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10

Entitlement Reforms in Europe
Policy Mixes in the Current Pension Reform Process

Axel H. Börsch-Supan

10.1 Introduction

Europe is proud of its entitlement programs. They include, in approximate order of size: (a) public pensions, (b) public health care and health insurance, (c) unemployment insurance and active labor market policies, and (d) others, which are primarily child care, maternity benefits, family cash benefits, and means-tested social assistance, plus sickness benefits, long-term care insurance, and many smaller programs. Together, these entitlement programs represent between 20 and 30 percent of GDP in most European countries—with considerable variation, especially in Eastern Europe (figure 10.1)—while entitlement programs are about 18.5 percent of GDP in the United States.

The generosity of the European entitlement programs is considered a great social achievement because it has historically provided social stability over the life cycle and across business and political cycles. Population aging, negative incentive effects, and other design flaws, however, threaten the very core of these public support systems. As the current debt crisis in Europe shows, they may themselves become a source for fiscal instability due to their large costs.

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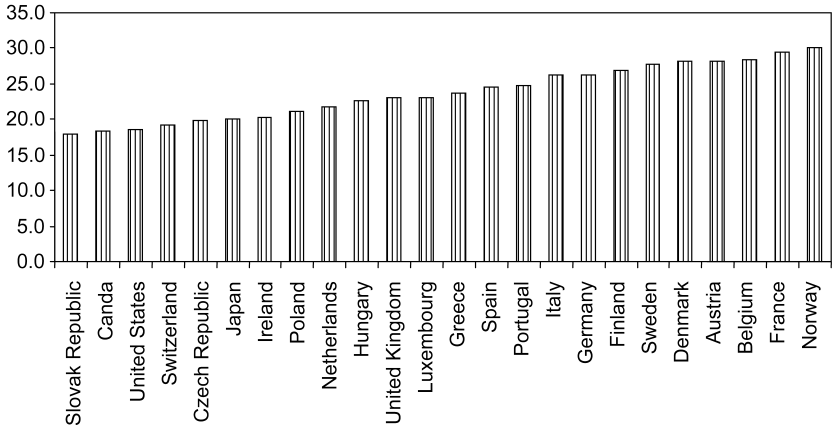

Fig. 10.1 Entitlement programs in Europe and other selected countries (percentage of GDP, 2011)

Source: OECD Social Expenditure database (SOCX, www.oecd.org/els/social/expenditure, November 2011).

Not only the size but also the structure of entitlements by the four above-mentioned program groups is quite different across countries (see table 10.1).

Pension expenditures account for more than half of entitlements in Italy and Greece, while they are less than 20 percent in Ireland and Denmark. Health care, in turn, accounts for the largest share of entitlements in the United States and Canada with more than 40 percent, while it is only about 22 percent in Estonia and Finland. The Mediterranean countries have large pensions systems, but small unemployment insurance and social assistance systems, a structure of public expenditures that has regained prominence in the current debt crisis because it worsens both long-term prospects for debt reduction (due to the implicit debt created by pensions entitlements) and the ability to sustain austerity programs (due to the lack of sufficient unemployment insurance and social assistance).

Since public pension expenditures are the single largest item in the social budget in almost all European countries, this chapter largely focuses on public pension systems. They alone represent a substantial share of GDP. In 2011, Italy and France are frontrunners with some 14 percent of GDP, and in Greece, Portugal, and Austria, this share is about 12 percent—roughly twice the share of GDP compared to the United States (6.7 percent of GDP). In terms of fiscal stability in the current debt crisis, pension systems are a scary example of how current program design, the size of future entitlements, and political credibility interact as either virtuous or vicious spirals. This chapter argues that it is not a coincidence that the countries that spend the highest share of GDP in pension entitlements are also the countries that are currently most pressured to offer very high yields to sell government bonds.

Table 10.1 **Structure of entitlement programs, 2011 (percent of total entitlement programs)**

2011	Pensions (%)	Health (%)	Working age (%)	Children/other (%)
Austria	43.0	24.5	20.5	12.1
Belgium	31.8	25.7	27.5	15.1
Canada	23.9	*44.1*	14.5	17.5
Czech Republic	32.7	29.2	23.1	15.1
Denmark	**19.6**	22.3	26.8	*31.3*
Estonia	31.7	**22.1**	*30.4*	15.8
Finland	31.6	**22.0**	25.1	21.3
France	42.5	25.0	16.6	15.9
Germany	39.4	30.6	15.6	14.4
Greece	*51.1*	25.8	**10.0**	13.1
Hungary	40.8	22.8	23.6	12.8
Ireland	**16.8**	27.0	*36.8*	19.3
Italy	*51.9*	24.7	11.5	11.8
Japan	46.5	33.5	**8.5**	11.5
Luxembourg	27.8	27.7	28.1	16.4
Netherlands	21.3	27.5	27.3	23.9
Norway	22.6	25.4	26.4	25.6
Poland	45.2	22.0	17.2	15.5
Portugal	44.8	26.9	18.7	**9.7**
Slovak Republic	31.9	30.7	23.7	13.7
Slovenia	41.5	24.3	19.2	15.0
Spain	33.0	23.8	25.5	17.8
Sweden	26.4	24.4	20.8	*28.5*
Switzerland	33.2	28.2	24.7	13.9
United Kingdom	23.0	29.3	23.2	24.6
United States	32.9	*44.7*	15.1	**7.3**

Source: OECD Social Expenditure database (SOCX, www.oecd.org/els/social/expenditure, November 2011).

Note: The countries with the two highest and two lowest values are marked in bold and italics.

Through this mechanism, high pension costs imply high costs of debt service, thereby worsening the fiscal balance and crowding out other spending.

Ironically, in spite of their size, some of the expensive pension programs nevertheless fail to provide adequate support for certain population groups since they are targeted heavily to the middle-class median voter. Greeks aged sixty-five and over, for example, face a poverty rate of 22.7 percent, almost twice as large as the Organization for Economic Cooperation and Development (OECD) average.

This chapter links the causes for current problems to the cures required to make the typically pay-as-you-go financed entitlement programs in Continental Europe sustainable above and beyond the financial crisis. It discusses examples that appear, from a current point of view, to be the most viable and effective options to bring the entitlement system closer to fiscal balance

and still achieve their key aims (e.g., preventing old-age poverty). It stresses that there is nothing like "the optimal pension reform" since the initial state (in particular the current institutional setup) varies as much as the causes for problems in the future. In any case, solutions to the demographic challenges ahead require a mix of reform elements, as no single element is likely to suffice quantitatively in the face of the dimensions of population aging.

The first part of the chapter sets the stage with a brief overview of the current landscape of entitlement programs in Europe (section 10.2).

The main body of the chapter focuses on the pension reform process in Europe. Section 10.3 is devoted to the causes for reform, while section 10.4 outlines possible cures and presents concrete examples. Specifically, section 10.3 describes (a) the lack of sustainability due to population aging, (b) the negative incentive effects that threaten not only the stability of pension systems but economic growth at large, and (c) examples of where pension adequacy fails.

Section 10.4 is then devoted to the respective cures: (a) setting limits to contribution rates and increasing retirement age will lower the weight of pay-as-you-go financed public pensions; (b) private saving and longer working lives will have to fill the emerging gaps, obtaining a larger weight in retirement income; and (c) since the reform steps have large redistributive consequences, they may require additional targeting.

Section 10.5 provides some estimates of the fiscal effects of these reforms, and section 10.6 concludes.

10.2 The Current Design of Pension Systems in Europe

Figure 10.1 and table 10.1 have shown how different the European entitlement programs are, both in overall size (as percent of GDP) and structure (pensions vs. health care vs. working age vs. children).

Similarly, pension systems are very different across Europe. We focus on four dimensions that characterize the pension systems in Europe: prefunding versus pay-as-you-go financing; earnings-related versus flat benefits; generosity in terms of replacement rate; and eligibility age for pension benefits. The point is not to provide an exhaustive description of European pension systems (for that purpose, see, e.g., OECD 2011), but to give an idea how diverse the initial positions are for potential pension reform in Europe.

The first characterizing dimension is the share of retirement income provided by public pay-as-you-go pension pillars vis-à-vis occupational and private pillars that are, in general, fully funded (see figure 10.2).[1] This dimension is important because pay-as-you-go pensions have to be financed by the next generation through contributions while prefunded pensions are financed by the same generation through savings, which also enjoys the con-

1. Some occupational pensions in France are also at least partly pay-as-you-go.

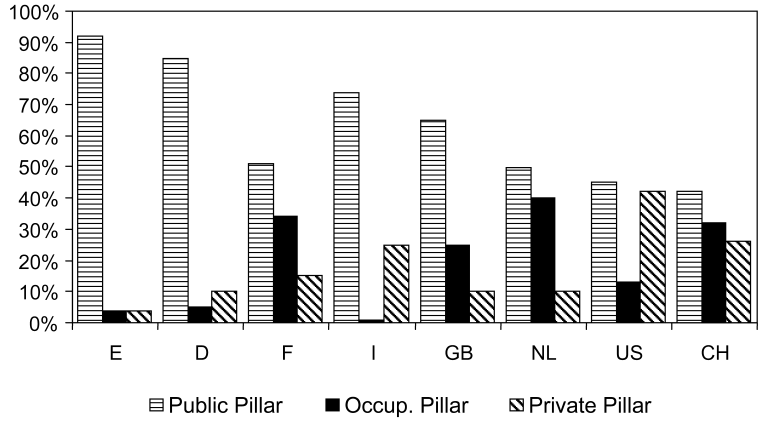

Fig. 10.2 Public, occupational, and private pension income in selected countries (percentage of total retirement income)
Source: Updated from Börsch-Supan and Miegel (2001).

sumption value of pensions. The share of the public pay-as-you-go pillars in total retirement income varies greatly between 92 percent in Spain and 42 percent in Switzerland.

The second characterizing dimension is the linkage between pension benefits and contributions, which are usually a fixed percentage of earnings. Its importance stems from the underlying negative incentive effects on labor supply. It has two extremes: flat pensions without any link to earnings, usually associated with the name of Lord Beveridge, and pensions that are strictly proportional to contributions, usually associated with the name of Chancellor Bismarck. In a Beveridgian system, contributions tend to be interpreted as taxes with resulting labor supply disincentives, while in a Bismarckian system, contributions are closer to insurance premiums.[2] There are many refinements: some pension systems define pension benefits ex ante, while in others benefits emerge ex post as the outcome of lifetime contributions. Often, the public pension systems consists of two parts: a flat-benefit part to prevent poverty ("pillar 0" in the language of the World Bank; Holzmann and Hinz 2005), and an earnings-related part that is usually capped at a maximum benefit level ("pillar 1").

Table 10.2 is adapted from OECD (2011) and characterizes European pension systems along these lines. The Denmark and the Netherlands, for example, have a basic pension that is essentially independent from the contributions paid and/or the income earned during working life (Beveridge type). France and Germany, on the other hand, have earnings-related pensions based on a point system that defines the benefits (Bismarck type).

2. See Börsch-Supan and Reil-Held (2001).

Table 10.2 Structure of pension programs, 2010

	Poverty prevention part ("pillar 0")			Earnings-related part ("pillar 1") Type
	Resource tested	Basic	Minimum	
Austria				DB
Belgium	x		x	DB
Czech Rep.		x	x	DB
Denmark	x	x		
Estonia		x		Points
Finland			x	DB
France			x	DB+points
Germany	x			Points
Greece			x	DB
Hungary				DB
Ireland		x		
Italy	x			NDC
Japan		x		DB
Luxembourg	x	x	x	DB
Netherlands		x		
Norway			x	NDC
Poland			x	NDC
Portugal			x	DB
Slovak Republic			x	Points
Slovenia			x	DB
Spain			x	DB
Sweden			x	NDC
Switzerland	x		x	DB
United Kingdom	x	x	x	DB
United States				DB

Source: Adapted from OECD, *Pensions at a Glance,* 2011.

Notes: Resource-tested plans pay a higher benefit to poorer pensioners. The value of benefits depends on income from other sources and, in some countries, on assets. Basic schemes pay flat benefits (in some countries, their value depends on years of work but not on past earnings. Additional retirement income does not change the entitlement. Minimum pensions are resource-tested plans in which the value of entitlements takes account only of pension income but it is not affected by income from savings, etc. In some countries, benefits for workers with very low earnings are calculated as if the worker had earned at a higher level. Defined-benefit (DB) plans are those in which retirement income depends on the number of years of contributions and individual earnings. Point schemes are those in which workers earn pension points based on their earnings each year. At retirement, the sum of pension points is multiplied by a pension-point value to convert them into a regular pension payment. Defined-contribution (DC) plans are those in which contributions flow into an individual account. The accumulation of contributions and investment returns is converted into a pension-income stream at retirement. Notional defined countribution (NDC) plans record contributions in an individual account and apply a rate of return to the balances. The accounts are "notional" in that the balances exist only on the books of the managing institution. At retirement, the accumulated notional capital is converted into a stream of pension payments using a formula based on life expectancy.

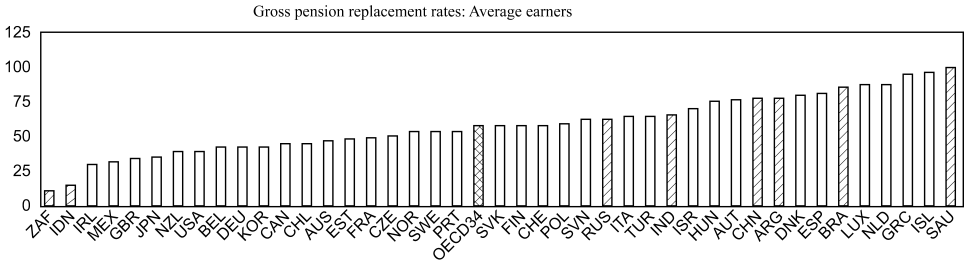

Fig. 10.3 Gross relative pension level (average pension in percent of average earnings)

Sources: OECD pension models; StatLink (http://dx.doi.org/10.1787/8888932370835); OECD, *Pensions at a Glance* (2011).

Sweden and Italy introduced notional defined contribution systems (NDC). These are pay-as-you-go pension systems mimicking funded systems insofar as they accrue interest on the contributions into personal accounts that are, upon retirement, converted into annuities. They feature the closest link between contributions and benefits, followed by the point systems (e.g., in France and Germany).

Third, pension replacement rates are a measure for the generosity (and thus costs) of pension systems. Figure 10.3 shows the average pension in percentage of average earnings before taxes, with a very large variation from just over 25 percent to almost 100 percent. Ireland has the lowest and Greece the highest replacement rate in Europe. The OECD average is slightly above 50 percent.

Finally, the fourth characterizing dimension is the eligibility (commonly, retirement) age because of its strong influence on labor supply and system costs. Figure 10.4 shows the statutory and effective retirement ages. Already the statutory retirement ages display an enormous variation and even more so the effective retirement ages.

The figures in this section show clearly how different the current pension systems in Europe are. They vary in all policy-relevant dimensions: financial mechanism, structure, generosity, and labor market influence. Much of this is due to historical country-specific political and cultural preferences. As a first consequence, pension expenditures are only loosely related to the demographic structure of a country (see next section). Secondly, there is no single optimal design strategy for pension reform in Europe; rather, pension reform has to focus on different design dimensions in each country to account for the country-specific initial states.

10.3 Causes for Reform

Population aging is one important reason to align current entitlements with future fiscal capacity. As a consequence, pension and entitlement reform

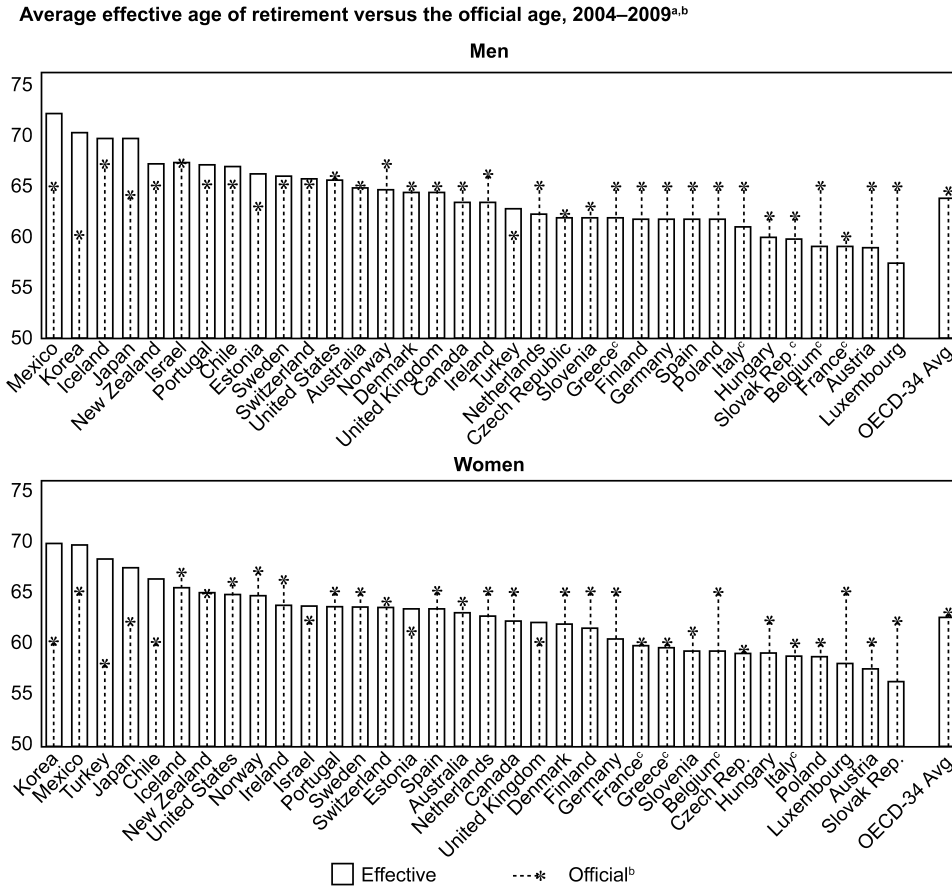

Fig. 10.4 Statutory and effective retirement age
Source: OECD, *Pensions at a Glance* (2011).

is an ongoing process in virtually all European countries. It therefore may come as a surprise how weakly the current demographic structure is linked to the current relative size of the European public pension programs (see figure 10.5).

This is mainly due to the many design differences between European pension systems described in the previous section. Some of these designs are self-stabilizing and thus prevent high cost increases. This is the case, for example, for Estonia, Poland, and Sweden, and is described in section 10.4. Other designs create strong negative incentive effects on labor supply and generate early retirement, which decreases economic capacity and thus threatens fiscal capacity and economic growth at large. This in turn increases the force of population aging on pension expenditures. Figure 10.6 shows,

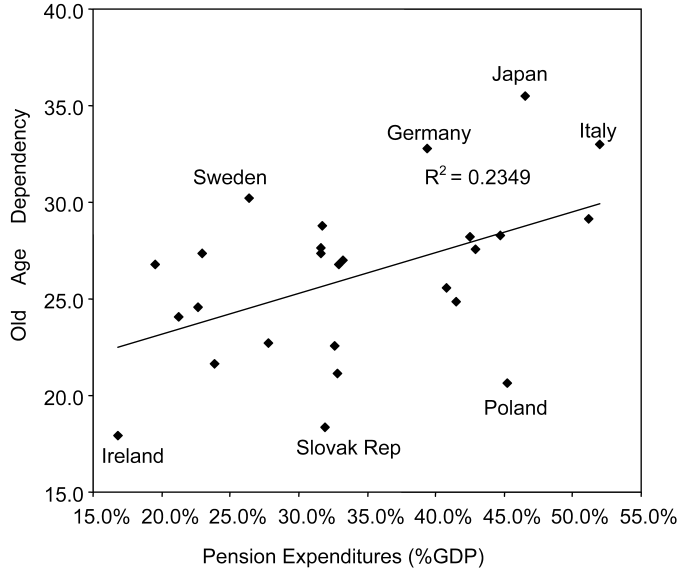

Fig. 10.5 Pension expenditures (percent of GDP, 2011) by old-age dependency (percent)

Source: OECD Social Expenditure database (SOCX, www.oecd.org/els/social/expenditure, November 2011).

that, while almost all European countries face increasing pension costs as percent of GDP, there are very large differences across countries. On average across the European Union, the cost share will increase by 16 percent until 2030 and by 37 percent until 2050. In Greece and Luxembourg, however, pension expenditures will more than double until 2050, while they are projected to decline in Estonia, Poland, and Sweden.

The weak correlation between aging and projected pension costs, and the huge variation in cost increases, are a symptom of many other reasons for reform. Subsection 10.3.1 describes the link between demography and sustainability as a reason to reform the pension systems. Subsection 10.3.2 analyses the link between expected cost increases and incentive effects that reduce labor supply. Finally, subsection 10.3.3 is concerned with the redistributive features of European pension systems and the alleviation of old-age poverty.

10.3.1 Population Aging and Lack of Sustainability

While all European countries are aging, there are remarkable differences. Italy, Austria, and Germany will experience a particularly dramatic change in the age structure of the population. Such change is much less incisive in France, Great Britain, and Scandinavia. The severity of the demographic

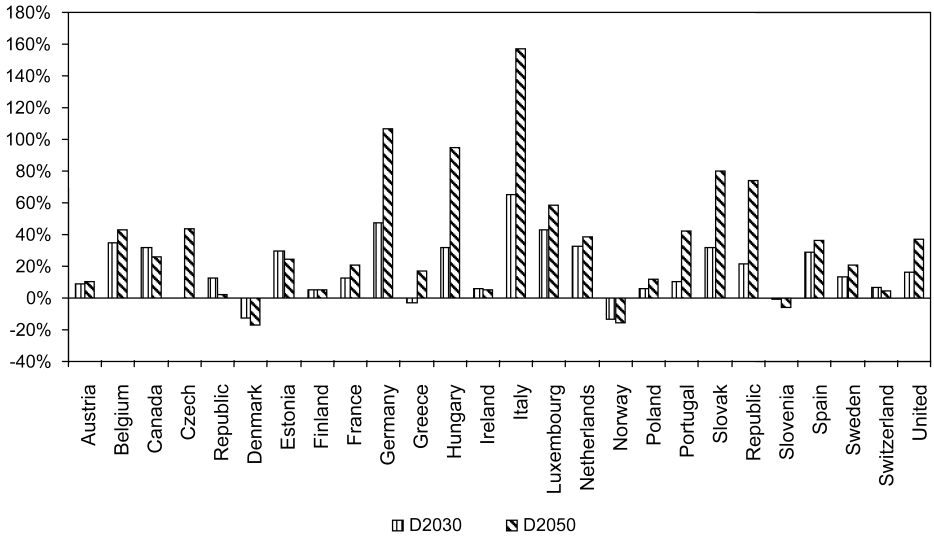

Fig. 10.6 Change in pension expenditures (percent, 2030 and 2050 versus 2010)
Sources: EPC projections in EU, OECD elsewhere; OECD Social Expenditure database (SOCX, www.oecd.org/els/social/expenditure, November 2011).

transition in most of Europe has two causes: a quicker increase in life expectancy than elsewhere, partly due to a relatively low level until the 1970s, and a more incisive baby boom/baby bust transition (e.g., relative to the United States) to a very low fertility rate in some countries (1.2 children per lifetime in Italy, Spain, and Greece, 1.3 in Austria and Germany).

Both demographic developments have a similar consequence: the ratio of elderly to working-age persons—the old-age dependency ratio—will increase steeply (see figure 10.7). According to the latest projections of the European Union, the share of elderly (aged sixty-five and above) will exceed a quarter of the population in 2030. The old-age dependency ratio will more than double during the next fifty years. In Italy, Spain, Austria, and Germany, there will be one person aged sixty-five and over for every two other persons. Moreover, population aging is not a transitory phenomenon but will persist even after the baby boom generation will be deceased: the dependency ratio plateaus after 2040 for most European countries and will not return to preaging levels for the foreseeable future.

While both demographic developments—decreasing fertility and increasing longevity—have similar consequences, it is important to distinguish the two causes because they imply different policy responses, which is often confused in the public debate. We take Germany as an example, but similar features exist in its neighboring countries: Austria, the Netherlands, and Switzerland (see figure 10.8). The sharpness of the change is generated

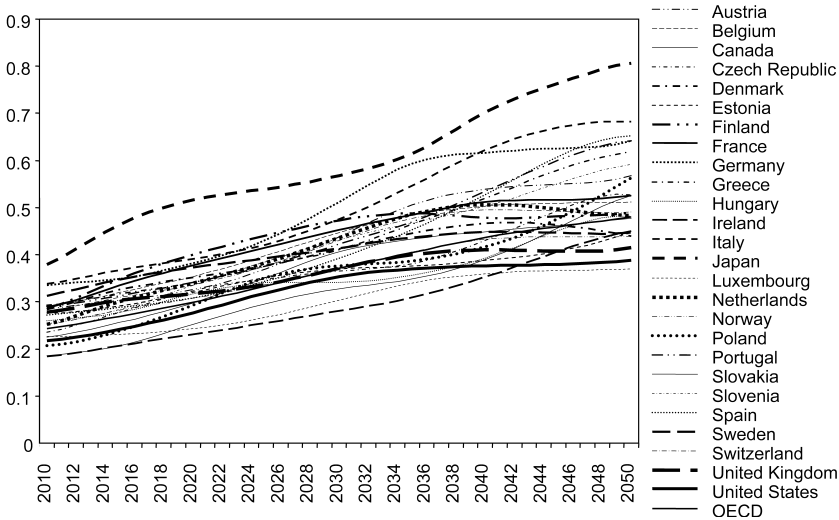

Fig. 10.7 The old-age dependency ratio in Europe and selected countries (population 65+/population 20–64: 2010–2050)

Sources: EPC projections in EU, OECD elsewhere; OECD Social Expenditure database (SOCX, www.oecd.org/els/social/expenditure, November 2011).

by the first cause, the sudden decline in birth rates during the baby boom to baby bust transition in the 1970s. The number of children born during the baby boom in the 1960s was about 2.4 children per woman and led to the bulge in the age pyramids of figure 10.8. In 1997, these children were about thirty-five years old. The baby bust started with a sudden decline to 1.3 children per woman, visible in the much smaller number of persons aged below thirty-five. Thirty years from now, the numerous baby boomers will be pensioners, and the much smaller baby bust generation will have to finance them. Compensating this by changes in the retirement age is virtually impossible and other policy responses are needed.

The second cause for the demographic transition is the secular change in life expectancy. This is a more steady development, and it is likely to persist after 2035. Figure 10.9 shows that since 1970, the remaining life expectancy of German men and women at age sixty-five has increased by four years. It is projected to increase another three years until 2030. This implies that a pension in 2030 will be paid seven more years than in 1970. Since the average length of pension receipt was about fifteen years in 1970, the increase in life expectancy represents an expansion of pension benefits by almost 50 percent. An increase in the actual retirement age is a feasible and effective cure for this cause of financial strain.

Public health insurance (and in particular long-term care insurance, LTC) face similar sustainability problems because they are financed pay-as-you-go

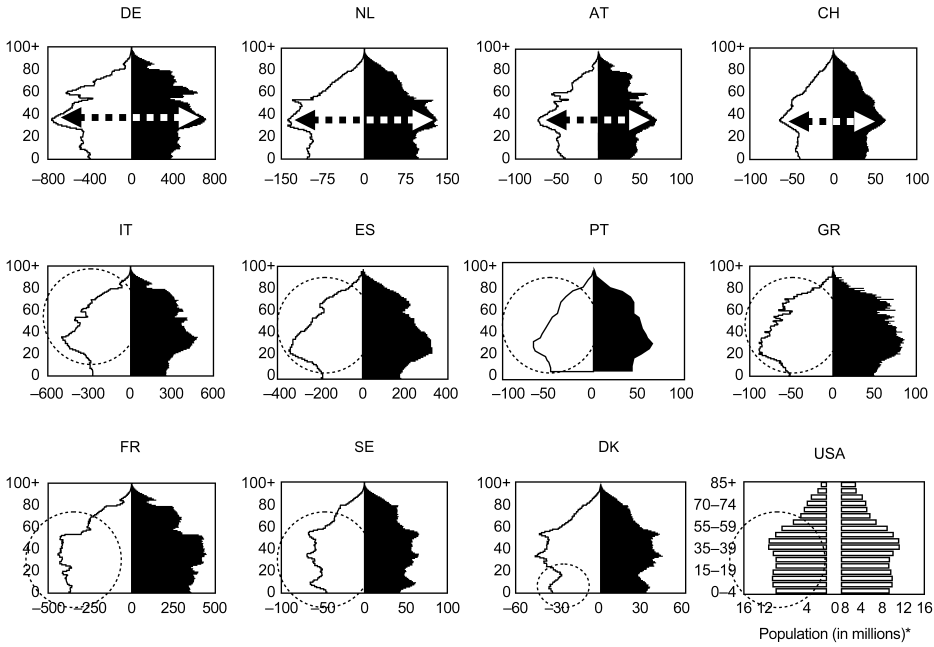

Fig. 10.8 Baby boom to baby bust transition in Europe
Sources: Own depiction based on Eurostat and US Census IDB data.
*US Census Bureau International Database.

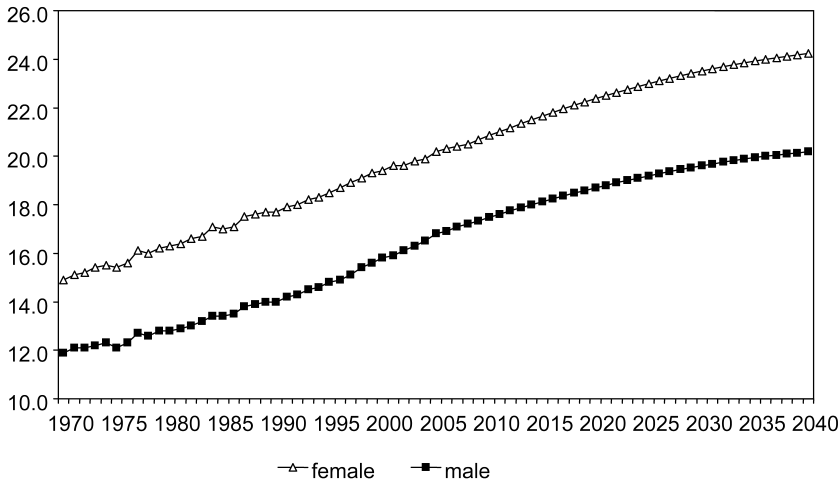

Fig. 10.9 Life expectancy at age 65, German men and women, 1970–2040
Sources: For 1970–2008, Statistisches Bundesamt; for 2009–2040, MEA-Projection.

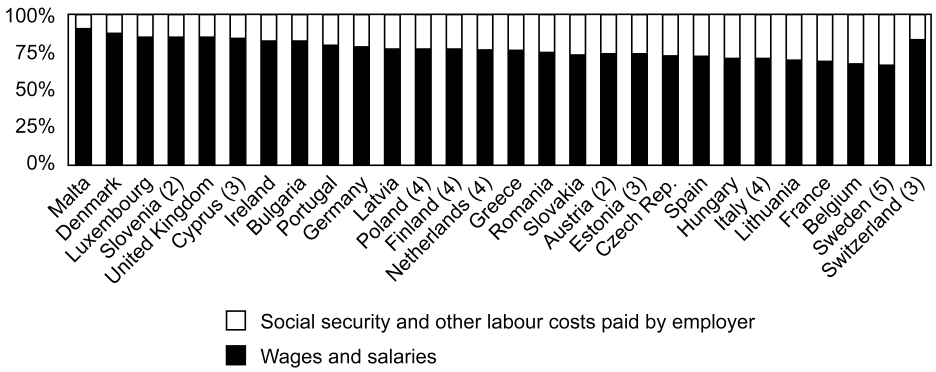

Fig. 10.10 Composition of total hourly labor compensation in Europe (percent, Eurostat)

Source: Eurostat (online data codes: lc_an_struc and lc_an_struc_r2).

by the younger generation and give the bulk of benefits (all in LTC) to the older generation.

10.3.2 Design Flaws and Negative Incentive Effects

The well-known demographically-induced problems are not the only challenges for the European entitlement programs. Another challenge are the distortions created through financing mechanisms and design flaws.

Some entitlement programs may be considered a fair insurance because the expected benefits of the program equals the expected contributions over the life-course. Therefore, at least according to traditional economies, one would not expect very large labor supply disincentive effects.[3] Examples are most defined contribution pensions (including NDC systems) and most private health insurance. Most programs, however, have strong transfer components (see section 10.2), for example, payroll-tax financed pension programs with flat benefits (in Great Britain, Netherlands, and Switzerland). Such payroll taxes are known to distort labor supply of the younger generation (Blundell, Duncan, and Meghir 1998). Since contributions to social insurance are a large part of total labor compensation (see figure 10.10), and increase total labor costs, demand for labor declines, with consequent higher unemployment and lower economic growth. Reducing the contribution burden is therefore not only important for the long-run stability and sustainability of the pension system itself, but for fiscal stability and economic performance at large. It is important to keep both in mind, since economic growth is an important source to finance future pensions.

There are two additional tax components in pension contributions. Since

3. See the implicit tax argument in pay-as-you-go systems.

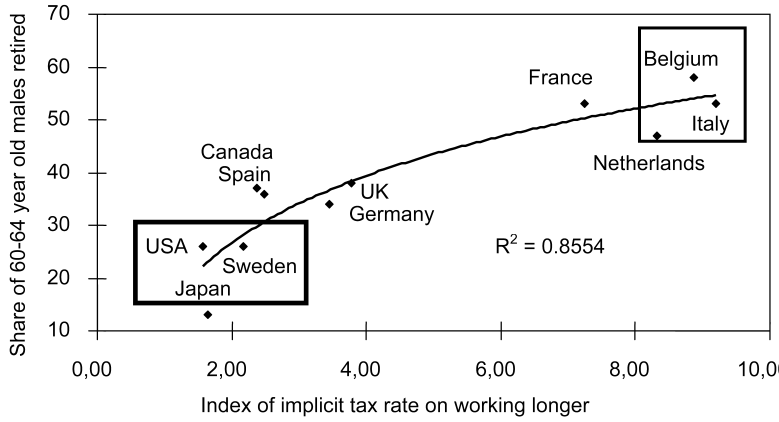

Fig. 10.11 Tax force and early retirement
Source: Börsch-Supan (2000) adapted from Gruber and Wise (1999).

the implicit return from a mandatory pay-as-you-go system tends to be lower than the explicit return on the voluntary investment in a funded pension, there is an implicit tax in all pay-as-you-go systems (see Börsch-Supan and Reil-Held 2001). Moreover, most public pension systems are not actuarially neutral because they distort labor supply of the older generation through early retirement incentives. This creates an implicit tax on working longer, measured, for example, by the Gruber-Wise group and the OECD.[4] Figure 10.11 links an index of this implicit tax to the share of those men who are already retired at age sixty to sixty-four. In countries with a large implicit tax on working longer (e.g., Belgium, France, Italy, and the Netherlands), the share of retirees is much larger than in countries with a low implicit tax (e.g., Sweden, the United States, and Japan).

The aggregate correlation in figure 10.11 permits no causal interpretation. Supplemental analyses, however, have produced convincing evidence for causality. First, figure 10.12 shows that especially in Belgium, France, the Netherlands, and Italy, very few workers aged sixty to sixty-four are still in the labor force. This is quite different from what it was in the 1960s, in spite of a lower life expectancy and a higher prevalence of illness at that time.

Second, this decline is not a "natural trend" tied to secular income growth. It did not occur, for example, in Japan and Sweden. Rather, the decline happened exactly when the tax force on working longer increased; the decline has been largely "engineered" by the incentive effects that are intrinsic in some of the public pension systems, in particular by an incomplete adjustment of benefits to retirement age. A particularly striking historical example for the exogenous policy change that can be exploited for formal micro-

4. Gruber and Wise (1999); Blondal and Scarpetta (1998).

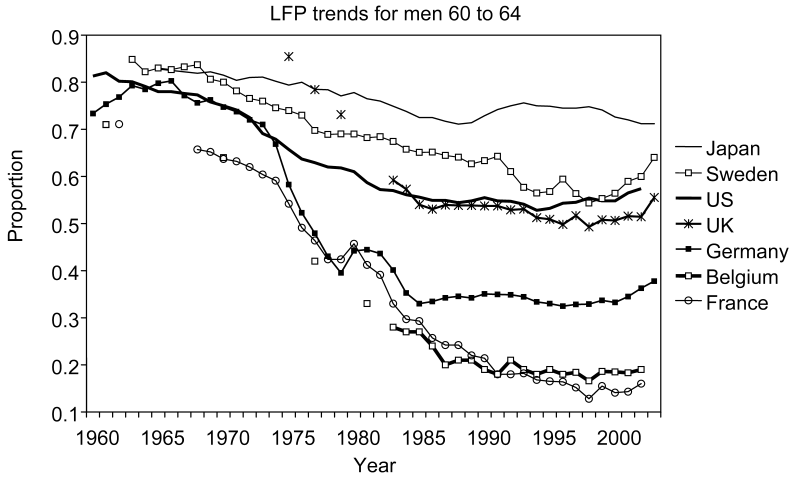

Fig. 10.12 Labor force participation among men aged 60–64, 1960–2008 (proportion of male population 60 to 64)
Source: Gruber and Wise (2010).

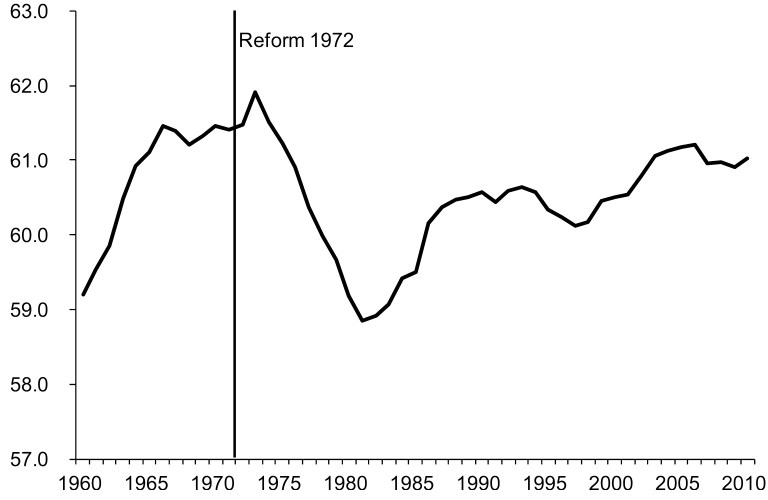

Fig. 10.13 Average retirement age in Germany, 1960–2008
Source: Updated from Börsch-Supan and Schnabel (2010).

econometric evidence with a causal interpretation is the German pension reform in 1972 (see figure 10.13).[5]

The German public pension system with its "flexible retirement" introduced in 1972 tilted the retirement decision heavily toward the earliest retire-

5. Börsch-Supan and Schnabel (1998); Börsch-Supan (2000); Gruber and Wise (2003).

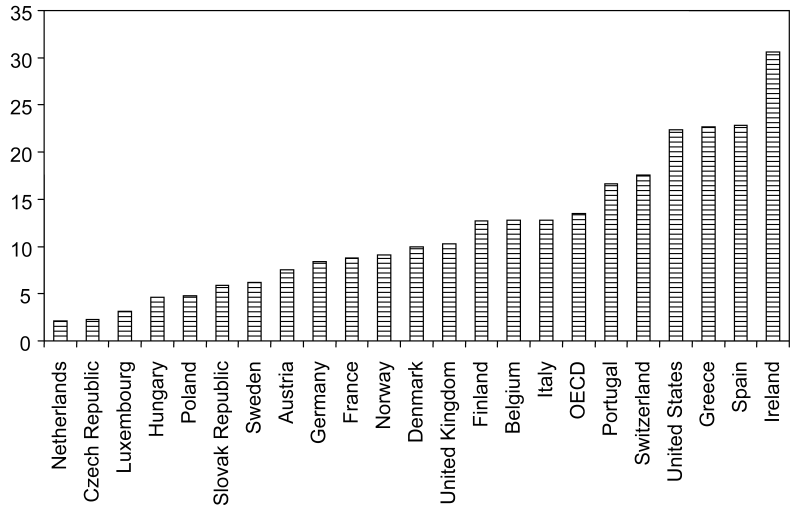

Fig. 10.14 Old-age poverty rates, 2010 (OECD, 2008)
Source: OECD, *Pensions at a Glance* (2011).

ment age applicable because the annual benefit was essentially independent of the retirement age. Hence, retiring earlier gave a worker essentially the same pension for a longer time. At the then prevailing generous replacement rates, this was a pretty good deal. The 1992 reform, in force after 1997, has diminished this incentive effect, but pension benefits are still not actuarially neutral at conventional interest rates.

The retirement behavior of entrants into the German public retirement insurance system reflects these incentive effects quite clearly in figure 10.13. Immediately after the introduction of "flexible retirement" in 1972, the average retirement age declined dramatically by more than three years. We interpret this as a clear sign of a policy reaction. The most popular retirement age switched by five years, from age sixty-five to age sixty. As a striking example of effective reform, a large part of this decline has been reversed since 1997.

10.3.3 Lack of Adequacy and Perverse Redistribution

Many countries have a minimum pension, either as statutory basic or minimum pension or effective through social assistance mechanisms.[6] As figure 10.14 shows, this has kept poverty rates low in most European countries, at least relative to the OECD average and certainly vis-à-vis the United States.

There are, however, three striking exceptions where the old-age poverty rate exceeds 20 percent of individuals aged sixty-five and over: Greece, Spain,

6. For example, in Germany: the tax-financed "Grundsicherung im Alter," which is not part of the German public pension system.

Table 10.3 **Synopsis of pension reform elements in Europe, 1980–2010**

	Retirement age	Link of benefits to contributions	Indexation
Austria	women → 65	+	
Germany	all → 67	(universal point sys)	Sustainability
France	all → 62	Basis of point system	
Italy		NDC	NDC
Spain			
Greece		Partially	
Denmark	all → 67 rev		
Sweden	DI	NDC	NDC
Norway		point	life expectancy
Finland	UI tunnel	scale factors	
Netherlands	EEA, DI		
UK	all → 68		price → wage
US	all → 67		

and Ireland. Ireland spends very little on pensions, as we saw in table 10.1. Greece and Spain, however, have both above-average pension replacement rates (see figure 10.3) but nevertheless very high old-age poverty rates. While in most countries, pension systems and/or their associated social assistance systems distribute from rich to poor, this suggests some extent of perverse redistribution in Greece and Spain.

10.4 Curing the Problems

Reform processes are under way in almost all European countries. Some countries reformed early in the 1980s (e.g., Sweden), most countries much later, and some not at all (e.g., Greece). Typically, we have experienced "reforms in installments." These reforms have combined parametric elements (introducing actuarial adjustments, changing the benefits indexation formula, increasing the retirement age) with fundamental elements (changing the financial mechanism by moving substantial parts of retirement income from public pensions to private savings). Table 10.3 presents a synopsis.

The multitude of reform elements in Europe is partly a result of initially different and different political preferences. It also reflects the fact that there is no single reform measure that can lead to a stable and sustainable system of old-age provision; rather, a mix of several reform elements is needed. If the goal is to restore fiscal sustainability, then reform will require an overhaul of the existing pay-as-you-go systems as well as the reintroduction of private saving as a major source of future retirement income. Extreme policies are unlikely to work: the public pension systems alone cannot provide a sufficient retirement income at reasonable tax and contribution rates, and private savings cannot fully substitute for pay-as-you-go pensions.

Relying on public pay-as-you-go financed pensions alone is not possible because the resulting tax and contribution rates from maintaining the current generosity (and thus costs, see figure 10.6) will damage economic growth through the negative labor supply incentive effects described earlier. Further increases of the tax and contribution rates are particularly damaging in those EU countries that already have high total labor costs—in particular Germany, Austria, Denmark, and Sweden (see figure 10.10).

In turn, transiting pensions entirely to private saving is also not a policy option. One fatal reason against such an option is simply that it is too late. Saving requires time, and there will not be sufficient time until 2030 for the baby boomers to accumulate funds in the order of magnitude required to finance a full pension. Time and history is of the essence in pension reform. The baby boom/baby bust transition dictates the time schedule and makes reforms impossible that were possible twenty-five years ago, such as a complete transition to a fully funded system.

There are other reasons to advocate a more subtle but also more complex multipillar system rather than a pure pay-as-you-go or a pure fully funded system. An important reason is diversification. Pay-as-you-go systems carry large demographic and political risks, while fully funded systems carry large capital market risks. Since these risks are not perfectly correlated, diversification provides lower risk of poor outcomes than monolithity.

Hence, in order to achieve long-run fiscal balance, reforms typically need to include two components: adapting the public system to demographic change under the restriction that taxes and contributions cannot increase much further, and strengthening private savings under the restriction that not much time is left until 2035. Subsection 10.4.1 addresses the first, and subsection 10.4.2 the second element. Subsection 10.4.3 discusses issues of targeting and poverty alleviation.

10.4.1 Adapting Pay-as-You-Go Public Pension Systems

Stabilizing tax and contribution rates implies expenditure cuts if and when at the same time demographic change reduces the number of contributors to, and increases the number of beneficiaries from, the pay-as-you-go pension systems. Pension expenditures have two dimensions: the level of benefits (via the replacement rate) and the duration of benefits (via the retirement age). Expenditure cuts are easier to shoulder if they involve both dimensions.

Both dimensions are politically difficult. Fortunately, the demographic change, while dramatic, is of a magnitude that is far from absorbing all available resources. Figure 10.15 shows a rough approximation of the force of aging on economic growth, represented by the loss of productive capacity due to a decline of the number of workers relative to the number of consumers. It is measured as the percentage change of the old-age dependency ratio (from figure 10.7). The dependency ratio deteriorates at a rate of about

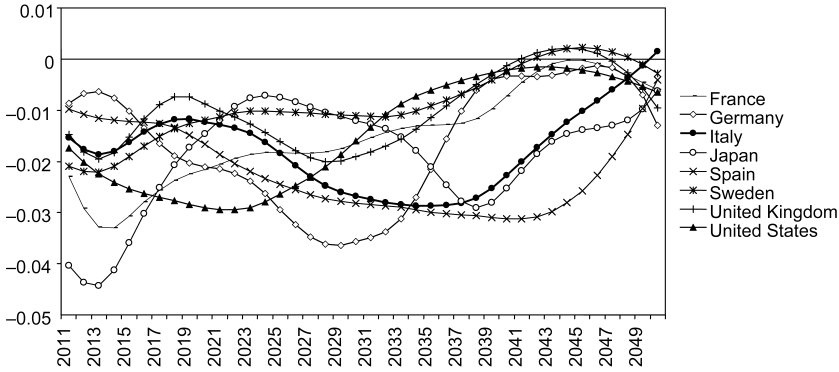

Fig. 10.15 The force of aging in terms of the rate of economic growth
Source: Own calculations based on OECD Social Expenditure database (SOCX, www.oecd.org/els/social/expenditure, November 2011).

0.2 to 0.5 percent p.a. (per annum), with a large variation in timing across the selected countries. This is much less than the long-run averages of productivity growth, which is about 1.5 to 2.5 percent p.a. for most European countries. Hence, population aging absorbs between a seventh and a third of future productivity growth, leaving the bulk for real income growth. Pension benefits can therefore rise in real terms in spite of population aging, and all that is required is a growth rate of benefits that remains below the growth rate of wages.

Adapting the Level of Benefits: Reducing the Replacement Rate

How much benefit increases have to be dampened depends on the speed and the extent of demographic change in each country relative to its productivity growth. France and Sweden, for example, will need less adaptation than Italy and Germany. Some countries have formalized this link between demographics and benefit level. Sweden and Italy have introduced notional defined contribution (NDC) systems, which compute benefits on the basis of the accumulated contributions plus some fictitious interest, which depends on demographic essentials such as life expectancy and dependency ratio and wage growth. In macroeconomic abstraction, this interest rate should be the labor force growth rate plus productivity growth. Since the labor force growth rate is declining as a population ages, an NDC system features a declining replacement rate in the course of population aging. Moreover, longevity decreases the value of the annuity emanating from the accumulated notional wealth.

Germany has taken an apparently very different approach, preserving the defined benefit structure that has so much political acceptance in many countries. It augmented the conventional benefit indexation formula, which

increases benefits at the rate of wage (in other countries: price) increases by a new factor, the so-called "sustainability factor."[7] This factor reflects the development of the relative number of contributors to pensioners, the system dependency ratio, which is the most important long-term determinant of pension financing. The annual benefit changes are then proportional to two factors: changes in gross earnings minus contributions to the pension system (positively related), and changes in the system dependency ratio (inversely related), weighted harmonically:[8]

$$PV_t = PV_{t-1}\left(\frac{\mathrm{AGE}_t}{\mathrm{AGE}_{t-1}}\frac{(1-\tau_t)}{(1-\tau_{t-1})}\right)a \cdot \left(\frac{\mathrm{SDR}_{t-1}}{\mathrm{SDR}_t}\right)^{1-a},$$

where PV is pension value per earnings point, AGE is average gross earnings, τ is contribution rate to public and private pensions, and SDR is system dependency ratio: pensioners/contributors.

The weight has been set achieve a politically determined contribution rate target. This new pension formula will lead to decreases in pension benefit levels vis-à-vis the path of wages. Currently, gross benefits are about 48 percent of gross earnings. This corresponds to a net pension level of about 70 percent of net earnings. In 2035, when the plafond of population aging is reached, the gross pension level will be about 40 percent.

The Swedish and the German reform approaches look very different. However, as Börsch-Supan and Wilke (2005) point out, the sustainability factor can almost perfectly mimic a national defined contribution system; it can thus be interpreted as a notional defined contribution system "wrapped" as a defined benefit system. The different selling approaches responded to the political economy differences between Sweden and Germany.

Adapting the Duration of Benefits: Increasing the Retirement Age

The other crucial dimension of pension expenditures is the duration of pension benefits, determined by the difference between the age at which pension benefits are taken up and life expectancy. As pointed out earlier, life expectancy is projected to increase by about three years between now and 2030. This increase is expected to be about the same for all European countries. Figure 10.4 has shown the international differences in both normal retirement age (the statutory age to take up old-age pensions) and actual retirement age (the age in which workers leave the labor force) which in most European countries is equal to the age in which some kind of public pension is taken up. The two main policy instruments to reduce the duration of benefits are increasing the statutory retirement age and reducing early retirement benefits. Both instruments are extremely unpopular throughout Europe.

7. Börsch-Supan and Wilke (2005); Börsch-Supan (2007).
8. The actual formula avoids exponentiation and features various lags due to data availability.

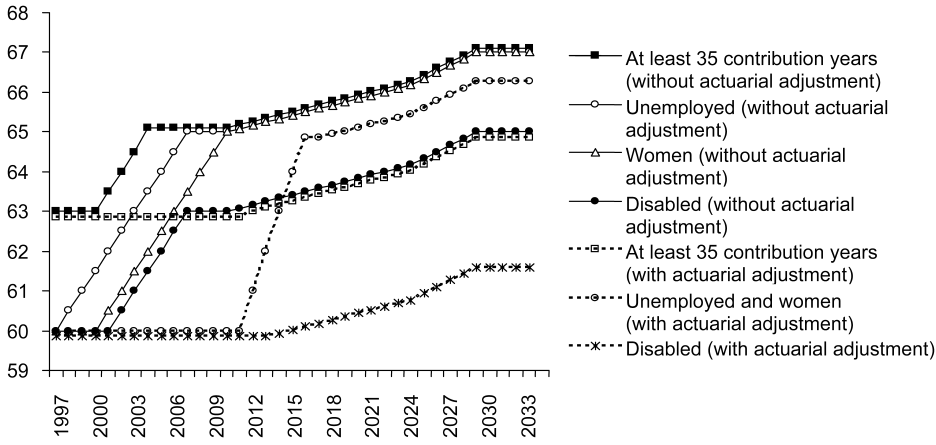

Fig. 10.16 Projected retirement age, Germany, 1997–2035
Source: Updated from Berkel and Börsch-Supan (2004).

In Germany, the 1992 reform has succeeded in abolishing most early retirement pathways without actuarial adjustments. This law became effective in 1997, but it has a transition period until 2017 (see figure 10.16).

In addition, Denmark, Germany, France, and the United Kingdom have enacted increases of the statutory normal retirement age (e.g., Denmark and Germany from sixty-five to sixty-seven years, United Kingdom even to sixty-eight years, while in France only from sixty to sixty-two years). Most increases are slow and gradual. In Germany, it started in 2011 with monthly steps such that the retirement age of sixty-seven will be reached in 2029. This increase corresponds to two-thirds of the projected change in life expectancy. This approximately keeps the ratio of time spent in working life to time spent in retirement constant and thus neutralizes, from an expenditure point of view, the effect of longevity increases on pension expenditures.

In some countries, the statutory retirement age is not the primary determinant of actual retirement age but the number of years worked. In Germany, forty-five years of contributions will generate a full pension even if these service years are reached before age sixty-five. In some countries, the number of required contribution years is much lower, notably in France, Greece, and Italy, and vary by profession (see the quite colorful Greek case described by Börsch-Supan and Tinios 2002). With increasing life expectancy, such mechanisms create a very long and thus costly duration of pension benefit recipiency. If one follows the previous logic, the required number of service years should also be adapted to the longer life span. This has been particularly controversial in France and Italy.

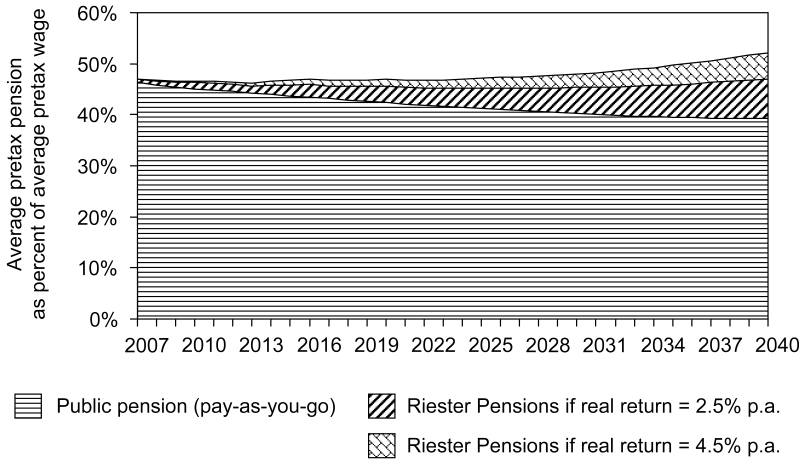

Fig. 10.17 Projected retirement income components, Germany, 2002–2040
Source: Börsch-Supan et al. (2008).

10.4.2 Private Saving and Prefunding

Reducing the first pillar of pay-as-you-go financed public pensions creates a gap in retirement income relative to what workers have become accustomed to. There are only two mechanisms to fill the gap: working longer and saving more.[9] A reasonable approach is of course to exploit both mechanisms, in spite of the unpopularity (particularly of the first mechanism described in the preceding subsection).

Figure 10.17 shows how this can work, again using the recent German reform proposals as an example. Taking account of the increase in the normal retirement age to sixty-seven, which increases pension benefits according to the German benefit formula, and adding income from private retirement savings, the reform proposal manages to deliver an income level for retirees that is comparable to today's income level, in spite of the reduction of public pillar pensions according to the sustainability formula. This projection assumes a private retirement saving rate of four percent of gross income from 2009 on. These 4 percent are the current limit of tax-subsidization, if either occupational pensions ("second pillar") or private savings ("third pillar") are used to finance additional retirement income. Under many circumstances, both subsidies can be combined such that 8 percent of gross income can be tax-privileged.

9. Higher fertility is only a long-run solution and does not help to offset the fiscal strains generated by the baby-boom generation. Higher migration would help but net immigration numbers need to be unrealistically large to offset the domestic aging process (see United Nations Population Division 2001).

This is important for the early baby boomers. Figure 10.17 shows the crux of all transition schemes to more funded pensions via private saving: the transition generation will have to pay extra in order to maintain their total retirement income when the income from pay-as-you-go pensions is reduced. For the younger generation, born after about 1980 and retiring after about 2040, 4 percent is sufficient to maintain or even to obtain higher retirement income levels than today, but a saving rate of 8 percent is required for the cohort with the highest transition burden, the early baby boomers born in the 1950s and early 1960s.

Such high saving rates are feasible, but they of course hurt consumption. They are the price for reforming too late. Figure 10.2 shows the weight of the three pillars in selected European countries. Those countries, which have reformed their pension systems in the 1980s by transiting to multi-pillar systems (Switzerland, the Netherlands, and Great Britain), have succeeded in lower contribution rates; they also need lower private saving rates because they have saved for a longer time, accumulating more capital and enjoying higher compound interest. The latecomers in this process (Spain, Germany, France, and Italy) still have dominant first pillars and need to save much more and much quicker, if they want to alleviate the tax and contribution burden and at the same time maintain their accustomed retirement income levels. Given the short time period until the baby boomers retire, this may only be an option for later generations but not feasible for them.

10.4.3 Targeting and Redistribution

Cutting pay-as-you-go pensions to a sustainable share of GDP will particularly hurt those who have earned very little and whose saving capacity is also low. The reform-driven reduction of replacement rates will drive workers who have earned incomes only slightly above the poverty line into old-age poverty after retirement.

This dilemma between sustainability and old-age poverty can only be solved by targeting policies for those who are in danger of old-age poverty. One instrument is basic and/or minimum pensions (see table 10.2). Another instrument is a nonlinear (concave from above) schedule linking benefits to contributions (e.g., via the PIA/AIME [primary insurance amount/average indexed monthly earnings] conversion in the US Social Security system).

Some countries have basic or minimum pensions that prevent old-age poverty virtually by definition, as they set the minimum level of pension income just above the poverty level (e.g., Denmark and Germany). In other countries, such basic or minimum pensions are nonexistent or provide income below the poverty line (e.g., Greece and Ireland). Such countries need to redistribute more from rich to poor pensioners if they want to prevent old-age poverty.

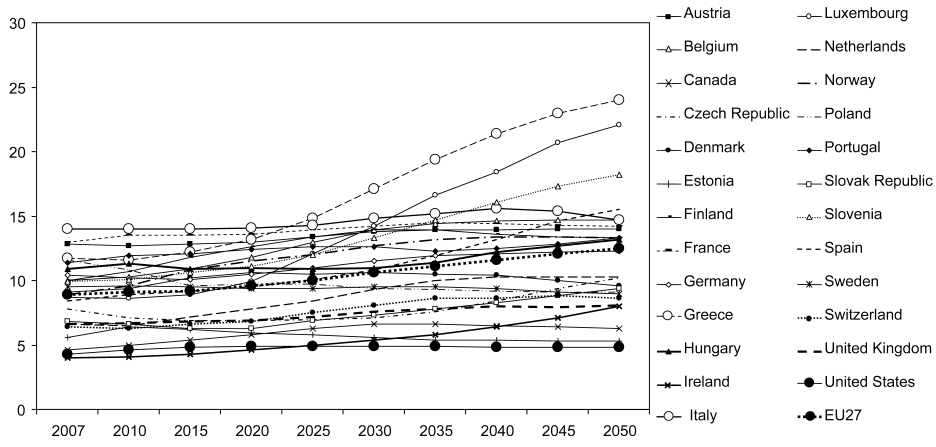

Fig. 10.18 Projected public pension expenditures (percent of GDP), 2007–2050
Sources: EPC projections in EU, OECD elsewhere; OECD Social Expenditure database (SOCX, www.oecd.org/els/social/expenditure, November 2011).

10.5 Implications for Fiscal Stability

Because pensions are a large part of entitlements, which in turn take up a large share of public expenditures, fiscal stability is closely linked to the path of future pension expenditures. The Economic Policy Committee of the EU, together with the OECD, provide projections on future public pension expenditures, see figure 10.18.

Two countries stand out: Italy, because it has currently the highest public pension expenditures, and Greece, because it features the most dramatic increase. While both countries have very high pension expenditures today, their dynamics could not be more different: expenditures in Italy are stable until 2030, rise only weakly until 2040 and then decline, while they rise in proportion to the dependency rate in Greece.

The reason for this tale of two countries is quickly told. As section 10.2 described, Greece has a defined benefit system with a high replacement rate and very early retirement. So far, there is no feedback of demography to this generosity. Italy features two pension systems. The old system is similar to the current Greek system, while the new system is modeled after the Swedish NDC system. Workers who started after 1993 are completely in the new NDC system, while those who had more than eighteen years contribution before 1996 are completely in the old system. Those in between are under a "pro rata" system: benefits corresponding to contributions before 1993 are paid according to the old system and the ones after 1993 according to the NDC.[10] Hence, the Italian system has not yet deeply cut benefits. The new

10. I am grateful to Agar Brugiavini for this description.

Table 10.4 **Decomposition of projected changes in pension expenditure, 2005–2050 (gross public pension expenditures as percent of GDP)**

	Level 2005	Percent change 2005–2050	Dependency ratio	Employment rate	Take-up ratio	Benefit ratio	Residual (interaction)
Austria	13.2	–1.0	11.3	–1.3	–5.8	–4.3	–0.8
Belgium	10.4	5.1	7.7	–1.5	–0.4	–0.6	–0.1
Denmark	9.5	3.2	7.2	–0.4	–2.8	–0.5	–0.3
Finland	10.4	3.3	8.8	–0.9	–3.1	–0.9	–0.6
France	12.9	2.0	9.7	–0.9	–1.9	–3.5	–0.5
Germany	11.1	1.9	7.5	–1.1	–0.6	–3.5	–0.4
Ireland	4.6	6.5	7.9	–0.5	–1.4	0.8	–0.2
Italy	14.3	0.4	11.5	–2.0	–3.2	–5.3	–0.7
Luxembourg	10.0	7.4	7.2	–4.4	2.5	2.1	0.0
Netherlands	7.4	3.8	6.3	–0.2	–1.6	–0.4	–0.3
Portugal	11.5	9.3	13.7	–0.2	–3.9	–3.0	–0.4
Spain	8.7	7.0	12.4	–1.8	–2.3	–0.8	–0.4
Sweden	10.4	0.9	4.8	–0.6	0.2	–2.8	–0.2
United Kingdom	6.7	1.9	4.7	–0.1	0.0	0.0	–2.6

Source: Carone et al. (2008).

system, however, has a strongly stabilizing influence on pension expenditures (see section 10.4) if it is actually implemented. Some crucial parameters, such as the fictitious interest rate of the NDC system and the conversion factor of the notional wealth into the pension annuity, however, are politically much more vulnerable in the Italian copy than in the Swedish original; the pension costs expected by financial markets may thus be higher than suggested by figure 10.18. It is therefore no coincidence that Greece and Italy are currently most under pressure from financial markets.

In order to understand how the projections in figure 10.18 depend on demographic trends and future policy actions, it is helpful to decompose the projected expenditure increases into four potential causes (old-age dependency, employment rate, take-up ratio, and benefit ratio) according to the following equation (see Carone et al. 2008):

$$\frac{\text{PensExp}}{\text{GDP}} = \frac{\text{Pop} > 65}{\text{Pop}(15-64)} \times \frac{\text{Pop}(15-64)}{\text{EmplNo}} \times \frac{\text{PensNo}}{\text{Pop} > 65} \times \frac{\text{PensExp/PensNo}}{\text{GDP/EmplNo}}.$$

Results are displayed in table 10.4.

The demographic pressure, measured as the dependency ratio effect, is positive in all countries, especially the Mediterranean countries. Some countries have strong counterbalancing forces, for example, Sweden and Italy. This is the effect of the automatic stabilizers in the NDC systems, which are somewhat weaker in Germany with its sustainability factor and the gradual increase of its retirement age. These mechanisms reduce the benefit and

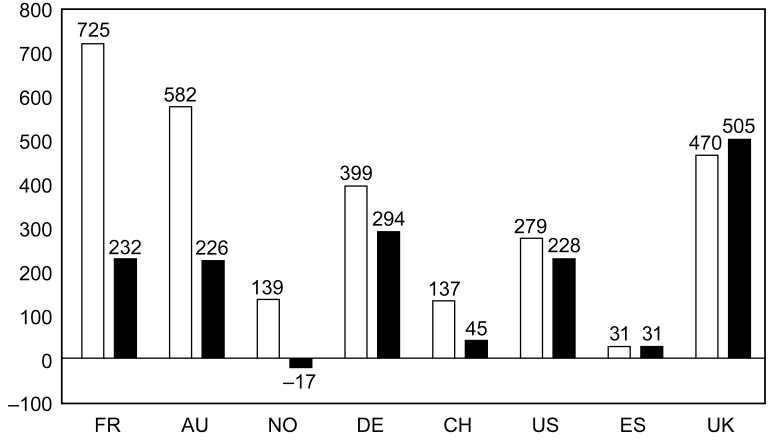

Fig. 10.19 Projected implicit pension debt before and after recent reforms (percent of GDP)

Source: Moog, Müller, and Raffelhüschen (2010).

take-up ratios and increase the employment, mainly through later retirement. In other countries, such as Spain (Greece did not provide figures for this EU exercise), demographic factors were not or only very little dampened by countervailing policy measures. Table 10.4 shows that the demographic pressures can effectively be counteracted by the policy mixes described in section 10.4.

Moog, Müller, and Raffelhüschen (2010) have provided estimates of the implicit pension debt and its reduction through pension reform. He computes the present discounted value of future pension entitlements and subtracts the present discounted value of future contributions. In virtually all countries, entitlements exceed contributions in present discounted value, leaving an implicit debt. Figure 10.19 shows the effect of selected recent reforms on this implicit pension debt, expressed as percent of GDP. While these figures rest on many assumptions and are very sensitive to the choice of a discount rate, the overall message is robust: the implicit pension debt exceeds the explicit government debt in most European countries by several multiples. Pension reform has improved this fiscal imbalance dramatically in some countries (e.g., France and Austria), and significantly in others (e.g., Germany). There is, however, little change in the United States and even an increase in the United Kingdom.

Werding (2007) provides a similar calculation for the effects of the various German reform steps (see figure 10.20). The gap between unfunded pension liabilities and future contributions corresponds to the implicit pension debt of figure 10.19. His estimate of the reform effects are larger. The 1992, 2001, and 2004 acts reduced the benefit ratio in several steps, while the last reform step increased the statutory eligibility age from sixty-five to sixty-seven. The

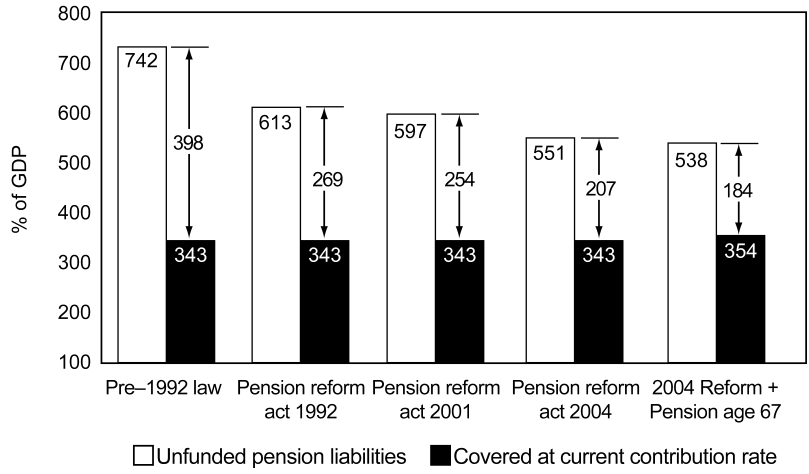

Fig. 10.20 Projected implicit pension debt before and after recent reforms (percent of GDP)

Source: Werding (2007).

largest effect was the change from gross to net wage indexation in 1992, and the introduction of the sustainability factor in 2004. Figure 10.20 reiterates our earlier message: the fiscal pressure of entitlement programs can and have been reduced substantially by relatively mild parametric reforms.

An indicator of long-term fiscal balance that is less sensitive to assumptions about the discount rate and thus timing of events is the sustainability gap. It departs from a projection of pension expenditures, a projection of pension contributions, and a final level of debt (e.g., the 60 percent of GDP defined in the Maastricht treaty) to be achieved after a target date. The sustainability gap then measures the additional income (primary balance as percent of GDP) necessary to avoid ending up with a higher final level of debt at the target date. In figure 10.21, based on the latest report by the European Commission, S1 takes the year 2060 as the target date, while S2 assumes an infinite horizon.

The commission report shows that only Denmark features a fiscally sustainable pension system according to these calculations. Denmark is closely followed by Finland and Sweden, plus Bulgaria and Estonia. In all other European countries, achieving fiscal sustainability requires further reforms. Figure 10.21 shows the particularly precarious situation of Greece, but also the unsustainability of the pension systems in Ireland and the United Kingdom. The results by the commission depicted in figure 10.21 only partly include the costs of the financial crisis. Since the calculations were made, the debt taken on through stimulus and bank rescue packages have worsened the debt situation considerably.

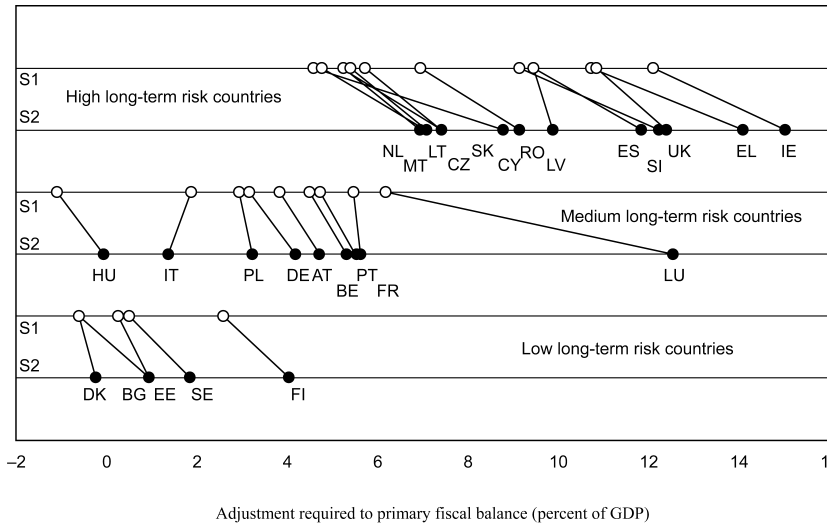

Fig. 10.21 Sustainability gap in Europe (percent GDP)
Source: European Commission (2010).

10.6 Conclusions

The major European pension systems (France, Germany, Italy, and Spain) still have some ways to go in order to become financially sustainable. This chapter has shown that this goal is achievable with a combination of reasonable policy steps. Italy, for example, has introduced a new entrants system that will stabilize pension expenditures if it is implemented consistently also in the future. Sweden, with its NDC system, has no sustainability gap. Germany has substantially reduced its implicit pension debt through a set of politically accepted gradual steps: increasing retirement age, indexing benefits to the system dependency ratio, and introducing individual-accounts-type private pensions to fill the emerging pension gap.

The recent crisis makes pension reform even more urgent. It is no coincidence that Greece and Italy are currently most under pressure. These countries have the highest pension expenditures as share of GDP in Europe. In Italy, these high pension expenditures are at least stable; but they will remain a fiscal challenge as they will not get lower for the foreseeable future and its parameters face political risks. Pension expenditures are still dramatically increasing in Greece. Without pension reform, which cuts the high share of pension expenditures in GDP, no fiscal consolidation appears possible.

There is no single "optimal pension policy" since the initial state (general welfare state design emerged through culture, history, and political preferences) and problems (pressure through demography, design flaws) differ so much among countries. Rather, the policy mix between reducing pay-as-

you-go benefit levels, increasing retirement age, introducing actuarial adjustments, and establishing occupational and individual funded pensions has to be different across countries.

Moreover, restrictions differ across countries. Building up funded pensions takes time. The feasibility of a transition strategy depends on the time left until the "baby-boom bulge" will enter retirement. This differs across countries. Moreover, it depends on the current size of the pay-as-you-go pillars. The higher the pay-as-you-go share is currently, the harder is a transition during the remaining years.

What has emerged as the most effective reform? The introduction of NDC systems have reduced fiscal strain when it was done early and consistently, like in Sweden. In Italy, not only is the demographic pressure much higher, but the introduction was also effectively postponed until after the baby boom generation will have retired, and there are many loopholes in the actual implementation, for example, in the definition of the conversion rate to an annuity that leaves room for political maneuvering. The "dressing" of the reform as a new NDC system did help in the political economy situation in Sweden, and to some extent also in Italy. It failed, however, in Germany, where the taste of a funded system seems unpalatable. "Dressing" a similar reform in terms of a complex defined benefit formula was politically much easier.

Automatic stabilizers, such as the NDC systems in Sweden, Italy, and Poland, and the indexation of pension benefits to the system dependency ratio in Germany, may help to put pension systems on a long-run fiscally sustainable path since they are sheltered from day-to-day political opportunism. One may want to introduce similar automatic rules for the retirement age, such as a proportionality rule that keeps the ratio of time spent in retirement to time spent working constant. The sheltering effect, of course, goes only so far. In Germany, for example, the sustainability factor in the benefit formula has been set out of force through a "pension benefit guarantee" that rules out any nominal benefit reduction, and parts of the dynamic increase in the retirement age have been offset by the introduction of new duration-of-service rules. By and large, however, pension reforms introducing automatic stabilizers have been more successful in achieving long-term fiscal balance than those without such mechanisms.

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Comment David A. Wise

Axel Börsch-Supan has presented a very careful summary of the pension reforms in Europe. He brings out the substantial complexity of getting from here to there. And he emphasizes two critical dimensions of pension expenditures—the level of benefits and the duration of benefits. I cannot offer important areas of improvement in his discussion. Instead I will try to add additional framing and context to his analysis. In particular, I emphasize, and hope to contribute to, an understanding of the core of the problem that has led to the need for reform. In doing this, I will focus on working lives and years in retirement, the part that lies behind what Börsch-Supan terms the duration of benefits.

The core of the problem is promises that cannot be met—social security plan provisions that promise benefits that are often unsustainable. Why? Countries did not adjust to the demographic changes that occurred over the past four decades. They did not accommodate declining mortality and increasing life expectancy. And countries did not adjust to changing health. Expansions in "work capacity" were not matched by more work. It is now too late to address the problem only by saving more. Social and economic customs must adapt to demographic trends. I will expand on three points:

1. Living longer and working less without regard to demographic trends.
2. The relationship between employment of older workers and mortality (taken as one important indicator of health).

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