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RECENT DEVELOPMENTS IN OLD-AGE PENSION SYSTEMS —

AN INTERNATIONAL OVERVIEW

BY

KLAUS-JÜRGEN GERN



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individual (retirement) savings. Across countries, there is a great deal of variation in the relative importance of these three sources of income as well as in the institutional organization of each of them. Differences in the organization of the pension systems are one reason behind the fact that the problems that the pension systems face for the future are more serious in one country than in the other.¹

Table 1 summarizes facts over a number of dimensions of the institutional design of old-age pension systems in 17 OECD-countries. The relative importance of public pension schemes is to some extent reflected in the level of public pension expenditure relative to GDP, and is related to the ratio of average pensions to average wages (the implicit replacement rate). According to these indicators the role of the public sector is particularly prominent in continental Europe (with the Netherlands, Switzerland and Denmark as the exceptions) and tends to be less pronounced in the Anglo-Saxon countries.² The present value of uncovered future liabilities in the public sector pension system as a percentage of GDP may give an indication as to the extent to which reforms are necessary. As a measure of the relative weight of occupational pensions in the overall old-age security system, the percentage of employees covered can be misleading when occupational pension plans are only designed to provide a marginal addition to other (public) pensions. This is the case for example in Germany. Therefore, the importance of occupational pension plans may be better reflected in the value of accumulated assets measured as a proportion of GDP.³

In most industrial countries, a mandatory public pension plan is at the heart of the old-age security system. Formal arrangements, however, can differ in a number of ways. Pension schemes may have either redistribution or saving and insurance as dominant objectives. They

¹ Of course, the differing degree of population aging is another important factor.

² For Japan and New Zealand the assessment is somewhat unclear because a relatively low share of GDP spent on public pensions combines with a relatively high implicit replacement rate.

³ Mandatory occupational pension schemes that work (primarily) on a pay-as-you-go basis are included in the public sector even if private sector institutions are involved in the management of the system. Such arrangements can be found in Finland and France.

Table 1 – Synoptic Overview on Old-Age Pension Systems in Industrial Countries

Country	Public Pension System					Occupational Pensions			Recent Reforms of Significance
	Type (benefits, financing)	Pension Expenditure (p.c. of GDP) ^a	Implicit Replacement Rate ^b	Assets of the System (p.c. of GDP) ^a	Net Unfunded Liabilities (p.c. of GDP) ^c	Type	Coverage (p.c. of employees) ^d	Assets (p.c. of GDP) ^d	
Australia	MTF, TF	2.6	30	n.a.	96.7 ^e	compulsory	92	45	Introduction of a pattern of mandatory fully funded occupational pensions (since 1986).
Austria	CR, CF ^f	8.8	40	n.a.	92.5	voluntary	10	n.a.	Change of indexation from gross to net wages (1993); reduction of preferential treatment of public sector employees (1997).
Belgium	CR, CF ^f	10.4	63	n.a.	152.6	voluntary	31	10	
Canada	UF/MTF/CR, TF/CF	5.2	33	7	100.7	voluntary	48	25	Increased pre-funding of the earnings-related scheme through advanced contribution hikes, improved investment rules, lower benefits (1997). Revision of the basic scheme (2001).

MTF: means-tested flat benefit; TF: tax financed; CR: contributions-related benefit; CF: contributions financed; UF: universal flat benefit.

Table 1 - continued

Country	Public Pension System					Occupational Pensions			Recent Reforms of Significance
	Type (benefits, financing)	Pension Expenditure (p.c. of GDP) ^a	Implicit Replacement Rate ^b	Assets of the System (p.c. of GDP) ^a	Net Unfunded Liabilities (p.c. of GDP) ^c	Type	Coverage (p.c. of employees) ^d	Assets (p.c. of GDP) ^d	
Denmark	UF/MTF/CR, TF/CF	6.8	40	n.a.	234.5 ^e	quasi-compulsory	80	21	Extension of coverage of occupational pension schemes through collective bargaining (early 1990s).
Finland	UF/CR, TF/CF	11.5	65	41.0 ^f	64.8	voluntary ^g	n.a.	0.5	Increase of actuarial fairness, increase in the period of reference earnings, change in reference index, gradually increased means-testing on the basic pension (1993-1996).
France	CR, CF ^f	10.6	56	-0.5	102.1	voluntary ^g	n.a.	3	Change of indexation from gross to net wages (1984) to CPI (1988), only private sector scheme: increase in the period of reference earnings, transfer of noncontributory pension rights to a tax financed „solidarity fund“ (1993).
Germany	CR, CF ^f	11.1	46	1.1	61.6	voluntary	42	6	Change of indexation from gross to net wages; reduction of benefits for early retirees, gradual increase in the normal retirement age for women (1992); introduction of a demographic factor into the benefit formula (1999).

MTF: means-tested flat benefit; TF: tax financed; CR: contributions-related benefit; CF: contributions financed; UF: universal flat benefit.

Table 1 – continued

Country	Public Pension System					Occupational Pensions			Recent Reforms of Significance
	Type (benefits, financing)	Pension Expenditure (p.c. of GDP) ^a	Implicit Replacement Rate ^b	Assets of the System (p.c. of GDP) ^a	Net Unfunded Liabilities (p.c. of GDP) ^c	Type	Coverage (p.c. of employees) ^d	Assets (p.c. of GDP) ^d	
Italy	CR, CF ^f	13.3	49	nil	59.7	voluntary	5	4	Suspension of indexation to gross wages (1992); shift towards a more uniform contribution-based system with improved actuarial fairness and an effective reduction in average benefits (1995). Introduction of tax incentives for individual retirement savings.
Japan	CR, CF ^f	6.6	54	26.5	70.0	voluntary	50	18	Gradual increase of the retirement age to 65 between 2001 to 2018, change of indexation from gross to net wages, increase of the contribution rate by 2.5 percentage points every 5 years (1994).
Netherlands	CR, CF	6.0	39	n.a.	53.3	voluntary	83	85	Calculation of benefits in occupational pension schemes on the basis of lifetime rather than last earnings (underway).
New Zealand	UF, TF	5.9	51	n.a.	212.8 ^e	voluntary	22	n.a.	Gradual increase of the statutory retirement age from 60 to 65 (1992-2001).

MTF: means-tested flat benefit; TF: tax financed; CR: contributions-related benefit; CF: contributions financed; UF: universal flat benefit.

Table I – continued

Country	Public Pension System					Occupational Pensions			Recent Reforms of Significance
	Type (benefits financing)	Pension Expenditure (p.c. of GDP) ^a	Implicit Replacement Rate ^b	Assets of the System (p.c. of GDP) ^a	Net Unfunded Liabilities (p.c. of GDP) ^c	Type	Coverage (p.c. of employees) ^d	Assets (p.c. of GDP) ^d	
Spain	CR, CF	10.0	34	n.a.	108.6	voluntary	15	2	Introduction of private pension funds (1988); increase of the reference period for earnings, increased actuarial fairness (1995).
Sweden	UF/CR, TF/CF	11.8	54	25.8	132.3	partly compulsory	90	16	Improved actuarial fairness, increased means-testing of basic pension, introduction of a growth factor into indexation, increased prefunding through individual accounts (1998).
Switzerland	CR, CF ^f	6.7	n.a.	6.6	n.a.	compulsory	90	70	Funded occupational pensions made mandatory (1985); only minor changes to public system.
United Kingdom	CR, CF	4.5	23	-0.2	23.8	voluntary	75 ^h	82	Introduction of personal pensions as an option to contract out of the public scheme (1987); measures to increase the attractiveness to opt out (1986, 1995); increase in the statutory retirement age of women to 65 between 2010-2020.

MTF: means-tested flat benefit; TF: tax financed; CR: contributions-related benefit; CF: contributions financed; UF: universal flat benefit.

Table 1 – continued

Country	Public Pension System					Occupational Pensions			Recent Reforms of Significance
	Type (benefits financing)	Pension Expenditure (p.c. of GDP) ^a	Implicit Replacement Rate ^b	Assets of the System (p.c. of GDP) ^a	Net Unfunded Liabilities (p.c. of GDP) ^c	Type	Coverage (p.c. of employees) ^d	Assets (p.c. of GDP) ^d	
United States	CR, CF ^f	4.1	30	7.0	23	voluntary	46	72	Increased pre-funding through accumulation in a trust fund, increase of the retirement age to 67 from 2000 onwards (1983); increased prefunding through individual accounts, increase of the retirement age to 70 by 2029 (underway).

MTF: means-tested flat benefit; TF: tax financed; CR: contributions-related benefit; CF: contributions financed; UF: universal flat benefit.

Notes: ^aAs of 1995. - ^bImplicit replacement rates are calculated as the ratio of average pensions to average wages. - ^cAs of 1994. - ^dAs of 1993. - ^eNet liabilities are equal to gross liabilities, because pensions are tax financed. - ^fIn these countries, there is a significant subsidy from the government budget, ranging from around 10 percent of expenditures in France and the United States to 33 percent in Japan. - ^gBecause of their pay-as-you-go character in the cases of Finland and France the mandatory occupational pensions are included in the public pension system. - ^hIncluding personal pensions (25 p.c. points).

Source: World Bank 1994 (Table A6, A7); Chand and Jaeger 1996 (Table 7); OECD 1996b (Table 2.2), 1997 (Table 16); Davis 1996 (Table 1); Thomas 1997 (Table 1); own compilation.

may specify either their benefits in advance (*defined-benefit type*), or their contributions and pay benefits according to the return on the contributions (*defined-contribution type*). They may be financed on a *pay-as-you-go* basis (from general tax revenues or from social security contributions), or on a largely funded basis.

In reality, we find basically two different approaches to public pension schemes. The first is the social insurance approach which can be found in most continental countries of Western Europe, in the US, and also in Japan. Here, the working generation is required to contribute to the system a certain percentage of a relevant income, and benefits are related to contributions and/or earnings. The countries that have public pension schemes at work according to the social insurance approach again differ significantly with respect to the arrangements in detail, for example as concerns the degree of redistribution inherent in the system, the coverage of the population, and the proportion of retirement income that is supplied by the system. Another difference concerns funding. While financing is in principle *pay-as-you-go* across the board, it works in some countries, like in the US or Japan, effectively on a partially funded basis because contribution rates have deliberately been set beyond what is needed to finance current pension expenditure in order to accumulate funds that can be used in the years when the strong cohorts are to retire.

The other approach to social security dominates in the Anglo-Saxon countries (with the major exception of the US), and in Scandinavia. Here the public pension was originally designed as a flat-rate benefit that sets a floor to old-age income and is financed by flat-rate contributions or general tax revenues. Retirement income exceeding this basic benefit should, in principle, be provided for privately. Over time, however, an earnings-related part was usually added. This has led to an increased importance of the public pension schemes for the overall old-age security system and has reduced the actual difference between the two approaches to some extent.

As concerns the second important source of retirement income, occupational pensions, countries differ in a number of aspects, including the arrangement as *defined-benefit* or

defined-contribution plans, the adjustment for inflation, regulations on investment which have an effect on risk and return, and relevant rules in the tax code, which make it more or less attractive for a firm to offer a pension fund. Of particular importance for the outcome in terms of coverage is that in some countries, namely in Australia, Switzerland and, increasingly, Denmark, the enrollment in occupational pension schemes is mandatory, while it is voluntary in the other countries. An additional factor is whether it is possible to contract out of public earnings-related schemes; this is the case in the UK and in Japan. The relative role of occupational pensions as a source of retirement income is found to be dependent on the scale of public pension provision, particularly if there is generous provision for individuals with higher income levels (Davis 1998). The replacement of a rather high share of earnings through the public pension system also for medium and high income earners, as is the case for example in Germany, France or Italy, tends to reduce incentives to provide for additional sources of retirement income. By contrast, the role for additional pillars is likely to increase, when the replacement rate of public pensions decreases strongly with rising income so that the pensions are more like a flat benefit, which is the case, for example, in the Netherlands or in Switzerland.

With respect to the third pillar of retirement income, individual voluntary savings, there is a lack of data which can to some extent be traced to the fact that it is difficult to discriminate between savings for retirement and other savings. It seems, however, safe to say that the extent of voluntary retirement savings is negatively influenced by the amount of savings that is already „forced“ by the arrangements in the first and second pillars.⁴ Another influence is the tax treatment of income saved for retirement.

⁴ Voluntary saving will be affected less when the promised pension benefits implicit in current rules are not credible.

Recent Reforms in Industrial Countries⁵

Recent reforms to adjust to the pressures of the changing economic and demographic environment, have essentially proceeded along three routes: (1) redressing the public pension systems; (2) strengthening the role of funded occupational pension schemes; (3) increasing incentives for voluntary retirement saving.

In almost every country surveyed there have been reforms of the public pension schemes of some significance in order to improve the financial prospects of the system. One direction of reform was reducing the effective level of benefits through a number of measures: The period of earnings referred to in the calculation of benefits has been increased (Belgium, Finland, France, Netherlands, Spain). Basic benefits have increasingly been made subject to an income-test (Canada, Finland, Sweden). Indexation rules have been changed (Austria, Finland, France, Germany, Italy, Japan, Sweden). In Germany, an additional factor reflecting the increase of life expectancy of new retirees has been introduced in order to lower the benefits relative to relevant earnings. As a further measure to contain the rise in pension expenditure the statutory retirement age will be gradually lifted in a number of countries (Germany, Italy, Japan, New Zealand, UK, US), and eligibility rules to early retirement have been tightened in most countries. In addition, sometimes as part of a general tendency to strengthen the link between contributions and benefits and improve actuarial fairness, steps have been taken to reduce the attractiveness of early retirement and reward a longer working life. Another direction, which has been followed by a number of countries is to increase prefunding of future pension expenditure. In some countries, a gradual increase in the rate of contribution has been legislated beyond what would have been necessary to immediately balance the system's finances in order to partially fund future liabilities (US, Japan, Canada). Other countries have decided to divert a certain share of contributions into funds (Finland, Sweden), which in the

⁵ A sketchy overview on reform measures is given in the last column of Table 1.

case of Sweden (and in the future, according to recent plans, also in the US) are personal accounts.

A second route of reform was to increase the importance of fully-funded, privately managed occupational pensions. One way to achieve this was to reduce the generosity of public pension benefits and, hence, reduce the attractiveness of these schemes. But there were also important changes in the regulations concerning occupational pensions. In several cases occupational pensions have been made compulsory (Australia, Denmark, Switzerland). Other countries enable individuals to opt out of part of their social security contributions (UK, Japan). A further direction was to allow additional types of pension schemes to be operated. Particularly, there has been a tendency to favor the establishment of defined contribution plans over defined benefit plans (Australia, Denmark, Switzerland, UK, US) in order to make occupational pension schemes more attractive, especially for smaller firms, and reduce the problem of portability.⁶ On the investment side, there is a clear tendency to ease restrictions on investment of funds, which are now recognized to contribute to increasing risk by limiting the possibility of diversification rather than to foster „prudent“ investment behavior. Particularly, the allowed share of equity in the portfolio has been increased, and restrictions on cross-border investments have been eased in countries such as Australia, Canada, Denmark, Germany, Japan, and Sweden. External funding of liabilities is becoming increasingly the rule, with Japan for example reducing the tax benefits to book reserve funding relative to external funding.

As to the third pillar of retirement income, the tax treatment of retirement savings has been improved in some countries. Particularly, in Italy and Spain tax incentives have been introduced only rather recently.

⁶ Another reason to favor defined-contribution plans may have been the risk of default that is inherent in defined-benefit plans.

More Radical Reforms in Middle Income Countries

While reforms in the industrial countries have been rather gradual in most cases (as will be the impact of these changes), an increasing number of middle income countries have, in face of a much more imminent pressure to reform, resorted to a more radical transition towards a multi-pillar system comprising a major funded element. In Latin America the pioneering example of Chile was followed in recent years by countries like Argentina, Bolivia, Colombia, Mexico, and Uruguay. Others are engaged in serious discussions. More countries that are about to implement pension reforms along similar lines can be found in Central and Eastern Europe, including Estonia, Hungary, Latvia, and Poland. The experience in these countries leads to the conclusion that at some stage a radical approach to reform may be more feasible than gradual adjustment. The considerable variation in the details of the pension systems that are to be established as well as in the details of the transition can partly be explained by country-to-country differences with respect to objectives, history, and current circumstances, particularly the relative strengths of redistributive and saving goals, the financial market development, and the taxing and regulatory capacities (James 1997). However, comparative evaluation of the pension reforms in these countries can be expected to give further empirical evidence on the shape of a well-designed pension reform.

Conclusion: Towards Increased Funding

Summing up, there is a clear tendency to reforms that increase the degree of pre-funding of pension obligations. A number of countries has proceeded significantly along that route, be it through stronger funding in the public pension schemes (Canada, Finland, Sweden, US), be it through strengthening the role of private occupational pensions (Australia, Denmark, the Netherlands, Switzerland, UK). These measures that tend to lessen the burden on future generations, have resulted in a burden today that is somewhat higher than without such reforms despite the fact that measures to restrain expenditure were taken also. In some countries, contribution rates are raised beyond what would have been necessary without an increased funding, in other countries subsidies to the system from general tax revenues are

increased. To this end, it can be said that the consolidation of the general government finances (excluding social security) can greatly contribute to the viability of a major switch to funded pensions. This can be also concluded from the experience of the increasing number of middle-income countries that have implemented rather wide-sweeping reforms. Another set of industrial countries have confined their reforms mainly to more or less significant adjustments to the prevailing pay-as-you-go systems, without increasing the funded element (Austria, Belgium, France, Germany, Italy, Japan, New Zealand, Spain). The capacity of the conventional measures to redress these systems in order to balance their finances in the long-term seems limited, however.

2. Pension Systems and Pension Reforms in Industrial Countries

2.1 Australia

The Australian government has introduced a three-pillar system which is very similar to the World Bank (1994) recommendations (Bateman and Piggott 1997). It consists of a basic tax financed state pension (Age Pension) which is means-tested.⁷ The pension for an individual is a flat rate 25 percent of average weekly earnings, and the cost to the federal budget is at the moment around 3 percent of GDP (Edey 1997: 169). The eligibility age is 65 for men and 60 for women, and the pension is indexed to consumer prices (Rosenman and Warburton 1996).

Since 1986, there has been gradually introduced a second pillar, an obligatory (since 1992) private insurance which is fully funded and primarily financed from employer's contributions. These are scheduled to reach 9 percent of wages in the year 2002. In addition, there are employee's contributions that will be 3 percent in the year 2000. The contributions are paid

⁷ Since the Age Pension was introduced in 1909, it was subject to income or property tests that changed over time. In the 1970s, the means test was abolished for those over the age of 70, but during the 1980s an income test for all age pensions was reintroduced combined with an asset test (Knox 1995:107).

into an individual account which belongs to the employee, and low-wage earner's contributions are supplemented by the state. The contributions are tax deductible. A third pillar is voluntary savings or voluntary occupational pension schemes which also have some preferential tax treatment.

One main reason for the move of the Australian government towards a compulsory superannuation was the desire for a wider coverage of occupational old-age insurance, as occupational pension schemes have traditionally been an important source of retirement income. Since the introduction of the scheme, private sector coverage has risen from around 30 percent to some 90 percent of employees. The transition has been relatively easy as many of the features of the superannuation industry remains as they were when coverage was voluntary⁸ and has not been complicated by the existence of a contributory public sector pension scheme with unfunded liabilities.

One problem with the Australian system is that it produced a substantial uncertainty because, although it had been established only recently, there have been frequent changes in the provisions of the system and in the tax treatment of contributions as well as benefits (Knox 1995). An additional problem is the integration of the various pillars in a rational, equitable and sustainable way. Specifically, the question of means tested or universal basic pension benefits has in Australia so far been solved in favor of a means test. However, the retirement age of the compulsory superannuation has not been aligned with the pension age nor is it required to take the superannuation entitlement in form of a pension. Thus, incentives remain to retire early and become eligible for the age pension after dissipation of some of their superannuation benefit.

⁸ Most of the older (voluntary) plans which have been of the defined-benefit type remain in existence while the newer plans introduced in response to the government requirement are of the defined-contribution type.

2.2 Austria

The Austrian old-age pension system resembles closely to the German system. It is basically earnings related and does not provide a minimum pension, although the principle of contribution equivalency is weakened by various provisions that introduce a rather strong redistributory element into the system. One quarter of expenditures is covered by general tax revenues in order to compensate for expenditures that result from such kind of redistribution. The financing is pay-as-you-go, and pensions are indexed to net wages although the increase of consumer prices serves as a bottom limit. The statutory retirement age is at 65 for men and 60 for women.

Austria's public pension payments represent more than 15 percent of GDP which is the highest number among the industrialized countries (World Bank 1994), mainly because of a relatively high benefits level; the replacement rate is at 76 percent on average with significantly higher numbers for some groups of workers (Guger 1998). The rate of contribution paid by employers and employees (with the exception of civil servants) is 22.8 percent with a maximum contribution threshold.

The future problems to the system due to the aging of populations are particularly alarming. One reason is that the demographic developments are slightly more unfavorable than on average in the OECD-countries. A second problem is that the present burden of the system on the economy is already relatively large. Necessary to balance the system in the year 2045 would be a contribution rate of more than 35 percent, a reduction of the replacement rate to below 50 percent, an increase in the retirement age by more than ten years, or a combination of these. However, a significant reform has not been implemented yet, although the pension reform of 1993 included the change of indexation from gross to net wages. Recently, there has been some discussion on further steps to secure the viability of the system, but proposals are mainly restricted to adjustments within the system (Rürup 1997). Recent further measures which aimed at reducing the preferential treatment of public sector employees have not been convincing (Lenhardt 1997). They also include an increase in the number of years used to calculate the pension from 15 to 18 years in the case of early retirement.

2.3 Belgium⁹

The Belgian public pension system is on a pay-as-you-go basis. It comprises of four major schemes, for civil servants, for wage earners, for the self-employed, and a guaranteed minimum income scheme. There is a supplementary pillar of occupational pensions which is of limited significance although some 30 percent of the workforce are covered.; accumulated assets amount to around 10 percent of GDP (OECD 1994c). Private retirement insurance is available but has so far been limited in size.

The pension scheme for private sector wage earners is funded through social security contributions of 16.36 percent of gross income (7.5 percent by the employee another 8.86 percent by the employer) and a government subsidy amounting to around 1 percent of GDP. The level of pensions paid depends on the salary during the entire career (with an imputed salary used for spells of illness or unemployment etc.), the length of the career and the marital status when retired. Pensions are indexed to CPI. While there is a ceiling on earnings used to calculate the pension, there is no ceiling on contributions. Since the ceiling on pensionable income is rather low — about 20 percent above the average wage — the tax component of the social security contributions is rather large. Because the ceiling is indexed to the CPI and real wage growth is not accounted for, the pension scheme is gradually moving towards a flat basic pension scheme.

Pensions for public sector employees are paid out of the general government budget. Retirement age is between 60 and 65. The retirement pension depends on the reference salary, the career length and the replacement rate which is dependent on the career length, and is subject to a maximum. There is also a minimum pension differentiated according to household structure. The pension scheme for the public sector is more generous than the private sector scheme, one reason being that pensions are effectively indexed to wages rather than CPI.

⁹ This section draws on Callatay and Turtelboom (1997).

A minor reform undertaken in 1996 will raise the career length necessary to receive the full pension benefit for women over the next 15 years from 40 years to 45 years that is already effective for men. Retirement age at which the full pension can be drawn is between 60 and 65 under the premises that the required number of years has been worked.¹⁰

2.4 Canada

The Canadian public pension system has two tiers. The first is financed from tax revenues and is designed to put a floor on old-age income. It consists of a basic universal grant (Old Age Security, OAS) and income-tested supplements (Guaranteed Income Supplement, GIS, and Spouse's Allowance, SPA). The benefits are indexed to CPI and are not taxable. They are payable from the age of 65 (from the age of 60 to 65 for widows of OAS pensions in the case of SPA). The second tier is an earnings-related pension scheme (Canada and Quebec Pension Plans) financed pay-as-you-go¹¹ by compulsory contributions from employers, employees and self-employed. The contribution rate is presently at 6.1 percent of covered earnings.¹² Benefits replace 25 percent of average lifetime earnings, but combined with the OAS the benefit schedule is steeply progressive, i.e. the replacement ratio declines strongly with increasing earnings. Benefits are taxable and indexed to consumer prices. The statutory retirement age is 65, but it is possible to retire as early as 60 with an actuarial reduction of the benefit. In addition, there are tax incentives to engage in registered private pension plans which are a relatively important source of retirement income in Canada. In 1992, 47.5 percent of workers were covered by occupational pensions (Gruber 1997: 13).

At 5 percent of GDP, public pension expenditure is presently relatively modest in international comparison, one reason being that public pensions replace a relatively small share of working age income. But the expenditure ratio has doubled over the recent 25 years, and is projected to

¹⁰ Before 1991 it was 65 for men and 60 for women, and the pension was reduced by 5 percent for each year of retirement before reaching this statutory retirement age.

¹¹ The CPP has in the past accumulated a fund amounting to roughly 7 percent of GDP.

¹² There is a basic exemption and an upper limit to pensionable earnings.

rise to over 9 percent of GDP by 2030, partly as a result of a particularly steep rise in the old-age dependency ratio.¹³ Although currently the expenditure on the first tier of the public pension system represents about one half of total outlays, the debate has focused on the second tier because the increase in expenditure stems mainly from this part of the public pension system. It is expected that contribution rates will have to triple in the absence of reforms to keep the Canada Pension Plan in balance.

In order to keep the CPP solvent, an increase in the contribution rate to 7.9 percent in 2005 and to 9.9 percent in 2025 has already been legislated (Kramer and Li 1997: 7), but this will not be sufficient without further reform. In 1997, a reform proposal was drafted that consisted of an increased pre-funding through an increase of the contribution rate to 9.9 percent as early as 2003. Further measures included a revision on regulations of the investment of social security funds in order to raise the rate of return on these funds, a tightening of eligibility criteria and lower benefits. The combination of these measures is projected to allow the contribution rate to be held constant after the year 2003.

Other important changes relate to the first tier benefits (OAS, GIS and SPA). It is envisaged to replace these benefits through a single Seniors Benefit from the year 2001. The essential feature of the Seniors Benefit is that it is more targeted than the old system, and at the same time increases the guaranteed minimum income for pensioners (OECD 1996: 142ff.). As to the transition, all Canadians age 60 by the end of 1995 can choose either the new Seniors Benefit or the old system for the rest of their lives (Battle 1996).

¹³ As compared to the contribution rate that had been projected for the year 2030 at the time of the introduction of the Canada Pension Plan in 1966 (5.5 percent), the difference to the currently expected 14.5 percent is to only 30 percent demographic developments. Another 25 percent is attributable to revisions in the underlying macroeconomic assumptions. The remainder can be attributed to enrichment of benefits and higher disability benefits (OECD 1996c: 126).

2.5 Denmark

The Danish pension system consists of a tax-financed general basic pension that is paid at the age of 67 at a flat rate replacing about 38 percent of an average wage (Barnes 1997). The amount can be supplemented subject to an income test. Adding to the basic old-age pension is a compulsory national pension scheme (ATP), which is fully-funded and of a defined contribution type. Contributions are based on hours worked, but are fairly low¹⁴, so that the share of the ATP-pension in retirement income will be fairly low when the system that has been established in 1964 first matures in the early years of the next century.

In addition to the public pension schemes, most salaried employees contribute to fully-funded defined contribution pension plans established through the collective bargaining system.¹⁵ In the beginning of the 1990s, employers and trade unions agreed to extend the coverage to virtually all workers. Contributions will gradually rise to about 9 percent of gross wages. The collective savings schemes are legally independent of the company whose employees are covered, and the savings belong to the individual.

To promote further individual provision for retirement income there is a tax deduction for savings in private pension plans. However, a tax of 40 percent is levied when these savings are withdrawn. Despite this fact, individual pension plans are a popular form of saving. As a result, the state's tax claim on current pension assets amounts to 40 percent of GDP and is expected to rise to about 80 percent of GDP by 2030 (Barnes 1997).

With a major part of the pension system organized in fully-funded defined contribution schemes, the threat of an aging population is less pronounced in Denmark compared to other countries. Recent reforms have been primarily concerned with extending the coverage of

¹⁴ In 1995, the contribution for a full time worker was DKR 2 332 a year, or about over 1 percent of an ordinary annual wage income (Barnes 1995).

¹⁵ There are still some central government civil service pension schemes working on a pay-as-you-go basis but they are being discontinued.

occupational pension schemes. Discussion about a reform of the tax-financed basic pension involves particularly the question of introducing an income test (Gamillscheg 1997).

2.6 Finland

The Finnish public pension system consists of two pillars (OECD 1997e: 67ff.). One is a basic pension (national pension) which is comparatively low (and supplemented from general tax revenues in the event of no other income), the other is a compulsory employment scheme granting earnings related benefits. The basic pension scheme is nationally administered and financed by contributions on a pay-as-you-go basis; while the employment scheme is managed by over sixty private pension institutions. The employment scheme is also financed by contributions, but it is partially funded: financial assets cover roughly one-third of the present pension obligations (Noord 1997). The national pension tends to fall as the occupational pension increases. Except for low-wage earners, the combination of both replaces a maximum of 60 percent of pensionable income. The statutory retirement age is 65 years, but average retirement age is only 58 due to disability or early retirement schemes. Due to the generous benefit levels and a virtually universal coverage of the population by the public pension system, the market share of voluntary pension insurance has been very small until recently.

Against the background of a particularly pronounced aging of the population, relatively generous benefits and a low effective retirement age, combined with a general erosion of the tax base due to the recession in the early nineties, a relatively far-reaching reform of the system was implemented in several steps during recent years. Without changes, the pension expenditure had been estimated to reach nearly 18 percent of GDP by the year 2030 — a level only exceeded in Italy (OECD 1996b).

The main objective of the pension reform was to promote longer working careers, reduce benefits, and improve the management of the pension funds, while the basic features of the system, its two-tier approach, mixture of funding and pay-as-you-go financing, pronounced redistribution and strong involvement of private insurers in the management of the system, has been maintained.

Major reform components have been (OECD 1997e: 76ff.; Noord 1997):

- Discontinuation of preferential treatment of public sector employees (1993).
- Measures to improve the pensions of older workers remaining active relative to those who retire early (1994 and 1996).
- Increase in the number of years on which the calculation of pensions is based from the last 4 years to the last 10 years (1996).
- Change in the indexation of earnings related pensions to a weighted average of CPI (80 percent) and earnings index (20 percent). National (basic) pensions remain indexed to CPI (1996).
- Decision to gradually abolish the flat-rate component of national pensions by the end of the decade. National pensions will in the future be fully offset against employment pensions.
- Adjustment of the funding method of the employment pensions (since 1993). Since 1993 also employees contribute to the system. Roughly three fifth of the contributions are used to finance current pension expenditure, the remainder enters the account of the pension institutions. A number of measures aim at raising the efficiency of the financing of the system.

As a result of the reforms, the rise in contributions necessary to balance the system is now expected to be contained to roughly 26 percent of earnings from 21.4 percent currently, compared to an estimated 38 percent under pre-reform rules.

2.7 France

In France, the pension system (OECD 1994a) comprises a large number of pay-as-you-go schemes (about 120 basic schemes and 400 supplementary ones). The system differentiates between the private sector and the public sector employees (including some categories of workers like railway men, miners, EDF-employees etc.). The private sector consists of a two-level system, the general level and the supplementary level while the public sector pensions are usually one-level. Retirement age, contribution rates and calculation of benefits may vary

considerably between different schemes (Kaufmann 1997). The ordinary retirement age, introduced in 1982, is 60. Funded pension schemes play only a very minor role.

In 1993, a first major effort to reforming the public pension system aimed at the method of calculation of pensions in the general scheme of the private sector (Darnant 1997). It included

- the increase of the contribution period necessary to receive the full rate pension from 37.5 years to 40 years;
- the increase of the number of years used for calculation of the reference wage from 10 to 25 years;
- the change of indexation from wage growth to CPI;
- the creation of a separate funds in order to finance non-contributory old-age benefits resulting from national solidarity.

The effect of the 1993 reform is rather limited. While it improves financial prospects until 2005, it leaves many questions unresolved particularly the sustainability of the public sector "special schemes". A proposal aimed at reforming public sector pensions had to be withdrawn in 1995 following strikes in the public sector. Given that demographic developments are relatively beneficial until 2005 but worsening progressively afterwards, the main problems are still to be solved.

In 1997, a law passed the National Assembly that allows employers and employees to contribute to fully-funded private pension schemes to top up their state retirement income. The levels of payments are voluntary but there is an incentive to contribute up to a certain level. The aim is to strengthen the role of privately managed capital funded pension schemes. However, after the change of government, legislation came to a halt and the situation remains unclear.

A peculiarity of the French situation is that despite the obvious demographic developments and a worldwide trend of increasing the retirement age there is a strong demand to go into the

opposite direction and decrease further the retirement age — which already is amongst the lowest in the world — to 55.

2.8 Germany

The provision of old-age pensions in Germany is dominated by the public system which provides roughly 85 percent of pensions. Voluntary occupational pension schemes, although some 50 percent of employees are covered, provide only 5 percent of pensions; around 10 percent comes from life insurance (OECD 1996d). Old-age insurance in the public pension scheme (Gesetzliche Rentenversicherung, GRV) is compulsory for employees other than civil servants whose pensions are paid out of general tax revenue, and voluntary for the self-employed. The system is financed pay-as-you-go by contributions levied on gross wages at the rate of 20.3 percent (1998), and a transfer out of the Federal budget that currently covers about one fourth of pension outlays. The statutory retirement age is 65, but employees can retire earlier if they have a long contribution record (at the age of 63), if they are handicapped (at the age of 60), or if they are unemployed prior to retirement (at the age of 60). Women also can retire at the age of 60 if they fulfill certain eligibility criteria. As a result of these rules, more than half of the work force retires before the statutory retirement age.

A major adjustment to the system has been made in 1992 in order to cope with the financial burden of a rising old-age depending ratio (SVR 1991: 142f.). Particularly, the retirement age for women will be raised gradually to 65 from 2001, and benefits for pensioners retiring early were reduced.¹⁶ Most importantly, the adjustment of pensions was changed from indexation to gross wages to indexation to net wages. Pension benefits are calculated according to a formula that is designed to replace 70.1 percent of average net wages during a 45-year working career (67.8 percent in East Germany).

¹⁶ The 1992 pension reform has diminished but not abolished the incentives for early retirement (Börsch-Supan 1998).

Despite the reform of 1992, the public pension system's viability remained in doubt due to the progressive aging of the population. To combat the expected increase in pension expenditure — from 11.1 percent of GDP in 1995 to almost 19 percent of GDP in 2035 (OECD 1996d: 71f.) — that without other changes would require an increase in the contribution rate from the current 20.3 percent to nearly 30 percent in 2030, a further reform package was legislated taking effect in 1999 (VDR 1997). The main feature of the Reform Act 1999 is that the ratio of pensions to net wages is gradually reduced according to a demographic factor reflecting the increase of life expectancy of new retirees. Ultimately, a ratio of 64 percent is projected to be reached in about three decades. Additional measures include a further increase in the effective retirement age especially for women, unemployed and handicapped people. After 2012, early retirement will only be possible for workers with at least 35 years of contributions at the age of 62 and at the price of an actuarial fair reduction of the pension.

According to new projections, the contribution rate that is necessary to finance the system at 1999 rules will be 24.4 percent in 2040 (Handelsblatt 1998b). Thus, the 1999 reform has only partly succeeded in balancing the finances of the public pension system in the long-term. While the package has broadly been in the directions outlined by the Council of Economic Advisors (SVR 1996: 227ff.), it has responded to the needs for reform only to a limited extent and it seems likely that further measures will prove to be necessary already in the near future (SVR 1997:98ff.). However, proposals for further reforms which include an increase of the retirement age to 70 years or an indexation of pensions to consumer prices rather than wages, are refused at the moment. Also, a shift towards a funded system as discussed in Siebert (1998) or Börsch-Supan (1998) is currently opposed in the political arena.

2.9 Italy

The Italian pension system is the most expensive old-age security system in terms of GDP among OECD-countries and has displayed a rapid expansion over the last 30 years. Although the average pension benefit relative to per capita income is broadly in line with other EU-countries, there is a disproportionate number of pensions relative to population. This, in turn, reflects the relatively high proportion of persons over 60, the use of pensions as a substitute for

passive income support to unemployed, and favorable access to early retirement through seniority pensions (until recently workers could retire after 35 years of work irrespective of age; in the public sector even earlier). Institutionally, the Italian pension system is extremely fragmented, administered by funds differentiated for professional categories (Klammer 1997). This translates into significant inequalities across groups, particularly with more favorable treatment for public sector employees and the self-employed.

In the early nineties, a number of minor reforms were undertaken; the most important probably the suspension of the link between nominal wage growth and pension benefits (1992). In August 1995, however, a major reform package passed Parliament (Dini reform). It provided (OECD 1996: 82ff.; Reynaud and Hege 1996):

- a shift from an earnings-based system to a contribution-based system, with contributions over a life-time period capitalized on the basis of nominal GDP growth;
- a flexible retirement age (57-65 years), with a link between benefits and residual life expectancy at retirement age;
- a phased increase from 35 to 40 years of contributions required for a seniority pension;
- a ceiling on the pensionable income;
- fiscal incentives for stimulating the growth of private pension funds.

As to the implementation of this major institutional reform, there is a transition period in which the old system and the new system co-exist. New entrants into the labor market fall under the new system, and workers with more than 18 years of contributions remain in the old one. To the intermediate group applies a weighted average of the old and the new formulas.

Although the 1995 reform represents an important improvement towards a more uniform and financially variable system, there still remains a significant shortfall between benefits and contributions. Moreover, the worsening of the situation over the coming 30 years is mitigated only to a limited extent. This is partly due to the long transition period; and the retirement age remains among the lowest in the OECD.

2.10 Japan

The Japanese pension system (OECD 1997d: 121ff.) consists of a major pillar of funded occupational pension schemes; 90 percent of private enterprises provide some form of occupational benefits at retirement, be it in form of a lump sum payment or in form of pensions. The public pension system is pay-as-you-go financed although the system has been held in surplus over an extended period of time which resulted in the accumulation of assets that amount to some 30 percent of GDP. It consists of two tiers. The first is a flat rate system, which covers, in principle, all residents between the ages of 20 and 60 (National Pension). Benefits are proportional to the number of years of contributions (minimum 25 years, maximum 40 years). In the second tier, contributions and pensions are related to earnings (Employees Pension). It is possible to contract out into certain occupational pension plans. Pensions are indexed to net wages. The statutory retirement age is 60 years.

Against the background of the extremely rapid aging of the Japanese population, a massive deterioration of the fiscal balance of the public pension system (or a drastic increase of contribution rates to around 35 percent from 17 percent today, respectively) was to be expected. As a reaction to the deteriorating prospects of the system, the pension system was revised in 1994 (Kihara 1998; Takayama 1995).

- The retirement age at which the full amount of the Pension is payable will be raised from 60 to 65 over the period 2001 to 2013 for men and over the period 2006 to 2018 for women.¹⁷
- The indexation was changed from gross wages to net wages.
- A one percent special contribution rate was applied to the semi-annually bonus payments which had not been subject to contributions before.
- The increase in the contribution rate which is scheduled to take place every five years was increased from 2.2 percentage points to 2.5 percentage points.
- Various measures aimed at promoting a delayed retirement were introduced.

¹⁷ For details of the rules concerning retirement age see Takayama (1995: 52ff.)

As a result of this measures it was expected that the contribution rate from the year 2025 onwards could be lowered from 35 percent to 30 percent. However, a revision in underlying assumptions about birth rates and life expectancy resulted in a revised estimate of the contribution rate that is necessary to balance the system in the long-term that is very close to the number of 35 percent estimated before the reform (Kihara 1998).

Despite this bleak outlook for the public pension system a discussion on a full-fledged reform of the system has barely started in the political arena.

2.11 Netherlands

The Dutch pension system consists of a pay-as-you-go financed public pension scheme that secures a universal basic pension, an extremely well developed occupational pension sector, and, in addition, voluntary retirement savings. The public old-age pension (*Algemeene Ouderdomswet*, AOW) is part of a broader social security scheme that also insures against nursing care and disability. It pays a flat-rate pension benefit to those who have reached the age of 65 which is set at 70 percent (100 percent for a married couple) of the statutory minimum wage. The full rate is contingent on 40 years of contribution. The benefit is reduced by 2 percent for each full year a person was not insured (Bedeé et al. 1995: 268). The AOW pension benefits amounted to 5.5 percent of GDP in 1996 (Heizel 1997), and they are financed pay-as-you-go by contributions that are levied on the first income bracket of the tax code at the rate of 15.4 percent (1997).

The second pillar is funded occupational pension schemes that have developed over a long period, and, probably partly as a consequence of the fact that the replacement rate under the public pension scheme falls sharply with increasing income, covers virtually the entire labor force (83 percent). This is highly unusual, since provision is voluntary. In most countries where provision is voluntary, coverage of occupational pension schemes tends to peak at around 50 percent (Davis 1996). Most pension plans are of the defined benefit type, usually designed to replace 70 percent of final salary at the age of 65 together with the public pension, and 90

percent of pensioners receive inflation protection.¹⁸ To increase labor mobility, there is a kind of clearing house implemented that makes transfers between defined benefit plans straightforward. The occupational pension funds have accumulated a huge amount of assets representing nearly 100 percent of GDP. Additional individual retirement saving is of relatively little importance, although there are quite significant tax incentives.

In the recent discussions on reforming social security, the main focus in the Netherlands has been on cutting down on expenditures for disability insurance which due to extremely generous rules had virtually exploded during the 1980s (OECD 1991) with the result that 15 percent of the labor force received disability benefits at the beginning of the 1990s (NZZ 1993). In 1993, disability benefits were reduced and eligibility criteria tightened.

With respect to old-age pensions, there have only been minor changes recently. Notwithstanding, contribution rates to the public scheme are planned to be held at around 15 percent. The government counts on an improved macroeconomic performance in general and an increase of the labor force participation ratio, which is extremely low by international standards, in particular in order to finance the rising pension expenditure that is expected due to the aging of the population. Also, the benefits level of the basic pension may be gradually lowered relative to the incomes of the active generations because statutory minimum wages are expected to lag behind average incomes. Any resulting deficit in the public pension scheme is planned to be covered by tax revenues. As to the occupational pension schemes, it is envisaged to calculate the benefits so that they replace 70 percent of average incomes over the whole career rather than 70 percent of the last earned wage.

2.12 New Zealand

In New Zealand, public pensions are flat-rate benefits which are not means-tested and paid from general tax revenues. The system works under the label "New Zealand Superannuation".

¹⁸ This is also unusual. In most countries with defined benefit plans, inflation protection is incomplete or partial, and, as a result, pensions often fall sharply in real terms over time (Davis 1996: 2).

Since 1994, benefits are differentiated according to household and marital status (NZZ 1994). In order to raise revenues in the process of fiscal consolidation, a surtax of 20 percent had been introduced in 1985 on additional retirement income that exceeds a certain limit. In 1992, the surtax rate was increased to 25 percent, and the limit was nearly halved which aggravated the detrimental incentive effects implied by this rule. The tax surcharge has been removed in 1997. From 1990 to 1993, the benefits which are normally adjusted for inflation remained nominally unchanged with the result of a real decrease in the benefits level.

Despite a currently relatively low level of benefits (public pension benefits in 1994 amounted to 5 percent of GDP in 1997, well below OECD-average), the rapid aging of population will put a considerable strain on the public finances. As one reaction, a gradual increase in the statutory retirement age, from 60 to 65 years, in the years 1992 to 2001 has been legislated.

In 1997, a major reform proposal was voted down by an overwhelming majority of 92.4 percent of the voters (Hall 1997). The reform essentially planned to replace the state pension with a compulsory private insurance scheme in which 8 percent of taxable income would have been set aside in individual long-term savings accounts a target sum (of 120 000 NZ\$) was reached in order to buy an annuity on retirement. The government would have supplemented the amount where the target would not have been met, but there would have been neither government guarantees nor indexation. The result would have been a decrease in government pension outlays to 2 percent of GDP in the long run. However, with the old system remaining in place now an increase to 12 percent of GDP is still to be expected (The Economist 1997).

2.13 Spain

The public pension system in Spain is part of a more general social security scheme that also includes support for survivors and disabled, health care, and social services. Contributions amount to 28.3 percent of wages of which only 4.7 percent are paid by employees. The share of contributions that goes to old-age pensions is not published separately. The system is extremely generous (OECD 1996a: 87f.), it delivers the highest income replacement ratio in

the EU after Greece (nearly 100 percent after contributions and taxes). Pensions are indexed to consumer prices.

Fiscal imbalances have led to subsequent reforms that partially rectified the problems for a limited period of time (OECD 1997c: 70ff.). In the second half of the eighties, benefit criteria were tightened with an increase in the minimum contribution period from 10 to 15 years, and pensions began to be assessed on the last eight rather than the last two years' earnings. Since 1988, old-age pensions in addition to the public pension system, can be obtained through participation in private pension funds which is promoted by the tax code. Because they have been introduced only recently, pension funds are still relatively spare although they are growing rapidly (Stapf 1996; OECD 1996a: 79ff.). The volume of assets amount to approximately 5 percent of GDP.

In 1995, a concept for reform known as the Toledo-pact envisaged only minor changes (Engler 1997), including an institutional separation of the different branches of social security, an increase in the number of years on which the calculation of pensions is based from 8 to 15, and a change in the pattern of the accrual rate over the time of contribution which is a (minor) step towards a more actuarially fairness and reduces incentives to retire early. Another important change is that financing of non-contributory pensions is no longer to be made from contributions but from general tax revenues by the year 2000. Any resulting surplus in the social security system shall be used to build up a reserve fund.

2.14 Sweden¹⁹

The Swedish public pension system consists of two pillars, a flat rate basic pension and an income-related supplementary pension (ATP). The system works primarily on a pay-as-you-go basis although there have been surpluses accumulated in the past amounting to some 35 percent of GDP (1994). Discussion about reform of the system is old. In 1994, a major

¹⁹ This section draws on OECD (1995b, 1997b) and Persson (1998).

reform proposal was principally agreed upon albeit the specific details of the report had not been decided at that time, and it was only at the beginning of this year when government and opposition parties agreed upon the introduction of the new system (Handelsblatt 1998; FAZ 1998). The dominant feature of the 1994 proposal was to improve actuarial fairness (only 25 percent of the contribution can be regarded as an (actuarial) insurance premium under the old system). The new system is to be phased in over a period of 20 to 25 years. Its main features are:

- The flat rate basic pension is gradually clawed back as the earnings-related pension exceeds a certain threshold.
- Earnings-related pensions are based on life-time income rather than the best 15 years as in the old system.
- Pensions are indexed to inflation with the indexing factor reduced when real GDP growth is under a certain norm (1,6 percent) and increased when growth exceeds that norm.
- The official retirement age remains 65 but earlier retirement from the age of 61 onwards and later retirement (no upper limit) is possible with an actuarial adjustment of the pension.
- Pensions will be linked to life expectancy at retirement.
- Strengthening of the funded element of the system. 2.5 percentage points of the contribution rate which at 18.5 percent of wages will be put into individual accounts to be managed upon the guidelines of the contributor.
- Contributions which used to be paid by employers only (since 1995 employees contributed at a rate of 1 percent) are shared equally between employers and employees in the new system. The extra-burden on workers is compensated by income tax reductions.

2.15 Switzerland

In Switzerland, the three-pillar system of old-age income provision has a long tradition. The system consists of a government-run old-age insurance (AHV) which is financed pay-as-you-go²⁰, obligatory occupational pension schemes on a funded basis, and voluntary savings promoted by preferential tax treatment.

The public pension AHV is financed by contributions by every person over 18 years at a rate of 4.2 percent of every earned income. Contributions are paid by employees and employers at an equal share. Since 1998, also spouses who are not in the labor force have to contribute and are from the year 2005 onwards entitled to a pension at the age of 64. There is also a contribution from the Federal budget amounting to around 20 percent of expenditures (Rechsteiner 1996: 376).

A minimum contribution is set at FR 390 per year, an upper limit does not exist. By contrast, for the resulting benefits there is an upper limit at FR 1 990 (1997) for a single and FR 2 985 for couples. The minimum pension is FR 995 and FR 1 493, respectively (Ahfeldt 1997). Pensions are adjusted according to the average of a wage index and the consumer price index, and the statutory retirement age is 65 for men and, since recently, also for women (Berger 1997).

As the public pension system is designed to deliver only a floor to retirement income, the second pillar has been made compulsory after a referendum in 1985. It requires employers to insure their employees with a pension scheme and pay at least half of the contributions which are 10 percent of the wage bill (Brestel 1998). While occupational pensions before the introduction of the obligatory second pillar often were lost when the employer was changed, the contributions are now paid into personal accounts that belong to the individual worker.

²⁰ The AHV consists of assets amounting to one year of expenditure (Ausgleichsfonds), however (Günthardt 1997).

The funds collected in the second pillar pension schemes amounted to roughly 90 percent of GDP in 1995 and are increasing rapidly.

Due to the huge funded part of the old-age pension system, the problems with the aging of the population are limited compared to other OECD-countries. However, the AHV which is pay-as-you-go financed will progressively run into a deficit and needs additional financing in the medium to long-term (NZZ 1998) in the absence of other reform measures.

2.16 United Kingdom

The public pension system in the United Kingdom originates from the Beveridge-idea of a comprehensive "National Insurance" (providing a basic flat rate benefit in the case of unemployment, sickness, and disability, and an old-age pension) that is financed by flat rate contributions (Disney and Johnson 1998). Additional private insurance would be left to the individual's choice. In the decades after the war, a system developed in which flat rate benefits were combined with earnings-related contributions which eventually led to the demand for an earnings-related component of pensions. As a result, in 1978 the State Earnings Related Pension Scheme (SERPS) was introduced. An essential feature of the arrangement was the contracting out principle, which allows to opt for contributing to an approved company pension scheme in exchange for a reduction in the contribution rate to the National Insurance. This is to be seen against the background that at the time of introduction of SERPS already half of the work force was covered by occupational pension schemes.

Further reforms, mainly the return to consumer price indexation (1979) and downgrading of SERPS benefits (1986) made the public pension scheme less attractive (and much less expensive for the budget in the long run). In addition, the range of pension plans entitled to obtain the contracted-out status was expanded to include defined contribution plans in order to make occupational pension schemes more attractive, especially for smaller companies. Also, the possibility of opting for individual retirement savings accounts (Personal Pensions) was introduced. As a result, since the mid-80s the number of persons remaining in SERPS declined further to around one quarter of the work force.

The problem for the government with this development has been that contributions to the pay-as-you-go system were reduced through increased contracting-out. An estimated 2 percentage points of the increase in National Insurance contributions that was necessary to finance the current expenditure on SERPS-pensions can be attributed to this factor (Disney and Johnson 1998)²¹.

In 1995, a reform bill was primarily designed to tighten up the regulation of occupational pension plans, but contained some notable components relevant to the future prospects of the public pension system. First, the pensionable age of women will be raised gradually to equal that of men at 65, between the years 2010 and 2020. Second, a technical reform of the calculation of SERPS benefits and the abolition of a guaranteed minimum pension will produce a large saving in future government expenditure.

As a result of a relatively small market share of pay-as-you-go financed public pensions consisting of basic pensions which are relatively low (approximately 15 percent of average earnings for an individual; Dilnot et al. 1994) and a small and declining portion of earnings-related pensions, combined with a compared to other countries relatively benign demographic structure, the problems of the public pension schemes in the United Kingdom are projected to be minor. Provided that the basic state pension continues to be indexed to prices, no increase in contribution rates will be necessary (OECD 1994b).

2.17 United States

In the United States, the central part of the public pension system is the Old Age, Survivors and Disability insurance (OASDI), which is known as Social Security. This is a defined benefit pension scheme financed by a pay-roll tax of currently 12.4 percent on a pay-as-you-go basis. The system covers in principle every person in employment (except part of the public sector

²¹ At the same time, the obligations in the future and, hence, the future contribution rates decreased.

and household servants with income of less than \$1 000 per year). There is an upper limit to average monthly earnings subject to the pay-roll tax. Benefits are calculated on the basis of the best 35 years of the career and are indexed to the consumer price index. The benefits formula contains a quite significant element of redistribution, so that low-income wage earners get a retirement return on their social security taxes at more than triple the rate of high-income wage earners (Kuttner 1998).

The OASDI is required to be financially balanced over a period of 75 years. In 1983, after a commission chaired by Alan Greenspan had testified a severe long-term financial disequilibrium, a reform was carried out that included a slight cut in the inflation adjustment formula, an increase in the taxable income base, a gradual raising of the statutory retirement age by two years to 67 beginning in the year 2000, and the taxation of social security benefits to retirees with abundant other incomes. Also incentives to retire early were reduced and obstacles to working longer years removed (Lumsdaine and Wise 1994: 21ff.). In addition, the Social Security tax rate was gradually raised from 10.8 to 12.4 percent.

In combination, these measures not only restored the short-term solvency of the system but generated a surplus of contributions and return on assets of the system over pension outlays. As a result, assets are accumulated in a Trust fund. The volume of these is expected to peak in the year 2021 (Kijakazi, Primus, Greenstein 1998)²². From that year on, expenditures on Social Security benefits will surpass revenues so that the trust fund assets will progressively be run down until from the year 2032 onwards, according to recent projections, the system becomes (partially) insolvent. In contrast to the assessment of the Greenspan commission, the 1983 reforms have apparently not been sufficient to stabilize the system. There is still a significant deficit diagnosed when finances are calculated over the next 75 years.²³

²² The amount of assets at the peak is estimated at around \$ 3 Trillion, about 35 percent of GDP in 1998 (The Economist 1998a).

²³ The unfunded obligations of OASDI are an estimated \$ 9 Trillion, 106 percent of this year's GDP (Mitchell 1998). The main reason for the revision has been unanticipated weak wage growth in the decade between 1983 and 1993. It has to be noted that the calculations are now based on

As a reaction to the perception of a high level of unfunded liabilities implicit in current rules, an Advisory Council was formed to evaluate the situation and possible reforms of the system. The committee came up with a number of reform proposals (Gramlich 1998), ranging from minor changes in benefit schedules and contribution rates (the financial balance would be restored mainly through improved investment of social security funds) to a wide-sweeping reform in which the present defined benefit system would be replaced with a large-scale defined contributions scheme, similar to the Chilean model.

Very recently, the proposal of a bipartisan working group has entered the discussion that essentially plans to divert two percentage points of the current 12.4 percent payroll tax into individual savings accounts (The Economist 1998b). To secure the system's solvency despite the reduced contributions that finance current pension expenditure, the retirement age would rise to 70 by 2029, and the early retirement age (at which a reduced pension can be received) would rise to 65 by 2017. In addition, some of the expected surplus in the Federal Budget could be used to finance the transition. As a result, the transition to a system comprising a significant funded pillar could be managed without a (Social Security-)tax rise.

While a major overhaul of the public pension scheme has not been decided yet, the administration has progressively increased incentives to save for retirement on voluntary basis (Eckhardt 1998). Contributions to individual retirement accounts are tax deductible up to a certain limit (currently \$2 000 per year). So called 401(k)-accounts (named after the respective paragraph in the income tax code) are tax favored savings where the amount of individual savings is matched by an employer contribution. Occupational pension schemes are relevant mainly for employers of major companies. The majority is of the defined-benefit type although defined contribution plans gained popularity in recent years, after a number of pension plans' solvency came into doubt in the early 1990s (The Economist 1993).

assumptions about real growth in the economy that are extremely moderate (1.6 percent annual real GDP growth, compared to about 3 percent over the last 75 years).

3. Other Parts of the World

3.1 Central and Eastern Europe

The formerly centrally planned economies in Central and Eastern Europe inherited a comprehensive unfunded pension system. Pension expenditure in percent of GDP has been in many countries quite high and has increased rapidly during the early years of transition, partly due to the fact that the necessary reduction of the work force often took place through early retirement. High pension expenditure is reflected in high rates of social security contributions, often at around 50 percent of gross wages (Holzmann 1997).²⁴

The typical old-age pension scheme that prevailed in Central and Eastern Europe is characterized by relatively low statutory retirement ages (Cichon et al. 1997: 16f), generally men were entitled to receive a pension at the age of 60, women at the age of 55 (with the exception of Poland where retirement ages were 65 and 60, respectively). Typical qualifying conditions were 25 years of contributions for men and 20 for women. Benefit formulas normally used a fixed percentage of reference income for the required minimum number of years, plus an increment for additional years of contributions. Actual replacement rates were usually relatively high and could reach 75 percent of the reference income for persons with 40 years of contributions and 50 percent for as little as 20 years of contributions. In the early years of transition, however, due to incomplete indexation, the real value of pensions declined markedly in a number of countries, with the result that despite high pension expenditure in terms of GDP a significant share of pensioners receive income below the official poverty lines (Holzmann 1997: 16).

Initial reform considerations were geared towards a financial redressing of the unfunded schemes and an elimination of the main distortions with the traditional measures. These include an increase in the statutory retirement age, an extension of the reference period on which

²⁴ In most countries, the lions' share, if not all, of the contributions is paid by the employer.

benefits are calculated, a reduction in the replacement rate, higher deaccrual factors for early retirement, price instead of wage indexation, elimination of group privileges, consistent tax treatment of contributions and benefits.

However, none of the reform countries succeeded in the implementation of a consistent reform package along these lines that would have made it possible to put the public pension scheme on a sound financial footing for the short and medium term. In most countries, only minor adjustments or discretionary changes have been made.²⁵

While progress in reforming the pay-as-you-go financed pension systems along traditional lines proved to be difficult against the background that such measures necessarily mean a cutback on acquired rights for important segments of the population, the focus increasingly shifted towards possibilities of a major systemic reform. Particularly, a move towards funded schemes by means of the introduction of a multi-pillar pension system as proposed by the World Bank (1994) gained popularity. In a number of countries, pension reform plans that include a (partial) shift to funded pension schemes have been proposed and in an increasing number of them, among them Estonia, Latvia, Hungary and Poland, the implementation is prepared in earnest or has even already started. The preparation of the reform plans has been assisted by the World Bank (Eesti Pank 1998) and financial assistance in the implementation is also granted (The Financial Times 1998). In the remainder of this section, recent developments in the three major countries of the region are described in more detail.

— Czech Republic

The main pillar of the Czech pension system is a public pay-as-you-go financed system comprising a flat-rate and an earnings-related component (since 1996). In order to provide additional retirement income, the establishment of private pension funds, which are restricted in

²⁵ For a country by country overview of pension reforms undertaken or under discussion see Cichon et al. 1997: 22ff.

their investment decisions, has been made possible as early as 1993. Participation in private insurance schemes is voluntary but supported by state contributions. Although the public pension expenditure is relatively modest at 9 percent of GDP (OECD 1996e) compared to other Central European countries, the rate of contribution to the public pension scheme at 26 percent is still high by international standards and expected to increase due to a deteriorating depending ratio. As a reaction, it was decided in a 1995 reform bill to gradually increase the retirement age from 60 years to 62 years for men and from 53 - 57 years (according to the number of children) for women to 57 - 61 years by the year 2006. Additional measures include a gradual increase in the number of active years on which the calculation of benefits is based from 10 to 30 years, the introduction of more formal indexing rules²⁶ and, maybe most importantly, strengthening the link between contributions and benefits. The pension reform debate has begun again recently, focusing on the introduction of an additional mandatory fully funded tier.

— Hungary²⁷

In Hungary, the National Pension Fund was established in 1991 paying pensions on a pay-as-you-go basis. A second voluntary tier was introduced in 1995 based on mutual funds. The aging of the population, declining employment rates and a large and rising share of the work force on early retirement and disability pensions has inclined the government to make a number of reforms in recent years. These reforms have included a broadening of the contributions base, and the raising of the statutory retirement age from 60 and 55 for men and women.

²⁶ Contributions are indexed to average wages and benefits to CPI and wages. The adjustment of pensions to developments in prices has still a significant discretionary element. According to the reform bill, pensions are to be adjusted when consumer price increases have accumulated to 5 percent, and increases in wages are to be taken into account. In order to generate savings in government expenditures in face of the deteriorating economic environment, it was, however, decided to raise pensions not before a rise in prices of at least 10 percent occurred (Lodaht and Schrooten 1998: 109).

²⁷ This section draws on OECD (1997f: 136ff.) and Cichon et al. (1997: 23).

respectively, to a uniform 62 years by 2009. In its latest reform package, there is also a change of indexation from a wage-based system to a combination of wages and consumer prices ("Swiss index").

The above changes in the pay-as-you-go scheme are expected to lead to a significant surplus in the finances of the system at today's contribution rate (30 percent) in the short to medium-term (although a fall into deficit after 2030 is still to be expected). These surpluses are planned to be used to help finance the transition to a more equitable and financially sustainable three-tier system which was started at the beginning of 1998. The new system comprises a scaled-down pay-as-you-go scheme, complemented by a compulsory, privately managed, fully-funded second tier and a voluntary fully-funded third tier.

In the new system, the pay-as-you-go tier will be defined benefit and earnings related providing a replacement rate of 40 percent after 35 years of contributions. It will be financed by three-quarters of the total present contributions. The remaining quarter will be paid into the individual retirement savings scheme. The new system will be compulsory for new entrants into the labor market, while existing employees under 47 years of age can opt for either the new multi-tier system or the modified old pension system.

— **Poland**

The Polish public pension system underwent a major revision in 1993, when the system was split up into two tiers (Heinrich et al. 1996: 87ff.). One tier provides a flat rate basic pension amounting to 24 percent of the average gross wage, the second tier pays a benefit related to the individual's years of contribution and her earnings in the five best of the fourteen years preceding retirement. Pension benefits are taxable. Together with the reform of the institutional characteristics of the pension system, the benefits level was raised in order to compensate for incomplete indexation in the preceding years, and a regular adjustment to changes in average wages was introduced. Currently, public pensions are on average as high as 70 percent of the average wage. As a result of the combination of a high benefits level and a rising number of

pensioners²⁸, public pension expenditure has increased strongly and has reached 16 percent of GDP compared to 10 percent on average in the OECD-countries.

The high financial burden of the existing pension system and the mounting doubts about its viability in the future led to persistent demand for further reform. Recently, a rather wide-sweeping reform²⁹ has been legislated and is scheduled to become effective beginning in 1999 (Woycicka 1998). It essentially means to replace the present social security system gradually by a system consisting of two mandatory pillars: the first financed on a pay-as-you-go but defined-contribution basis (as has been introduced recently in Latvia), and the second fully funded and privately managed. In addition, retirement income is to be supplied by voluntary individual savings. As to the first pillar, benefits are calculated according to past contributions and the life expectancy at retirement which effectively corrects for early or late retirement. In light of experience made in Latvia, however, the statutory retirement age will be kept at present levels. 20 percent of the current social security contributions (9 percent of wages) will be paid into the second leg of the system comprising individual accounts in privately managed but regulated pension funds.

The system will be introduced gradually. Workers aged over 50 remain in the old system. Workers younger than 30 will contribute to the new system, and workers between 30 and 50 can contribute to the second leg of the new system on a voluntary basis. A deficit in the current pension scheme that results from the effective 20 percent reduction in contributions to the pay-as-you-go system for younger workers is planned to be financed from the general budget using receipts from privatization.

²⁸ While the statutory retirement age at 65 and 60 for men and women, respectively, is relatively high compared to other Central European countries, the actual retirement age is much lower due to early retirement.

²⁹ For a detailed description of the reform and its rationale see World Bank (1997a: 72ff.) and Loboda and Szalkiewicz-Zaradzka (1998).

3.2 East Asia

East Asia is the most rapidly aging and most rapidly growing region (James 1997: 362). In many countries the aging of population combines with the erosion of the extended family, and governments will have to act quickly to these challenges. Currently, public pension schemes based on the principle of pay-as-you-go financing are virtually non-existent. While in some countries, like Singapore and Malaysia, retirement saving is mandatory and in the Philippines, there is a relatively well-developed two-pillar pension system (Asher 1998), most countries, including China and Indonesia, still have to build up formal universal pension schemes. Recent steps have been dominated by efforts to extend the coverage of occupational pension schemes on a defined-contribution basis (Piazolo 1998). A special case which deserves particular attention is China, where the problems of the pension system interlink with the challenge of structural adjustments in the state-enterprise sector (World Bank 1997b).

3.3 Latin America

Public pension systems have in Latin America traditionally been financed pay-as-you-go. These systems, however, have fared particularly bad in an international comparison. They did not deliver what they had promised, and although there had been cuts in benefits and a rising rate of contributions, financial disequilibrium increased. The Argentine public pension system, for example, was virtually bankrupt in 1991 (Queisser 1998).

In view of the deteriorating performance of the pay-as-you-go schemes and the prospects for a further worsening of the situation, an increasing number of Latin American governments decided to implement a major systemic reform, partly along the lines of the Chilean model, partly more in accordance with the World Bank's three-pillar approach. However, the introduction of a significant element of pre-funding of pensions was at the heart of the reforms in any case.

The Chilean reform of 1981 is well known and well documented (e.g. Edwards 1998; Vittas 1995). Essentially, the reform meant to privatize old-age pensions. The former pay-as-you-go

system which was inefficient, distributively unjust and basically insolvent was replaced with a mandatory individual capitalization, fully funded, privately managed system that delivers pensions on a defined contribution basis. The government guarantees a minimum pension that is defined relative to the average yield of the pension funds. Pension claims that had been accumulated under the old system were recognized by issuance of government bonds.

While there have been some weaknesses identified, including a lack of coverage, problems of moral hazard among low wage workers, and high administration costs, the Chilean reform has been widely judged as a success. This may have contributed to a spreading of the idea of reforming public pension systems towards more funding to an increasing number of Latin American countries. Major reforms have been undertaken or are underway in Argentina (1994), Bolivia (underway), Colombia (1994), Mexico (1992, 1995), and Uruguay (1996). Other countries, including Brazil, Costa Rica, Ecuador, El Salvador, Honduras, and Paraguay, are engaged in serious discussions. In all cases the reform involved setting up a fully-funded saving plan, continuing to pay the pensions of retirees and of workers who do not switch, and issuing bonds recognizing the accrued entitlements of workers who do switch (James 1997: 363). However, the reforms in the individual countries differ significantly in a number of key respects.³⁰ Differences can be identified concerning the character of the funded pillar (mandatory or voluntary), the mode of financing of the new system, the size of a remaining pay-as-you-go pillar and the existence and level of a guaranteed minimum pension, the size and finance of the transition obligation, and the details of the regulatory framework. The variations in recent approaches to old-age pension reform in Latin America will give an opportunity to gain further empirical evidence on the shape of a well-designed pension reform.

³⁰ For a more detailed discussion of the characteristics of the reforms and of problems associated with the various pension systems see Aiyer (1997) and Mitchell and Barreto (1997).

4. Concluding Remarks

There is a clear tendency to reforms that increase the degree of pre-funding of pension obligations. A number of countries has proceeded significantly along that route, be it through stronger funding in the public pension schemes (Canada, Finland, Sweden, US), be it through strengthening the role of private occupational pensions (Australia, Denmark, the Netherlands, Switzerland, UK). These measures that tend to lessen the burden on future generations, have resulted in a burden today that is somewhat higher than without such reforms despite the fact that measures to restrain expenditure were taken also. In some countries, contribution rates are raised beyond what would be necessary without an increased funding, in other countries subsidies to the system from general tax revenues are increased. Another set of industrial countries have confined their reforms mainly to more or less significant adjustments to the prevailing pay-as-you-go systems, without increasing the funded element (Austria, Belgium, France, Germany, Italy, Japan, New Zealand, Spain). The capacity of the conventional measures to redress these systems in order to balance their finances in the long-term seems limited, however:

- An increase in revenues through higher contribution rates or taxes is obviously about to reach a ceiling in a number of countries due to the associated excess burden of such a policy and rising international tax competition.
- Lowering of other public expenditure (e.g. education or defense) can only contribute partially given the scope of the task.
- A marked increase in the retirement age can potentially contribute significantly but is politically difficult to implement, especially where high unemployment is effectively pressing actual retirement age into the opposite direction.
- The reduction in the benefit level per retiree through lower pension benefits, lower indexation, higher taxing or enhanced means-testing has been applied in recent reforms in various countries but these measures can only mitigate some of the problems and are unlikely to put the pension schemes on a sound long-term fiscal footing.

Because an early move to increased funding can reduce significantly the burden that is to be ultimately borne when the strong cohorts will retire, pension reform in that direction should be part of a strategy to cope with the problems of an aging population. Particularly, the majority of Euroland countries have until now been lagging behind on that route. By increasing the capacity to finance the transition, further consolidation of the general government finances (excluding social security) can greatly contribute to the viability of a major switch to funded pensions. The rectifying of existing pay-as-you-go schemes (raising retirement age, eliminating rewards for early retirement, downsizing benefits) can be seen as a first necessary step on the way towards a system comprising a major funded pillar, in order to reduce the uncovered liabilities and increase the relative attractiveness of a new system. Perhaps the examples of more radical reforms in some future member countries of the European Union in Central Europe can stimulate the discussion on more decisive reforms in the Union itself.

References:

- Ahfeldt, H. (1997). Umlagesystem dient nur der Sicherung der Existenz. *Handelsblatt*, 11. Dezember.
- Aiyer, S.-R. (1997). Pension Reform in Latin America: Quick Fixes or Sustainable Reform? *World Bank Policy Research Working Paper* 1865.
- Asher, M.G. (1998). Die Zukunft der Altersversorgung in Südostasien. *Internationale Revue für Soziale Sicherheit* 51 (1): 3–34.
- Barnes, H. (1995). Security for Elderly. *The Financial Times*. 29. März.
- (1997). The Danes Will be Growing Old Gracefully. *The Financial Times*. 9. April.
- Bateman, H., and J. Piggott (1997). Mandatory Retirement Saving: Australia and Malaysia Compared. In M.S. Valdés-Prieto (ed.). *The Economics of Pensions*. Cambridge.
- Battle, K. (1996). A New Old-Age Pension. In K.G. Banking and R. Boadway (eds). *Reform of Retirement Income Policy*. Kingston.
- Bodee, H., W. D'haese, V. Peitry, and A.J. Rompelman (eds.) (1995). *The International Guide to Social Security*. The Hague.
- Berger, A. (1997). Die AHV von 1948 bis heute. *Neue Zürcher Zeitung*, 30. Juni: 65.
- Blake, D. (1997). Pension Choices and Pension Policy in the United Kingdom. In S.Valdés-Prieto (ed.). *The Economics of Pensions*. Cambridge: 277–317.
- Börsch-Supan, A. (1998). Germany: A Social Security System on the Verge of Collapse. In H. Siebert (ed.). *Redesigning Social Security*. Tübingen.
- Brestel, H. (1998). 400 Milliarden Franken Zwangssersparnisse in der Schweiz. *Blick durch die Wirtschaft*. 12. März.

- Callatay, E. de, and B. Turtelboom (1997). Pension Reform in Belgium. *Cahiers Economiques de Bruxelles* 156: 373–412.
- Cichon, M., K. Hagemeyer, and M. Ruck (1997). Social Protection and Pension Systems in Central and Eastern Europe. *ILO-CEET Working Paper* 21.
- Darnant, N. (1997). Reform of the Social Security System in France: Challenges and Prospects. In *European Economy, Reports and Studies* 4: 193–236.
- Davis, E.P. (1996). International Experience of Pension Fund Reform and its Applicability to the Netherlands. *The Pensions Institute Discussion Paper* 9611.
- (1998). Pensions in the Corporate Sector. In H. Siebert (ed.). *Redesigning Social Security*. Tübingen.
- Dilnot, A.W., R. Disney, P. Johnson, and E. Whitehouse (1994). Pensions Policy in the UK—An Economic Analysis. London. Institute for Fiscal Studies.
- Disney, R., and P. Johnson (1998). The United Kingdom: A Working System of Minimum Pensions? In H. Siebert (ed.). *Reforming Social Security*. Tübingen.
- The Economist (1993). And when they got there... 18. December.
- (1997). When Pay Stops. 19. July.
- (1998a). Social Security, Star of the Show. 31. January: 50.
- (1998b). And the Work Goes on. 23. May.
- Edey, M.L. (1997). Retirement Income Policy in Australia. In S.A. Sass and R.K. Triest (eds.). *Social Security Reform. Federal Reserve Bank of Boston Conference Series* 41.
- Eesti Pank (1998). Republic of Estonia Memorandum of Economic Policies. [Http://www.ee/epbe/en/release/memorandum.html](http://www.ee/epbe/en/release/memorandum.html).

- Edwards, S. (1998). Chile: Radical Change Towards a Funded Pension System. In H. Siebert (ed.), *Redesigning Social Security*. Tübingen.
- Eckhardt, J. (1998). Privat vorsorgen oder kurztreten. *Handelsblatt*, 2. Juni.
- Engler, A. (1997). Renten in Spanien auf weichem Fundament. *Börsen-Zeitung*, 12. März.
- FAZ (1998). In Schweden gibt es eine Einigung über die große Rentenreform. *Frankfurter Allgemeine Zeitung*, 14. Januar.
- The Financial Times (1998). Hungary to Reform Pensions. 30. January.
- Gamillscheg, H. (1997). Volkspension auf dem Prüfstand. *Frankfurter Rundschau*, 17. Januar.
- Granlich, E.M. (1998). The United States: How to Deal with Uncovered Future Social Security Liabilities. In H. Siebert (ed.), *Reforming Social Security*. Tübingen.
- Gruber, J. (1997). Social Security and Retirement in Canada. *NBER Working Paper* 6308.
- Günthardt, W. (1997). Offene Generationsrechnung bei der AHV. *Neue Zürcher Zeitung*, 30. Juni: B5.
- Guger, A. (1998). Austria's Pension System in an International Comparison. *Austrian Economic Quarterly* 1 (1): 31–42.
- Hall, T. (1997). NZ Coalition in Doubt After Referendum Defeat. *The Financial Times*, 30. September.
- Handelsblatt (1998a). Parteien einigen sich nach zähem Ringen auf Rentenreform (12. Januar).
- (1998b). Rentenbeiträge sollen bis 2002 stabil bleiben. 21. Mai.
- Heinrich, R.P., M.J. Koop et al. (1996). *Sozialpolitik im Transformationsprozeß Mittel- und Osteuropas*. Kieler Studien 273. Tübingen.
- Hetzl, H. (1997). Pensionsfonds federn vieles ab. *Börsen-Zeitung*, 5. April.

- Holzmann, R. (1997). Pension Reform in Central and Eastern Europe: Necessity, Approaches and Open Questions. *Serie Financiamiento Del Desarrollo* 45. Santiago /Chile.
- James, E. (1997). Public Pension Plans in an International Perspective. In M. S. Valdés-Prieto. *The Economics of Pensions*. Cambridge.
- Jones, U. (1997). Reforming New Zealand Welfare. St. Leonards.
- Kaufmann, O. (1997). Alterssicherung in den französischen Sondersystemen. *Die Angestelltenversicherung* 44 (9): 430-442.
- Kihara, S. (1998). How Should Japan's Public Pension System be Revised? *Japan Research Quarterly* 7 (1): 64-113.
- Kijazaki, K., W. Primus and R. Greenstein (1998). Understanding the Financial Status of the Social Security System in Light of the 1998 Trustee's Report. <http://www.cbpp.org/424socsec.html>.
- Klammer, U. (1997). Alterssicherung in der Europäischen Union II: Alterssicherung in Italien. Berlin.
- Kramer, C., and Y Li (1997). Reform of the Canada Pension Plan: Analytical Considerations. *IMF Working Paper* 97.141.
- Kuttner, R. 1998). Rampant Bull. *The American Prospect* 39 (July-August: 30-36).
- Lenhardt, P. (1997). Die gescheiterte Reform. *Die Presse*, 6. November.
- Loboda, A., and L. Szalkiewicz-Zaradzka (1998). Zur Reform des Rentenversicherungssystems in Polen. *Wirtschaft und Recht in Osteuropa* 7 (4): 128-130.
- Lodahl, M., and M. Schrooten (1998). Probleme der Rentenversicherung in Osteuropa. *Soziale Sicherheit* 47 (3): 104-110.

- Lumsdaine, R.L. and D.A. Wise (1994). Aging and Labor Force Participation: A Review of Trends and Explanations. In Y. Noguchi and D.A. Wise. *Aging in the United States and Japan*. Chicago.
- Mitchell, O.S., and F.A. Barreto (1997). After Chile, what? Second-Round Pension Reforms in Latin America. *NBER Working Paper 6316*.
- Mitchell, O.S. (1998). Developments in Pensions. *NBER Reporter*. Spring 1998.
- NZZ (1993). Niederländische Rentenreform verabschiedet. *Neue Zürcher Zeitung*, 8. Juli.
- (1994). Pensionsfragen im pazifischen Raum. *Neue Zürcher Zeitung*, 11. Februar.
- (1996). Staatszuschuß zur niederländischen Altersrente. *Neue Zürcher Zeitung*, 18. September.
- (1998). Wie solide ist die Altersvorsorge? *Neue Zürcher Zeitung*, 28. Februar.
- Noord, P. van den (1997). Finland — Reforming the Pension System. *The OECD Observer* 207. October/November 1997: 34–35.
- Noord, P. van den, and R. Herd (1993). Pension Liabilities in the Seven Major Economies. *OECD Working Paper 5*. Paris.
- OECD (1991). *Economic Surveys*. Netherlands. Paris.
- (1994a). *Economic Surveys*. France. Paris.
- (1994b). *Economic Surveys*. United Kingdom. Paris.
- (1994c). *Economic Surveys*. Belgium/Luxembourg. Paris.
- (1995a). *Economic Outlook 57*. June. Paris.
- (1995b). *Economic Surveys*. Sweden. Paris.
- (1996a). *Economic Surveys*. Spain. Paris.

- (1996b). Aging in OECD-countries: A Critical Policy Challenge. *OECD Social Policy Studies* 20. Paris.
 - (1996c). *Economic Surveys*. Canada. Paris.
 - (1996d). *Economic Surveys*. Germany. Paris.
 - (1996e). *Economic Surveys*. The Czech Republic. Paris.
 - (1997a). *Economic Surveys*. Italy. Paris.
 - (1997b). *Economic Surveys*. Sweden. Paris.
 - (1997c). *Economic Surveys*. Spain. Paris.
 - (1997d). *Economic Surveys*. Japan. Paris.
 - (1997e). *Economic Surveys*. Finland. Paris.
 - (1997f). *Economic Surveys*. Hungary. Paris.
- Piazolo, M. (1998). Alterssicherungssysteme in Asien: Reformbedarf und neueste Entwicklungen. *Asien* 66 (Januar): 5–22.
- Persson, M. (1998). Reforming Social Security in Sweden. In H. Siebert (ed.) *Redesigning Social Security*. Tübingen.
- Rechsteiner, R. (1996). Neugestaltung der schweizerischen Alterssicherung: flexibler, funktioneller und sozialer. *Schweizerische Zeitschrift für Sozialversicherung* 40 (5): 372–398.
- Reynaud, E., and A. Hege (1996). Italien: Grundlegende Umgestaltung der Altersversorgung. *Internationale Revue für Soziale Sicherheit* 49 (3): 75–86.

- Rosenman, L., and J. Warburton (1996). Umgestaltung der australischen Altersversorgung: Veränderungen in den Arbeits- und Ruhestandsstrukturen und ihre Auswirkungen. *Internationale Revue für Soziale Sicherheit* 49 (4): 5–27.
- Rürup, B. (1997). Perspektiven der Pensionsversicherung in Österreich. *Study commissioned by the Federal Ministry of Labor, Health and Social Affairs*. Vienna-Darmstadt.
- Siebert, H. (1998). Pay-as-you-Go versus Capital-Funded Pension Systems: The Issues. In H. Siebert (ed.), *Redesigning Social Security*. Tübingen.
- Stapf, H. (1996). Alterssicherung in der Europäischen Union I — Alterssicherung in Spanien. Berlin.
- SVR (1991). Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung. *Die wirtschaftliche Integration in Deutschland. Perspektiven — Wege — Risiken*. Jahresgutachten 1991/92. Stuttgart.
- (1996). Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung. *Reformen voranbringen*. Jahresgutachten 1996/97. Stuttgart.
- (1997). Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung. *Wachstum, Beschäftigung, Währungsunion — Orientierungen für die Zukunft*. Jahresgutachten 1997/98. Stuttgart.
- Takayama, N. (1995). Der Gesetzentwurf von 1994 zur Reform der öffentlichen Renten in Japan: Hauptinhalt und Erörterung. *Internationale Revue für Soziale Sicherheit* 48 (1): 51–73.
- Vittas, D. (1998). Strengths and Weaknesses of the Chilean Pension Reform. Washington.
- VDR (1997). Verband Deutscher Rentenversicherungsträger. *Die Rentenreform 1999*. Frankfurt.
- World Bank (1994). *Averting the Old-Age Crisis*. Oxford.

— (1997a). Poland Country Economic Memorandum. Washington.

— (1997b). Old Age Security. Pension Reform in China. Washington.

Woycicka, I. (1998). Dreisäulenmodell soll Rentensystem vor dem Kollaps retten.
Handelsblatt, 2. Juni.