophes does not lead to individual pension entitlement losses as long as only capital is destroyed, since the claims on future output are not stored materially. However, a reduction in capital leads to a diminution of total resources available for redistribution and reduces economic growth. A drop in current output affects both wages and pensions, so that the risk of catastrophes with regard to pensions is shared among all members of the population. A significant risk applies to pay-as-you-go schemes if the number of victims is unevenly distributed among the living generations, in particular if disproportionately high numbers of contributors are killed. In this case, the dependency ratio of beneficiaries to contributors worsens at least for one period of time. How the existing risks are shared among pension scheme participants depends on the calculation of benefits (see 3.2.2.1).

A *funded scheme* is affected by other risk categories than a pay-as-you-go scheme. It is assumed that the funded scheme takes the form of a private pension insurance, which pursues a determined investment strategy chosen by the insured. The choices of investments are limited by legislation.³⁶ The pension benefit is determined by the funds accumulated through contributions during working life and the rate of return on investments. At the time of retirement, the funds (including earned interest) are transformed into a life-long annuity. The monthly pension payment therefore depends on the accumulated funds and their return before and after retirement as well as the average life expectancy at the time of retirement. The pension scheme provider calculates the initial annuity according to gender-specific life expectancy, but pensions in payment are not adjusted to changes in life expectancy.³⁷

All macroeconomic risks concern the build-up period and the date of retirement. During retirement, the general unemployment rate does not affect the amount of individual pension immediately and the development of wages only concerns the relative income level compared to the working population. However, insofar as these macroeconomic figures have an impact on the development of prices, they contribute to a considerable price inflation risk concerning the real value of pension benefits received. On the individual level, long-term unemployment leads to contribution gaps, thus to insufficient pension provision and finally to an inadequate replacement rate. It constitutes an essential difference to pay-as-you-go financing that predicted changes in macroeconomic figures have to be considered for the calculation of an adequate contribution rate during pension build-up. In contrast, pay-as-you-go schemes adjust contribution rates or replacement rates at the time of pension receipt and may so affect intergenerational distribution. Investment risks are a major source of risk in a funded pension scheme

³⁶ Investments can be of different risk categories but may have to fulfil legal conditions that specify limits for high risk investments for prudential reasons.

³⁷ In consequence, the scheme risks becoming unsustainable in case of wrong expectations by the provider at the time of retirement.

only. The date of retirement determines the available funds and thus the pension benefit.³⁸

Although changes in demographic structures do not seem to affect the pension level at first glance, these are related to the return on investments realised when transforming the pension provision funds into benefits. Obviously, the benefit level depends on the realised asset prices, which in turn are affected by the relative number of buyers and vendors who determine the demand and supply of assets.³⁹ However, since the market of pension assets constitutes only a fraction of the capital market, especially in a small open economy, changing demographic structures can only have limited effects on the overall asset prices.⁴⁰ Thus, demographic risk is limited in a funded scheme. However, changes in life expectancy affect the old-age income level and lead to considerable individual risk.⁴¹

The risk of catastrophes fully applies to funded schemes. In the event of a total loss of their pension provision funds especially shortly before retirement, individuals (or cohorts in the case of a common fund) face the risk of old-age poverty and probably have to claim the public subsistence benefit.

In a funded pension scheme, all risks are borne by the pensioners unless there is a certain subsidy by the state or by another institution administering the pension scheme.⁴² Due to investment return volatility, funded schemes usually result in a higher inequality of incomes among pensioners than pay-as-you-go schemes. Elements of intragenerational redistribution may be introduced, depending on the calculation of benefits. Apparently, the effects of the financing mechanism largely depend on the established benefit calculation rule (see 3.2.2.1).

Another aspect when comparing both financing mechanisms concerns the introductory period and transition possibilities. As mentioned before, pay-as-you-go systems can pay pensions immediately when being established; the first generation of pensioners receives pensions even without having contributed to the system.⁴³ In contrast, funded pension schemes can only pay pensions in the second period, namely to those people who had contributed in the first period. Therefore, when introducing a funded scheme, the first generation of pensioners have to receive their pension from outside the scheme. These characteristics can be witnessed when a transition from one financing mechanism to the other is carried out. If a

³⁸ This may be denominated the ‘annuity risk’ or ‘crystallisation risk’; cf. Turner (2003), p 10.

³⁹ Cf. Heigl and Katheder (2001).

⁴⁰ Cf. Gillion et al. (2000), p 281. However, this reasoning applies only if a limited number of countries maintain funded pension systems. Otherwise, the effect is similar to a closed economy and is of much more importance.

⁴¹ Changes in life expectancy that are realised after retirement do not affect pension benefits because a life-long annuity is bought at the time of retirement.

⁴² Such as the employer in an occupational scheme.

⁴³ However, it can be argued that the children of this first generation would have had to pay the pensions of their parents in any way, even without the established pension system. Sinn (2004) analyses pay-as-you-go pension schemes as an enforcement device for children to pay for their parents’ pensions.

pay-as-you-go financed scheme is transformed into a funded scheme, it is necessary to finance the transition period – i.e. the pensions of one generation of pensioners – from external sources.⁴⁴ For a functioning funded scheme (from the second time period), there is no need for transfer into a pay-as-you-go scheme, because all generations of pensioners receive pensions from their accumulated funds. Furthermore, as explained above, a pay-as-you-go scheme can be introduced at any time without initial funds.

A large part of recent scientific discourse has focused on the comparative macroeconomic effects of the financing mechanisms.⁴⁵ Effects on aggregate savings have been analysed particularly, since it has been argued that funding leads to higher economic growth rates than pay-as-you-go financing due to a positive effect on savings.⁴⁶ Although this study in general does not deal with the effects of pension systems on the macroeconomic performance, this is a crucial factor for the assessment of benefits from the different modes of financing. Empirical studies have come to controversial results with regard to the link between funding and aggregate savings as well as between savings and growth.⁴⁷ On the whole, there is theoretical evidence that funding may have a positive effect on growth compared to pay-as-you-go financing.⁴⁸ However, advantages of funding in this regard may be insufficient to justify a transition from an existing pay-as-you-go financing to funding given the transition costs pointed out above.⁴⁹ Nevertheless, it has to be noticed that macroeconomic goals are not primary but secondary goals of pension systems and are probably better achieved through other policy areas.⁵⁰ Therefore, they are not considered central for the argumentation of this study but rather allowed for as first order conditions.

Table 3.2 summarises the types of risks that apply to both methods of finance under the assumption of an existing social security system and full coverage of the population.⁵¹ The central issue is how the applicable risks are shared among the population subgroups. In pay-as-you-go schemes, members of one generation – contributors or pensioners in one time period – are affected simultaneously by exogenous risks. Therefore, the issue of risk sharing concerns the distribution of risks between generations, i.e. intergenerational income distribution. In contrast,

⁴⁴ Breyer (1990), p 90 shows that in the event of a transition from pay-as-you-go to funded pension schemes, at least one generation has to pay for the implicit debt of the pay-as-you-go scheme, i.e. the benefits paid to the first generation of participants.

⁴⁵ E.g., see Schmitt (2001), Attanasio and DeLeire (2002), Holtz-Eakin et al. (2000), Zhang and Zhang (1998) and Baillu and Reisen (1997).

⁴⁶ This argument is based on a study by Feldstein (1973); cf. Barr (2000), p 12.

⁴⁷ Cf. Barr (2000), p 13. Schmitt (2001), p 626 argues on the basis of endogenous growth theory that pay-as-you-go financing gives more incentives to invest in human capital – the most important condition for long-term economic growth.

⁴⁸ Cf. World Bank (1994), p 307

⁴⁹ Cf. Barr (2000), p 13.

⁵⁰ Cf. Gillion et al. (2000), p 458.

⁵¹ Due to the full coverage assumption, individual risks from long-term unemployment and complete working incapacity are not considered at this stage.

Table 3.2. Exogenous factors and method of finance

Type of risk ^a	Pay-as-you-go financing	Funding
Change in nominal wages (change in replacement rate)	risk covered	risk applies
Employment rate (change in number of contributors) ^b	risk applies	n.a.
Price inflation (devaluation of real benefit in payment)	risk covered ^c	risk applies
Volatility of return on investments	n.a.	risk applies
Investment failure risk	n.a.	risk applies
Exchange rate risk	n.a.	risk applies to investments abroad
Change in birth rate	risk applies	n.a. ^d
Change in life expectancy	risk applies	risk applies
Political risk	risk applies	risk applies
Risk of catastrophes	risk applies, esp. if population structure is changed	risk applies

n.a.: risk does not apply.

^a The types of risks relate to section 3.1, summarised in Table 3.1.

^b The individual risk of long-term unemployment resulting in contribution gaps applies to both methods of finance; it is not considered because of the complete coverage assumption.

^c assumption: nominal wage growth rate \geq price inflation rate.

^d risk may apply indirectly through asset prices.

Source: own illustration.

funded schemes lead to intragenerational redistribution, because a capital stock is distributed among the members of one age cohort. Due to investment risks, pension benefits are presumably much more spread in funded schemes compared to pay-as-you-go schemes. Consequently, the intragenerational distribution of income is supposed to be significantly less equal in funded schemes. There are no immediate effects on intergenerational equity.⁵² There are a number of system parameters that – combined with one of the financing mechanisms – determine the risk sharing and thus the distributional effects of a pension scheme, namely the calculation of benefits, the scope of compulsory insurance, the sources of financing and the choice between public and private provision. These parameters and their interaction with both financing mechanisms will be studied in the following section.

⁵² Cf. Eisen (2001), p 148. However, as explained above, the relative size of generations affects asset prices and therefore replacement rates realised.

3.2.2 Further system parameters

The most important parameter of pension schemes with regard to risk sharing among scheme members is how benefits are calculated. Therefore, this system element will be studied first.

3.2.2.1 Calculation of benefits

The calculation of pension benefits is dealing with two aspects. First, the initial pension entitlement is determined by the way the pension scheme assigns the accumulated claims. Second, there may be uprating rules for pensions in payment to maintain their real value at a certain level. The benefit calculation design has major implications for the risk sharing among scheme members and thus the distributional effects of the pension scheme. Furthermore, the choices of the financing mechanism and the calculation rule are interdependent.

Before analysing the benefit calculation rules, the issue of pension adjustment is introduced briefly. The risks for well-being that pensioners face after retirement are determined by the development of the real value of their pension benefit and concern the individual longevity risk. Pension schemes may contain *adjustment or indexation rules* for pensions in payment. Price level adjustments provide protection against price inflation risk and guarantee a constant real pension benefit over time. However, if real wages increase, the relative income position of pensioners compared to the working population diminishes continuously over time. In turn, if real wages decrease, the pensioners' relative position improves. This poses a conflict with the objective of intergenerational equity that requires an equitable participation in economic welfare of all living and future generations.⁵³ According to this aim, pension benefits should be adjusted to changes in nominal wages. However, only pay-as-you-go pension schemes can provide an effective adjustment of pensions to nominal wages without extra cost, since benefits rely on current wages. Such wage adjustment rules improve the sustainability of a pay-as-you-go scheme in face of economic fluctuations, since receipts and expenditure develop similarly.⁵⁴ In the long run, it can be assumed that nominal wage growth covers price inflation as well, but a complete insurance against inflation can only be provided by the government, e.g. in a public pension scheme (see 3.2.2.4) or in the form of price-indexed bonds. Pensions provided by funded schemes in the form of private pension insurance are determined in advance on the basis of projected price inflation and real interest rates; an adjustment to the effective development of wages or prices would require supplementary insurance and would result in additional cost.

The *calculation of pension benefits* may be either defined contribution or defined benefit or a mixture of both. The two designs of calculation described and analysed are the extreme cases that foster the understanding of the particular ef-

⁵³ See section 2.3.2.

⁵⁴ In practice, there is a delay since pensions are adjusted according to the development of wages of the previous time period.

fects of either method. *Defined contribution* means that benefits solely depend on the total contributions plus interest accumulated during working life in an individual account.

Defined benefit pension schemes assign pensions not according to paid contributions but to other criteria such as relative earnings during working life, final earnings before retirement, total contribution years, the family context etc. Contributions are not accumulated in individual accounts but in an aggregate ‘fund’ that covers at least a group of people, e.g. the employees of a company in an occupational pension scheme. The choice of criteria used for the calculation of benefits determines the extent of income redistribution between the participants and reveals the targeted level of vertical equity. Defined benefit schemes may provide a minimum pension benefit regardless of the actual contributions paid or assign credits for periods without contribution payments.⁵⁵ Thus, defined benefit schemes can promote the established objectives directly in incorporating measures to prevent poverty, to compensate for gender inequality and to enable people to maintain their standard of living after retirement. Such measures primarily affect the vertical intragenerational distribution of incomes.⁵⁶

In a defined contribution scheme, contributions and benefits are directly linked according to actuarial rules.⁵⁷ This requires that the scheme be financed by contributions and not by taxes (see 3.2.2.3). Social redistribution elements cannot be included in such schemes unless there are direct grants to the individual accounts of scheme members. Consequently, aims such as the prevention of poverty and equality of women and men have to be achieved outside the scheme, e.g. by income taxation.

The different combinations of financing mechanism and benefit calculation rule determine the risk sharing among scheme members, summarised in Table 3.3.

In a *defined benefit pay-as-you-go scheme*, all prevailing risks are borne by the contributors of the scheme.⁵⁸ The relevant risks are those which lead to an increase in the dependency ratio between beneficiaries and contributors, namely the risk of changes in population size, changes in average life expectancy and the risk of catastrophes with impact on the population structure. Changes in the realised replacement rate through nominal wage developments do not occur if contributions and pensions are indexed to nominal wages. Furthermore, there is no price inflation risk if nominal wages grow at least at the same rate as prices. Political risks apply to all participants in the pension scheme. The effective intergenerational redistribution of income depends on the risks that actually do materialise. In the event of adverse macroeconomic and demographic shocks, the scheme risks to be-

⁵⁵ E.g. for periods not spent in paid labour but in activities considered socially desirable, e.g. education or family work.

⁵⁶ Paying equal benefits to women and men (‘unisex benefits’) implies a significant redistribution of income in favour of women, since they have a longer life expectancy in all industrialised countries; cf. section 4.2.1.

⁵⁷ The predominant principle is horizontal equity.

⁵⁸ If there is no external source of revenues.

Table 3.3. Risk sharing in a pension scheme according to the method of finance and the calculation of benefits: concerned participants

Type of risk ^a	Pay-as-you-go financing		Funding
	DB	NDC	DC
Change in nominal wages (change in replacement rate)	covered	depends on adjustment rules	pensioners
Employment rate (change in number of contributors) ^b	contributors	pensioners	n.a.
Price inflation (devaluation of real benefit in payment)	covered ^c	depends on adjustment rules	pensioners
Volatility of return on investments	n.a.	n.a.	individual pensioners
Investment failure risk	n.a.	n.a.	individual pensioners
Exchange rate risk	n.a.	n.a.	individual pensioners
Change in birth rate	contributors	pensioners	n.a.
Change in life expectancy	contributors	pensioners	pensioners
Political risk	all participants	all participants	subgroup of participants
Risk of catastrophes	contributors if dependency ratio increases	pensioners if dependency ratio increases	individual pensioners

DB = defined benefit.

DC = defined contribution.

NDC = notional defined contribution.

n.a.: risk does not apply.

^a The types of risks relate to section 3.1, summarised in Table 3.1.

^b The individual risk of long-term unemployment resulting in contribution gaps applies to both methods of finance; it is not considered because of the complete coverage assumption.

^c assumption: nominal wage growth rate \geq price inflation rate.

Source: own illustration.

come financially unsustainable, because contributors may be overtaxed by the financial burden they face.

A pay-as-you-go scheme that calculates benefits according to paid contributions is usually called *notional defined contribution scheme*. This is because contributions are accumulated in fictitious individual accounts, since the pay-as-you-go mechanism requires the immediate payout of revenues as benefits. The risk of an increase in the dependency ratio due to demographic change or catastrophes is borne by the pensioners. Although their pension in theory ('notionally') depends on their accumulated pension rights, they rely on the contribution payments of the

working population. Consequently, if the dependency ratio increases and the contributions remain defined at a fixed percentage of earnings, the average pension benefit per pensioner shrinks. Increases in life expectancy before retirement are entirely borne by the pensioners, because the extension of the expected duration of pension payment reduces the amount paid per month. Whether changes in nominal wages lead to a reduction in the realised replacement rate or price inflation reduces real pension benefits over time depends on the adjustment rules applied. Political risks that change the taxation and pension provision environment may concern all participants, though probably to a varying extent.

Risks arising in a *funded defined contribution scheme* are entirely borne by the individual beneficiary.⁵⁹ Unexpected increases in wages and prices as well as in life expectancy may result in failing the target replacement rate of retirement income; these macroeconomic risks apply to all pensioners in a similar way.⁶⁰ Personal old-age income is unpredictable because of the investment risks inherent to funded schemes that affect the individual accounts of pensioners. The same effect may result from catastrophes that destroy individual pension provision. Political risk, e.g. in the form of changes in tax regulations, applies to at least a part of the participants, both during the build-up and payout period. A funded scheme cannot define benefits, since the expenditure on pension benefits is limited to the accumulated funds plus interest.⁶¹ However, a minimum guarantee may be provided within a defined contribution scheme. It then depends on the scheme design who is involved in the income redistribution mechanism.⁶²

Apart from the response to exogenous risks, defined contribution schemes create positive labour market incentives, because there is a direct link between the time spent in the labour market (resulting in contributions) and the resulting pension benefit.⁶³ Insofar as this raises the number of productive persons, defined contribution schemes may lead to a higher GDP per capita than defined benefit schemes.⁶⁴ This can in turn affect the financial sustainability of the pension system on the whole.

In reality, pension systems are usually based on a mix of the respective elements. There may be partial funding as a mix of pay-as-you-go financing and funding, and pay-as-you-go benefit formulas may recourse to both contribution records and benefit targets. Defined benefit pension schemes may rely mainly on

⁵⁹ Cf. Gillion et al. (2000), p 406. It may be possible to insure private investments on the financial markets for an extra cost.

⁶⁰ Cf. Gillion et al. (2000), p 309 who provide empirical evidence from industrialised countries based on the time period 1953–1995 for the high sensitivity of funded defined contribution schemes to the economic environment.

⁶¹ Cf. Hauser (1998), p 677; World Bank (1994), p 87.

⁶² It is important whether the scheme is provided publicly or privately (see 3.2.2.4) and in how far external sources are available to finance the minimum guarantee.

⁶³ The Pensions Commission (2004), p 38 finds empirical evidence for this effect for British pension scheme participants.

⁶⁴ The potential increase in employment depends on the prevailing labour market situation for the elderly.

contributions, but finance elements of social redistribution through taxes (see 3.2.2.3). The chosen combination of financing elements determines the risk sharing and thus sustainability and distributional effects of the pension scheme.⁶⁵

3.2.2.2 Scope of compulsory insurance

All members of the population should provide for their old age so that they are able to ensure at least their subsistence until the end of their life.⁶⁶ One of the issues of pension policy is to determine the scope of mandatory old-age insurance. In order to achieve the objective to prevent old-age poverty through the pension scheme without recurrence to the public subsistence benefits, a compulsion for minimum insurance at the subsistence level is necessary. It has been pointed out above that a compulsory minimum old-age insurance is improving social utility because it protects those members of society that provide voluntarily for their retirement from the financial consequences of non-insurance of other individuals.⁶⁷ Compulsory minimum insurance reduces the risk of unsustainable public finances, since it prevents expenditure on public benefits to fight old-age poverty. Furthermore, insurance against old-age poverty presumably reduces the inequality of incomes, because it raises the lower end of the income distribution. However, due to the investment risks involved in funded pension schemes, these schemes cannot ensure the prevention of old-age poverty through the scheme or that an envisaged replacement rate is achieved for all participants even if membership is compulsory.

The mandatory replacement level considered optimal depends largely on the prevailing political philosophy of a country.⁶⁸ On the one hand, a large scope of compulsion reveals that a strong weight is attached to the objective to secure an accustomed individual living standard after retirement. Obliging people to participate in a pension scheme for an appropriate retirement provision may be justified as the provision of a merit good or as the protection of people from their own myopia concerning pension planning.⁶⁹ This point of view implies a paternalistic definition of the state's attitude towards old-age security. On the other hand, if compulsory old-age insurance is limited to the subsistence level, a large weight is given to individual preferences, since it may be argued that a large scope of compulsion – especially if combined with certain requirements for the types of compulsory investments – reduces the number of choices and therefore the individual

⁶⁵ Section 3.3 and 3.4 will analyse sustainability and distributional effects of three prototypes of pension schemes and a beneficial mix of them.

⁶⁶ The pension system objectives established in section 2.4.2 require that people are able to provide for maintaining their individual pre-retirement living standard.

⁶⁷ Cf. Bruno-Latocha (2001), pp 595f.

⁶⁸ Cf. Gillion et al. (2000), p 455.

⁶⁹ Breyer (1990), p 46 shows in an equilibrium model that people provide less than the social optimum.

utility of participants.⁷⁰ Furthermore, extensive obligation may prevent financial resources from being invested in their most efficient way, leading to welfare losses on the social level.

For those parts of a pension system that aim at securing an adequate individual standard of living after retirement and exceed the function of providing a minimum old-age income for all participants through social redistribution, compulsory participation is contentious. It can be argued that at least those groups of the population who earn high incomes and are well educated know best how to provide for their old age. Low-income earners may be less sophisticated in choosing the right way of old-age protection.⁷¹ If mandatory insurance above a certain minimum level is rejected, the government may set incentives to provide sufficiently for old age and create an environment that enables all individuals to build up pensions.⁷²

If a pension scheme has the explicit objective to provide a high replacement rate,⁷³ it has to levy considerable revenues that may lead to acceptance problems and evasion tendencies. This can challenge the long-term financial sustainability of the pension scheme.⁷⁴ Acceptance may be improved if benefits are closely linked to contributions. However, such a close link is incompatible with social redistribution measures unless public subsidies cover the redistributive elements (see 3.2.2.1). Consequently, if the government obliges people to participate in a pension system that provides more than a minimum protection, it may be a viable option to separate the socially redistributive element of the pension system from the element that provides the means for individual income smoothing. Mandatory components of pension systems are not necessarily provided publicly; they can also consist of a compulsion to insure against particular age-related risks with private insurers (see 3.2.2.4).

With regard to the alternative financing mechanisms, the line of argumentation holds for both methods. However, an effective prevention of poverty by mandatory old-age insurance cannot be ensured by a funded scheme (without additional insurance elements), given the investment risks induced by this financing mechanism. Furthermore, a large scope of compulsion may be easier implemented in a pay-as-you-go scheme, since this financing method does not need to accumulate capital. In contrast, the capital stock required for a funded scheme with a high replacement level achieves such a magnitude that it may exceed the investment opportunities in an economy, in particular those investments with low volatility, leading to considerable investment risks. This problem may be overcome with in-

⁷⁰ However, the Pensions Commission (2004), p 209 finds that the complexity of the pension provision decision increasing with the number of choices leads to a longer procrastination of the decision, because “people shy away from complexity”.

⁷¹ Gillion et al. (2000), p 292 shows empirical evidence for the USA that the rate of return on individually managed retirement savings are increasing with personal salary. Consequently, such pension schemes have a regressive effect; cf. Davies (2000), p 124.

⁷² However, subsidies for private pension provision are costly and may be better spent on social transfers to prevent poverty.

⁷³ This may be the case for defined benefit schemes, cf. section 3.2.2.1.

⁷⁴ Cf. World Bank (1994), p 148.

vestments in foreign economies, though with the earlier mentioned effect of high volatility of the rate of return resulting from macroeconomic and social risks abroad and exchange rate risk (see 3.1.1). Funded systems of a large scope may imply system risks for the market economy insofar as large amounts of accumulated pension fund capital may lead to an inefficient replacement of labour by capital in the production process. This may also result in a reduction in real interest rates. Furthermore, there is a system risk concerning the competitive structure, i.e. whether a funded pension market would tend to become monopolistic. One single pension fund provider would have significant influences on the economic and political system and would cause considerable system risk.

A target replacement rate may be missed on the individual level in both financing mechanisms despite compulsion due to drop-out periods without pension contributions. Such non-contributory periods can be a result of long-term unemployment or unpaid work.

3.2.2.3 Sources of financing

Sources of pension scheme revenues may be either contributions or taxes or a mix of both. Contributions can stem from the insured or persons or institutions who pay on his/her behalf.⁷⁵ The choice of appropriate financial sources depends on the structure and objectives of the pension scheme.

Full coverage of the population by a pension scheme based on contributions is only possible under the assumption that every person is capable to contribute at least in one period of his/her life to the system.⁷⁶ To achieve full coverage in terms of contribution payments by each member in every period of time, those who are neither capable to pay contributions themselves nor have relatives with legal obligation to support them would need to receive public subsidies for the contribution payments. Consequently, full coverage requires a certain extent of tax financing.⁷⁷

If the whole population participates in the pension system, the difference between contribution and tax financing depends on the respective types of taxes and contributions.⁷⁸ Furthermore, only contributions can be directly assigned to a specific individual whereas tax financing abstains from the definition of sources. Therefore, pension schemes completely financed by taxes have to be defined benefit with benefits calculated according to criteria independent of former labour earnings. If contributions are paid out of labour income, they may either be paid by the employee, the employer or both. If they are fixed as a percentage of wages, they automatically adjust for the development of nominal wages. In pay-as-you-go schemes, this allows for providing a nominal wage adjustment of pensions (see

⁷⁵ This may be either the employer, persons privately related to the insured or insurance institutions (such as health insurance, unemployment insurance etc.).

⁷⁶ This assumption may be failed for persons who are incapable to work throughout their entire working age.

⁷⁷ Pension system can foresee the common insurance of married couples if only one partner contributes to the system.

⁷⁸ Contributions are taxes on wage income.

3.2.2.1). In funded schemes, wage inflation risks during the build-up period are avoided. If price inflation is reflected in the development of nominal wages, there is no price inflation risk in the build-up period either. However, these risks still apply to the payout period in funded schemes. Obviously, the choice of the appropriate source of financing is closely connected to the calculation of benefits analysed above (3.2.2.1).

It seems adequate to determine the appropriate source of financing according to the redistributive character of the pension scheme. In general, elements of social redistribution should be tax-financed to divide the financial burden of these measures among the largest possible number of payers and all sources of income. Contribution financing is preferable for those pension system components that mainly fulfil the function of replacing former labour earnings (intertemporal income-smoothing) and are not focused on redistributive measures primarily.⁷⁹ Hence, the mix of redistribution and savings elements should determine the financing mix.

With regard to the financing mechanisms, both tax and contribution financing can be combined with either mechanism, the crucial issue being the choice of the benefit calculation rules.

3.2.2.4 Public versus private provision

The issue of public pension provision is often confused with the question of compulsory insurance. Although these choices are not entirely independent, compulsory components of pension schemes may also be provided in the form of actuarial insurance by the private sector. Private schemes may be group schemes such as occupational pension schemes administered by employers or may consist of individual solutions. The choice of the most appropriate institution for providing pensions should be based on efficiency considerations.⁸⁰ In other words, it is the choice of the most efficient way of allocating social resources according to the defined objectives of pension policy subject to the defined risk factors. In general, economic theory proves competitive markets to be the most efficient mechanism of allocation. However, if the market of pension provisions fails to fulfil the generally accepted standard assumptions of the model, state intervention may improve efficiency.⁸¹ The function of pension schemes is to provide insurance against individual and macroeconomic risks.⁸² Competitive actuarial insurance may not be able to provide adequate protection due to imperfect information of both consum-

⁷⁹ However, Barr (1998), p 183 argues that contribution financing may be preferable to tax financing also for pension scheme components providing a minimum pension to prevent old-age poverty. The reason is that the stigma concerning the receipt of tax-financed benefits is more important than for benefits people feel entitled to because of contribution payment. Stigma may result in non-take up of social benefits, rendering them less effective in preventing poverty.

⁸⁰ Cf. Barr (1998), p 97.

⁸¹ Cf. Barr (1998), p 78.

⁸² See sections 2.2 and 3.1, respectively.

ers and insurers with regard to individual behaviour⁸³ and the long-term development of crucial influencing risk factors defined in section 3.1. Such uncertainty reduces the potential welfare gains from competitive actuarial insurance in the field of pensions. Furthermore, market income distribution is not necessarily in accordance with considerations of social justice.⁸⁴ Therefore, a certain degree of social redistribution of income is desirable that cannot be carried out by private actuarial schemes. Reliable insurance against price inflation and redistribution elements can only be provided publicly, either as public elements in private schemes⁸⁵ or in the form of an entirely public scheme.⁸⁶

Where market solutions are possible, efficiency is closely related to administration. Low administration costs improve the return on pension provisions. Administration costs per participant tend to decrease with scheme size due to economies of scale, pointing to efficiency gains of large schemes compared to schemes with few participants.⁸⁷ However, this is not per se a reason for public provision. Public administration may reduce the costs of marketing and contribution collection. Still, political risk is significantly higher in publicly provided schemes than in private solutions, because public policy can completely change the parameters of public schemes, whereas privately provided schemes are only concerned by changes in tax regulations and indirectly through policy effects on the macroeconomic conditions, in particular on price inflation.

In terms of sustainability, public and private solutions may not differ as much as it seems at first glance. If a public subsistence guarantee exists, private scheme failure may translate into a sustainability risk for the public finances.

With regard to the choice of the financing method, it seems inappropriate to provide a pay-as-you-go scheme with complete population coverage privately, because a system failure would lead to existential risks for entire generations of pensioners.

The analysis of system parameters of pension schemes has shown that the combination of different structural elements enables the schemes to provide full or partial protection against different types of prevailing risks. The following section deals with the issue how different system combinations comply with the established objectives of pension systems.

⁸³ Moral hazard arises for the insured to take less care when they are covered by insurance, and for the insurer to maximise his own profit on the cost of the customers who are 'locked' in their long-term pension contract.

⁸⁴ See section 2.3.

⁸⁵ E.g., governments can issue indexed bonds to enable private pension insurers to cover price inflation risks; cf. Barr (2000), p 22.

⁸⁶ Reliability depends on the respective policy makers and is subject to political risk.

⁸⁷ Council of the European Union (2003), p 85 provides empirical evidence that administration costs in private schemes are about 10–35% of contributions, significantly higher than in public schemes.

3.3 Sustainability and distributional effects of three prototypes of old-age insurance

To condense the results from the analysis, three prototypes of old-age provision are constructed as a combination of the studied system parameters. They are borderline cases of possible pension systems in their ability to deal with different risk categories and bear resemblance to existing pension schemes. Their potential performance in terms of sustainability and distribution of income fosters the understanding of advantages and disadvantages of different types of old-age insurance. Eventually, section 3.4 depicts a desirable design of pension systems as a mix of these prototypes.

The analysis refers to a closed economy where people cannot escape from compulsory insurance by leaving the country. Funds can only be invested in the home country so that exchange rate risk does not apply. As explained earlier, there exists a social security system that protects people against the major social risks and contains a final safety net in the form of publicly provided subsistence benefits.

3.3.1 Characteristics

First of all, the three prototypes of pension provision are described in more detail. Table 3.4 summarises their characteristics, based on the structural elements studied in section 3.2. Income taxation issues are not considered for the analysis.

Prototype 1 is a universal defined benefit pay-as-you go scheme. It provides a basic pension at about 10% above general social assistance. Benefits are financed by taxes and are only subject to residency in the country. Thus, every resident is automatically covered. There is no differentiation of the benefit level according to earlier income or to individual longevity risk; women receive the same benefit as men. Pensions in payment are adjusted annually to the development of nominal gross wages. The scheme pays derived benefits to depending survivors if these are below retirement age and have no entitlement to the public pension themselves. The pension scheme is administered by public institutions.

Prototype 2 refers to a mandatory public old-age insurance primarily based on contributions that are determined as a proportion of gross wage. Therefore, only the working population is covered by the scheme.⁸⁸ The pension scheme is financed on a pay-as-you-go basis and pays unisex benefits according to a benefit formula that considers contribution years and the amount of contributions, accumulated in fictitious individual contribution accounts. There is a target net replacement rate for long-term insured of two thirds of their former average net labour earnings so that people can approximately maintain their individual living standard after retirement. The pension scheme pays benefits to surviving depend-

⁸⁸ In fact, the scheme covers all persons who are in gainful employment at least in one period of their life.

Table 3.4. Characteristics of the prototypes of old-age insurance

Structural element	Prototype 1	Prototype 2	Prototype 3
Coverage of the population	full coverage	full coverage of working population	full coverage of working population
Compulsion	n.a.	compulsory	compulsory
Method of finance	pay-as-you-go	pay-as-you-go	funded
Target level of pension	universal basic pension	income replacement to maintain living standard	income replacement to maintain living standard
Source of financing	taxes	contributions	contributions
Calculation of (initial) benefits	defined benefit based on residence	benefit formula with elements of DB and DC, unisex benefits	defined contribution
Adjustment of benefits	nominal gross wages	nominal gross wages	none
Survivors' benefits	yes	yes	no
Public / private provision	public	public	private

n.a.: not applicable; the resident population is covered by definition.

DB = defined benefit; DC = defined contribution.

Source: own illustration.

ants of the insured person. There is no splitting of acquired pension rights within married couples.⁸⁹ Pensions in payment are adjusted to nominal gross wages. The scheme is provided publicly.

Prototype 3 is a funded defined contribution scheme in the form of private pension insurance. People are obliged to contribute a fixed percentage of their earnings to a pension provision scheme provided by private investment or insurance firms. Contributions are accumulated in individual accounts. At the time of retirement, the accumulated funds plus interest are transformed into a life-long annuity that is calculated according to gender-specific life expectancy.⁹⁰ The scheme aims at replacing former labour income. There is no adjustment rule for pensions in payment.⁹¹ Since survivors' are not covered by the scheme, wage earners have to provide for their dependants in addition to their own pension insurance.

⁸⁹ Consequently, pension rights are individual and can only be derived as survivors' benefits if the insured person has died.

⁹⁰ Other criteria for benefit differentiation such as profession, race etc. are forbidden by law.

⁹¹ However, it is possible to buy a progressive annuity which increases annually by a defined percentage reflecting the assumed average price inflation rate. Furthermore, it is possible to insure against price or wage inflation for an additional cost.

For prototypes 2 and 3, periods spent in socially desirable activities such as education and family work could be rewarded with assigned pension credits financed from general tax revenue. Since this measure of social redistribution is possible in both contribution-financed prototypes, it is not introduced in the analysis to keep the results as straightforward as possible. Naturally, such social measures would improve the ability of the schemes to comply with the established objectives, in particular those concerning intragenerational redistribution.

3.3.2 Risks assumed by participants

Section 3.2 has shown that different structures of pension systems – as a combination of the studied elements – have a significant impact on the systems' ability to deal with different types of risk exerted by exogenous factors (see 3.1) and the consequences for scheme members in terms of risk bearing. Table 3.5 provides a summary of the risks assumed by participants of the prototypes of pension provision outlined above. Since the assumption of full population coverage is relaxed, the analysis now includes individual long-term unemployment risk and the risk to provide for surviving dependants in addition to the exogenous macroeconomic and social risks defined in section 3.1 to give a comprehensive picture of all risks not covered by social security schemes beside the pension system.

As explained in section 3.2, risks assumed by participants of a public pay-as-you-go scheme (prototypes 1 and 2) always concern at least one age cohort of contributors and/or beneficiaries if not the entirety of scheme members. In contrast, an individualised form of pension provision (prototype 3) naturally leads to a different degree of exposure to risks according to the investment strategy applied. The occurrence of investment failure or catastrophes may result in total loss of funded pension provisions. In prototype 3, wage growth and price inflation affect all pensioners with regard to their relative income position whereas political risk – e.g. changing tax regulations – presumably is of concern only for subgroups of contributors and beneficiaries. Increases in life expectancy before retirement considered for the benefit calculation lead to lower than expected pension benefits and concern all pensioners. Spells of long-term unemployment produce gaps in the individual contribution record and may result in failure to achieve an adequate replacement income after retirement. The risk that dependants are left with insufficient income in case the insured person deceases has to be borne by those individuals who have dependants and has to be covered by additional insurance.

With regard to prototypes 1 and 2, post-retirement growth in nominal wages and prices is covered, because pension benefits are indexed to the development of nominal gross wages.⁹² Increasing general unemployment or low birth rates concern contributors in prototype 1 and 2, since the defined pension benefits have to

⁹² Price inflation is only covered if nominal gross wages grow at least at the same rate as prices in the long run.

Table 3.5. Risks assumed by participants of the prototypes of old-age insurance

Type of risk	Prototype 1	Prototype 2	Prototype 3
Growth in nominal wages (change in replacement rate)	covered	covered	pensioners
Reduction in employment rate of the working age population	contributors ^a	contributors	n.a.
Price inflation (devaluation of real benefit in payment)	covered ^b	covered ^b	pensioners
Volatility of return on investments	n.a.	n.a.	individual pensioners
Investment failure risk	n.a.	n.a.	individual pensioners
Birth rate below replacement level	contributors ^a	contributors	n.a.
Increase in life expectancy	contributors ^{a c}	contributors ^c	pensioners
Political risk	all participants	all participants	subgroup of participants
Risk of catastrophes	contributors ^a if dependency ratio increases	contributors if dependency ratio increases	individual pensioners
Individual long-term unemployment risk (gaps in contribution record)	n.a.	pensioners	pensioners
Protection of dependants in case of death of the insured	covered	covered	participants with dependants

n.a.: risk does not apply.

^a contributors = taxpayers.

^b assumption: nominal wage growth rate \geq price inflation rate.

^c assumption: fixed retirement age.

Source: own illustration.

be paid by a smaller number of contributors. The risk of increasing life expectancy is borne by the contributors if the legal retirement age is fixed, because benefits are defined relative to current wages (prototype 1) or former wages (prototype 2). In other words, the replacement rate is determined in average terms in type 1 and in individual terms in type 2. The general longevity risk could be shared among contributors and beneficiaries if the retirement age was adjusted for each age cohort to the expected increase in life expectancy. Political risks concern all participants of publicly provided schemes, since contribution/taxation and benefit calculation rules can be changed immediately by public policy.

Individual long-term unemployment and depending survivors are not an issue in prototype 1, because pension benefits received do not depend on earlier contri-

bution records and dependants receive derived pension benefits.⁹³ In prototype 2, spells of long-term unemployment lead to gaps in the contribution record and may lead to a replacement rate below the targeted level of two thirds of former earnings. Dependent survivors are covered by the scheme through derived benefits; they do not have to be protected by separate insurance.

These remarks about the distribution of risks lead to the following sections focusing on the distributional effects and sustainability related to the different types of old-age provision.

3.3.3 Distributional effects

The summary of risk sharing according to the three prototypes of pension provision in the previous section has pointed to their effects on the distribution of income among the elderly and between the working population (contributors) and the retirees (beneficiaries). The dimensions of distributional effects studied are based on the defined objectives of pension systems and thus consider the effect on overall inequality of old-age incomes, the equal treatment of men and women, the prevention of poverty, the ability of individuals to maintain their living standard after retirement and intergenerational justice. Table 3.6 provides an overview of the main results.

Distributional effects can only be identified in their direction, not to their extent. However, there are significant differences in the general tendencies of effects

Table 3.6. Distributional effects of the prototypes of old-age insurance

	Prototype 1	Prototype 2	Prototype 3
Overall inequality of old-age incomes	reduced	slightly reduced	enhanced
Equality of women and men	enhanced	enhanced	not achieved
Preventing old-age poverty through the pension scheme	achieved	achieved for majority of pensioners	not for all pensioners
Securing a decent living standard in retirement	not achieved	achieved for long-term insured	not for all pensioners
Intergenerational justice	depends on demographic structure and regulation of retirement age	depends on demographic structure and regulation of retirement age	not achieved for pensioners in the long run

Source: own illustration.

⁹³ Widow(er)s receive benefits until they have reached retirement age and are entitled to pension benefits themselves, children until having reached adult age.

outlined in Table 3.6. When considering the *overall inequality of old-age incomes* and differences between *men and women*, the prototypes have significantly different effects. In prototype 1, the fact that the pension benefit is completely independent of former earnings leads to a strong reduction in pension income inequality. Income inequality is slightly reduced relative to working age in prototype 2, because the pension benefit reflects the number of contribution years in addition to the paid contributions.⁹⁴ Women tend to profit from the unisex benefit calculation in prototypes 1 and 2; the schemes therefore have an equalising effect between genders.

If old-age income is derived from prototype 3, there are two reasons for significant inequality of old-age incomes. Firstly, the volatility of investment returns and investment failure risk translate to volatility of annuities bought from the accumulated funds. Secondly, actuarial insurance takes differences in life expectancy according to gender into account for the calculation of the annuity, so that there are no unisex benefits – even with the same funds accumulated at the date of retirement.⁹⁵ Thirdly, dependants are not insured within the scheme and may be at risk of poverty in case the insured income earner deceases. Hence, this type of provision tends to lead to considerably more inequality of old-age incomes in general and between genders.⁹⁶

A complete *prevention of old-age poverty* through the pension scheme is possible in prototype 1 only, because this scheme covers the entire population and provides benefits above the subsistence level. Prototype 2 can prevent poverty in old age for the majority of insured people and their dependent survivors. However, a subgroup of scheme members may earn insufficient pension entitlements throughout their working life to prevent them from old-age poverty due to drop-out periods, e.g. as a result of long-term unemployment. Prototype 3 does not provide complete insurance against poverty in retirement due to the prevailing investment risks and the missing adjustment of pension benefits to price inflation (or wages). Furthermore, surviving dependants are not covered by scheme 3. In case the insured person deceases, it depends on the existence of additional pension provision whether the dependants are exposed to poverty immediately and in old age. Those who fail to attain sufficient pension entitlement will rely on the public subsistence benefit.

Prototype 1 cannot enable individuals to *maintain their standard of living* in old age, because it provides only a basic pension benefit and does not reflect former earnings. In prototype 2, long-term contributors are able to maintain their pre-retirement living standard, because they realise the target replacement rate of two thirds of their former net labour earnings. The scheme may fail to meet this objective for people with a very unstable earnings history and with long drop-out periods. For scheme members in prototype 3, the individual replacement rate depends on the realised return, i.e. the success of the investment strategy of the pension in-

⁹⁴ If high-income earners have more contribution years than the average, the level of income inequality may remain unchanged.

⁹⁵ The calculation of unisex benefits may be set as a legal requirement.

⁹⁶ Casey and Yamada (2002), p 5 come to the same result.

insurance chosen. Probably, the realised living standard decreases in the long run due to price inflation and the absence of pension adjustments.⁹⁷

Intergenerational justice is not achieved in prototype 3 schemes: pensioners are not participating equally in general economic welfare gains because their old-age income is not indexed to nominal wage growth. They experience a loss in their relative income position compared to the working population if nominal wages grow. In this regard, the considered pay-as-you-go schemes provide intergenerational justice, because pension benefits are indexed to changes in nominal gross wages. Depending on the design of the benefit formula, pay-as-you-go financing has further implications for intergenerational justice. If the formula fixes a target pension benefit as assumed in prototype 1 without indexing retirement age to life expectancy, adverse demographic trends may cause an intergenerational imbalance, because they lead to an increase in the public spending on pensions without any adjustment on the benefit side. The same reasoning applies to prototype 2 with the determined replacement rate target. If replacement rate target and retirement age remain fixed and the average life expectancy increases, the contributors have to bear the entire financial burden of the longer duration of pension payment. A benefit formula that splits the demographic risk between contributors and beneficiaries could provide an intergenerationally equitable solution. This can be achieved by an indexation of the retirement age to life expectancy. However, it depends on distributional judgements which repartition may be perceived just, because beneficiaries are unable to compensate for a reduction in their pension payment.⁹⁸

3.3.4 Financial sustainability

The strengths of old-age provision in the form of prototypes 1 and 2 in terms of their distributional effects are at the same time their potential weaknesses with regard to financial sustainability⁹⁹. These factors are that, firstly, materialised risks concern at least one age cohort of pensioners or contributors if not all participants (in particular demographic risks); secondly, there exists a politically decided target pension or replacement rate; and thirdly, the public provision of the scheme gives policy makers a large scope of decision. In the event of adverse external effects on the relationship between contributors and beneficiaries due to an increase in long-term unemployment rates, increasing life expectancy and falling birth rates, both schemes risk to become financially unsustainable in the long run if they remain unchanged.¹⁰⁰ This is because a reduced number of contributors may be overtaxed

⁹⁷ The possibility to buy price inflation adjustment for pensions in payment is not considered.

⁹⁸ See section 2.3 for more detail about distributional judgements.

⁹⁹ The approach of sustainability used refers to section 2.3.3.

¹⁰⁰ According to the established definition of financial sustainability (2.4.2.5), this would be true if the contributors face a reduction in disposable income while pensioners realise an increase in their disposable pension income.

by paying sufficient contributions for covering the promised pension benefits to the pensioners.¹⁰¹ To maintain sustainability in this situation, either (additional) public funds have to be injected into the scheme or the pension formula has to be reformed so that benefit expenditure is reduced or the retirement age is increased. The first measure solely shifts sustainability problems from pension scheme finances to public finances and therefore provides no escape from overall unsustainability.

Concerning prototype 1, a reduction of pension benefits is not a viable option, since the benefit is restricted to 10% above subsistence level. Prototype 2 would fail its targeted replacement rate if benefits were reduced. Furthermore, a reduction in individual pension benefits may undermine the contributors' confidence in the pension scheme. This may lead to a political sustainability risk. An increase in the legal retirement age is a very unpopular political decision. There are strong incentives to delay necessary adjustments of this kind as long as possible.¹⁰² As consequence of delayed reforms, sustainability risks would increase further and require an even stronger political response in the long run.

At first glance, prototype 3 does not affect financial sustainability, because pension benefits are covered by earlier contribution payments. However, the risk for financial sustainability of public finances arises from investment risks and the risk of an increasing life expectancy as well as uncovered surviving dependants. If these risks lead to insufficient old-age incomes, this entails a growing expenditure on means-tested public subsistence benefits. Consequently, individual investment risks as well as rising average life expectancy translate to a considerable risk for financial sustainability of overall public finances attached to this type of old-age provision.

The comparison of effects on income distribution and sustainability exerted by three prototypes of pension provision has summarised the key results of the theoretical analysis carried out in section 3.1 and 3.2. It has pointed out the different capacity of the outlined prototypes to deal with diverse categories of exogenous risks. Consequently, combining the approaches in a pension system should result in risk diversification in pension provision and enhance old-age security. The following section 3.4 relies on this idea and analyses a desirable mix of the studied elements of old-age provision.

3.4 Reducing exogenous risks with a combined system of old-age insurance

Based on the analysis of exogenous risks assumed by three outlined types of pension provision carried out in section 3.3.2 and summarised in Table 3.5, there

¹⁰¹ However, sustainability can be longer maintained in prototype 1 since the benefit level is considerably lower than in type 2.

¹⁰² Cf. Gillion et al. (2000), p 316.

seems to be scope for risk diversification in a pension system combining elements of the studied prototypes. The table shows that most types of risk are covered by either of the prototypes or do not concern one type of scheme at all. Only political risk, the risk of catastrophes and the risk of an increasing life expectancy apply to all types of pension provision. Consequently, a combination of the contrary approaches to old-age provision in a compound pension system may allow reducing the effects of the externally imposed risks to old-age security.¹⁰³ The present section aims at deriving such a beneficial mix of system elements. The combined pension system brought forward consists of two components, the first being a combination of the earlier studied prototypes 1 and 2 and the second being constructed as prototype 3, but limited to a supplementary provision function. Table 3.7 provides an overview of the system elements for this combined old-age insurance system.

The analysis carried out in section 3.2 and 3.3 suggests that insurance of a basic old-age income sufficient for subsistence should be compulsory for the entire population – at least covering the part of the population that is financially capable to contribute. This compulsory part of the pension system is financed through a pay-as-you-go mechanism primarily from contributions,¹⁰⁴ calculate unisex benefits according to the number of contribution years and index pensions in payment to nominal gross wage growth. Apart from real contribution years, the pension scheme assigns pension credits for periods of socially desirable activity such as family work without contributions. With a full contribution record (e.g. 40 years), people earn a pension of about 20% above subsistence level. A minimum pension slightly above subsistence level is guaranteed to every participant in the scheme. Every person who has ever contributed to the scheme or has earned pension credits is insured in this first component. In consequence, only people with lifelong working incapacity are not covered by this basic insurance.¹⁰⁵ Assigned pension credits and the upgrading of insufficient entitlements to the minimum pension level is financed from general taxation. Since defined benefit elements, especially if partly financed by taxes, can be more easily carried out in a public scheme, this component is provided publicly.¹⁰⁶ This first component of the pension scheme redistributes income for reasons of equity, leading to an almost complete prevention of old-age poverty through the scheme and a reduction in overall income inequality and in gender inequality. However, it does not enable participants to maintain their standard of living after retirement, because the benefits are restricted to 120% of the socio-economic subsistence level. Due to sustainability considerations, the benefit formula may divide demographic risks between contributors and

¹⁰³ This is confirmed by Althammer (2000) who finds that a mix of financing mechanisms is beneficial compared to using one single mechanism.

¹⁰⁴ Contributions should be paid as a proportion of earnings.

¹⁰⁵ These people would then rely on public subsistence benefits in their old age if they do not receive sufficient private transfers. Without minimum pension guarantee included in the scheme, the proportion of public subsistence benefit claimants would probably be considerably higher.

¹⁰⁶ Cf. Barr (1998), pp 194f.

Table 3.7. Combined pension system

Structural element	1 st component	2 nd component
Coverage of the population	full coverage of working population ^a	full coverage of working population
Compulsion	compulsory	compulsory
Method of finance	pay-as-you-go	funded
Target level of pension	universal basic pension	income replacement to maintain living standard (in combination with 1 st comp.)
Source of financing	contributions, taxes	contributions
Calculation of (initial) benefits	defined benefit based on contribution years, minimum pension guarantee	defined contribution
Adjustment of benefits	nominal gross wages	none
Survivors' benefits	yes	no
Public / private provision	public	private

^a covers all people who have been employed or self-employed at least in one period of their life.

Source: own illustration.

beneficiaries. E.g., legal retirement age could be tied to life expectancy. Adjusting the legal retirement age to life expectancy reduces the risk of unsustainability resulting from changes in the demographic structure. Still, it does not protect finances from being unsustainable in the case of unfavourable macroeconomic conditions. In particular a consistently high unemployment rate causes problems because this scheme may set adverse labour market incentives since it guarantees a minimum benefit to all participants independent of completed working years. However, since this component only provides a basic pension income, the adverse incentives are very limited. This nearly universal scheme gives people a certain level of old-age security as a basis for their pension planning.

This first component is complemented by a second element that enables people to secure the maintenance of their standard of living after retirement, i.e. to supplement the benefit derived from the public pay-as-you-go scheme. The second component is compulsory funded provision within private pension insurance with defined contribution benefits.¹⁰⁷ The scope of compulsion in such a scheme depends on the prevailing values and traditions of the respective society. These private pension schemes may take the form of individual insurance contracts or of

¹⁰⁷ This component could also be voluntary, since a basic pension income is guaranteed by the first component. Here, compulsory participation of the working population is assumed to comply with the analysis of prototype 3 above.

group schemes¹⁰⁸. The government is required to provide a regulatory framework that gives all people access to such private provision and obliges private pension providers to comply with certain rules against fraud and total capital loss as well as with information duties. This regulation guarantees that participants are informed and reduces investment risks. Due to the defined contribution approach, this component compensates the adverse labour market incentives of the first component.

This second part of the pension system probably leads to significant inequality in its benefits. However, this might be considered unproblematic, since the first component provides a basic old-age income for almost all pensioners as a certain floor of the income distribution. Furthermore, the second component is less affected by adverse demographic trends and high unemployment rates and it does not cause problems for public financial sustainability. Since the proportion of funding of the entire system is limited, there is no system risk for the economy resulting from the need of capital for the accumulation of pension funds. It has to be borne in mind that especially high-income earners need to contribute a considerable proportion of their earnings to such a scheme to achieve a sufficient replacement level. To account for individual preferences, it might be useful to limit the amount of earnings taken into account for calculating the compulsory pension provision within this second component.

To sum up, most exogenous sources of risk can be reduced considerably by a pension system combining elements of the prototypes studied in section 3.3. The remaining risks that apply to all participants are political reforms and catastrophes. The risk of catastrophes cannot be ruled out by any type of old-age insurance, but can be better dealt with in pay-as-you-go schemes. Political risks may be reduced through the diversification of pension provision in different components. If two components of old-age provision exist, a change in policy relating to one of the components does not necessarily affect the other. Table 3.8 summarises the risks borne by insured members in the combined pension system.

With regard to the defined objectives of pension systems (see 2.4.2), the combined solution is able to achieve all objectives at least partially except for a complete prevention of poverty through the pension system. The combined system meets most of the objectives concerning intragenerational distribution¹⁰⁹ along with the rather macroeconomic objectives of intergenerational equity and financial sustainability. In contrast, Table 3.6 showed that each of the earlier studied prototypes of pension provision performs better than the other either in terms of intragenerational distribution (prototypes 1 and 2) or in intergenerational equity and financial sustainability (prototype 3). Table 3.9 resumes the ability of the combined pension scheme to achieve distributional equity and financial sustainability.

Concerning gender equality and the prevention of poverty, the first component is successful in achieving these objectives for the income received from this component. Whether the combined system enables people to maintain their individual

¹⁰⁸ Group schemes may be run by employers.

¹⁰⁹ These are the prevention of poverty, equal treatment of men and women and enabling people to maintain their standard of living after retirement.

Table 3.8. Risks assumed by participants in a combined pension system

Type of risk	Participants concerned
Growth in nominal wages (change in replacement rate)	pensioners, only 2 nd component
Reduction in employment rate of the working age population	contributors, only 1 st component
Price inflation (devaluation of real benefit in payment)	pensioners, only 2 nd component ^a
Volatility of return on investments	pensioners, only 2 nd component
Investment failure risk	pensioners, only 2 nd component
Birth rate below replacement level	contributors, only 1 st component
Increase in life expectancy	shared between contributors and pensioners of 1 st component ^b , pensioners of 2 nd component
Political risk	all participants
Risk of catastrophes	all participants of 1 st component if dependency rate is changed, individual pensioners of 2 nd component
Individual long-term unemployment risk (gaps in contribution record)	pensioners in both components
Protection of dependants in case of death of the insured	participants of 2 nd component with dependants

^a assumption: nominal wage growth rate \geq price inflation rate.

^b assumption: retirement age linked to life expectancy.

Source: own illustration, based on Table 3.5.

pre-retirement living standard depends on old-age income derived from the second component. The achieved replacement rate is determined by the duration of insurance – subject to individual drop-out years – and the success of the chosen investment strategy of the private pension insurance as well as longevity.

The results for intergenerational justice and financial sustainability need some further explanation. With regard to intergenerational justice, the first component shares the burden of an increasing life expectancy between contributors (and taxpayers) and pensioners if the retirement age is adjusted to life expectancy. However, other demographic developments lead to intergenerational imbalances. If the number of contributors falls relative to the number of pensioners due to low birth rates, the contributing generation faces a considerable financial burden which may be considered intergenerationally unjust. On the other hand, the pensioners have to bear the risk of increasing life expectancy and wage and price inflation within the second component. Overall, this risk sharing may lead to intergenerational equity.

Table 3.9. Distributional effects and financial sustainability of a combined pension system

Pension policy objectives	Compliance with the objective
Overall inequality of old-age incomes	reduced by 1 st component, enhanced by 2 nd component
Equality of women and men	enhanced by 1 st component, not achieved in 2 nd component
Preventing old-age poverty through the pension system	achieved for all participants through 1 st component ^a
Securing a decent living standard in retirement	achieved through 2 nd component, but not for all participants
Intergenerational justice	diverse effects of the components, may lead to overall intergenerational justice
Financial sustainability	high probability for financial sustainability due to diversification of pension provision and opposite financial effects of demographic risks

^a only people who have neither contributed nor earned pension credits throughout their life are not covered.

Source: own illustration, based on Table 3.6.

Concerning financial sustainability, the diverse financial effects of demographic risks as described above have a balancing effect on the development of net incomes of contributors and pensioners. Risks in public financial sustainability can only arise from the first component because it is publicly provided and partly tax financed. A considerable problem for financial sustainability arises from persistently high rates of unemployment, because their macroeconomic effect on the pay-as-you-go component and their individual effect on the replacement level achieved through the second component cannot be solved by the combined system. The diversification of pension provision in a pay-as-you-go defined benefit and a funded defined contribution component reduces the risks arising from changes in pension and tax policy.

This chapter has set the theoretical framework for the applied part of the study in the remaining chapters. It provides the basis for assessing how existing pension systems affect the level and distribution of old-age incomes as well as how sustainable they are. Such risk analysis could also be carried out in a formal model which may allow quantifying the magnitude of the determined effects. However, the systematic approach to risk sharing implications of various structural compositions of pension provision provides a profound framework for the applied parts of this study.

The theoretical analysis has shown that a combination of different components of old-age provision reduces exogenous risks assumed by the covered individuals or even by the entire population. Real pension systems usually consist of a combination of provision types for this reason, whereas the implemented combination

depends largely on political traditions and institutions.¹¹⁰ The variety of possible system structures complicates a comparison of national pension systems. Nevertheless, this study applies a comparative approach and focuses on two pension systems, namely those established in Germany and the United Kingdom and enquires their capacity to comply with the objectives set forth in chapter 2.¹¹¹

¹¹⁰ Cf. Gillion et al. (2000), p 327.

¹¹¹ The reasons for the selection of these countries have been introduced in section 1.1 above.

4 The macroeconomic and social environment of Germany and the United Kingdom

The preceding chapter 3 has focused on the interaction between macroeconomic and social factors and structures of pension systems in general. This chapter introduces the applied part of the study. In order to gain an understanding of the macroeconomic factors that have influenced pension policies and their performance throughout the last decades, section 4.1 provides an overview of the development of macroeconomic key indicators for Germany and the United Kingdom. These are the macroeconomic risk factors studied in section 3.1.1. The time series analysed go back in time to 1975–1980 and cover the observation period of the empirical analysis (chapter 6). The second part of this chapter focuses on a number of ongoing social and economic developments that threaten the performance of pension systems. These trends constitute demographic and political risks as studied in section 3.1.2. Their common characteristic is that they challenge traditional assumptions on social and labour market structures and thus question the foundations of prevailing pension policies. These developments have put forward the international discussion on the sustainability of pension systems and consecutive pension reforms.¹

4.1 Development of macroeconomic key indicators

Since this section is limited to providing essential background information for the remainder of the study, especially for the empirical results (chapter 6), the figures will not be analysed in detail. The macroeconomic trends pointed out are needed as contextual information only for the analysis of old-age incomes, their distribution and the financing of pension systems.² The presentation focuses on those macroeconomic aspects that have been defined as exogenous risk factors for pension systems.³ German time series are split into West German figures until 1990 and data for the reunified country since 1991. In 1991, just after German reunification, about 64.1 million people were living in West Germany and about 15.9 million in East Germany including Berlin. In 2002, total population amounted to about 82.5 million in the whole country (65.5 million living in the

¹ See section 2.3.3.

² Cf. Hauser and Becker (2001), p 9.

³ See section 3.1.1.

17.0 million in the Eastern part including Berlin). The United Kingdom had 59.7 million inhabitants in 2002.⁴

To begin with, Figure 4.1 shows the growth rates of real GDP per capita in Germany and the UK. Obviously, both countries realised considerable economic growth throughout the 1980s, starting from a recession period. From 1989–1992, the British economy did not perform well and even shrank from 1990 to 1991. During the rest of the 1990s, the UK economy grew steadily until the global economic downturn in 2001. The German economy was hit by the general downturn of the late 1980s and early 1990s with delay because of the effects of German reunification. In the following, the country experienced major fluctuations in economic growth without recovery for a longer period of time.

The analysis of macroeconomic factors affecting the performance of pension systems has shown that – apart from GDP growth – it is important what fraction of GDP is spent as pensions to the elderly.⁵ Therefore, Table 4.1 provides a view on total pension expenditure in Germany and the United Kingdom during the last decades. The figures comprise all kinds of pension benefits, from both public and private sources.



Figure 4.1. Growth rates^a of real GDP per capita in Germany^b and the United Kingdom, 1980–2002

^a Growth rates refer to the change in real GDP per capita compared to the preceding year; nominal values are deflated by national consumer price indices, cf. Table A.2 in the Appendix.

^b Germany: until 1990 West Germany, then reunified Germany.

Source: cf. Table A.3 in the Appendix; own calculations.

⁴ Cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2003), Tab. 1*; <http://www.destatis.de> (9.02.2005).

⁵ See section 3.1.1.

Table 4.1. Total pension expenditure^a as a proportion of GDP in Germany and the United Kingdom, 1991–2001

	1991	1993	1995	1997	1999	2000	2001
Germany	11.7	12.5	12.8	13.0	13.0	13.0	13.1
United Kingdom	11.2	13.0	11.9	12.0	11.6	12.2	11.8

^a Based on the ESSPROS by Eurostat. The "pension expenditure" aggregate is the sum of seven categories of benefits: disability pension, early-retirement benefit due to reduced capacity to work, old-age pension, anticipated old-age pension, partial pension, survivors' pension and early retirement benefit for labour market reasons. Some of these benefits (e.g., disability pensions) may be paid to people who have not reached the standard retirement age.

Source: Abramovici (diverse years).

The figures show that spending on pensions on the whole has occupied a similar part of GDP in both countries in recent years. This is important background information for the analysis, given the great differences in pension system structure (see chapter 5). When studying prospects for financial sustainability of pension systems, it has to be considered that a single analysis of public pension expenditure is not appropriate to reflect the entire pension system. This is even more so if parts of non-public pension provisions are a mandatory element of the pension system as in the UK. In contrast to total pension expenditure, public pension expenditure differed considerably between the observed countries in 2000, with 10.8% of GDP in Germany compared to 5.5% in the UK.⁶

Obviously, the proportion of elderly people is important for evaluating these numbers. Therefore, Table 4.2 shows a measure that relates demographic information to the macroeconomic expenditure figures. The ratio of pension expenditure per elderly person divided by GDP per person of working age shows the average pension spending per elderly – presumably inactive – person compared to the average economic output per potentially active person. It would be more adequate to use the national income instead of GDP to compare income received on average by the working-age population compared to average pension income. However, GDP figures are more comparable over the observed time period since the official definition of national income has been changed in 1996. If gross investments as a proportion of GDP are assumed to be constant, the development of both macroeconomic figures is similar. Only the level of the figures is concerned: the ratios shown are considerably below those calculated with the national income.⁷

⁶ Cf. Council of the European Union (2003), Table 8, p 65. A comparison of these numbers is not possible since public expenditure on public sector pensions is excluded from the UK figure but included in the German calculation. See section 7.1 for a further discussion of these expenditure figures and projections.

⁷ In 2000, GDP was about 26% higher than national income in Germany and about 24% higher in the UK; cf. <http://europa.eu.int/comm/eurostat/newcronos> (28.02.2005). Consequently, the expenditure ratios would be about ¼ higher if the calculation were based on national income.

Table 4.2. Pension expenditure per elderly person (aged 65+) relative to GDP per person of working age (aged 15–64) in Germany and the United Kingdom, 1991–2001

	1991	1993	1995	1997	1999	2000	2001
Total pension expenditure ^a per elderly person / GDP per person of working age (%)							
Germany	53.6	57.2	56.8	56.5	55.8	54.3	53.2
United Kingdom	46.1	53.3	49.1	49.6	48.4	51.1	49.5
Public pension expenditure ^b per elderly person / GDP per person of working age (%)							
Germany						45.1	
United Kingdom						23.0	

^a definition of total pension expenditure: cf. Table 4.1.

^b Public pension expenditure in the UK does not include expenditure on pensioners in the public sector schemes (this expenditure is included in the German figures).

Sources: Table 4.1; Council of the European Union (2003), Table 8, p 65; <http://europa.eu.int/comm/eurostat/newcronos> (9.02.2005); own calculations.

Although the underlying demographic changes over the observed decade were not dramatic⁸, the demographically weighted expenditure ratios reveal interesting pension spending patterns. First of all, the ratio of total pension spending differed between both countries across the observation period, but not very largely: the figures were in a range of 53–57% for Germany and 46–53% for the UK. In other words, about half of the average economic output per person of working age was spent as pensions on the average elderly person. In contrast to total pension expenditure, the weighted ratio of public pension expenditure in 2000 was almost twice as high in Germany (45%) as in the UK (23%).⁹

Concerning the development of the total pension expenditure ratio, there are clearly different development patterns in both countries. In Germany, the ratio increased in the early 1990s from about 54% in 1991 to more than 57% in 1993 but started a continuous downward trend from 1995 until the end of the observation period. Apparently, after an increase in pension expenditure presumably due to the inclusion of East German pensioners after reunification in the early 1990s without similar increases in GDP, the growing proportion of elderly people and pension reforms led to a reduction in the weighted pension expenditure figure in the second half of the observation period. The development of the ratio in the UK was far less even than in Germany. The fluctuations are probably partly due to the significant proportion of private pension expenditure that is supposedly less stable than public pension spending.

⁸ The proportion of elderly persons in Germany grew from 15% in 1991 to 16.7% in 2001, whereas the proportion of the elderly population in the UK decreased slightly from 15.8% to 15.6% during this time period.

⁹ As mentioned above, for a comparison of these numbers the figures for the UK would have to be adjusted by (public) expenditure on public sector pensions that are excluded from the UK figure but included in the calculation for Germany.

Price inflation is an important source of exogenous risk for old-age pensions.¹⁰ Hence, Figure 4.2 shows growth rates of consumer prices. It is obvious that consumer price inflation diminished during the observation period from 1980 until 2002. While inflation exceeded 6% in West Germany and 11% in the UK in 1980–81, they fell almost continually to levels near price stability in Germany and 3% in the UK in the middle of the 1980s. Around 1990, there was a considerable increase in inflation in both countries, followed by a period of more stable consumer prices, not growing markedly beyond 3% from 1994 onwards. The considerable increase of the German figure from 1990 to 1992 is largely due to price adjustments in the former GDR following reunification.

In order to provide additional information about the context of the trends in income levels and income distribution analysed later (chapter 6), Figure 4.3 illustrates the development of disposable income of private households and their saving as part thereof.¹¹ For reference, GDP figures have been added. To abstain from the influences of inflation and the absolute level of the aggregates, their development is expressed in form of indices based on the respective value in 1980. Amounts are in real terms at 1995 prices. The calculation per capita of the population permits a comparison of the figures between countries of different size.

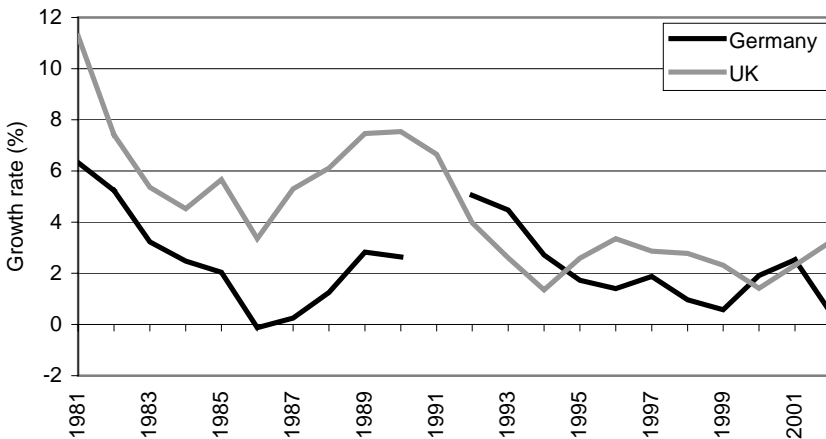


Figure 4.2. Growth rates^a of consumer prices in Germany^b and the United Kingdom, 1981–2002

^a Growth rates refer to the change in the national consumer price index compared to the preceding year.

^b Germany: until 1990 West Germany, then reunified Germany.

Source: cf. Table A.2 in the Appendix; own calculations.

¹⁰ See section 3.1.1.

¹¹ Saving of the private households = gross household disposable income minus consumption expenditure as a proportion of disposable income.

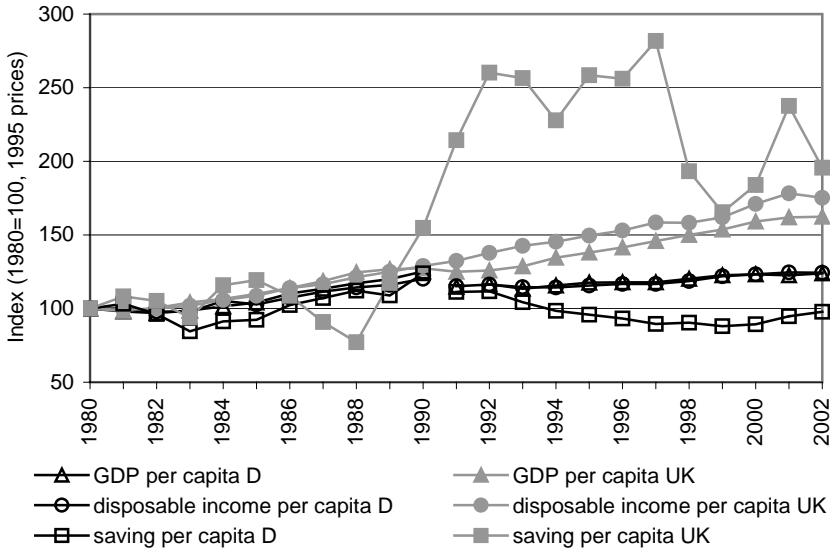


Figure 4.3. Gross domestic product, disposable income and saving of the private households in Germany^a and in the United Kingdom, 1980–2002

^a Germany: until 1990 West Germany, then reunified Germany.

Source: cf. Table A.3 in the Appendix.

Apparently, GDP and disposable income of the private households have risen nearly steadily in both countries, with a drop in Germany caused by reunification (data for reunified Germany from 1991 onwards). After reunification, German economic growth remained slow and until 2002, the indices had not reached the level attained by West Germany in 1990. In the UK, the disposable income of the private households grew slightly stronger than the GDP in the 1990s, whereas in Germany, both aggregates developed similarly.

The lines for the average amount saved by the private households out of disposable income show adverse trends. After a drop in the early 1980s, private saving in West Germany grew permanently until German reunification. After reunification, there was a remarkable decline in average saving with an upturn only during the last three years, resulting in a slight U-shape on the chart. The fluctuations of private saving in the UK were significant. After a drop by more than 20% in 1988 compared to 1980, there was a steep increase until 1992 to almost 300% of the initial value, followed by considerable fluctuations until 2002. Since the disposable income grew steadily and smoothly, there is no obvious reason for this finding. A possible explanation would be that British households preferred capital investments to consumption especially during the 1990s because of the well-

performing capital markets.¹² Another possible reason may have been an increasingly unequal income distribution, giving the better-off considerably larger saving capacities and leading to a higher aggregate value.

Another important macroeconomic index with strong influences on public and private pension provisions and benefits is the unemployment rate. Unemployment is a source of risk on both the individual and the social level.¹³ Besides pension systems, the entire welfare state is concerned with the social costs of unemployment.¹⁴ The German and the British unemployment rates are illustrated in Figure 4.4.

Both countries experienced a sharp rise in unemployment during the early 1980s, though the UK started from a higher level of unemployment in 1980. However, the steep fall in the late 1980s let the British unemployment figures diminish considerably to about 7% in 1990, compared to 4.8% in Germany. The following period of upward trend started one year earlier in the UK – already in 1991 – and peaked in 1993 at an unemployment rate of 9.9%. The rates have been falling permanently since then to about 5% in 2001, remaining nearly constant in 2002. In Germany, however, the rise in unemployment began instantly after reunification, reaching a peak of 9.7% in 1997. After a short recovery period in the late 1990s

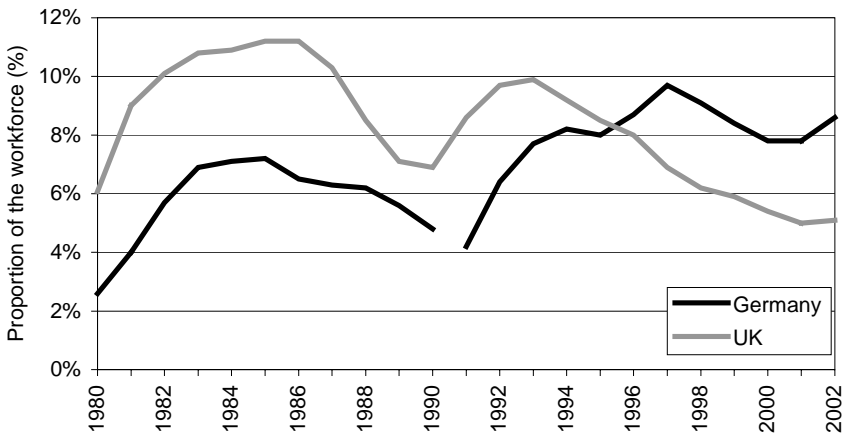


Figure 4.4. Unemployment in Germany^a and the United Kingdom, 1980–2002

^a Germany: until 1990 West Germany, then reunified Germany.

Source: cf. Table A.3 in the Appendix.

¹² See section 6.6.3 for more detail about the capital market developments and their influence on old-age incomes.

¹³ Cf. section 3.1.1.

¹⁴ E.g., unemployment benefits, social assistance etc.

to handle the effects of globalisation better, i.e. to be more competitive under the existing economic conditions (see 4.2.2), because unemployment has been much lower than in Germany since 1986. However, it has to be taken into account that Germany had to struggle with the transition from a socialist system to a market economy in the Eastern part of the country with significant effects *inter alia* on the labour market.

This section has focused on the general macroeconomic environment of Germany and the UK since 1980, i.e. the macroeconomic context of the analysis of both pension systems carried out in the remaining parts of the study. The following section focuses on several changes in the structures of the studied economies that have a significant impact on the parameters of pension systems.

4.2 Social and economic trends challenging pension systems

In addition to the general macroeconomic development, both countries were influenced by a number of common trends in the developed economies that affect the structures of societies and labour markets, i.e. ageing populations, changing family structures and employment patterns, as well as the effects of globalisation and European integration. These changes concern the foundations of social security because they question the traditional assumptions about societies and labour markets.¹⁵ Thus, they are sources of demographic and political risk for old-age security as described above.¹⁶ The trends have a direct impact on the operation of pension systems and will therefore be described in further detail. Although the figures presented in this section are for Germany and the United Kingdom,¹⁷ the named trends can be observed similarly in all of the EU member states and other industrialised countries, just to a more or less pronounced degree.

4.2.1 Demographic change

Most of the developed countries will experience a reduction in population size in the next decades and the composition of the population has already started to shift. The major reasons for these trends are a continuously increasing life expectancy on the one hand and low birth rates on the other hand. Demographic change is re-

¹⁵ Cf. Council of the European Union (2003), p 88.

¹⁶ See section 3.1.2.

¹⁷ The projections are mainly taken from Eurostat calculations for the Economic Policy Committee (2001), because these figures build the basis for the projections of long-term financial sustainability that are analysed in section 7.1.

inforced by the large post war baby-boom generation that is gradually reaching retirement age from 2010 onwards.¹⁸

Figure 4.5 displays the structure and size of the population in Germany and the United Kingdom since 1975 and their projected change until 2050. Such long-term population projections rely on a number of assumptions and only slight alterations of the latter may lead to significant changes in the resulting figures.¹⁹ However, demographic changes take effect slowly and today's young people determine how many elderly will live in the future,²⁰ so at least the major trends are indisputable. The figure shows a number of important changes in the demographic structure of both populations, which are all more pronounced in Germany than in the UK.²¹ Firstly, it is visible that the number of inhabitants has increased considerably from

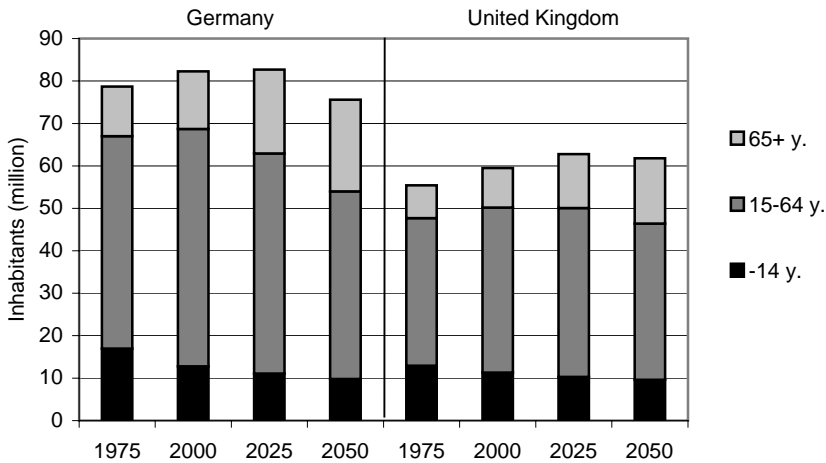


Figure 4.5. Demographic change in Germany and the United Kingdom, 1975–2050

Sources: Economic Policy Committee (2001), UN Population Prospects 2001 Revision; cf. Table A.4 in the Appendix.

¹⁸ Cf. Dang et al. (2001), p 4. The Pensions Commission (2004), p 10, argues that the baby-boomers have depressed the old-age dependency ratio during the last 30 years. As a result, necessary adjustments of the pension systems to demographic change have been delayed.

¹⁹ Cf. Economic Policy Committee (2001), p 13.

²⁰ Under the assumption that there are no catastrophes, wars etc.

²¹ The underlying figures for West and East Germany are differing considerably. East German population has decreased since reunification (due to emigration to the Western parts of the country) and will probably decline faster than in West Germany. Cf. Handelsblatt, 5.07.2004, *Deutlich mehr Sterbefälle als Geburten*.

1975 to 2000.²² Throughout the period from 2000 to 2025, population size is projected to be almost stable in Germany, while the population in the UK will continue to increase. From 2025 until 2050, both countries experience a reduction in total population size.²³ The underlying figures show that Germany will reach its peak in population size before 2020 and then the number of inhabitants will start to shrink. In the UK, inhabitant numbers will reach their turning point around 2035.²⁴

Besides the total number of inhabitants, there are also shifts in the age structure. The absolute number as well as the relative proportion of children (under 15 years) is permanently decreasing over time in both countries. However, the reduction is much more significant in Germany where this age-group drops by 42% of its initial number from 1975 to 2050, compared to a reduction by about 26% in the UK. In contrast to the youngest age-group, the working-age population (15–64 years) grew in both countries by about 12% from 1975 to 2000 and decreases only later on. In Germany, the turning point is achieved between 2000 and 2025: the working-age population is shrinking in both absolute and relative numbers. This trend is projected to intensify in the succeeding 25 year-period (2025–2050). From 2000 to 2050, the working-age population will decrease by more than 20%. In the UK, the working-age population is projected to increase during the time period 2000–2025, followed by a reduction both in absolute and relative numbers from 2025 to 2050. The development will be smoother than in Germany with a reduction by only about 5% in absolute numbers for the time period 2000–2050 compared to about 21% in Germany for the same period.

The most important changes concern the elderly population (65 years and older) who will increase sharply both in absolute and in relative terms. The post-war baby-boom generation will reach retirement age during the next decades. While people of the oldest age-group had a share in total population of less than 15% in 1975 in both countries, their fraction is projected to rise to nearly 29% in Germany and 25% in the UK by 2050.²⁵ The number of elderly persons will almost double from their initial values in 1975 in this time frame. As explained in section 3.1, the relationship between the working-age population and the elderly is crucial for the operation of pension systems, especially in terms of financing aspects. Section 7.1 will provide projections of the financial sustainability of the studied pension systems based on these demographic assumptions.

There are two major reasons for these shifts in population structures, namely continually low birth rates and increasing life expectancy. To begin with, Table 4.3 gives an impression of the fertility rates in the past and what demographers expect for the future.

²² Population growth was about 4.6% in Germany and about 7.4% in the UK over this period.

²³ The German figure is projected to decrease by 8.6%, the UK figure by 1.6% during this 25 year-period.

²⁴ See Table A.4 in the Appendix.

²⁵ A turning point in absolute as well as in relative numbers will be reached around 2040 in both countries; see Table A.4 in the Appendix.

Table 4.3. Fertility rates in Germany and the United Kingdom, 1975–2050

	Germany	United Kingdom
1975–1980	1.5	1.7
1990–1995	1.3	1.8
2000	1.4	1.7
2025	1.5	1.8
2050	1.5	1.8

Sources: Economic Policy Committee (2001), UN Population Prospects 2001 Revision; cf. Table A.4 in the Appendix.

These rates show the average number of life births per woman. A fertility rate of about 2.1 is necessary to replace the existing population.²⁶ Obviously, fertility rates are well below 2.1 in both countries over the entire observation period. In 2000, the rates were at a historically very low level, i.e. 1.4 for Germany and 1.7 for the UK. The Economic Policy Committee (2001) assumes that they will approach 1.5 and 1.8, respectively, from 2025 onwards. However, fertility rates are surely difficult to predict. It is contentious if fertility rates are going to recover at all in future decades. On the other hand, the UN Population Prospects assume an increase of fertility in Germany to more than 1.8 in 2050, equal to the prospects for the UK.²⁷ These differences reveal how cautious total population projections have to be treated.

Given that fertility rates are too low to guarantee a stable population size, improvements in life expectancy have the opposite effect, since they lead to an increase in average age and in total population. Figure 4.6 shows the development of life expectancy at birth for women and men in the studied countries.

On average, women live longer than men. This fact is not presumed to change in the foreseeable future. Life expectancy at birth has increased considerably from 1975 until 2000, from less than 70 years to about 75 years for men in Germany and the UK, and from slightly more than 75 years to more than 80 years for women in both countries. The figures are projected to rise by about five more years until 2050. According to the Economic Policy Committee (2001), men born in 2050 in either Germany or the UK will have an average life expectancy of 80, women of 85. While the past improvements in life prospects were mainly due to a reduction in mortality during the first years of life, the future gains in life expectancy will be caused by reduced old-age mortality.²⁸ Longer lives translate to

²⁶ Cf. Ulrich (2001), p 25. In theory, two children would be sufficient, but because of mortality before maturity, a rate of about 2.1 is necessary for replacing the parents in numbers.

²⁷ Cf. UN Population Prospects 2001 Revision, <http://esa.un.org/unpp> (30.07.2004).

²⁸ Cf. Ulrich (2001), p 25. The Pensions Commission (2004), p 10 estimates that about 80% of the increase in old-age dependency in the UK is a result of increasing life expectancy from the age of 65.

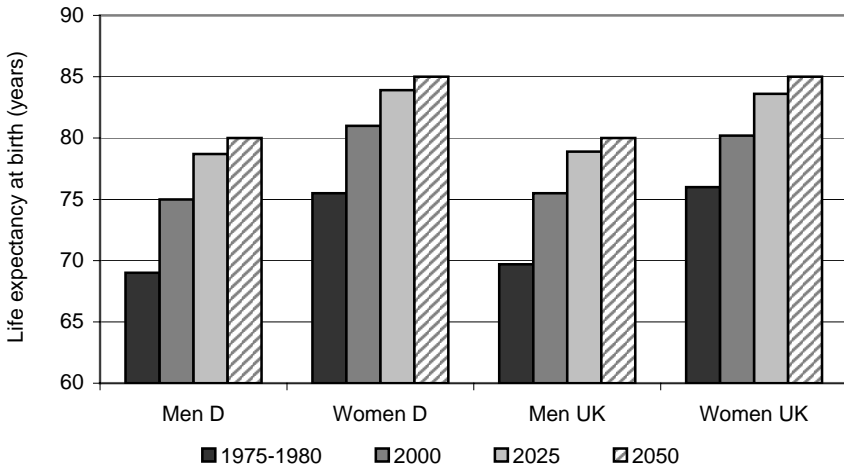


Figure 4.6. Life expectancy at birth by gender in Germany and the United Kingdom, 1975–2050

Sources: Economic Policy Committee (2001), UN Population Prospects 2001 Revision; cf. Table A.4 in the Appendix.

longer periods of life after retirement at a given retirement age, leading to a longer average duration of pension benefit receipt.²⁹ In the period from 1950 to 1990, average effective retirement age in Western Europe declined from 65.7 years to 59.3 years and the average duration of retirement increased from 12.8 years to 20.7 years.³⁰

The described determining factors for demographic change can be influenced by social policy to a limited extent only. Insofar as life expectancy is concerned, its prolongation is in itself an objective of social policy. It is difficult to influence fertility rates by means of state activity. Public policy can only provide a child-friendly infrastructure inter alia in the form of access to childcare and family support,³¹ but there are a number of other influencing factors on the people's child-bearing propensity beyond state control.³²

²⁹ Oeppen and Vaupel (2002), p 103 argue that life expectancy increases continuously by 0.25 p.a. Other projections calculated in the past turned out to be too low at most five years after their publication and have thus led to wrong expectations in long-term planning.

³⁰ Cf. Gillion et al. (2000), p 441. The financial consequences deriving from this trend will be analysed in section 7.1.

³¹ For an overview of potential political strategies to increase fertility, see Bagavos and Martin (2000), pp 24f.

³² These are inter alia social values and traditions, fertility and general economic perspectives.

The only political measure to influence size and structure of the population is the regulation of immigration.³³ Figure 4.7 displays net migration figures and projections for Germany and the UK. The numbers stem from different sources that differ in their assumptions on future migration. The figures show why Germany's population was growing during the 1990s despite a low fertility rate. The drop in births was more than compensated for by strong net migration flows into the country, especially from Central and Eastern Europe.

However, both Eurostat and UN projections do not assume important net migration to the studied countries in the future. Although there is considerable uncertainty about these figures, it is obvious that migration will not be a means to offset demographic change. Even if it is possible to promote immigration, this would require major political and economic efforts in terms of integration.³⁴ With regard to pension systems, if people immigrate in their working-age they will earn pension entitlements that will translate to future pension expenditure. Therefore, not only the number but also the age structure of emigrants and immigrants is important to

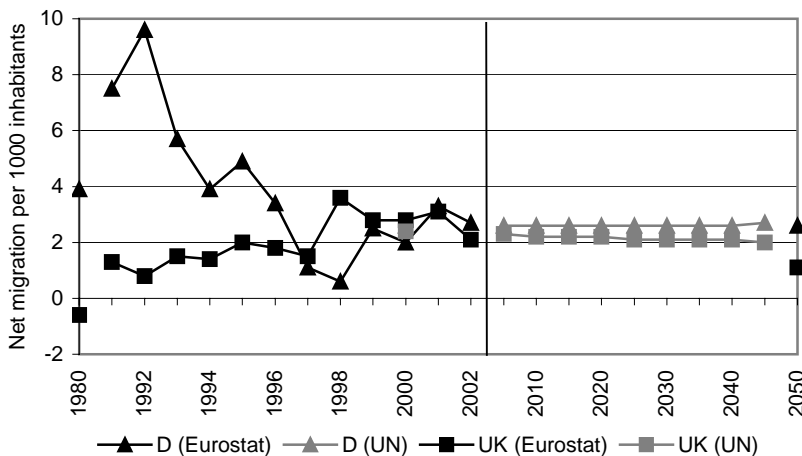


Figure 4.7. Net migration^a per 1,000 inhabitants in Germany and the United Kingdom, 1980–2050

^a net migration = difference between immigration into and emigration from the respective country during the year.

Note: UN projections apply to five-year-periods; figures are assigned to the first year of the period in the graph; projected figures from 2005.

Sources: Eurostat, Economic Policy Committee (2001); UN Population Prospects 2001 Revision; cf. Table A.5 in the Appendix.

³³ Cf. Hauser (2003), p 203.

³⁴ Cf. Hauser (1995a), p 54.

estimate their effects on pension systems.³⁵

Consequently, there appear to be no measures to reverse the trends in demography so that public policy has to adapt social security systems to the changing population structure. With regard to pension system objectives, the demographic change endangers especially financial sustainability and intergenerational equity. Intergenerational relations have to be redefined on the basis of changing population shares of generations. Chapter 7 focuses on the foreseeable consequences for financial sustainability and which reform options may offer better prospects for the current pension systems of Germany and the UK. Since the effects of population ageing will be noticeable soon, there is a “narrow window of opportunity”³⁶ to restructure old-age security.

4.2.2 European integration and globalisation

There are two major influencing factors of European integration on the national social policy of the EU member states. Firstly, there has been an effort to coordinate and harmonise elements of social policy on the EU level. Apart from these direct influences on national social policy, European Monetary Union (EMU) has put financial pressure on public finances. In addition to the reduction in national autonomy due to the EU, globalisation further narrows the room for national policies.

The European Union is getting more and more important in terms of social policy. One of the first areas of concern of the European Communities in the 1970s was the co-ordination of public pension entitlements and other social security benefits earned in different member states by EC citizens. The objective was to protect the rights of workers moving between member states³⁷ as a prerequisite to free movement of labour in the common market. A growing number of public social benefits have to be exported across national borders to other EU member states, leading to a detachment of benefits from national territory.³⁸ However, the co-ordination was explicitly not aiming at a harmonisation of the national pension systems. With the agreement on revised EU treaties, an increasing number of social policy areas have been integrated in the treaties (see 2.4.1). Throughout the

³⁵ Cf. Schmähl (2001), p 135. See section 4.2.3 for more detail about the effect of work-force immigration.

³⁶ Dang et al. (2001), p 19.

³⁷ Council Regulation (EEC) No 1408/71 of 14 June 1971 on the application of social security schemes to employed persons, to self-employed persons and to members of their families moving within the Community. The regulation is regularly revised. The most recent consolidated version dates of 30.01.1997.

³⁸ Cf. Hauser (2003), p 200. The European Court of Justice has been deciding in favour of consumers rather than national governments regarding the export of social benefits. A prominent example is the decision about care benefits of the German long-term care insurance, which were judged to be monetary benefits in contradiction to the German public definition of them being benefits in kind; Decision C-160/1996 (Molenaar) by the European Court of Justice on 5.03.1998.

last years, the European Commission has engaged in the field of social policy with the ‘Open Method of Co-ordination’³⁹, especially concerning measures to reduce unemployment, to prevent poverty and social exclusion and in the area of old-age pensions with regard to public and occupational schemes.⁴⁰

Apart from EU activities in the field of pension policy, the public budget requirements of the EMU convergence criteria and later of the Stability and Growth Pact (SGP)⁴¹ have put pressure on public finances of the member states. Public pension schemes were found to be a major threat to long-term financial sustainability of public budgets,⁴² so that the European Commission engaged increasingly in this area. EU member states have to report annually on their achievements to comply with the SGP, including projections for future public spending on social security. There is a permanent process of benchmarking and evaluation of national policies.⁴³ Consequently, competition has intensified among EU member states, not only on product and labour markets, but also with regard to economic growth and ‘best practise’ in social systems. Although the UK is not a member of the EMU, it participates in this process and its performance is directly compared to other EU member states.

In addition to the effects of European integration, globalisation has changed the foundations of public policy. The liberalisation of international trade and the progress in communication technologies have lead to almost global product, labour and capital markets. In consequence of the shrinking relevance of national frontiers, competition between fiscal and social regimes has emerged. National governments are losing their capacity to determine their welfare-state arrangements independently,⁴⁴ because international competition puts pressure on labour costs, especially for the unskilled workforce. Since wages are directly linked to social security through contributions and/or income taxation, extensive social systems are criticised as being a competitive disadvantage.⁴⁵ Furthermore, workers and businesses are increasingly able to evade income taxation and social contributions because of European integration and globalisation as well as by engaging in new forms of employment (see 4.2.3).⁴⁶ Because of these influences, a number of countries have shifted the financing of social security away from employers towards

³⁹ See section 2.4.1.

⁴⁰ A further open method of co-ordination has been initialised in the field of health care and long-term care.

⁴¹ These are ceilings of 3% of GDP for the current deficit and of 60% of GDP for total debt.

⁴² A communication by the European Commission in 2000 estimated that, without reforms, unfunded pension liabilities could reach up to 200% of GDP in some countries in 2030; cf. European Commission (2000a), p 3.

⁴³ See http://www.europa.eu.int/comm/economy_finance/about/activities/sgp/main_en.htm for the national stability and convergence programmes and their evaluation by the European Commission.

⁴⁴ Cf. Lampert (2000), p 108.

⁴⁵ Cf. Barr (1998), p 12.

⁴⁶ Cf. Hauser (2003), pp 214f.

increased tax financing.⁴⁷ However, this may aggravate the problems of compliance with the EMU targets for public budgets.

Along with the effects of ageing mentioned above, these international influences played a major role in raising concerns about the long-term financial sustainability of public pension schemes,⁴⁸ thus forcing national governments to reform pension systems. Consequently, such external influences on national policy translate to political risk for pension scheme participants.

4.2.3 Labour markets: changing employment patterns

Döring (2002, p 53) defines three developments on labour markets that have a major impact on pension systems: increasing flexibility of working time, more self-employment (along with changes between employment and self-employment) and the continuing immigration of working-age people. These trends lead to more 'fractional' work histories. Insofar as pension entitlements are based on paid work, this presumably results in insufficient old-age income from public pension schemes and even more so from occupational pension schemes. Thus, there is a risk for pension systems to fail the objective to provide an adequate old-age income (see 2.4.2).⁴⁹ Since pension systems were designed to protect full-time workers (and their dependants) who were staying employed (a high proportion even with the same employer) their whole working life if possible, traditional pension arrangements are not able to provide a more flexible workforce with adequate old-age security.⁵⁰ Furthermore, the labour force participation of women has increased constantly, many of them being in part-time employment.⁵¹

Frequent changes of employers challenge the capability of occupational pension schemes.⁵² Originally, the intention of occupational pension arrangements was to tie employees to their employer for a long period of time.⁵³ This can no longer be the aim of these arrangements if the obligation exists that accrued funds have to be transferable to the new employer in the event of a job change.⁵⁴ There is a trend towards employee-financed 'occupational pension provisions' which are only linked to employment because this organisation allows economies of scale in administration costs compared to individual pension arrangements. Consequently,

⁴⁷ Cf. Abramovici (2004), p 7. See section 6.5 for the trends in Germany and the UK.

⁴⁸ See sections 2.3.3 and 2.4.2.

⁴⁹ Cf. Council of the European Union (2003), p 88.

⁵⁰ The topic of providing social security for flexible working patterns is treated under the term 'flexicurity'; see for Germany Klammer and Tillmann (2001).

⁵¹ Subsequent cohorts of women have participated at higher numbers and longer years; cf. O'Rand and Henretta (1999), p 18.

⁵² Cf. Council of the European Union (2003), p 7.

⁵³ Cf. World Bank (1994), p 37.

⁵⁴ This requirement exists for parts of occupational pension schemes in Germany and in the UK; see sections 5.3 and 5.4 and Council of the European Union (2003), pp 90f.

the borders between private and occupational pension schemes become more permeable.

Changes between self-employment and dependent employment cause major problems if the self-employed are not obliged to participate in a public pension scheme, whereas employed persons' participation is mandatory. If a person is changing between the two statuses, she/he will face difficulties building up either adequate public pension entitlements or private savings.

The capability of pension systems to provide old-age security for people who immigrate during their working-age depends heavily on the systemic structure and on the time of immigration.⁵⁵ If pension entitlements are determined by the number of working years in a country and there is no co-operation agreement with the immigrant's country of origin, there are major risks for achieving an adequate old-age income. This risk does also apply if pension entitlements earned in the country of origin are considerably lower than in the immigration country.

In addition to the presented changes in the structure of labour, there are further influences on labour markets resulting from globalisation. As mentioned earlier (4.2.2), globalisation has put pressure on labour costs, especially for unskilled labour, due to an increasing (almost world-wide) competition on labour markets. Since labour is more expensive in industrialised countries, a large part of labour-intensive production has been relocated to low-wage countries. The consequence is increasing unemployment among people with low professional qualifications in countries with high social standards such as Germany and the UK and, therefore, high wages.⁵⁶ Unemployment itself challenges pension systems both on the individual and on the macroeconomic level, as explained above. Furthermore, poor employment opportunities for older people have led to a considerable decrease in effective retirement ages in both countries, but more so in Germany.⁵⁷ Retirement before the legal retirement age affects pension expenditure; either it is costly for the pension scheme – this is the case if there are no benefit deductions – or it leads to a risk of an inadequate replacement rate for early retirees. Accordingly, the effective retirement age is closely connected to the financial sustainability of public finances.

4.2.4 Changing family patterns

Family structures have been subject to important changes during the past decades. The average family size has been shrinking permanently, reflecting the transformation from three-generation households to core families with or without children

⁵⁵ Cf. Döring (2002), pp 53ff.

⁵⁶ For an analysis of the effects of globalisation and technological progress on labour markets, see Eisen (2001).

⁵⁷ See 6.6.1 and Kromphardt (2001), p 41.

and to single households.⁵⁸ Figure 4.8 shows the projected development of household size in both countries from 1995 until 2025. The projections assume that the decrease in average household size will continue throughout the next two decades. During the whole observation period from 1995 to 2025, German household size is projected to decline from 2.2 to 2.0 persons on average. British households are larger, but they are also going to shrink from almost 2.4 to about 2.1 members. These figures reflect an increasing proportion of single households. In 1995, about 16% of German households consisted of only one person; in 2025, this household type is supposed to reach a share of almost 20% of the total number of households.⁵⁹ In the UK, the corresponding figure for 1995 is 12%, increasing to 17% in 2025.

Moreover, family structures have become more fluid because of increasing rates of divorce and re-marriage. There is a trend towards growing individualisation and a plurality of lifestyles.⁶⁰ Pension systems are affected by these changes in household patterns, since they were built to protect the archetypal nuclear family with one (male) main breadwinner, married forever to his wife, who is occupied with (unpaid) family work.⁶¹ The husband's wage had earned sufficient pension entitlements to protect himself and his wife in old age. Smaller families and

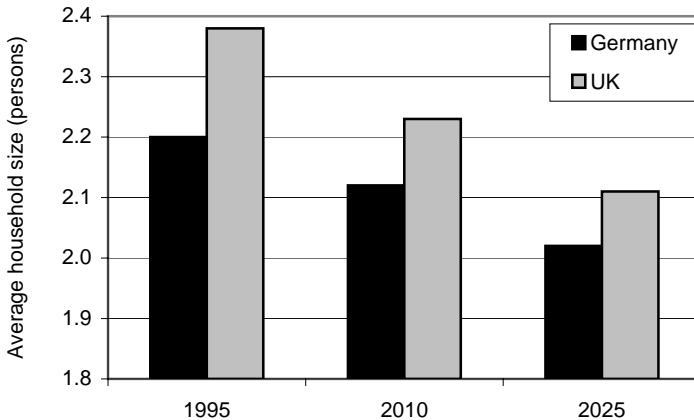


Figure 4.8. Average household size in Germany and the United Kingdom, 1995–2025

Source: Eurostat (2003), p 2 (baseline scenario).

⁵⁸ Cf. World Bank (1994), p 33. This process may have been promoted by the established pension systems that make people more independent from their family; cf. Council of the European Union (2003), p 23.

⁵⁹ Cf. Eurostat (2003), p 3 (baseline scenario).

⁶⁰ Cf. Hauser (2003), p 206. However, Ostner (1995), p 86 argues that these trends are overestimated.

⁶¹ Cf. Barr (1998), p 12.

more fluid family structures reduce the ability of intra-family protection and lead to an increasing need for independent social protection of individuals, especially for women, who are not 'automatically' protected with a life-long husband any more.⁶² However, the increasing labour market participation of women will have a compensating effect in this regard. Apart from pensions, an increase in single and one-generation households reduces the potential for intra-family sharing of family work such as childcare and long-term care for elderly persons.⁶³

Changing family structures concern the pension system objectives of providing an adequate old-age income and of equity between men and women.

This chapter has provided an overview of the macroeconomic and social conditions for pension policies and (old-age) income distribution since 1975–80. The presentation is the basis for putting recent pension reforms in both countries (chapter 5) into perspective as well as analysing the trends in income distribution among the elderly (chapter 6). The changes in society and on the labour markets addressed in section 4.2 challenge the traditional operation of social security systems and have encouraged scientific and political discourse concerning the future financial sustainability of pension systems (see 2.3 and 7.1). The remainder of the study analyses the German and the British pension systems and their experiences and perspectives in terms of distributional effects and sustainability.

⁶² Cf. Yamada and Casey (2002), p 27; Rechmann (2001), p 45.

⁶³ Increasing needs for long-term care will induce significant costs if care has to be provided by formal institutions instead of family members who mostly work unpaid; cf. Economic Policy Committee (2003), p 25.

5 Comparative description of the pension systems in Germany and the United Kingdom

After having introduced major macroeconomic and social risk factors influencing the pension systems in the previous chapter, this chapter provides an overview of the main characteristics of the German and British pension systems. Emphasis is put on those aspects that are essential for understanding their distributional effects and assessing their financial sustainability carried out in the subsequent empirical parts of this study (chapters 6 and 7). Since this presentation only considers the present regulations as of March 2005, it does not reflect the former pension law, which influenced the building of pension rights of today's pensioners. However, even though there has been continual development within the national pension systems, their fundamental structures and underlying ideas have not been totally revolved during the past decades. Hence, this systemic overview will provide a helpful basis for interpreting the empirical results. To give a structure to the presentation, a set of essential criteria is defined in a first step that is founded on the analysis of structural parameters of pension systems carried out in section 3.2.

5.1 Criteria of comparison

In order to provide a common basis for the comparison of the systems, it is helpful to define the most important organisational criteria of their statutory components¹. There are additional aspects that would have to be taken into account for a complete institutional analysis of both systems. However, as this presentation is not an aim in itself and merely tries to give an idea of the main features of the systems in preparation for the empirical analysis, the criteria studied have to be reduced to the essential core.² The key parameters of pension systems have been studied theoretically in section 3.2. For the institutional analysis, there is very little to add. The criteria are complemented by the issue of income taxation of contributions and benefits as well as the choice between an integrated or an external approach of providing public subsistence benefits for the elderly.³

¹ For a definition of pension systems, see section 2.1.

² See Hauser (1995b), p 3ff for a general overview of the core elements.

³ In the theoretical analysis in chapter 3, income taxation was only considered as a source of exogenous political risk to the pension system and it was assumed that public subsistence benefits are provided externally.

Concerning social redistribution, only intragenerational redistribution elements are analysed. Certainly, pension schemes also contain elements of intergenerational redistribution, but these cannot be assessed on the basis of institutional regulations at one point in time but would require analysing the development of systemic structures. Therefore, intergenerational equity will be studied after having conducted the empirical analysis (chapter 6).

Table 5.1 summarises the structural elements and their specifications used for the comparison. The treatment of contributions to pension schemes and of different sources of old-age income by income taxation influences the personal choice between different types of pension provisions. Normally, income is taxed only once: either the contributions to a pension scheme as a part of labour income are paid out of taxed income, or the pension benefits including interests are subject to income taxation. The situation that contributions are deductible from taxable income, but the pension income including investment return is fully taxed at payment is called the EET model (contributions are *Exempt*, investment income is *Exempt* during accumulation, benefits are *Taxed*)⁴.

Public pension schemes may include a *minimum pension*. That is, every insured person receives at least the minimum pension, even if the pension entitlements

Table 5.1. Institutional characteristics of pension systems

Parameter	Characteristics
1. Covered part of the population	- universal / partial - defined by labour market status / country of residence
2. Insured risks	- longevity - death (of the insured) - invalidity - (illness and need for long-term care)
3. Financing	- pay-as-you-go / funded - contributions / taxes
4. Calculation of benefits	- adjustment of contributions and benefits over time - defined contribution (DC) / defined benefit (DB) - factors for calculating the initial pension (DB only) - targeted benefit level (DB only)
5. Elements of social redistribution	- unisex benefits - pension credits for periods of unemployment, unpaid labour (parental leave, long-term care etc.), education
6. Taxation of contributions and benefits	- taxation of contributions - taxation of benefits
7. Minimum pension and subsidiary system	- minimum income guarantee incorporated in the pension system / subsidiary system

Source: own illustration.

⁴ See Council of the European Union (2003), pp 33f.

calculated according to the general pension formula would not lead to this amount. The integration of such minimum insurance in a pension scheme is very effective in avoiding poverty among the insured part of the elderly population, but it is also a highly redistributive means. Because of this redistributive character, subsistence benefits are often tax-financed and organised at a subsidiary level of the pension system.⁵ Such *subsidiary systems*, which provide income to pensioners, have to be considered in order to get a complete picture of a national pension system and to enable a reasonable international comparison.⁶ Subsidiary benefits are those benefits paid after taking into account all types of income received by a person or other members of the same household and are therefore called means-tested benefits. The existence of this final safety net presumably affects personal choices on how and to what extent to provide for the individual old-age pension.⁷ In other words, if a person is sure he or she will not receive pension benefits above the guaranteed minimum income – even by paying contributions to a pension scheme – he/she may try to avoid contributing to the pension scheme at all, in case contributions are not mandatory.

The following comparative institutional review of the German and the British pension system will be based on these criteria. After touching briefly upon the popular pension pillar concept and providing an overview of the general structure, the analysis focuses first on the mandatory part of the pension systems and then on supplementary pension provision.

5.2 Short overview

5.2.1 Introductory remarks: Shortcomings of the pension pillar concept

The different components of old-age income are often referred to as *pillars*, invoking the picture of a house, of which the roof is held by several – at least two – pillars. Usually, it is assumed that old-age income consists of three parts (pillars), namely public, occupational and personal pensions.⁸ This approach has several shortcomings. Firstly, the picture of three pillars for the building of an old-age pension system conveys an idea of similar importance of the pillars. This is not the case in most countries, especially not in Germany. Secondly, it is impossible to compare the German and British pension systems on the basis of the three-pillar concept.

Figure 5.1 illustrates what the result of such a comparison is. In the German case, it would be inappropriate to speak of the different types of pensions as three pillars. For the majority of the population there exists only one real pillar, i.e. the

⁵ See section 3.2.2.3.

⁶ Cf. Hauser (2003), p 222; Gillion et al. (2000), p 98.

⁷ Cf. World Bank (1994), p 240.

⁸ E.g., see Economic Policy Committee (2001), p 84ff.

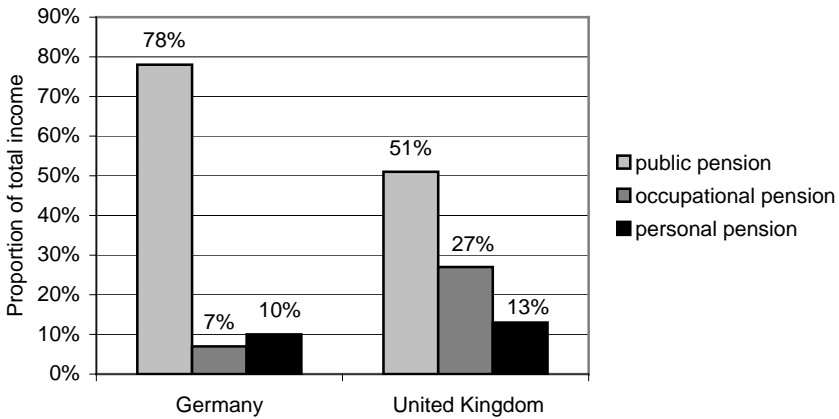


Figure 5.1. The pension pillar concept – Income sources of the elderly in 2000 (% of total income^a)

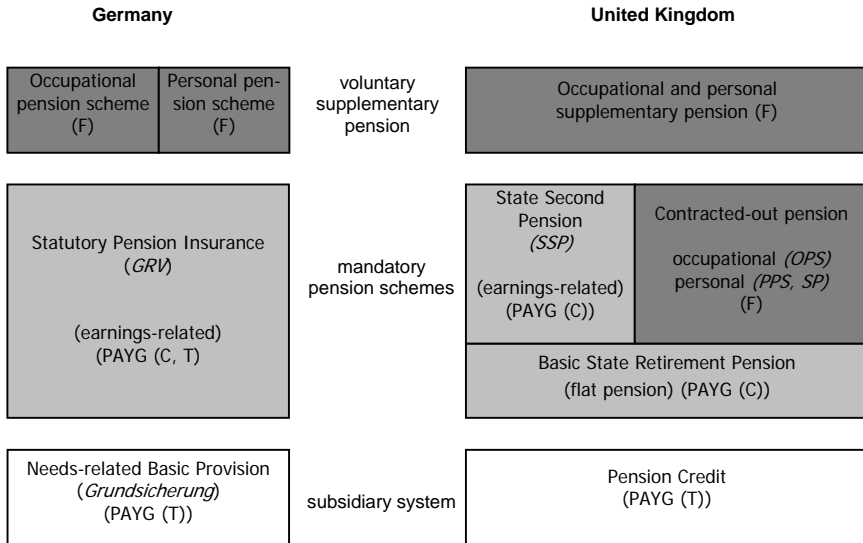
^a Residual income from other sources; rental value of owner-occupied housing not taken into account.

Germany: Persons aged 65 years and over; UK: pensioner units.

Source: Federal Republic of Germany (2002) and United Kingdom of Great Britain and Northern Ireland (2002); own illustration.

public pension. Occupational and personal pensions are considerably less important sources of old-age income. The picture of three pillars holding a roof is therefore misleading. Although the pillars of the British pension system formed by public, occupational and personal pensions are more balanced, the comparison with the German system would be misleading. In the United Kingdom, parts of the occupational and personal pensions are contracted-out schemes and thus compulsory (see 5.2.3). Therefore, a less simplistic approach has to be used to compare the two pension systems, taking into account not only the source (public, occupational, or personal) of the pension benefit, but also the financing of the pension scheme and whether participation is mandatory or not. As mentioned above (5.1), the subsidiary systems of social assistance for pensioners have to be integrated. Still, a payment from the tax-financed subsidiary system does not have the same meaning as one from the so-called pension pillars – it may rather be represented as the foundation of the house – which is another shortcoming of the ‘pillar approach’.

Thus, in this study the term ‘pension income components’ is used instead of ‘pension pillars’. The different components are illustrated in Figure 5.2, which provides an initial overview of the institutional composition of the pension systems.



F = funded (contributions)

PAYG (C/T) = pay-as-you-go financed (contributions/taxes)

Figure 5.2. Institutional structure of the German and the British pension system^a

^a as of March 2005.

Source: own illustration.

5.2.2 Germany

The German pension system has one predominant component: the public pension, which is the main income source for the majority of German pensioners. More than 80% of the working population are covered by the most important public pension scheme, the Statutory Pension Insurance (*Gesetzliche Rentenversicherung*, GRV). Other public pension schemes such as the civil servants' scheme are much less important in terms of contributors and benefit volume.⁹ Therefore,

⁹ In total, 19.2% of employees were working in the public sector in 1999, cf. Hammouya (1999), Table 1, p 12f. There are two types of employees in public administration. State employees (*Angestellte im Öffentlichen Dienst*) take part in the GRV and have an additional pension scheme run by the state, whereas civil servants (*Beamte*) are insured in a completely independent pension scheme financed from the general state budget. 4.6% of the working population are covered by the civil servants' pension scheme, cf. Federal Republic of Germany (2002), Annex, p 2. There also exist independent public pension schemes for miners, sailors and boatmen, farmers, employees of the (former public) railway company, et cetera; cf. Table A.6 in the Appendix.

the remainder of this institutional analysis is restricted to the GRV, which can be considered the core scheme among public pension schemes.

Occupational or personal pension schemes are far less important sources of old-age income. They are not obligatory although partly supported by the German State. The pension reform 2001 was the starting point for the ‘Riester Pension’ (named after the minister of labour and social affairs at the time, Mr. Walter Riester), which introduced profound public support for voluntary contributions to occupational and personal pension schemes to replace parts of the public pension by these schemes. The objective of the reform has been to reduce public pension liabilities to maintain financial sustainability of public finances (see 5.4.1).

5.2.3 United Kingdom

The British statutory pension system for those who are not employed in the public sector is split into two levels. The first level is the *Basic State Retirement Pension* (Basic Pension), which provides a flat-rate old-age pension at a very low level (less than social assistance). On top of the Basic Pension exists a compulsory additional pension for employees. This is the *State Second Pension* (SSP), which was introduced in April 2002 and has replaced the *State Earnings-related Pension Scheme* (SERPS). However, people can also decide to ‘contract out’ into an approved occupational or personal pension scheme.¹⁰ The mandatory character of this second pension reduces the significance of a comparison of the future public pension liabilities in Germany and the UK.¹¹ The comparison of future pension liabilities of the whole economy including the private sector is more adequate.¹²

Because of the possibility of contracting-out, occupational and personal pension schemes are far more important income sources for pensioners in the United Kingdom than in Germany, where these types of pension income will gain relevance for future pensioners only.¹³ Various reforms have led to a consecutive replacement of state pension benefits with privately organised pensions. The aim of the British government is to reach a 60/40 ratio of private and public pension income until 2050.¹⁴

Civil servants and other public sector employees are covered by separate pension schemes that are based on government acts.¹⁵ Since the majority of people is

¹⁰ For participants in contracting-out schemes, a rebate on the employer’s and the employee’s National Insurance contributions is given. Furthermore, occupational pension schemes have been usually more profitable than the additional state pension and benefits are not limited to 20% of the personal average earnings – as it is the case for the SSP (SERPS).

¹¹ See section 7.1.

¹² See Table 4.1.

¹³ See section 6.5.

¹⁴ Government of the United Kingdom of Great Britain and Northern Ireland (1998), p 8.

¹⁵ In 2003, about 18% of the British workforce were employed in the public sector; cf. Pensions Commission (2004), p 166.

employed in the private sector, the remainder only considers Basic Pension and SSP along with contracted-out occupational and personal pension schemes as the core schemes.

Table A.6 in the Appendix provides a detailed overview of the institutional regulations of both pension systems and may be referred to for more detail at any stage of the following analysis.

5.3 The mandatory pension systems

Following the definition of section 2.1, the mandatory pension system comprises all pension schemes in which participation is compulsory at least for a part of the population. This is important with regard to the British system, since contracted-out pension schemes are included in this pension system definition.

5.3.1 Covered part of the population

5.3.1.1 Germany

The GRV is a partial pension scheme for employees. Participation is mandatory for all types of employees in the private and public sectors, for some groups of self-employed and some other parts of the labour force-attached population¹⁶. The majority of self-employed are not included in the GRV and instead covered by other voluntary profession-specific pension schemes. There is a 'lower earnings limit' (*Geringfügigkeitsgrenze*) for employees' contributions¹⁷; persons with earnings below this limit can choose whether they want to contribute (and accumulate pension credits) or not. Voluntary participation is possible for persons who are not obligatorily insured. In 2002, about 82% of the workforce were insured.¹⁸ 96% of men and 98% of women aged 65 and over received public pension benefits (including public sector pensions) in 2001.¹⁹

5.3.1.2 United Kingdom

Participation in the Basic Pension scheme is mandatory for employees in the private sector and for all self-employed. It is a partial pension scheme based on la-

¹⁶ Among the insured are parents during their parental leave (max. 3 years per child), persons during military or civil service and recipients of public replacement income such as unemployment benefits, sickness benefits etc.

¹⁷ Currently €400 per month. The employer has to pay contributions below this limit also; see section 5.3.3.

¹⁸ About 33 million contributors (including those in receipt of public transfers with contributions to the pension scheme); cf. Federal Republic of Germany (2002), Annex, p 2.

¹⁹ Own calculations based on the CNEF dataset; see Table A.15 in the Appendix.

bour market participation. The lower earnings limit is set at the amount of a full Basic Pension²⁰. Married women are automatically insured through their husbands.²¹ In 2001, 98% of pensioners were receiving a Basic Pension.²² However, only 56% of women had their own Basic Pension entitlements.²³

The additional state pension SSP is compulsory for employees who have not chosen to contract out into a recognised occupational or personal pension scheme. The self-employed are not eligible for this additional state pension. Thus, it is a partial pension scheme for employees. In 2002, about 32% of pensioners were receiving income from SERPS.²⁴ Nearly 73% of those for whom participation in an additional pension scheme is mandatory (about 75% of the workforce) had contracted out of SERPS in 1997²⁵, 70% of them into an occupational pension scheme. Indeed, the objective of the latest British pension reforms was to improve incentives to leave the public system and to join occupational and personal schemes. The intention was to further reduce future public pension liabilities.

Coverage by occupational pensions is important; about 35% of people in the private sector and 80% in the public sector were covered by an occupational pension scheme in 2000.²⁶ Personal pension schemes are less important; only 12% of employees and 44% of the self-employed were insured by these schemes in 2000.²⁷

5.3.2 Insured risks

5.3.2.1 Longevity

In both countries, old-age income benefits are paid from retirement date until death. The uniform legal retirement age for men is 65 years. This age also applies to women in Germany since 2004.²⁸ At present, the legal retirement age for British

²⁰ The full Basic Pension for a single person amounted to £79.60 per week in 2004/2005 (all figures refer to the tax year 2004/2005, valid until April 2005). Employees who earn more than the lower earnings limit (£4,108 p.a. in 2004/2005) but less than the primary threshold (£4,745 p.a.) do not pay National Insurance contributions but receive pension credits (employers have to pay as from the lower earnings limit).

²¹ After retirement, a woman receives 60% of her husband's Basic Pension entitlements; own pension benefits are entirely deducted. From 2010, married husbands can also derive pension credits from their wives' entitlements.

²² Cf. United Kingdom of Great Britain and Northern Ireland (2002), p 8.

²³ Cf. DWP, State Pension Summary of Statistics: March 2003, www.dwp.gov.uk (26.09.2003).

²⁴ Cf. DWP, Client Group Analysis of the Population Over State Pension Age: May 2003, p 83, <http://www.dwp.gov.uk/asd/cga.asp> (2.01.2004).

²⁵ Cf. United Kingdom of Great Britain and Northern Ireland (2002), p 8.

²⁶ Cf. Whitehouse (2002), p 48.

²⁷ See United Kingdom of Great Britain and Northern Ireland (2002), p 56.

²⁸ The retirement age for German women was 60 years until 1999. Since 2000, it has been gradually raised until the end of 2004.

women is 60 years. It will be raised to 65 years in a transition period between 2010 and 2020.

In Germany, people can retire from age 62 at the cost of a reduced pension.²⁹ In the UK, public pensions cannot be received before the legal retirement age, but occupational pension schemes often bridge the period until this age is reached.³⁰ Retirement after the legal retirement age is possible in both Germany and the UK; additional months are rewarded by an increase of pension benefits in the public schemes.³¹ The intention of flexible retirement rules is to allow people adjusting their retirement date to their circumstances of life.

To ensure coverage of individual longevity risk, uprating rules for pension benefits are of major importance (see 5.3.4). In the absence of benefit adjustments, the real value of the pension would shrink over time due to price inflation and the relative income compared to the working-age population would diminish because of labour income growth (see 3.2.2.1).

5.3.2.2 Invalidity

Both the German and the British public pension system include an invalidity (or long-term incapacity to work) insurance.

In Germany, a full earning incapacity pension (*Erwerbsunfähigkeitsrente*) is paid if a person's working capacity is less than three hours per day. The pension is calculated in adding fictitious contribution years to the personal contribution record for the missing years until the earliest possible retirement age (currently 60 years, increasing to 63 years). There exists also a halved earning incapacity pension for people who are capable of working between three and six hours a day. The payment is reduced if other income exceeds legal income limits. These public incapacity pensions are only payable if the concerned person is not (sufficiently) covered by an industrial injury insurance benefit (*Berufsunfallrente*) provided by the respective guild.³² Apart from incapacity pension payments, the GRV provides rehabilitation measures to reintegrate people into the labour market.

In the UK, there are two different types of incapacity benefits, both payable by the *National Insurance*. If the working incapacity presumably is temporary, people receive an *Incapacity Benefit* of an amount which depends on age and duration of incapacity.³³ For disability caused by industrial injuries (accidents or diseases), people are entitled to a *Disablement Benefit*, dependent upon age and degree of disablement.³⁴ Additionally, there is a means-tested *Disability Living Allowance* for all disabled people under State Pension Age and the *Attendance Allowance* for

²⁹ See section 5.3.4.1. The limit will be shifted to 63 years over the next decades.

³⁰ Cf. Casey and Yamada (2002), p 7.

³¹ See section 5.3.4.

³² The full regular pension for 100% working incapacity is 2/3 of previous earnings and the incapacity insurances pay unconditioned minimum pensions.

³³ £55.90–74.15 per week in 2004/2005.

³⁴ £24.04–120.10 per week in 2004/2005.

those who have achieved this age.³⁵ Contracted-out pension schemes usually do not cover working incapacity.

5.3.2.3 Death of the insured: Survivors' benefits

The public pension systems include survivors' benefits if the insured person deceases during the contribution period or after retirement. In both countries, there have been reductions in the amount of widow(er)s' pensions. Pension reforms in Germany have led to a considerable reduction of derived pension entitlements.³⁶

Until 2002, British widow(er)s received the full state pension payments of their partner's entitlements to Basic Pension and SERPS after his or her death. This is still the case for Basic Pension benefits, but the British parliament has agreed on a reduction of widow(er)s' pensions derived from SERPS pension rights from 100% to 50% starting from October 2002, depending on the date of the insured's death, his/her birth year and the retirement age of both partners. SSP entitlements can only be inherited at 50%. For contracted-out pension schemes, there are different regulations concerning survivors' benefits. Defined benefit occupational schemes are required to pay widow(er)s' pensions, whereas defined contribution schemes do usually not provide survivors' benefits because annuities are purchased for a single person only.³⁷

5.3.2.4 Health insurance

German pensioners with GRV benefits have to pay half of the contribution rate to health insurance on their GRV pension, while the other half is paid directly by the GRV.³⁸ Since April 2004, pensioners pay the full contribution rate to nursing care insurance, which was divided between them and the GRV like health insurance contributions until then.³⁹

In the UK, people aged 65 and over do not pay National Insurance Contributions that include the *National Health Service* (NHS). Furthermore, they are entitled to certain privileges concerning health care, travel costs etc. For example,

³⁵ The Disability Living Allowance is composed of a care component (£15.55/39.35/58.80 per week in 2004/2005) and a mobility component (£15.55/41.05 per week in 2004/2005), the Attendance Allowance amounts to £39.35–58.80 per week (2004/2005).

³⁶ Within the scope of the pension reform 2001, widow(er)s' pensions have been reduced from 60% to 55% of the old-age pension of the deceased if the survivor is either aged 45 and over or educating at least one child. Supplements are granted according to the total number of children the survivor has brought up. Pensions to childless widow(er)s under 45 are only paid for 24 months. In addition, since 2002 40% of own labour income (other percentages for other income sources) above a nominally fixed threshold is taken into account, leading to a relative reduction of real pension payments to widow(er)s over time.

³⁷ Cf. Pensions Commission (2004), p 262.

³⁸ In March 2005, the total contribution rate to health insurance was 16%.

³⁹ In March 2005, the contribution rate to nursing care insurance was 1.7% for those who were either born until 1940 or have raised children, 1.95% otherwise.

people aged 60 and over get free prescriptions from the NHS. Since July 2002, people aged 65 years and over receive free nursing care.⁴⁰

5.3.3 Financing

5.3.3.1 Germany

The GRV is mainly contribution-financed with a contribution rate of 19.5% of gross income in 2005, equally shared by employee and employer. The 2001 pension reform foresees a restriction of the total contribution rate to 20% until 2020 and 22% until 2030.⁴¹ Income is only considered between a lower and an upper earnings limit, where the upper earnings limit equals about 2.3 times the average income of all contributors⁴². In 2004, contribution payments accounted for about 76% of total funds. The remaining 24% were derived from the state budget.⁴³ The public funds aim at compensating the GRV for the payments to former citizens of the German Democratic Republic (the former East German State) who receive pension payments without having contributed to the scheme. Public funding is also used to cover payments based on pension credits for periods such as child-care, military or civil service and recognised educational periods (see 5.3.5). Since the public subsidy accounts for a considerable part of pension payments, the public pension financing has to be characterised as a mix of contributions and taxes. Public subsidies are uprated in line with the development of the contribution rate.

The GRV is a pay-as-you-go system, based on a pension formula (see 5.3.4).

5.3.3.2 United Kingdom

The Basic Pension and the SSP are contribution-financed pay-as-you-go systems. The contributions to the National Insurance (NIC) do not only cover the Basic Pension and the additional state pension, but the entire social security system. More than 10% are transferred directly to the National Health Service Fund that provides health insurance⁴⁴, the rest is managed by the National Insurance Fund and covers risks such as longevity, unemployment, long-term illness etc.

⁴⁰ People under the age of 65 years are only entitled to free nursing care if they reside in a nursing home.

⁴¹ See Federal Republic of Germany (2002), p 1. If the targeted rate is at risk of being surpassed, the government has to intervene.

⁴² In 2005, the upper earnings limit was €62,400 p.a. for West Germany and €52,800 p.a. for East Germany.

⁴³ See <http://www.vdr.de> (11.02.2004). Some taxes are directly transferred to the pension insurance, for example the receipts of the ecology tax.

⁴⁴ In the year 2001/2002, about 11% were transferred to the National Health Service; see Daykin (2000), p 22.

Contribution rates for employers and employees are progressively increasing with income.⁴⁵ Except for health, NIC amounted on average to 11.9% for the employer and 10% for the employee in 2003.⁴⁶ The progression has the effect of keeping the add-on costs for low-income labour relatively low, while high-income labour is charged relatively more. The rates are reduced if the person has contracted out of the additional state pension.

Contracted-out occupational or personal pension schemes are funded.⁴⁷ The contributions to the pension scheme have to be at least equal to the amount of the contracted-out NIC rebate. On average, employees in the private sector contributed 4.6% and employers 12% of gross wage to occupational pension schemes in 2001,⁴⁸ with contribution rates being significantly higher in the case of defined benefit compared to defined contribution schemes.⁴⁹ There are a number of legal requirements concerning the benefits and the types of investments.⁵⁰

Since contracted-out pensions are part of the statutory pension schemes, the British pension system is to a much smaller extent working on a pay-as-you-go basis in comparison with the German public pension and has, instead, a higher funded proportion.⁵¹

5.3.4 Calculation of benefits

5.3.4.1 Germany

Old-age pensions of the GRV are calculated on the basis of ‘earnings points’ (*Entgeltpunkte*) earned by participants during their working life. One point equals the payment of contributions for the average income of all contributors in one year. The annual maximum – corresponding to contributions at the upper earnings limit – has been about 1.8 earnings points before 2003. Due to strong increases in the upper earnings limit in recent years, the maximum number has risen to more than 2 earnings points in 2005.⁵² A minimum of five insured years is required to receive a pension payment at all. At the retirement date, the total of earnings points is multiplied by the ‘current pension value’ (*aktueller Rentenwert*). This pension value is updated every year according to the ‘pension formula’ (*Renten-*

⁴⁵ There are four contribution classes for different types of employment statuses. See Table A.6 in the Appendix for detail.

⁴⁶ Cf. Council of the European Union (2003), Table 9, p 69.

⁴⁷ The funds of occupational pension schemes are required to be held outside the company.

⁴⁸ Cf. Whitehouse (2002), p 37.

⁴⁹ Total contributions were about 16–20% of wage in defined benefit schemes and 7–11% in defined contribution schemes in 2003; cf. Pensions Commission (2004), p 88.

⁵⁰ Regulation based on the Pensions Act 1995 and the Welfare Reform and Pensions Act 1999, see Table A.6 in the Appendix.

⁵¹ Germany: 87% PAYG, 13% funded; Great Britain: 58% PAYG, 42% funded. See section 6.5.1.

⁵² Cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004), p 226.

formel) that is valid for the initial and the current old-age pensions.⁵³ Since 1992, retirement before the statutory age of 65 years leads to an actuarial reduction of the pension by 0.3% per month of early retirement; every additional month beyond 65 increases the pension by 0.5%.

Because of the accumulation of earnings points, contributions are recorded as relative incomes rather than a nominal amount of money. There is an intrinsic adjustment with the growth of wages according to the pension formula. Since July 2001, the formula uprates benefits in proportion to the development of gross wages minus GRV contributions and intended supplementary pension provisions.⁵⁴ However, the adjustment was suspended in 2004 and 2005.⁵⁵

In 2004, the pension formula has been reformed in two ways. As from 2005, a so-called ‘sustainability factor’ (*Nachhaltigkeitsfaktor*) corrects the pension benefit adjustment according to demographic changes, i.e. the development of the relationship between contributors and beneficiaries.⁵⁶ However, the sustainability factor is suspended if it would result in a nominal benefit reduction. Furthermore, a second correction factor has been introduced into the pension formula and will apply from 2006 onward. It takes into account changes in the basis of contributions, i.e. the development of total gross earnings of employees in the private sector⁵⁷ below the upper earnings limit.⁵⁸ The new pension formula leads to an adjustment by about 0.7 percentage points below earnings growth.⁵⁹

In addition to changes in the pension formula, the German Government has agreed on a gradual transition to EET taxation until 2040, starting in 2005 (see 5.3.6.1).

Before the 2001–2004 pension reforms, the goal of the German public pension policy has been to provide pensioners with sufficient income to maintain their position in society and allow for only a slightly reduced living standard after retirement. 67% of the personal average net income over the whole working life was

⁵³ For the calculation of incapacity and survivors’ benefits, the same formula is used but multiplied by a factor <1.0.

⁵⁴ During the two years prior to the introduction of this adjustment mechanism, adjustments were based on increases in the price level. Between 1969 and 1992, the pension formula led to a gross wage adjustment, from 1992 to 1998 a net wage adjustment.

⁵⁵ According to the current pension formula, there would have been a negative adjustment in 2004; cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004), p 237. The same is the case for 2005.

⁵⁶ Cf. Kommission zur Nachhaltigkeit in der Finanzierung der sozialen Sicherungssysteme (2003), p 84. Until 2030, this demographic factor will reduce pension adjustments by 7.7%; cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004), p 238.

⁵⁷ Including incomes of unemployed persons that lead to contribution payments.

⁵⁸ For more detail, see Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004), p 238. They come to the conclusion that the correction factor leads to a reduction in pension benefit growth by 2.2 percentage points in the time period 2006–2010 (p 239).

⁵⁹ Cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004), p 238.

assumed to be a sufficient net earnings replacement rate.⁶⁰ Since 1976, a net replacement rate between 67% and 72% has been realised by the GRV for a 'benchmark pensioner' (*Eckrentner*) with 45 contribution years at average income.⁶¹ However, currently 50% of male and 95% of female pensioners do not achieve this amount of earnings points.⁶² Since contributions are limited to an upper earnings limit at about twice the average income, GRV can only provide an adequate replacement rate up to that level of earnings.

With the pension reform 2001, the German Government moved from a replacement rate target to a contribution-oriented expenditure policy. The Government formulated a two-sided objective: to keep total contribution rates below or at 20% of earnings until 2020 and below or at 22% until 2030 while providing a pre-tax replacement rate for a standard pensioner of at least 46% of average net earnings until 2020 and of 43% until 2030.⁶³ The change in the target indicator from post-tax net replacement rate to pre-tax net replacement rate is necessary because of the transition to EET taxation. The currently realised pre-tax net replacement rate for a standard pensioner is about 52.4%. Obviously, the pension reforms of recent years lead to a considerable reduction in the level of public pension benefits. The gap is intended to be filled by heavily subsidised voluntary contributions to occupational and personal pension schemes⁶⁴.

Since entitlements for GRV benefits mainly derive from participation in the labour market, the objective to secure the living standard people had during working age can only be met for people who worked for most of their life or earned above average. The pension reforms of the 1990s have added several elements of social redistribution through granting pension credits (see 5.3.5).

The GRV has been a defined benefit pension scheme, but as a result of the pension reforms 2001–2004 with considerable reductions in the replacement rate target and an additional contribution rate target for the future it now is a mixed system with elements of both defined benefit and defined contribution calculation.

5.3.4.2 United Kingdom

For the calculation of Basic Pension benefits, only the number of contribution years is important. Every year of participation in the public pension system counts as a 'qualifying year' for the Basic Pension. Periods for which people receive credited pension entitlements also count as qualifying years. To receive the full Basic Pension⁶⁵, men need to accumulate 44, women 39 qualifying years.⁶⁶ A minimum

⁶⁰ Cf. §154 Abs. 3 No. 2 SGB VI (Social legislation concerning the public pension scheme GRV). Pensioners need relatively less net income because they do not need to provide for old age and have less expense in particular with regard to family obligations and work-related expenditure.

⁶¹ Verband Deutscher Rentenversicherungsträger (2000), p 236.

⁶² Schmähl (2003), p 16.

⁶³ Cf. <http://www.bmgs.bund.de/deu/gra/themen/rente> (12.02.2005).

⁶⁴ The so-called 'Riester pension'; see section 5.4 for detail.

⁶⁵ A full Basic Pension was worth £79.60 per week in 2004/2005.

minimum of one fourth is required to receive a pension payment at all. The amount is calculated proportionally to the total qualifying years. As from April 2005 people may postpone their retirement and gain an addition to the pension benefits of about 10.4% per year.⁶⁷ It is impossible to receive pension payments before the legal retirement age. Every pensioner aged 80 or over receives a minimum of 60% of the Basic Pension.

For the calculation of SSP benefits, earned income during the contribution years is multiplied by the average increase in wages. The upper limit for the pension benefit is set at 20% of the average individual income over the whole working life. SSP upgrades pension payments for people with low earnings.⁶⁸ In order to receive benefits, there is no minimum number of insured years.

Basic Pension benefits are adjusted annually to the increase in price levels in the preceding year. There were some extraordinarily high increases in 2001 and 2002, which aimed at improving the income situation of pensioners.⁶⁹ However, the full Basic Pension is still worth less than the guaranteed minimum income, called Pension Credit.⁷⁰ SSP (SERPS) benefits are uprated annually according to the increase in wages.

British governments have not formulated a targeted level of benefit payments for the public pension schemes. The reason is that the public pension payments are not aimed at securing a former living standard as in Germany. The Basic Pension provides a basic level of income that is supposed to prevent poverty among older people.⁷¹ As already mentioned, benefits from SSP/SERPS are limited to 20% of the personal average income during working life except for low-income earners in SSP. The British public pension schemes are defined benefit schemes.

Contracted-out occupational or personal pension schemes have to provide benefits no less than the level of SSP (until 2001 of SERPS). Defined benefit occupational schemes have to index pension benefits to prices, at maximum 5% per year.⁷² This rule does not apply to defined contribution schemes.⁷³ The majority of occupational pension schemes are defined benefit, but the proportion of defined

⁶⁶ In 1997, only 32% of the pensioners had a full Basic Pension; cf. Wittrock (1998), p 388.

The number of necessary qualifying years for women will be adjusted with retirement age from 2010 to 2020. Then, women will also need 44 years.

⁶⁷ Until then, retirement could only be postponed for a maximum of five years and was rewarded by an increment of 7.5% per year.

⁶⁸ Earnings below £11,600 p.a. are treated as £11,600 p.a., people with earnings between £11,600 p.a. and £26,600 p.a. receive higher pension payments than according to SERPS regulation (amounts at 2004/2005 levels).

⁶⁹ The increase was about 7.9% in 04/2001 and about 4.1% in 04/2002. Cf. Council of the European Union (2003), p 36.

⁷⁰ For one person, the full Basic Pension was £79.60 per week in 2004/2005, the maximum Pension Credit for people aged 65 and more was £105.45 per week; see also section 5.3.7.

⁷¹ Public benefits are considered to be the last safety net in the event of social risks, but they are not supposed to guarantee a certain living standard; cf. Wittrock (1998), p 389.

⁷² Cf. Pensions Act 1995, c. 26 no. 51.

⁷³ Cf. Pensions Commission (2004), p 262.

contribution schemes is growing continuously.⁷⁴ Personal pension schemes are defined contribution by their nature and do not uprate pension benefits with prices or wages.

5.3.5 Elements of social redistribution

An important means of social redistribution in both the German and British statutory pension systems are unisex pension benefits because of different life expectancy of women and men.⁷⁵ Furthermore, survivors' benefits are included in both pension systems. Additional redistributive measures in each country are presented below.

5.3.5.1 Germany

Social redistribution in the GRV is realised by awarding pension credits or by upgrading the paid contributions. Pension credits are inter alia assigned for each child (three earnings points per child), for periods of unpaid private nursing care and for educational periods (up to three years). Additionally, people in military or community service receive credits for this period.⁷⁶ Persons who had contributed for at least 35 years at an income level of less than 75% of average earnings before 1992 are entitled to a minimum pension (*Rente nach Mindesteinkommen*), i.e. a pension calculated as if the respective person had earned 75% of the average wage over her working life.⁷⁷

5.3.5.2 United Kingdom

For the Basic Pension, social redistribution is achieved by the flat-rate pension payment. Even though every insured person pays contributions relative to his/her labour income⁷⁸, the pension only depends on the number of qualifying years. In addition, pension credits are awarded to persons under so-called 'Home Responsibilities Protection' (HRP) such as caring for children or disabled relatives, or people receiving jobseeker's allowance.

For the SERPS, pension credits were awarded under the same conditions. The SSP is more generous to low-income earners and upgrades entitlements for earn-

⁷⁴ See United Kingdom of Great Britain and Northern Ireland (2002), p 56.

⁷⁵ See section 4.2.1.

⁷⁶ For more detail, see Table A.6 in the Appendix.

⁷⁷ People from East Germany were integrated in the GRV after reunification. Pensions paid are tax-financed through public transfers to the GRV.

⁷⁸ The insured person pays a contribution rate of 8% on earnings up to the upper earnings limit and 1% on earnings above this limit, employer contributions are paid on total earnings without upper limit.

ings below certain earnings limits. There are also some additional personal circumstances according to which people receive free pension credits.⁷⁹

5.3.6 Taxation of contributions and benefits

5.3.6.1 Germany

Employers' contributions to all types of statutory pension schemes are deductible from taxable income. Employees' contributions to the GRV can be deducted from taxable income as provision expenditure (*Vorsorgeaufwendungen*) along with health insurance contributions. As the tax allowance is not always sufficient for deducting the total provisions, it can be assumed that parts of the GRV contributions are subject to income taxation. Benefits from GRV are only partly taxed.⁸⁰ Since tax allowances are high, only a small proportion of pensioners is affected. However, in April 2004 the German parliament decided on a gradual transition to the EET model for the taxation of all pension incomes from 2005 until 2040.⁸¹ Pension contributions will be gradually exempt from income taxation until 2025 and pension benefits will be – apart from general tax allowances – entirely subject to income taxation in 2040.

5.3.6.2 United Kingdom

The British tax treatment of pension schemes follows the EET model. Employers' contributions to the basic state pension and SSP are not subject to taxation. Employees' contributions can be deducted from taxable income. Contributions to contracted-out occupational and personal pension schemes are deductible from taxable earnings by employers and employees up to a certain limit of total contributions.⁸²

All types of pension benefits are treated equally and are fully subject to income taxation.⁸³ However, personal tax allowances are higher for people over the age of 65 than for younger people.⁸⁴

⁷⁹ For more detail, see Table A.6 in the Appendix.

⁸⁰ The benefit payments are fictitiously split into two parts, the basic benefits (repayment of accumulated capital) and interest income. Only the latter is taxable. The calculation of the interest is questionable from an economic point of view; see Andel (1970).

⁸¹ *Alterseinkünftegesetz* (Law on old-age incomes).

⁸² The maximum amount deductible from employer and employee was £3,600 for the tax year 2004/05.

⁸³ Except for child and Christmas supplements.

⁸⁴ Cf. Table A.6 in the Appendix.

5.3.7 Minimum pension and subsidiary system

5.3.7.1 Germany

As from 2003, there exists a means-tested minimum income called ‘Needs-related Basic Provision’ (*Bedarfsorientierte Grundsicherung*) for persons aged 65 or over and for permanently disabled persons aged 18 and over. The means test concerns household income and savings. The benefits are slightly higher than the general social assistance and there usually is – in contrast to the social assistance – no claim of maintenance to children⁸⁵. This minimum income is not paid by the GRV, but the GRV administration advises people about this benefit. The minimum income benefits are tax-financed and the responsibility for the payment lies with the local authorities.

Until 2002, pensioners had to rely on the general social assistance (*Sozialhilfe*). At the end of 2000, only 1.4% of persons older than 65 years were receiving continuous social assistance.⁸⁶ This percentage is considerably smaller than the German average of 3.3% and the lowest among the population if split in age-groups.⁸⁷ However, proportions of social assistance recipients were considerably above average for those aged 75 and over and especially for women of this age.⁸⁸

5.3.7.2 United Kingdom

In October 2003, a new form of minimum income called *Pension Credit* was introduced, replacing the *Minimum Income Guarantee* (MIG). It is a tax-financed and means-tested benefit for people over the age of 60 and is subsidiary to the public pension schemes. The means test applies to household income and savings. In contrast to the MIG, where every type of own income was fully deducted from the payable amount, the withdrawal rate of the Pension Credit is only 40% of own incomes for people aged over 65 and savings allowances were considerably raised as well. Up to 50% of households over 60 were supposed to receive the Pension Credit in 2004.⁸⁹ The benefits are uprated in line with earnings growth rates annually.

The Pension Credit upgrades income to a higher level than the value of the full Basic Pension. Consequently, poor pensioners do not rely on the Basic Pension but on this minimum income. This fact is important for the empirical analysis of pensioners’ incomes (6.6). It is necessary to include the minimum income benefits in the calculations to find out how the income situation of British pensioners really is.

⁸⁵ If the child’s income does not exceed €100,000 p.a.

⁸⁶ See Federal Republic of Germany (2002), p 9.

⁸⁷ Cf. Statistisches Bundesamt (2003), Schaubild 1.

⁸⁸ Cf. Statistisches Bundesamt (2003), Schaubild 2.

⁸⁹ Cf. Council of the European Union (2003), Table 1, p 26. About two thirds of Pension Credit beneficiaries are women; cf. Pensions Commission (2004), p 268.

5.4 Supplementary pension provision

5.4.1 Germany

Occupational and personal pension schemes only provide a relatively small part of German old-age incomes (17% of total old-age income, cf. Figure 5.1).⁹⁰ The 2001 pension reform tried to increase their share in old-age income sources. Therefore, a short summary of this important pension reform is given before the analysis proceeds with non-mandatory pension schemes in general. Further types of personal pension provision will not be included in the institutional analysis but in the empirical part in chapter 6.

5.4.1.1 *The pension reform 2001*

The objective of the German pension reform 2001 was to reduce the public pension payments to participants in the GRV as well as to members of the civil servants' pension scheme and in turn to improve pensioners' entitlements to occupational and personal pensions. An increasing part of labour income (1% in 2002, increasing to 4% in 2008) should be voluntarily invested into occupational and personal pension schemes, publicly supported by tax reductions or direct public grants ('Old-age provision bonus'). The grants especially favour low-income earners and large families. A right for employees to convert up to 4% of their pre-tax earnings into contributions to an occupational pension scheme was introduced.⁹¹ There are several legal conditions that have to be fulfilled until the state approves a pension contract.⁹² The reform has also introduced pension funds in Germany that were not legally embodied pension schemes before.

The issue of whether or not to make the supplementary pension provisions mandatory was discussed at great length. The majority of pension policy experts favoured a mandatory insurance, but the government chose a voluntary solution. They hoped that the incentives given by the high subsidies would be strong enough to incite people's interest in supplementary pension provisions. But the response rate is much lower than expected. By the end of the year 2002, only 16%

⁹⁰ For a detailed analysis of old-age income composition, see section 6.5.

⁹¹ §1a Gesetz zur Verbesserung der betrieblichen Altersversorgung (Law for the improvement of occupational pension provision). Depending on the type of occupational pension scheme, contributions to these schemes are also exempt from social security contributions until 2008; cf. Table A.6 in the Appendix.

⁹² E.g. benefits have to be paid as a lifelong pension at the latest from the 85th birthday, guarantee of total contributions, no inheritance of the state subsidies, loss of subsidy in case of move abroad; see §1 Gesetz über die Zertifizierung von Altersvorsorgeverträgen (Law on the certification of old-age provision contracts).

of the eligible persons had signed a 'Riester contract'.⁹³ The Government is legally obliged to review the voluntary approach in the course of the year 2005.⁹⁴

The pension reform also comprised a reduction of survivors' benefits, especially for widows and widowers (see 5.3.2).

5.4.1.2 Coverage of the population

Occupational pension schemes covered 48% of male and 18% of the female workforce in the private sector in West Germany in 1996 and only 15% of men and 22% of women in East Germany.⁹⁵ 64% (59%) of men and 40% (52%) of women in West (East) Germany contributed to personal pension schemes.⁹⁶ Contributions to recognised 'Riester contracts' are publicly supported for members of the GRV and the civil servants scheme.

Until the introduction of public support for 'Riester products', the most popular means of personal old-age insurance was the 'life insurance' (*Lebensversicherung*), which does not always contain pension insurance. In 2003, three quarters of German households had one or more life insurance contracts.^{97 98} This insurance covers a previously defined person in the case of the death of the insured, but it can also be transformed into a lump-sum payment or an annuity when an agreed age is reached. Contributions and benefits of life insurances have always been treated favourably by income tax law. However, from January 2005, life insurance contracts are not treated exceptionally any more. Contributions and investment returns are entirely submitted to income taxation.

5.4.1.3 Insured risks

Two thirds of occupational and personal pension schemes comprise provisions for invalidity and/or survivors' pensions.⁹⁹ For the public support as a 'Riester product', only the risk of longevity by providing a life-long pension payment must be insured.

⁹³ See Schnabel (2003), p 14. 3.5 million people had signed a private pension provision contract, two million had entered an occupational scheme. Total occupational pension coverage increased from 35% in 2001 to 42% at the end of 2003.

⁹⁴ §154 SGB VI (social law). Hauser (2003), p 222 assumes that there will be an obligation for private provisions in the future.

⁹⁵ Persons of birth cohorts 1936–1955; including additional pension schemes of the employees in the public sector. Cf. Verband Deutscher Rentenversicherungsträger (1999), p 51.

⁹⁶ Cf. Verband Deutscher Rentenversicherungsträger (1999), p 51.

⁹⁷ Cf. Handelsblatt, 5.9.2003, *Glanz der Lebensversicherung verblasst*.

⁹⁸ Stein (2004), Tabelle 3.9, p 172 finds for the year 1998 on the basis of the German Income and Expenditure Survey that more than 27% (West 29%, East 14%) of the private households' net monetary wealth was the current value of insurance assets, mainly in the form of life insurance contracts.

⁹⁹ See Ebinger (2001), p 109.

5.4.1.4 Financing

Occupational and personal pension schemes are contribution-financed. There is public financial support of various types, often provided by tax relief or – less commonly – by direct public grants. Both possibilities exist alternatively for the support of ‘Riester products’. Employers often participate in the contributions to occupational pension schemes. Their intention is to tie the employee to the company. The conditions are often part of wage negotiations between employers’ federations and trade unions. However, funds accumulated in ‘Riester products’ are required to be transferable to a new employer’s scheme.¹⁰⁰ Occupational pension entitlements may be transferable as well, depending on the duration of employment with one employer and individual age.

Occupational pension schemes are funded within the company or by investment companies who manage the pension provision funds. Personal pension schemes are funded schemes and take the form of a pension insurance (or life insurance) or a savings plan with a bank or an investment firm.

5.4.1.5 Calculation of benefits

Most of the occupational pension schemes are defined benefit. Pension payments depend on both contribution years and income, where the duration of employment for the respective company is the most important aspect. A few schemes have targets for the total replacement rate, including GRV benefits.

Personal pension schemes are defined contribution, since a body like the state or the company to bear the risks incorporated in defined benefit schemes as defined in section 3.2.2.1 does not exist. In consequence, there is no benefit level target. However, the legal conditions for ‘Riester products’ demand a guarantee that at least the nominal value of the contributions will be available at the date of retirement.¹⁰¹

There are adjustment rules for benefits of occupational pension schemes, but they may be ruled out if the employer faces a difficult economic situation.¹⁰² As these are funded schemes, their development depends only on the rate of return of the underlying investment products.

5.4.1.6 Elements of social redistribution

Generally, only occupational pension schemes can carry out social redistributive measures, because they cover a collective of insured members. This is especially the case for pension schemes negotiated between employers’ federations and trade

¹⁰⁰ Cf. Gesetz über die Zertifizierung von Altersvorsorgeverträgen, §1 Abs. 1 Nr. 10b (Law on the certification of old-age provision contracts).

¹⁰¹ Cf. Gesetz über die Zertifizierung von Altersvorsorgeverträgen, §1 Abs. 1 Nr. 3 (Law on the certification of old-age provision contracts).

¹⁰² Cf. Gesetz zur Verbesserung der betrieblichen Altersversorgung, §16 (Law for the improvement of occupational pension provision).

unions. Most of the occupational pension schemes offer unisex pension benefits as a means of redistribution in favour of women. Many of them also grant survivors benefits without additional contributions. Other measures are very rare in non-public pension schemes.

5.4.1.7 Taxation of contributions and benefits

Contributions to occupational pension schemes and personal pension provisions in a 'Riester contract' are deductible as special expenditure (*Sonderausgaben*) from the taxable income up to a certain limit¹⁰³. Benefits from such occupational and personal pension schemes are subject to income taxation. In other words, taxation of 'Riester' supplementary pension schemes corresponds to the EET model. However, other types of occupational pension schemes are subject to other tax regulations.¹⁰⁴

5.4.2 United Kingdom

Most of the existing occupational and personal pension schemes in the UK are based on contracted-out legal regulations. Because their features were already analysed in section 5.3, there is nothing to add about these schemes.

There are a variety of other personal pension provisions, from real estate to investment of any kind that will not be analysed further. Nonetheless, all sorts of pension incomes are included in the empirical study in chapter 6.

5.5 Preliminary assessment of the pension systems

On the basis of the theoretical analysis of the effects of exerted by external risk factors and influenced by different structural elements of pension systems carried out in chapter 3 and the institutional overview of the two studied systems given by the present chapter, it is possible to formulate assumptions about sustainability and distributional effects of both pension systems. The assumptions will be formulated in the form of hypotheses. It will be queried in the following chapters 6 and 7 if they apply or not, where chapter 6 focuses on income distribution and section 7.1 on the issue of sustainability. However, it has to be taken into consideration that the hypotheses refer to the key pension schemes of each system as described above. Thus, some parts of the pension systems are missing and may countervail the effects assumed for the core systems. Furthermore, the description reflects the current pension regulations in both countries, whereas pension benefits are also

¹⁰³ €25 p.a. in 2003.

¹⁰⁴ See Table A.6 in the Appendix.

the result of earlier regulations, since reforms usually do not change already acquired pension rights.

The hypotheses about the distributional effects and the financial sustainability of the German and the British pension systems are the following, where hypotheses 1–5 refer to the current situation of the pensioners and the pension systems and hypothesis 6 concentrates on the expected development of the systems throughout the coming 40–50 years:

1. The *distribution of old-age incomes* is more equal in Germany than in the United Kingdom due to the higher proportion of public defined benefit pensions including elements of social redistribution in that country. Additionally, a large part of British pensioners faces investment risk in their contracted-out pension schemes.
2. British pensioners face a higher *poverty risk* than German pensioners because of the lower replacement rate of public pension benefits in that country. Even a full Basic Pension does not attain the level of subsistence benefits (Pension Credit). Therefore, many British pensioners rely on means-tested public benefits.
3. *Gender equality*: Women benefit disproportionately from the elements of social redistribution in public pension schemes. Consequently, the higher proportion of public benefits in Germany compared to the UK brings German women closer to equitable pensions (relative to men) than British women.
4. Both theoretical and institutional analyses cannot predict which system is providing better means for individuals to *secure their standard of living after retirement*, or in other words, which system leads to higher individual replacement rates.¹⁰⁵ The outcome of the UK pension system in this regard depends largely on the individuals' propensity to voluntarily build up sufficient funds for old age. In Germany, with the reforms already in place people face a reduction in the target replacement rate of the public pension scheme. Therefore, German pensioners in the future will have to rely increasingly on their individual saving effort, too, either in the form of occupational or personal pensions (e.g. Riester) or other forms of saving.
5. *Intergenerational equity* is not achieved in the UK system, because Basic Pensions and contracted-out pensions are not indexed to wages. Consequently, the relative income position of pensioners compared to the overall average decreases over time. In Germany, intergenerational equity may have been considered at risk until recently because the financial burden of demographic change seemed to be disproportionately borne by contributors. However, recent reforms seem to have led to a more equal split of emerging costs. This argument is closely connected to the issue of sustainability.
6. *Financial sustainability* of the public pension scheme in the UK is not at risk. However, if an increasing number of pensioners relies on the tax-financed Pension Credit because Basic Pensions are below subsistence and contracted-out

¹⁰⁵ However, higher replacement rates must not always be better; the adequate level depends on individual preferences.

pensions miss their target level, total public old-age expenditure may rise considerably and consequently risk the overall sustainability of public finances. Due to the adverse effects of demographic change on pay-as-you-go-financed pension schemes, the German public pension system faces a significant risk of unsustainable finances. Recent reforms have come very late to limit financial problems. Since pension benefits are reduced considerably, particularly low-income pensioners may have insufficient other sources of old-age income and may become dependent on public subsistence benefits – thus a transition of the financial burden to another part of the public budget without effect on overall financial sustainability.

These hypotheses reflect the earlier established objectives of pension systems and can be considered the guidelines for the empirical analysis carried out in chapters 6 and 7. A crucial question is whether the institutional arrangements of a pension system do significantly affect the level of old-age incomes and their distribution. In this case, the hypotheses should hold. In contrast, if people provide sufficiently for their old age, independently of the scope of mandatory insurance, the hypotheses will turn out to be wrong. Accordingly, the empirical results will show to what extent the structure of a pension system affects its outcomes and hence what can be expected from different reform proposals with respect to sustainability and distributional effects.

6 Empirical analysis of the income situation of the elderly in Germany and the United Kingdom

6.1 Preliminary remarks

The following empirical analysis will measure the success of the national governments in meeting the formulated objectives of pension policies (chapter 2) with the legally embodied structures of the national pension systems (chapter 5). In contrast to the rest of the study, the empirical analysis refers to Great Britain instead of the United Kingdom. This is due to the used income data set that does not cover Northern Irish households appropriately (see 6.1.4). However, the trends in income distribution presumably are not significantly influenced by the differing geographic definition.

6.1.1 Objectives of the empirical analysis

With a sound knowledge of the institutional composition of the German and the British pension system (chapter 5), the question has to be raised whether institutional structure really matters. To be more precise: Does the legal framework affect the level and the distribution of pensioners' incomes or do people provide for their old age independently from statutory arrangements? Since the two considered pension systems differ fundamentally, empirical findings about old-age incomes and their distribution among the elderly must also be significantly different if there is an impact of the institutional structure on the distributional effects of the respective system. Hypotheses about the differences were formulated in section 5.5. On the contrary, if there are similar results for both countries, it has to be assumed that the income situation of the elderly does not depend on the underlying regulation.¹ In that case, a theoretical analysis about the best possible organisation of a pension system as carried out in chapter 3 would mainly be interesting from a macroeconomic point of view, namely concerning the best financing structure of future pension liabilities. Yet there would only be a minor effect of the

¹ Yamada and Casey (2002), p 8 calculate quasi replacement rates of total old-age income to income of the working age population in a number of OECD countries (including Germany and the UK) on the basis of LIS income data (Luxembourg Income Study) and achieve the result that the elderly realise an average replacement rate of about 70–80%, regardless of the level of public pension expenditure.

pension system on the individual income situation of the elderly. National governments would either need to influence the population's attitude toward pension provisions or decide to fill the gap between the actual and the desired level of old-age incomes.

As formulated in the hypotheses above, it can be assumed from the institutional background that the incomes are distributed more equally among German than among British pensioners. This is because the British pension system contains more private pension provisioning with significantly less elements of social redistribution and with a continued record of inequalities that originated in working life.² On the other hand, the majority of German pensioners rely heavily on the public pension scheme (GRV), which contains a number of redistributive elements and pursues the objective of providing a standard of living comparable to that during a person's working life.

As far as the composition of incomes is concerned, British old-age incomes presumably consist of relatively similar shares from different sources, whereas German pensioners receive most of their income from the public scheme with minor contributions from other components.

6.1.2 Income concepts

The used income concepts are based on the definitions by Becker et al. (2002, Table 2.1). The authors refer to recommendations of the *Expert Group on Household Income Statistics* or *Canberra Group*, published in their Final Report in 2001³.

Personal income is used as a proxy for economic well-being, because it is usually the most objective measure for well-being for policy purposes⁴. However, it would be desirable to include information on the level of wealth and consumption spending to get a more precise picture of a person's living standard. But firstly, there is insufficient data for the elderly in this regard and secondly that would go beyond the scope of this empirical section. Thus, the results can only give an indication of the effective personal well-being of the elderly in Germany and Great Britain during the past decades.

As a reference for the following, Becker et al. (2002, Table 2.1, p 57) provides a detailed picture of the components of different income definitions.⁵

6.1.2.1 From market income to disposable income

Market income (or primary income) is the sum of all incomes that originate from market activities such as cash wages and salaries, income from self-employment as well as income from financial and real assets. If received private transfers are

² Cf. Casey and Yamada (2002), p 5.

³ The Canberra Group (2001).

⁴ The Canberra Group (2001), p 3.

⁵ A more detailed disaggregation is used in The Canberra Group (2001), Appendix 4, pp 167ff.

added – for example child support or alimonies – the notion *pre-government income* is used.

In the next step, income redistribution by public administration is taken into account. Tax payments and social security contributions reduce the income of a household. On the other hand, public transfers from social security and social assistance schemes are added. The result is the post-government income or *net income* of a household. The *disposable income* is further reduced by regularly paid private transfers to other households and charities. Disposable income is the preferable measure for analysing income distribution.⁶

The defined income categories are not always exactly matched by the survey data, but the analysis tries to stay as close as possible to the defined concepts. In the dataset used, the net household incomes are constructed as explained in section 6.1.4.

The analysis considers cash income and the rental value of owner-occupied housing. Other in-kind benefits such as medication and care services are not taken into account, although they can be assumed to be of major importance for parts of the elderly population. Casey and Yamada (2002, pp 11f, Table 7) argue that public in-kind benefits to elderly persons in both Germany and Great Britain are worth about 50% of public monetary benefits.

6.1.2.2 Equivalent income

So far, income is only measured on the individual or on the household level. However, to study the welfare of individuals, their household context has to be taken into account. In order to assign income to all household members, there are some assumptions to be made about intra-household income repartition. First, all incomes of household members are considered to be equally shared so that all household members attain the same level of economic well-being.⁷ Second, there exist economies of scale for two and more person-households.

To derive an adjusted or *equivalent* income for the household members – taking into account the household size and its composition –, a weight is assigned to each person. In this study, the earlier OECD equivalence scale is used, which assigns the weight 1.0 to the household head, 0.7 to every additional household member aged 15 years or older and 0.5 to every child under 15 years. There are other equivalence scales, but the comparative results on income distribution for the two countries only differ in terms of absolute numbers and usually not in relative levels.⁸ However, a different equivalence scale may lead to differing results in a

⁶ The Canberra Group (2001), p 24.

⁷ This assumption is not always true. For example, roomers or boarders do not share in the income of the rest of the household but contribute to the main renter's or owner's income. Cf. The Canberra Group (2001), p 34.

⁸ Gottschalk and Smeeding (1998), p 13 find that the choice of equivalence scale does not affect the ranking in a cross-national context. Yamada and Casey (2002), p 33–36 show the effects of different equivalence scales in an international comparative context. See

comparison between different groups of the population, i.e. the elderly compared to other age-groups. The use of the revised OECD scale (personal weights are 1.0 – 0.5 – 0.3), which is employed by the European Commission, would lead to relatively worse results for the income situation of the elderly compared to the rest of the population. That is because the revised OECD scale assumes higher economies of scale in the household and pensioners live in households below average in terms of size.⁹ For the comparison within the group of elderly people, it seems more appropriate to use the earlier OECD scale implying lower economies of scale because of a high proportion of health and consumption expenditure and a low level of savings of this age-group.

The equivalent income of the household members is calculated by dividing the household income by the sum of personal weights. It corresponds to the income each household member would have to receive if he/she would live in a single household at the same level of welfare. Consequently, the total income of other than single households is ‘inflated’ by the gains from common housekeeping. The equivalent income is thus affected by changes in household income as well as in household structure. For example, the entrance of an additional person into the household can have different effects on the equivalent income. If the new entrant is receiving income, it depends on the amount of his/her income and the incomes of the initial household members whether the new entrant can improve the overall well-being of all household members by increasing the equivalent income of every person in the household. If a new household member does not receive any income (like a baby born into the family), equivalent income is reduced for all household members. On the other hand, if a person leaves the household, it depends on his/her previous income in relation to that of the other household members whether equivalent income increases or decreases. In the case of the target population of this study, namely the elderly, the exit of a household member may be the death of the partner, which can result in a better equivalent income position afterwards if derived income flows exist (e.g. survivors’ benefits from public or private pension schemes).¹⁰

For the analysis, only cases with a positive equivalent net income are taken into account, since it is not reasonable that people can live with a negative or zero annual income.¹¹ Price level changes are reflected by transforming the income data into real incomes at prices of 1995 using national consumer price indices.¹² German figures are converted into Euro at a fixed rate of 1.95583 DEM per EUR.

also Hauser and Strengmann-Kuhn (2004) who calculate old-age poverty rates for the EU based on different equivalent scales and poverty lines.

⁹ Cf. Yamada and Casey (2002), chart 5.1, p 66 and tables 5.1 and 5.2, p 47. The relation of household size and age is similar in the studied countries.

¹⁰ Due to the equivalent income concept, this is the case if the survivor of a couple receives more than 58.8% of the former common income.

¹¹ In Germany, the maximum number of 55 cases is dropped because of this assumption, i.e. 0.3% of the observations. In Great Britain, usually one case is dropped. Consequently, it can be assumed that the results are not affected by the restriction.

¹² Cf. Table A.2 in the Appendix.

The comparison of German and British income figures requires a transformation of currency. Since the exchange rates do not adequately reflect the real value of an amount of money, purchasing power parities (PPP) by the OECD are used to achieve comparative price levels¹³. When useful, British income data are transformed into Euro.

6.1.3 Measuring income distribution

6.1.3.1 Income levels

To get an initial idea of an income distribution, central tendency measures such as the arithmetic mean and the median are used. The *mean* is the arithmetic average of all (income) observations. The problematic aspect of this measure with income data is that it is very vulnerable to extreme values and asymmetries of distributions.¹⁴ Its advantage is that the means of different income sources in one period add to mean total income. To prevent the strong influence of extreme values, the *median* can be used alternatively. The median value is the observation in the middle of the distribution. This measure is more robust, but it does not reflect the upper part of the distribution. The median income is usually lower than the mean income because income distributions are normally skewed towards the lower end of the distribution.¹⁵

6.1.3.2 Inequality

There are a variety of measures for the inequality of income distributions that respond differently to changes in the distribution of income across individuals.

A graphical representation of income distribution is the *Lorenz curve*. On the horizontal axis, the units of analysis (usually persons) are lined up according to their income and are presented as a cumulated proportion of the considered population. The vertical axis shows the cumulated proportion of total income they receive. The income is distributed equally if the curve is a diagonal line. The farther the curve is below this line, the more unequal the income distribution. The problem with this presentation is that it only allows a judgement about two income distributions if there is no intersection between the corresponding Lorenz curves. Figure 6.1 shows a sample Lorenz curve for income distribution.

¹³ PPP are rates of currency conversion that eliminate differences in price levels between countries. The OECD estimates annually PPP for all member countries in relation to one US Dollar. For the numbers and more information on PPP cf. Table A.2 in the Appendix and <http://www.oecd.org/std/ppp>.

¹⁴ Cf. The Canberra Group (2001), p 92.

¹⁵ Cf. The Canberra Group (2001), p 93.

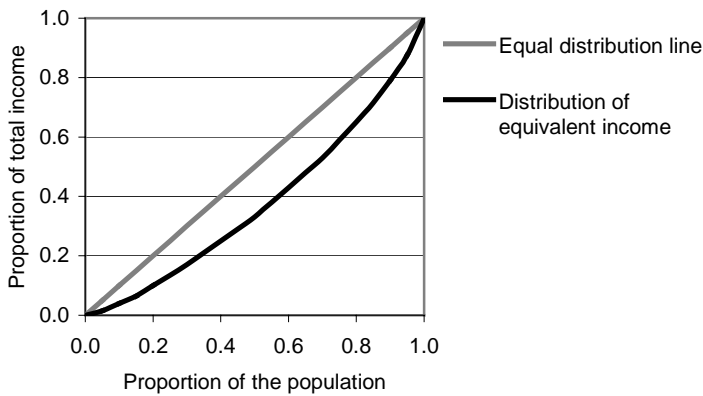


Figure 6.1. Lorenz curve for the distribution of equivalent net income

Source: own illustration.

The *Gini coefficient* is derived graphically from the Lorenz curve. It measures the Lorenz area between the curve and the equal distribution line as a proportion of the total area below the diagonal.¹⁶ It takes values between 0 and 1, where 0 signifies equal distribution and 1 means that one person receives the whole income. Since the calculation of the Gini coefficient is based on the Lorenz curve, it bears the same problems concerning the comparability of two distributions. The same value can be derived from totally different Lorenz curve shapes. Furthermore, it is very sensitive toward changes around the mean of the distribution and less so to changes at the lower or upper end.¹⁷

Other summary measures are sensitive to different segments of the income distribution. The *Atkinson index* is able to reflect changes in different parts of the distribution by using different values for the parameter ε – the level of inequality aversion – in the formula¹⁸. ε can be set between 0 and 1, where the index is the

¹⁶ $G = 1 + \frac{1}{n} - \frac{2}{n^2 \mu} \sum_{i=1}^n i y_i$ where: n = number of persons; μ = mean income;

y_i = income of person i ; $y_1 \leq y_2 \leq \dots \leq y_n$

¹⁷ Cf. The Canberra Group (2001), p 96.

¹⁸ $A = 1 - \left[\frac{1}{n} \sum_{i=1}^n \left(\frac{y_i}{\mu} \right)^{1-\varepsilon} \right]^{\frac{1}{1-\varepsilon}}$ where: n = number of persons; μ = mean income;

y_i = income of person i ; ε = level of inequality aversion, $0 \leq \varepsilon \leq 1$

more sensitive to changes in the lower (upper) segment of the distribution the closer ε is to 1 (0).¹⁹

A measure that can be used to examine changes in the lower part of the income distribution is *Theil's entropy index*, i.e. the *Mean Logarithmic Deviation (MLD)*.²⁰ It has the minimum value 0, but there is no maximum. The less equal the distribution of income, the higher the value.²¹

6.1.4 The datasets

The empirical analysis relies on microeconomic household datasets. Calculations are mainly based on the Cross-National Equivalent File (CNEF), which contains comparative data files for Germany and Great Britain, derived from the German Socio-Economic Panel (GSOEP) and the British Household Panel Survey (BHPS), respectively. The datasets are presented briefly in the following paragraphs.²² All datasets are of panel structure, meaning that the same individuals are interviewed repeatedly (in this case, every year) and can be identified over time. Consequently, this allows for the study of developments in income, employment etc. over time on the individual and on the household level.²³

6.1.4.1 The German Socio-Economic Panel (GSOEP)²⁴

The German Socio Economic Panel (GSOEP) is the international public use version of the Socio-Economic Panel (SOEP) and contains a 95 percent random subsample of the original data. The SOEP was established in 1984 and has been produced by the DIW (Deutsches Institut für Wirtschaftsforschung, *German Institute for Economic Research*) since 1990. It is a random sample²⁵ with voluntary participation.²⁶ In 1984, it contained about 15,300 individuals belonging to 5,600 households in West Germany, both with German and foreign household heads.²⁷

¹⁹ Cf. The Canberra Group (2001), p 101.

²⁰ $MLD = \frac{1}{n} \sum_{i=1}^n \ln \left(\frac{\mu}{y_i} \right)$ where: n = number of persons; μ = mean income;

y_i = income of person i

²¹ There is a second specification of the MLD which measures changes in the upper tail of the distribution.

²² Haisken-DeNew (2001) provides a comparative overview of the three datasets.

²³ For the application of panel methods, see section 6.6.

²⁴ This introduction to the SOEP is mainly based on Haisken-DeNew and Frick (2001) and <http://www.diw.de/english/soep/index.html>.

²⁵ The samples are multi-stage random samples with regional clustering. For more detail about the survey design, see Haisken-DeNew and Frick (2001), pp 121–136

²⁶ Non-participation seems to follow a random process, cf. Wagner et al. (1994).

²⁷ Sample A contained about 4,500 households with a household head who does not belong to the main foreigner groups. The latter – i.e. households with a Turkish, Greek, Yugo-

In 1990, about 2,200 East German households were included additionally. A survey on immigrant households in West Germany (immigration after 1984) with a sample size of about 500 households was added in 1995. The sample size was increased by 1,100 in 1998 and doubled in 2000. In 2001, the SOEP contained approximately 30,000 individuals in about 13,000 households. All household members aged 16 and over are interviewed directly with a choice among face-to-face, self-completion and computer-assisted telephone interviews. Proxy interviews are not allowed for adult members. All household members are followed in the case of household split-offs.²⁸

Income is recorded in different ways. First, the household head is asked for the present monthly net income received by all household members. This income measure is called ‘income screener’. Second, all household members aged 16 and over are interviewed about the different types of income received during the previous year as well as the average monthly amount for those months that the income source was received.²⁹ The CNEF file is based on these income figures, aggregated on the household level.³⁰ Finally, every adult is asked about his/her present gross and net labour income per month without any extraordinary payments.³¹ Tax payments and social security contributions are simulated by a model developed by Schwarze (1995), the imputed rental value for owner-occupied housing is estimated by a regression model developed by Frick and Grabka (2000). The dataset contains cross-sectional weights that are based on the annual Population Survey of Germany (*Mikrozensus*) as well as longitudinal weights, derived from the cross-sectional weight of the first wave and the annual staying probabilities of the respective individual.³²

The tails of the distribution are underrepresented in the dataset.³³ Homeless people are entirely excluded and people living in institutionalised accommodation³⁴ are only covered if they have moved out of a SOEP household³⁵. Only 60–

slavian, Spanish or Italian household head – were part of Sample B, which covered about 1,400 households; see Haisken-DeNew and Frick (2001), p 17.

²⁸ Until 1989, only original household members were followed.

²⁹ The distinguished income sources are: employment income, self-employment income, second job income, old-age pension, widow(er)s pension, unemployment benefits, unemployment relief, subsistence allowance, maternity benefits, student aid/scholarship, payments from outside of the household, other. For details about the corresponding survey design, see Haisken-DeNew and Frick (2001), pp 67–73.

³⁰ Cf. Haisken-DeNew and Frick (2001), p 88.

³¹ Wagner (1991), pp 27–29 gives an introduction to both ways of income recording in the SOEP interviews.

³² For more detail on the construction of weights in the SOEP, see Haisken-DeNew and Frick (2001), pp 136–148.

³³ Cf. The Canberra Group (2001), p 53; see section 6.1.1.4.

³⁴ Institutional accommodation includes student homes, armed forces barracks, hospitals, nursing homes for frail elderly, etc.

³⁵ The follow-up rules have led to a better representation of persons residing in institutions in later waves, see Haisken-DeNew and Frick (2001), pp 148ff.

70% of social assistance recipients are covered.³⁶ Households with high incomes are underrepresented. An important aspect for this study is that also elderly persons are under-represented in the samples, especially those aged 70 and over in East Germany.³⁷ Non-response to income questions as well as understatement of income is substantial, especially for incomes from self-employment and property income with only 60–75% of total income covered.³⁸

6.1.4.2 The British Household Panel Survey (BHPS) ³⁹

The British Household Panel Survey (BHPS) is carried out annually by the ESRC UK Longitudinal Studies Centre with the Institute for Social and Economic Research (ISER) at the University of Essex. It started in 1991 with a nationally representative sample⁴⁰ of about 10,300 individuals in about 5,500 households in England, Wales and Scotland.⁴¹ In 1997, a sub-sample of the UK European Community Household Panel (ECHP) was integrated, including 140 households of Northern Ireland and an over-representative sample of 1,000 low-income households in Great Britain who had been surveyed since 1994.⁴² Consequently, the panel has been covering the entire UK since then. However, the size of the Northern Irish sample is not representative for the proportion of the population living in that region. In 1999, two additional samples in Scotland and Wales of about 1,500 households each were added to the BHPS. A further extension was realised in 2000 with a new sample of about 2,000 households of Northern Ireland.

All members of the household aged 16 and over are interviewed personally with the entire questionnaire. Since 1994, there is a short additional questionnaire to children aged 11–15. Proxy interviews about other household members are allowed. Income data is surveyed in similar ways as in the GSOEP. Individuals are asked about their income sources and the corresponding amounts for every month of the preceding year.⁴³ Additionally, there is a question about the individual net income received in the previous month. Where parts of the information are missing, the values are imputed.⁴⁴ As for the German data, the figures for the preceding year are annualised and aggregated over all household members in the British

³⁶ Cf. Becker et al. (2002), p 64.

³⁷ Cf. Haisken-DeNew and Frick (2001), p 129.

³⁸ Cf. Becker et al. (2002), p 64 and Schräpler (2002).

³⁹ This introductory section on the BHPS is mainly based on Taylor et al. (2001) and <http://www.iser.essex.ac.uk/bhps/>.

⁴⁰ The selection of households was based on a representative sample of postcode sectors with implicit stratification of the population by region and by three socio-demographic variables derived from information obtained for the 1981 Population Census; cf. Taylor et al. (2001), p A4-1.

⁴¹ See Taylor et al. (2001), Tables 17 and 18, p A4-26.

⁴² See Taylor et al. (2001), p A2-3 and Haisken-DeNew (2001), p 6.

⁴³ The reference year is 1.9.–30.8., but the amounts in the CNEF are based on calendar years.

⁴⁴ For a short introduction to the underlying routines, see Taylor et al. (2001), pp A5-16ff.

CNEF. Household tax payments and thus annual net income are estimated by a routine developed by Bardasi et al. (1999)⁴⁵ and the imputed rental values have been computed until 1999 by Henley (2001). The dataset contains cross-sectional as well as longitudinal weights. Cross-sectional weights reflect the initial selection probabilities as well as non-response at the household and on the individual level, re-scaled to the raw sample size.⁴⁶ The longitudinal respondent weights reflect the initial selection probabilities and the further staying probabilities of the participants.⁴⁷ In addition, there are population factors to derive the corresponding absolute numbers.

Members of the original households and their natural descendants are followed when they move into a new household and all members of the new household are included in the sample.⁴⁸ In 1991, only households with domestic residence in England, Wales and Scotland south of the Caledonian Canal were eligible. However, respondents were followed into institutionalised accommodation (except for prisons) and to all parts of Scotland afterwards. Since household membership requires a continuous six months residence in the respective household during the year, students are treated as members of their term-time household.

6.1.4.3 The Cross-National Equivalent File (CNEF)

The CNEF was established in 1996 and contains annual national household panel data for Canada, Germany, Great Britain and the United States of America.⁴⁹ Besides the already introduced German and British datasets (GSOEP and BHPS), the Canadian data is derived from the Survey of Labour and Income Dynamics (SLID) and the US data from the Panel Study of Income Dynamics (PSID).

The CNEF is administered at Cornell University, USA in co-operation with the national data providers. The resulting cross-national files comprise a set of comparable panel data for a number of common variables such as demographic characteristics, employment information and details on household incomes.⁵⁰ The variables are intended to be equivalent across surveys as well as over time. All income variables are annualised.⁵¹

There are variables for pre and post-government household incomes generated comparatively.⁵² The post-government or net income is the sum of labour earn-

⁴⁵ For the BHPS, only households with complete income records are considered. For the CNEF, all households are included and income figures are imputed; cf. Bardasi et al. (1999), p 4.

⁴⁶ For detailed information, see Taylor et al. (2001), pp A5-1ff for the weighting procedures of wave 1 and pp A5-9ff for the cross-sectional weights of the other waves.

⁴⁷ See Taylor et al. (2001), pp A5-7ff.

⁴⁸ See Taylor et al. (2001), pp A4-5f.

⁴⁹ Burkhauser et al. (2001) provides a comprehensive introduction to the CNEF.

⁵⁰ For a complete list of CNEF variables, see Burkhauser et al. (2001), Table 2, pp 364f.

⁵¹ Cf. Haisken-DeNew and Frick (2001), p 59.

⁵² Income variables with missing values in the GSOEP are imputed for the CNEF, while the BHPS data already comprises imputed values (see 6.1.4.2).

ings, asset income, private transfers, private retirement income, public transfers and public pensions in a given household minus taxes.⁵³ Initially, a further fictitious income component – the imputed rental value – had been included for those households living in their own house or flat in order to reflect the well-being of those household members in the income figures. However, comparisons have shown that the methods of imputation were too different to achieve comparable results of absolute income levels. German data is measured following the so-called opportunity cost approach, British data with the capital-market approach. The opportunity cost approach deducts owner-related costs from an estimated comparable rent for equivalent dwellings.⁵⁴ In contrast, the capital market approach calculates imputed rent as a percentage of net equity of the homeowners. Net equity is derived from historic purchase prices, reflated to current prices, and the estimated total of monthly payments already paid for the mortgage.⁵⁵ This approach of measurement tends to considerably overestimate imputed rental values for Great Britain and thus leads to relatively higher figures than in Germany.⁵⁶ Therefore, imputed rental values are not included in the calculations based on equivalent pre-government or net incomes. Accordingly, the relative well-being of owner-occupiers is underestimated in comparison to tenants, since they realise a relatively higher disposable income. In contrast, imputed rental values have been considered for the analysis of income components so that the effect of their inclusion on income levels can be evaluated. The results show that the proportion of owner-occupiers among pensioners is considerably higher in Great Britain than in Germany (see 6.5.3). Consequently, net income figures for Great Britain tend to understate the well-being of pensioners in comparison to German figures.

Since there is no information on annual tax payments in the original surveys, these have to be estimated for calculating net incomes. For the British file, Bardasi et al. (1999) developed a simulation program to estimate tax burdens that allows deriving net incomes. In contrast to the British data, the German original data provides only monthly income figures. These have to be aggregated over the year and across the household members to attain annualised household income. Second, a tax estimation routine developed by Schwarze (1995) is used to derive annual tax burdens including taxes and payroll taxes (social security contributions) and thus net incomes.⁵⁷

⁵³ The CNEF codebooks for each national file contain detailed information about how variables are derived from the original datasets; cf. Lillard (2004) and <http://www.human.cornell.edu/units/pam/gsoep/equivfil.cfm>.

⁵⁴ Cf. Frick and Grabka (2002), pp 8f.

⁵⁵ Cf. Henley (2001), pp 1f and Frick and Grabka (2002), pp 7f.

⁵⁶ Cf. Frick and Grabka (2002), p 9.

⁵⁷ Becker et al. (2002), p 72 argue that the simulation model overestimates taxes on high incomes, leading to underestimation of inequality in net incomes.

The individual (monthly) income figures are annualised and aggregated on the household level. All income variables are in current year local currency, i.e. British Pounds and Deutschmarks, respectively.⁵⁸

Labour earnings include wages and salary from all employment and self-employment as well as bonuses, overtime pay and profit-sharing income. The variable is fully comparable across both files.

Asset income comprises all income flows from all kinds of savings and investments in the form of interest, dividends and rent. Respondents who could not estimate their interest and dividend income directly were asked to select a range from a set of categories. They were then assigned an average interest and derived dividend amount. Rental income is net of operation and maintenance costs in the German data; the 1991 figures are imputed because there was no question on rental income in that wave. In contrast, British data is not net of operation and maintenance. Therefore, asset income figures are not totally comparable across both files.

Private transfers consist of all income regularly received from persons outside the household, including private educational grants, maintenance and alimony payments and foster allowances. In the British file, the values are estimated by the model by Bardasi et al. (1999).⁵⁹ Single payments such as lottery gains or inheritances are not included.⁶⁰ The variable is comparable across countries.

Private retirement income is the sum of occupational pensions, private pensions and annuities, including benefits from the supplementary civil servant pension schemes in Germany; it is a comparable variable.⁶¹

Public transfers are all kinds of public benefits except for public pensions, namely maternity benefits, child benefits, unemployment benefits, housing allowances, subsistence assistance, public student assistance and student grants and all other benefits paid by public administration. The amounts of some of the benefits were imputed for the CNEF files. The variable is comparable across the files.

Public pensions include old-age pensions, invalidity pensions and survivors' pensions from the public pension schemes. In Great Britain, this variable comprises benefits from the Basic State Retirement Pension and the State Earnings-Related Pension Scheme (SERPS).⁶² In Germany, payments from the Statutory Pension Insurance (Gesetzliche Rentenversicherung, GRV), other obligatory pen-

⁵⁸ As mentioned above, German figures were converted into Euros at a fixed rate of 1.95583 DEM/EUR.

⁵⁹ The values for 1991 and 1992 are derived from the variable for the income of the previous month and not the previous year.

⁶⁰ A new variable for this 'windfall' income was added to the CNEF in its 2001 release, but it does only take values for 2000 and 2001 in the German file and is not yet available for Great Britain. For this reason, this income category is excluded from the analysis. It is not included in the pre- and post-government figures.

⁶¹ Private retirement income is not available in the German CNEF for 1984 and 1985, because it was not separable in the original data. Therefore, private pension income is included in the public pension variable for these two years.

⁶² Benefits from the State Second Pension (SSP) are not yet in payment.

sion schemes for specific professions (e.g. minors and farmers) and from the Civil Servants Pension Scheme are included.⁶³ ⁶⁴ The definition of the variable is comparable.

The file contains the cross-sectional and longitudinal sample weights from the original surveys. The covered period is determined by the original datasets: the German file starts in 1984, the British in 1991. In contrast to the GSOEP data, East German income data is included only from 1992 because of the annualised income concept of the CNEF. The most recent data considered are those of the year 2001 for both countries.⁶⁵ However, the British data for 2000 and 2001 are problematic. The values for 2000, especially for the elderly, show significant changes from the 1999 figures. Also the number of public transfer recipients and the total amount of transfers received show shifts that are unexplainable by any institutional changes.⁶⁶ Furthermore, the variable for the imputed rental value for these years is missing. Therefore, the years 2000 and 2001 are not included in the charts, but they are contained in the tables in the Appendix for reference.

6.1.4.4 Shortcomings of the datasets

A problem common to most household income datasets is the under-representation of households at the upper and lower end of the income distribution. People belonging to these households tend to be less willing to participate in such surveys. Homeless are not included in the surveys; people living in institutionalised accommodation are under-represented.⁶⁷

Since the observations are concentrated in the middle of the income distribution, all measurements of income inequality tend to underestimate the real extent of inequality.⁶⁸ It is not clear how this ‘central bias’ affects the results for average income measures such as the mean and the median income.

The CNEF does not contain a variable reflecting retirement. Therefore, it is impossible to identify pensioners directly. In consequence, the analysis refers to the elderly population, defined as people aged 65 or more. This definition is consid-

⁶³ See Table A.6 in the Appendix and chapter 5 for detailed information on the institutional arrangements of both pension systems.

⁶⁴ As mentioned earlier, the public pension variable of the German CNEF for 1984 and 1985 contains all kinds of pension income including private pensions, because they are not separable in the original data.

⁶⁵ For more detail about the CNEF see Burkhauser et al. (2001) and <http://www.human.cornell.edu/pam/gsoep/equivfil.cfm>.

⁶⁶ Neither the experts of the Institute of Social and Economic Research who are responsible for the BHPS nor the staff administering the CNEF at Cornell University were able to explain these observations on request.

⁶⁷ See The Canberra Group (2001), p 52. Both BHPS and GSOEP did only select domestic residence households in their first waves, but individuals of interviewed households that move into institutionalised accommodation are followed afterwards where response is still possible. People in institutionalised accommodation constitute about 0.1% of the population in either country.

⁶⁸ See Hauser and Becker (2001), p 49.

ered adequate, since the age 65 corresponds to the legal retirement age except for British women (for whom it is 60) and the vast majority of people of this age are retired. There are only few among this group who receive individual labour income (see 6.5.4). The panel analysis (6.6) approaches retirement by considering a change in primary activity from 'labour market active' to 'inactive'.⁶⁹

Another problem – especially in the context of this study – is the relatively small number of elderly people included in the panel surveys. Therefore, the elderly population cannot be split into many subgroups if the results are to be reliable.

6.1.5 Outline of the empirical analysis

For an initial summary of the income data, section 6.2 shows the development of net old-age incomes over time. Trends in incomes are also compared to the macroeconomic developments in Germany and the UK to assess whether these developments had a crucial impact on personal incomes.

Then, the income distribution among the elderly and relative to the distribution among the whole population is given a closer look (6.3). The analysis concentrates on the lower parts of the income distribution in section 6.4, namely in looking at relative poverty among elderly people. Section 6.5 shows the sources from which pensioners receive their income. Eventually, a panel analysis helps to answer questions about individual income histories (6.6). The chapter concludes with a summary of the main results with respect to the established objectives (2.4.2) and the hypotheses formulated in section 5.5.

6.2 Developments in net incomes

This section will give an outline of the general income levels attained by the elderly population in comparison to the population of working age.⁷⁰ It aims to derive the overall living standard of the elderly in relation to those who are still in earlier periods of life and how the elderly participate in the general economic well-being. A point of special interest is how the incomes developed over time in the two countries and if these trends were influenced by the institutional structures presented in chapter 5.

An analysis of how well income during working age can be replaced by pension income after retirement will be carried out later (section 6.6.2), because this question necessitates a panel analysis design.

⁶⁹ Receipt of private and public pension income is only available on the household level and can therefore not be used for the analysis of individual retirement.

⁷⁰ The analysis considers persons of the respective age-group in their household context. Consequently, members of the same household can belong to different age-groups in the analysis.

6.2.1 Pre-government and net incomes

For an initial picture of the income situation of the elderly, aged 65 years and over, in comparison with the population of working age (25 to 54 years), the development of equivalent pre-government and net incomes over time is analysed. People aged 55–64 are considered to be in transition between labour market and pension age.⁷¹ Since there is no variable indicating the actual retirement age, this age-group is not a suitable basis for comparison and is therefore left beside the analysis.

It has to be assumed that the transition from pre-government to net incomes is in favour of the elderly. They receive public pensions⁷² and other social benefits, whereas the working population has to pay contributions to the social insurance system and receives relatively less social benefits on average.

Figures 6.2 to 6.4 display the development of median pre-government and net incomes in Germany and Great Britain over time. The German figure shows West German data to provide a comparable basis for the whole period of time. It can be seen from Figure 6.2 that the West German net incomes of the elderly increased nearly steadily in real terms. Meanwhile, median net income of the working age population had a positive trend until 1994 and showed a slight U-shape afterwards. The elderly's median net incomes were lower than those of the age-group 25–54. After a period of an increasing net income gap between the elderly and the younger in favour of the younger during the late 1980s and early 1990s – reaching nearly €2,500 p.a. in 1993 and 1994 –, the elderly caught up partly in the late 1990s. The income gap shrank to under €1,500 p.a. until 1999 and to less than €1,400 p.a. in 2001 after a temporary increase to nearly €2,000 p.a. in 2000.

The chart illustrates how the incomes of the population of working age and of the elderly were influenced by government activity. While the younger 'lost' a part of their income to taxes and social security contributions, the elderly profited from public interference. The main share of their income was derived from public sources, mainly public pension payments. They received only very little pre-government or market income, even though the absolute amount increased slightly. Elderly people in East Germany had hardly any pre-government income.⁷³ Government action seems to have smoothed out the development of incomes, since the median pre-government income fluctuated much more than the median net income. More details about income sources and their contribution to total old-age incomes are presented in section 6.5.

⁷¹ Bardasi et al. (2000), p 9 show that the transition from work into retirement lasts several years.

⁷² In the CNEF data, public pensions are considered to be paid by the government. Although the officially independent status of the statutory pension scheme in Germany, this is consistent for the comparative approach.

⁷³ The median pre-government income for East Germany fluctuated between €75 and €108 in the observed period 1992–2001; see Table A.7 in the Appendix.

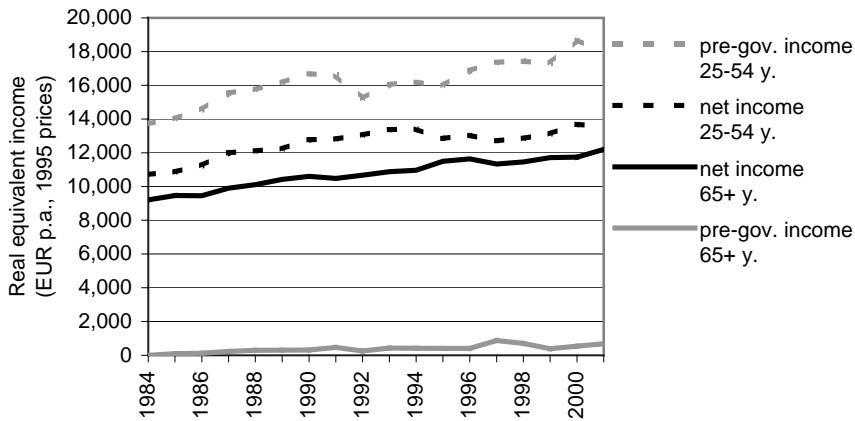


Figure 6.2. Median real equivalent pre-government and net incomes of the population of working age and the elderly, West Germany 1984–2001

Source: CNEF, own calculations; cf. Table A.7 in the Appendix.

An interesting question is whether the illustrated trends represent the whole country, or if there were different trends in the Western and the Eastern part. Therefore, Figure 6.3 separates the regional developments in median net income. The chart illustrates that the general trends were parallel in the two regions but more pronounced in East Germany. However, there are several conclusions to be drawn from the comparison. Firstly, there are still important differences in the net income levels between people living in West Germany compared to East Germany. While the incomes of the East German elderly (aged 65 or more) increased sharply and thus reduced the income gap to the West German pensioners, this tendency was less significant for the incomes of people of working age (from 25 to 54 years).

The rise in median old-age income in East Germany was very steep in the time period from 1992 to 1996, when the gap shrank from about €3,800 p.a. to €1,300 p.a. In other words, the incomes of the elderly in East Germany grew from about 65% of the median income of their Western counterparts in 1992 to nearly 89% in 1996. This development was caused to a large extent by the different price levels that approached only after some years. Then, the rise slowed down and the Eastern old-age incomes fluctuated at about 93–94% of the Western amount, with a temporary downward movement to 86.3% in 2001, mostly because of a significant increase in West German incomes. Yet, it is uncertain if this was the beginning of a re-widening of the income gap. In East Germany, the median net income of the elderly was higher than that of the working-age population in 1998 and 1999 and about equal in 2000 and 2001.

The working age population was able to improve its median income from less than 70% of the Western amount in 1992 to over 80% in 1995. After a temporary

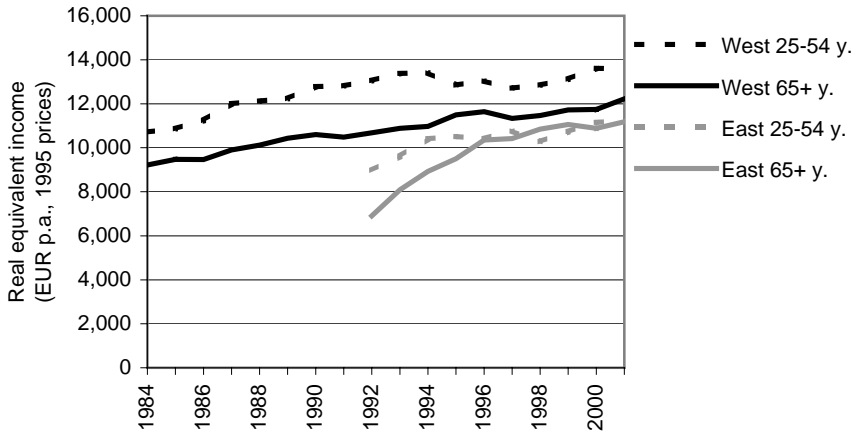


Figure 6.3. Median equivalent net incomes in West and East Germany for the population of working age and the elderly, 1984–2001

Source: CNEF, own calculations; cf. Table A.7 in the Appendix.

increase in 1996, the relative income showed a slight upward trend from about 80% in 1997 to nearly 83% in 2001. A detailed analysis of relative income positions in the course of time will follow in section 6.2.3.

As shown in Figure 6.4, net incomes had increased steadily in Great Britain during the 1990s. The relative net income gap between the elderly and the younger people was much larger than in Germany (see also Figure 6.5). However, this gap narrowed, starting from £2,200 or 43% of the elderly's incomes in 1991 to £1,800 or less than 30% in 1999. Thus, the elderly were able to catch up slightly with the population of working age during the observation period.

Pensioners' pre-government incomes were relatively higher than in Germany due to the higher proportion of private income sources (see 6.5). Median old-age pre-government income was almost stable at about £2,000 throughout the observation period. Looking at pre-government incomes of the working-age population, the line gradually approaches the median net income line until 1999. This trend can only be found for real incomes, whereas the nominal amount of median net incomes increased throughout the observation period. I.e., price inflation led to a decline in the median value of net pre-government incomes.

In the next step, the levels of net income in both countries are compared. Since a comparison of the series in local currency does not provide much information, the British figures are converted into Euro on the basis of purchasing power parities (PPP, see 6.1.2.2). Figure 6.5 illustrates the development of median net incomes in West Germany and Great Britain. This comparison seems to be more adequate since it abstains from the special influences of German reunification. The graph shows that the net income level of persons of working age was similar across the two countries. The British median income was just beneath the West

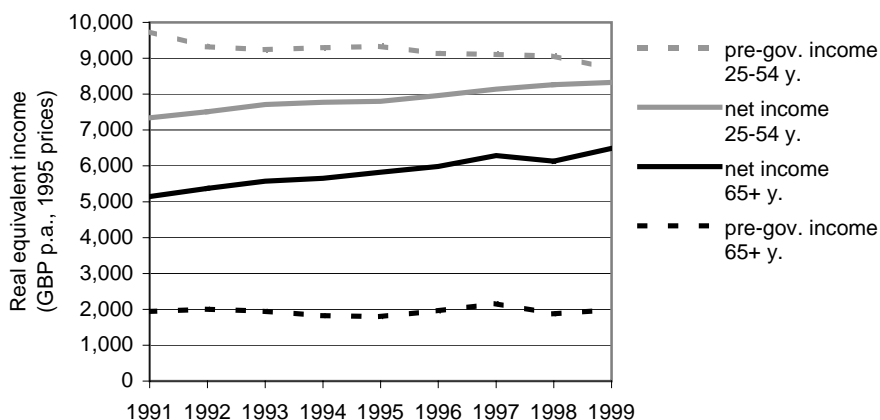


Figure 6.4. Median real equivalent pre-government and net incomes of the population of working age and the elderly, Great Britain 1991–1999

Source: CNEF, own calculations; cf. Table A.7 in the Appendix.

German value for most of the observed years. There were even similar fluctuations over time. Whether or not these fluctuations matched the macroeconomic fluctuations will be addressed later.

The picture for the elderly is different. The British pensioners received significantly less income than the West Germans and there was no trend of closing this gap. The median income of the elderly in Great Britain fluctuated between 80% and 87% of the German value. Thus, British pensioners achieved a lower level of well-being than the Germans, despite the almost equal positions of the population of working age of the two countries (see also section 6.2.3).

The lower level of incomes of the elderly in Great Britain compared to Germany is not surprising. It appears to be the consequence of the different pension systems as presented in chapter 5. There is no politically pursued replacement rate in Great Britain and there are much lower levels of income replacement by the public pension schemes. Apparently, the British do not add enough private pension provisions to reach the German income level that is dominated by public pension benefits. In so far, these results confirm the institutional differences of the countries. However, it has to be taken into consideration that imputed rental values of owner-occupied housing have not been included in the equivalent income figures. An inclusion would probably lead to a higher level of British old-age income compared to the German figures due to the higher proportion of owner-occupiers in Great Britain.⁷⁴

⁷⁴ In 1999, the inclusion of imputed rent as contained in the CNEF would lead to a median real net income of about EUR 12,300 for the German and EUR 17,000 for the British elderly (1995 prices, British data converted into EUR by OECD purchasing power parities).

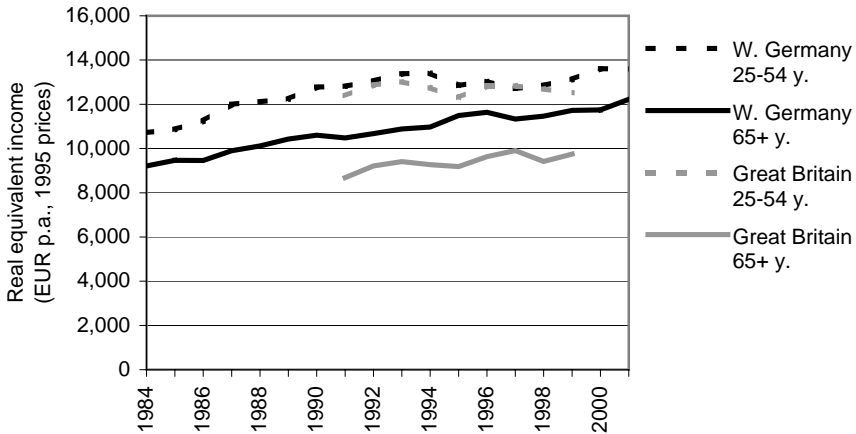


Figure 6.5. Median equivalent net incomes in West Germany and Great Britain for the population of working age and the elderly in Euro^a, 1984–2001

^a British data is converted into EUR by OECD purchasing power parities, cf. Table A.2 in the Appendix.

Source: CNEF, own calculations; cf. Table A.7 in the Appendix.

Up to now, the presentation has been about ‘the elderly’ in general, aged 65 or more. It would be interesting to know if there are differences between people of different ages among the elderly. Therefore, the following Figures 6.6 and 6.7 split the elderly into three age-groups: from 65 to 69, people in their 70s and those aged 80 or more.

Apparently, median net income differed between the age-groups in West Germany. It seems as if the oldest were receiving relatively less income than the younger age-groups. The 70–79 year-olds experienced the highest increase in income among the elderly. It is impossible to infer from these general figures if the visible differences were caused by cohort or age effects, which have to be distinguished in empirical analyses.

Cohort effects are similar pension provision patterns such as the propensity and the possibilities to save as a result of living circumstances experienced by all members of a birth year (e.g. economic crises, wars etc.). On the contrary, age effects are only related to the age of a person, regardless of the age cohort he/she belongs to. People may adjust their financial planning to their age and their further life expectancy. These effects can only be distinguished in a regression model based on panel data design that will be carried out later (section 6.6).

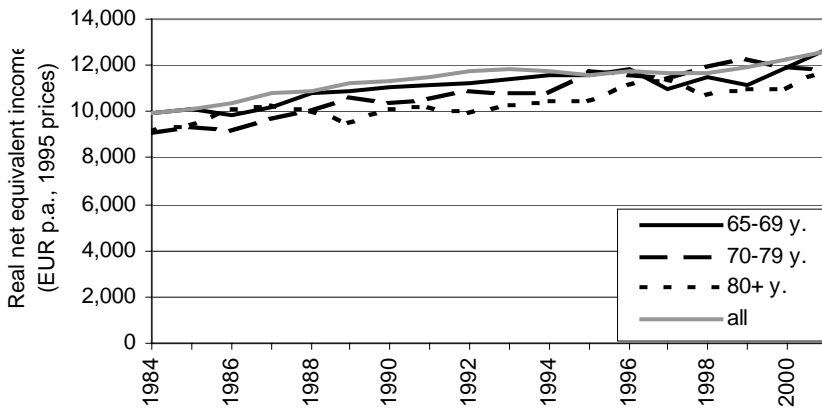


Figure 6.6. Median real equivalent net incomes of the elderly by age, West Germany 1984–2001

Source: CNEF, own calculations; cf. Table A.8 in the Appendix.

In Great Britain, the picture is less ambiguous than in Germany. Apparently there is a correlation between the age of a pensioner and his/her net income. Older people tend to be noticeably less well off than the younger over the whole period – except for the age-group 65–69 that realised a higher median income than the population on the whole in 1993. The fact that older people have less income may be due to increasing private and additional public pension entitlements of younger

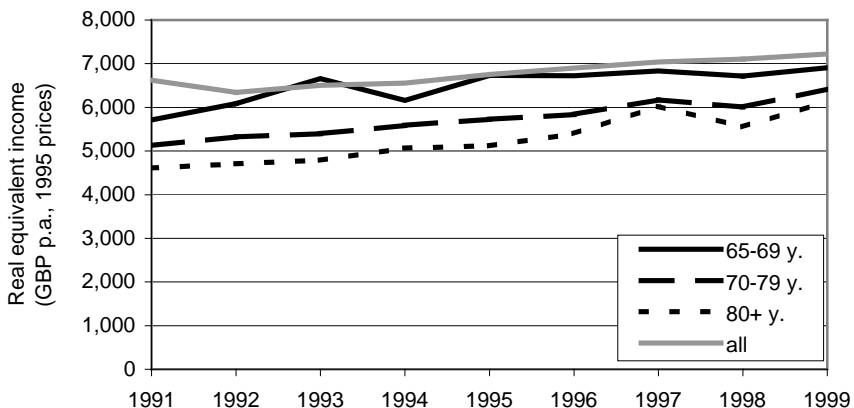


Figure 6.7. Median real equivalent net incomes of the elderly by age, Great Britain 1991–1999

Source: CNEF, own calculations; cf. Table A.8 in the Appendix.

cohorts and the price indexation of the Basic Pension that implies a devaluation of benefits relative to average earnings over time.⁷⁵ Still, net incomes have increased over the observation period for all age-groups.⁷⁶

This assumption is supported by a correlation analysis, based on cross-sectional data. Table 6.1 shows significant correlations between the age of a person and his/her equivalent income. The analysis is also conducted according to sex.

The table shows a negative correlation between age and income of a person for every year in both countries. However, the value of the correlation coefficients has not been very high. This supports the hypothesis that old-age incomes tend to decrease relatively with a person's age. Again, whether this is caused by cohort or age effects has to be inferred from a panel analysis, which will be conducted later (section 6.6).

Table 6.1. Correlation coefficients^a between age and equivalent net income as well as sex^b and equivalent net income for the elderly (aged 65+) in West Germany and Great Britain, 1984–2001

Year	Age - Income		Sex - Income	
	West Germany	Great Britain	West Germany	Great Britain
1984	-0.061		-0.049	
1985	-0.055		-0.007	
1986	-0.074		-0.081	
1987	-0.068		-0.081	
1988	-0.112		-0.093	
1989	-0.102		-0.165	
1990	-0.087		-0.119	
1991	-0.111	-0.156	-0.165	-0.135
1992	-0.111	-0.148	-0.144	-0.111
1993	-0.124	-0.139	-0.160	-0.136
1994	-0.119	-0.095	-0.105	-0.125
1995	-0.113	-0.103	-0.068	-0.127
1996	-0.048	-0.113	-0.041	-0.103
1997	-0.055	-0.104	-0.050	-0.105
1998	-0.120	-0.110	-0.045	-0.053
1999	-0.010	-0.145	-0.057	-0.098
2000	-0.026		-0.023	
2001	-0.034		-0.060	

^a The correlations are all significant at a level of 0.01 (both sides).

^b Sex is a binary variable: male = 1, female = 2. Thus, a negative value means that being a woman is negatively correlated with income.

Source: CNEF, own calculations.

⁷⁵ Cf. Rechmann (2001), p 303; Pensions Commission (2004), p 138.

⁷⁶ This result is confirmed by the findings of Bardasi et al. (2000), p 8.

Concerning the relation of sex and income, the analysis shows that being a woman is negatively correlated to the income received. However, this result may be largely due to the different household context of elderly men and women. In both countries, more than half of women aged 65 and over were living alone, compared to only about a quarter of elderly men.⁷⁷ There is evidence that living alone has a considerably negative impact on the income situation.⁷⁸ This fact will be found again in the poverty figures in section 6.4.

6.2.2 Net incomes in the national macroeconomic context

An interesting question is whether the development of median incomes corresponds to the macroeconomic trend. Therefore, the following Figures 6.8 and 6.9 combine macroeconomic and microeconomic income data for each country. Looking back to the defined objectives of pension systems, one of the pursued objectives is to let pensioners participate in economic growth. Thus, pension income should develop in line with macroeconomic growth.

From 1984 until 1991, the median real income of the elderly as well as of the entire population in West Germany grew steadily, apart from 1991 for the elderly (Figure 6.8). However, the increase in incomes was slower than the increase in the macroeconomic figures. The incomes of the elderly grew similarly to those of the entire population. In consequence, the elderly did not participate in national economic growth at the full rate, but they participated in the increasing well-being of the population to almost the same extent as the other members of society.

The picture looks different in the 1990s in reunified Germany. Although starting from the lowest index value in 1992, the median income of people aged 65 or more grew at the relatively fastest pace, whereas the development of the overall median incomes was not as good as the trend for the German economy for most of the time. As shown before, the growth in old-age incomes was due to the sharp increase in East German pensioners' incomes and price level effects. The elderly experienced the largest improvement of their income situation compared to the reference year 1984. Obviously, they had participated in the general economic growth while even exceeding the macroeconomic growth rates.

A second conclusion that may be drawn from Figure 6.8 is that fluctuations in the macroeconomic figures had translated into even greater fluctuations in the median incomes in the 1990s. The stagnation from 1996 to 1997 in GDP and disposable income per capita was accompanied by a downward movement in the median income figures. However, the analysis whether there is a significant relationship between these macroeconomic and microeconomic trends would require the application of an econometric model and would have to be based on two different datasets. This is beyond the scope of this study.

⁷⁷ Cf. Winqvist (2002), p 2. The figures refer to 1998.

⁷⁸ Winqvist (2002), p 5 finds income gaps of more than 20% between single elderly women compared to the overall average female old-age income.

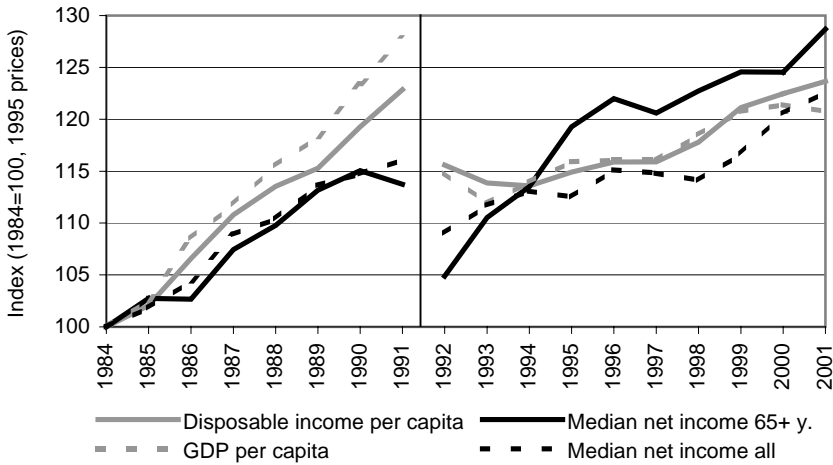


Figure 6.8. Median real equivalent net incomes, GDP per capita and disposable income per capita in Germany^a, 1984–2001

^a Germany: until 1991 West Germany, then reunified Germany.

Source: cf. Tables A.2 and A.6 in the Appendix.

The British picture, shown in Figure 6.9, resembles the right part of the previously discussed German chart. The British economy grew almost steadily during the 1990s. Compared to the reference year 1991, the elderly were able to improve

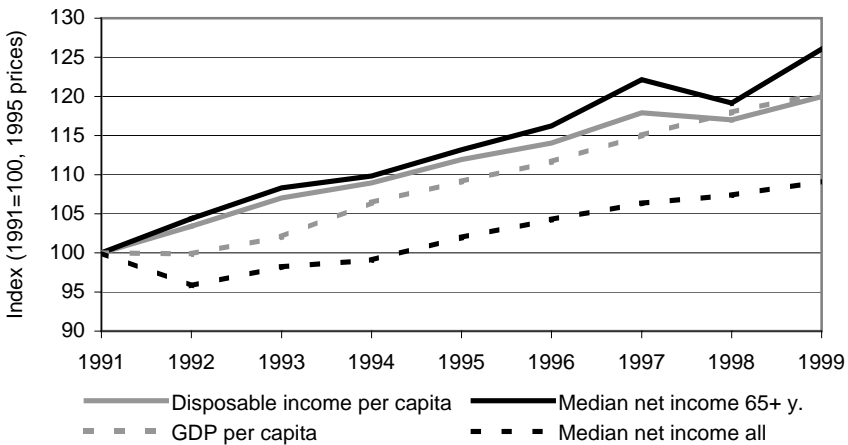


Figure 6.9. Median equivalent net incomes, GDP per capita and disposable income per capita in Great Britain, 1991–1999

Source: cf. Tables A.2 and A.6 in the Appendix.

their income situation best and seem to have participated in economic growth. Their incomes increased relatively more than the British economy. In contrast, the overall median dropped below the 1991 value for the next three consecutive years and grew at a slower pace than the macroeconomic figures until 1999. Both median net income for the elderly and disposable income per capita show a temporary drop in 1998.

The British economy and the median incomes do not seem to have experienced major fluctuations during the observed time period. However, it would be interesting to have income data for the preceding and the following years, when the macroeconomic data fluctuated more.

6.2.3 Relative income positions

Relative income positions can illustrate the income situation of the elderly relative to other groups of the population. They show the median income of an age-group in relation to the median income of the entire population. The following Figures 6.10 and 6.11 illustrate the relative income positions of several age-groups in West Germany and Great Britain. The reference line 1.0 is equivalent to the median income of all people.

It can be seen from Figure 6.10 that the income position of the elderly in West Germany was beneath the reference value of 1.0 for the entire observation period. Their relative position fluctuated between 90% and the full median income of all. In the early 1990s, the elderly gained ground and improved their relative income markedly. In 2000, there was a temporary drop from which the incomes recovered in 2001.

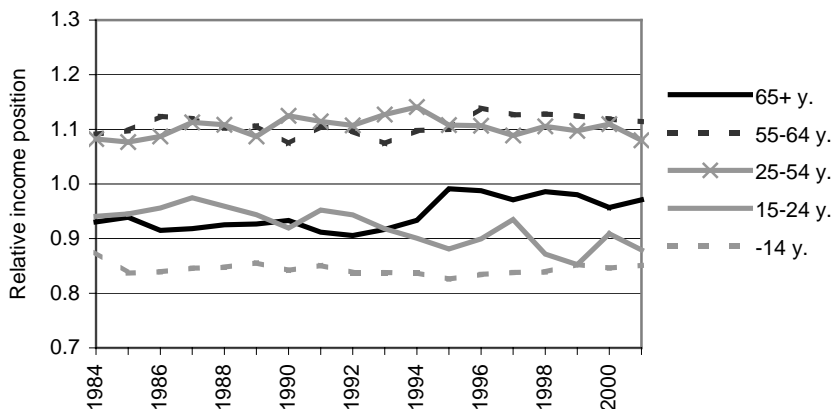


Figure 6.10. Relative income positions (reference: median equivalent net income) for different age-groups, West Germany 1984–2001

Source: CNEF, own calculations; cf. Table A.7 in the Appendix.

The graph shows that children aged 14 or younger were living in the comparatively worst income context. Their relative income position was nearly stable at 83–85% of the overall median income. People belonging to the next age-group of 15–24 years had experienced a downward trend in their relative income position over time. However, this group is very heterogeneous and people of this age often live in a household context that is not appropriately reflected by the income data.⁷⁹

As expected, people of the two age-groups of main working age were enjoying the highest relative income positions. Their median income was about 10% higher than the overall median. During the 1980s, the highest income position was held by the age-group just before retirement (55–64 years). From 1990 until 1994, the younger groups (25–54) were able to take the lead, before falling back again from 1996 onward. It is surprising that people aged 55–64 years had the highest relative income position of all age-groups despite increasing rates of early retirement.⁸⁰ It seems that early retirees were well prepared for their labour market exit. However, it may be that the income distribution among this age-group is strongly unequal and that the early retirees are at the lower end of the distribution.⁸¹ Since the actual income level below the median value does not influence this measure, the relative income position of these early retirees would then not be reflected in the presented figures.⁸²

There are some similarities in the British charts, shown in Figure 6.11, but with a larger spread of income positions. First of all, children had the lowest relative income among all age-groups and their position was even worse than in West Germany. The median equivalent income of those aged 14 or less was only 77–80% of the overall median. Secondly, the relative income position of the elderly was beneath the 1.0 overall average line for the entire time period. However, the elderly were able to improve their median income from under 80% to 90% of the median of all persons. This confirms the hypothesis that the institutional structure

⁷⁹ Many people in education (apprenticeship, university studies) are still living with their parents and participate in the household income sharing. Of the rest, there are many living in shared flats where the income-pooling thesis (section 6.1.2.2) does not hold and in (single) households that are still participating in the income patterns of their parents.

⁸⁰ In West Germany, the proportion of men retiring before the age of 65 because of unemployment or old-age part-time arrangements increased continuously from 11% of all new pensioners in 1984 to more than 28% in 2001. The rate fell first in 2002, to about 27%. Proportions in East Germany were even higher with at least 30% of new pensions. West German women did make considerably less use of these possibilities for early retirement: the proportion increased from 1% in 1984 to about 4% in 1996 and sank back to less than 1% in 2002. Cf. <http://www.vdr.de> (24.2.2004).

⁸¹ Yamada and Casey (2002), p 17 find that early retirees in Great Britain and Germany are considerably less well off than those who continue working until state pension age. In contrast, an analysis by Bardasi et al. (2000), p 15 draws the conclusion that male early retirees in Great Britain are on average less exposed to the risk of poverty as the population average.

⁸² Additionally, these figures do not reflect changes in the income composition of new pensioners. An analysis with this perspective will be conducted in section 6.6.3.

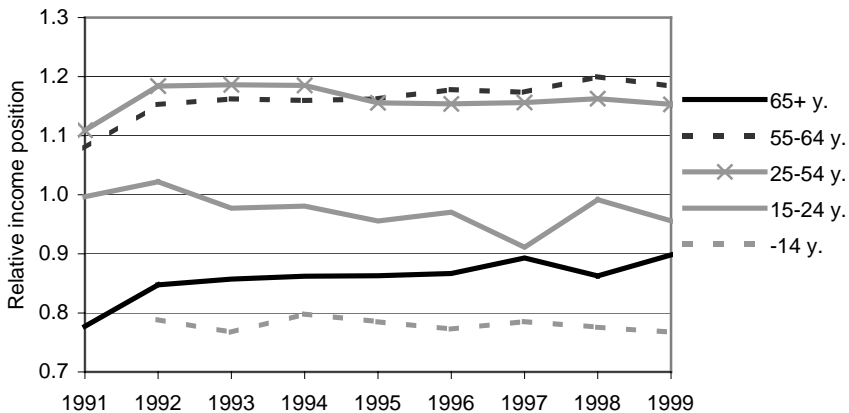


Figure 6.11. Relative income positions (reference: median equivalent net income) for different age-groups, Great Britain 1991–1999

Source: CNEF, own calculations; cf. Table A.7 in the Appendix.

of the British pension system leads to a relatively lower old-age income than in Germany.

In contrast to West German data, the age-group of 15–24 years had a better relative position than the elderly. It was fluctuating between 0.9 and 1.0 most of the surveyed time. Still, as explained earlier the results for this age-group have to be treated with caution. Like in West Germany, the highest income positions were held by the middle-aged and the people just before retirement (including early retirees); they were surpassing the younger in the middle of the 1990s. Although early retirement is less common in Great Britain than in Germany, it is important to keep this trend in mind for further analysis.

6.3 The distribution of income

This section focuses on income inequality, that is to say on the distribution of income among people. The underlying questions are whether the incomes of the elderly are distributed more equally than across the population on the whole and if there is evidence that the different structures of the German and the British pension system lead to different levels of inequality among the elderly. As in the previous section on the development of median pre-government and net incomes, the imputed rental value is not included in the analysis.⁸³ It might be expected that the

⁸³ As explained above (section 6.1.4.3), the rental value is estimated according to different models, leading to significant differences in the level of this income component and thus

British old-age incomes are distributed less equally, since a larger part of them are private pension benefits. The analysis of the distribution of incomes among the elderly and in comparison to the distribution among the entire population in each country requires several indicators of inequality, which were introduced in section 6.1.3. First of all, Lorenz curves for the most recent observation years will illustrate the distributional situation at the time in Germany and Great Britain. Later, the emphasis will be on the levels of income inequality and their development over time, mainly based on the Gini coefficient.

6.3.1 Lorenz Curve presentations

Lorenz curves give an impression of the overall distribution of incomes across individuals. Figure 6.12 illustrates the distribution of equivalent pre-government and net incomes in Germany in 2001.

It can be seen that the distribution of net income among the elderly was slightly more equal than among the entire population. The Lorenz curve for the elderly dominates that of the whole population, because it is closer to the equal distribution line in all points. Thus, old-age incomes differed less than incomes in general. The lines for the distribution of pre-government incomes are given as a reference. As expected, they show that the distribution of incomes before interference by the tax and transfer system was much less equal than afterwards. The distribution of pre-government incomes among the elderly was extremely unequal. E.g., 80% of the elderly received only 14% of total pre-government income. This is not surprising, since old-age incomes apart from public pensions and benefits mainly consist

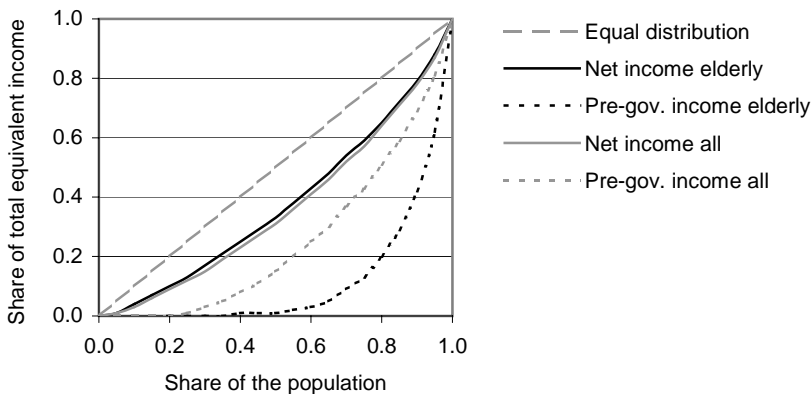


Figure 6.12. Lorenz curves for the distribution of equivalent pre-government and net incomes among the elderly (65+ years) and the entire population, Germany 2001

Source: CNEF, own calculations.

in the median pre-government and net income figures. This affects the comparability of income distribution measures across the countries as well.

of asset and property income, which is presumably distributed very unequally. For more detail on the different income sources see section 6.5.

Since Figure 6.12 has shown charts for all of Germany, it is possible that the inequality is largely due to income differences between Western and Eastern German incomes and not a result of inequality among people living in the same region. This would lead to different conclusions, also in comparison with the British data.

For this reason, Figure 6.13 illustrates the differences in income distribution among the elderly in West and East Germany. The overall distribution is drawn additionally.

It can be seen from Figure 6.13 that the East German pensioners received much more equal incomes than the West Germans on average. The East German Lorenz curve is considerably closer to the equal distribution line than the West German curve over the whole income distribution. This result is not surprising, since the majority of East German pensioners received mainly public pension income and public transfers and only very little income from private sources such as occupational pensions, income from assets or property etc. Public pension entitlements depend on earlier labour income. Since labour income was much more equally distributed in the former communist East German State and the employment rate of women was similar to that of men, public pensions have themselves a significantly smaller spread among today's pensioners in the East compared to the West.

Although the East German old-age incomes were distributed more equally, this had no crucial effect on the overall income distribution. The line for entire Germany is slightly above the West German curve, which means that incomes were distributed less unequally on the scale of the whole country. By decomposing inequality in intra- and inter-regional inequality, Becker and Hauser (2003) found that intra-regional inequality was significantly more important for the overall Ger-

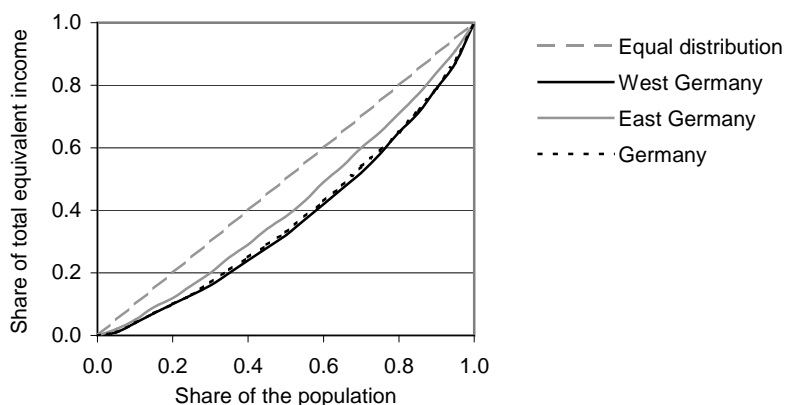


Figure 6.13. Lorenz curves for the distribution of equivalent net incomes among the elderly (65+ years) in West, East and entire Germany 2001

Source: CNEF, own calculations.

man inequality measures than inter-regional inequality.⁸⁴ The regional distributions behind the overall German figure should be kept in mind for the rest of the analysis. The inequality measures in the following section 6.3.2 will be able to give more detailed information about the extent of income inequality on the regional and national level.

The distribution of income among the elderly in Great Britain compared to the entire population is illustrated in Figure 6.14 for 1999.⁸⁵

Like in Germany, the distribution of net incomes was more equal among the elderly than among the whole population. As expected, pre-government income was much less equally distributed than net income. However, the distribution of pre-government old-age income was much closer to the other Lorenz curves than in Germany (Figure 6.12). This result reflects the significantly higher importance of non-public income sources such as personal and occupational pensions for the British compared to the German pensioners.⁸⁶ Since public pensions account for a relatively smaller portion of old-age incomes in Great Britain, their elements of social redistribution have less influence on the overall level of income inequality than in Germany. Gini coefficients will quantify these results later (6.3.2). Obviously, the public tax and transfer system including public pensions has a considerable equalising effect on the incomes of the elderly.

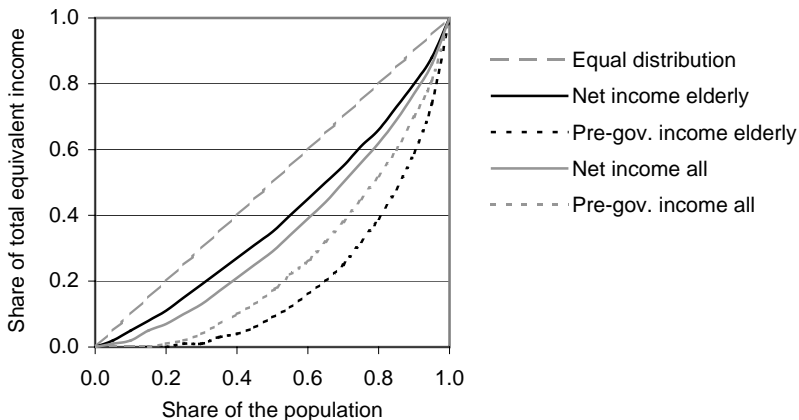


Figure 6.14. Lorenz curves for the distribution of equivalent pre-government and net incomes among the elderly (65+ years) and the entire population, Great Britain 1999

Source: CNEF, own calculations.

⁸⁴ Based on data of the German Income and Consumption Survey (EVS) for 1993 and 1998, Becker and Hauser (2003), Table 10.9, p 216 show in a decomposition analysis based on the MLD measure that less than 5% of overall German income inequality can be attributed to West-East inter-regional differences. For further research on income inequality within and between socio-economic groups in Germany, see Becker (2001).

⁸⁵ Data for 2000 and 2001 differ considerably from the years before; see section 6.1.4.3.

⁸⁶ See section 6.5.

6.3.2 Indicators of income inequality

Departing from the Lorenz curve presentations of the preceding section, the illustration of the development of inequality in the distribution of incomes starts with the Gini coefficients.⁸⁷ Figure 6.15 shows Gini coefficients for the distribution of equivalent net incomes among the elderly.

For Germany, regional figures for East and West Germany are provided, because there are still significant differences between the levels of income inequality within the West German and the East German part of the population. It has to be borne in mind that the Gini coefficient is not decomposable into inter-group and intra-group inequality, meaning that the West and East German figures do not sum up to the overall German income inequality figure.

The chart shows that the Gini coefficients for West Germany and the reunified Germany as well as for Great Britain remained in a range between about 0.25 and 0.30. Only the East German income distribution has been much more equal with Gini coefficients between 0.15 and 0.18. However, income inequality in East Germany increased slightly from 1992 to 2001. It is interesting to note about the German figures that the lower regional inequality in East Germany seems to have over-compensated the inter-regional income inequality on the national level, since the Gini coefficient for West Germany is above that for the entire country.⁸⁸ This

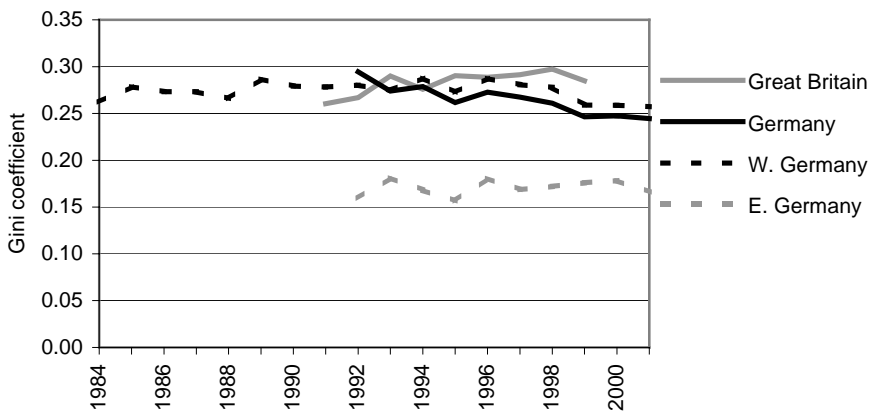


Figure 6.15. Gini coefficients for the distribution of equivalent net incomes among the elderly (65+ years) in Germany and Great Britain, 1984–2001

Source: CNEF, own calculations; cf. Table A.9 in the Appendix.

⁸⁷ As described in section 6.1.3.2, the Gini coefficient measures the Lorenz area between the curve and the equal distribution line as a proportion of the total area below the diagonal.

⁸⁸ See also Becker (2001), Table 5, pp 14ff.

effect has already appeared in the Lorenz curve, Figure 6.13 and is confirmed by these findings.

Looking at the development in West Germany since 1984, there seemed to be a slight downward trend in inequality from 1994 until 1999 after a period of stagnation during the early 1990s; then it was almost constant until 2001. On the national scale, there was a similar development on a lower level due to the lower inequality in East Germany.

The British Gini coefficients show a trend of increasing income inequality among the elderly over the observation period. Starting from a lower level than West Germany in 1991, the British line surpassed the German figures during the middle of the 1990s to remain comparatively on the highest level until 1999. This may be a sign of increasing importance of privately funded old-age incomes such as occupational and personal pensions compared to more equally distributed public pension benefits, a question to be postponed to section 6.6.3 where income sources of new pensioners are examined.⁸⁹

Compared to the income distribution among the entire population, incomes were distributed not as unequal among the elderly, illustrated by Figure 6.16 for West Germany and Great Britain.

For Great Britain, the chart shows a significantly higher level of income inequality among the entire population than among the elderly. However, the slightly increasing trend in inequality for the elderly has no parallel for the general population, where no trend is visible. West Germany gives a less homogeneous picture.

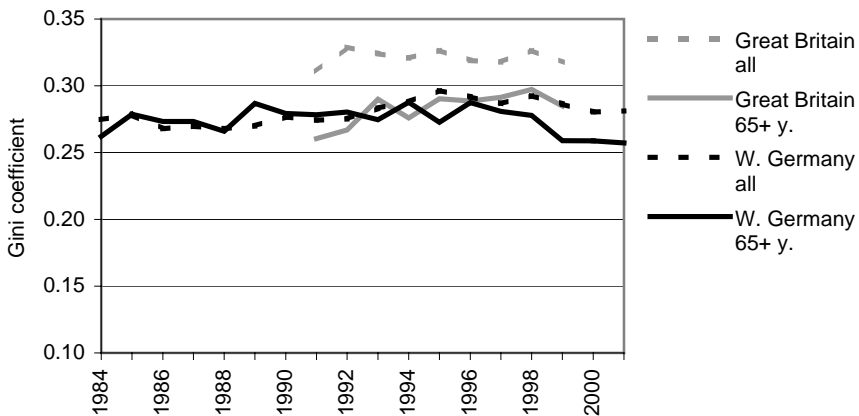


Figure 6.16. Gini coefficients for the distribution of equivalent net incomes among the entire population and the elderly (65+ years) in West Germany and Great Britain, 1984–2001

Source: CNEF, own calculations; cf. Table A.9 in the Appendix.

⁸⁹ The Pensions Commission (2004), p 132 argues that the 1990s were a “golden age” for some retirees, but the rise in pension incomes has been unequally distributed.

Starting from a lower level of inequality in 1984, the elderly had experienced similar income inequality among themselves as the population on the whole until 1992. From 1993, there was a slight downward trend for the elderly. An increase in inequality for the entire population started in the late 1980s and continued until 1998. In conclusion, income inequality among the elderly population had declined despite an overall stable or slightly increasing tendency of income inequality. This is in contrast to the situation in Great Britain, where the elderly experienced increasing income inequality in a generally stable context.⁹⁰

Since the Gini coefficient is a measure of overall inequality, it does not reflect in which parts of the income distribution the changes in income inequality appeared. Therefore, results for the Atkinson index and the Mean Logarithmic Deviation (MLD) were calculated additionally. These measures are particularly sensitive for changes in the lower part of the income distribution, which is most important for the analysis of poverty and low incomes among the elderly (see 6.4).⁹¹ The development of these two indices is very similar to the Gini coefficients. The comparable results – shown in Table A.10 in the Appendix – indicate that the trends shown for the entire income distribution can be witnessed in the lower part of the distribution to the same extent.

6.4 Income poverty

The analysis now focuses on the lower part of the income distribution, namely on income poverty among the elderly.⁹² It is based on a concept of relative poverty, meaning that the poverty line is defined as a percentage of the mean or median income. This relative poverty concept is preferable to a fixed line at a certain amount, since poverty leading to social exclusion has to be defined in relation to the rest of the population.⁹³ Particularly in the context of this study, where two countries are observed over a time period, a fixed poverty line would lead to methodological difficulties concerning the adjustment for changes in price levels and currency exchange rates. The Social Protection Committee of the European Commission has recommended the use of a relative poverty line at 60% of the median income,⁹⁴ which will also be applied here. People receiving less income have to be considered as relatively poor and are facing a high risk of social exclusion.⁹⁵

⁹⁰ Gini coefficients for old-age incomes increased considerably during the 1980s, from 0.25 in 1979 to 0.35 in 1991 according to calculations net of housing; cf. Ginn (2004), p 192.

⁹¹ For more detail about the two indicators, see section 6.1.3.2.

⁹² The analysis is based on net income figures excluding imputed rental values of owner-occupied housing. The reasons for this decision have been explained in section 6.4.1.3.

⁹³ See Hauser and Becker (2001), p 39 and Atkinson et al. (2001), pp 105f.

⁹⁴ Cf. Social Protection Committee (2001), p 2.

⁹⁵ For a comparison of the effect of using different poverty lines for the calculation of old-age poverty rates in the EU, see Hauser and Strengmann-Kuhn (2004). See section 6.1.2.

A comparison for the year 1999 shows that the poverty line of 60% of median equivalent income corresponds broadly to the respective subsistence benefits paid in that year in both countries. In West (East) Germany, the derived poverty line for a single person of DEM 1,225 (1,091) compares to the average social assistance benefit of DEM 1,181 (1,025). In Great Britain, the single person poverty line was about £105 per week whereas the minimum benefit amounted to £75 per week plus premium for pensioners. Furthermore, pensioners are entitled to housing benefits which depend on individual housing costs. Thus, the definition of the poverty line does not contradict the values implied in the social security systems.

Figure 6.17 provides a first overview of the trends in income poverty among the elderly in Germany and Great Britain.⁹⁶ It comprises different lines for East and West Germany as well as a curve for the reunified country from 1992, because there are significant regional differences. It has to be mentioned that the poverty rates are based on a national poverty line, i.e. 60% of the overall German median.⁹⁷

Comparing the levels of relative income poverty in West Germany and Great Britain, it is obvious that the British elderly were much more exposed to poverty than their German counterparts. The difference was between five and ten percentage points over the whole period. Nevertheless, there was a common downward

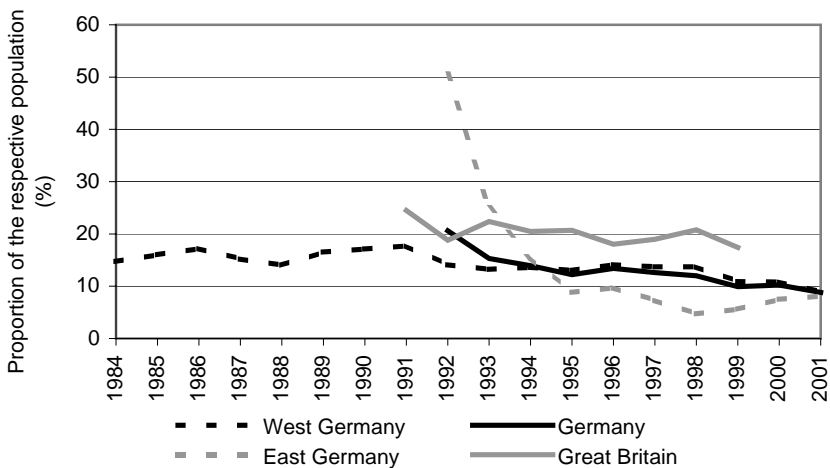


Figure 6.17. Poverty rates among the elderly (65+ years) in Germany^a and Great Britain, 1984–2001 (poverty line: 60% median equivalent net income)

^a The German poverty rates relate to the national German median from 1992 onwards.

Source: CNEF, own calculations; cf. Table A.11 in the Appendix.

⁹⁶ Since the 2000 and 2001 data for Great Britain differ extremely from the other years (see section 6.1.4.3), the British figures are only shown until 1999.

⁹⁷ The poverty levels differ if poverty is measured relative to the regional median income. See Table A.11 in the Appendix for all results.

trend in old-age poverty.⁹⁸ After some fluctuations between 14.7% and 17.2% during the 1980s, the West German poverty rate has been decreasing nearly continuously to less than 10% in the last observed year, 2001. The British chart shows nearly a parallel development from 24.5% in 1991 to 17.4% in 1999. Although there were some fluctuations, there was a visible reduction in old-age poverty in both countries.

The most impressive line is that of the East German elderly, who experienced a dramatic reduction in poverty rates from the starting point of 50.6% in 1992, especially during the first years after reunification. The rate even dropped under the corresponding West German figure in 1995 and decreased further until 1998 to a poverty rate of 4.7%. During the last three observation years, the rate re-increased to 8.1% in 2001, approaching the West German level of 8.9%. When interpreting the East German figures, it has to be taken into account that most of the results are based on relatively few observations.⁹⁹ The high poverty rates in East Germany in the first years are partly a result of the significant differences in price levels, which were considerably lower in East Germany than in the West during the first years after reunification and converged only later on. Consequently, the application of an overall German poverty line led to an upward shift of the East German figures.¹⁰⁰ This development confirms the findings from the analysis of incomes in section 6.2 that the East German pensioners were able to catch up in relation to the West Germans. The lower East German poverty rates may be particularly caused by the higher public pension entitlements of East German women, whose labour market participation rates were markedly above those of the West German women.¹⁰¹ This may partly explain the increase in poverty during later years, because later cohorts had fewer entitlements to the public pension scheme derived from their employment in the former East German state.

The next question to explore is how the old-age poverty rates have to be judged in the national context, that is to say whether the elderly were more or less exposed to poverty than other age-groups of the population. Another important distinction is by sex. Figure 6.18 gives an overview of the age and sex specific poverty rates in 1999.¹⁰² First, men were less exposed to income poverty in both countries. This was true for all age groups apart from the second group (15-24) for

⁹⁸ This result is confirmed by Gillion et al. (2000), p 102.

⁹⁹ See Table A.11 in the Appendix.

¹⁰⁰ The old-age poverty rate based on the regional poverty line for East Germany amounted to about 11% instead of about 51% based on the national poverty line. Cf. Table A.11 in the Appendix.

¹⁰¹ For the birth cohort of the years 1936–1940, the average period of full-time and part-time employment with entitlements to public pensions is 36.2 years (only full-time: 30.9) for East German women compared to 22.9 years (12.9) for West German women. Cf. Klammer and Tillmann (2001), p 164.

¹⁰² Since the 2000 and 2001 data for Great Britain differ extremely from the other years (see section 6.1.4.3), the comparison is based on 1999 figures. The number of cases for the elderly in East Germany does not allow inferring reliable results for this group of

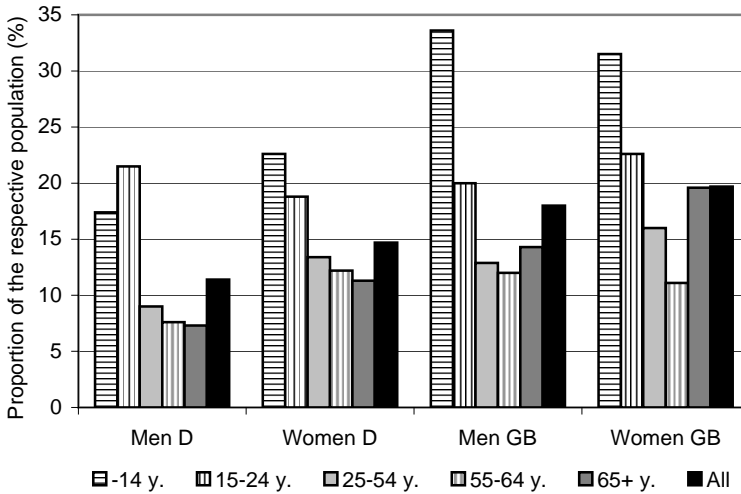


Figure 6.18. Poverty rates in Germany (D) and Great Britain (GB), 1999 (poverty line: 60% median equivalent net income)

Source: CNEF, own calculations; cf. Table A.12 in the Appendix.

Germany and the fourth group (55-64) for Great Britain. The distance between elderly men and women was 4 percentage points (11.3% compared to 7.3%) in Germany and almost 5 percentage points (19.6% compared to 14.3%) in Great Britain. Still, German women were less exposed to poverty than British men.

In Germany, poverty rates decreased with age, at least from the second age-group (15-24), so that the elderly – women as well as men – attained the comparatively lowest level of poverty. These results support the frequently heard public statement that old-age poverty has been overcome in Germany – at least relative to the other age-groups.¹⁰³ However, there were still nearly 11.3% of elderly women living in relative income poverty. The British picture differs significantly from the German. Similarly, children and their families are most exposed to poverty. This is consistent with the results for the relative income positions in section 6.2.3. Markedly different from the German situation was the position of the elderly. They were experiencing more poverty than the two age-groups of working age (25-54, 55-64). This was true for both men and women. Elderly British women were almost at the same level of poverty as the population on the whole.

Main reasons for higher old-age poverty among women than among men are the higher proportion of single households of women of this age¹⁰⁴ and the fact

people with a distinction by age and sex. Therefore, the overall German figures are presented.

¹⁰³ Cf. e.g. Handelsblatt, 26.09.2003, *Zahl der Sozialhilfeempfänger steigt*.

¹⁰⁴ Cf. Grabka (2004), p 69.

that they own fewer entitlements for public pension benefits. Since there were reductions in survivors' pensions in both countries with recent pension reforms, this group of elderly women may be even more exposed to poverty in the future. Women of younger age cohorts will probably be able to compensate for reductions in derived benefits because they earn more individual pension entitlements as a result of increasing labour market participation.

The remainder of this section will provide more details about the trends in poverty rates by age and sex over time. Figure 6.19 illustrates the development of poverty by sex in both countries. The considerable fluctuations of the observed poverty rates presumably are due to relatively small case numbers in the datasets with a distinction by sex.¹⁰⁵ Still, the visible trends can be considered reliable. During the 1990s, there was a downward trend in poverty for all sub-groups. In the late 1980s in West Germany, men's poverty rates declined whereas women's poverty rates increased, followed by a convergence in poverty rates throughout Germany after reunification. The coming together of men's and women's poverty rates in reunified Germany may be the result of increasing numbers of women with their own pension entitlements, in particular in East Germany. In Great Britain, too, there was a decreasing gap between men's and women's poverty rates during the observation period, but to a smaller extent than in Germany.

Next, it is worth taking a closer look at the development of old-age poverty rates in comparison with overall poverty rates and those of the population of working age. This is done by country in Figures 6.20 and 6.21.

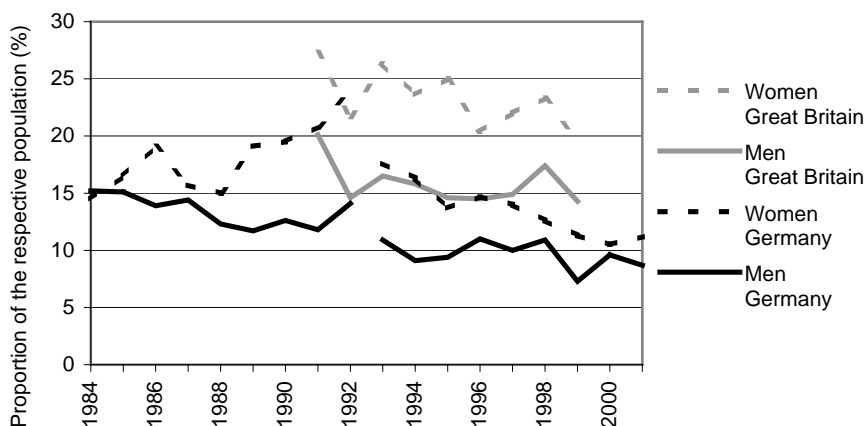


Figure 6.19. Poverty rates among the elderly (65+ years) by sex in Germany^a and Great Britain, 1984–2001 (poverty line: 60% median equivalent net income)

^a Germany: until 1991 West Germany, then reunified Germany.

Source: CNEF, own calculations; cf. Table A.12 in the Appendix.

¹⁰⁵ See Table A.12 in the Appendix.

The chart for Germany (Figure 6.20) shows that the elderly were at a higher than average risk of being poor in West Germany until reunification. There were similar movements in poverty rates for the three compared population groups from 1984 to 1991; the lines run nearly parallel. The poverty rates among the elderly (14.7–17.7%) were continuously above the rates for the whole population (12.5–14.4%), which were above the poverty rates for the people aged 25–54 (9.4–11.2%).

The earlier (West German) ranking has changed dramatically after reunification. Whereas the poverty rates of the entire population (10.2–14.6%) and of the people of working age (8.2–12.1%) have roughly maintained their earlier levels, the old-age poverty rate experienced not only a steep fall in absolute terms, but also relative to the other parts of the population. This drop was mainly due to the East German developments described earlier.¹⁰⁶ Poverty among the elderly has been reduced to the comparatively lowest level in the long-term perspective as well as in comparison to the other population groups.

Figure 6.21 illustrates the trends in poverty in Great Britain. During the observation period, the overall poverty rates have fluctuated around 20%, starting and ending at about 18.5%, with two peaks at around 21% in 1993 and 1998. In con-

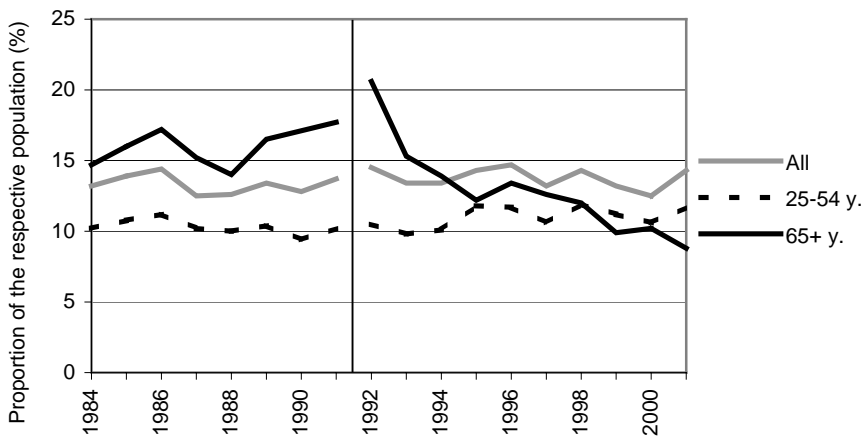


Figure 6.20. Poverty rates by age in Germany^a 1984–2001 (poverty line: 60% median equivalent net income)

^a Germany: until 1991 West Germany, then reunified Germany.

Source: CNEF, own calculations; cf. Table A.11 in the Appendix.

¹⁰⁶ The development in East Germany is exaggerated due to the application of the national poverty line in the face of significant price level differences between the two parts of the country in the first years after reunification.

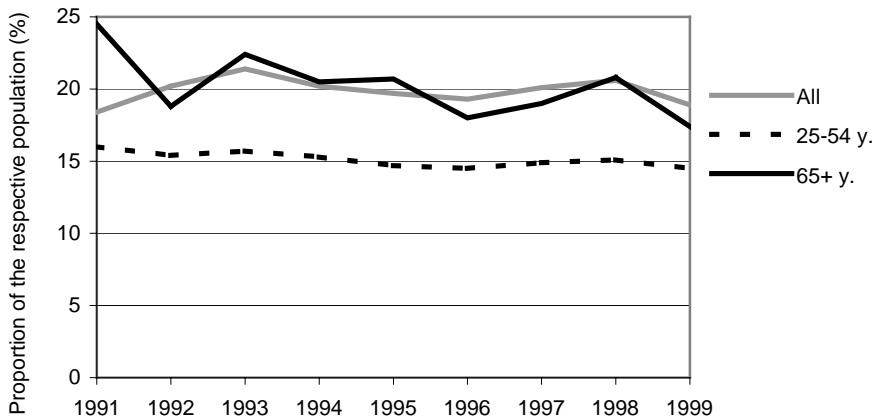


Figure 6.21. Poverty rates by age in Great Britain, 1991–1999 (poverty line: 60% median equivalent net income)

Source: CNEF, own calculations; cf. Table A.11 in the Appendix.

trast, poverty rates for the elderly and for the working-age population had a downward trend over time. While there was only a minor reduction in poverty for the population aged 25–54 from 16% in 1991 to 14.5% in 1999, the decline in old-age poverty was much more important. Starting from 24.5% in 1991, the poverty rate for the elderly shrank to 17.4% in 1999. Since 1996, elderly people have been on average less exposed to poverty than the whole population. This is a success of the British government’s objective to prevent old-age poverty.¹⁰⁷ However, poverty rates were still higher among the elderly than among the working-age population and are fluctuating.

To conclude, old-age poverty rates have been reduced to a level beneath the national average during the past decade, in Germany even beneath the poverty levels of all other age-groups. This success can be attributed to governmental efforts to prevent poverty among the elderly. Nevertheless, especially elderly women still run a high risk of being poor. The British poverty rates are significantly above those experienced in Germany at almost all ages.

6.5 Income sources of the elderly

This section focuses on the sources of old-age income. The composition of individual equivalent income reflects the impact of the national pension systems on the income situation of the elderly. Thus, the income composition reveals informa-

¹⁰⁷ See United Kingdom of Great Britain and Northern Ireland (2002), p 3.

tion on how people plan for their old age – and are capable of doing so – by adding individual provisions to their public pension entitlements.

However, it has to be borne in mind that the results are based on household income figures. For example, the existence of labour income does not necessarily indicate an occupation of the elderly person who is in the centre of the analysis and public transfers like child allowances may be received by a younger person in the household. Therefore, the crucial question of labour market participation among the elderly is studied on the basis of their individual labour income (see 6.5.4).

The first subsection concentrates on overall old-age income sources. These figures allow for deriving the aggregate repartition in different types of financing that were defined as an important factor for the sustainability of a pension system.¹⁰⁸ The second step is to go back to the individual level and analyse the mean income from an income source for those who receive income of this type. Finally, the influence of sex on the income composition will deliver further evidence for the sex income gap observed previously.

In contrast to the earlier sections of this chapter, this section shows mean income data. The reason for this shift in measurement is that the mean amounts of all income sources add to total mean income.¹⁰⁹ This allows calculating percentages of total income for each income component. However, mean values normally fluctuate more than median values.¹¹⁰ A second difference is the use of gross equivalent income as opposed to net incomes. This is necessary because tax payments usually cannot be directly attributed to a certain income category but reduce total income. Therefore, the consideration of gross income is more adequate for the objectives of the analysis. Furthermore, this section shows as a fictitious income component the imputed rental value of owner occupied housing which has not been included in the previous analyses.

6.5.1 Overall income composition

Figures 6.22 and 6.23 give a first impression of the relative importance of the various income components in West Germany and Great Britain over time. The distinguished components are the following:¹¹¹

- *Public pensions* are income from the public pension schemes, i.e. old-age pensions, disability pensions, survivors' benefits;
- *Public transfers* are all transfers from the national social security system apart from public pensions, e.g. subsistence assistance, unemployment benefits, housing allowances, child benefits etc;

¹⁰⁸ See section 3.2.1.

¹⁰⁹ This requires that the mean income of each source is calculated for all persons, including those without income of the respective source.

¹¹⁰ See section 6.1.3.1.

¹¹¹ For a detailed description of the components, see section 6.1.4.3.

- *Private pensions* consist of benefits from occupational and personal pension schemes;
- *Asset income* is income from all types of investments, i.e. interest, dividends and rent;
- *Labour income* is the total of wages and salary from every kind of employment and self-employment including irregular payments;
- *Private transfers* are all incomes received from persons outside of the household including alimony and child support payments;
- *Imputed rent* stands for the imputed rental value of owner-occupied housing.

Private transfers are not included in the charts because they are based on a very small number of observations that do not allow drawing secure conclusions.¹¹² Since these transfers do not exceed 2% of total income for the whole period of time, the missing values do not have an important influence on the remaining numbers. Imputed rental values are not a cash income component but show the importance of owner-occupied housing. They have not been considered for earlier figures due to significant differences in the imputation methods (see 6.1.4.3).

Figure 6.22 shows smooth shifts between different income components over time in West Germany. The dominating source of old-age income was the public pension scheme with about 70% of total income. There was a negative trend from nearly 73% in 1986 to about 66% in 2000, but the figure recovered to 69% in 2001. These numbers confirm the result of the institutional analysis (chapter 5) that public pensions constitute a major source of old-age income. Public transfers

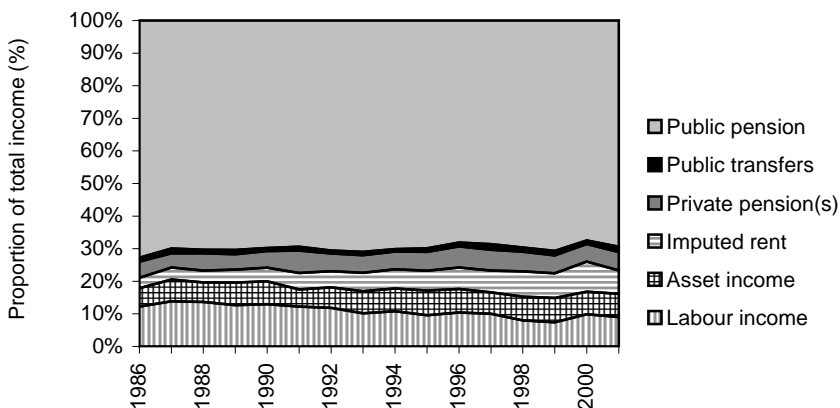


Figure 6.22. Composition of total old-age income (mean equivalent gross income) in West Germany, 1986–2001¹¹³

Source: CNEF, own calculations; cf. Table A.13 in the Appendix.

¹¹² Table A.13 in the Appendix comprises all underlying figures including private transfers.

¹¹³ The presentation starts in 1986 because private pension income was not surveyed in the years 1984 and 1985.

were only a minor income source for the elderly with 0.7–1.7% of total income – another confirmation for the low poverty rates and thus (potential) recipients of subsidiary benefits. Private pensions from occupational and personal schemes added up to 4.7–6.8% of total income. There was no significant trend towards more private pensions. However, the overall mean figures change only slowly, because the income sources of a pensioner usually do not change over time in retirement. For this reason, the income composition of new pensioners will be studied additionally in section 6.6.3.

On the contrary, the rental value of owner-occupied housing has experienced the strongest improvement of relative importance among the studied income components. This fictitious value increased from 3% of total income in 1986 to 9% in 2000, followed by a decrease to 7.1% in 2001. Whether these figures resulted from increasing housing costs or more real estate owners, has to be answered later, taking into account the number of recipients (see 6.5.2). Income originating in assets has increased slightly from 5.7% in 1986 to about 7% in 2001, with the highest value being achieved in 1995 (7.5%). The strong growth rates of the international capital markets in the late 1990s do not seem to have affected the elderly's return on investments. However, since the data only measures income from assets and not increases in the value of assets, the potential influence of the capital market situation is limited.¹¹⁴

Labour income had a diminishing relative importance for the total income of the elderly. From a value of about 14% in 1987, the part of this income source had been reduced to 7.4% in 1999, to grow again to more than 9% in 2001 after 9.5% in 2000. However, it has to be remembered that these are equivalent incomes; therefore labour income – like the other income sources – may also have been received by younger household members. The analysis will focus on this point later (6.5.4). A far more impressive reduction of the importance of labour income has been experienced in East Germany (not illustrated), where the proportion of this income component shrank from 12% in 1992 to 4.2% in 2000, followed by a slight regain to 5.2% in 2001.¹¹⁵ These figures presumably reflect the increasingly difficult labour market situation in East Germany, where the general unemployment rate reached 17.3% in 2001.¹¹⁶

Figure 6.23 shows the corresponding chart for Great Britain.¹¹⁷ As in West Germany, there was no dramatic shift between different income components over time. Nevertheless, the picture is extremely different from that seen in the preceding figure. The relative importance of the income sources was much more bal-

¹¹⁴ See section 6.6.3 for more information on the development of capital markets and its influences on private pensions and asset income.

¹¹⁵ See Table A.13 in the Appendix.

¹¹⁶ The employment opportunities for people aged 50 or more were even worse: more than 50% of the unemployed of this age-group were in unemployment for more than one year in 2001, compared to 40% of those aged 25–40; cf. Bundesanstalt für Arbeit (2003), Tab. IV.E.9c, p 217.

¹¹⁷ The figures end in 1999, because the imputed rent variable is missing in the 2000 and 2001 data files so that the inclusion of these years would result in a misleading chart.

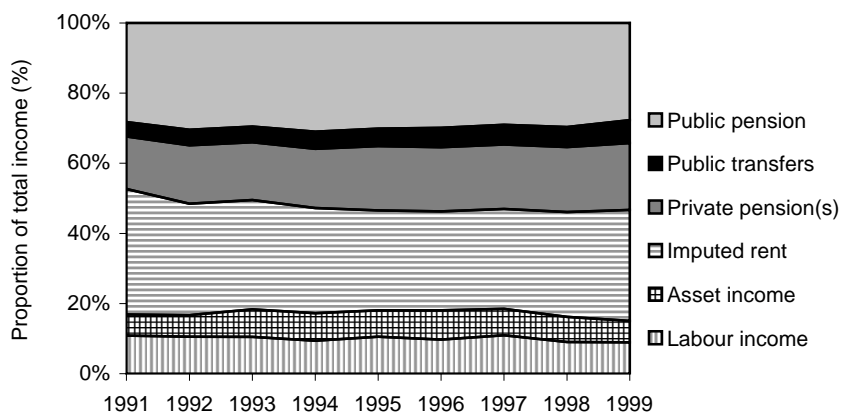


Figure 6.23. Composition of total old-age income (mean equivalent gross income) in Great Britain, 1991–1999

Source: CNEF, own calculations; cf. Table A.13 in the Appendix.

anced in Great Britain. Public pension income accounted for about 30% of total income. The proportion had increased from 28% to 31% in the first half of the observation period, but it fell back to slightly below its initial level until 1999. These figures are significantly lower than those for Germany, which is not surprising considering the institutional background presented in chapter 5. They reflect the fact that the State Basic Pension and the additional State Pension (SSP, SERPS) are only parts of the entire pension system – complemented by occupational and personal pension schemes – and are not intended to secure a certain living standard. Furthermore, the inclusion of imputed rent leads to a reduction in the relative importance of the other income components.

The institutional framework also explains the higher relative importance of public transfers for the British elderly in comparison to Germany. These transfers increased from 4% to 6.5% of total income during the 1990s. This increase reflects the restricted adjustment of the State Basic Pension since the late 1980s that resulted in a growing number of elderly receiving the Minimum Income Guarantee¹¹⁸, which was higher than the Basic Pension during the observation period.

As expected, private pensions (occupational or personal) were far more important in Great Britain than in West Germany. Their part of total income increased nearly continuously from about 15% in 1991 to 19% in 1999. The rising share of private pensions reflects the maturing of the occupational pension schemes which have been operating since the 1970s.

The rental value of owner-occupied housing had a significant importance for the elderly. It corresponded to about one third of total income. The rental value

¹¹⁸ The Minimum Income Guarantee has been replaced by the Pension Credit in October 2003; see section 5.3.7.

developed in a U-shape, decreasing from 35.6% in 1991 to 28.1% in 1996 and recovering to 31.6% in 1999. A direct comparison to the German values is impossible, because the way of calculating imputed rent differs in both datasets.¹¹⁹ The different approaches of measurement tend to overestimate imputed rental values for Great Britain.¹²⁰

Asset income as a proportion of total income grew slightly from 6% in the beginning to 8.3% in 1996, but fell back to its initial level in 1999. As in Germany, there was no visible effect of the good performance of the international capital markets on the mean asset income of the elderly. Concerning labour income, this component contributed about 10% to the total income. There was a slightly negative trend during the observation period from about 11% to 9%. This proportion was surprisingly similar to the German figures of the 1990s despite significantly lower unemployment rates in Great Britain¹²¹. Whether there are similar employment rates in old age will be touched upon later (section 6.5.4).

To obtain an impression of the different income components and total income in real terms, Figure 6.24 illustrates results in Euro for Germany and Great Britain in 1999¹²². Since the relative importance of the income sources has not changed dramatically over the observed years (Figures 6.22 and 6.23), this comparison for a single year can be considered representative for the general situation.

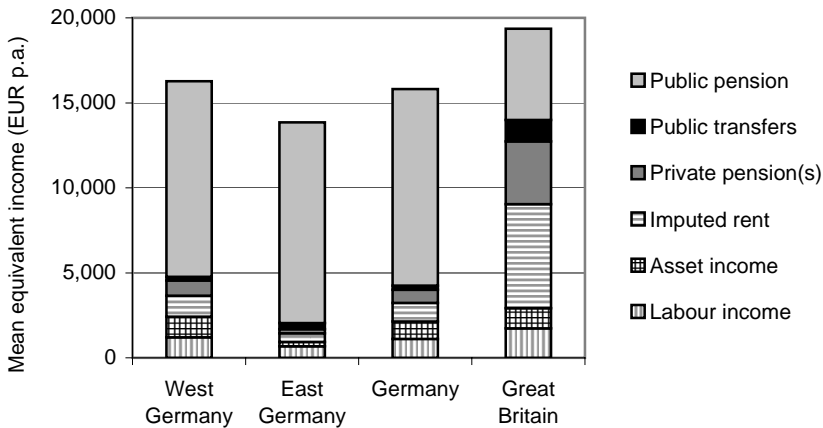


Figure 6.24. Composition of total old-age income (mean equivalent gross income) in West, East and entire Germany and Great Britain in 1999, in Euro^a

^a British data is converted into EUR by OECD purchasing power parities, cf. Table A.2 in the Appendix.

Source: CNEF, own calculations; cf. Table A.13 in the Appendix.

¹¹⁹ See section 6.1.4.3.

¹²⁰ Cf. Frick and Grabka (2002), p 9.

¹²¹ See Table A.3 in the Appendix.

¹²² The chart is based on 1999 figures because the British datasets for 2000 and 2001 do not comprise imputed rental values.

The most astonishing fact of this chart is the higher total income in Great Britain compared to Germany that seems to contradict the previously made statements based on net income data (section 6.2.1). The difference is due to the inclusion of imputed rent and the higher taxation of old-age incomes in Great Britain compared to Germany. While German pensioners profit from considerable tax allowances and only a minor part of their income is subject to taxation, British pension schemes operate according to the EET model, meaning that contributions are exempt from taxation, but the benefits are subject to income taxes. There exist only minor age-related tax allowances.¹²³ In consequence, gross income is reduced considerably in Great Britain, so that the ranking of the countries changes for net incomes.¹²⁴

Concerning the relative importance of the various income components, Figure 6.24 shows again that income sources were of a more similar importance in Great Britain than in Germany. The most unbalanced picture is provided by East Germany, where more than 85% of total income originated in public pension benefits. On the other hand, private pensions and asset income contributed less than 2% to total income.¹²⁵

However, it has to be kept in mind that these are overall mean figures. This is a rather macroeconomic view that fails to consider that not every pensioner receives income from each source. Therefore, the presented figures are not equal to the mean income from a source among those who receive this kind of income at all. This approach will be pursued later (6.5.2). Nevertheless, this general overview allows aggregating the income components according to their financing. As shown in the theoretical analysis in section 3.2, the financing structure of a pension system is crucial for its ability to deal with exogenous effects.

After taking a look at the overall income structure of the elderly, the analysis now breaks down the numbers to the individual level of the recipients of the respective income component. Further analyses of income sources, but with focus on the income composition at the start of retirement and based on a panel data design, will be conducted in section 6.6.3.

6.5.2 Mean income among recipients

The average amount of each income source for those who receive income of this kind is different than the overall mean value of it. This is especially the case for those income components that are only received by few elderly and thus lead to a much lower overall mean than the average value for the recipients. Proportions of recipients will be presented in the following section 6.5.3 whereas this section analyses the mean values of the different income sources among the recipients of the respective source.

¹²³ See section 5.3.6 and 5.4.1 as well as Table A.6 in the Appendix.

¹²⁴ Taxation concerns cash income components only, i.e. the amount of the imputed rental value is not reduced by taxation.

¹²⁵ Table A.13 in the Appendix contains the underlying figures.

Figure 6.25 illustrates the long-term development of the mean income from each component among recipients in West Germany. There is no data available for private pensions in the first two years, where it is included in public pension income. The extraordinary high values for some of the components in 1986 may be due to the mean income approach that leads to a greater variability of the data than the earlier used median income measure.¹²⁶

While the level of public pensions did not differ markedly from the overall mean level shown in the previous section 6.5.1, labour income was much higher for those who received this type of income. For example, in 2001 the mean equivalent labour income among recipients reached nearly €9,500 p.a. compared to €1,500 p.a. on average for all elderly.¹²⁷ This demonstrates that only few households with elderly persons received labour income (6.5.3). Similarly, private pension income and public transfers were of a markedly higher amount for the recipients of these income components. Private pensions attained an average amount of more than €3,000 p.a. in most of the observed years (€800–900 p.a. overall average).¹²⁸ Public transfers amounted to nearly €2,000 p.a. during the late 1990s and were therefore of a higher value for the recipients than asset income (€1,300–1,480 p.a.), which was the income source with the lowest amount. Taking a look at the development of the different income components, real public pension income showed a nearly continuous upward trend (+25%) during the observation

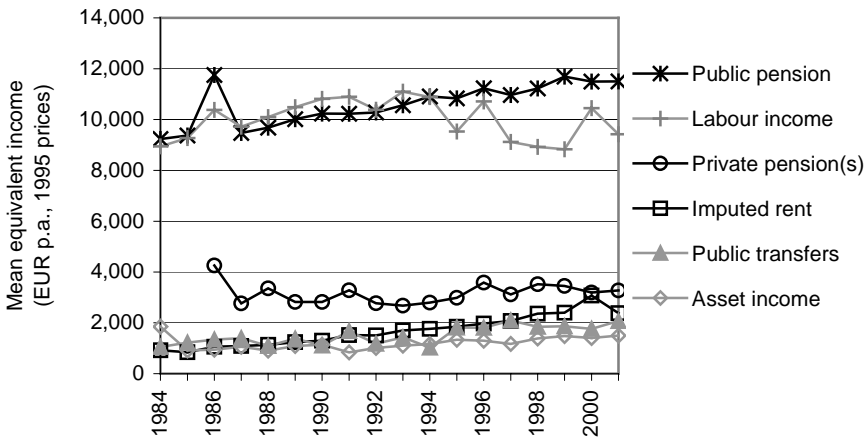


Figure 6.25. Income components (mean real equivalent gross income) of elderly recipients (65+ years) in West Germany, 1984–2001

Source: CNEF, own calculations; cf. Table A.14 in the Appendix.

¹²⁶ See section 6.1.3.1.

¹²⁷ See Tables A.13 and A.12 in the Appendix, respectively.

¹²⁸ According to Casey and Yamada (2002), p 5, private pensions are relatively more important for high-income earners.

period. On the other hand, the amount of real labour income seems to have decreased during the 1990s, with two temporary positive shocks in 1996 and 2000 (or two negative shocks in 1995 and 1997–99) that cannot be explained from the macroeconomic context. Private pensions and asset income remained relatively stable in real terms, while the real imputed rental value of owner-occupied housing and real public transfers increased slightly over time. In the context of increasing total incomes and growing international capital markets, the constant levels of private pensions and asset income are surprising. Section 6.6.3 will refer to this context in more detail.

Although the previous charts have shown important differences in the income structures of West and East Germany, the East German values – especially those for the private pensions – have to be treated carefully, because the case numbers are not very high due to low overall response numbers among the elderly in East Germany. Therefore, there is no chart about the development of absolute amounts over time.

Figure 6.26 provides the corresponding information for Great Britain. Concerning labour income, the picture is similar to West Germany. If a household received labour income at all, it was an important income source, which had the highest average value of all income components for the British pensioners with about £5,500 p.a. in 1999. Imputed rent and public pension obviously were widely spread income sources (see also 6.5.3), because their value is not significantly different from the overall approach. Comparable to the West German situation, public transfers and private pensions were of a markedly higher average amount for those who received these income components.

Concerning the long-term development of the real values of the income sources, the majority is continuously increasing over time. Public transfers and private pensions achieved the highest growth with 82% and 37% respectively

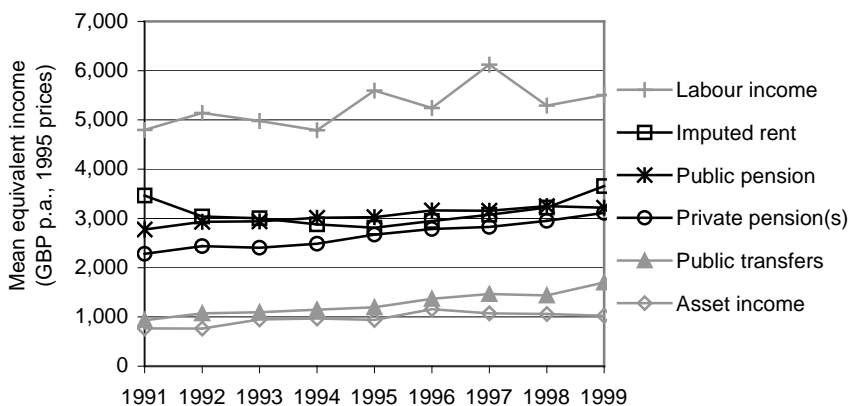


Figure 6.26. Income components (mean real equivalent gross income) of elderly recipients (65+ years) in Great Britain, 1991–1999

Source: CNEF, own calculations; cf. Table A.14 in the Appendix.

from 1991 until 1999. Asset income (+34%), public pension income (+16%) and labour income (+15%) grew less markedly. The graph for imputed rent shows a U-shape, starting and ending at about £3,500 p.a.

6.5.3 Recipients by sex

In order to draw conclusions from the previous figures, it is important to know how many of the elderly were receiving income from the respective income source. This question will be analysed by sex because there are supposedly important differences in the income structure between male and female elderly in each country. However, the calculation is based on equivalent income, i.e. all household incomes (whether received by the elderly person or another household member) are taken into account. A close analysis of the East German results is impossible due to data limitations.¹²⁹ It has to be mentioned that an analysis of mean equivalent incomes among recipients by sex did not lead to significantly different values for men and women.¹³⁰ Thus, the gender income gap noted previously is presumably a result of differing income sources and not of an important income gap within the income flows from a respective source.

Figure 6.27 illustrates the proportion of elderly men and women receiving income from the respective source in 1999¹³¹. Almost all elderly men and women were receiving public pension benefits. There were no significant differences between the sexes with percentages of 94.5% (men) and 95.1% (women) in Germany and 97.4% (men) and 97.2% (women) in Great Britain. However, as seen earlier (6.5.2), the average value of these public pension benefits differs markedly between the two countries. The slightly lower recipient rates in Germany may be due to the fact that the self-employed are not obliged to participate in a public pension scheme as it is the case in Great Britain. While the picture for public pension income was similar, the proportion of private pension recipients varied markedly by country and sex.

In both countries, women were less likely to receive private pension income than men. Taking a look at the proportions, there were only 24.4% of German men and 18.7% of German women who received benefits from a private pension scheme, compared to 74.8% of British men and 65.6% of British women. This large gap between the two countries reflects the institutional structure as presented in chapter 5: British employees can choose between a public and a private manda-

¹²⁹ The results can be found in Table A.15 in the Appendix. Small case numbers are labelled.

¹³⁰ The results can be provided by the author.

¹³¹ There were no dramatic changes in the proportions of recipients in Germany and Great Britain during the observation period. On the contrary, the receipt of some income components seems to have changed significantly in East Germany. Nevertheless, as already mentioned, the East German figures are based on very low case numbers and are not sufficiently reliable. For the underlying figures of the entire observation period, see Table A.15 in the Appendix.

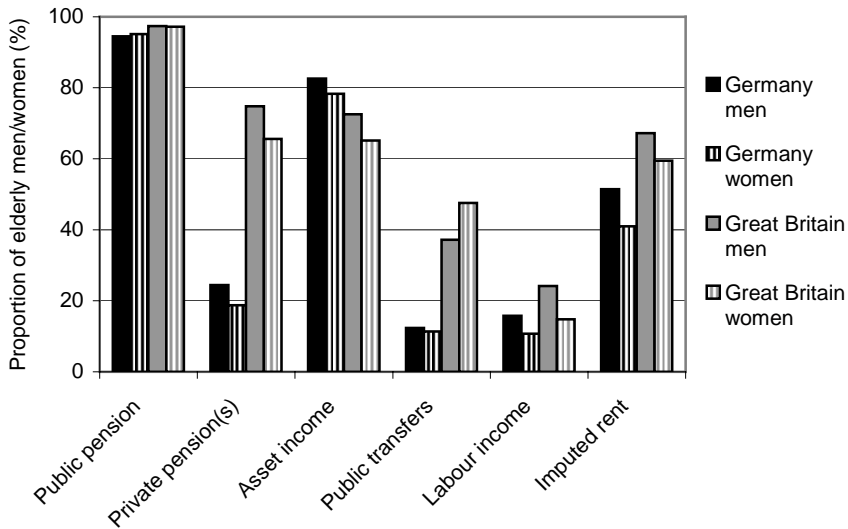


Figure 6.27. Elderly recipients (65+ years) of the respective equivalised income component by sex in Germany and Great Britain, 1999 (recipients in % of all elderly men/women)

Source: CNEF, own calculations; cf. Table A.15 in the Appendix.

tory additional pension.¹³² Thus, private pensions – and among these especially occupational pension schemes – are much more common in Great Britain than in Germany.

Asset income was the only component that was received by a higher proportion of Germans than British and in both countries, this was more common among men than among women. 82.6% of German men and 78.3% of German women were recipients of this income category. On the other hand, British men and British women achieved recipient rates of 72.6% and 65.2%, respectively. The high percentages in Germany reflect the institutional situation, in which private old-age provision is partly realised through investments that are not considered private pension schemes, such as life insurances and bank savings accounts. For example, in 2003 three quarters of German households had at least one life insurance contract.¹³³ ¹³⁴ Considering the institutional background during the observation period with a private pension sector much more established in Great Britain, it is no surprise that German pensioners relied relatively more often on asset income than the British.

¹³² See section 5.2.3.

¹³³ Cf. Handelsblatt, 5.9.2003, *Glanz der Lebensversicherung verblasst*.

¹³⁴ However, income from insurance contracts is only included in the asset income variable if it is a regular monthly income component. Lump sum payments from life insurances are not taken into account. Cf. section 6.1.4.3.

Concerning public transfers, they were less spread in Germany than in Great Britain. Only 12.4% of German men and 11.3% of German women were receiving these social benefits compared to 37.3% of British men and even 47.6% of British women. These differences were caused by the institutional framework (chapter 5). Since the British Basic Pension was lower than the minimum income guarantee during the observation period, many elderly were relying on means-tested benefits from the subsidiary system.¹³⁵

Labour income was an income source for only a small proportion of German elderly, precisely 15.8% of men and 10.7% of women. The British proportions were only some percentage points higher, with 24.1% of men and 14.8% of women. Obviously, there was a significant gender gap in terms of labour market income. It has to be borne in mind that these figures are derived from household data; an analysis of labour market participation will follow in section 6.5.4.

Finally, the figures for imputed rent allow inferring the number of people living in their own flat or house. A surprising result is the gap between the proportions of men and women with self-occupied real estate property. Only 41% of German women compared to 51.5% of German men and 59.5% of British women compared to 67.2% of British men were living in their own dwellings. Obviously, proportions of homeowners were significantly higher in Great Britain than in Germany, explaining the large importance of this income source from a macroeconomic point of view as shown in Figure 6.23.¹³⁶

6.5.4 Labour market participation among the elderly

Since labour market participation of the elderly is of major interest for possible increases in the effective retirement age, this section concentrates on individual labour income, which can be derived from the CNEF data. The most important question is about the proportion of elderly who participate in the labour market. This analysis is done by sex and by age. Finally, there will be a short overview of the average amount of labour income among those who are taking part in the workforce. In contrast to the rest of this analysis, the figures of this section are not equivalent but individual incomes that do not consider the household context.

Figure 6.28 shows the proportion of elderly with individual labour income by sex. The values may not reflect the accurate numbers, because some of them are based on few observations. However, the level can be taken as a reliable estimation.

The lower proportions of labour income earners compared to those for recipients of equivalent labour income (Figure 6.27) show that more than half of the German recipients of equivalent labour income did not receive this income from

¹³⁵ The introduction of the Pension Credit in 2003 led to an increase in recipients of this public transfer to about 50% of British pensioners; cf. Pensions Commission (2004), p 225.

¹³⁶ The Pensions Commission (2004), p 186 argues that there are considerable cohort effects and that increasing numbers of pensioners will have housing wealth in the future.

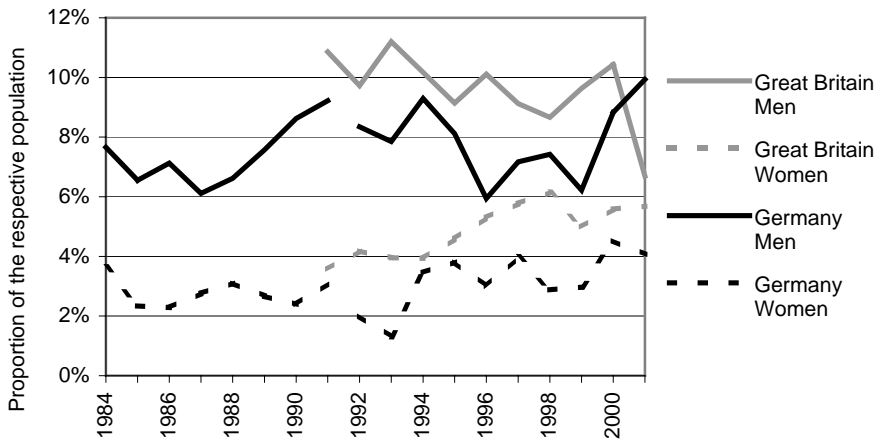


Figure 6.28. Elderly recipients (65+ years) of individual labour income by sex in Germany^a and Great Britain, 1984–2001

^a Germany: until 1991 West Germany, then reunified Germany.

Source: CNEF, own calculations; cf. Table A.16 in the Appendix.

their own labour market participation; instead it was earned by other household members. The difference was less significant in Great Britain, where the rates of individual labour income recipients were only about two percentage points lower than those for recipients of equivalent labour income. In consequence, British pensioners were usually relying on their own income and less on the labour income of other household members.¹³⁷

Obviously, labour market participation was more frequent among men than among women in both countries. In Germany, men's participation rates ranged from 6% to 10%, those of women between about 2% and 4%. Around 9–10% of British men and 3.5–6% of British women were taking part in the labour market.¹³⁸ Thus, participation rates were one to two percentage points higher in Great Britain than in Germany. For some years, both public pension schemes have given incentives to work beyond the statutory pension age of 65 years.¹³⁹ However, these incentives

¹³⁷ Yamada and Casey (2002), p 20 find that the British who work after reaching the legal retirement age usually only have public pension income and are thus obliged to work to achieve sufficient income for maintaining an adequate living standard above legal retirement age.

¹³⁸ Other studies find similar results. According to Winqvist (2002), p 3, 6% of German men and 2.5% of German women as well as 11% of British men and 6% of British women aged 65 or more were working in 2000. Among these, about 40% of men and 60% of women had part-time employment.

¹³⁹ Germans participating in the statutory public pension scheme (GRV) receive an additional 0.5% of their pension payment for each month of work after turning 65, British

do not seem to have led to significantly higher participation rates. Labour market participation was very low among women and not significantly higher than 10% among elderly men in both countries.

While there may have been a positive trend among women during the 1990s in both countries, there was no visible trend for the participation rates of men during the same decade. Consequently, the incentives in the systems for postponing retirement (Germany, Great Britain) or employment in addition to the public pension (Great Britain) have not met their objectives. This may be a result of the high overall unemployment rate in the late 1990s in Germany, but this argument is untenable for Great Britain.¹⁴⁰

Figure 6.29 takes a look at the labour market participation among younger (65–74 years) and among older (75+ years) pensioners. As expected, participation rates were higher among those aged 65–74 years. About 12% of British elderly in this range were receiving individual labour income during the late 1990s, a rate that had increased from 10% in the early 1990s. In Germany, between 6% and 9% of the elderly under 75 years were participating in the labour market during the observation period. The German line is fluctuating significantly, which may be either due to the data or to real fluctuations in labour market participation. However, the general increase in unemployment is not mirrored in the figures.

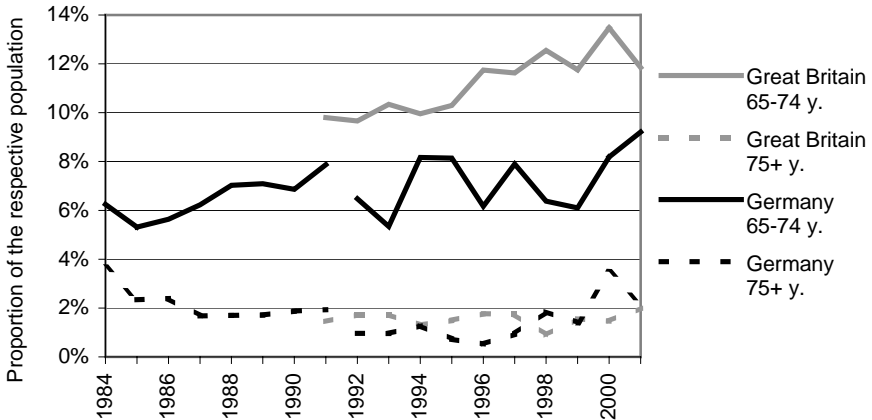


Figure 6.29. Recipients of individual labour income by age in Germany^a and Great Britain, 1984–2001

^a Germany: until 1991 West Germany, then reunified Germany.

Source: CNEF, own calculations; cf. Table A.16 in the Appendix.

members of the public pension schemes receive a bonus of 0.14% of their pension for each additional week of work; cf. section 5.3.4.

¹⁴⁰ In Great Britain, occupational pension schemes often comprise bridging arrangements for early retirement; cf. Casey and Yamada (2002), p 7. 40% of total funded pension income is received by early retirees; cf. Pensions Commission (2004), p 14.

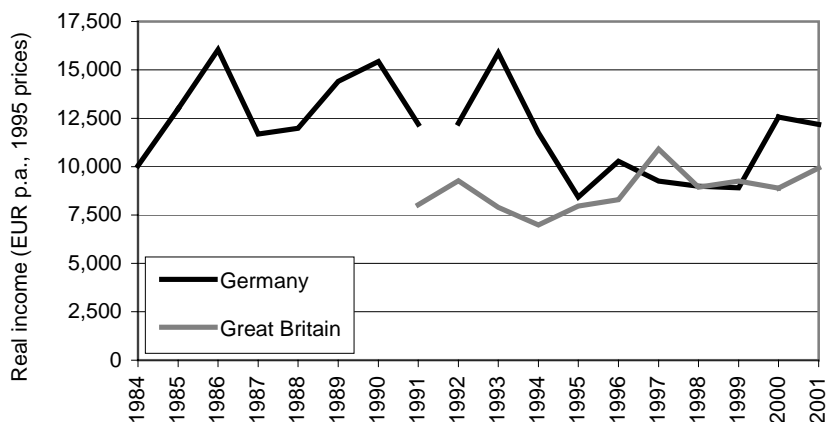


Figure 6.30. Individual labour income of elderly recipients (65+ years) in Euro^a in Germany^b and Great Britain, 1984–2001

^a British figures converted by OECD purchasing power parities, cf. Table A.2 in the Appendix.

^b Germany: until 1991 West Germany, then reunified Germany.

Source: CNEF, own calculations; cf. Table A.17 in the Appendix.

For those aged 75 and over, the results are less robust, because they are based on very few observations. However, there is high evidence that participation rates decrease with age. Among the older age-group, there were less than 2% labour income recipients for most of the observed years. Labour market participation of elderly persons is naturally closely connected to the average effective retirement age that will be analysed in section 6.6.1.

In addition to this analysis of labour market participation rates, Figure 6.30 provides an overview of the average amount of individual labour income¹⁴¹ received by the elderly. The figure shows that the mean income figures fluctuated significantly over the observed period without showing a distinct trend. On average, German elderly received at least as much individual labour income as the British. The amounts were considerable with €8,400–16,000 p.a. in Germany and €7,000–10,900 p.a. in Great Britain. Obviously, labour income was an important income component for those who were participating in the labour market.

To summarise the most important ideas of section 6.5, it has been shown that the national institutional arrangements seen in chapter 5 have important influences on the composition of old-age incomes (see 6.7.1). A macroeconomic overview of overall mean equivalent incomes from different sources can give some interesting information about the financing structure of pension systems, but it cannot replace a detailed analysis of the actual importance of an income component for those

¹⁴¹ As mentioned above, these figures are based on individual and not on equivalent income.

who receive income of this type. There was an additional section about individual labour income because labour market participation of the elderly is an important subject of the public and political debate about reform options and sustainability of public pension schemes.

6.6 Panel analyses

The data structure of the CNEF is a panel structure, meaning that the same individuals are surveyed each year. This structure is suited for following individuals over time. After having conducted cross-sectional analyses that do not take into account the link of the information of two or more years by the same individual, there are some questions which can only be answered by a panel analysis design. This is the case for all analyses concerning different periods of an individual's life, e.g. the change from labour market participation to retirement or the thereby caused change in income.¹⁴²

There are two possible panel structures, which are called balanced and unbalanced panels. A balanced panel takes into account only those individuals who have participated in all years of the survey. On the other hand, an unbalanced panel links individual information of all participants in the survey, regardless of non-participation in one or more years. The result are income histories with gaps for the missing years or shorter histories in case of an early drop-out of the respective person.¹⁴³ In the following, the different panel data structures are used according to the respective research questions.

6.6.1 Retirement age

This section focuses on the age of individuals when they change their primary activity from 'working' to 'not working'.¹⁴⁴ The term of retirement is used in a broad sense: people aged 55 or more are considered to have retired if they have been active on the labour market for two consecutive years, followed by two years of inactivity. More precisely, a person has retired during the present year t if he/she has been working in the years $t-2$ and $t-1$ and is inactive in the years t and $t+1$. Although some individuals may re-enter the labour market later on, this change of primary activity – if it is only observed for people aged 55 or more – can be considered a good indicator for the personal withdrawal from working life. It may also reflect the event of long-term working incapacity. A variety of possibilities have existed for elderly employees to advance their effective retirement with regard to the legal retirement age, some without being retired from a legal point of

¹⁴² For a detailed introduction to panel data and appropriate econometric models to conduct calculations based on panel data, cf. Greene (2003), chapter 13, pp 283ff.

¹⁴³ See Greene (2003), p 293.

¹⁴⁴ Variable 'Primary Activity of Individual' in the CNEF datasets.

view and without public pension receipt.¹⁴⁵ In contrast to public pension(ers) statistics, these arrangements are included in the observed change in primary activity.

The results are based on an unbalanced panel data structure, since the change in activity is observed on the basis of four consecutive years only without consideration of the observations before and after this period. Consequently, all individuals who responded for at least four subsequent periods with a change in primary activity from working to not working (from year $t-1$ to t) at the age of 55 or older are taken into account, even if they did not respond in any of the following years (from $t+2$).

There are two different hypotheses about the development of retirement age during the observation period. On the one hand, there has been an increase in the legal retirement age for women in Germany, though only slightly influencing the latest observations, as well as a reduction of incentives for early retirement in both countries. These measures should lead to an increasing retirement age. On the other hand, there has been increasing unemployment, especially among elderly persons, presumably causing a reduction in retirement age.¹⁴⁶ The latter has been of special importance for the East German labour market.

Figure 6.31 shows the development of retirement age in Great Britain and in West and East Germany. First of all, it can be recognised that the retirement age

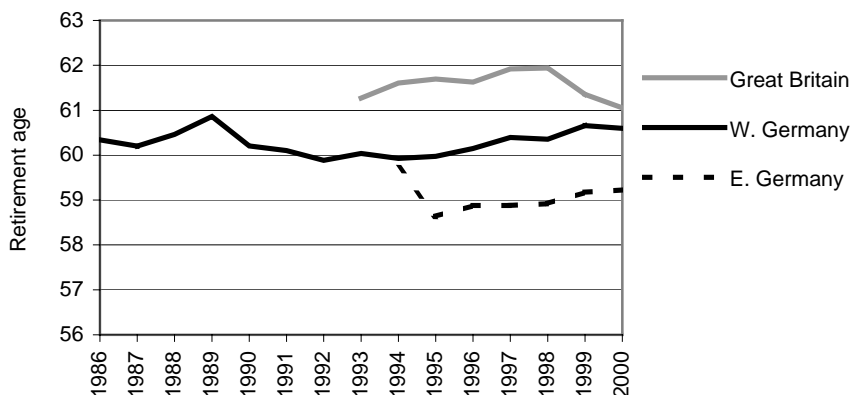


Figure 6.31. Mean retirement age in Germany and Great Britain, 1986–2000

Source: CNEF, own calculations based on unbalanced panel structures; cf. Table A.18 in the Appendix.

¹⁴⁵ E.g. the so-called ‘Altersteilzeit’ in Germany, where people are paid as part-time workers, but they may also work only the first half of the period full-time and quit the labour force entirely for the second half. There have also been arrangements in both countries letting unemployed elderly people stay in this status until legal retirement age without being considered for labour placement.

¹⁴⁶ In Germany, long-term unemployed had the possibility to advance retirement to the age 60 during the observation period; cf. section 5.3.2 and Table A.6 in the Appendix.

was lowest in East Germany and highest in Great Britain; West Germany lay in between these two during the whole observation period. The line for West Germany had a slight U-shape during the 1990s. While the average retirement age fluctuated around 60.5 years in the late 1980s, there was a continuous downward trend from 60.9 in 1989 to less than 59.9 in 1994. From then on, the retirement age re-increased to 60.6 years in 1999 and 2000.

The upward trend during the 1990s can also be found for the British and the East German data. In Great Britain, there was a relatively stable increase starting from 61.3 years in 1993 up to 61.9 years in 1997 and 1998 followed by a drop in 1999 and 2000 to about 61 years. The East German retirement age fell sharply from 59.7 in 1994 to 58.6 in 1995. Then, the figure increased continuously to 59.2 years in 2000¹⁴⁷. When interpreting the figures, it seems that the reduced incentives for early retirement during the past decade have led to an increase in the point of time of individual retirement. These findings are in contrast to the fact that the employment opportunities especially for the elderly have deteriorated during the same period.

An important question is the differentiation of the national data by sex, illustrated in Figure 6.32. In Great Britain and East Germany, women retired earlier than men as expected. This reflects the higher legal retirement age for men than for women in both countries. Men can only retire from age 65, women already from 60. However, the retirement age for women in Germany was gradually raised to 65 from 1999 to 2004.¹⁴⁸ In contrast to the difference in legal retirement age, the line for West German women is fluctuating around the men's. On average, there

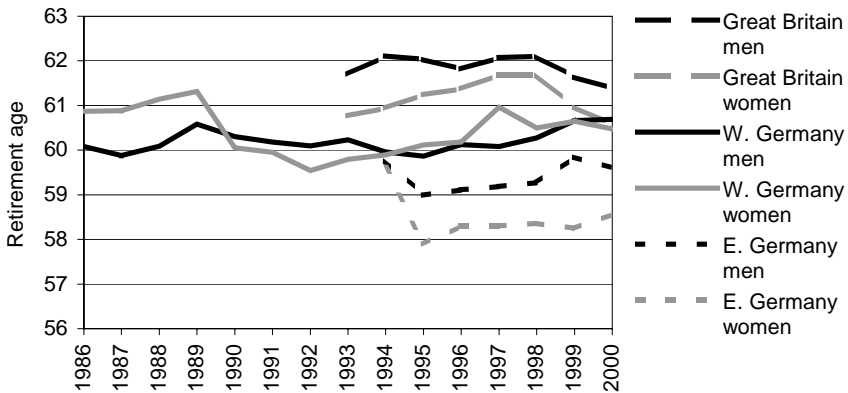


Figure 6.32. Mean retirement age by sex in Germany and Great Britain, 1986–2000

Source: CNEF, own calculations based on unbalanced panel structures; cf. Table A.18 in the Appendix.

¹⁴⁷ See Table A.22 in the Appendix.

¹⁴⁸ Likewise, the British public pension legislation will be changed gradually from 2005 until 2020; see section 5.3.2.

does not seem to have been a large gap in the individual retirement age between men and women in West Germany.

Although there was different legislation for men and women during the observation period, the difference in the actual retirement figures was much less than the five years according to legislation. In fact, West German women have been retiring on average between 60 and 61 (except for the early 1990s), slightly later than the legal retirement age for them. West German men were retiring at about the same age, in contrast to their legal retirement age of 65 years. Although the same legislation applied to East Germany, people retired significantly earlier in this part of the country from 1995, probably due to considerable labour market problems. From a very low level in 1995 – 57.9 years for women and 59 for men – the age of individual retirement increased to 58.6 (women) and 59.6 years (men), respectively. The British figures for women were above the legal ‘frontier’ of 60 for all observation years; they show a U-shape from 60.8 years in 1993 to 61.7 in 1998 and back to 60.5 in 2000. It seems as if a considerable number of women were active on the labour market even after reaching the legal retirement age, or they considered working their primary activity at least. The individual retirement age of British men increased from 61.7 years in 1993 to 62.1 in 1998 and fell back to 61.5 in 2000, staying considerably lower than the legal retirement age of 65.

The results indicate that the effective retirement age was not much different among men and women and that the majority of early retirement applied to men.¹⁴⁹ The question has to be addressed whether the agreed increase in the women’s legal retirement age will have an effect on the actual retirement age, or if women will just close the small gap between the men’s and the women’s figures. However, there are two reasons to dismiss the latter assumption: sex-specific employment and incapacity rates. On the one hand, the cohorts that have retired during the observation period were characteristic male earner cohorts. That is to say, the employment rates of women were considerably lower than those of men and it is possible that those women retiring at all – i.e. that have been working before – have retired at about the same age as their male colleagues.¹⁵⁰ Relatively long working lives of labour market active women of these cohorts may be due to the absence of a male earner either because of his death or a divorce, never married or separated women, leaving women on their own to provide for their old age. Consequently, they would have had to work as long as they considered their pension entitlements to be sufficient. On the other hand, the proportion of early retirement due to work incapacity is much higher among men than among women,¹⁵¹ reducing the average retirement age of men.

¹⁴⁹ Results from the Council of the European Union (2003), Table 6, p 53 support the main findings concerning effective retirement age.

¹⁵⁰ Scherer (2002), pp 21f confirms these findings.

¹⁵¹ In 2002, 21.6% of male pension receivers and 15.5% of female receivers of the German GRV had incapacity pensions, cf. <http://www.vdr.de/internet/vdr/statzr.nsf>, Tables *Versichertenrenten nach Rentenarten* (2.01.2004). In the UK, about 16% of people aged 50–64 years (6% of those aged 20–49) received incapacity related benefits in 2003; cf. Pensions Commission (2004), p 39.

An analysis of the spread of retirement age, namely of the 20th, 40th, 60th and 80th percentiles, shows that retirement age variation was considerably larger in Great Britain than in Germany.¹⁵² The upper 20% of British pensioners have retired at the age of 66 or more during the observation period compared to 63 years or more in West Germany and 61 or more in East Germany. From a gender view, the spread is more important for men than for women in Germany, whereas there are no significant differences across sexes in Great Britain.

To examine the criteria that may influence the individual retirement age, a correlation analysis is conducted. However, such analysis can only examine the relation of two coefficients and not the direction of the influences. The results are shown in Table 6.2. In contrast to the earlier figures, these rely on balanced panel structures. The first correlation is that of the retirement age to the birth year of the individual. Belonging to a later cohort was negatively correlated with retirement age in both countries, meaning that later born individuals retired earlier than their predecessors did. The results seem to confirm the general opinion about a continuously decreasing retirement age. On the other hand, this contradicts the earlier seen charts where retirement age seemed to increase over the observation period.¹⁵³ An increasing average retirement age would be reflected in the correlation between calendar year of retirement and retirement age. In this regard, the only significant positive relation – meaning that the retirement age increased over time – can be found in West Germany, whereas British data show a slightly positive relation only and no significant relation can be found in East Germany.

Table 6.2. Correlation analysis of the effective retirement age^a in Germany and Great Britain, 1985–2001

Pairwise correlation coefficients	West Germany 1986-2000	East Germany 1994-2000	Great Britain 1992-1999
Retirement age – Birth cohort	-0.2442**	-0.1132**	-0.8990**
Retirement age – Year of retirement	0.0823**	-	0.0438+
Retirement age – Sex ^b	-0.0705**	-0.2354**	-0.0659**
Retirement age – Equivalent income	0.0875**	-	0.2133**

^a Age when changing activity status from ‘active’ to ‘inactive’, if two years of activity are followed by two years of inactivity.

^b Sex is a binary variable: 1 for male, 2 for female. Consequently, a negative relation means that being a woman is negatively correlated with retirement age.

** significance level 99%.

+ significance level 90%.

- no significant correlation.

Source: CNEF, own calculations based on balanced panel structures.

¹⁵² See Table A.19 in the Appendix.

¹⁵³ However, it has to be taken into account that the correlation analysis is based on balanced panel structures, whereas the previous figures were derived from an unbalanced panel.

Concerning the influence of sex on retirement age, the table shows that women have retired earlier than men in both countries, with a higher correlation of female sex and retirement age in East Germany than in West Germany and Great Britain. This result is surprising, given the high employment rates of women in East Germany before reunification. It seems that women were more concerned by the deteriorating labour market situation in East Germany in the 1990s and were withdrawing from working life relatively earlier than men.

With regard to equivalent net income, British data show a significant and quite important positive relation to retirement age, whereas the West German data reflect a minor positive relation and no significant relation can be found in East Germany. The significant positive correlation in Great Britain is surprising, because it suggests that those people with high equivalent incomes tend to work longer than those with lower monetary resources.¹⁵⁴ This suggests that high-income earners attach a higher estimated gain to postponing retirement than people earning lower incomes. However, since the analysis is based on equivalent incomes, the household context and the income received by other household members has a large influence on the results and does not allow inferring such precise conclusions on the individual level.

6.6.2 Old-age income ratios

An important topic of analysis is a comparison of an individual's income before and after retirement, giving information about how well people provided for retirement and if they are able to maintain their living standard after having left the labour market. The ratio of post-retirement and pre-retirement income will be called old-age income ratio. In this section, old-age income ratios are calculated according to two different concepts. Firstly, the analysis is based on the binary variable on primary activity used for the calculation of the retirement age above. The second concept compares income in two points of time – before and after the statutory retirement age.

It has to be borne in mind that the analyses are based on equivalent net incomes, taking into account the household structure and the total household income, which depends not only on the retired person herself but also on the rest of the household. The figures are therefore not comparable with any official statistics on pension replacement rates of individuals, but they reflect more adequately the actual change in welfare connected with retirement.¹⁵⁵

¹⁵⁴ In contrast, Yamada and Casey (2002), p 20 find that most of the people working beyond legal retirement age only have public pension entitlements and need to earn additional income to achieve a desired living standard.

¹⁵⁵ Not only do official statistics provide income data without household context, but they also usually compare average pension benefits with average labour income without considering the 'individual replacement rate' of a person. German official statistics show a net replacement rate of 0.67–0.72 during the observation period for a fictitious person

Figure 6.33 shows the results of the first approach based on the change in primary activity from working to being inactive for people aged 55 and more. The old-age income ratio reflects the income in the second year of inactivity divided by the income in the last year of activity. The chart shows median income ratios of those individuals retired in the previous year ($t-1$), without taking into account their retirement age.¹⁵⁶ In West Germany, the median old-age income ratio increased from 1987 until 1992 from 1.05 to 1.12, shrank to about 1.0 from 1992 to 1996 and recovered from then on until 2001 to 1.06.

All in all, the fluctuations were considerable and there seemed to be a link between year of retirement and income ratio, but without any identifiable trend. In East Germany, the median income ratio was relatively high during the first observation year 1995 at 1.15, followed by a steep drop to less than 1.06 in 1996. From then on, the median income ratio fluctuated around 1.05, with a minor negative trend until 1999 and a slight recovery in 2000 and 2001. The lines for West and East Germany seem to have converged during the last observation years 1999–2001. The high income ratio compared to West German retirees in the beginning may be the effect of the extraordinary situation in East Germany directly after reunification. Many East Germans had very low incomes due to low wages, high unemployment and transformation problems, so that their income position was increasing considerably after retirement because of their integration in the GRV.

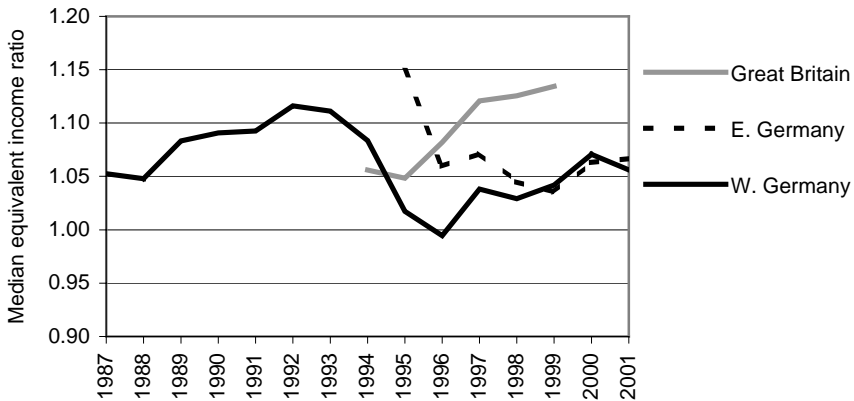


Figure 6.33. Median old-age income ratios (based on real equivalent net income) in Germany and Great Britain, 1987–2001 – Basis: change in primary activity

Source: CNEF, own calculations based on balanced panel structures; cf. Table A.20 in the Appendix.

with 45 contribution years at average income, cf. <http://www.vdr.de/internet/vdr/statzr.nsf> (2.01.2004).

¹⁵⁶ British figures are only included until 1999 due to major data inconsistencies; see 6.1.4.3.

The British chart shows a considerable positive trend, starting from 1.06 in 1994 and reaching 1.13 in 1999. From 1995 on, the British figures lie above the West German income ratios. Given the high relative importance of personal and occupational pension arrangements in Great Britain,¹⁵⁷ this upward trend may be due to the high performance of the international capital markets during the late 1990s. To analyse the impact of private pension income, the following section 6.6.3 deals with the pension structure of new pensioners. Whether this positive trend in income ratios was accompanied by an increasing spread in these ratios will be studied later.

After having calculated the old-age income ratio based on equivalent income before and after retirement, the second approach will be used in the following. This approach is based on the income ratio of real equivalent net incomes in two points of time, determined by individual age. According to the institutional arrangements¹⁵⁸, different base years are used for men and women in Germany and Great Britain, i.e. the ratio 66/61 for men in both countries, 63/58 for German women and 61/56 for British women. Only those persons above pension age who consider themselves inactive on the labour market are included in the calculations.¹⁵⁹ Figures 6.34 and 6.35 show the charts for men and women in both countries.¹⁶⁰

It is assumed that the results of this time-related approach are more influenced by changes in the household composition compared to the previously used measure of retirement (change in primary activity) because of the longer time period covered.¹⁶¹ Due to eligibility to public pension benefits and a shrinking household size with increasing age, the results based on this concept presumably are above the earlier results based on primary activity. The shapes of the curves for men are considerably different from the chart shown earlier based on the change in primary activity. First of all, the fluctuations are much more important and the median income ratios – especially for East Germany and Great Britain – are on markedly higher levels than according to the previous approach.¹⁶²

In West Germany, the median old-age income ratio of men had no visible trend during the early 1990s until 1998, but fluctuated between 1.06 and 1.27. In contradiction to the earlier results, the median income ratio had a negative trend after 1998, dropping beneath the 1.0 reference line for 1999 and the following years.

¹⁵⁷ See section 6.5.

¹⁵⁸ See section 5.3.2.1 as well as Table A.6 in the Appendix.

¹⁵⁹ Only retired persons over state pension age are eligible for public pension benefits that have a major influence at least on German income figures.

¹⁶⁰ If analysing the following charts, it should be kept in mind that the case numbers in the respective cells are not very large if split by sex. Consequently, figures should be considered an approach and not a determined value.

¹⁶¹ On average, household size is shrinking with age; the development is similar in both countries, cf. Yamada and Casey (2002), Chart 5.1, p 66. The impact of a changing household composition can be diverse, see section 6.1.2.2.

¹⁶² According to the first approach, income ratios were in a range of about 1.0–1.15, compared to about 0.95–1.7 resulting from the second approach.

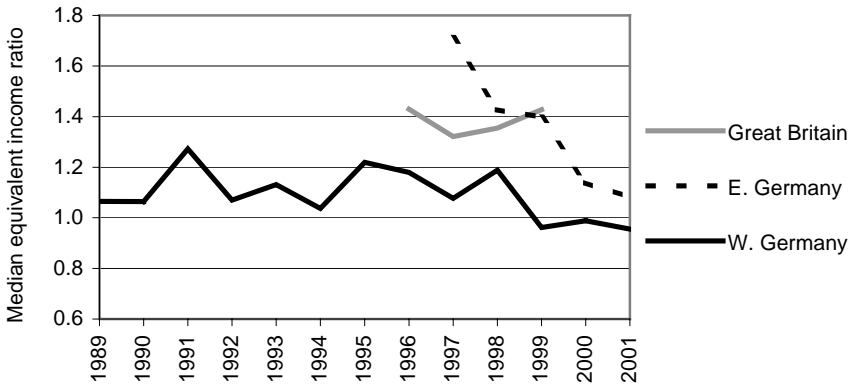


Figure 6.34. Median old-age income ratios (based on real equivalent net income) of men in Germany and Great Britain, 1989–2001 – Basis: individual age, quotient 66/61^a

^a Real equivalent income at age 66 divided by equivalent income of the same individual at age 61.

Source: CNEF, own calculations based on balanced panel structures; cf. Table A.21 in the Appendix.

The East German median income ratio was dropping during the entire observation period, from about 1.7 in 1997 to less than 1.1 in 2001. Still, East German men received more equivalent income at the age of 66 than they had at the age of 61, leaving them relatively better off than West German men. The British figures show a slight U-shape in old-age income ratio, starting (1996) and ending (1999) at 1.43 with a minor drop in between.

The results for women (Figure 6.35) do not differ significantly from the men's figures, except for Great Britain. The East German chart resembles the earlier shown line for men, but starts from a higher median income ratio of 1.9 in 1997, dropping to 1.1 in 2001. As explained earlier, the high ratios in the early observation years presumably are due to the low income of East Germans before retirement.

The median income ratio for West German women fluctuated more than men's. Starting from 1.1 in 1989, the West German rate peaked at 1.35 in 1993. This period was followed by a decline to less than 1.0 in 1997. During the late 1990s, the median income ratio fluctuated around 1.0 and could only recover in the last observation year 2001 to 1.2. The upward trend of the last two years has led to an income ratio similar to the East German women's ratio and has produced a considerable positive gap to the men's figures shown above. The income ratios of British women show large fluctuations that cannot be explained by any changes in institutional arrangements. Therefore, they will not be interpreted here.

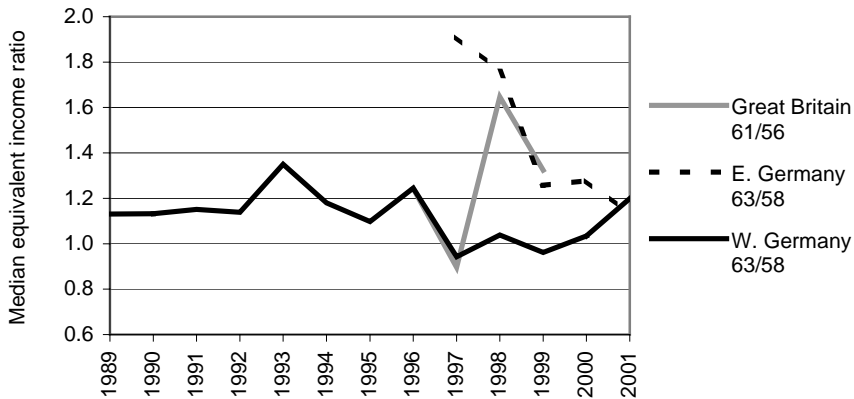


Figure 6.35. Median old-age income ratios (based on real equivalent net income) of women in Germany and Great Britain, 1989–2001 – Basis: individual age, quotient 61/56 or 63/58^a

^a Real equivalent income at age 61 (63) divided by income of the same individual at age 56 (58).

Source: CNEF, own calculations based on balanced panel structures; cf. Table A.21 in the Appendix.

Since the West German data allow for calculating ratios over a longer time distance due to the longer observation period compared to East Germany and Great Britain, the results will be presented briefly in Figure 6.36. For comparison, the earlier shown figures are also included in the chart.

The figures based on the ratio of equivalent income at the age of 66 compared to 59 – considering a larger age difference – lay above the earlier presented figures for most of the observation period. An interesting fact is that the women's median old-age income ratio 66/59 was higher than the men's for all but the first observation year. This surprising result may have been caused by lower average equivalent incomes during working life or by the higher proportion of survivor's pension receipt among women than among men. A larger proportion of old women than men of this age are living in single households. If these single women have their own pension entitlements and/or a large part of their deceased husband's pensions, this may have led to higher income ratios.

There was a continuously negative trend in the men's figures (66/59), starting from about 1.2 in 1991 and decreasing to less than 1.0 in 2000 and 2001. The median income ratio of women (66/59) has increased markedly from 1.07 in 1991 and peaked at 1.37 in 1996. From then on, the income ratio fell back to only 1.06 in 2001. Obviously, the income ratios have converged again at the end of the time period. In contrast to the quotient 63/58, the women's old-age income ratio based on the quotient 66/59 did only show a very small regain during the last observation year.

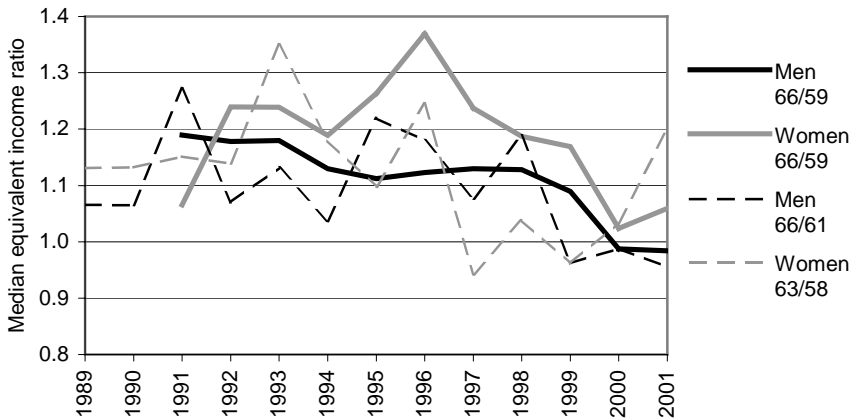


Figure 6.36. Median old-age income ratios (based on real equivalent net income) of men and women in West Germany, 1989–2001 – Basis: individual age, quotients 66/59 and 66/61 or 63/58^a

^a For detailed explanations, see Figures 6.34 and 6.35.

Source: CNEF, own calculations based on balanced panel structures; cf. Table A.21 in the Appendix.

All in all, the shapes of the charts for men's income ratios show that a larger time difference for the calculation of income ratios reduced the fluctuations of the curves across years, but did not influence the average level of the ratio to a significant extent. In contrast, the women's lines for the respective ratios show considerable differences in the level and the trend of median income ratios. The strong fluctuations over time indicate that women have relied relatively more on income sources from other household members, which are consequently less dependent on their pre-retirement income and more influenced by changes in the household structure.

However, all figures suggest that there is a relation between the personal old-age income ratio and the year of retirement or the base year of the calculation.

Drawing conclusions from the charts on median income ratios, it seems surprising that British pensioners have experienced higher ratios than West Germans during almost the whole observation period – given the institutional arrangements analysed in chapter 5 and the empirical results on equivalent incomes in section 6.2.¹⁶³ Despite the small extent of obligatory provision,¹⁶⁴ the British seem to

¹⁶³ These results are confirmed by Yamada and Casey (2002), p.8 who find that personal replacement rates on average are independent of public pension expenditure and thus systemic structures.

¹⁶⁴ The Basic Pension currently replaces about 15% of average labour income. The targeted replacement level of the State Second Pension is 20% of former individual earnings.

provide relatively well for their pension age. Therefore, it is necessary to have a look at the distribution of replacement rates among pensioners in each country. The following Figure 6.37 shows the upper limits of the 20th, 40th, 60th and 80th percentiles of old-age income ratios in the second year of retirement, based on the earlier used approach of change in primary activity from working for two consecutive years followed by two years of inactivity after the age of 55. The figures are for the last common observation year 1999.¹⁶⁵

It is obvious that the spread of old-age income ratios was much larger in Great Britain than in Germany. The distance between the upper limit of the 80th percentile and the 20th percentile totalled almost 0.5 in Great Britain compared to 0.3 in West and East Germany. This distance has increased during the observation period in Great Britain from 0.39 in 1994 to 0.49 in 1999.¹⁶⁶ In contrast, the East German P80-P20 distance has declined from 0.44 in 1995 to 0.28 in 2001 and the West German income ratio spread fluctuated around 0.3 for the entire observation period. It is not surprising that income ratios were distributed less equally in Great Britain than in Germany, given the institutional structure of the pension systems and the earlier results on income distribution in both countries. However, it would be interesting to know the reasons for the increasing gap between the P20 and the P80-lines in Great Britain. A possible explanation might be the increasing differ-

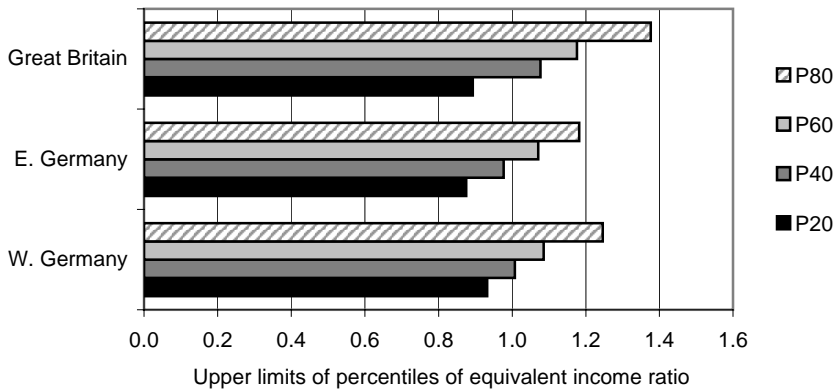


Figure 6.37. Upper limits of selected percentiles of old-age income ratios (based on real equivalent net income) in Germany and Great Britain 1999 – Basis: change in primary activity

Source: CNEF, own calculations based on balanced panel structures; cf. Figure A.1 in the Appendix.

Contracted-out occupational or personal pension schemes have to provide at least the same replacement level as the State Second Pension. See section 5.3.4.2.

¹⁶⁵ For the development of the income ratio spread over time, see Figure A.1 in the Appendix.

¹⁶⁶ Cf. Figure A.1 in the Appendix.

ences in private pension income that is distributed very unequally in Great Britain.¹⁶⁷ For this reason, the following section 6.6.3 will focus on the income composition of people reaching the legal retirement age.

In comparison with the earlier findings, it is surprising that old-age income ratios were higher in Great Britain than in Germany for almost all pensioners – only the 20th percentile ratio of West Germany was above the respective British figure. There may be two reasons for this finding. Firstly, the British earned relatively less during their working life, or secondly, they provided either more or with higher returns for their old age. Both reasons may have contributed to the observed higher replacement rates in comparison to Germany.

6.6.3 Income composition of new pensioners

In addition to the analysis of income sources of people aged 65 and over in section 6.5, this section deals with the income composition of new pensioners. These are defined as being inactive on the labour market and having surpassed the legal retirement age – 66 for men in both countries, 63 for women in Germany and 61 for women in Great Britain. The underlying question is how the relative importance of the different income sources has changed for the newly retired over time and how changes may have influenced the distribution of income among the elderly. The focus is on the developments in Great Britain, since the higher proportion of funded pension benefits is supposed to lead to larger fluctuations in income of new pensioners across years because of financial market fluctuations. Therefore, the analysis starts with Figure 6.38 showing the development for British pensioners.

In contrast to the public benefits – public transfers and public pension – the average private pension income fluctuated significantly during the observation period and increased in relation to the other income sources. Starting from the second lowest rank among all income components in 1991, private pension income grew faster than the other incomes and had about the same importance as public pension benefits in 1999. This development is a result of the maturing of contracted-out private and additional public schemes, which were introduced in the late 1970s, so that retirees were more and more able to accumulate entitlements to these schemes. The grown importance of private pensions may have led to the relatively large old-age income ratios found in the previous section.

An analysis of the distribution of private pension income in 1999 shows that the lowest 20% of pensioners did not have any private pension, whereas the upper 20% received £3,300 p.a. and more.¹⁶⁸ Similar to private pensions, the average amount of asset income has grown considerably from 1991 to 1998, but it fell

¹⁶⁷ The Pensions Commission (2004), p 132 supports this argumentation.

¹⁶⁸ In the time from 1979 to 1997, the lower 20% of British pensioners experienced a growth in income by 30%, whereas the incomes of the upper 20% increased by 80%. This was mainly due to increases in private pensions. Cf. Council of the European Union (2003), p 38.

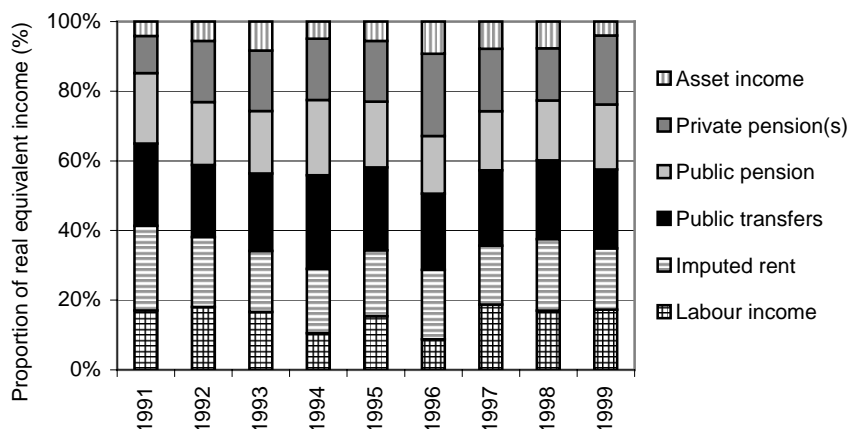


Figure 6.38. Sources of old-age income of new pensioners (men aged 66, women aged 61; based on real equivalent net income) in Great Britain, 1991–1999

Source: CNEF, own calculations based on unbalanced panel structures; cf. Table A.22 in the Appendix.

back almost to its initial level in 1999. A further result is that – on average – public transfers have been the largest income component for newly retired persons for almost all years of the 1990s with increasing relative importance.

In order to examine whether the development of private pensions received by new pensioners was *inter alia* a result of the general trend on the financial markets, Figure 6.39 illustrates these trends for comparison, accomplished by the line for asset income.¹⁶⁹

The chart shows that the private pension entitlements of new pensioners grew faster than the real market value of equity until 1996, but seems to have converged to the growth path of the financial market in the following years. Apparently, the extraordinary positive development of the financial markets had a significant impact on private pension benefits of those retiring during the 1990s.¹⁷⁰ Retirees were able to realise high annuity rates from the accumulated funds of their private pensions.¹⁷¹ Asset income was subject to significant fluctuations and diminished markedly during the last two observation years. After the observation period in the

¹⁶⁹ The development of the reference interest rate may have been an interesting aspect as well. However, changes in interests have rather long-term implications than short-term effects.

¹⁷⁰ Apart from the developments of financial markets, the maturing of private pension schemes presumably played an important role in the development of private pension benefits as well.

¹⁷¹ This concerns especially personal pension schemes and money purchase occupational pension schemes, whereas defined benefit occupational pension schemes react less to financial market fluctuations.

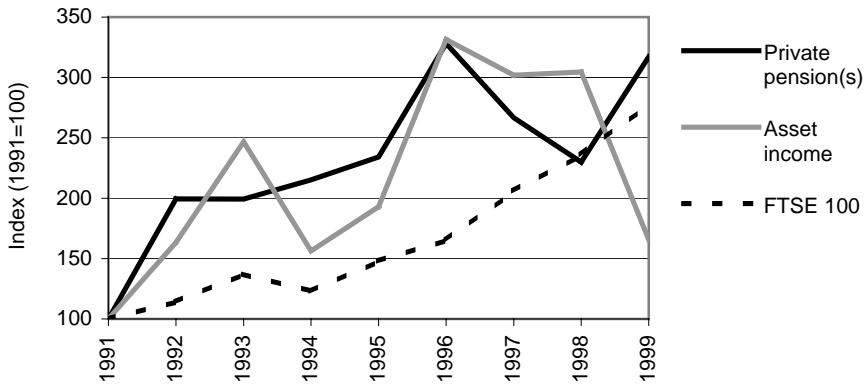


Figure 6.39. Trends in the financial market and in private pension and asset income of new pensioners in Great Britain, 1991–1999

FTSE 100 = UK blue chips index.

Sources: CNEF, own calculations; Bloomberg Net.

early 2000s, occupational pension benefits dropped significantly because of lower asset values leading to lower realised rates of return. People who retired in 2003 have received only 50% of the pension benefits that retirees of 1997 achieved, given the same pension scheme contract of the same amount.¹⁷²

Figure 6.40 shows the development of the income composition of new pensioners in West Germany.¹⁷³ The chart confirms the earlier results insofar as private pension income is only of minor importance for West German pensioners. The average amount of private pensions received by new pensioners does not show any trend during the observation period; it fluctuated between 3.8% and 7.5%. Obviously, West German newly retired were not able to profit from the good performance of the financial markets during the 1990s, as did the British.

This result may be due to the higher proportion of defined contribution or money purchase occupational pension schemes in Great Britain that were not common in Germany as well as the lower proportion of investments in shares. The existing defined benefit pension schemes are less affected by fluctuations in the financial markets than defined contribution schemes. An analysis of the development of private pension income in East Germany is impossible because of the insufficient case numbers of recipients of this income source.

Figure 6.41 shows the financial market performance and the development of private pension and asset income. The chart confirms the previous hypothesis. The

¹⁷² Cf. Times online, 2.04.2003, *Pension returns halved in six years* (1.10.2003).

¹⁷³ Since there are no values for 1986 – meaning that there was no new pensioner according to the used definition – and private pensions were not surveyed in 1984 and 1985, the charts start in 1987.

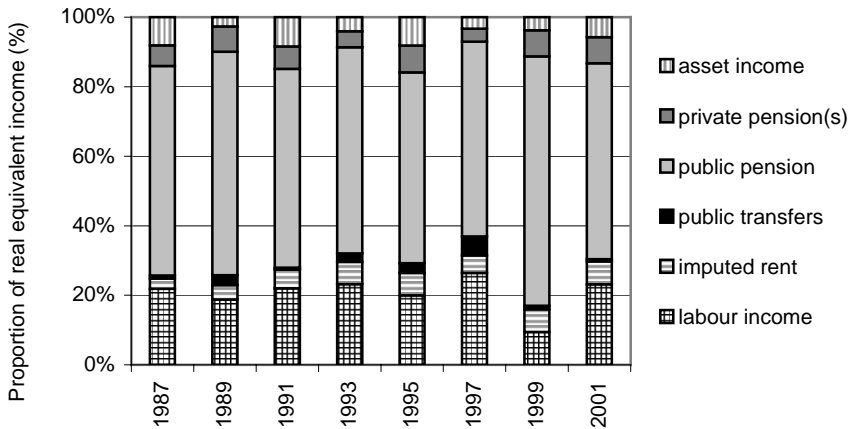


Figure 6.40. Sources of old-age income of new pensioners (men aged 66, women aged 63; based on real equivalent net income) in West Germany, 1987–2001

Source: CNEF, own calculations based on unbalanced panel structures; cf. Table A.22 in the Appendix.

positive performance of the financial markets during the late 1990s did not have a significant impact on either private pension benefits or asset income of new pensioners in West Germany.

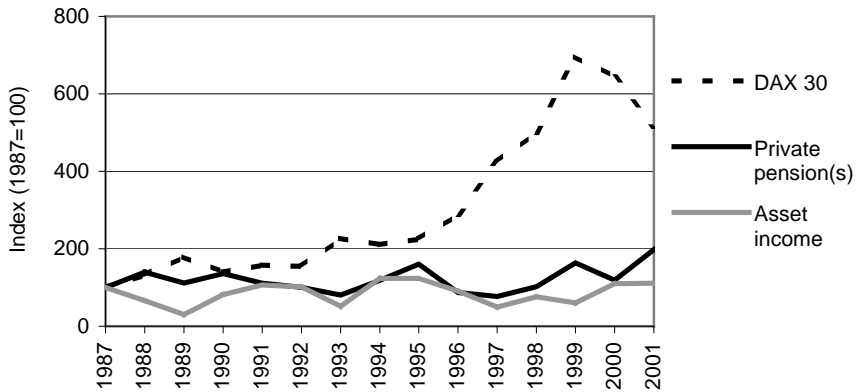


Figure 6.41. Trends in the financial market and in private pension and asset income of new pensioners in West Germany, 1987–2003

DAX (Deutscher Aktienindex) = German blue chips index.

Sources: CNEF, own calculations; Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2003), Tab. 46*.

The increasing proportion of private pensions in old-age income of British pensioners has led to a relative improvement of mean British old-age incomes (and median old-age income ratios) in comparison to Germany. However, this development has led to an increasing inequality in Great Britain, as shown earlier (section 6.3.2) in terms of Gini coefficients.

6.6.4 Regression analysis on equivalent income

To find an answer to the question whether the earlier found tendency of decreasing median income with age (section 6.2) is caused by age effects or cohort effects that has been asked before, a regression analysis is conducted in this section.

The analysis uses a random effects regression model of the following form:¹⁷⁴

$$EI_{it} = K + \alpha * A_{it} + \beta * C_i + \gamma * S_i + u_i + e_{it} \quad (6.1)$$

where:

- EI_{it} = equivalent income of individual i in year t
- A_{it} = age of i in t
- C_i = cohort of i
- S_i = sex of i
- u_i = random heterogeneity specific to i , constant through time
- e_{it} = random disturbance

A random effects model assumes that the unobserved individual heterogeneity u_i is uncorrelated with the included variables. The adequacy of the random effects model has been tested with the *Hausman specification test*¹⁷⁵, confirming the model to fit to the data¹⁷⁶.

Table 6.3 shows the results of the regression for people aged 65 and over, based on balanced panel structures¹⁷⁷. Besides the predicted coefficient of the regression equation, the values of R^2 are given for additional information.

The results of the regression concerning the influence of age on equivalent income are surprising: in both countries, age has a significant positive impact on income ($\alpha > 0$). That is to say, on the individual level, people tend to have increasing equivalent income with growing age. These findings contradict the overall results from the cross-sectional analysis conducted in section 6.2, which found a negative correlation between age and income. A possible explanation is that the average household size is shrinking with age while the income sources of the pensioners remain fairly stable, leading to larger 'shares' of income of those remaining in the

¹⁷⁴ For more detail, see Greene (2003), pp 293–303.

¹⁷⁵ See Greene (2003), pp 301–303.

¹⁷⁶ The null hypothesis that the model does not fit has been rejected.

¹⁷⁷ Table A.23 shows the results of a regression using unbalanced panel structures, which confirm the findings of the balanced panel regressions.

Table 6.3. Regression analysis on equivalent income in Germany and Great Britain, 1984–2001

	West Germany 1984–2001	East Germany 1992–2001	Great Britain 1991–1999
Coefficient age (α)	19,754.0**	1,842.7**	662.5**
Coefficient cohort ^a (β)	3,677.6**	10,795.5**	5,178.9**
Coefficient sex (γ)	-	-2,192.7 ⁺	-949.9**
Constant (K)	-41,760.8**	-48,413.8**	-9,547.3**
R ² within	0.561	0.586	0.336
R ² between	0.011	0.030	0.006
R ² overall	0.300	0.304	0.113

^a cohort=birth cohort.

** significance level 99%.

⁺ significance level 90%.

- no significant correlation.

Source: CNEF, own calculations based on balanced panel structures.

household.¹⁷⁸ However, the net effect of changes in the household structure depends on the relative amounts of own income and derived (survivors') pensions (see 6.1.2.2).

Concerning cohort effects, there is a positive impact of belonging to a younger birth cohort on equivalent income ($\beta > 0$). In East Germany and Great Britain, these cohort effects are larger than the age effects. They even seem to overcompensate the existing age effects in these populations, leading to the earlier found negative correlation of age on income which was especially distinct in Great Britain. In other words, the fact that equivalent income is decreasing with age is not due to age effects – these are even positive – but to the effect, that later born cohorts were able to provide better for their old-age than their predecessors. This is not surprising, since older cohorts suffered more from the economic consequences of the Second World War and experienced higher price inflation rates on average over their working life, having a considerable impact on the real value of accumulated funds.¹⁷⁹ The importance of cohort effects differs markedly between the countries and especially between East and West Germany. In East Germany, younger cohorts seem to have considerably better income prospects for their pension age than the earlier born cohorts. This may be a result of the political and economic transformation of the country with considerable losses in individual savings due to the currency reform and continuously increasing public pension bene-

¹⁷⁸ The balanced panel structure refers to people aged 65 and over and not to the entire household in which the elderly person is living. Thus, changes in the household structure are possible.

¹⁷⁹ O'Rand and Henretta (1999), p 17f argue that incomes increase sharply with each cohort, giving the baby boomers the best chances for high old-age incomes, but leaving the succeeding cohorts in a worse situation because of labour market problems.

fits. In Great Britain, younger cohorts of pensioners probably accumulated more pension entitlements to the SERPS and contracted-out occupational and personal schemes, introduced in the late 1970s.¹⁸⁰

A significant negative impact of female sex on equivalent income ($\gamma > 0$) can only be found in Great Britain, but the effect is far less important than the cohort effect. The negative effect found in East Germany is not highly significant. In West Germany, there is no significant sex effect on equivalent income.¹⁸¹

The R^2 values show how much of the variance is explained by the model. Since the model is based on equivalent incomes, it is evident that a large part of the variance is due to the changes in household size and in household income received by other individuals and thus independent of the personal characteristics of the surveyed individual. In this context, the proportion of about 30% explanation of overall variance for West and East Germany are very good results. Variations over time for each individual (R^2 within) are even explained by 56% and 59%, respectively, showing that the considered characteristics have an important impact on the income situation of the respective individual.

The R^2 values are much lower for Great Britain, with only 33% of within variation and 11% of overall variation being explained by the model. This result is not surprising, since it can be assumed from earlier findings that capital returns, which are volatile by nature, have an influence on the income situation of British pensioners. These effects are not included in the model and reduce its explanation capacity of equivalent income variation.

6.7 Conclusions from the empirical analysis

This chapter has provided a variety of empirical findings on the incomes of people aged 65 and over in Germany and Great Britain over the past decades. Before proceeding to the future prospects of both pension systems, it will be helpful to review the main findings in the context of the entire study. Therefore, a first subsection questions whether the institutional arrangements are reflected in the results of the analysis of each pension system, i.e. if the hypotheses of section 5.5 are confirmed. Eventually, section 6.7.2 compares the findings with the key objectives of pension systems, as formulated in chapter 2.

When deriving conclusions from the empirical results, it has to be taken into account that the presented old-age income figures are not a result of current legislation only, but depend on the entirety of institutional arrangements that were valid throughout the working age of today's pensioners. A person who retired in 1995 at the age of 65 has earned public pension entitlements and has provided privately under the legal framework of his/her entrance into the labour market (pos-

¹⁸⁰ Cf. Pensions Commission (2004), p 138.

¹⁸¹ In contrast, the results based on unbalanced panel structures show significant negative effects of female sex on equivalent income for both West and East Germany; cf. Table A.21 in the Appendix.

sibly in 1950) and its developments until retirement. Furthermore, tax and pension reforms enforced after retirement affect pension income as well. Therefore, the conclusions drawn in the following sections are rather an assessment of tendencies and trends than strictly proven results.

6.7.1 Impact of the institutional structures

In order to facilitate the connection with the institutional description in chapter 5, the following section is based on the criteria defined there (Table 5.1).

6.7.1.1 Coverage of the population

Public pension schemes cover the majority of German and British pensioners. For all observation years in both countries, recipient rates among the elderly are over 90% (section 6.5.3). The coverage is slightly higher in East Germany and Great Britain compared to West Germany. Obviously, the public schemes, which are composed of several partial schemes, amount to a nearly universal coverage. The labour market orientation of both systems is responsible for the uncovered fraction of the population.

The coverage by occupational and personal pension schemes is significantly higher in Great Britain than in Germany. In Great Britain, 75% of men and 66% of women received a private pension in 1999, compared to 29% of men and 22% of women in West Germany.¹⁸² These results reflect the institutional structure, since private pension schemes are part of the statutory system in Great Britain, but merely voluntary additional provisions in Germany.

6.7.1.2 Insured risks

Although a direct inference from the empirical findings concerning covered risks is impossible, the high coverage of the elderly population by public pension schemes (see 6.7.1.1) points to the importance of survivors' pensions. Since only 60% of British¹⁸³ and 78% of German women¹⁸⁴ have their own pension entitlements, the remaining difference to the found recipient rates of more than 30% of women in Great Britain and almost 20% in Germany obviously rely on widows' pensions.

¹⁸² East German results are not very reliable due to small case numbers, but they suggest a very low proportion of private pension recipients; cf. Table A.15 in the Appendix.

¹⁸³ Proportion of women with own entitlements for a Basic Pension; the proportion for additional State Pension entitlements (SERPS/SSP) is similar. Cf. DWP, State Pension Summary of Statistics: March 2003, <http://www.dwp.gov.uk> (26.09.2005). This low proportion is probably the result of the possibility for married women to pay a reduced rate of NI contributions, if they were satisfied with their derived entitlement for a married women Basic Pension (60% of their husband's pension); cf. Table A.6 in the Appendix.

¹⁸⁴ Cf. Bundesministerium für Arbeit und Sozialordnung (2001), p 46.

Concerning the risk of longevity, the cross-sectional analysis suggests that the statutory pension systems do not provide comprehensive protection against this risk, because old-age incomes tend to decrease with age (Figures 6.6 and 6.7, Table 6.1). However, the panel analysis has shown that this result is not valid from a personal view. Equivalent income usually does not shrink with age on the individual level, though there are important cohort effects, leaving pensioners belonging to earlier birth cohorts in a worse situation than those born later (section 6.6.3). In consequence, the risk of longevity seems to be solved for most of the younger retirees, but not sufficiently for earlier cohorts. Especially old single women are still exposed to high poverty risks (Figure 6.19).¹⁸⁵

6.7.1.3 Financing

The influence of the institutional framework on the financing structure of both systems is reflected in the empirical findings. Since the British mandatory pension system contains a funded part, namely the contracted-out occupational and personal pensions, there are almost equal parts of pay-as-you-go financing and funding based on contributions (Figure 6.24). In contrast, 87% of German pension payments were pay-as-you-go financed in 1999 and only 13% funded. The higher proportion of tax financing in Great Britain partly results from the institutional setting that the tax financed subsistence benefit¹⁸⁶ is worth more than a full Basic Pension.¹⁸⁷ Furthermore, the relatively high poverty rates among British pensioners suggest that there is a higher proportion of people relying on public transfers. This is confirmed by the number of public transfer recipients (section 6.5.3).

6.7.1.4 Calculation of benefits

The existence of a policy objective for the replacement rate of public pension payments to long-term insured in Germany (about 2/3 net replacement rate) that has been valid for the observation period¹⁸⁸ is reflected in the pension formula, including the intrinsic adjustment rules. This institutional regulation had obvious effects on the level of old-age incomes, which mainly consist of public pension benefits. The elderly achieved equivalent income positions very close to 1.0 (the overall median income, Figure 6.10). During the observation period, old-age equivalent incomes grew continuously in real terms and performed slightly better than the median incomes of the population of working age (Figure 6.8).¹⁸⁹ Public pensions increased steadily during the observed period (Figure 6.25). Consequently, the pension formula seems to have met the objective of adjusting pension

¹⁸⁵ Yamada and Casey (2002), p 22 draw the same conclusion.

¹⁸⁶ The Minimum Income Guarantee has been replaced by the Pension Credit in October 2003.

¹⁸⁷ See section 5.3.4.

¹⁸⁸ See section 5.3.4.

¹⁸⁹ However, the relatively better performance of old-age incomes can also result from the fact that the distribution of incomes among the elderly is less unequal.

benefits according to net earnings. Considering total income, German pensioners realised individual income ratios of 1.0 and more (section 6.33.). However, this might not be true for future cohorts of pensioners who experience increasing discontinuities in their employment status such as periods of unemployment, different family patterns etc., likely to cause gaps in their public pension contribution records, and who face considerable reductions in the level of public pension benefits.¹⁹⁰

In Great Britain, there is no targeted benefit level for the Basic Pension. SSP/SERPS aim at a gross replacement rate of 20% of the average income over the whole working life.¹⁹¹ However, pension benefits from SSP/SERPS and contracted-out schemes are supposed to increase according to the development in net earnings. This adjustment seems to be realised, since old-age incomes grew stronger than overall median incomes during the observation period (Figure 6.9). Furthermore, median public pension income increased steadily (Figure 6.26). If measuring an equivalent old-age income ratio of pre- and post-retirement income (section 6.6.2), British pensioners were reaching higher median levels than German pensioners. Supposedly, the higher ratios are partly due to the considerable improvement in private pension benefits realised during the late 1990s because of a good financial market performance and the maturation of occupational pension schemes (section 6.6.3). However, the spread of lower and upper quintile of replacement rates is significantly larger in Great Britain than in Germany.

6.7.1.5 Elements of social redistribution

The Lorenz curve presentations and inequality measures for pre-government and net incomes show the effect of public pensions and transfers as well as taxes on the income inequality among the elderly (section 6.3). While pre-government old-age incomes are distributed very unequally in Germany – and inequality is much higher than for the population on the whole –, the distribution of net incomes is much more equal and closer to equal distribution than for the entire population or the working-age population (Figure 6.12). However, it is impossible to separate the effects of specific redistributive elements of the pension systems (e.g. pension credits for educational periods) and subsidiary benefits on the overall inequality, because there are no significant trends in income inequality during the observed period of time, neither in Germany¹⁹² nor in Great Britain (Figures 6.15 and 6.16).

Income inequality among the British elderly is less influenced by public action than in Germany (Figure 6.14). This is a result of the lower relative importance of income from public sources and thus less effect of the included elements of social redistribution. Nevertheless, the Gini coefficient was only slightly higher than in

¹⁹⁰ See section 4.2.

¹⁹¹ See section 5.3.4.2.

¹⁹² Still, there are significant differences between East and West Germany in the level of inequality (Figure 6.13).

Germany, but with a increasing trend in Great Britain and a falling trend in Germany.

6.7.1.6 Taxation of contributions and benefits

Most of the analysis is based on net incomes. Tax payments by the elderly are not analysed in detail, since their actual amounts are only estimated for the CNEF dataset.¹⁹³ British pensioners' incomes are significantly more exposed to income taxation. This can be seen with the change from pre-government to net incomes. While British pensioners have higher pre-government incomes (Figure 6.24), they fall below the German level in net incomes (Figure 6.5) due to taxation. However, the tax status of pensioners is going to change in Germany, following the decision in April 2004 to introduce the EET taxation model gradually from 2005 until 2040.¹⁹⁴

6.7.1.7 Minimum pension and subsidiary system

Subsidiary benefits provided by the German and the British state seem to differ in their ability to prevent poverty among the elderly (see 6.7.2.1).¹⁹⁵ In the UK, the reduction in old-age poverty during the observation period can be mainly attributed to the Minimum Income Guarantee, which was higher than the full Basic Pension. Compared to Germany, where only few pensioners (less than 2%) receive social assistance, up to 50% of elderly households in the UK are expected to benefit from the recently introduced Pension Credit in the future.¹⁹⁶ This institutional structure has a major impact on future tax-financed spending on the elderly in the UK; a fact to be considered for the analysis of long-term sustainability (see 7.1).

The empirical analysis has shown clearly that the institutional arrangements of pension systems do in fact influence the level and the distribution of old-age incomes among individuals. Consequently, pension reforms do not only have to consider macroeconomic effects like financial sustainability but also effects on the individual (microeconomic) distribution of incomes – an aspect that was often missing in the recent reform discourse. This will be taken into account for the remainder of the study.

¹⁹³ See section 6.1.4.3.

¹⁹⁴ See section 5.3.6.

¹⁹⁵ The public subsistence benefits are close to the calculated poverty lines, especially if additional housing benefits are taken into account; see section 6.4.

¹⁹⁶ See section 5.3.7 and Council of the European Union (2003), Table 1, p 26.

6.7.2 Assessment of compliance with the key objectives of pension systems

Before concluding this chapter, the empirical findings are used to assess whether pension policies in both countries have succeeded in achieving the formulated key objectives of pension systems.

6.7.2.1 Preventing poverty

The performance of the German pension system has been significantly better than the British with regard to preventing old-age poverty (Figure 6.17). In both countries, elderly women are much more exposed to poverty than men. In 1999, poverty rates for women were 11% in Germany and 20% in Great Britain, compared to 7% and 14% of men, respectively (Figure 6.18). Old-age poverty rates have declined during the 1990s in both countries and for both sexes. Apparently, pension policies concerning old-age poverty were successful, but there are still high poverty rates among problematic groups like single women. However, recent pension reforms in both countries introduced new categories of subsidiary benefits – Needs-related Basic Provision in Germany and Pension Credit in Great Britain – that are likely to improve the situation for those in the lower parts of the income distribution.¹⁹⁷

6.7.2.2 Securing a decent standard of living

In an analysis based on cross-sectional data, the population of working age achieves the highest relative income positions (Figures 6.10 and 6.11). Then, relative incomes drop to a value less than 1.0 for the elderly. If decomposed by age, there is an almost continuous decline in relative income positions. Thus, people seem to experience a drop in their standard of living after retirement.

In contrast, the panel analysis suggests that – in a median income approach – pensioners realised at least as much equivalent net income after retirement than they did before leaving the labour market, since the median old-age income ratios based on equivalent incomes before and after retirement of the same individual hardly fall below the 100% line (section 6.6.2). Apparently, the living standard on average can be maintained in old age. However, the personal income ratio seems to depend on the year of retirement and there are significant cohort effects on the development of equivalent income (section 6.6.3). The historic labour market situation, the development of capital returns, the maturing of public and private pension schemes as well as changes in pension legislation play a significant role in the realised individual income replacement rate.

Since the analysis only considers net income without taking into account non-monetary income flows, the actual standard of living may be underestimated, be-

¹⁹⁷ See section 5.3.7.

cause the elderly profit from a number of public in-kind benefits such as reduced travel costs, reductions for medication etc. (Table A.6).¹⁹⁸

6.7.2.3 Equality of women and men

There exists a gender income gap among the elderly in terms of total income, leading to significantly higher relative poverty rates among women (Figure 6.18). However, the analysis of income composition shows that the differences in incomes usually result from a lower coverage of women by the respective pension scheme or type of income and not from the lower amount received from an income source (section 6.5.3).

As far as public pension income is concerned, women have comparable recipient rates to men. Consequently, public pension schemes seem to provide equal opportunities for men and women. Yet, women often receive derived pension income (see 6.7.1.2). In contrast to income from public sources, women's coverage by occupational and personal pension schemes is still much lower than among men. There are obviously not equal opportunities for participation in these private pension schemes, resulting in a gender income gap in old age. Consequently, policy against gender discrimination should focus on better access for women to private pension schemes. However, since participation in occupational pension schemes is linked to labour market participation, an increase in women's employment rates and in the number of working hours may automatically lead to higher participation in occupational pensions. Additionally, recent pension reforms have introduced general access to occupational pensions for employees.¹⁹⁹

6.7.2.4 Intergenerational justice

During the observation period, old-age equivalent incomes have grown slightly more than the respective incomes of the working-age population and the macroeconomic income aggregates (Figures 6.8 and 6.9). These findings may point to a certain shift of intergenerational distribution of income from the young towards the elderly.

On the other hand, the findings of the panel analysis show that there are considerable cohort effects among the population aged 65 and over in favour of the younger cohorts (section 6.6.3). Combined with the results from the cross-sectional analysis, it is probable that those belonging to the 'middle generation' aged 50–60 today are best off in an intergenerational comparison. However, this may have changed already in Germany due to recent pension reforms.

¹⁹⁸ Casey and Yamada (2002), pp 11f, Table 7 come to the result that in-kind benefits for pensioners are worth 53% of their cash benefits in both countries.

¹⁹⁹ UK: 'Stakeholder pension', Germany: 'Riester-Rente'; cf. sections 5.3.1.2 and 5.4.1.1 and Table A.6 in the Appendix.

6.7.2.5 Financial sustainability

In order to assess future financial sustainability, projections for the development of key demographic and macroeconomic figures are needed. These will be presented in chapter 7. Therefore, the assessment of financial sustainability for both pension systems is postponed to that chapter.

The last section has illustrated how the empirical figures can be assessed in terms of institutional arrangements and pension system objectives. The hypotheses formulated in section 5.5 have been broadly confirmed. After having analysed the outcomes of both pension systems in the past, the study now focuses on probable developments in the future.

7 Sustainability and distributional perspectives of the German and the United Kingdom pension system

After having concentrated on the developments in income distribution in the preceding chapter, the focus is now shifted to the perspectives of the pension systems' performance in the future. The first section introduces projections of financial sustainability and its determining factors until 2050 by Eurostat and the OECD. Based on these projections, major risks for the accomplishment of the initially formulated key objectives of pension systems in the future are identified for both countries in section 7.2. Eventually, section 7.3 assesses reform options for both pension systems with regard to their assumed impact on sustainability and income distribution.

7.1 Status quo projections until 2050

Figures presented in this section are mainly based on projections by the Economic Policy Committee of the European Commission in 2001–2003.¹ These data are supplemented by projections by the OECD.² Both data sources rely on the assumptions about demographic trends presented in section 4.2.³ Projections for a time period of about 50 years are subject to considerable uncertainty and have therefore to be treated with caution.⁴ This is even more true for simulations of public pension expenditure or total public spending that are based on these demographic assumptions. Furthermore, these are status quo projections for the legal status as of 2003 that show the perspectives of the pension systems in case they would remain unchanged until 2050 – a rather unrealistic assumption in view of the continuous reform process in welfare states (with influences on pension systems). E.g., updated pension expenditure projections for Germany in 2002 and for

¹ Economic Policy Committee (2001), Economic Policy Committee (2002), Economic Policy Committee (2003).

² Dang et al. (2001).

³ I.e. the middle variant of Eurostat population projections; cf. Dang et al. (2001), p 4. See Bucerius (2003), pp 167–170 for a comparison of the differences between the studies by the Economic Policy Committee and the OECD in 2001.

⁴ The Economic Policy Committee (2001), p 9 notices that “the simulations are not forecasts, but rather projections of possible outcomes”.

the UK in 2003, taking into account recent pension reforms, show the effect of institutional changes on the figures. The proportion of GDP to be spent on pensions in 2050 has been corrected from 16.9% to 14.9% for Germany and from 4.4% to 5.3% for the UK.⁵ In Germany, the reform measures of 2004 that lead to a considerable reduction in future pension expenditure, are not included in the figures.⁶ However, such projections provide a helpful orientation for public policy insofar as they show risks for future sustainability that arise without further pension reforms.

The expenditure of pension schemes depends on the number of pensioners and the average pension benefit they receive. On the financing side, the number of contributors and their average contribution determine the receipts of the pension scheme. Additionally, the share of tax financing is important. Thus, the ratio of contributors (taxpayers) to beneficiaries is an important parameter for pension finance.⁷ Independently of the financing mode, people of working age have to earn the national income to provide for those who are not productive because they are too young or too old to earn their living. Figure 7.1 therefore displays old-age and total dependency ratios for Germany and the UK in the past and projections until 2050.

Obviously, the old-age dependency ratio will increase considerably in both countries, until 2035 in Germany and until 2040 in the UK. This trend reflects the important increase in the number of elderly persons (retiring baby boomers) and low fertility rates since the late 1970s.⁸ After the respective turning point, the ratios are diminishing only slightly. In other words, while five persons of working age were 'responsible' for earning the income of one pensioner in 1970, this number went down to four middle-aged in 2000 and will drop to 2.5 in the UK and 2.0 in Germany until 2050.

However, the working-age population does not only have to produce income for themselves and the elderly, but also for their children. Even if transfers to children are often made within the family and are thus less explicit than contributions and taxes paid for public and private pensions, it is evident that society on the whole has to earn their children's living.⁹ Naturally, total dependency ratios are on a higher level than old-age dependency ratios, but their development over the observation and projection period is different and opens up another perspective. Due to low fertility rates, the total dependency ratio has decreased in both countries from 1970 to 1985 and has only slightly increased thereafter until 2000. The ratio will reach its initial level of 1970 around 2025. This means that only after 2025 to-

⁵ Cf. Council of the European Union (2003), p 65 and United Kingdom of Great Britain and Northern Ireland (2003), p 43. The figures will be analysed in more detail later.

⁶ Their effect will be discussed in section 7.2. 2004 reforms include the introduction of the so-called 'sustainability factor' and a change in taxation of pension contributions and benefits; see sections 5.3.4.1 and 5.3.6.1.

⁷ See section 3.1.1.

⁸ See section 4.2.1.

⁹ Cf. Gillion et al. (2000), pp 287f.

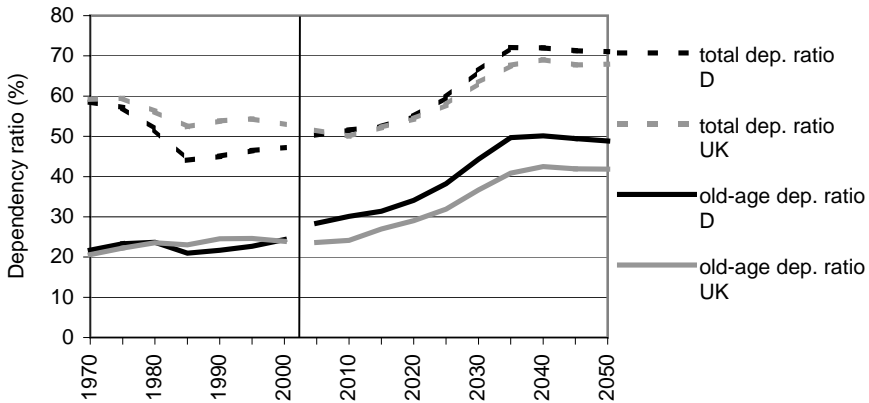


Figure 7.1. Old-age dependency and total dependency ratios for Germany (D) and the United Kingdom (UK), 1970–2050

Old-age dependency ratio = number of persons aged 65+ / number of persons aged 15–64.

Total dependency ratio = number of persons aged <15 or 65+ / number of persons aged 15–64.

From 2005: projected values.

Sources: Council of the European Union (2003), UN Population Prospects 2001 Revision; own calculations; cf. Table A.4 in the Appendix.

tal dependency is higher than experienced in the past and the increase in this ratio 2025–2035 is not as pronounced as for old-age dependency. It may be argued that generations with fewer children have more financial capacity to support older generations.¹⁰ However, projections of education expenditure show that there is no scope for important reductions in this area.¹¹ Findings about total dependency do not affect pension expenditure, but are important for the analysis of intergenerational justice. It should be considered that, due to population ageing, transfers to the inactive population are carried out rather through public mechanisms and are thus more explicit. Gillion et al. (2000, p 286) argue that the proportion of total income transferred to the inactive parts of the population in OECD countries has decreased from 45.2% in 1950 to 42.3% in 1995 and will increase to about 49% in 2050 unless reforms are implemented.

To come back to old-age dependency, the mere comparison of age-group sizes does not provide an adequate basis for evaluating the real economic dependency. Therefore, the Economic Policy Committee (2001) carries out additional projections of *potential and effective economic dependency ratios*. Their development is presented in Figure 7.2. These figures do not include dependent children under

¹⁰ Cf. Fabig (2001), p 171.

¹¹ Cf. Economic Policy Committee (2003), p 29. Due to globalisation, developed countries cannot compete on low-skilled labour markets and have to specialise in high-skilled labour (see section 4.2.2). Consequently, they have to invest more per person in education.

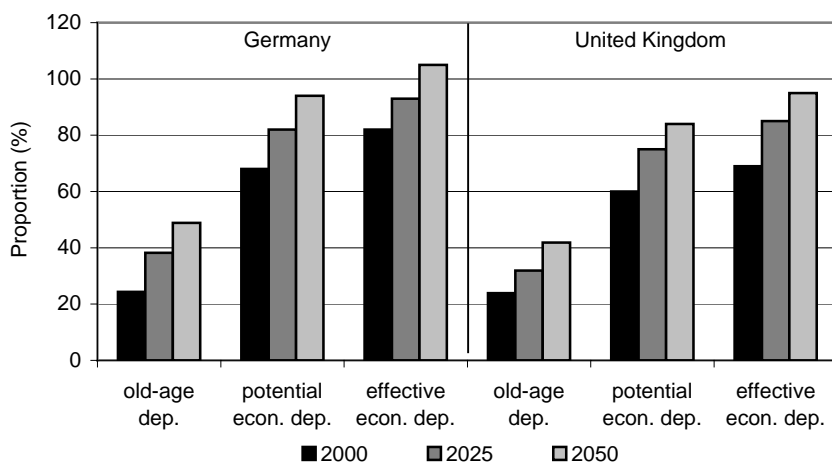


Figure 7.2. Old-age dependency ratios and potential and effective economic dependency ratios for Germany (D) and the United Kingdom (UK), 2000–2050

Old-age dependency ratio = number of persons aged 65+ / number of persons aged 15–64.

Potential economic dependency ratio = number of persons aged 15+ not in the labour force/ number of persons in the labour force.

Effective economic dependency ratio = number of persons aged 15+ who are not employed/ number of persons employed.

From 2025: projected values.

Source: Economic Policy Committee (2001), p 19; own presentation.

15 years. As shown in Figure 7.1, total age dependency is considerably higher than old-age dependency and the same would apply to potential and effective dependency if calculations considered dependent children.

Economic dependency ratios are significantly higher than old-age dependency ratios. They reflect the relation between (potentially) economically active and inactive persons, a more adequate measure for the expected economic effects of ageing. Furthermore, these ratios show the importance of employment rates among the working-age population, since unemployment leads to the difference between potential and effective economic dependency. In comparison with old-age dependency ratios, economic dependency is growing relatively less. Old-age dependency is supposed to double in Germany and to increase by 75% in the UK from 2000 to 2050, while potential economic dependency rises by about 38% in Germany and 40% in the UK. The projected increase in effective economic dependency is even less pronounced with about 28% in Germany and 38% in the UK in the same time period. Nevertheless, these are important shifts in the balance between active and inactive parts of the population aged 15 and over.

Although these figures are helpful for analysing the development of relations between those who can produce the output to pay for old-age pensions and those who will be dependent on old-age income, they are very sensitive to the underly-

ing assumptions about trends in unemployment. The applied unemployment rates seem rather implausible particularly in Germany, given the past developments in unemployment and the effects of globalisation.¹² The calculations assume diminishing unemployment rates for Germany, from 7.9% in 2000 to 6.6% in 2005 and 5.6% from 2020 onwards.¹³ The assumption for 2005 has already proven illusive and the projections for the remaining period of time are also contentious. Meanwhile, the unemployment rate in the UK is supposed to increase from 5.3% in 2000 to 5.6% in 2005, where it is assumed to remain until 2050.

Table 7.1 shows the labour market participation rates in the past and the assumed future values used for the projections by the Economic Policy Committee. Obviously, the trend of growing female labour market participation is expected to

Table 7.1. Labour market participation rates^a (%) by gender in Germany and the United Kingdom, 1991–2050

		Germany		United Kingdom	
		men	women	men	women
Working age					
15–64 y.	1991 ⁽¹⁾	82.0	61.2	86.3	66.1
	2000 ⁽¹⁾	78.9	63.3	83.2	68.2
15–54 y.	2000 ⁽²⁾	86.6	71.8	92.2	76.1
	2050 ⁽²⁾	84.3	76.3	91.0	80.7
	change 2000–2050 ⁽²⁾	-2.3	4.5	-1.2	4.6
Older workers					
55–64 y.	1991 ⁽¹⁾	56.6	26.6	67.5	39.0
	2000 ⁽²⁾	55.7	37.0	66.4	40.0
	2050 ⁽²⁾	62.4	51.4	62.9	51.9
	change 2000–2050 ⁽²⁾	6.7	14.4	-3.5	11.9
Elderly persons					
65+ y.	1991 ⁽³⁾	9.2	3.1	10.8	3.6
	2000 ⁽³⁾	8.8	4.5	10.4	5.6
	2000 ⁽²⁾	4.5	1.7	6.8	2.7
	2050 ⁽²⁾	2.4	1.1	5.8	2.4
	change 2000–2050 ⁽²⁾	-2.1	-0.6	-1.0	-0.3

^a Employed and unemployed persons as a percentage of the respective age group; projected values for 2050.

Sources:

⁽¹⁾ Eurostat structural indicators (<http://europa.eu.int/comm/eurostat/newcronos>, 26.8.2004).

⁽²⁾ Economic Policy Committee (2001), Table 3.2, p 18.

⁽³⁾ CNEF, own calculations (people with labour income); see Table A.16 in the Appendix.

¹² See sections 4.1 and 4.2.2, respectively.

¹³ These assumptions were made by the national governments, cf. Economic Policy Committee (2001), p 17.

continue in the future and to offset the slight reduction in male participation rates. The projections especially for older workers (aged 55–64 years) seem ambitious, even in the context of a shrinking total population of working age (see Figure 4.5).¹⁴ A change in the employers' attitude towards older workers and a reduction of incentives for early retirement are needed to fulfil these expectations (see 7.2).¹⁵

Employment has a crucial impact on public old-age spending, because employment rates affect both receipts and expenditure of public pension schemes. Higher employment rates lead to reductions in public net expenditure because they induce more contributions (and tax payments) and less spending on pensions and other public benefits at the same time. If people earn more pension entitlements in a longer working life, they usually receive a higher amount of pension benefits and they face a lower risk to rely on tax-financed subsistence benefits. Furthermore, higher employment translates to a higher GDP, meaning total resources increase.¹⁶ Thus, the work incentives set by a pension system are a crucial factor for sustainability.

After having presented the underlying assumptions of the Economic Policy Committee (2001) projections, Figure 7.3 shows the expected trends in public pension spending, projected for the legal setting of 2003. It is important to notice that these results are not fully comparable, since the German numbers include expenditure on public sector pensions whereas this part of pension expenditure is excluded from the British calculation. In 2003, UK public spending on public sector pensions was about 1.5% of GDP, containing 0.8% of GDP spent on pensions to persons over legal retirement age. The expenditure is supposed to stay at least at this level in the future.¹⁷

German public pension expenditure as a proportion of GDP is projected to increase significantly, from 10.8% in 2000 to 14.9% in 2050. These figures do not take into account the 2004 reforms with considerable impact on pension spending.¹⁸ Obviously, the consideration of these reform measures would lead to a significant reduction in projected pension spending in 2050. Meanwhile, British public spending on pensions other than for the public sector constitutes not only a

¹⁴ The employment figures reflect the ambitious EU employment targets of the Lisbon and the Barcelona strategy; cf. Kommission der Europäischen Gemeinschaften (2003), p 2. Accordingly, employment rates among older workers (both men and women, aged 55–64) should increase to more than 50% until 2010 and the effective retirement age should increase by 5 years during the same period of time.

¹⁵ Cf. Kommission zur Nachhaltigkeit in der Finanzierung der sozialen Sicherungssysteme (2003), p 87.

¹⁶ See section 3.1.1.

¹⁷ Cf. Pensions Commission (2004), p 144.

¹⁸ The sustainability factor leads to a reduction in pension benefits by 7.7 percentage points until 2030. The standard gross replacement level in 2030 will shrink from 42.4% according to the legal status before 2003 to 39.7% according to current regulations. Cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004), pp 238, 241.

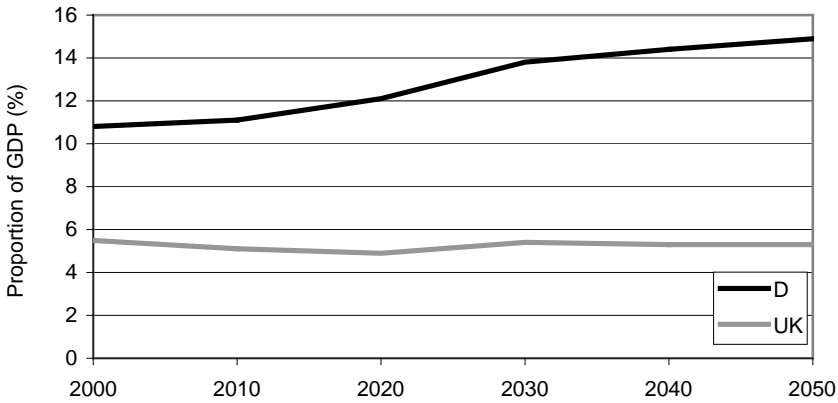


Figure 7.3. Public pension expenditure^a in Germany (D) and the United Kingdom (UK), 2000–2050

^a Most public replacement revenues to people aged 55 and over; UK: excluding public sector pensions. Status quo 2003.

Sources: Council of the European Union (2003), Table 8, p 65 and United Kingdom of Great Britain and Northern Ireland (2003), p 43¹⁹.

considerably lower proportion of GDP – starting at a level of 5.5% in 2000 – but also remains relatively stable between 4.9% and 5.5% of GDP until 2050. In other words, public pension expenditure is growing at about the same rate as GDP in the UK, whereas German pension expenditure requires an increasing part of national resources. However, taking into account the reform measures undertaken in Germany after this forecast was made, both the UK and Germany supposedly comply with the definition of financial sustainability established above, i.e. that both contributors and pensioners should share the financial burden of ageing and that net working-age incomes should not develop worse than net pension incomes.²⁰ However, there may still be concern about the long-term sustainability of overall public finances. The higher level of public pension expenditure in Germany reflects the considerably greater scope of the German compared to the British public pension scheme.²¹ The fact that there is no increase in UK public pension spending can be

¹⁹ These are updated national projections to the Economic Policy Committee (2001), taking into account recent pension reforms until 2003.

²⁰ Concerning Germany, real GDP is projected to increase by 1.4% p.a. during the period 2000–2050 (cf. Economic Policy Committee (2001), p 21) and contribution rates are limited to 22% of earnings to the public and 4% to private schemes. On the other hand, public pension expenditure presumably increases by less than 4 percentage points of GDP (taking into account the 2004 reform measures) while the old-age dependency ratio almost doubles on the other hand. Consequently, it can be assumed that net incomes of the working-age population do not decrease in real terms over time.

²¹ See sections 5.2 and 6.5.

primarily attributed to the price level indexation of the Basic Pension that leaves the development of pensions behind general economic growth and thus compensates for increasing numbers of pensioners.²² On the basis of these figures, the British public pension scheme has been considered sustainable by the Council of the European Union (2003, p 74). This evaluation will be discussed further in the following section.

As mentioned earlier, the presented figures are updated national projections to the Economic Policy Committee (2001), taking into account pension reforms implemented in 2001–2003. The original figures by the Economic Policy Committee and the OECD, based on the institutional setting in 2000, projected an increase until 2050 to 16.9% of GDP in Germany and a reduction to about 4% in the UK.²³ The updated results reflect the direction of recent pension reforms in both countries. While the German pension reform in 2001 aimed at a reduction in pension benefits and thus led to a decrease in projected spending,²⁴ the extraordinary increases in Basic Pension benefits in 2000 and 2001 and the introduction of the Pension Credit in 2003 resulted in higher expected pension expenditure for the UK.

A comparison of the projected numbers by the Economic Policy Committee and the OECD in 2001 reveals the considerable uncertainties about the ‘right’ figures. In addition to a marginal discrepancy in the considered benefits, there are slightly deviating assumptions about the macroeconomic performance, leading to different expenditure projections for the UK.²⁵ These differences show that this kind of exercise can only provide an idea of the real developments. Furthermore, the narrowed view on public pension expenditure omits the risks for financial sustainability of private pension schemes such as investment risks, the risk that the provider becomes insolvent and the risk of fraud.²⁶

²² Cf. Economic Policy Committee (2001), p 23. Public spending on SERPS and SSP are supposed to stay at about the same level due to high numbers of contracting out and changes in the calculation basis for contribution payments and thus pension entitlements. Spending on the Pension Credit is supposed to increase.

²³ The percentage projected by OECD and EPC for Germany is equal. For the UK, the Economic Policy Committee (EPC) projected a proportion of 4.4%, the OECD of only 3.6%. The difference presumably results from the exclusion of means-tested benefits in the OECD projections, whereas these are included in the EPC calculations; cf. Dang et al. (2001), p 8.

²⁴ Apart from financial effects of the 2001 reform, the difference in German public pension spending is partly due to the inclusion of health expenditure (transfers from pension insurance to health and long-term care insurance) in the earlier projections by the Economic Policy Committee (2001); cf. Council of the European Union (2003), p 120.

²⁵ See footnote 23. Average productivity growth for 2000–2050 was projected by the EPC to be 1.8% p.a. for both countries; the OECD projected 1.75% p.a. for Germany and 1.82% for the UK. Projections for real GDP growth were more similar: the EPC assumed 1.4% p.a. for Germany and 1.7% p.a. for the UK, compared to 1.41% p.a. for Germany and 1.72% for the UK projected by the OECD. Cf. Economic Policy Committee (2001), p 21; Dang et al. (2001), p 31.

²⁶ Cf. Council of the European Union (2003), p 62.

If a large part of old-age pensions stems from occupational and personal pension schemes – as in the UK –, the financial stability of these schemes is essential for the public budget, since a failure in providing adequate private pensions affects public expenditure on subsidiary benefits. Calculations by Eurostat show that total pension expenditure from private and public sources in 2001 was 11.8% of GDP in the UK and 13.1% in Germany.²⁷ These results point out that the analysis of financial sustainability of pension systems has limited explanatory power if it is restricted to public pension expenditure (and even to private sector pensioners in the case of the UK). Therefore, the following section takes into account the entire pension systems of Germany and the UK for deriving risks for sustainability and distributional equity.

7.2 Risks for sustainability and distributional equity of the pension systems

With regard to the fact that total pension expenditure is going to increase due to population ageing, the issue of pension policy is twofold. First, it has to determine by how much public pension expenditure will increase, i.e. the average public pension benefit per pensioner. Secondly, it has to decide on the repartition of the financial burden of population ageing among contributors, taxpayers and future generations (in case of public borrowing). These decisions imply distributive judgements. Risks for sustainability arise from a concentration of the financial burden on one generation, if the members of this generation are incapable to bear it, meaning that their incomes on average risk to fall below the subsistence level either immediately or in old age due to insufficient means to provide for adequate pension income. The case that people are unwilling to bear this burden despite sufficient financial resources is not considered here. However, there are limits to the political sustainability of pension systems.²⁸ Thus, sustainability is closely tied to intergenerational equity. Changes in intergenerational distribution affect the intragenerational distribution of incomes as well, since weak groups within a generation are particularly concerned by reductions in public expenditure and thus in solidarity. These interdependencies will be considered for the following analysis of risks for sustainability and distributional equity faced by the German and the British pension system.

7.2.1 Germany

The empirical analysis of old-age incomes of German pensioners carried out in chapter 6 has shown that most of the objectives concerning intragenerational eq-

²⁷ Cf. Table 4.1.

²⁸ See section 2.3.3.

uity²⁹ have been largely achieved in the past. However, concerns were raised about the financial sustainability in particular of the public pension scheme in the face of demographic change, given the structure of the pension system with the predominant public component.³⁰ Recent pension reforms have aimed to improve the financial sustainability of the public pension scheme by reducing its benefit level.³¹ The ‘benchmark pension level’ of new pensioners – the benefit level of a person with a total of 45 earnings points³² – is projected to shrink from 69% of average net earnings in 2002 to 64.5% in 2015 and to about 58.5% in 2030, if the income tax reform is not taken into account.³³ Allowing for the effects of transition to EET taxation, this benchmark net replacement level decreases to 62.5% in 2015 and 52.2% in 2030.³⁴ Complete EET taxation will only be achieved for people retiring in 2040. The change in taxation affects both elements of the net income replacement ratio: it increases average net earnings (because contributions are exempt from taxation) and reduces average net pensions (because pensions are subject to income taxes). Therefore, it is difficult to evaluate the effect on individual lifetime income induced by the pension tax reform.³⁵

Pensions in payment are also concerned insofar as their growth rate will slow down; sustainability factor and correction factor applied from 2005 and 2006 respectively, lead to significant reductions in pension benefit growth.³⁶ Future pensioners are requested to compensate the lower level of public pensions by supplementary provision within occupational and personal pension schemes on a voluntary basis.³⁷

Public pension expenditure has been projected to rise by about four percentage points of GDP until 2050 without consideration of the 2004 reforms.³⁸ The estimate by the Economic Policy Committee (2003, p 15) that demographic change would have led to an increase in pension expenditure by 6.2 percentage points until 2050 without reforms reveals the significant expenditure cuts involved in the pre-2004 reforms. Taking into account the effects of the 2004 reforms, the German public pension scheme faces a significantly reduced risk of financial unsus-

²⁹ Intragenerational equity objectives are to prevent poverty, to treat women and men equally and to enable people to provide adequately for their old age; see section 2.4.2.

³⁰ See section 6.7.2.

³¹ See chapter 5.

³² This value corresponds to 45 contribution years with average earnings; see section 5.3.

³³ Cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004), p 241.

³⁴ Calculations by the Verband Deutscher Rentenversicherungsträger (Federation of German Pension Insurance Institutes) assuming constant real lower and upper earnings limits; cf. <http://www.vdr.de> (27.09.2004).

³⁵ Calculations for specific household types are presented by the Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004), pp 224–230.

³⁶ See section 5.3.4.1.

³⁷ Such voluntary private provision is publicly subsidised by direct grants and tax relieves; see section 5.4.1.

³⁸ See Figure 7.3.

tainability³⁹ and can even be considered financially sustainable according to the definition established above.⁴⁰ With the 2001–2004 reforms, German public pension policy has moved from a replacement rate target to a mix of replacement rate and contribution rate target and thus from an expenditure-oriented to a rather revenue-oriented approach.⁴¹ The shift from almost entire pay-as-you-go financing to partial funding brings the German pension system closer to the British system, so that the findings about the incomes of British pensioners and their distribution provide a rough idea of the distributional consequences associated with this shift.

In consequence of the benefit reductions, a part of the financial burden resulting from population ageing is transferred from the generation of working age (contributors) to the elderly (pensioners). This intergenerational redistribution may influence intragenerational distribution within all living generations as well. The analysis will focus on two groups of people (or generations) affected by the reforms. The first group are pensioners and those people entering retirement during the next decade, who have in common that they are unable to adjust their pension planning to the altered conditions. The second group roughly covers people of working age up to 50 years who should be able to revise their pension planning accordingly.

The group comprising pensioners and those near retirement age faces a reduction in replacement rates without having the opportunity to compensate for this loss in the value of their pension entitlements by building up additional income sources. The continuously lower adjustment of pensions relative to earnings tends to shift the intergenerational balance in favour of the younger generation. However, on an aggregate level this shift seems fair, since public pension entitlements were assigned under different assumptions on demographic conditions. Without adjustments, subsequent generations would bear a disproportional share of the financial burden of ageing, since net pensions would increase faster than net working-age incomes.⁴² On the microeconomic level, things are less straightforward. Public pension policy has failed to provide reliability insofar as it has changed the basis of people's pension planning. For those receiving small public pensions and only minor additional private old-age income, the reduced adjustments entail a higher old-age poverty risk in the future. Taking into account the existence of public subsistence benefits, it is rather a social assistance risk. Furthermore, since women constitute the majority of low-income pensioners,⁴³ the reductions may lead to increasing gender inequality.⁴⁴ Today, 50% of male and 95% of female

³⁹ Cf. European Commission (2004), p 47.

⁴⁰ See section 2.4.2.

⁴¹ Schmähl (2003), p 21 argues that the earnings-related pension scheme has been replaced by a minimum pension scheme.

⁴² See section 2.3.2.

⁴³ See section 6.4.

⁴⁴ This tendency is amplified by the reduction in survivors' pensions mainly paid to women. However, age cohorts entering old age show higher female participation rates so that the effects may balance.

pensioners have less than 45 earnings points,⁴⁵ the number that is referred to as basis for the calculations of the benchmark pension level. For those pensioners with minor entitlements, a reduction in the benefit level will lead to considerable poverty risks – or rather to the risk to fall back to public subsistence benefits – if they cannot rely on further income sources.⁴⁶ These risks are increasing over time with the gradual reductions in benefits so that younger age cohorts are relatively more concerned. Furthermore, the age cohorts near retirement age (born 1945–1955) are severely affected by unemployment, but cannot profit from the very generous early retirement regulation of their predecessors. These cohorts have not anticipated such unemployment risk in their pension planning and those unemployed have no means to compensate for the loss in future public pension benefits.⁴⁷ Accordingly, it can be assumed that new pensioners will be increasingly unable to maintain their living standard after retirement⁴⁸ and may even be at risk of poverty. In consequence of the rising poverty risks, the number of potential claimants of the public subsistence benefit – the so-called ‘needs-related basic provision in old-age’ – increases and may endanger the sustainability of public finances.

Individuals belonging to the second group, aged about 20–50 years, must adapt to new conditions of old-age provision. The public pension will not provide sufficient old-age income to maintain the accustomed standard of living. Thus, people will have to rely on supplementary pension income from occupational and personal schemes to achieve the living standard they aim for. As shown in the theoretical analysis and confirmed by the empirical results, funded private pension provision leads to more inequality in old-age incomes than public pay-as-you-go schemes due to risks associated with this kind of provision and the considerably less than universal coverage.⁴⁹ Old-age income inequality will increase even if people build up private pensions to the extent intended by the German government.⁵⁰ This is a result of rate of return differentials among private pension schemes. However, since the supplementary pension provisions are voluntary, low-income earners may not be able to contribute (sufficiently) to supplementary pension schemes despite generous public subsidies.⁵¹ Consequently, old-age income inequality and poverty risks increase further – with a tendency to rising numbers of basic provision claimants. Due to the reduction in public pensions, the extent of social redistribution shrinks and income inequality in working life is mir-

⁴⁵ Schmähl (2003), p 16.

⁴⁶ Especially low-income earners rely predominantly on the public pension scheme, because they are unable to pay for supplementary pension provision during working life.

⁴⁷ Unemployment insurance (ALG I and ALG II) pays only minor contributions to the public pension scheme.

⁴⁸ Those unemployed immediately before retirement may be able to maintain or improve their living standard experienced during the spell of unemployment, but probably not the living standard achieved on average throughout their working life.

⁴⁹ See section 3.3 in connection with section 6.7.2.

⁵⁰ From 2010, people are supposed to voluntarily contribute 4% of their gross earnings to an occupational or personal pension scheme.

⁵¹ Cf. Döring (1998), p 254.

rored in the private parts of old-age income. This is especially disadvantageous to women, who tend to profit more from such solidarity elements. Furthermore, spells of unemployment, illness and working incapacity during the contribution period result in even more differences in old-age income because private contributions are not replaced by any insurance.⁵² The individual ability to build up adequate pension income therefore depends increasingly on the macroeconomic conditions, in particular on employment opportunities.⁵³ Early retirement due to unemployment is an individual problem, but it does not affect pension scheme sustainability, if the reduction in pension benefits resulting from retirement before the statutory retirement age is actuarially neutral in the sense that it adequately reflects shorter contribution and longer payment periods.⁵⁴ Still, high unemployment rates have an adverse impact on total output and overall public finances as a result of unemployment benefit expenditure.

Despite the transfer of a part of the financial burden resulting from demographic change to the pensioners, members of the second group (aged 20–50) still assume a large proportion of the financial responsibility. While replacement rates by the public pension are reduced considerably, contribution rates to the public scheme increase further – though not as much as in the absence of reforms.⁵⁵ For the insured persons, total contribution rates to the pension system including the private component actually rise. These costs result from the partial transition from pay-as-you-go-financing to funding: the working population has to pay for the pensions of the present pensioners and has to provide for their own retirement, additionally.⁵⁶ However, in comparison with the situation before reforms, this age group presumably profits on average from the reductions in future public pension spending, though with different individual net effects according to age and other characteristics. The reason for this is that the reforms reduce the implicit liabilities of the tax and transfer system. The contribution rate to the public pension scheme is restricted to 22% until 2030. The Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004, p 243) comes to the result that people born after 1975 on average profit from recent public pension reforms. If private pension provision is taken into account, the turning point lies in the late 1960s

⁵² Cf. Hauser (1998), p 677.

⁵³ Cf. Casey and Yamada (2002), p 13; Scherman (2004), p 181.

⁵⁴ The Kommission zur Nachhaltigkeit in der Finanzierung der sozialen Sicherungssysteme (2003), p 86 claims that the reduction by 3.6% p.a. of early retirement is neutral in this sense.

⁵⁵ Schmähl (2003), p.17 argues that the reduction in contribution rates by 1.6 percentage points in 2030 achieved by the 2001 reform is not worth the adverse implications of the pension reforms.

⁵⁶ Breyer (1990), p 90 shows that in the event of a transition from pay-as-you-go to funded pension schemes, at least one generation has to pay for the implicit debt of the pay-as-you-go scheme, i.e. the benefits paid to the first generation of participants. See also section 3.2.1.

birth years.⁵⁷ However, if people of this generation perceive the results of the reforms in the long run to be unjust, political sustainability may be at risk.⁵⁸

To sum up, recent reforms have improved the financial sustainability of the public pension scheme, though with an uncertain net effect on sustainability of overall public finances due to probably increasing expenditure for public subsistence benefits in the long run. Yet, the improvement in sustainability has been at the cost of increasing poverty risks at least for those in or near retirement and less gender equality due to the reduction in social redistribution elements implied in the shift towards a higher proportion of private pensions. The government has gradually abandoned the objective to secure a certain standard of living in old age through the public pension scheme, leaving those cohorts near retirement age in an increasingly weak situation – in particular the many unemployed of these cohorts. With respect to the working-age population, the issue is in how far they will adapt to the new conditions of old-age provision and if they are able and willing to contribute sufficiently to non-mandatory private pension schemes. General economic performance and employment opportunities for older workers in particular will be crucial for the success of the reformed pension system with regard to sustainability and distributional equity.

7.2.2 United Kingdom

The UK's experiences in old-age security differ considerably from Germany's. According to the empirical findings about old-age incomes and their distribution, the British pension system has not been able to prevent old-age poverty throughout the last decade.⁵⁹ This points to a failure in intergenerational equity as well, although the empirical results do not confirm that in general for the past.⁶⁰ Old-age incomes have been distributed considerably less equal than in Germany. On average, pensioners could maintain their accustomed standard of living, but there were significant differences in individual replacement rates.⁶¹ Such inequality is not a problem per se, but there are significant numbers of people who have to live on very low incomes in old age. The British pension system can be considered sustainable if solely public pension expenditure is taken into account. However, this judgement is challenged if the analysis allows for total old age-related expenditure including pension income from private sources.

⁵⁷ The Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004) calculates the nominal implicit rate of return of the public pension scheme for a standard pensioner with 45 earnings points with pre-2004 and 2004 regulations.

⁵⁸ In 2004, about 90% of Germans had doubts about the reliability of public pensions; cf. Frankfurter Allgemeine Zeitung, 31.01.2004, *Überschätzte Rente*.

⁵⁹ See section 6.4.

⁶⁰ E.g., median old-age incomes have developed similar or even better than those of the working-age population; cf. section 6.2.

⁶¹ See section 6.6.2.

Poverty risk increases with age due to the indexation of benefits from the Basic Pension scheme to price levels only. In 2004, 18% of British pensioners were only entitled to a Basic Pension⁶², with a full pension being worth less than 20% of average labour earnings for single pensioners⁶³ and thus markedly below the level of means-tested public subsistence benefits. The value of a full Basic Pension is projected to shrink to less than 10% of average earnings by 2050 due to the fact that benefits are only uprated with prices and not with earnings.⁶⁴ Benefits from the additional public pension schemes (SSP, SERPS) are restricted to replace 20% of earnings for middle-income earners (SSP is slightly more generous to low-income earners) and will shrink for high-income earners according to a new adjustment rule for earnings limits.⁶⁵ The Pensions Commission (2004, p 132) projects that the level of a full Basic Pension together with a full entitlement to the State Second Pension will shrink from about 35% of average earnings in 2000 to about 20.5% in 2060. Consequently, increasing numbers of pensioners will be at risk of poverty and will rely on public subsistence benefits that were worth about 30% of average earnings in 2004.⁶⁶

Since the introduction of the Pension Credit in 2003, more than 50% of pensioners have been eligible to means-tested benefits and the numbers will presumably increase further.⁶⁷ This is a result not only of the decline in public pension benefits, but also of mistakes made with regard to contracted-out occupational and personal pension schemes. These contracted-out pension schemes were intended as a replacement of the public additional pension scheme (SERPS, now SSP), but could not provide the insured with similar old-age security due to the risks involved in funded pension provision.⁶⁸ Public regulation of the schemes was insufficient and has improved only after the so-called misselling of personal pensions in the early 1990s.⁶⁹ Inadequate protection of private pension entitlements and fre-

⁶² Cf. Frankfurter Allgemeine Zeitung, 30.01.2004, *Das schwarze Kapitel der britischen Rentenpolitik*.

⁶³ Basic Pension benefits to couples were equal to 32% of average earnings. Cf. Whitehouse (2002), p 7. The figures refer to 2002.

⁶⁴ Cf. Ginn (2004), Tab. 1, p 185.

⁶⁵ Replacement rates for middle to high income earners will decrease considerably according to government plans: earnings limits taken into account for contributions and thus benefit calculation are intended to grow with prices and not with earnings in the future. Cf. Pensions Commission (2004), p 248.

⁶⁶ In 2004/2005, the means-tested minimum benefit (Pension Credit) of single pensioners was worth about 150% of the full Basic Pension; Table A.6 in the Appendix.

⁶⁷ Cf. Ginn (2004), p 188. The Pensions Commission (2004), p 225 estimates that more than 60% of pensioners will be eligible to receive at least partial Pension credits.

⁶⁸ See section 3.2.

⁶⁹ In the late 1980s, the British government promoted contracting out to personal pension provision by heavy subsidies. However, the established regulation system became effective only after some years. A study published in 1994 revealed that about 2.4 million personal pension contracts had been missold, meaning that they were sold to people who had better stayed in the public or occupational pension scheme they were contributing to before. Cf. Gillion et al. (2000), pp 320ff.

quent changes in regulation have led to declining confidence in such private provision.⁷⁰

Furthermore, two developments have resulted in a considerable reduction especially in the value of occupational pension schemes since 2000. Firstly, many employers have closed their defined benefit schemes and have shifted to defined contribution mode in face of the prevailing financial risks due to increasing longevity.⁷¹ This has reduced the value of pension entitlements of the concerned employees by 30% on average.⁷² Secondly, the global slowdown of financial markets since 2000 has reduced projected pensions of both personal and occupational schemes by about 10% each year.⁷³ Consequently, future pensioners probably will on average realise less old-age income than the age cohorts observed in the empirical part and many of them will fail to maintain their living standard after retirement. The Pensions Commission (2004, p 160) finds that at least 54% of all people aged 41 and over are under-saving, i.e. do not save enough to reach the target replacement rate.⁷⁴ For the age group 36–45, they estimate that more than 50% of self-employed do not save besides participation in the Basic Pension scheme and 67% of employees and all self-employed are under-saving on the whole.⁷⁵ Despite a major effort by the British government to improve knowledge about old-age provision and underlying financial issues, many savers seem unaware of the risks for their well-being in old age and incapable to profit from the large choice of private pension provision.⁷⁶ Even the recently introduced new form of personal pension (stakeholder pension) could not induce many people to provide (more) for their old age.⁷⁷ If future pensioners want to experience a level of well-being comparable to the present pensioners despite the demographic change and public expenditure remains roughly at 5.5% of GDP, then private savings would have to increase from 4.3% of GDP in 2000 to about 8.5% in 2030.⁷⁸ It is improbable that private provision will increase on this scale.⁷⁹ To conclude about risks for the distributional equity of the British pension system, it seems likely that old-age incomes will become more unequal in the future and that an increasing proportion of pensioners will be at risk of poverty. Accordingly, the number of social benefit (Pension Credit) claimants is determined to rise considerably.

⁷⁰ Cf. Ring (2003), p 76.

⁷¹ Active membership in open defined benefit schemes is estimated to have fallen by 60% from 1995 to 2004; cf. Pensions Commission (2004), p 84.

⁷² Cf. Ginn (2004), Tab. 1, p 186.

⁷³ Cf. Ginn (2004), Tab. 1, p 186.

⁷⁴ The Pensions Commission assumes target replacement rates gradually decreasing with earnings level, from 80% for lowest income earners (less than £9,500 p.a.) to 50% of high income earners (£50,000 or more p.a.); cf. Pensions Commission (2004), Fig. 4.11, p 143.

⁷⁵ Cf. Pensions Commission (2004), p 163.

⁷⁶ Cf. Ring (2003), p 77.

⁷⁷ Cf. Pensions Commission (2004), p 92.

⁷⁸ Cf. Turner (2003), p 2.

⁷⁹ Cf. Turner (2003), p 29.

This in turn raises concerns about the sustainability of overall public finances in the long run. Public expenditure on subsistence benefits to elderly persons is projected to grow from 1% of GDP in 2000 to 2.6% in 2050.⁸⁰ Means-tested benefits as a proportion of average public spending per pensioner is estimated to increase from about 8% in 2003 to more than 20% in 2050.⁸¹ In addition to this part of public spending, there are important subsidies to contracted-out pension schemes in the form of tax expenditures and rebates on the National Insurance contributions, an amount of about 2.5% of GDP or one third of funded contributions in 2000.⁸² Given the perspectives of insufficient private pension income, public old age-related expenditure may not stay at the same level relative to GDP as projected. Still, public finances are not at a high risk of becoming unsustainable because of increasing old age-related expenditure unless there is a radical shift in pension policy.

However, if there is no shift in pension policy towards a higher Basic Pension at least at subsistence level, intergenerational justice seems at risk. A disproportionate share of the financial burden of demographic change seems to be borne by the present elderly generation and those age cohorts retiring during the next three decades.

British pension policy has not provided a reliable framework for old-age provision. There were frequent changes in both the public and (the regulation of) the private components of the system. This has misled the population about their pension entitlements⁸³ and resulted in a loss in confidence in the pension system, reinforced by the continuous reductions in public pensions and the failure of private schemes. In 2003, 38% of people mistrusted pension promises given by the retail financial services industry and even 81% those given by the government.⁸⁴ A larger private provision may require more confidence in the pension system and greater social security through higher Basic Pensions instead of ever lower benefits over time.⁸⁵

The Pensions Commission (2004, p 236) concludes in their report on the current situation that “unless new government initiatives make a major difference to behaviour, the current voluntary system, combined with the current state system, is unlikely to deliver a solution to the problem of inadequate pension saving.”

This section has provided an overview of probable risks for financial sustainability and distributional equity of the German and the British pension system, based on the developments in old-age incomes observed during the last two dec-

⁸⁰ Cf. Ginn (2004), Tab. 1, p 185.

⁸¹ Cf. Pensions Commission (2004), Figure 3.21, p 78.

⁸² Tax expenditure to contracted-out personal pension schemes alone was £13.7 billion in 2000, equal to 40% of Basic Pension spending in that year. Cf. Ginn (2004), p 187.

⁸³ Cf. Whitehouse (2002), p 64. According to the Pensions Commission (2004), p 212, only 44% of the population claimed to have good or reasonable understanding of pension issues in 2003.

⁸⁴ Cf. Pensions Commission (2004), p 214.

⁸⁵ Cf. Ring (2003), p 77.

ades, the reforms undertaken recently and the projections of future public pension expenditure. The risks defined suggest considering further reforms of both pension systems that may lead to a better achievement of the established objectives.

7.3 Reform options and their effects on sustainability and income distribution

A considerable share of recent work has focused on reform options for the pension systems implemented in the industrialised countries in Europe and elsewhere.⁸⁶ Many of these comparative studies have derived a more or less ‘optimal’ pension system structure with public and private, pay-as-you-go and funded components.⁸⁷ However, the most beneficial system structure depends on national traditions and on the already existing pension system. The applied part of this study from chapter 4 onwards has made clear that different national systems face diverse risks, on both the microeconomic and the macroeconomic level. Therefore, also the respective reform options differ. Since this study provides background information on individual risks and macroeconomic conditions in Germany and the UK in addition to a theoretical framework, it is possible to derive specified reform options for both pension systems. They will be evaluated in terms of their effect on financial sustainability and income distribution.

7.3.1 Germany

There are two issues of paramount interest for future pension policy. On the one hand, it is questionable whether the German government will be able to achieve both the targeted replacement level and the contribution rate objective at the same time until 2030. Parts of the reforms undertaken do not seem very systematic in their implementation and rather a product of the current budget constraints than a logical concept of how to divide the financial burden of population ageing equitably among the living and future generations. E.g., the sustainability factor contains a completely politically decided weight to adjust pension benefit development to the established contribution rate and benefit targets.⁸⁸ Such political elements bear a significant risk of ad hoc changes in pension policy, undermining the reliability of the public pension scheme.

On the other hand, the reforms have reduced public pension benefits in general without considering the distributional impact. The approach to reduce the replacement rate of an earnings-related scheme proportionally for all participants

⁸⁶ E.g., see Feldstein and Siebert (2002), Fehr (2000), Boldrin et al. (1999), World Bank (1994) and Gillion et al. (2000).

⁸⁷ E.g. Dang et al. (2001), World Bank (1994).

⁸⁸ Cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2004), p 239.

risks to fail both the objective to secure a decent standard of living and the prevention of poverty.⁸⁹ Although preventing poverty has never been an explicit aim of the public pension scheme, the scheme has been very successful in this regard due to the included elements of social redistribution.

Therefore, reforms should either improve long-term financial sustainability in a systematic way without creating adverse effects on distributional equity or improve old-age security especially for low-income earners without increasing public old age-related expenditure in the long run. Furthermore, pension reforms should enhance rather than reduce labour market incentives. Three approaches will be analysed in greater detail: a mandatory supplementary private provision, a gradual increase in the legal retirement age according to rising life expectancy and the separation of redistributive and income replacement components.

7.3.1.1 Compulsion for supplementary private provision

As described above, recent reforms of the German pension scheme have led to considerable reductions in the benefit level of the public pension scheme, i.e. from 67% standard net pension level in 2002 to 58.5% in 2030 (see 7.2.1). Obviously, especially low and middle-income earners need additional old-age income from private sources to achieve an individual pension income above subsistence level. However, these groups in particular are unable to set aside current income for old-age provision, despite important public support for contributions to occupational and personal pension schemes.⁹⁰ Since the total contribution rate of compulsory public and intended private provision exceeds the public pension contribution rate of former years and net incomes have not increased considerably recently, low-income households presumably cannot dispose of a part of their income for old-age provision. Furthermore, people tend to overestimate the value of their pension entitlements and may not consider old-age provision as important as it actually is.⁹¹ The British example of a voluntary approach has shown that it does not produce adequate pensions for the entire population, especially because people tend to delay complicated decisions such as pension planning.⁹² Apart from the financial restrictions to save privately, people on low incomes may also foresee that they will not attain a total old-age income significantly above subsistence level even with private savings. In this case, there are adverse incentives for private provisions, since public means-tested subsistence benefits take into account private pension income.

The theoretical analysis has shown that an obligation for pension insurance at a minimum level is socially just, because it protects those people that provide adequately for their old age against the financial burden resulting from tax-financed

⁸⁹ Cf. Rechmann (2001), pp 343f.

⁹⁰ Cf. Dünn and Fasshauer (2003), p 8.

⁹¹ Cf. Frankfurter Allgemeine Zeitung, 30.01.2004, *Überschätzte Rente*.

⁹² The Pensions Commission (2004), pp 205–210 analyses barriers to a voluntary solution for pension provision in general on the basis of behavioural economics.

subsistence benefits paid due to non-insurance of others.⁹³ Consequently, if the public pension scheme is no longer able to provide people with a minimum pension at least at subsistence level, it seems appropriate to mandate supplementary provision to fill the gap left by the reduction in public pensions.⁹⁴ Low-income earners should receive the designated public grants without adding own resources, if they are unable to afford own contributions.⁹⁵ The German government is legally obliged to review the voluntary approach to supplementary private pension provision in the course of the year 2005.⁹⁶

The British experiences show that compulsion for supplementary private provision in principle is a possible way to enable people to secure an adequate old-age income.⁹⁷ Regulation would have to be improved compared to the British implementation. In particular the large requirements of information and transparency relating to alternative investment strategies of occupational and personal pension schemes should be considered in a move to compulsory supplementary insurance.⁹⁸ If there are sufficient means for low-income earners to participate in appropriate pension arrangements, a compulsory funded (defined contribution) element may have beneficial effects on the macroeconomic level, since it improves work incentives.⁹⁹

The analysis suggests that a compulsory solution for supplementary private provision in the form introduced by the 2001 reform would be an improvement compared to the current situation. This is because people with low incomes will hardly be able to qualify for a public pension above subsistence level and will probably rely on tax-financed social benefits in their old age if supplementary saving remains voluntary.

Apart from employees already participating in the public pension scheme, the requirement of a minimum old-age insurance should also apply to other parts of the population, namely the self-employed. Since employment patterns have become more flexible and changes between dependent employment and self-employment are more frequent, the prevailing exclusion of the self-employed from compulsory pension provision seems outdated. Recent research has come to the conclusion that the self-employed are on average as exposed to the risk of old-age poverty as people in dependent employment.¹⁰⁰ However, as explained above, the public pension scheme will not provide a minimum insurance for low-income earners in the future and may need more reforms to provide an appropriate frame-

⁹³ See section 3.2.2.2.

⁹⁴ Cf. Hauser (2003), p 222.

⁹⁵ The financial ability must then be determined according to definite rules.

⁹⁶ §154 SGB VI (social law).

⁹⁷ On average, the British pensioners realised individual old-age income ratios similar to those of German pensioners.

⁹⁸ This point is also crucial if this component of the pension system remains voluntary.

⁹⁹ However, there is evidence that especially people on low incomes tend not to profit from the privatisation of pension provision, since this normally implies increasing administration costs per person. This argument leads to section 7.3.1.3.

¹⁰⁰ Cf. Betzelt and Fachinger (2004), p 339.

work for compulsory basic insurance of the self-employed. Section 7.3.1.3 will return to this issue.

7.3.1.2 Adjustment of the legal retirement age

Since 2004, the legal retirement age of 65 years applies to both female and male participants in the public pension scheme (GRV). The earliest possible retirement date will increase gradually to the age of 63 (beginning in 2006). Despite the proposal of the ‘Sustainability Commission’¹⁰¹ to increase the retirement age to 67 over the next two decades, the government decided to retain the legal retirement age at 65 years. In the past, there has been a significant extension of pension years, mainly due to rising life expectancy, with considerable financial consequences for the public pension scheme.¹⁰² In the face of continually increasing life expectancy, it seems inappropriate to keep a fixed retirement age with the consequence that the entire gain in longevity is spent in pension age, at the cost of increasing public pension expenditure and a reduction in the proportion of productive life.¹⁰³ Persistently difficult labour market conditions for older workers cannot be an argument for a constant legal retirement age, since the pension scheme is not the appropriate branch of social security to compensate people for the consequences of unemployment. If structural unemployment is considered a national problem, it has to be tackled by the tax system and unemployment benefits including adequate contributions to the pension system, but not by a public pension scheme with incomplete coverage of the population. However, an increase of the retirement age by two years as proposed by the Sustainability Commission is not an adequate solution in the long run to address continually increasing longevity.

The reform option is to index the legal retirement age of each age cohort to their projected life expectancy (calculated at the age of 50) according to a fixed rule, leading to a stable repartition of adult life into a productive and a retirement period. The retirement age (RA) could be determined by the formula

$$RA = (LE_t - 20) * 0.75 + 20 \quad (7.1)$$

with

$$LE_t = 50 + LE_{50} \quad (7.2)$$

¹⁰¹ The ‘Commission for sustainability in the financing of social security’ was established in 2002 by the German government and published its results in 2003. One reform proposal implemented was the introduction of the so-called ‘sustainability factor’ in the benefit formula as from 2005. Cf. Kommission zur Nachhaltigkeit in der Finanzierung der sozialen Sicherungssysteme (2003), p 84.

¹⁰² The average number of years in pension receipt has increased for men from 9.6 years in 1960 to 14.1 years in 1999 and for women from 10.6 to 18.2 years over the same time period; cf. Kromphardt (2001), p 41.

¹⁰³ The theoretical analysis (chapter 3) suggested that a flexible solution for the retirement age in face of increasing life expectancy would be a means to share the financial effects in an equitable way between contributors and beneficiaries.

where

LE_t = age cohort-specific life expectancy calculated at the age of 50

LE_{50} = further age cohort-specific life expectancy at the age of 50 as projected by the national statistical office

Applying this formula means that life from the age of 20 ($LE_t - 20$) is split into a working period and a retirement period, with 75% attributed to working life and 25% spent in retirement. LE_{50} would be announced for each birth cohort at the age of 50. The calculation should not consider gender differences for gender equality reasons.

The further life expectancy of the age cohort who reached the age of 50 in 2000 was 27.7 years for men and 32.6 for women.¹⁰⁴ With an average further life expectancy of about 30 years, this would have led to a unisex retirement age of 65 years for this birth cohort according to the formula. Subsequently, people of this cohort could retire in 2015 with their full pension benefit. The earliest possible retirement date with actuarially reduced benefits would be set at two years before the legal retirement age, so that people can adjust their retirement age to their living circumstances.¹⁰⁵ This corresponds to the current legislation, allowing a smooth introduction of the measure. Changes would apply to future cohorts of pensioners only. If the projections of retirement age are published frequently and fixed when the cohort reaches 50 years, everyone is informed about his/her retirement conditions. This is a reduction in political risk for participants in the public pension scheme and prevents people from wrong expectations for their pension planning.¹⁰⁶ If the further life expectancy at age 50 for future age cohorts increases from 30 to 32 (35) years, retirement age would be raised automatically to 66.5 (68.75) years.

This reform option would improve the sustainability of the public pension scheme in a more systematic way than the adjustment factors introduced in the pension formula by recent reforms, because it adjusts the repartition between working period and pension period to changes in life expectancy. Intergenerational equity seems maintained, since this repartition is equivalent for each cohort and thus for each generation. However, for an improvement in overall sustainability of public finances, it is the increase in effective retirement age and not only in legal retirement age that is necessary, because unemployment reduces the potential GDP and produces costs in other parts of social security.¹⁰⁷ The Economic Policy Committee (2002, p IV) estimates that an increase in the effective retirement age by one year would diminish the growth of German public pension expenditure by 0.7 percentage points of GDP until 2050. Consequently, labour market condi-

¹⁰⁴ Cf. <http://europa.eu.int/comm/eurostat/newcronos> (24.03.2005).

¹⁰⁵ An exception could be introduced for people with long periods of employment under hard working conditions.

¹⁰⁶ Wrong expectations concerning the statutory arrangements of early retirement have led to considerable problems for those age cohorts near retirement age who have based their retirement decision – in co-operation with their employer – on the former regulations.

¹⁰⁷ See section 7.1.

tions are essential for the future of pension policy in Germany, in particular the employment opportunities of older workers.¹⁰⁸

To sum up, a systematic adjustment of the legal retirement age according to changes in life expectancy seems to be a viable reform option for the German public pension scheme, because it improves sustainability in a predictable and inter-generationally equitable way.¹⁰⁹ Measures to strengthen the German labour market are indispensable to achieve overall financial sustainability in the long run and to reduce the individual risk of unemployment with consequences for intragenerational income distribution.

7.3.1.3 Separation of the social insurance function from the savings function

In reaction to the recent pension reforms, the German public has lost much confidence in the public pension scheme. As explained above, this scheme will not be able to provide all participants with an old-age income above means-tested social subsistence benefits in the future. Consequently, public pension policy has dropped the objective to secure a standard of living for retirees similar to that experienced during working life, but has not improved the capacity of the public scheme to prevent poverty. A subsidiary scheme provides means-tested subsistence benefits, but many elements of social redistribution are included in the public pension scheme as well. They are mostly tax-financed through the considerable public subsidy to the scheme, but this mechanism is very intransparent for the general public.¹¹⁰ Consequently, especially middle and high-income earners consider the ‘investment’ into the public pension scheme to have a low, if not negative return. There are increasing tendencies to evade from social contributions, e.g. by special forms of self-employment.¹¹¹

Confidence in the public pension system would probably re-increase if there was a closer link between contributions and benefits. This may also improve incentives for later retirement, because people would have a considerable positive return on additional contribution years.¹¹² However, elements of social redistribution and close links between contributions and benefits can only be combined if redistributive elements are entirely tax-financed. Even if that is the case in the German public pension – and there is evidence that supports this assumption –

¹⁰⁸ Apart from increases in the retirement age, total output can be raised by higher participation rates of the working-age population, especially of women, and an extension of the average working life by shortened education periods and thus a reduced age of labour market entry; cf. Hauser (2003), p 206.

¹⁰⁹ In turn, adjustment factors introduced in the pension formula by recent reforms could probably be abolished.

¹¹⁰ Cf. Börsch-Supan et al. (2004), p 31

¹¹¹ A law against ‘fictitious self-employment’ came into effect in 1999 that aimed to detect people who are only working for one employer and thus only pretend to be self-employed.

¹¹² Cf. Council of the European Union (2003), p 8.

people do not seem to perceive the system as just, given the evasion tendency mentioned above.

Therefore, a reform option is to split the public pension system into two components: one redistributive component and a second component with almost actuarial links between contributions and benefits.¹¹³ This system would have some similarities with the British pension system, though at a significantly higher income replacement level. The first component, containing most of the elements of social redistribution, would provide a flat-rate minimum pension for all participants, only depending on the contribution years. Social redistribution could be effected by assigning entitlement credits for socially desirable but unpaid work or periods of unemployment. With a complete contribution record (e.g. 40 years), people would be entitled to a pension benefit slightly above the subsistence benefit level, at about 40–45% of average earnings. The contribution rate to this first component of the public pension scheme should be about 10% of earnings.¹¹⁴ This contribution rate could be reduced with an increase in the upper limit of earnings taken into account as contribution base.¹¹⁵ Contributions would be similar to taxes, but they would lead to individual pension entitlements. For those already participating in the scheme, the split would be fictitious in the form of a backward redefinition of the paid contributions into the two components. During a transition period, public guarantees would protect people from an absolute loss in pension benefits compared to the former regulations. The minimum pension scheme could be combined with subsidiary benefits in a way that every participant receives a pension at the defined minimum level, with a means test for those with incomplete contribution records. Self-employed persons should be compulsorily insured in this scheme as well. This first component would be highly redistributive.

The second component would have the function to provide low and middle-income earners with a secure framework to build up sufficient old-age income for maintaining their accustomed standard of living after retirement; high-income earners would need supplementary private provision. Benefits would be closely linked to contributions, i.e. defined contribution, but would pay unisex benefits. The scheme may be either pay-as-you-go financed or funded. However, since a transition of such a significant part of the existing public pay-as-you-go pension scheme to funding would be very costly during demographic change, it seems more apt to retain the pay-as-you-go mode. Consequently, it would be a notional defined contribution scheme.¹¹⁶ An upper ceiling for earnings considered for contribution payments would be set at about 150% of average earnings. High-income

¹¹³ A similar combined pension system has been suggested by the theoretical analysis (see 3.4).

¹¹⁴ These figures build on experiences from the Swiss pension system, where the public pension is set up in a similar way, requiring about 10% contributions.

¹¹⁵ A high upper ceiling – or even no ceiling – would be appropriate for this redistributive mechanism, since redistribution should consider individual financial capacities to the full extent.

¹¹⁶ Such a mechanism has been introduced in Sweden in the context of the 1999 pension reform and in Italy in 2003.

earners would be responsible to supplement their old-age income by private sources. The contribution rate could be fixed in the long run at about 10% of earnings. A contracting-out of this scheme as practised in the UK would be a further reform option that is not discussed here.¹¹⁷

Such a split of the pension scheme would have major advantages in diverse respects as analysed in section 3.4. First of all, sustainability would improve because tax financing would only be involved in the first component of the scheme and the second component would not cause large increases in pension expenditure due to the defined contribution mode at a fixed contribution rate. Second, old-age poverty could be almost entirely prevented through the compulsory pension schemes and would reduce the scope of means-testing among elderly people. Third, social redistribution would be carried out among a larger fraction of the population, would benefit especially those with lower incomes and therefore would not cause major regressive effects in the financing of the scheme. Furthermore, incentives for a later retirement would be strengthened by the second pension component. It can also be assumed that such a differentiation would improve the confidence especially of high-income earners into the public pension system and therefore reduce evasion tendencies.

This section has discussed three reform options for the German pension system. They can be considered beneficial in terms of a better overall performance in the formulated objectives of pension systems. The first reform option requires relatively small changes in the existing system, whereas the second and in particular the third option go further and aim at a more systematic approach to pension policy than today. Political risks for people participating in the German public pension scheme have been significant throughout years. More reliability and thus long-term solutions are required to improve confidence in old-age security – a major condition for an adequate individual pension planning.

7.3.2 United Kingdom

Compared to the German system, reform options for the UK pension system seem rather straightforward. There is one major problem, i.e. the considerable poverty risks for pensioners, especially for the very old. Although poverty has declined during the 1990s as observed in the empirical part, the probability is high that future pensioners will face a re-increased poverty risk in old age, especially for those retiring from 2015 onwards.¹¹⁸ This leads to the next issue: despite the good underlying ideas of the institutional setting, its implementation is rather poor.¹¹⁹ The

¹¹⁷ Such a reform would require significant public subsidies to transform the pay-as-you-go financing into a funded scheme. In the transition period, pensions would have to be paid from the public budget.

¹¹⁸ Cf. Pensions Commission (2004), p 168.

¹¹⁹ Rechmann (2001), p 343 draws the same conclusion from her detailed analysis of the British pension system.

analysis of system risks (7.3.2) points to three reform options worth detailed examination: to rebuild a real basic pension, to improve the operation of contracted-out schemes and to increase the legal retirement age gradually. The latter reform option applies to both countries and will thus only be briefly adapted to the British system.

7.3.2.1 Rebuilding a real basic pension

The most important reform option for the British pension system is to rebuild an effective basic pension. Benefits from the existing Basic Pension scheme have been devaluated in relation to labour incomes since the shift to price indexation in 1980. The extraordinary increases in its value in recent years have not improved the situation fundamentally. Single males who retired in 2000 with a full contribution record of 45 qualifying years (women: 39 years) were entitled to a pension benefit worth 20% of average earnings in that year.¹²⁰ Accordingly, the Basic Pension cannot be considered a real basic old-age income.

The reform option is to increase the full Basic Pension to a level of about 35–40% of average earnings – slightly above the existing minimum Pension Credit – and apply an indexation according to gross earnings for the future. This step has a number of implications for the performance of the British pension system. First of all, the risk of old-age poverty would shrink considerably for all pensioners, especially for those who have only Basic Pension entitlements and therefore rely on means-tested subsistence benefits. In consequence of the reduction in claimants of means-tested social benefits, the expenditure for this type of benefits could be reduced to a significant degree. Since means-testing requires an enormous administrative effort, there may be savings in administration that could partly offset the increase in expenditure resulting from the upgraded Basic Pension. Additionally, an increase in the legal retirement age as proposed in the following section could compensate for another share of the extra costs. The Pensions Commission (2004, p 246) estimates that the increase of the full Basic Pension to the level of the Pension Credit and the application of a gross earnings uprating rule would lead to an increase of public pension spending from 5.0% in 2002/2003 to 8.2% of GDP in 2043/2044 instead of 5.7% according to current legislation.¹²¹ An adjustment of retirement age would probably lead to considerably lower increases. Yet there remain significant costs that have to be borne by the contributors. On the other hand, contributions could be shifted from contracted-out subsidies to the Basic Pension. The significant uprating of the Basic Pension would justify a reduction of both the NIC rebate to occupational pension provision and the tax expenditures to personal pension schemes. The contributions assigned to the State Second Pension (SSP) and its replacement rate may be reduced as well, since the Basic Pension would effectively assume its role and secure a basic old-age income for those who have long-term contribution records. Furthermore, the reduced proportion of means-

¹²⁰ Cf. Whitehouse (2002), p 7.

¹²¹ This calculation assumes that the regulations concerning the retirement age remain unchanged.

testing in old age reduces the disincentives to save for retirement and may lead to an increase in private pension provision.

Subsequent to the implementation of this reform option, the British pension system would achieve better results for most of the formulated objectives. The risk of old-age poverty would be prevented almost for the entire current working population,¹²² people would be able to build their pension planning on a reliable foundation, there would probably be less gender inequality due to a higher value of own rights of women and the financial burden of ageing would be shared more equitably among the living and future generations. The net effect on overall sustainability of public finances may be slightly negative. However, it seems worth to increase spending by a small proportion of GDP targeted at an increasing part of the population during demographic change. Such reform of the Basic Pension seems to conform with public opinion since the Pensions Commission (2004, p 21) presumes that “most people would desire pensioner incomes to grow over the long-term in line with average incomes, to ensure that pensioners can participate fully in society.”

7.3.2.2 Adjustment of the legal retirement age in the compulsory pension schemes

The principal idea of introducing an adjustment rule for the legal retirement age has been explored in section 7.3.1.2. There are the same arguments in favour of such a systematic rule instead of ad hoc adjustments as explained for Germany. However, the initial situation in the UK differs from the German situation for two reasons. Firstly, there are still different retirement ages for men and women and harmonisation will not be achieved until 2020. Secondly, the public pension schemes constitute only a part of the mandatory pension system, so that legal retirement age has just a limited effect on the average de facto retirement age. The Economic Policy Committee (2002, p IV) projects public pension expenditure to decrease by 0.2 percentage points of GDP until 2050 if effective retirement age rises by one year. The Pensions Commission (2004, p 44) estimates that an increase of effective average retirement age of men from currently 63.8 to 69.8 years by 2050 and for women from 61.6 to 67.4 years in the same time period would be necessary to completely compensate for the increasing old-age dependency, if no other pension system parameter is changed.

Contracted-out occupational and personal pension schemes may be requested to apply the same adjustment rule for retirement age in case they are publicly supported. This is no problem for personal pension schemes, but it may raise conflicting interests in the case of occupational pensions. Employers will probably not be willing to apply such a rule because it limits their capacity to pursue company goals with respect to the retirement age of employees. On the other hand, there are

¹²² This is of particular importance for the self-employed, because 53% of male and 67% of female self-employed did not contribute to other pension schemes than the Basic Pension in 2002/2003; cf. Pensions Commission (2004), p 62.

still a significant number of defined benefit occupational pension schemes that would presumably profit from a rising retirement age.

Consequently, the introduction of a systematic rule for indexing the legal retirement age according to the growth of life expectancy may require a faster harmonisation of the different regulation for men and women. However, raising the legal retirement age seems adequate in the face of increasing longevity and an issue of intergenerational fairness in the long run in all existing defined benefit schemes, whether public or private. Furthermore, this reform option could be combined reasonably with the option described in the previous section, the return to a real basic pension.

7.3.2.3 Improving security of contracted-out schemes

Contracting out has implied considerable risks for participants since its introduction. The British government's strategy to set important incentives to employees to leave the public additional pension scheme (SERPS/SSP) has pushed people into private pension provision without being prepared for that move. Regulation of contracted-out pension schemes has already been improved considerably, especially in reaction to the misselling scandal of personal pensions in the early 1990s. Yet there are several options for improving the reliability of these pension schemes and their capacity to provide old-age security.

The most important problem of private pension participants over the last years has been the annuity risk or crystallisation risk, i.e. the risk that the value of the accumulated funds has dropped significantly shortly before entering pension age due to financial market fluctuations. Especially low-income earners with insufficient alternative sources of income have to transform their accumulated funds into an annuity at the date of retirement, even at very unfavourable conditions.¹²³ This risk has risen considerably with the replacement of defined benefit by defined contribution occupational pension schemes, in particular in small and middle-sized enterprises.¹²⁴ Furthermore, many employers have closed their schemes to new members as a result of major financial problems. One reform option to improve old-age security for participants in occupational pension schemes has been proposed by Turner (2003, p 12), chairman of the 'Independent Pension Commission' installed in 2003 by the British government.¹²⁵ He suggests a new form of occupational pension scheme that shares risks between employer and employee in a different way: employees should bear the risk of increasing life expectancy – that could be done in the form proposed in the previous section – and the risk of wage growth, because pensions are only indexed to inflation. In turn, the employer would bear the crystallisation risk in that he/she provides a guaranteed minimum

¹²³ Cf. Turner (2003), p 10.

¹²⁴ Cf. Opra (2003), <http://www.opra.gov.uk/publications> (4.10.2003).

¹²⁵ The Commission has published its first report in 2004 and will give reform recommendations in their final report, scheduled for autumn 2005.

amount of funds at the date of retirement.¹²⁶ This solution could prevent employers to shift entirely to defined contribution schemes and keep participants insured against the crystallisation risk. In the face of demographic change, it seems beneficial for the future performance of occupational pension schemes not only in terms of a reduced risk for participants compared to defined contribution schemes but also in terms of more acceptable conditions for employers compared to defined benefit schemes. Since such schemes could also prevent a considerable number of persons from marked old-age income losses, the reform option may lead to a decreasing claim on means-tested benefits and may thus improve the sustainability of overall public finances.

In addition to such a structural reform, more and better information of the participants of both personal and occupational pension schemes is needed. The British government has already made some steps forward in this regard that have to prove their effectiveness. Inter alia, a combined forecast of public and private pension entitlements is sent to all participants from 2005.¹²⁷ Until now, there are large deficits in terms of individual information about individual pension entitlements¹²⁸ that may lead to insufficient old-age provision of future pensioners.

Imperfect information seems to be a crucial factor for the problems of the British pension system on the whole. Due to frequent changes in the statutory framework, people are overtaxed with an adequate pension planning. Pension policy therefore should become more reliable and more long term-oriented. The described reform options would improve reliability and could restore the original intentions of the pension system: to provide a basic old-age income for everyone and to enable people to choose their favourite way of supplementary pension provision.¹²⁹

The question remains for both countries whether policy makers are really interested in a long-term solution for pensions or if they prefer to implement the necessary adjustments in an ad hoc manner when the public opinion is prone to reforms.¹³⁰ Pension reforms will probably become increasingly difficult due to the changing proportions of elderly and younger voters.

In addition to pension expenditure, population ageing also has a major impact on public health and long-term care expenditure. The European Commission

¹²⁶ A similar requirement was introduced in Germany for the so-called 'Riester contracts' in that providers must guarantee the nominal amount of contributions paid; see section 5.4.1.

¹²⁷ Cf. Whitehouse (2002), p 68.

¹²⁸ In 2003, only 44% of British adults claimed to have good or reasonable understanding of pension issues; cf. Pensions Commission (2004), p 212.

¹²⁹ That was the idea of old-age security established in the *Beveridge Report* on which the British pension system was build; cf. Blasche (1998), p 117.

¹³⁰ The Pensions Commission (2004), p VI states: "The problems of the British pension system today reflect the cumulative impact of short-term decisions, of commitments made, and of policies rejected, sometimes under the pressure of electoral cycles, by governments over several decades."

(2004, p 40) estimates an increase in this old age-related expenditure in Germany from 5.9% of GDP in 2008 to 7.1% in 2050 and in the UK from 7.9% in GDP in 2009 to 9.9% in 2050.¹³¹ Consequently, the rise in health care expenditure exceeds the increases in public pension expenditure in the UK. Although beyond the scope of this study, these effects on public budgets have to be taken into account when evaluating financial sustainability of pension systems, given that whole public expenditure has to be raised by today's or tomorrow's taxes and contributions.

Still, it was possible to derive concrete reform options for both systems, based on theoretical, institutional and empirical analyses. This shows the necessity of a comprehensive approach to come to a profound evaluation of reform proposals.

¹³¹ These estimates only consider the effect of ageing on expenditure but not the effect of technical progress.

8 Final remarks

This study has brought together theoretical, institutional and empirical analyses of pension systems with application to Germany and the United Kingdom. Emphasis has been on the effects on sustainability and income distribution inherent in different pension arrangements. A deep understanding of both the theoretical foundations and the structure of the pension systems examined is indispensable for evaluating the systems' performance with regard to the formulated objectives: preventing poverty, enabling people to provide adequately for their old age, treat women and men equally and aim for intergenerational justice and financial sustainability. The objectives used were derived from the commonly agreed catalogue of the EU member states in the context of pension policy co-ordination. Such internationally agreed targets are required for a comparative approach of different national pension systems that are based on national traditions and history. A theoretical analysis determined the risk sharing effects of the institutional structures, especially of the choice of the financing mechanism (pay-as-you-go versus funding) and derived a beneficial mix of pension system components.

The systemic structures presented briefly were mirrored in the empirical results on composition and distribution of old-age incomes. However, despite the low level of mandatory old-age insurance in the UK, most of the British pensioners were able to maintain their standard of living after retirement. Accordingly, there is evidence that most people provide adequately for their old age independently of the scope of compulsory insurance.¹ Yet not all people are able to build up sufficient old-age income – a fact shown by the comparatively high poverty rates among British pensioners. The empirical analysis confirmed the assumptions about the different outcomes of the studied pension systems and was thus a valuable basis for deriving the risks faced by both systems in terms of sustainability and distributional equity.

In consequence of the relations found between systemic structures and their effects on sustainability and income distribution, it was possible to derive reform options directly targeted at the problematic aspects of each pension system. This is a fundamentally different approach from many recent works on pension reform that have tried to derive an optimal pension system without reference to one specific country.² Such general analyses can provide a useful overview of pension policies worldwide, but they are naturally limited to formulate reform options that

¹ This conclusion is confirmed by the findings of Yamada and Casey (2002), p 18.

² E.g., World Bank (1994), Gillion et al. (2000).

may apply to an 'average' country.³ Most recent work of this kind focused on appropriate policy responses to the demographic change experienced by all industrialised countries throughout the next decades. As a result of public discussion about considerable financial sustainability problems in a large number of countries and pressure exerted by international organisations, in Europe especially by the EMU criteria, many countries started to reform their traditional pension systems. The implemented reforms focused on the reduction of public pension expenditure and pension liabilities for the future to improve the financial sustainability of public pension schemes and thus of public finances on the whole. However, it seems that there has been only minor interest in the probable effects of the reforms on distributional equity.

British governments have started a strategy of drawing back public involvement in the field of pensions as early as in the 1980s. The consequences are high poverty rates among the elderly, a comparatively unequal distribution of old-age incomes and relative income positions of the elderly considerably beneath the population average. Countries that have shifted pension policy in a similar direction later on can learn from these experiences and may choose a more equitable way to achieve financial sustainability with regard to both intragenerational and intergenerational justice.

In the UK, the situation of the elderly on the whole improved during the 1990s. Reforms have been implemented to improve subsistence benefits and thus to *relieve* old-age poverty, but recent developments in private pension components raise concerns about the pension system's ability to *prevent* poverty initially.

German pension reforms have come very late to prepare the extensive public pension scheme for the financial consequences of demographic change.⁴ In the face of a difficult macroeconomic situation including the highest unemployment rates in decades, the implemented reform measures have focused on the objective to cut public expenditure and thus to improve sustainability rather sooner than later. However, the reforms have merely reduced the scope of the predominant public pension scheme without building a new pension system in a systematic and comprehensive way. The German population has partly lost their confidence in the public scheme, but does not seem to have understood yet that they are requested to assume responsibility for providing sufficiently for their old age by themselves.⁵ This confusion is at least partly the fault of German politicians who have promised 'secure pensions'⁶ for too long. E.g., a demographic adjustment factor introduced for the public pension benefits by the conservative-liberal coalition in 1997 has never been applied because it was rejected by the social-democratic and green

³ E.g., Dang et al. (2001) build their analysis on a 'stylised' country with average characteristics.

⁴ Dang et al. (2001) argue that the timing of pension reforms is crucial. They estimate that a delay of pension reforms by ten years increases the required effort to achieve the same results by about 25%, a delay of 20 years by 75%.

⁵ Cf. Frankfurter Allgemeine Zeitung, 30.01.2004, *Überschätzte Rente*.

⁶ Refers to the famous quotation 'The (public) pensions are secure.' by the former Federal Minister of Labour and Social Affairs, Mr. Norbert Blüm.

government after its election in 1998. A similar ‘sustainability factor’ has now been adopted and applies for the calculation of pensions from 2005.

On the whole, it seems that British and German pension policies are approaching. On the one hand, the UK government asked an independent commission to examine whether it is necessary to “move beyond the voluntary approach”. On the other hand the latest pension reforms in Germany reduced the replacement level of public pensions considerably, switched from a purely expenditure-oriented to a more revenue-oriented approach and introduced funded elements of pension provision. Therefore, it is useful for both sides to learn from the experiences the other country had with the respective pension policy approach.

Information problems are a crucial element of old-age provision. Governments should improve the reliability of their pension policy and pursue a more systematic approach in this field. This would provide people with a solid foundation for their pension planning. The proposed reform options would be a step in this direction in both countries. Further research based on an appropriate econometric model would be necessary to estimate the net financial effects of the proposals.

Apart from the choice of sensible reform measures, it seems to be an increasing challenge for governments to ‘sell’ the necessity of pension reforms.⁷ This does not only concern the general public, but the intentions and implications of reforms need also be shared and understood by the public administration that has to bring the measures into effect.⁸ There seems to be a tendency of shrinking solidarity among the population on the whole and with respect to the elderly.⁹ Consequently, the issue of old-age security in the future will not only be a question of the *ability* of the younger generation to assume the financial burden of ageing, but also of their *willingness* to bear the burden.¹⁰ This has much to do with prevailing values and how intergenerational justice is perceived by the people.

A sound economic development is crucial for the ability of pension systems to deal with the consequences of demographic change, since it determines the total resources available for distribution among the active and inactive parts of the population. The influences of a pension system on the macroeconomic performance have been beyond the scope of this study. However, this is an important aspect of pension policy and requires further research. Much of the recent scientific discourse has tried to show the beneficial macroeconomic effects of either funded or pay-as-you-go financed pension schemes. However, such general analyses cannot provide the best solution for a specific pension system since they ignore the existing systemic structures of old-age security.

Pension reforms will certainly be on the political agenda throughout the coming decades. This study provides an appropriate framework for informed political decisions in the long run and suggests a number of reform options in both countries examined.

⁷ Cf. Council of the European Union (2003), p 97.

⁸ Cf. Barr (2000), p 35.

⁹ Cf. Eisen (2001), p 80 and Hauser (2003), p 216.

¹⁰ Cf. Fabig (2001), p 170.

Appendix

Table A.1. Agreed indicators for the Open Method of Co-ordination in the field of pensions for the National Strategy Reports 2005

– Indicators in normal letters from EU sources, in *italics* from national sources –

Demography

- Population breakdown by age groups 0–14, 15–24, 25–44, 45–59, 60–64, 65–74, 75+ (current and projected for 2010, 2030, 2050)
- Life expectancy at birth and at ages 60 and 65, by gender (current and projected for 2010, 2030, 2050)
- Demographic old-age dependency ratio (current and projected for 2010, 2030, 2050): number of persons aged 65+ (60+) in relation to number of working age population (aged 15–64 and 15–59)

Household structures

- Housing tenure status: percentage of people aged 65+ (60+) and for complementary age groups (below 65 and below 60) by the housing tenure status of the household they live in (owner-occupied with and without mortgage obligations on the property they live in, rent-free and rented accommodation) (men/women/total)
- Percentage of people aged 65+ (60+) living with their children, living with another adult aged 65+ (60+) and living alone (men/women/total)
- Percentage of people aged 65+ (60+, 75+) living in institutions, men/women/total

General socio-economic data

- GDP per capita, recent growth and growth prospects
- Employment and unemployment rates for age groups 25–54 and 55–64
- Social protection expenditure and pension expenditure as a % of GDP (ESPROSS), 1995/2000/2002

Adequacy of pensions

- Risk of poverty for people aged 60+, 65+ and 75+ and <60, <65, <75 (men/women/total, by household type)
 - Incidence and distribution of risk of poverty for people aged 60+, 65+, 75+ and <60, <65, <75 by housing tenure status of their households (owner-occupied with and without mortgage obligations on the property they live in, rent-free and rented accommodation)
 - Risk of poverty calculated at different income thresholds (40, 50, 70% of median national equivalised income) for people aged 60+, 65+ and 75+
 - Relative risk of poverty: risk of poverty for age groups 60+ and 65+ relative to the risk of poverty for complementary age groups (men/women/total)
 - Risk of poverty for people whose main activity status is 'retired' and for active population aged 15–64 (men/women/total)
-

Table A.1. continued

Adequacy of pensions (cont.)

- Relative income, i.e. the ratio of median equivalised income of people aged 60+, 65+ and 75+ relative to median equivalised income of people aged <60, <65 and <75 respectively and of people aged 45–54
 - Composition of income by source, for people aged 60+, 65+, 75+, <60, <65, <75. For each age group: income composition for the group as a whole and for each income quintile. Sources of income: pensions; other social benefits; earnings from work; other sources
 - Median individual pension income of retirees aged 65–74 in relation to median earnings of employed persons aged 50–59 including and excluding social benefits other than pensions
 - Inequality of income distribution (S80/S20), 60+, 65+ and 75+ (men/women/total)
 - Relative income inequality: income share ratio S80/S20 for age groups 60+, 65+ and 75+ relative to the income share ratio for complementary age groups (men/women/total)
 - *Income simulations based on the ISG methodology for theoretical replacement rates (simulations should include interrupted careers due to unemployment, family responsibilities and invalidity; where appropriate, they should be carried out for current scheme rules and for post-reform rules)*
 - *Current and prospective coverage rates as a percentage of the population aged 15–64 of statutory schemes, occupational schemes and individual schemes; appropriate breakdowns notably by sex, age groups, profession, company size, sector.*
 - *Current and prospective level and share of the income of pensioners provided by statutory schemes, occupational schemes and individual schemes; appropriate breakdowns as above.*
-

Financial sustainability of pension systems

- Total employment rate: Percentage of people aged 15–64 and 55–64 in employment (men/women/total) 2003 and projected for 2010, 2030, 2050
 - Current and projected (2010, 2030, 2050) effective economic old-age dependency ratio: non-active population 65+ in relation to employed population (aged 15–64)
 - Employment rates of older workers: Percentage of people aged 55–59, 60–64, 55–64, and 65–69 in employment (men/women/total)
 - Effective age of withdrawal from the labour market (men/women/total)
 - Projections of public expenditure on pensions (results validated by the EPC to be used in the synthesis report and the table "Background statistics for country summaries").
 - Breakdown of expenditure growth by main factors of change (demography, employment, coverage, benefit level)
 - *Projected public pensions expenditure per person aged 65+.*
 - *Projected situation of public finances including debt, primary deficits and interest payments.*
 - *Projected evolution of public pension reserve funds.*
 - *Projected budgetary transfers to pension schemes.*
 - *Projected economic or effective old-age dependency ratio: non-active population 65+ (60+) in relation to employed population (aged 15–64; 15–59).*
 - *Stock and flow data (number of beneficiaries) on benefits allowing an early withdrawal from the labour market (see SPC special study on promoting longer working lives for types of benefits to be considered).*
-

Table A.1. continued

Financial sustainability of pension systems (cont.)

- *Current and future contribution rates to pension schemes (as far as possible, distinguishing between old age, invalidity and survivors benefits and between contributions to the main public and typical private schemes).*
 - *Current and projected level of reserves of public and private pension schemes in % of GDP.*
 - *Current and projected real rates of return on assets held by pension reserve funds (public and private).*
 - *Current and projected composition of assets held by pension reserve funds (public and private).*
-

Modernisation of pension systems

- *Gender differences in the risk of poverty (percentage points) by age group (60+, 65+ and 75+ and <60, <65, <75); calculated for all household types and for women/men living alone*
 - *Percentage point difference between men and women in the relative income, i.e. the ratio of median equivalised income of people aged 60+, 65+ and 75+ relative to median equivalised income of people aged <60, <65 and <75 respectively and of people aged 45–54; calculated for all household types and for women/men living alone*
 - *Typical length of vesting/waiting periods.*
 - *Average pension entitlements by sex, individual and derived rights, pensioners aged 65–74 and 75+.*
-

Source: European Commission (2005).

Table A.2. National consumer price indices and OECD purchasing power parities (PPP) for Germany and the United Kingdom, 1980–2001

Year	Consumer price index (1995=100) ^a				OECD purchasing power parities ^b		
	West Germany	East Germany	Germany	United Kingdom	EUR per USD	GBP per USD	GBP per EUR
1980	66.4			45.5	1.31	0.52	0.40
1981	70.6			50.7	1.23	0.53	0.43
1982	74.3			54.4	1.21	0.54	0.44
1983	76.7			57.4	1.19	0.54	0.45
1984	78.6			60.0	1.16	0.54	0.46
1985	80.2			63.4	1.14	0.55	0.48
1986	80.1			65.5	1.15	0.55	0.48
1987	80.3			68.9	1.13	0.56	0.50
1988	81.3			73.2	1.10	0.58	0.52
1989	83.6			78.6	1.08	0.59	0.55
1990	85.8			84.5	1.07	0.60	0.56
1991	89.0	75.5	87.2	90.2	1.07	0.64	0.59
1992	92.5	85.6	91.6	93.8	1.06	0.62	0.58
1993	95.8	94.7	95.7	96.2	1.08	0.64	0.59
1994	98.4	98.1	98.3	97.5	1.06	0.65	0.61
1995	100.0	100.0	100.0	100.0	1.03	0.65	0.63
1996	101.3	101.9	101.4	103.3	1.04	0.64	0.62
1997	103.2	104.2	103.3	106.2	0.99	0.63	0.63
1998	104.1	105.3	104.3	109.4	0.99	0.65	0.65
1999	104.8	105.7	104.9	112.1	0.98	0.65	0.66
2000	106.9	107.5	106.9	114.6	0.95	0.65	0.68
2001	109.4	110.6	109.6	116.8	0.96	0.64	0.67

^a Germany: until 1990: Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (1999), Tab 58*; from 1991: Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2002), Tab. 64*.

United Kingdom: Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2002), Tab. 3*; <http://www.statistics.gov.uk> (5.6.2003).

^b Cf. <http://www.oecd.org/std/ppp>, (1.07.2003). EUR = Euro, USD = US Dollar, GBP = British Pound.

Table A.3. Macroeconomic trends in Germany^a and the United Kingdom

Panel A: Population and income aggregates

Year	Population (1,000)		Real ^b GDP per capita (local currency ^c)		Real disposable income per capita (local currency ^c)		Real saving per capita (local currency ^c)	
	D	UK	D	UK	D	UK	D	UK
1980	61,566	56,330	18,753	8,991	12,092	5,757	1,648	340
1981	61,682	56,352	18,375	8,856	12,096	5,708	1,702	369
1982	61,638	56,318	18,163	9,038	11,850	5,751	1,587	358
1983	61,423	56,377	18,514	9,355	11,822	5,868	1,392	320
1984	61,175	56,506	19,029	9,570	12,718	6,098	1,506	394
1985	61,024	56,685	19,519	9,884	12,429	6,260	1,521	407
1986	61,066	56,852	20,653	10,243	12,979	6,554	1,686	370
1987	61,077	57,009	21,272	10,676	13,492	6,706	1,767	309
1988	61,449	57,158	21,988	11,201	13,828	6,982	1,849	263
1989	62,063	57,358	22,517	11,402	14,039	7,198	1,795	400
1990	63,253	57,561	23,491	11,452	14,524	7,420	2,043	527
1991	64,074	57,808	24,324	11,246	14,962	7,623	2,055	730
1992	80,594	57,563	21,852	11,319	14,076	7,937	1,843	886
1993	81,179	57,672	21,293	11,579	13,866	8,212	1,719	873
1994	81,422	57,797	21,683	12,093	13,832	8,376	1,622	775
1995	81,661	57,928	22,058	12,415	13,994	8,616	1,578	880
1996	81,896	58,043	22,081	12,724	14,112	8,809	1,536	872
1997	82,052	58,167	22,081	13,114	14,115	9,121	1,476	959
1998	82,029	58,305	22,551	13,491	14,344	9,108	1,491	658
1999	82,087	58,481	22,978	13,827	14,750	9,322	1,453	563
2000	82,188	58,643	23,105	14,310	14,915	9,848	1,471	626
2001	82,339	58,837	22,979	14,567	15,059	10,266	1,563	809
2002	82,483	59,712	23,239	14,601	15,034	10,085	1,611	666

Table A.3. continued

Panel B: Unemployment and tax and contribution rates

Year	Unemployment rate (%)		Social contribution rate (% of GDP)		Tax and contribution rate (% of GDP)	
	D	UK	D	UK	D	UK
1980	2.6	6.1	28.8	21.5	42.8	33.5
1981	4.0	9.0	29.7	23.7	42.7	34.9
1982	5.7	10.1	29.8	24.1	42.8	35.8
1983	6.9	10.8	28.9	23.9	42.3	35.5
1984	7.1	10.9	28.5	24.2	42.5	35.9
1985	7.2	11.2	28.4	24.3	42.8	35.4
1986	6.5	11.2	28.2	24.3	42.1	34.8
1987	6.3	10.3	28.6	23.5	42.3	34.2
1988	6.2	8.5	28.5	21.9	41.9	33.8
1989	5.6	7.1	27.6	21.7	42.4	33.7
1990	4.8	6.9	25.4	23.0	40.5	33.3
1991	4.2	8.6		25.4		33.1
1992	6.4	9.7	28.3	27.8	41.5	32.2
1993	7.7	9.9	28.4	29.1	42.0	31.3
1994	8.2	9.2	28.9	28.0	42.5	31.9
1995	8.0	8.5	29.6	27.7	42.2	36.5
1996	8.7	8.0	30.0	28.3	43.1	36.1
1997	9.7	6.8	29.5	27.7	43.1	36.6
1998	9.1	6.2	29.3	27.2	43.1	38.0
1999	8.4	5.9	29.6	26.9	43.9	38.1
2000	7.8	5.4	29.5	26.8	43.9	38.7
2001	7.8	5.0			42.3	38.6
2002	8.6	5.1			41.4	37.1

^a Germany: until 1991 West Germany, from 1992 reunified Germany.^b Deflated by national consumer price indices, cf. Table A.2.^c Germany: EUR, United Kingdom: GBP.Sources: Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2003), Tab. 1*, Tab. 2*, Tab. 3*, Tab. 35*; Bundesministerium für Gesundheit und Soziale Sicherung (2003), Tab. 9.17; <http://www.statistics.gov.uk>; own calculations.

Table A.4. Demographic trends in Germany^a and the United Kingdom^b

Panel A: Demographic structure

Year	Population (million)		Population <15 (million)		Population 15–64 (million)		Population 65+ (million)	
	D	UK	D	UK	D	UK	D	UK
1970	78.2	54.8	18.2	13.3	49.3	34.4	10.7	7.1
1975	78.7	55.4	16.9	12.9	50.1	34.8	11.7	7.7
1980	78.3	55.5	14.5	11.6	51.6	35.6	12.2	8.4
1985	77.7	56.0	12.4	10.8	53.9	36.8	11.3	8.5
1990	79.4	56.8	12.8	10.8	54.8	36.9	11.9	9.1
1995	81.7	57.7	13.3	11.1	55.8	37.4	12.6	9.2
2000	82.3	59.5	12.8	11.3	55.9	38.9	13.6	9.3
2005	83.1	60.3	12.1	11.1	55.3	39.8	15.7	9.4
2010	83.5	60.9	11.8	10.5	55.1	40.6	16.6	9.8
2015	83.5	61.5	11.5	10.2	54.8	40.4	17.2	10.9
2020	83.2	62.2	11.2	10.2	53.7	40.3	18.3	11.7
2025	82.7	62.8	11.1	10.3	51.8	39.8	19.8	12.7
2030	81.8	63.2	10.8	10.3	49.2	38.7	21.8	14.2
2035	80.7	63.2	10.5	10.1	46.9	37.7	23.3	15.4
2040	79.3	62.9	10.1	9.9	46.1	37.2	23.1	15.8
2045	77.6	62.4	9.9	9.6	45.3	37.2	22.4	15.6
2050	75.6	61.8	9.8	9.6	44.2	36.8	21.6	15.4

Panel B: Fertility rates and life expectancy

Year	Fertility rate (life births per woman) ^c		Male life expectancy at birth ^c		Female life expectancy at birth ^c	
	D	UK	D	UK	D	UK
1970	1.6	2.0	67.9	69.0	73.8	75.2
1975	1.5	1.7	69.0	69.7	75.5	76.0
1980	1.5	1.8	70.3	71.0	76.8	77.2
1985	1.4	1.8	71.7	72.3	78.2	77.9
1990	1.3	1.8	72.2	73.1	78.7	78.7
1995	1.3	1.7	73.3	74.0	79.7	79.2
2000	1.4	1.7	75.0	75.5	81.0	80.2
2025	1.5	1.8	78.7	78.9	83.9	83.6
2050	1.5	1.8	80.0	80.0	85.0	85.0

^a Germany: until 1991 West Germany, from 1992 reunified Germany.

^b Eurostat figures in normal font, UN figures in italics. From 2005: projected values.

^c UN figures cover five year-periods starting in the named year.

Sources: UN Population Prospects 2001 Revision, <http://esa.un.org/unpp> (30.07.2004), Eurostat structural indicators, <http://europa.eu.int/comm/eurostat> (30.07.2004), Economic Policy Committee (2001); own calculations.

Table A.5. Net migration per 1,000 inhabitants in Germany^a and the United Kingdom 1980–2050

Year	Eurostat ^b		UN ^c	
	Germany	United Kingdom	Germany	United Kingdom
1980	3.9	-0.6		
1991	7.5	1.3		
1992	9.6	0.8		
1993	5.7	1.5		
1994	3.9	1.4		
1995	4.9	2.0		
1996	3.4	1.8		
1997	1.1	1.5		
1998	0.6	3.6		
1999	2.5	2.8		
2000	2.0	2.8		
2001	3.3	3.1		
2005–2010			2.6	2.3
2010–2015			2.6	2.2
2015–2020			2.6	2.2
2020–2025			2.6	2.2
2025–2030			2.6	2.1
2030–2035			2.6	2.1
2035–2040			2.6	2.1
2045–2050			2.7	2.0
2050	2.6	1.1		

^a Germany: until 1991 West Germany, from 1992 reunified Germany

^b Eurostat online (Download 30.07.2004); projection 2050: Economic Policy Committee (2001), Table 2.1, p. 10.

^c UN population prospects, <http://esa.un.org/unpp> (30.07.2004).

Table A.6. Comparative overview of the German and the British institutional framework of old-age pensions (core systems)^a, March 2005

	Germany	United Kingdom
Public pension system		
denotation	Gesetzliche Rentenversicherung (GRV) (Statutory Pension Insurance) Other: Seekasse (sailors and boatmen), Bahnversicherung (employees of the railway company), Knappschaftliche Rentenversicherung (miners), Alterssicherung der Landwirte (farmers)	Basic State Retirement Pension State Earnings-Related Pension Scheme (SERPS) Second State Pension (SSP)
lower earnings limit	2005: €400/month from 1/2000: employers have to pay social insurance contributions, no obligation for employees (benefit entitlement only if contributions are paid)	2004/05: £4,108 p.a. for employees (different limit for self-employed), corresponds to the amount of the Basic Pension but: contributions to the National Insurance only due from the primary threshold, 2004/05: £4,745 p.a. (between lower earnings limit and primary threshold: National Insurance Credits)
upper earnings limit	2005: €62,400 p.a. Western States, €52,800 p.a. Eastern States	2004/05: £31,720 p.a. (only for employees; employers pay for whole wage), different limit for self-employed
legal retirement age	65 years; flexible retirement age: -0.3% for each month earlier, +0.5% for each additional month (retirement age for women was lifted from 60 to 65 years during the transition period from 01/2000 to 12/2004) disabled persons: retirement age is lifted in steps from 60 to 63 years beginning in 01/2002 early retirement from the age of 60 years for people born until 1951 and for long-term unemployed	Men: 65 years, women: 60 years (will increase gradually to 65 years in a transition period from 2010 to 2020); possibility to postpone the retirement between 7 weeks and 5 years (in this period no contributions to the national insurance) with an addition of 1/7% per week (maximum 7.5% per year) from 2010: no limit for later retirement, benefit increase of 10.4% per additional year
required insured years	minimum of insured years (contributions or credits) for old-age pensions: 5 years (different requirements for other benefits)	<u>Basic Pension</u> : to receive full amount: men 44 qualifying years, women 39 qualifying years (until 2010, adjustment with retirement age); years when woman has chosen to pay the married woman's reduced rate of NI do not count towards qualifying years; minimum: 1/4 of the required qualifying years;

Table A.6. continued

	Germany	United Kingdom
Public pension system (cont.)		
required insured years (cont.)		reduction of the necessary years for people receiving Jobseeker's Allowance, carers with Home Responsibilities Protection (HRP) for children under 6/a person with long-term illness or disability, people receiving long-term Incapacity Benefit after at least 1/10 active employment, absolute minimum 22 qualifying years for men, 20 years for women; <u>SERPS</u> : no minimum of years required <u>State Second Pension</u> (since 04/2002): credits for periods described above and additional cases
insured persons	mandatory insurance for employees, trainees, some groups of self-employed (e.g. teachers, nursing staff, boatmen), beyond the lower earnings limit; parents during educational period (maximum 3 years per child), persons during military service or social service, beneficiaries of income substitution benefits (unemployment benefits, sickness pay etc.)	<u>Basic Pension</u> : mandatory for employees and self-employed beyond the lower earnings limit; entitlement for married woman pension (60% of the Basic Pension of the insured, other income sources are taken into account; from 04/2010 also possible for men) <u>SERPS/SSP</u> : mandatory for employees beyond the lower earnings limit without 'contracted out' occupational or private pension schemes, self-employed are not allowed to join
old-age pension benefits	voluntary insurance possible contributions of one year are transformed into income points (Entgeltpunkte, EP) (1 EP equals the average income of the insured); the total of EP is multiplied with the current pension value (aktueller Rentenwert; €26.13 in West Germany, €22.97 in East Germany since 1.7.2003), which is adjusted annually (exceptionally not adjusted in 2004)	<u>Basic Pension</u> : full amount 2004/05: £79.60 p.w. for singles (£127.25 for couples); less qualifying years: calculation pro rata temporis (minimum ¼ of the years, i.e. £19.90 p.w. singles) <u>SERPS</u> (since 1978): wages of the insured years are multiplied with the average increase in wages and added up to the tax year before retirement; amount maximum 20% of average income (25% of 20 best years from 1978 to 1986) <u>80 or over</u> : 60% of the Basic Pension (£47.76 p.w. singles, 2004/05) for people without Basic Pension or less than 60% of the Basic Pension

Table A.6. continued

	Germany	United Kingdom
Public pension system (cont.)		
old-age pension benefits (cont.)		<u>SSP</u> (since 04/2002): better pensions for people with low earnings (less than £26,600 p.a.), earnings less than £11,600 p.a. are treated as if it was £11,600 p.a. (2004/05 levels) – these regulations are also valid for contracted out pensioners <u>Christmas bonus</u> £10
inflation protection of contributions	pension entitlements are accumulated in the form of remuneration points (Entgeltpunkte), relative to the mean income of all insured in the respective year in consequence: uprating of contributions/entitlements with gross wage growth	<u>Basic Pension</u> : no protection required, because no income-related benefits <u>SERPS/SSP</u> : earnings on which pensions are calculated are revalued each year in line with gross wage growth
benefit adjustment	usually in July adjustment of current pension value (initial pensions) and pensions in line with development of gross wages minus GRV contributions and legally envisaged amount of private old-age provisions (until 1998 development of net wages, 1999 and 2000 adjustment with prices) in 2004 and 2005 no adjustment from 2011, inclusion of a ‘sustainability factor’ that reduces growth of pensions payments (Nachhaltigkeitsfaktor)	usually in April <u>Basic Pension</u> : until 2002/03: adjustment by rate of price index increase (estimation of the Secretary of State in autumn) extraordinary increase in 2003/04 from 2004/05: adjustment by the September rate of the Retail Price Index, but at least by 2.5% <u>SERPS/SSP</u> : adjustment by <u>growth rate of earnings</u>
survivors’ benefits	<u>Major survivors’ pension</u> (große Witwen-/Witwerrente): education of at least one child and/or age over 44 years and/or full incapacity; since 01/2002 55% of old-age pension <u>Minor survivors’ pension</u> (kleine Witwen-/Witwerrente): if conditions for major w.p. are not fulfilled; only paid for 24 month; 40% of old-age pension income taken into account (40%) if it exceeds legal limit of €625 p.m. (frozen since 01/2002),	from 04/2001 (amounts: 2004/05 levels): <u>Bereavement Payment</u> : lump sum payment (£2,000, not means-tested) <u>Widowed Parent’s Allowance</u> (at date of death with children under age of 16): the death’s SERPS/SSP entitlements plus child supplements (not means-tested; entitlement for other social benefits: only the higher amount is paid), maximum £79.60 p.w., child supplements £9.65/£11.35 p.w. with/without receipt of child benefit

Table A.6. continued

	Germany	United Kingdom
Public pension system (cont.)		
survivors' benefits (cont.)	<p>supplements for each child raised and increased entitlements for periods of childcare</p> <p><u>Orphan pension</u>: until age of 18, if in training until 27 (plus military or civil service); semi-orphan 10%, full orphan 20% of old-age pension; income taken into account if it exceeds legal limit of €150 p.m. (frozen since 01/2002)</p>	<p><u>Bereavement Allowance</u> (widow(er) at date of death between 45 and 65 years old): weekly flat rate benefit (not means-tested; entitlement for other social benefits: only the higher amount is paid), benefit dependent on age between £23.88–£74.03 p.w.</p> <p><u>Basic Pension</u>: Survivor inherits full pension entitlements</p> <p><u>SERPS</u>: until 09/2002: full pension entitlements go to the widow; from 10/2002 to 10/2010 reduction in steps to only 50% of the death's entitlements</p> <p><u>SSP</u>: 50% of the death's entitlements</p>
divorce	<p>from 01/2002: married couples who were younger than 40 years in 2001 and got married before 2002 have choice between 'pension splitting' (two independent pension accounts) and survivors' benefits</p>	<p>from 01/2000 possibility to share pension entitlements for other than the basic pension ('additional / second pensions')</p>
incapacity benefits	<p>from 01/2001:</p> <p><u>Full earnings incapacity pension</u> if working capacity less than three hrs/day; full old-age pension</p> <p><u>Half earnings incapacity pension</u> if working capacity between three and six hrs/day; 50% of the old-age pension reduction if legal income limits are exceeded</p>	<p><u>Incapacity Benefit</u>: for temporary incapacity to work; different rates dependent on age and duration of incapacity to work £55.90–74.15 p.w. (2004/05), receipt also possible after retirement</p> <p><u>Disablement Benefit</u>: disability caused by industrial injuries (accidents or diseases), dependent on age and degree of disablement £24.02–120.10 p.w. (2004/05)</p> <p><u>Disability Living Allowance (DLA) for persons below State Pension Age (means tested)</u>: care component £15.55–58.80 p.w., mobility component £15.55–41.05 p.w. (2004/05)</p> <p><u>Attendance Allowance (AA) for persons beyond State Pension Age (means tested)</u>: £39.95–58.80 p.w. (2004/05)</p>
other benefits financing	<p>rehabilitation measures (medical and professional)</p> <p>Pay-as-you-go financing system, public subsidy for additional benefits (integration of East German pensioners, entitlement for years of childcare etc.), in 2004 24% of total receipts</p>	<p>Pay-as-you-go financing system, public subsidy if National Insurance Fund Account falls under 1/6 of the annual benefit payments</p>

Table A.6. continued

	Germany	United Kingdom
Public pension system (cont.)		
contribution rate	01/2005: 19.5% of gross wage (equally shared by employee and employer) contributions for recipients of public transfers (unemployment benefits, social assistance) are paid by the respective schemes	different contribution rates for employers and employees (contribution rates increasing in steps with the income), reductions for contracted-out-employees contribution is paid to the National Insurance Fund which includes other branches of social insurance and goes in parts to the National Health Service Fund no contributions by employees beyond legal retirement age Distinction of different contribution classes and rates (2004/05): Class 1: employees: 11% below upper earnings threshold, 1% above; employer: 12.8% Class 2: self-employed (fixed amount): £2.05 p.w. p.w. Class 3: voluntarily insured: £7.15 p.w. Class 4: self-employed, like additional income tax (calculation base: taxed income): 8% on profits in range £4,745–31,720, 1% above
responsible authority	Different authorities for white collar workers (Bundesversicherungsanstalt für Angestellte) (central organisation) and blue collar workers (Landesversicherungsanstalten der Arbeiterrentenversicherung) (regional organisation), miners (Knappschaftliche Rentenversicherung), sailors and boatmen (Seekasse), farmers (Alterssicherung der Landwirte), employees of the former State Railway Company (Bahnversicherungsanstalt)	Department of Social Security (DSS) information: Citizens Advice Bureaux forecast: Retirement Pension Forecasting and Advice Unit (RPFA)
additional income	additional income taken into account above certain limits in case of survivors' pensions, limits for additional income in case of old-age pensions and incapacity pensions	<u>Basic Pension</u> : income limits for payment of supplements for spouses, children and child caretakers (income of entitled person and spouse/partner; entitlement is lost if unemployment benefit or incapacity pension is received) <u>SERPS</u> : payment independent of income and wealth, but if entitlement for two pensions: only the higher is paid

Table A.6. continued

	Germany	United Kingdom
Public pension system (cont.)		
taxation of contributions	<p><u>employee's contributions</u>: total of pension provision payments deductible as special expenditure (Sonderausgaben) up to €1,050 p.a. in 2005 (§10a Abs. 1 EstG), from 2005 gradual reduction of taxable amount, from 2040 on total exemption from income taxation (transition to EET taxation)</p> <p><u>employer's contributions</u>: as costs deductible from gains from 2005 gradual reduction of taxable amount, from 2040 on total exemption from income taxation (transition to EET taxation)</p>	<p><u>employee's contributions</u>: Class 1–3 full taxable, Class 4: 50% deductible from taxable income</p> <p><u>employer's contributions</u>: as costs deductible from gains</p>
taxation of benefits	<p>taxation of the (fictitious) interest part of the pension; high allowances</p> <p>from 2005 gradual increase of taxable amount, from 2040 on total income taxation (transition to EET taxation)</p>	<p>full taxation as income; only children supplements and Christmas payment free of tax</p> <p>personal tax allowances dependent on age (2004/05): £6,830 p.a. for people aged 65–74, £6,950 p.a. for people aged 75 or older</p> <p>Married Couple's Allowance for those born before 04/1935 (£5,725 p.a./£5,795 p.a. for people under/over age of 75 years)</p>
Occupational pension schemes		
Scheme types	<p>5 types of state-subsidised products:</p> <ol style="list-style-type: none"> 1) Pension Fund 2) Pensionskasse (pension investment fund) 3) Direktversicherung (direct insurance) 4) Unterstützungskasse (benevolent fund) 5) Direktzusage (direct guarantee) 	<p>3 types of contracting out:</p> <ol style="list-style-type: none"> 1) Contracted-Out Salary-related Schemes (COSRS, defined-benefit) 2) Contracted-Out Money Purchase Schemes (COMPS, defined-contribution) (at begin of retirement: purchase of an annuity / payment scheme + annuity; also payable to wife/husband) 3) Contracted-out Mixed-benefit schemes (COMBS, both types in sections of one scheme, but for every employee only one type)

Table A.6. continued

	Germany	United Kingdom
Occupational pension schemes (cont.)		
legal conditions	since 01/2002 entitlement for 'income conversion' (Entgeltumwandlung) into contributions to occupational pension schemes (max. 4% of wage), eligibility for subsidy according to 'Riester pension': annuity at the latest from the age of 85 (from retirement until 85 payment plan with fixed or increasing instalments possible), vesting period: 5 years, minimum age: 30 years	minimum contribution of employer: National Insurance Contribution rebate, increasing with age of employee divorce: repartition of pension entitlements possible (since 12/2000) from 04/1997: "reference scheme test" (before: 'guaranteed minimum pension' (GMP)) benefits broadly the same as, or better than, SSP (SERPS until 03/2001), adjustment by a minimum of 1.25% per year (based on average or last wage) vesting period: 2 years; minimum age: 26 years introduction of SSP: contracting-out arrangements were altered to make sure that people on earnings less than £26,600 p.a. (2004/05 level) will get a better pension than SERPS not eligible for self-employed all defined-contribution schemes: from 04/2003 requirement of annual forecast of pension benefits to insured for certified contracted-out schemes: reduction of the National Insurance contributions (employers and employees, but employers have to pay the difference into the contracted-out scheme) employees: 1.6% rebate; employers: 1.0% rebate for money-purchase schemes, 3.5% for salary-related schemes
public support	'Riester Pension' (only 1–3), since 01/2002): subsidy in form of 'Old-age Provision Bonus' or tax deduction of 'special expenditure' (Sonderausgaben, §10a EStG) tax subsidy for 4)+5): fixed tax rate or tax-free contributions up to 4% of the upper earnings limit of the public pension scheme (until 12/2008 also free of contributions to social insurance)	
responsible authority	administration of the allowances: Bundesanstalt für Angestellte, responsibility for tax deduction: financial authorities	Occupational Pensions Regulatory Authority (Opra) Certification by Inland Revenue National Insurance Contributions Office
taxation of contributions	<u>employer</u> : tax-deductible and free of social insurance contributions or fixed rate taxation	certified occupational pension schemes tax-deductible up to a limit for the total contributions (2004/05: £3,600 p.a.; total of employer's and employee's contributions and received tax relief but without the NIC rebate)

Table A.6. continued

	Germany	United Kingdom
Occupational pension schemes (cont.)		
taxation of contributions (cont.)	<u>employee</u> : ‘Riester Pension’: tax deduction for extraordinary expenses up to 4% of the upper earnings limit of the public pension scheme; other cases: tax deductible up to 4% of the upper earnings limit of the public pension scheme + free of social insurance contributions until 12/2008 from 2005 gradual transition of funded schemes to EET model	
taxation of benefits	full income taxation if contributions have been taxed from 2005 gradual transition of funded schemes to EET model (total benefits subject to income taxation)	full income taxation; personal tax allowance for total pension income (see public pension schemes)
Personal pension schemes		
Scheme types	‘Riester Pension’: 1) Banksparplan (bank savings plan) 2) Fondssparplan (savings fund plan) 3) Private Rentenversicherung (private pension insurance)	(also for self-employed) 1) Personal Pension Scheme 2) Stakeholder Pension (since 04/2001; employers have to provide possibility since 10/2001)
legal conditions	‘Riester Pension’: guarantee for the total of contribution payments pension payment at the earliest from age of 60 years annuity at the latest from the age of 85, before that age payment scheme with constant or increasing instalments possible exclusion of transfer and seizure (Pfändung) charges for signature and marketing distributed over 10 years or fixed percentage information requirements withdraw of savings for purchase of real estate for own use possible	Reference Scheme Test (RST) for all personal pension schemes (test if terms and returns are meeting reference scheme) Stakeholder Pension: investment in stocks and shares max. 1% of the pension fund’s value can be charged each year for administration + some defined expenses payments from £20 (per week, month or irregularly) up to £3,600 p.a. benefits: pension plan bought at the end of the savings period, purchase of an annuity at the latest at the age of 75; benefits from minimum contributions (‘protected pension rights’) are paid without gender differentials all defined-contribution schemes: from 04/2003 requirement of annual forecast of pension benefits to insured

Table A.6. continued

	Germany	United Kingdom
Personal pension schemes (cont.)		
public support	‘Riester Pension’ (since 01/2002): subsidy in form of additional allowance or tax deduction as ‘special expenditure’ other possibilities: saver’s allowance (Sparerfreibetrag), deduction of provision expenses, et cetera	Inland Revenue transfers National Insurance contributions rebate (amount depends on age and earnings) and tax relief for employee’s share of the rebate (not self-employed) directly on the private pension account once a year (when exact information about earnings: payment of minimum contributions)
taxation of contributions	‘Riester Pension’: tax-deductible up to 2% (2005) of the upper earnings limit of the public pension scheme (increase in steps to 4% in 2008) transition to EET taxation	certified private pension schemes tax-deductible up to limit of the total contributions (2004/05: £3,600 p.a.; total of employer’s and employee’s contributions and received tax relief)
taxation of benefits	‘Riester Pension’: full income taxation non-subsidised pension provisions: mostly taxation of the (fictitious) interest part of the pension life insurance contracts signed until 12/2004: tax-free benefits, contracts from 2005 on: full taxation of benefits (EET taxation)	full income taxation; personal tax allowance for total pension income (see public pension schemes)
Subsidiary system		
responsible authorities	administration of the allowances: Bundesversicherungsanstalt für Angestellte (BfA), responsible for the tax deduction: financial authorities, certification: Bundesaufsichtsamt für das Versicherungswesen (BAV)	supervision of information duty of pension schemes: Financial Services Authority (FSA), certification: Occupational Pensions Regulatory Authority (Opra), responsible for complaints: Pensions Advisory Service (OPAS) or Personal Investment Authority Ombudsman Bureau (PIAOB), payment of contribution reduction and other allowances: Inland Revenue
basic benefit	from 01/2003: means-tested Needs-related Basic Insurance (Bedarfsorientierte Grundversicherung) for persons aged over 65 and disabled over 18 (benefits likely to benefits of social assistance),	<u>Pension Credit</u> from 10/2003: 60+ years: upgrade of income for people 60–64 to £105.45 p.w. for singles (couples £160.95) (2004/05), 65+ years: up to £15.51 p.w. (couples £20.22) additional Savings Credit with 40% withdrawal rate for savings

Table A.6. continued

	Germany	United Kingdom
Subsidiary system (cont.)		
basic benefit (cont.)	information and advice by the public pension authorities (claim of maintenance to children only if their annual income exceeds €100,000)	
additional benefits	Housing benefit (Wohngeld)	Winter Fuel Payment: lump sum payment (2004/05) of - £200 for household with a person 60+ - £300 for household with a person 70+ - £400 for household with a person 80+ Housing Benefit: maximum benefit single person £120.96 p.w. (2004/05)
additional income	total income taken into account	free nursing care for people aged 65 and over from 07/2002; under 65: free nursing care for residents in nursing homes <u>Pension Credit</u> : for people from 60 to 65 years: 100% of own income deducted; over 65 years: only 40% of own income taken into account up to certain limits; reduction of benefits if savings exceed £6,000
financing	tax-financed	tax-financed
responsible authority	local authorities	local authorities

p.a. = per year.

p.m. = per month.

p.w. = per week.

^a German civil servants' scheme and UK public sector scheme not included in this overview.

Sources: Barr (1998), Deutsche Bundesregierung (2002), Rechmann (1994), Government of the United Kingdom of Great Britain and Northern Ireland (2001), <http://www.dwp.gov.uk>, <http://www.inlandrevenue.gov.uk>, <http://www.pensionguide.gov.uk>, <http://www.vdr.de>.

Table A.7. Median real^a net and pre-government equivalent income in local currency by age in Germany and Great Britain, 1984–2001

Age	Net equivalent income						Pre-government equivalent income					
	-14	15–24	25–54	55–64	65+	All	-14	15–24	25–54	55–64	65+	All
West Germany (EUR p.a.)												
1984	8,663	9,315	10,718	10,804	9,215	9,902	10,822	11,745	13,714	9,284	0	11,036
1985	8,439	9,533	10,860	11,067	9,468	10,084	10,432	11,704	14,023	10,313	96	10,988
1986	8,678	9,886	11,239	11,622	9,461	10,340	10,802	12,684	14,563	11,327	121	11,583
1987	9,122	10,511	12,001	12,072	9,902	10,783	11,441	13,285	15,548	11,881	225	12,095
1988	9,263	10,488	12,117	12,048	10,115	10,932	11,664	13,220	15,743	12,245	296	12,279
1989	9,630	10,618	12,231	12,454	10,429	11,252	11,893	13,753	16,162	13,527	306	12,834
1990	9,562	10,446	12,780	12,194	10,602	11,362	12,111	13,391	16,682	13,314	310	13,036
1991	9,783	10,947	12,812	12,706	10,481	11,495	12,165	13,887	16,600	13,455	460	13,272
1992	9,873	11,120	13,050	12,927	10,677	11,787	12,339	14,612	15,217	11,188	260	13,432
1993	9,946	10,895	13,378	12,737	10,881	11,868	12,467	14,492	16,051	11,221	427	13,343
1994	9,844	10,587	13,408	12,902	10,971	11,753	11,939	13,693	16,185	11,734	416	12,889
1995	9,577	10,217	12,847	12,755	11,495	11,598	11,836	13,242	15,984	11,844	410	12,773
1996	9,830	10,598	13,039	13,424	11,637	11,782	12,549	13,849	16,864	11,488	404	13,462
1997	9,782	10,914	12,710	13,152	11,334	11,673	12,521	13,978	17,379	11,474	874	13,100
1998	9,750	10,131	12,850	13,111	11,462	11,624	12,152	12,799	17,436	11,144	703	12,524
1999	10,197	10,188	13,118	13,442	11,720	11,954	12,552	13,122	17,310	11,709	390	12,773
2000	10,377	11,150	13,612	13,730	11,742	12,269	12,994	14,471	18,617	12,134	574	13,496
2001	10,717	11,071	13,596	14,024	12,225	12,590	12,986	13,902	18,036	11,045	687	13,776
East Germany (EUR p.a.)												
1992	7,696	8,254	8,968	8,018	6,905	8,084	8,422	9,391	10,393	7,027	96	8,418
1993	8,647	8,867	9,611	8,479	8,084	8,919	9,120	10,007	11,424	6,911	108	8,820
1994	8,893	9,469	10,411	9,232	8,925	9,606	9,732	10,914	12,356	7,445	104	9,362
1995	8,906	9,717	10,512	10,186	9,497	9,997	9,566	11,828	13,081	7,820	100	9,834
1996	8,444	9,014	10,408	11,098	10,348	10,008	9,232	11,445	12,747	4,265	85	9,372
1997	8,829	9,867	10,764	11,226	10,416	10,326	8,878	12,338	13,077	5,242	79	9,481
1998	8,823	9,321	10,268	11,218	10,847	10,112	8,999	11,280	12,696	3,355	97	8,697
1999	9,166	9,661	10,729	11,843	11,057	10,550	9,598	12,146	13,011	4,277	75	9,271
2000	9,384	10,220	11,151	11,909	10,884	10,840	8,808	12,128	13,777	5,372	81	8,826
2001	9,024	10,235	11,228	12,071	11,183	10,828	9,471	12,223	13,298	6,626	92	9,066
Germany (EUR p.a.)												
1992	9,261	10,389	11,892	11,768	9,665	10,796	11,031	13,546	15,367	11,298	263	11,976
1993	9,631	10,530	12,241	11,759	10,185	11,062	11,650	13,357	16,067	11,233	427	12,277
1994	9,695	10,298	12,556	11,876	10,461	11,198	11,690	13,109	16,201	11,746	416	12,246
1995	9,420	10,070	12,323	12,312	10,991	11,141	11,371	13,068	15,984	11,844	410	12,130
1996	9,510	10,291	12,379	12,691	11,242	11,401	11,918	13,476	16,847	11,476	403	12,564
1997	9,631	10,563	12,385	12,816	11,113	11,370	12,072	13,258	16,551	10,074	396	12,344
1998	9,662	9,967	12,248	12,664	11,310	11,301	11,629	12,439	16,318	9,533	392	11,731
1999	9,997	10,128	12,527	12,941	11,479	11,553	12,231	12,765	16,401	9,956	287	12,172
2000	10,209	10,974	12,988	13,332	11,475	11,938	12,545	14,115	17,362	10,410	239	12,695
2001	10,551	10,936	13,039	13,661	11,859	12,143	12,660	13,344	17,218	10,054	383	12,409

Table A.7. continued

Age	Net equivalent income						Pre-government equivalent income					
	-14	15-24	25-54	55-64	65+	All	-14	15-24	25-54	55-64	65+	All
Great Britain (GBP p.a.)												
1991	n.s.	6,598	7,342	7,142	5,147	6,620	n.s.	8,391	9,743	7,643	1,940	6,812
1992	5,001	6,480	7,508	7,309	5,373	6,341	5,712	7,879	9,320	7,271	2,005	6,465
1993	4,987	6,354	7,712	7,557	5,575	6,502	5,545	7,572	9,239	7,339	1,945	6,569
1994	5,234	6,432	7,772	7,606	5,653	6,558	5,614	7,454	9,296	7,288	1,825	6,575
1995	5,301	6,450	7,802	7,847	5,825	6,751	5,746	7,035	9,332	7,397	1,800	6,687
1996	5,333	6,698	7,963	8,132	5,982	6,902	5,726	7,265	9,133	7,620	1,958	7,080
1997	5,530	6,414	8,139	8,263	6,287	7,040	5,807	6,908	9,106	7,664	2,162	7,142
1998	5,515	7,048	8,265	8,531	6,133	7,108	5,430	7,331	9,061	7,851	1,873	7,345
1999	5,541	6,906	8,328	8,551	6,488	7,224	5,441	7,067	8,710	7,556	1,989	7,218
2000	6,394	7,848	9,363	9,703	10,190	8,166	6,072	7,878	9,541	7,889	2,139	8,084
2001	6,804	8,313	9,541	10,084	10,635	9,187	6,202	8,100	9,537	8,114	2,156	8,519

^a Deflated by national consumer price indices, cf. Table A.2.

Excluding imputed rental value of owner-occupied housing.

n.s.: not surveyed.

Source: CNEF, own calculations.

Table A.8. Median real^a net and pre-government equivalent income of the elderly by age in local currency in Germany and Great Britain, 1984–2001

Age	Net equivalent income						Pre-government equivalent income					
	55–59	60–64	65–69	70–79	80+	All	55–59	60–64	65–69	70–79	80+	All
West Germany (EUR p.a.)												
1984	11,748	10,006	9,916	9,047	9,187	9,902	13,775	2,011	0	0	0	11,036
1985	11,507	10,269	10,143	9,337	9,454	10,084	14,490	2,550	150	96	96	10,988
1986	11,944	10,671	9,849	9,201	10,091	10,340	15,038	5,532	300	121	121	11,583
1987	12,176	11,532	10,189	9,685	10,311	10,783	14,607	6,989	614	102	300	12,095
1988	12,482	11,585	10,777	9,994	9,983	10,932	15,654	7,062	925	126	425	12,279
1989	12,829	11,717	10,848	10,591	9,524	11,252	16,397	7,818	791	288	108	12,834
1990	13,004	11,809	11,074	10,378	10,130	11,362	16,055	9,254	900	280	95	13,036
1991	13,613	11,871	11,144	10,544	10,219	11,495	16,233	9,210	1,568	270	115	13,272
1992	14,311	11,802	11,263	10,851	9,965	11,787	17,279	7,482	1,570	260	111	13,432
1993	13,905	11,840	11,411	10,809	10,250	11,868	16,944	6,594	1,166	451	160	13,343
1994	13,831	11,472	11,544	10,780	10,498	11,753	17,450	6,208	1,627	721	104	12,889
1995	13,508	12,048	11,561	11,769	10,430	11,598	16,759	7,699	1,245	770	153	12,773
1996	13,813	12,687	11,803	11,620	11,140	11,782	16,777	8,114	1,312	648	86	13,462
1997	14,376	12,158	10,981	11,394	11,410	11,673	17,226	5,307	1,982	845	233	13,100
1998	14,430	12,233	11,472	11,930	10,680	11,624	16,767	5,836	1,525	703	98	12,524
1999	14,489	12,458	11,131	12,306	10,997	11,954	17,772	5,000	1,223	574	76	12,773
2000	14,815	13,133	11,925	11,896	10,948	12,269	18,167	6,109	1,128	844	81	13,496
2001	14,841	13,462	12,711	11,760	11,922	12,590	18,036	5,252	1,723	756	93	13,776
East Germany (EUR p.a.)												
1992	8,468	7,729	7,016	6,890	6,608	8,084	9,469	4,905	141	96	*96	8,418
1993	8,967	7,916	8,285	8,260	7,518	8,919	8,159	4,986	282	108	*86	8,820
1994	10,224	8,197	8,964	9,436	8,269	9,606	9,759	5,059	245	104	*104	9,362
1995	12,501	9,262	9,578	9,980	*9,160	9,997	13,754	3,799	241	100	*100	9,834
1996	12,097	10,272	10,436	10,534	*9,030	10,008	11,561	241	177	85	*85	9,372
1997	12,106	10,688	10,608	10,555	*10,109	10,326	11,956	231	185	79	*79	9,481
1998	11,436	10,850	10,624	10,847	*10,719	10,112	9,654	286	143	97	*97	8,697
1999	12,203	11,446	10,579	11,632	*10,447	10,550	10,892	228	75	75	*121	9,271
2000	12,203	11,559	10,292	10,894	*11,652	10,840	9,988	957	81	81	*81	8,826
2001	12,750	11,731	10,870	11,351	11,361	10,828	11,508	1,311	188	92	*92	9,066
Germany (EUR p.a.)												
1992	12,823	10,508	10,331	9,814	8,673	10,796	15,235	6,419	1,333	240	89	11,976
1993	12,740	10,785	10,634	10,140	9,734	11,062	14,991	5,933	880	272	85	12,277
1994	13,225	10,528	10,687	10,456	10,189	11,198	16,134	5,936	1,017	416	104	12,246
1995	13,147	11,187	11,187	11,461	10,300	11,141	15,410	6,435	902	410	100	12,130
1996	13,638	11,650	11,514	11,242	10,995	11,401	15,213	5,306	771	403	86	12,564
1997	13,737	11,720	10,970	11,251	11,215	11,370	15,600	3,731	1,398	396	99	12,344
1998	13,564	11,897	11,440	11,590	10,660	11,301	14,837	3,383	836	392	98	11,731
1999	13,864	12,198	11,114	12,059	10,878	11,553	16,287	3,802	390	390	76	12,172
2000	13,734	12,613	11,624	11,504	11,009	11,938	17,019	4,390	383	383	81	12,695
2001	14,331	12,886	12,225	11,570	11,868	12,143	16,709	4,446	988	383	93	12,409

Table A.8. continued

Age	Net equivalent income						Pre-government equivalent income					
	55-59	60-64	65-69	70-79	80+	All	55-59	60-64	65-69	70-79	80+	All
Great Britain (GBP p.a.)												
1991	7,805	6,456	5,712	5,124	4,614	6,620	8,779	5,126	2,568	1,663	795	6,812
1992	7,989	6,784	6,084	5,325	4,707	6,341	8,415	5,867	2,851	1,662	947	6,465
1993	7,923	7,183	6,660	5,400	4,787	6,502	8,240	5,871	3,014	1,678	814	6,569
1994	8,262	7,126	6,160	5,585	5,064	6,558	8,405	5,652	2,585	1,659	884	6,575
1995	8,224	7,348	6,734	5,728	5,118	6,751	8,770	5,873	3,336	1,753	882	6,687
1996	8,430	7,827	6,726	5,840	5,394	6,902	9,075	6,598	3,417	2,021	1,036	7,080
1997	8,316	8,118	6,833	6,174	6,029	7,040	8,914	6,894	3,433	2,131	1,297	7,142
1998	8,810	8,191	6,718	6,005	5,549	7,108	9,511	6,923	3,263	1,994	1,058	7,345
1999	8,904	7,879	6,908	6,420	6,137	7,224	10,423	6,880	3,491	2,237	970	7,218
2000	<i>10,104</i>	<i>9,340</i>	<i>11,095</i>	<i>10,056</i>	<i>9,641</i>	<i>8,166</i>	<i>10,925</i>	<i>7,108</i>	<i>4,018</i>	<i>2,207</i>	<i>1,114</i>	<i>8,084</i>
2001	<i>10,084</i>	<i>10,022</i>	<i>11,435</i>	<i>10,441</i>	<i>10,520</i>	<i>9,187</i>	<i>10,952</i>	<i>7,627</i>	<i>4,126</i>	<i>2,424</i>	<i>1,436</i>	<i>8,519</i>

^a Deflated by national consumer price indices, cf. Table A.2.

Excluding imputed rental value of owner-occupied housing.

* based on 30 ≤ cases < 80.

Source: CNEF, own calculations.

Table A.9. Gini coefficients for the distribution of net and pre-government equivalent income among the entire population and the elderly (aged 65+) in Germany and Great Britain, 1984–2001

Year	West Germany		East Germany		Germany		Great Britain	
	All	Elderly	All	Elderly	All	Elderly	All	Elderly
Net equivalent income								
1984	0.2748	0.2621						
1985	0.2782	0.2786						
1986	0.2678	0.2733						
1987	0.2697	0.2733						
1988	0.2679	0.2660						
1989	0.2700	0.2868						
1990	0.2768	0.2793						
1991	0.2743	0.2783					0.3107	0.2605
1992	0.2752	0.2804	0.2120	0.1594	0.2864	0.2945	0.3290	0.2670
1993	0.2833	0.2746	0.2092	0.1813	0.2825	0.2739	0.3241	0.2900
1994	0.2879	0.2877	0.2244	0.1682	0.2840	0.2787	0.3206	0.2759
1995	0.2966	0.2726	0.2214	0.1565	0.2885	0.2616	0.3266	0.2903
1996	0.2917	0.2875	0.2215	0.1809	0.2846	0.2728	0.3190	0.2886
1997	0.2866	0.2808	0.2230	0.1687	0.2791	0.2675	0.3178	0.2914
1998	0.2927	0.2779	0.2239	0.1721	0.2848	0.2609	0.3266	0.2973
1999	0.2864	0.2589	0.2221	0.1761	0.2784	0.2464	0.3175	0.2849
2000	0.2803	0.2588	0.2221	0.1784	0.2738	0.2475	0.2959	0.2291
2001	0.2812	0.2572	0.2194	0.1661	0.2739	0.2445	0.2888	0.2142
Pre-government equivalent income								
1984	0.4645	0.8652						
1985	0.4716	0.8487						
1986	0.4539	0.8081						
1987	0.4460	0.7958						
1988	0.4443	0.7864						
1989	0.4453	0.7896						
1990	0.4425	0.7896						
1991	0.4309	0.7587					0.3154	0.2618
1992	0.4389	0.7622	0.5152	0.8485	0.4508	0.7755	0.3152	0.2678
1993	0.4494	0.7652	0.5096	0.8430	0.4558	0.7723	0.3282	0.2906
1994	0.4556	0.7501	0.5071	0.8663	0.4615	0.7632	0.3249	0.2766
1995	0.4711	0.7528	0.4866	0.8452	0.4738	0.7678	0.3307	0.2912
1996	0.4688	0.7563	0.4718	0.8413	0.4747	0.7738	0.3232	0.2932
1997	0.4739	0.7298	0.4597	0.8176	0.4802	0.7540	0.3219	0.2914
1998	0.4878	0.7517	0.4500	0.8040	0.4956	0.7767	0.3304	0.3004
1999	0.4839	0.7556	0.4184	0.7847	0.4925	0.7776	0.4724	0.6047
2000	0.4761	0.7547	0.5151	0.8586	0.4871	0.7847	0.4532	0.6076
2001	0.4829	0.7380	0.5114	0.8563	0.4918	0.7648	0.4525	0.6005

Excluding imputed rental value of owner-occupied housing.

Source: CNEF, own calculations.

Table A.10. Inequality measures for the distribution of net equivalent incomes among the entire population and the elderly (aged 65+) in Germany and Great Britain, 1984–2001

Year	West Germany		East Germany		Germany		Great Britain	
	All	Elderly	All	Elderly	All	Elderly	All	Elderly
Atkinson index ($\epsilon = 1$)								
1984	0.1267	0.1151						
1985	0.1303	0.1360						
1986	0.1597	0.3003						
1987	0.1193	0.1287						
1988	0.1173	0.1222						
1989	0.1208	0.1414						
1990	0.1309	0.1349						
1991	0.1246	0.1331					0.1490	0.1145
1992	0.1219	0.1317	0.0742	0.0510	0.1314	0.1410	0.1677	0.1198
1993	0.1299	0.1276	0.0726	0.0593	0.1306	0.1271	0.1600	0.1381
1994	0.1330	0.1394	0.0855	0.0549	0.1320	0.1332	0.1580	0.1243
1995	0.1413	0.1246	0.0820	0.0480	0.1366	0.1177	0.1673	0.1407
1996	0.1375	0.1409	0.0795	0.0615	0.1331	0.1295	0.1568	0.1377
1997	0.1325	0.1306	0.0842	0.0494	0.1283	0.1228	0.1569	0.1422
1998	0.1390	0.1283	0.0846	0.0515	0.1343	0.1167	0.1698	0.1533
1999	0.1336	0.1081	0.0818	0.0518	0.1270	0.1004	0.1605	0.1344
2000	0.1266	0.1088	0.0812	0.0537	0.1215	0.1013	<i>0.1390</i>	<i>0.0912</i>
2001	0.1267	0.1068	0.0768	0.0446	0.1206	0.0981	<i>0.1347</i>	<i>0.0803</i>
Mean Logarithmic Deviation (MLD)								
1984	0.1354	0.1223						
1985	0.1396	0.1462						
1986	0.1740	0.3572						
1987	0.1270	0.1377						
1988	0.1248	0.1304						
1989	0.1288	0.1524						
1990	0.1403	0.1449						
1991	0.1330	0.1428					0.1614	0.1216
1992	0.1299	0.1412	0.0771	0.0523	0.1408	0.1520	0.1836	0.1276
1993	0.1391	0.1365	0.0753	0.0611	0.1400	0.1359	0.1743	0.1486
1994	0.1427	0.1501	0.0894	0.0565	0.1415	0.1430	0.1720	0.1328
1995	0.1524	0.1331	0.0855	0.0492	0.1469	0.1252	0.1831	0.1516
1996	0.1479	0.1518	0.0829	0.0635	0.1428	0.1387	0.1705	0.1481
1997	0.1422	0.1399	0.0879	0.0507	0.1373	0.1311	0.1707	0.1534
1998	0.1497	0.1374	0.0884	0.0529	0.1443	0.1241	0.1861	0.1664
1999	0.1434	0.1144	0.0854	0.0532	0.1358	0.1058	0.1750	0.1443
2000	0.1353	0.1152	0.0846	0.0551	0.1295	0.1068	<i>0.1497</i>	<i>0.0956</i>
2001	0.1355	0.1130	0.0799	0.0456	0.1285	0.1033	<i>0.1447</i>	<i>0.0837</i>

Excluding imputed rental value of owner-occupied housing.

Source: CNEF, own calculations.

Table A.11. Relative poverty rates (poverty line: 0.6 median equivalent net income) by age in Germany and Great Britain, 1984–2001 (% of the respective population)

Age	Basis: national poverty line						Basis: regional poverty line					
	-14	15–24	25–54	55–64	65+	All	-14	15–24	25–54	55–64	65+	All
West Germany												
1984							18.2	16.4	10.2	10.7	14.7	13.2
1985							20.4	17.3	10.8	10.0	16.0	13.9
1986							19.4	17.1	11.2	11.8	17.2	14.4
1987							17.7	13.3	10.2	9.7	15.2	12.5
1988							17.0	14.4	10.0	11.9	14.0	12.6
1989							18.7	16.2	10.4	10.0	16.5	13.4
1990							17.5	16.3	9.4	10.0	17.1	12.8
1991							19.0	16.4	10.2	11.3	17.7	13.7
1992	13.4	12.2	7.6	8.2	14.1	10.2	20.0	15.9	10.8	11.4	18.4	14.2
1993	16.8	14.7	8.8	10.4	13.2	11.7	21.7	18.1	10.9	12.4	17.3	14.7
1994	17.7	15.4	9.5	12.1	13.6	12.5	20.2	17.8	11.0	13.5	16.4	14.4
1995	21.9	19.3	11.7	11.4	13.0	14.4	25.5	20.9	13.4	12.9	14.1	16.3
1996	22.7	20.4	11.2	11.3	14.1	14.6	23.8	22.6	11.9	11.9	14.8	15.4
1997	18.5	18.6	10.1	11.8	13.7	13.1	19.7	19.6	10.8	12.7	14.5	14.0
1998	20.2	22.5	11.5	10.9	13.7	14.4	21.6	23.9	12.1	11.4	14.8	15.2
1999	19.8	20.0	10.6	10.7	10.9	13.1	21.2	21.5	11.5	11.5	12.1	14.2
2000	18.5	17.0	10.1	11.0	10.8	12.4	19.9	19.4	11.1	11.9	14.4	14.0
2001	22.3	22.6	10.9	13.6	8.9	14.0	23.7	24.7	12.1	15.0	10.7	15.4
East Germany												
1992	38.0	31.4	22.6	34.4	50.6	32.0	10.2	*10.3	6.7	*10.5	*10.8	8.8
1993	24.2	22.1	14.0	29.0	25.0	20.4	11.5	*9.7	6.4	*10.4	*9.9	8.8
1994	23.2	22.2	13.0	21.7	*15.5	17.4	15.5	*13.9	8.6	*9.3	**8.0	10.4
1995	24.6	15.5	12.4	*9.4	**8.8	13.8	20.7	11.7	9.4	*6.8	**5.0	10.5
1996	24.4	19.2	13.9	*10.8	*9.7	15.1	15.2	*12.9	9.4	*8.2	**7.8	10.3
1997	24.3	*13.8	12.8	*11.9	**7.3	13.7	17.8	*10.0	9.6	*9.7	**4.6	10.2
1998	23.6	20.5	13.7	*12.1	**4.7	14.3	15.1	*14.9	9.8	*10.0	**2.0	9.9
1999	20.5	20.7	14.0	*7.1	**5.6	13.3	14.4	17.8	9.8	**5.2	**3.9	9.7
2000	20.8	18.7	12.6	*8.4	*7.5	12.8	15.1	15.8	9.8	**6.7	**5.9	10.1
2001	24.8	24.8	15.4	*9.5	*8.1	15.6	19.2	18.9	12.3	**5.1	**4.3	11.5
Germany												
1992	18.9	15.8	10.5	13.7	20.6	14.5						
1993	18.4	16.2	9.8	14.4	15.3	13.4						
1994	18.8	16.8	10.1	14.2	13.9	13.4						
1995	22.4	18.5	11.8	11.0	12.2	14.3						
1996	23.0	20.2	11.7	11.2	13.4	14.7						
1997	19.5	17.5	10.6	11.8	12.6	13.2						
1998	20.8	22.1	11.9	11.2	12.0	14.3						
1999	19.9	20.2	11.2	10.0	9.9	13.2						
2000	18.9	17.4	10.6	10.4	10.2	12.5						
2001	22.7	23.1	11.7	12.8	8.8	14.3						

Table A.11. continued

Age	Basis: national poverty line						Basis: regional poverty line					
	-14	15-24	25-54	55-64	65+	All	-14	15-24	25-54	55-64	65+	All
Great Britain												
1991	n.s.	21.6	16.0	14.5	24.5	18.4						
1992	34.6	21.3	15.4	12.3	18.8	20.2						
1993	35.6	24.1	15.7	11.5	22.4	21.4						
1994	33.4	22.2	15.3	11.6	20.5	20.2						
1995	32.4	22.8	14.7	9.8	20.7	19.7						
1996	34.3	20.6	14.5	10.8	18.0	19.3						
1997	33.5	25.4	14.9	11.8	19.0	20.1						
1998	35.4	22.0	15.1	13.3	20.8	20.6						
1999	32.6	21.3	14.5	11.6	17.4	18.9						
2000	34.8	24.5	15.9	11.6	4.2	17.9						
2001	35.6	22.3	16.6	12.1	3.9	18.0						

Excluding imputed rental value of owner-occupied housing.

n.s.: not surveyed.

* based on 30 ≤ cases < 80.

** based on 10 ≤ cases < 30.

Source: CNEF, own calculations.

Table A.12. Relative poverty rates (poverty line: 0.6 median equivalent net income) by age and gender in Germany^a and Great Britain, 1984–2001 (% of the respective population)

Age	Men						Women					
	-14	15–24	25–54	55–64	65+	All	-14	15–24	25–54	55–64	65+	All
West Germany ^a												
1984	19.7	14.5	9.8	*8.5	*15.2	12.6	16.7	18.4	10.7	12.3	14.5	13.6
1985	22.1	15.9	10.2	*8.7	*15.1	13.4	18.7	18.7	11.4	*11.0	16.5	14.4
1986	19.0	15.4	10.3	*10.6	*13.9	13.0	19.8	18.9	12.2	12.8	19.1	15.6
1987	19.6	12.3	9.2	*8.3	*14.4	11.8	15.8	14.3	11.2	*10.9	15.7	13.1
1988	18.8	12.3	9.0	*10.5	*12.3	11.6	15.2	16.5	11.0	13.2	15.0	13.4
1989	19.9	15.8	9.5	*8.9	*11.7	12.2	17.5	16.6	11.2	*11.0	19.1	14.4
1990	18.2	15.5	8.3	*8.7	*12.6	11.4	16.8	17.2	10.5	*11.1	19.5	14.1
1991	19.2	14.8	7.7	*11.4	*11.8	11.5	18.8	18.2	12.7	*11.3	20.8	15.7
1992	20.8	13.8	8.7	*11.1	*13.1	12.3	19.1	17.9	12.9	*11.6	21.1	15.9
1993	21.4	15.1	8.6	*11.5	*13.3	12.6	22.1	20.9	13.1	13.1	19.5	16.6
1994	20.2	15.1	8.7	*10.9	*11.5	12.1	20.2	20.2	13.3	15.9	19.0	16.6
1995	25.3	21.1	11.2	*11.3	*11.5	14.9	25.7	20.7	15.5	14.5	15.5	17.5
1996	24.8	22.7	8.7	*10.6	*12.9	13.9	22.7	22.3	15.0	*13.1	15.9	16.9
1997	19.2	17.6	9.3	*10.2	*11.5	12.3	20.2	21.7	12.5	14.9	16.0	15.6
1998	19.7	22.3	9.4	*10.6	*14.1	13.4	23.7	25.6	14.6	12.2	15.2	16.9
1999	18.6	23.5	8.7	*8.2	*9.9	12.1	24.0	19.5	14.2	*14.7	13.3	16.1
2000	17.8	16.4	8.9	*9.4	*13.3	11.8	22.1	22.1	13.2	14.3	15.0	15.9
2001	24.0	25.6	9.1	14.4	*7.7	14.2	23.3	23.8	14.9	15.6	12.4	16.6
East Germany ^a												
1992	*10.2	**9.1	*5.8	**8.9	-	7.6	*10.2	**11.4	*7.5	*12.0	**12.8	9.9
1993	*11.2	**6.7	*6.8	**9.4	-	7.7	*11.9	*12.5	*5.9	*11.4	**12.9	9.7
1994	*16.1	*12.9	*8.1	**8.3	-	9.9	*14.8	*14.9	9.1	*10.2	**9.4	10.8
1995	*17.9	*10.4	*7.8	**5.4	-	9.1	*24.0	*13.1	11.2	**8.0	**6.4	11.9
1996	*14.8	*11.0	*9.1	**7.5	-	9.4	*15.7	*14.8	9.7	**8.8	**10.9	11.2
1997	*19.5	**9.7	*8.5	**7.3	-	10.0	*15.6	**10.4	*10.8	**11.7	**4.5	10.3
1998	*15.1	*15.9	*8.8	**9.3	-	9.8	*15.0	*13.6	10.8	**10.6	**2.7	10.1
1999	*15.4	*17.4	*9.6	**5.8	-	10.0	*13.2	*18.4	10.1	**4.6	-	9.5
2000	*13.4	*12.1	*9.8	**9.6	-	9.7	*16.7	*20.3	9.8	**4.0	**7.4	10.4
2001	*16.9	*15.8	11.2	**6.5	-	10.4	*21.2	*22.2	13.3	**3.6	**6.2	12.5
Germany												
1992	19.7	13.7	8.9	11.6	14.1	12.4	18.1	17.8	12.0	15.5	23.9	16.3
1993	18.3	12.9	8.1	13.0	*10.9	11.5	18.4	19.2	11.5	15.6	17.6	15.1
1994	19.0	14.3	8.1	11.7	*9.1	11.4	18.5	19.2	12.2	16.3	16.3	15.3
1995	22.4	18.4	10.0	9.6	*9.4	13.1	22.4	18.6	13.6	12.3	13.7	15.4
1996	24.1	19.9	8.9	10.0	*11.0	13.3	21.9	20.4	14.4	12.2	14.7	15.9
1997	19.1	15.8	9.0	*9.9	*10.0	11.7	20.0	19.4	12.2	13.6	14.0	14.6
1998	18.7	20.9	9.6	10.2	*10.9	12.7	23.1	23.3	14.2	12.0	12.6	15.8
1999	17.4	21.5	9.0	*7.6	*7.3	11.4	22.6	18.8	13.4	12.2	11.3	14.7
2000	17.1	15.4	9.2	8.8	9.6	11.2	20.6	19.3	12.0	12.0	10.5	13.7
2001	22.9	23.9	9.3	12.5	*6.2	13.3	22.4	22.2	14.0	13.0	10.2	15.1

Table A.12. continued

Age	Men						Women					
	-14	15-24	25-54	55-64	65+	All	-14	15-24	25-54	55-64	65+	All
Great Britain												
1991	n.s.	20.5	14.2	*12.8	20.1	16.1	n.s.	22.7	17.7	16.1	27.3	20.5
1992	34.4	19.1	13.9	*11.7	14.6	18.7	34.7	23.5	16.9	*12.8	21.7	21.5
1993	35.3	21.4	14.6	*10.3	16.5	19.7	35.9	26.9	16.7	*12.8	26.3	23.0
1994	33.9	19.5	13.6	*11.4	15.8	18.8	32.8	24.9	17.0	*11.8	23.6	21.6
1995	32.8	21.3	12.8	*9.6	14.6	18.0	31.9	24.3	16.5	*10.0	25.0	21.2
1996	34.5	18.6	12.2	*10.5	14.5	17.8	34.1	22.8	16.6	*11.1	20.4	20.7
1997	34.3	24.1	12.3	*11.4	14.9	18.6	32.7	26.8	17.3	*12.2	22.0	21.5
1998	35.0	19.9	12.9	*11.0	17.4	18.8	35.8	24.1	17.2	15.5	23.3	22.3
1999	33.6	20.0	12.9	*12.0	14.3	18.0	31.5	22.6	16.0	*11.1	19.6	19.7
2000	36.1	22.5	13.7	*13.5	**3.9	17.6	33.6	26.5	18.1	*9.8	**4.4	18.1
2001	35.1	21.7	14.6	*13.3	**3.6	17.7	36.2	22.9	18.4	*11.0	**4.1	18.4

^a based on regional poverty lines.

Excluding imputed rental value of owner-occupied housing.

n.s.: not surveyed.

* based on 30 ≤ cases < 80.

** based on 10 ≤ cases < 30.

- less than 10 cases.

Source: CNEF, own calculations.

Table A.13. Mean real^a equivalent income of all elderly (aged 65+) of the respective income component in local currency in Germany and Great Britain, 1984–2001

Year	Public Pension ^b	Public transfers ^c	Private pension(s) ^d	Asset income ^e	Imputed rent ^f	Labour income ^g	Private Transfers ^h	Total income
West Germany (EUR p.a.)								
1984	8,778	156	n.s.	451	388	1,724	**27	11,522
1985	8,976	146	n.s.	717	337	1,648	**150	11,974
1986	10,461	165	719	815	455	1,755	**49	14,419
1987	8,835	183	551	843	466	1,751	**23	12,652
1988	8,996	136	681	763	467	1,748	**72	12,863
1989	9,318	171	627	917	525	1,679	**50	13,287
1990	9,377	127	685	943	562	1,743	**33	13,470
1991	9,220	162	913	698	672	1,624	**40	13,329
1992	9,351	115	724	837	652	1,565	-	13,289
1993	9,648	138	739	916	769	1,385	-	13,624
1994	9,891	100	770	984	832	1,522	**34	14,135
1995	10,040	154	833	1,084	877	1,379	**33	14,399
1996	9,901	177	938	1,049	957	1,515	**27	14,563
1997	10,005	251	929	957	976	1,462	**80	14,659
1998	10,405	192	901	1,090	1,155	1,195	**30	14,967
1999	10,978	208	855	1,158	1,174	1,154	**24	15,552
2000	11,134	177	887	1,144	1,522	1,629	*374	16,867
2001	11,200	261	910	1,151	1,158	1,459	**50	16,188
East Germany (EUR p.a.)								
1992	6,163	101	*221	140	183	892	-	7,700
1993	7,168	242	**287	186	238	1,197	-	9,319
1994	8,168	193	**278	186	290	1,145	-	10,260
1995	8,811	*204	**255	200	389	1,103	-	10,963
1996	9,356	346	**323	400	320	*869	-	11,673
1997	9,918	*291	**199	266	323	*936	-	11,934
1998	10,672	*221	**138	287	497	*893	-	12,713
1999	11,173	*342	**232	245	478	*642	-	13,115
2000	11,034	*299	**150	243	523	*540	**27	12,816
2001	10,867	295	**233	256	458	*845	-	12,969
Germany (EUR p.a.)								
1992	8,797	112	639	720	573	1,450	-	12,327
1993	9,205	156	659	788	675	1,351	-	12,857
1994	9,588	117	683	842	736	1,456	**28	13,450
1995	9,818	163	728	924	789	1,329	**27	13,777
1996	9,806	206	830	936	845	1,403	**33	14,059
1997	9,997	258	800	835	860	1,369	**66	14,185
1998	10,456	197	759	941	1,033	1,139	**25	14,551
1999	11,023	234	736	983	1,041	1,057	**20	15,095
2000	11,126	201	741	966	1,325	1,414	*305	16,079
2001	11,139	268	779	978	1,023	1,340	**43	15,570

Table A.13. continued

Year	Public Pension ^b	Public transfers ^c	Private pension(s) ^d	Asset income ^e	Imputed rent ^f	Labour income ^g	Private Transfers ^h	Total income
Great Britain (GBP p.a.)								
1991	2,713	392	1,437	577	3,434	1,044	*39	9,636
1992	2,878	419	1,573	580	3,004	999	*54	9,507
1993	2,822	427	1,575	751	2,978	1,001	*15	9,568
1994	2,943	465	1,606	746	2,848	894	**11	9,512
1995	2,949	488	1,799	734	2,789	1,034	*20	9,813
1996	3,101	572	1,894	868	2,924	1,008	*34	10,399
1997	3,116	602	1,972	812	3,058	1,173	*24	10,757
1998	3,191	613	1,993	771	3,219	971	*21	10,780
1999	3,183	749	2,194	702	3,632	1,030	*19	11,508
2000	3,971	2,213	3,156	900	<i>n.a.</i>	1,295	*35	11,570
2001	3,424	4,236	2,310	759	<i>n.a.</i>	1,236	*25	11,990

^a Deflated by national consumer price indices, cf. Table A.2.

^b Public pensions: old-age pensions, invalidity pensions, and widow(er) pensions from the public pension schemes.

^c Public transfers: all kinds of public benefits except for public pensions, namely maternity benefits, child benefits, unemployment benefits, housing allowances, subsistence assistance, public student assistance and student grants, and all other benefits paid by public administration.

^d Private pension(s): sum of company pensions, private pensions, and annuities, including benefits from the supplementary civil servant pension schemes in Germany.

^e Asset income: all asset flows from all kinds of savings and investments in the form of interest, dividends, and rent.

^f Imputed rental value of owner-occupied housing.

^g Labour income: wages and salary from all employment and self-employment as well as deduction incomes, bonuses, overtime pay, and profit-sharing income.

^h Private transfers: all income regularly received from persons outside the household, including private educational grants, maintenance and alimony payments, and foster allowances.

n.s.: not surveyed.

n.a.: not announced.

* based on 30 ≤ cases < 80.

** based on 10 ≤ cases < 30.

- less than 10 cases.

Source: CNEF, own calculations.

Table A.14. Mean real^a equivalent income among elderly recipients (aged 65+) of the respective income component^b in local currency in Germany and Great Britain, 1984–2001

Year	Public pension	Public transfers	Private pension(s)	Asset income	Imputed rent	Labour income	Private transfers
West Germany (EUR p.a.)							
1984	9,236	1,051	n.s.	1,853	921	8,945	**1,953
1985	9,370	1,219	n.s.	914	840	9,276	**13,330
1986	11,753	1,342	4,252	946	1,057	10,379	**3,197
1987	9,477	1,395	2,763	1,057	1,089	9,719	**1,923
1988	9,681	1,088	3,354	908	1,136	10,097	**4,171
1989	10,013	1,378	2,817	1,091	1,241	10,486	**5,131
1990	10,235	1,109	2,823	1,139	1,294	10,813	**3,974
1991	10,231	1,676	3,280	839	1,518	10,893	**3,933
1992	10,279	1,178	2,771	1,011	1,502	10,386	-
1993	10,566	1,430	2,672	1,099	1,702	11,096	-
1994	10,907	1,026	2,797	1,165	1,760	10,885	**5,356
1995	10,836	1,813	2,984	1,332	1,845	9,529	**3,490
1996	11,228	1,809	3,584	1,298	1,968	10,717	**2,272
1997	10,968	2,088	3,115	1,169	2,070	9,122	**4,876
1998	11,227	1,842	3,517	1,385	2,363	8,926	**6,911
1999	11,688	1,866	3,450	1,479	2,399	8,830	**3,533
2000	11,497	1,761	3,195	1,404	3,071	10,448	*18,987
2001	11,502	2,068	3,274	1,496	2,377	9,424	**4,094
East Germany (EUR p.a.)							
1992	6,522	244	*2,561	145	618	6,219	-
1993	7,465	624	**3,747	202	882	6,684	-
1994	8,746	751	**4,558	202	1,125	7,033	-
1995	9,441	*1,114	**6,740	216	1,355	7,242	-
1996	9,892	2,082	**6,311	446	1,321	*8,024	-
1997	10,468	*1,884	**5,405	284	1,330	*8,592	-
1998	10,923	*1,831	**5,490	326	1,721	*8,847	-
1999	11,286	2,429	**6,420	284	1,767	*6,357	-
2000	11,208	*2,465	**7,717	263	1,824	*6,030	**2,148
2001	11,150	2,109	**8,277	307	1,626	*7,404	-
Germany (EUR p.a.)							
1992	9,604	733	2,771	845	1,398	9,700	-
1993	9,989	1,055	2,733	928	1,609	10,050	-
1994	10,518	926	2,880	981	1,694	10,112	**5,361
1995	10,582	1,587	3,093	1,109	1,787	9,098	**3,444
1996	10,982	1,883	3,690	1,136	1,906	10,339	**2,710
1997	10,885	2,046	3,172	994	1,996	9,056	**4,812
1998	11,171	1,841	3,554	1,169	2,286	8,913	**6,113
1999	11,616	1,998	3,547	1,232	2,326	8,450	**3,396
2000	11,452	1,926	3,272	1,155	2,916	9,904	*16,690
2001	11,437	2,078	3,387	1,251	2,284	9,119	**3,858

Table A.14. continued

Year	Public pension	Public transfers	Private pension(s)	Asset income	Imputed rent	Labour income	Private transfers
Great Britain (GBP p.a.)							
1991	2,776	933	2,280	766	3,465	4,795	*940
1992	2,932	1,072	2,438	764	3,037	5,141	*1,680
1993	2,940	1,094	2,404	950	3,001	4,978	*655
1994	3,012	1,148	2,486	970	2,878	4,789	**749
1995	3,024	1,197	2,673	939	2,812	5,597	*738
1996	3,163	1,370	2,785	1,157	2,948	5,241	*1,545
1997	3,154	1,465	2,826	1,071	3,075	6,123	*835
1998	3,251	1,435	2,952	1,058	3,221	5,291	*1,228
1999	3,218	1,700	3,112	1,025	3,655	5,505	*660
2000	3,210	4,019	3,105	1,244	<i>n.a.</i>	6,311	*1,008
2001	3,466	4,294	3,147	1,104	<i>n.a.</i>	6,679	*972

^a Deflated by national consumer price indices, cf. Table A.2.

^b For the definitions of the various income components cf. Table A.13.

n.s.: not surveyed.

n.a.: not announced.

* based on 30 ≤ cases < 80.

** based on 10 ≤ cases < 30.

- less than 10 cases.

Source: CNEF, own calculations.

Table A.15. Elderly recipients of the respective income component^a by gender in Germany and Great Britain, 1984–2001 (% of the respective population)

Panel A: Men

Year	Public pension	Public transfers	Private pension(s)	Asset income	Imputed rent	Labour income	Private transfers
West Germany							
1984	93.99	*10.85	n.s.	25.93	48.29	21.37	-
1985	95.24	*8.11	n.s.	80.83	44.35	19.65	-
1986	91.58	*9.78	20.61	86.12	47.04	20.00	-
1987	93.47	*10.88	23.94	81.21	46.89	*20.64	-
1988	94.60	*9.56	26.17	87.01	46.51	19.65	-
1989	95.12	*9.07	28.55	85.84	48.40	*20.07	-
1990	88.42	*8.81	28.89	81.93	46.42	20.99	-
1991	89.94	*6.04	32.93	84.98	49.70	19.57	-
1992	93.36	*7.04	34.19	87.40	51.80	21.58	-
1993	93.12	*5.67	34.43	84.87	53.12	16.98	-
1994	93.76	*6.33	32.37	88.65	56.41	18.18	-
1995	94.75	*6.82	33.02	82.54	57.21	19.02	-
1996	89.32	*9.89	30.92	84.32	57.06	19.34	-
1997	93.53	*11.84	35.23	85.72	51.83	21.51	-
1998	92.26	11.94	29.74	86.33	54.39	18.66	-
1999	93.34	13.35	29.38	80.68	55.86	16.99	-
2000	95.22	*10.04	33.77	88.53	59.32	20.00	-
2001	95.79	*13.84	33.61	82.59	56.07	21.64	-
East Germany							
1992	94.74	*25.46	**11.50	95.47	*38.10	*18.45	-
1993	98.33	**20.69	**8.01	94.80	*33.36	*24.74	-
1994	92.91	**13.72	-	93.31	*32.26	*25.44	-
1995	93.69	**11.16	-	96.17	*36.13	*21.97	-
1996	95.63	*19.10	-	97.11	*31.71	**14.13	-
1997	92.89	**14.22	-	96.37	*33.58	**11.68	-
1998	98.95	**9.35	-	90.95	*38.00	*11.74	-
1999	98.93	**8.58	-	90.04	*34.16	*11.02	-
2000	98.56	**7.81	-	93.85	*34.46	*11.53	-
2001	96.98	**8.10	-	85.50	35.29	*14.88	-
Germany							
1992	93.57	*9.94	30.61	88.67	49.64	21.09	-
1993	93.93	*8.01	30.32	86.42	50.05	18.18	-
1994	93.62	*7.56	27.72	89.43	52.39	19.39	-
1995	94.56	*7.60	27.79	84.96	53.45	19.54	-
1996	90.41	11.48	26.22	86.52	52.69	18.44	-
1997	93.41	12.27	29.73	87.65	48.52	19.73	-
1998	93.57	11.43	24.29	87.23	51.17	17.30	-
1999	94.47	12.38	24.40	82.58	51.47	15.78	-
2000	95.92	9.58	26.88	89.65	54.12	18.23	**1.98
2001	96.03	12.69	27.67	83.17	51.92	20.29	-

Table A.15. continued

Year	Public pension	Public transfers	Private pension(s)	Asset income	Imputed rent	Labour income	Private transfers
Great Britain							
1991	97.26	38.43	71.22	79.02	60.35	27.17	*4.97
1992	98.66	35.97	72.18	79.58	61.36	24.34	**3.20
1993	94.34	34.40	73.19	79.62	59.54	26.58	**2.01
1994	96.96	35.12	71.77	79.58	62.72	25.06	**1.44
1995	97.08	37.13	73.55	81.49	63.80	24.68	**3.16
1996	98.13	36.18	73.15	79.50	66.16	24.34	**2.34
1997	98.65	36.60	74.19	79.69	66.29	24.12	**3.34
1998	98.12	36.12	72.81	76.94	66.91	22.75	**1.48
1999	97.42	37.19	74.80	72.55	67.20	24.14	**2.68
2000	97.80	97.47	77.16	75.61	<i>n.a.</i>	26.13	**3.03
2001	97.92	97.44	79.16	57.36	<i>n.a.</i>	23.19	**2.46

Panel B: Women

Year	Public pension	Public transfers	Private pension(s)	Asset income	Imputed rent	Labour income	Private transfers
West Germany (EUR p.a.)							
1984	95.64	17.07	n.s.	23.44	38.53	18.06	**1.44
1985	96.11	14.18	n.s.	77.03	37.60	16.69	-
1986	87.53	13.75	14.77	86.10	40.69	15.13	-
1987	93.10	14.36	17.68	78.94	40.49	16.54	**1.72
1988	91.97	14.16	16.98	82.19	38.05	15.99	**2.42
1989	91.92	14.23	18.78	82.97	38.85	13.75	-
1990	87.40	12.15	20.28	78.21	39.20	12.49	-
1991	87.03	11.21	24.18	79.38	39.86	11.95	-
1992	89.76	11.10	22.01	80.54	39.17	11.75	-
1993	90.35	11.79	24.01	82.56	40.89	10.08	-
1994	89.11	11.54	25.07	82.30	42.64	11.84	-
1995	91.56	9.33	25.23	80.70	42.50	12.10	**1.19
1996	87.55	9.70	23.55	78.94	43.97	11.28	-
1997	90.02	12.11	27.04	79.84	44.67	13.18	**1.83
1998	92.91	9.57	23.34	74.50	45.85	10.48	-
1999	94.25	9.93	22.29	76.98	45.15	10.94	-
2000	97.72	10.04	24.51	77.71	44.26	13.20	**1.87
2001	98.28	11.92	24.46	73.73	44.50	11.95	-
East Germany (EUR p.a.)							
1992	94.40	48.14	**7.43	96.41	25.95	*12.61	-
1993	95.04	46.47	**7.52	90.57	24.33	*15.00	-
1994	93.60	31.10	**6.85	91.60	22.85	*12.15	-
1995	93.14	*21.99	-	90.55	24.97	*11.82	-

Table A.15. continued

Year	Public pension	Public transfers	Private pension(s)	Asset income	Imputed rent	Labour income	Private transfers
East Germany (EUR p.a.)							
1996	94.02	*15.25	**5.91	85.68	*20.20	*9.06	-
1997	95.75	*16.10	-	92.23	*19.28	*10.48	-
1998	96.92	*13.76	-	86.57	23.16	*9.06	-
1999	99.05	*17.48	-	83.91	22.66	*9.52	-
2000	98.38	*14.75	-	91.22	25.21	*7.39	-
2001	97.76	*17.68	-	82.39	23.74	*9.25	-
Germany (EUR p.a.)							
1992	90.61	17.91	19.33	83.46	36.74	11.91	-
1993	91.23	18.30	20.92	84.07	37.78	11.00	-
1994	89.94	15.15	21.70	84.02	38.98	11.90	-
1995	91.85	11.64	21.33	82.50	39.30	12.05	**1.00
1996	88.68	10.67	20.47	80.12	39.81	10.90	**1.20
1997	91.02	12.81	22.85	81.99	40.25	12.71	**1.54
1998	93.62	10.31	19.71	76.63	41.84	10.23	**0.62
1999	95.13	11.32	18.73	78.25	41.01	10.68	-
2000	97.85	10.95	20.31	80.30	40.60	12.08	**1.75
2001	98.18	12.99	20.30	75.34	40.63	11.45	**1.24
Great Britain (GBP p.a.)							
1991	97.26	38.43	71.22	79.02	60.35	27.17	*4.97
1992	98.66	35.97	72.18	79.58	61.36	24.34	**3.20
1993	94.34	34.40	73.19	79.62	59.54	26.58	**2.01
1994	96.96	35.12	71.77	79.58	62.72	25.06	**1.44
1995	97.08	37.13	73.55	81.49	63.80	24.68	**3.16
1996	98.13	36.18	73.15	79.50	66.16	24.34	**2.34
1997	98.65	36.60	74.19	79.69	66.29	24.12	**3.34
1998	98.12	36.12	72.81	76.94	66.91	22.75	**1.48
1999	97.42	37.19	74.80	72.55	67.20	24.14	**2.68
2000	97.80	97.47	77.16	75.61	<i>n.a.</i>	26.13	**3.03
2001	97.92	97.44	79.16	57.36	<i>n.a.</i>	23.19	**2.46

^a For the definitions of the various income components cf. Table A.13.

n.s.: not surveyed.

n.a.: not announced.

* based on 30 ≤ cases < 80.

** based on 10 ≤ cases < 30.

- less than 10 cases.

Source: CNEF, own calculations.

Table A.16. Elderly recipients of individual labour income by gender and age in Germany and Great Britain, 1984-2001 (% of the respective population)

Year	All (aged 65+)	Recipients by gender		Recipients by age	
		Men (aged 65+)	Women (aged 65+)	65-74	75+
West Germany					
1984	*5.10	*7.66	**3.65	*6.25	**3.68
1985	*3.88	*6.55	**2.34	*5.31	**2.34
1986	*4.06	*7.13	**2.28	*5.63	**2.39
1987	*3.97	*6.11	**2.76	*6.23	-
1988	*4.38	*6.62	**3.10	*7.03	-
1989	*4.42	*7.57	**2.67	*7.09	-
1990	*4.56	*8.63	**2.39	*6.86	**1.88
1991	*5.19	*9.22	**3.09	*7.87	-
Germany					
1992	*4.10	*8.34	**2.00	*6.47	-
1993	*3.53	*7.85	**1.30	*5.34	-
1994	5.42	*9.30	**3.46	*8.17	-
1995	5.30	*8.12	**3.82	8.14	-
1996	*4.06	*5.94	**2.99	*6.16	-
1997	5.11	*7.17	*3.99	7.89	-
1998	4.53	*7.42	*2.88	6.37	-
1999	4.12	*6.22	**2.97	*6.10	-
2000	6.06	*8.83	*4.53	8.19	**3.49
2001	6.22	*9.94	*4.06	9.21	**2.19
Great Britain					
1991	6.46	10.86	*3.57	9.80	**1.45
1992	6.42	*9.72	*4.18	9.66	**1.73
1993	6.85	*11.20	*3.96	10.34	**1.73
1994	6.47	*10.17	*3.93	9.96	-
1995	6.46	*9.14	*4.59	10.30	**1.49
1996	7.27	*10.11	*5.30	11.75	**1.77
1997	7.17	*9.12	*5.77	11.63	**1.75
1998	7.19	*8.66	*6.15	12.55	-
1999	6.89	*9.63	*4.99	11.76	**1.56
2000	7.61	*10.43	*5.59	13.48	**1.46
2001	6.22	*6.69	*5.68	11.85	**2.00

* based on 30 <= cases < 80.

** based on 10 <= cases < 30.

- less than 10 cases.

Source: CNEF, own calculations.

Table A.17. Mean real^a individual labour income (in Euro p.a.^b) of elderly recipients by gender and age in Germany and Great Britain, 1984–2001

Year	Mean labour income all (65+)	Mean labour income by gender		Mean labour income by age	
		Men (65+)	Women (65+)	65–74	75+
West Germany					
1984	*10,047	*14,471	**4,779	*10,594	**8,890
1985	*12,997	*16,054	**8,053	*14,351	**9,674
1986	*16,035	*20,914	**7,199	*19,366	**7,732
1987	*11,681	*15,849	**6,506	*12,094	-
1988	*11,982	*14,548	**8,855	*13,365	-
1989	*14,407	*18,096	**8,587	*16,203	-
1990	*15,431	*14,780	**16,688	*17,568	**6,311
1991	*12,209	*14,806	**8,183	*12,673	-
Germany					
1992	*12,249	*15,270	**6,007	*12,951	-
1993	*15,873	*19,449	**4,670	*17,297	-
1994	11,757	*14,573	**7,915	*12,235	-
1995	8,433	*10,922	**5,644	8,630	-
1996	*10,279	*12,409	**7,881	*10,428	-
1997	9,249	*13,082	*5,523	8,718	-
1998	8,983	*10,329	*6,996	9,965	-
1999	8,912	*9,789	**7,903	*9,731	-
2000	12,566	*16,071	*8,759	13,881	**8,818
2001	12,183	*15,675	*7,215	13,658	**3,812
Great Britain					
1991	8,031	10,153	*3,796	7,734	**11,049
1992	9,267	*10,567	*7,215	8,823	**12,871
1993	7,894	*9,573	*4,732	7,549	**10,922
1994	6,979	*8,166	*4,880	7,011	-
1995	7,970	*10,959	*3,796	7,924	**8,383
1996	8,287	*10,821	*4,924	8,277	**8,367
1997	10,911	*14,812	*6,464	10,482	**14,378
1998	8,945	*11,578	*6,308	9,213	-
1999	9,250	*11,538	*6,172	9,913	**3,782
2000	8,886	*11,619	*5,228	9,317	**4,716
2001	9,941	*12,233	*6,904	10,617	**5,969

^a Deflated by national consumer price indices, cf. Table A.2.

^b British figures converted by OECD purchasing power parities, cf. Table A.2.

* based on 30 ≤ cases < 80.

** based on 10 ≤ cases < 30.

- less than 10 cases.

Source: CNEF, own calculations.

Table A.18. Mean retirement age^a by gender in Germany and Great Britain, 1986–2000

Year	All	Men	Women
West Germany			
1986	60.34	60.08	60.87
1987	60.20	59.88	60.88
1988	60.46	60.09	61.14
1989	60.86	60.58	61.32
1990	60.21	60.30	60.05
1991	60.10	60.18	59.95
1992	59.89	60.09	59.54
1993	60.04	60.23	59.79
1994	59.93	59.96	59.89
1995	59.98	59.87	60.12
1996	60.15	60.13	60.18
1997	60.40	60.08	60.96
1998	60.36	60.28	60.50
1999	60.66	60.66	60.65
2000	60.60	60.69	60.48
East Germany			
1994	*59.72	*59.76	*59.62
1995	*58.63	*58.99	*57.89
1996	58.88	59.11	58.30
1997	58.88	59.18	58.30
1998	58.92	59.27	58.36
1999	59.18	59.85	58.25
2000	59.22	59.60	58.56
Great Britain			
1993	61.27	61.71	60.77
1994	61.61	62.11	60.94
1995	61.70	62.03	61.24
1996	61.63	61.81	61.37
1997	61.92	62.08	61.69
1998	61.94	62.10	61.69
1999	61.36	62.64	61.97
2000	61.06	62.39	61.58

^s Age when changing primary activity from “active” to “inactive”, if two years of activity are followed by two years of inactivity.

* based on 30 ≤ cases < 80.

Source: CNEF, own calculations based on unbalanced panel data structures.

Table A.19. Upper limits of selected percentiles of retirement age^a by gender in Germany and Great Britain, 1986–2000

Year	All				Men				Women			
	P20	P40	P60	P80	P20	P40	P60	P80	P20	P40	P60	P80
West Germany												
1986	58	60	61	63	58	60	61	63	58	60	61	64
1987	58	60	61	63	58	59	61	63	59	60	61	64
1988	59	60	61	63	59	60	61	63	59	60	61	64
1989	59	60	61	64	59	60	61	63	59	60	61	64
1990	59	60	61	63	59	60	61	63	58	60	61	63
1991	59	60	61	63	59	60	61	63	59	59	61	63
1992	58	59	61	63	58	60	61	63	58	59	60	62
1993	59	59	61	63	59	60	61	63	59	59	61	63
1994	58	60	61	63	58	60	61	63	58	60	61	63
1995	58	60	61	63	58	59	61	62	59	60	61	63
1996	59	60	61	63	59	60	61	63	58	59	61	64
1997	59	60	61	63	58	60	61	63	59	60	61	64
1998	59	60	61	63	59	59	61	63	58	60	61	64
1999	59	60	61	64	59	60	62	64	59	60	61	64
2000	59	60	61	63	59	60	61	64	58	60	61	63
East Germany												
1994*	58	59	60	63	58	60	61	63	58	59	59	61
1995*	58	58	59	61	58	59	60	62	58	58	59	60
1996	58	59	60	61	58	59	60	62	58	59	59	60
1997	58	59	60	61	58	59	60	62	58	59	59	61
1998	58	59	60	61	58	59	60	62	58	58	59	60
1999	58	59	60	62	59	60	61	63	58	59	59	60
2000	58	59	60	62	58	60	61	63	58	59	60	60
Great Britain												
1993	59	60	62	66	59	60	62	67	59	60	62	64
1994	59	61	63	66	59	61	63	68	59	60	63	65
1995	59	61	63	67	59	61	63	67	59	61	64	65
1996	59	61	63	67	59	61	63	67	59	61	63	66
1997	59	61	63	67	59	61	63	68	59	61	64	67
1998	59	61	63	67	59	61	63	66	59	60	64	67
1999	58	60	62	65	59	60	62	65	58	60	61	65
2000	59	60	62	65	59	60	63	65	59	59	61	64

^a Age when changing primary activity from “active” to “inactive”, if two years of activity are followed by two years of inactivity.

* based on 30 ≤ cases < 80.

Source: CNEF, own calculations based on unbalanced panel data structures.

Table A.20. Median old-age income ratios^a by year and gender in Germany and Great Britain, 1987–2001

Year	All	Men	Women
West Germany			
1987	1.053	1.071	*1.037
1988	1.048	1.056	*1.036
1989	1.083	1.091	*1.083
1990	1.091	1.096	*1.087
1991	1.093	1.102	*1.083
1992	1.116	1.120	*1.091
1993	1.111	1.112	*1.095
1994	1.083	1.082	*1.108
1995	1.017	1.017	*1.023
1996	0.994	0.998	0.989
1997	1.038	1.034	1.043
1998	1.029	1.035	1.024
1999	1.042	1.046	1.035
2000	1.071	1.075	1.057
2001	1.056	1.057	1.056
East Germany			
1995	*1.149	*1.144	-
1996	*1.059	*1.045	**1.100
1997	*1.072	*1.080	**1.027
1998	1.045	*1.058	*1.032
1999	1.035	*1.035	*1.047
2000	1.063	*1.048	*1.063
2001	1.067	*1.082	*1.030
Great Britain			
1994	1.056	1.060	1.041
1995	1.048	1.042	*1.060
1996	1.082	1.102	*1.053
1997	1.121	1.121	1.126
1998	1.126	1.120	1.136
1999	1.134	1.136	1.124

^a Real equivalent net income in the second year (t) after changing primary activity from “active” to “inactive” (t-1) divided by the income of the last year of activity (t-2).

* based on 30 ≤ cases < 80.

** based on 10 ≤ cases < 30.

- less than 10 cases.

Source: CNEF, own calculations based on balanced panel data structures.

Table A.21. Median old-age income ratios^a by gender in Germany and Great Britain, 1989–2001

Quotient ^b	West Germany				East Germany		Great Britain	
	Men 66/61	Women 63/58	Men 66/59	Women 66/59	Men 66/61	Women 63/58	Men 66/61	Women 61/56
1989	**1.065	**1.131						
1990	**1.065	**1.132						
1991	**1.272	**1.151	**1.190	**1.066				
1992	**1.070	*1.139	**1.178	**1.239				
1993	**1.131	*1.350	**1.180	**1.239				
1994	**1.037	*1.180	**1.130	**1.189				
1995	**1.220	*1.098	**1.112	*1.263				
1996	**1.180	**1.245	**1.123	*1.369			**1.429	**1.243
1997	*1.077	**0.942	*1.130	*1.237	**1.712	**1.910	**1.321	**0.896
1998	**1.189	*1.038	**1.128	*1.187	**1.428	**1.760	**1.355	**1.647
1999	**0.962	*0.962	**1.090	*1.169	**1.398	**1.257	**1.428	**1.324
2000	**0.988	*1.034	**0.987	**1.024	**1.140	**1.278		
2001	*0.956	*1.199	*0.984	*1.059	**1.080	*1.130		

^a Real equivalent net income at age Y divided by income at age X.

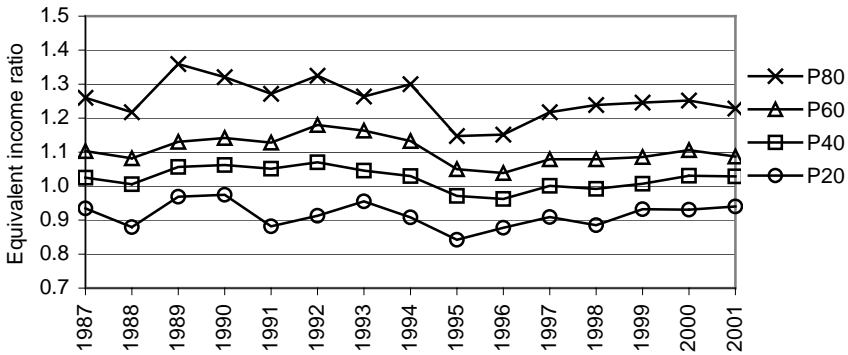
^b Quotient Y/X, cf. note 1.

* based on 30 ≤ cases < 80.

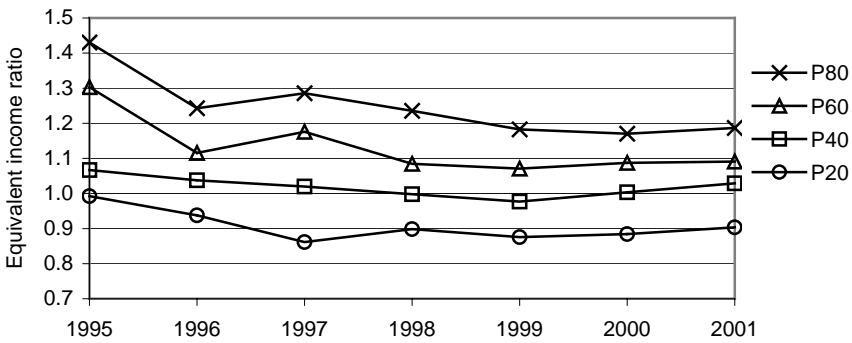
** based on 10 ≤ cases < 30.

Source: CNEF, own calculations based on unbalanced panel structures.

West Germany, 1987–2001



East Germany, 1995–2001



Great Britain, 1994–1999

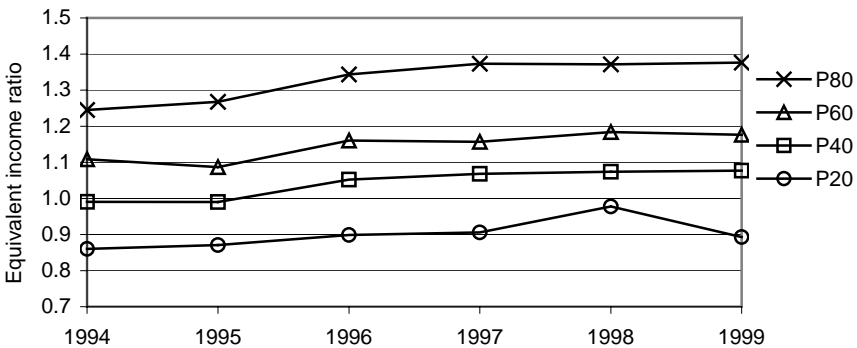


Figure A.1. Upper limits of selected percentiles of equivalent old-age income ratios^a in Germany and Great Britain

^a Age when changing primary activity from “active” to “inactive”, if two years of activity are followed by two years of inactivity.

Source: CNEF, own calculations based on unbalanced panel data structures.

Table A.22. Mean real^a equivalent income of new pensioners of the respective income component^b in local currency in Germany and Great Britain, 1984–2001

Year	Public pension	Public transfers	Private pension(s)	Asset income	Imputed rent	Labour income
West Germany (EUR p.a.)						
1987	5,827	86	575	782	281	2,115
1988	5,151	52	803	517	317	1,996
1989	*5,690	*251	*641	*237	*370	*1,660
1990	*5,589	*90	*782	*639	*446	*2,869
1991	*5,669	*55	*639	*833	*535	*2,179
1992	5,791	146	578	796	573	3,900
1993	5,933	241	463	404	641	2,320
1994	7,251	122	683	966	844	2,472
1995	*6,529	*332	*922	*968	*771	*2,374
1996	6,798	172	503	711	794	3,008
1997	6,586	641	442	387	593	3,104
1998	7,072	138	586	594	1,098	3,407
1999	8,983	125	941	471	820	1,180
2000	6,859	317	685	858	672	2,389
2001	8,546	95	1,139	869	1,002	3,506
East Germany (EUR p.a.)						
1992	*3,318	*162	**15	**90	*115	*1,989
1993	*4,290	*93	**23	**253	*170	*2,407
1994	**4,974	**138	-	**206	**120	**2,117
1995	*5,667	*100	**197	**229	*203	*2,566
1996	*7,529	*547	-	**123	*346	*623
1997	*7,536	*262	**43	**157	*394	*519
1998	*8,887	*57	-	**96	*515	*984
1999	*8,736	*331	**335	**182	*596	*1,009
2000	*9,403	*159	**18	**347	*369	*1,578
2001	*8,866	*346	**202	**268	*563	*1,388
Great Britain (GBP p.a.)						
1991	1,534	1,796	811	314	*1,845	1,294
1992	*1,670	1,913	1,617	513	*1,853	1,665
1993	*1,670	*2,074	*1,615	*775	*1,634	*1,546
1994	*2,148	*2,670	*1,744	*491	*1,834	*1,046
1995	2,057	2,600	1,898	606	*2,066	1,676
1996	*1,869	*2,466	*2,660	*1,041	*2,244	*991
1997	2,055	2,623	2,161	948	*2,047	2,268
1998	2,146	2,820	1,864	956	*2,564	2,113
1999	*2,427	*2,948	*2,571	*520	*2,164	*2,243
2000	2,243	3,194	2,080	847	<i>n.a.</i>	2,200
2001	2,503	3,164	2,653	1,106	<i>n.a.</i>	1,979

Table A.22. continued

^a Deflated by national consumer price indices, cf. Table A.2.

^b For the definitions of the various income components cf. Table A.13.

* based on 30 ≤ cases < 80.

** based on 10 ≤ cases < 30.

- less than 10 cases.

n.s. not surveyed.

n.a. not announced.

Source: CNEF, own calculations based on unbalanced panel structures.

Table A.23. Regression analysis on equivalent income in Germany and Great Britain, 1984–2001 – Basis: unbalanced panel structures –

Random effects model: $EI_{it} = K + \alpha * A_{it} + \beta * C_i + \gamma * S_i + u_i + e_{it}$

	West Germany 1984–2001	East Germany 1992–2001	Great Britain 1991–1999
Coefficient age (α)	856.8**	1,346.5**	410.0**
Coefficient cohort (β)	2,828.3**	5,006.6**	1,460.1**
Coefficient sex (γ)	-1,992.1**	-3,075.9**	-1,204.6**
Constant (K)	-24,155.3**	-45,872.0**	-10,882.6**
R ² within	0.163	0.488	0.193
R ² between	0.002	0.001	0.014
R ² overall	0.042	0.043	0.002

** significance level 99%.

Source: CNEF, own calculations.

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