

Entitlement Reforms in Europe: Policy mixes in the current pension reform process

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ABSTRACT

Many European countries have begun (or have announced) programs intended to reduce the growth of entitlement programs, in particular of public pensions.

Current costs are high, and the pressures will increase due to population aging and negative incentive effects. This paper focuses on the pension reform process in Europe. It links the causes for current problems to the cures required to make the pay-as-you-go entitlement programs in Continental Europe sustainable above and beyond the financial crisis. It discusses examples which appear, from a current point of view, to be the most viable and effective options to achieve successful changes in the entitlement system.

There is no single policy prescription that can solve all problems at once. Reform elements include a freeze in the contribution and tax rates, an indexation of benefits to the dependency ratio, measures to stop the current trend towards early retirement, an adaptation of the normal retirement age to increased life expectancy, and more reliance on private savings – elements of a sustainable but complex multipillar system of pensions and similar entitlement programs.

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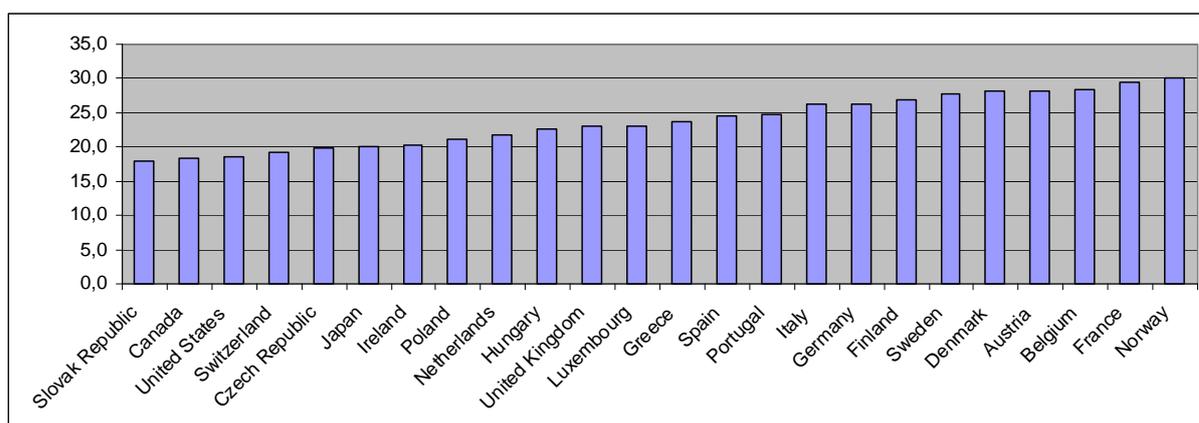
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1. Introduction

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, primarily child care, maternity benefits and social assistance, plus sickness benefits, long-term care insurance and many smaller programs. Together, these entitlement programs represent between 20 and 30% of GDP in most European countries, with considerable variation especially in Eastern Europe (Figure 1), while it is about 18.5% of GDP in the US.

Figure 1: Entitlement Programs in Europe and Other Selected Countries

(Percent of GDP, 2011)



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

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. They may themselves become a source for fiscal instability due to their large costs.

Not only the size but also the structure of entitlements by the four above program groups is quite different across countries, see Table 1.

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 Repub	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 Repub	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 Kingdc	23,0%	29,3%	23,2%	24,6%
United States	32,9%	44,7%	15,1%	7,3%

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

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

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 US and Canada with more than 40%, while it is only about 22% 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 paper 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 US (6.7 percent of GDP). In terms of fiscal stability in the current debt crisis, pension systems are a scary example how current program design, the size of future entitlements, and political credibility interact as either virtuous or vicious spirals. This paper argues that it is not a coincidence that the countries which spend the highest share of GDP in pension entitlements are also the countries which are currently most pressured to offer very high bond yields to sell government bonds. 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 65 and over, for example, face a poverty rate of 22.7%, almost twice as large as the OECD average.

This paper 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 which appear, from a current point of view, to be the most viable and effective options to achieve successful changes in the entitlement system. It stresses that there is nothing like “the optimal pension reform” since the initial state (in particular the current institutional set up) 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 face of the dimensions of population aging.

The first part of the paper sets the stage with a brief overview of the current landscape of entitlement programs in Europe (Section 2).

The main body of the paper focuses on the pension reform process in Europe. Section 3 is devoted to the causes for reform, while Section 4 lines out possible cures and presents successful examples. Specifically, Section 3 describes (a) the lack of sustainability due to population aging, (b) the negative incentive effects which threaten not only the stability of pension systems but economic growth at large, and (c) points out examples where pension adequacy fails.

Section 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 5 provides some estimates of the fiscal effects of these reforms, and Section 6 concludes.

2. The current design of pension systems in Europe

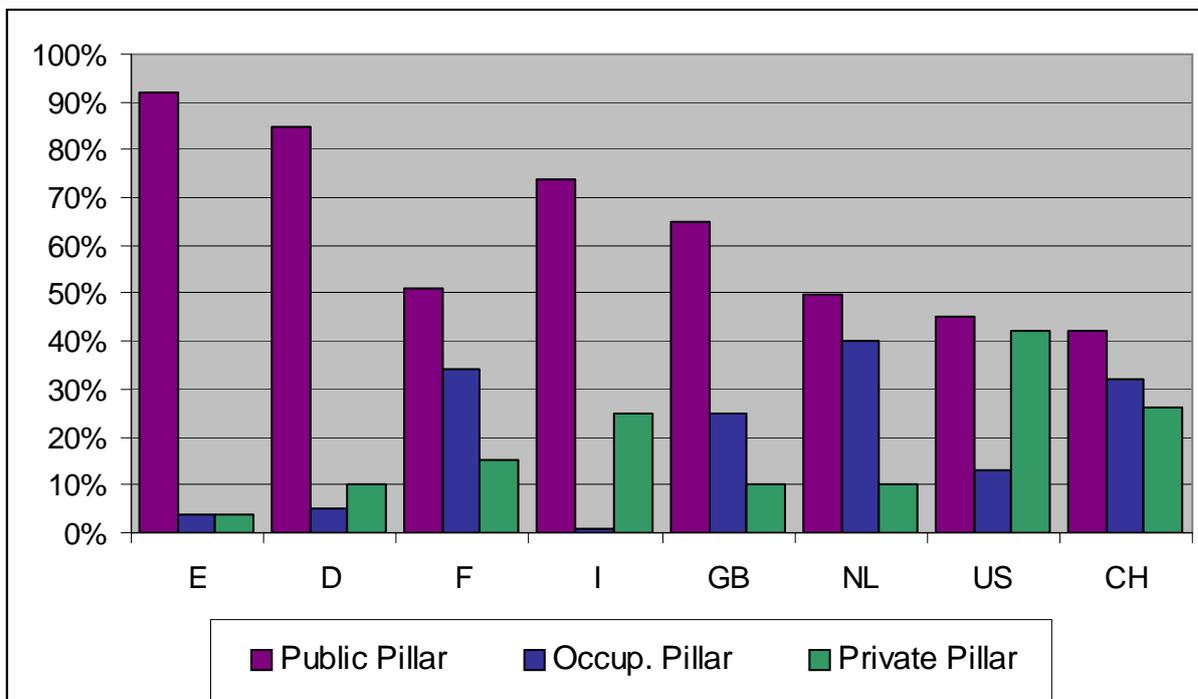
Figure 1 and Table 1 have shown how different the European entitlement programs are, both in overall size (as percent of GDP) and structure (pensions vs. healthcare vs. working age vs. children).

Similarly, pension systems are very different across Europe. The following figures and tables show selected dimensions of European pension systems. 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 for potential pension reform are in Europe.

A first dimension is the share of retirement income provided by public pay-as-you-go pension pillars vis-à-vis occupational and private pillars which are, in general, fully funded, see Figure

2, updated from Börsch-Supan and Miegel (2001).¹ The share of the public pay-as-you-go pillars in total retirement income varies greatly between 92% in Spain and 42% in Switzerland.

Figure 2: Public, occupational and private pension income in selected countries
(Percent of total retirement income)



Another important dimension of pension systems is the linkage to earnings and/or contributions, with two extremes: flat pensions without any link to earnings, usually associated with the name of Lord Beveridge, and pensions which are strictly proportional to contributions, usually associated with the name of Chancellor Bismarck. Moreover, 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 which is usually capped at a maximum benefit level (“pillar 1”).

Table 2, adapted from OECD (2011), characterizes European pension systems along these lines. The Denmark and the Netherlands, for example, have a basic pension which is

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

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). Sweden and Italy introduced “notional defined contribution systems”. These are pay-as-you-go pension systems mimicking funded systems insofar as they accrue interest on the contributions into personal accounts which are, on retirement, converted into annuities.

Table 2: Structure of Pension Programs, 2010

	Poverty prevention part ("Pillar 0")			Earnings-related part ("Pillar 1")
	Ressource tested	Basic	Minimum	Type
Austria				DB
Belgium	x		x	DB
Czech Rep.		x	x	DB
Denmark	x	x		
Estoria		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 Republik			x	Points
Slovenia			x	DB
Spain			x	DB
Sweden			x	NDC
Switzerland	x		x	DB
United Kingdom	x	x	x	DB
United States				DB

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: Retirement income depends on the number of years of contributions and individual earnings.

Point schemes: 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.

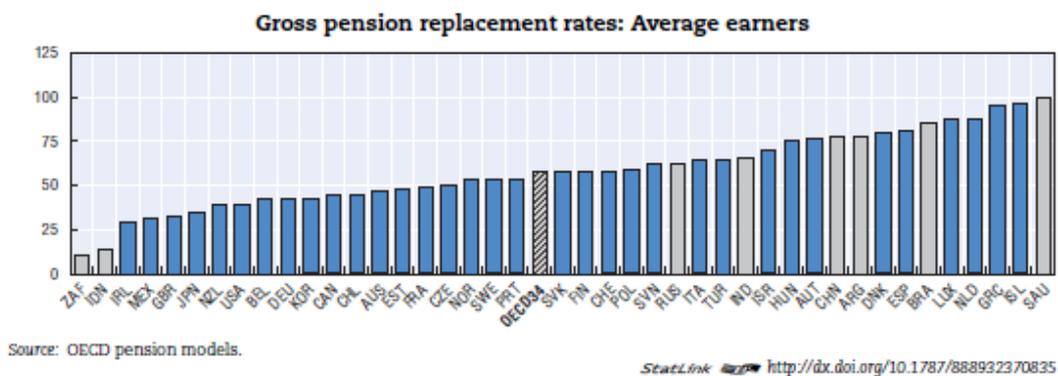
Defined-contribution (DC) plans: contributions flow into an individual account. The accumulation of contributions and investment returns is converted into a pension-income stream at retirement.

Notional defined contribution (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.

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

Third, pension replacement rates vary greatly from below 50% to almost 100%. Figure 3 shows this in terms of the average pension in percentage of average earnings before taxes.

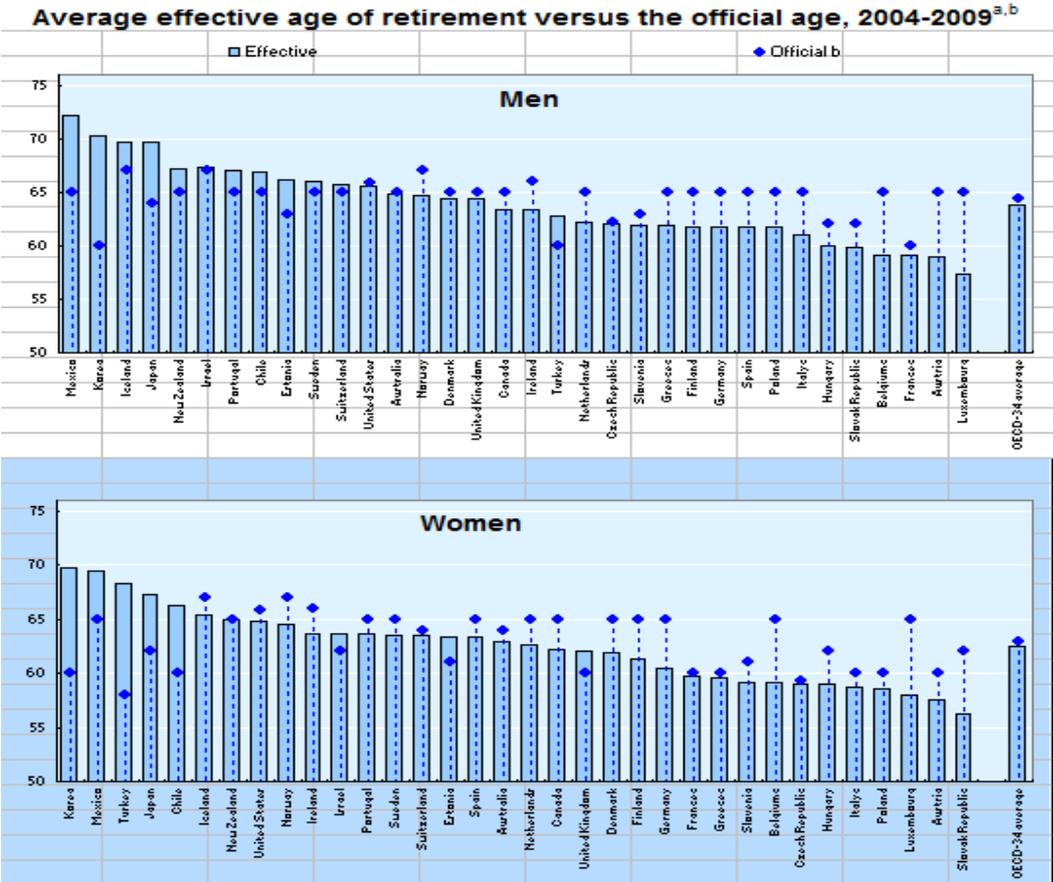
Figure 3: Gross relative pension level
(Average pension in percent of average earnings)



Source: OECD, Pensions at a Glance, 2011

Finally, as a forth important dimension, Figure 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.

Figure 4: Statutory and effective retirement age



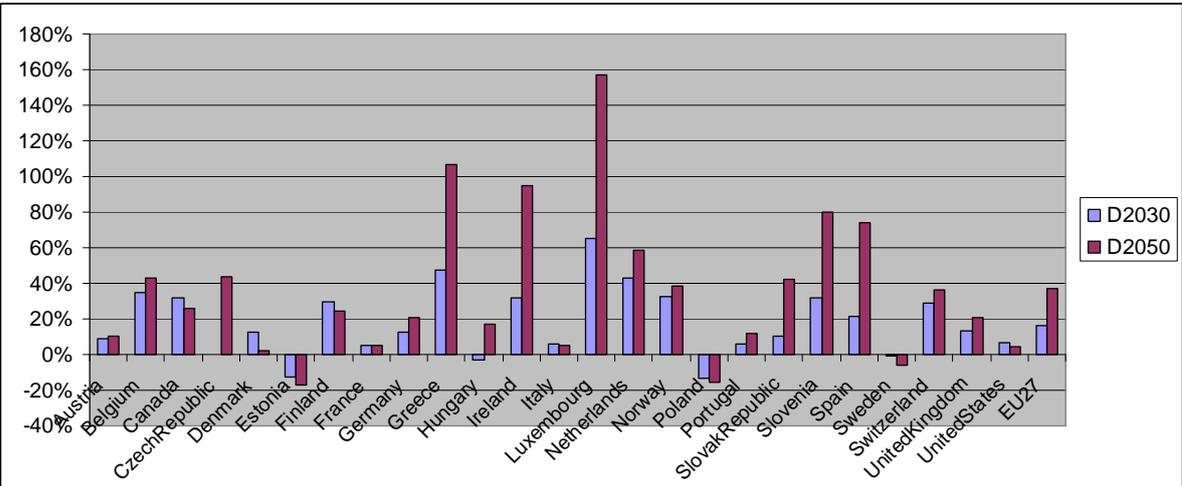
Source: OECD, Pensions at a Glance (2011)

To sum up this section: current pension systems in Europe are very different. They vary in all policy-relevant dimensions: size, structure, replacement rate and eligibility. As a consequence, pension expenditures are only loosely related to the demographic structure of a country, as we will see in the following section. Moreover, 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.

3. Causes for reform

Pension and entitlement reform is an ongoing process in virtually all European countries. Population aging is one important reason to align current entitlements with future fiscal capacity. Almost all European countries face increasing pension costs as percent of GDP, see Figure 5a. On average across the European Union, the cost share increase by 16% until 2030 and by 37% until 2050. There are, however, very large differences across countries. In Greece and Luxembourg, pension expenditures will more than double until 2050, while they are projected to decline in Estonia, Poland and Sweden.

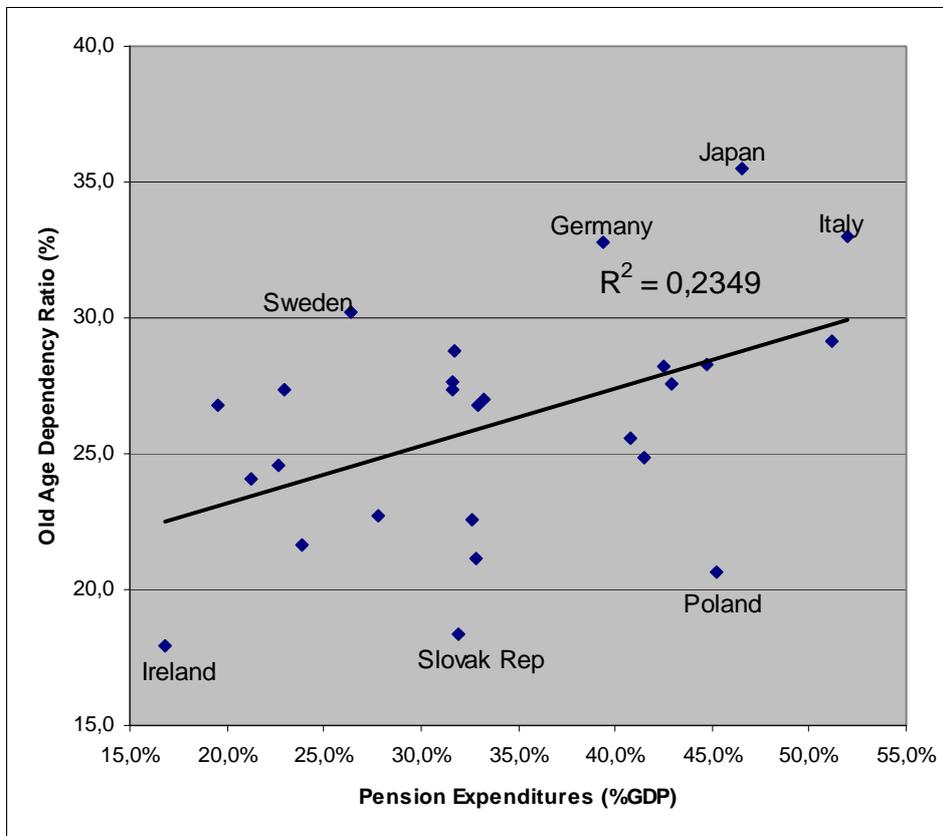
Figure 5a: Change in Pension Expenditures (Percent, 2030 and 2050 versus 2010)



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

Indeed, Figure 5b shows that the current demographic structure is surprisingly weakly linked to the current relative size of the European public pension programs.

Figure 5b: 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).

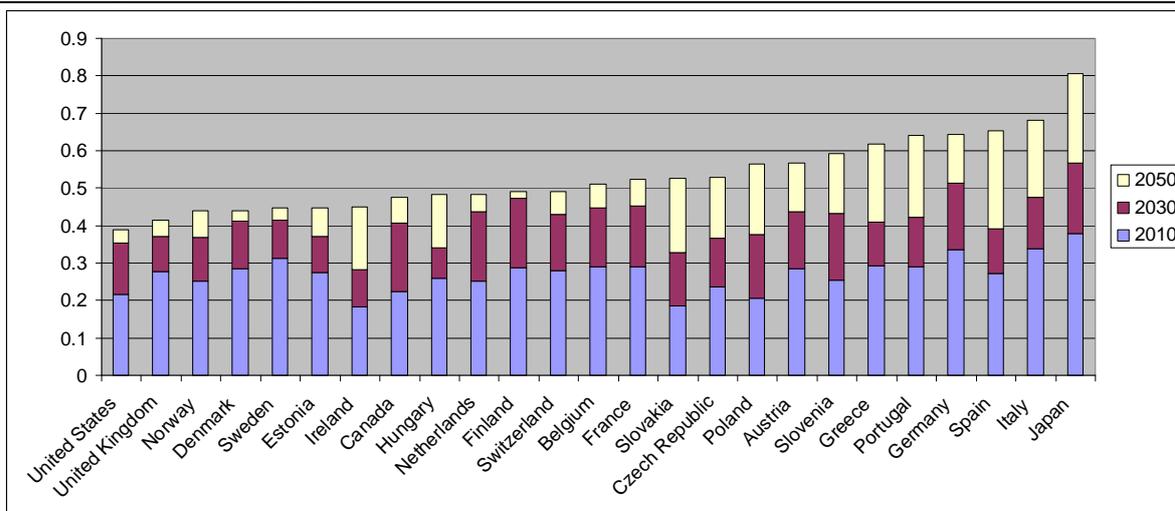
This is mainly due to the many design differences between European pension systems described in the previous section. Some of these designs are self-stabilizing and thus prevent high cost increases. This is the case, e.g., for Estonia, Poland and Sweden, and described in Section 4. Other designs create 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 as described in the second part of this section. The third is concerned with the redistributive features of European pension systems and the alleviation of old-age poverty.

(a) Population aging and lack of sustainability

While all European countries are aging, there are remarkable differences. Italy, Austria and Germany will experience a particular 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 transition in most of Europe has two causes: a quicker increase in life expectancy than elsewhere, partly due to a relatively low level still in 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 6a.

Figure 6a: The Old-Age Dependency Ratio in Europe and Selected Countries
(Population 65+/population 20-64: 2010-2030-2050)

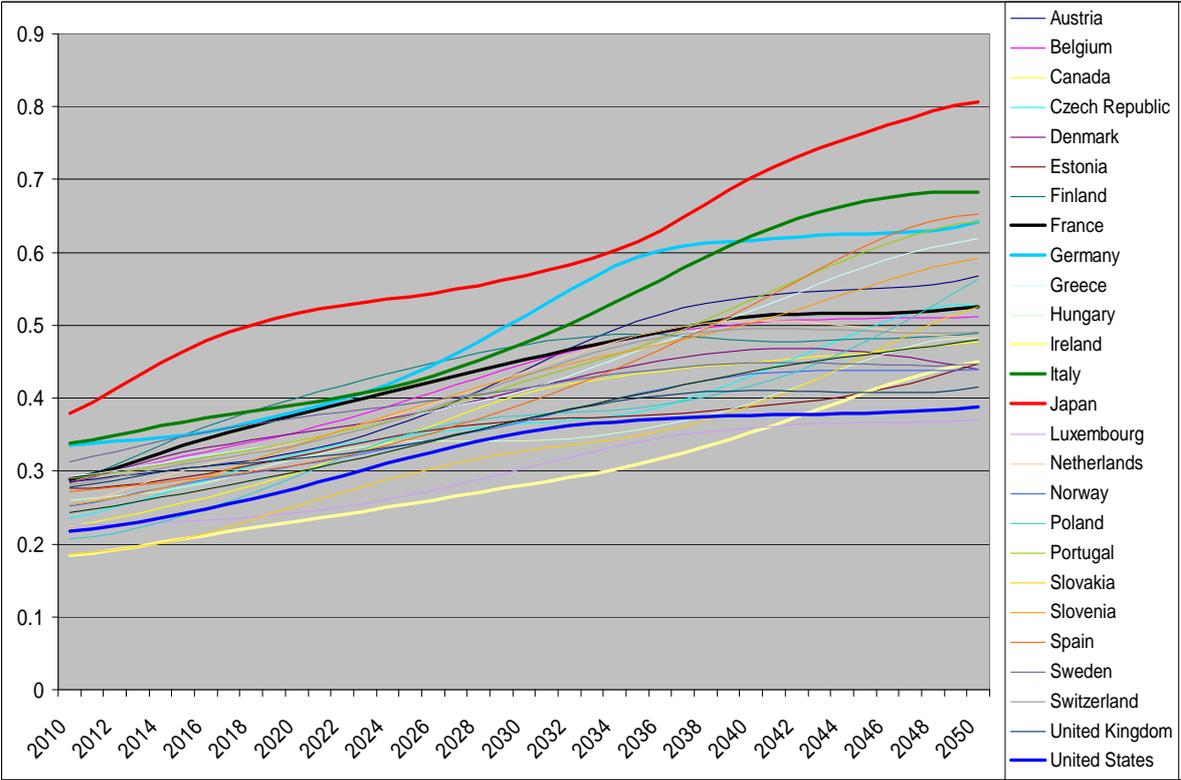


Source: EPC projections in EU, OECD elsewhere. OECD Social Expenditure database (SOCX, www.oecd.org/els/social/expenditure, November 2011).

According to the latest projections of the European Union, the share of elderly (aged 65 and above) will exceed a quarter of the population in 2030. The old age dependency ratio will more than double during the next 50 years. In Italy, Spain, Austria and Germany, there will be one person aged 65 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 pre-aging levels for the foreseeable future, see Figure 6b:

Figure 6b: The Old-Age Dependency Ratio in Europe and Selected Countries
(Population 65+/population 20-64: 2010-2050)

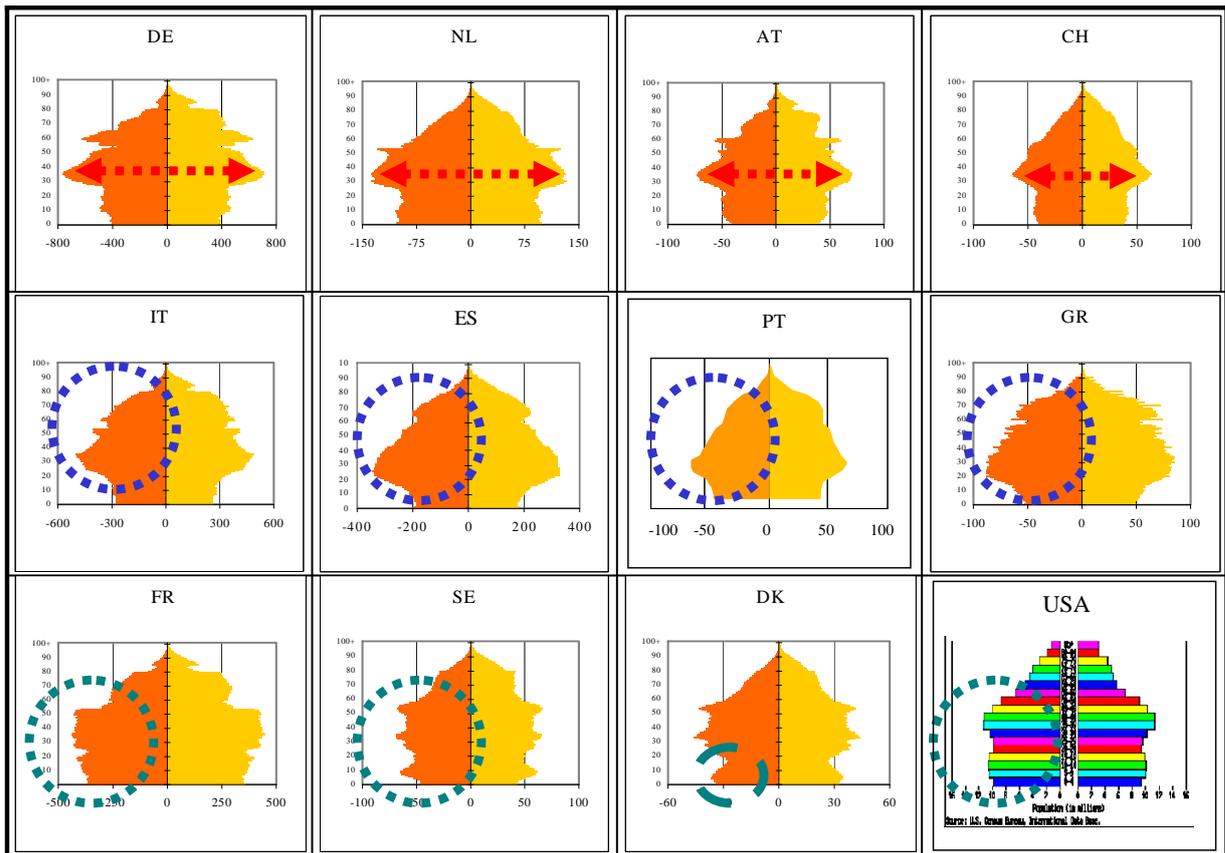


Source: EPC projections in EU, OECD elsewhere. OECD Social Expenditure database (SOCX, www.oecd.org/els/social/expenditure, November 2011).

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. The sharpness of the change is generated 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 pyramid, see Figure 7. In 1997, these children were about 35 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 35. 30 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, see below.

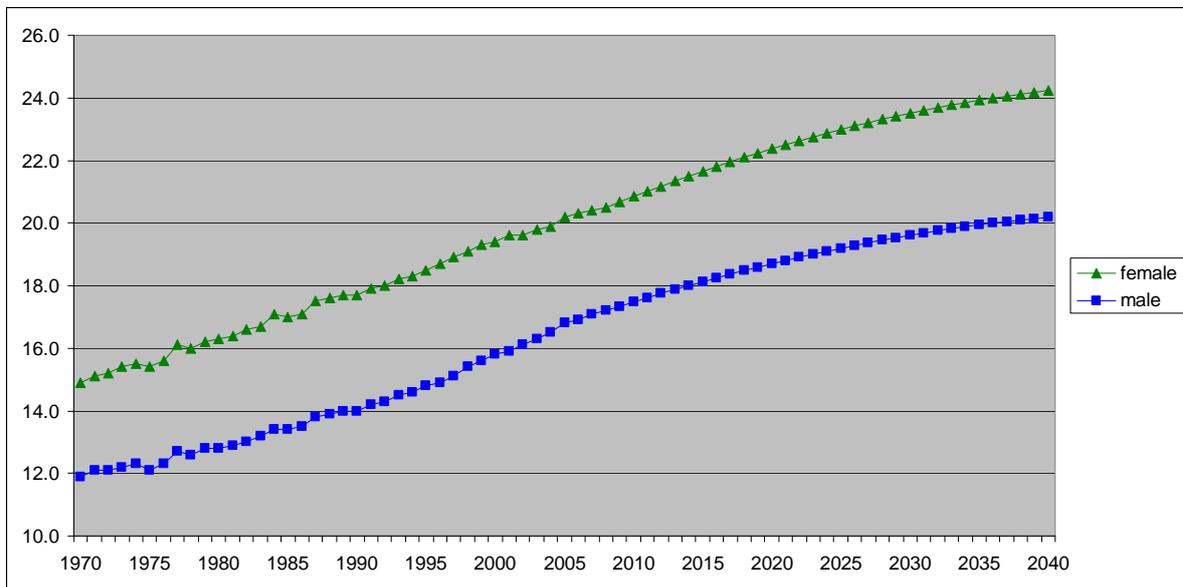
Figure 7: Baby Boom to Baby Bust Transition in Europe



Source: Own depiction based on Eurostat and US Census IDB data

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 8 shows that since 1970, the remaining life expectancy of German men and women at age 65 has increased by 4 years. It is projected to increase another 3 years until 2030. This implies that a pension in 2030 will be paid 7 more years than in 1970.

Figure 8: Life Expectancy at Age 65, German Men and Women, 1970-2040



Source: 1970-2008: Statistisches Bundesamt; 2009-2040: MEA-Projection

Since the average length of pension receipt was about 15 years in 1970, the increase in life expectancy represents an expansion of pension benefits by almost 50 percent. As shown below, 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 by the younger generation and give the bulk of benefits (all in LTC) to the older generation.

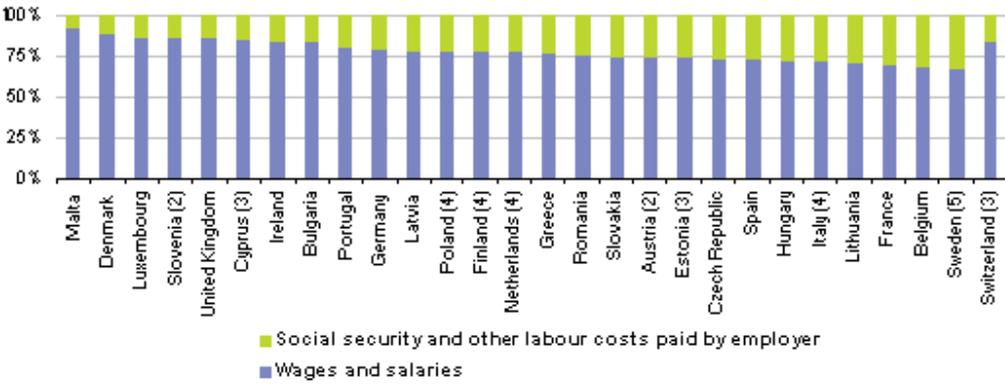
(b) Design flaws and negative incentive effects

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. Examples are most defined contribution pensions and most private health insurance. Most programs, however, have strong transfer components, see Section 2, e.g. payroll-tax financed pension programs

with flat benefits (in Great Britain, Netherlands, Switzerland). Such payroll taxes distort labor supply of the younger generation. Contributions to social insurance is a large part of total labor compensation, see Figure 9. Many economists regard the high total labor costs as the main reason for the low demand for labor, thus high unemployment and low 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 economic performance at large. It is important to keep both in mind, since economic growth is an important source to finance future pensions.

Figure 9: Composition of total hourly labor compensation in Europe (percent, Eurostat)

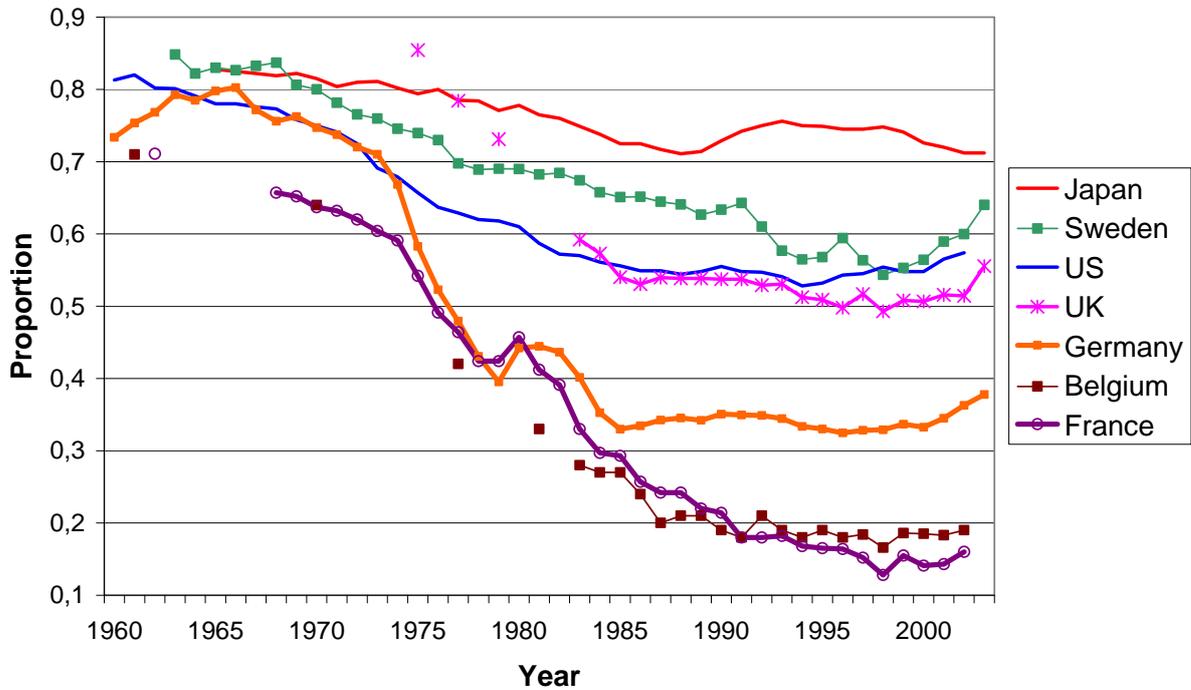


(1) Enterprises with ten or more persons employed, NACE Rev. 2 Sections B to N.
 (2) Provisional.
 (3) NACE Rev. 1.1 Sections C to K, 2008.
 (4) 2008.
 (5) NACE Rev. 1.1 Sections C to K, 2007.
 Source: Eurostat (online data codes: lc_an_struct_r2 and lc_an_struct)

In addition, most public pension systems are not actuarially neutral because they distort labor supply of the older generation through early retirement incentives. Figure 10 shows that especially in Belgium, France, the Netherlands, Germany and Italy, very few workers aged 60-64 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.

Figure 10: Labor force participation among men aged 60-64, 1960-2008
(percent of male population 60 to 64)

LFP trends for men 60 to 64

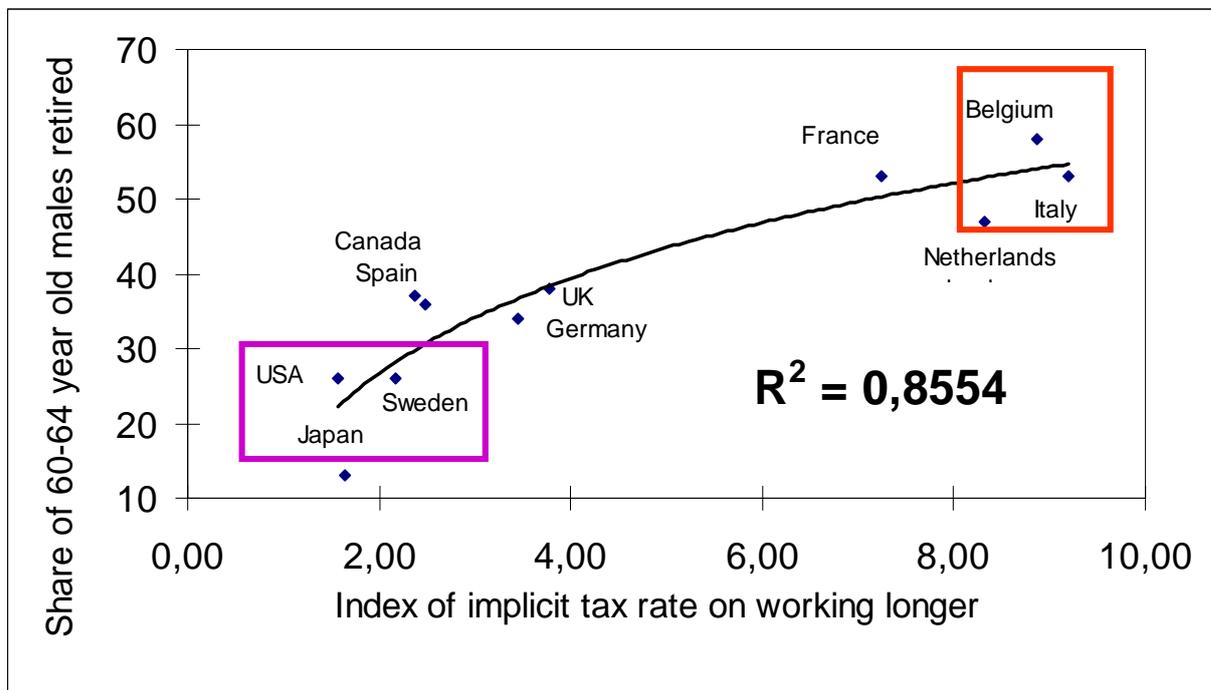


Source: Gruber and Wise (2010)

This decline is not a “natural trend” tied to secular income growth. It did not occur, for example, in Japan and Sweden. Rather, there is convincing microeconomic evidence exploiting reasonably exogenous policy changes that this 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.² Figure 11 summarizes the findings in an aggregate picture which links the share of those already retired to an index of early retirement incentives.

² Börsch-Supan and Schnabel (1999), Börsch-Supan (2000), Gruber and Wise (1999, 2003)

Figure 11: The Gruber-Wise exercise

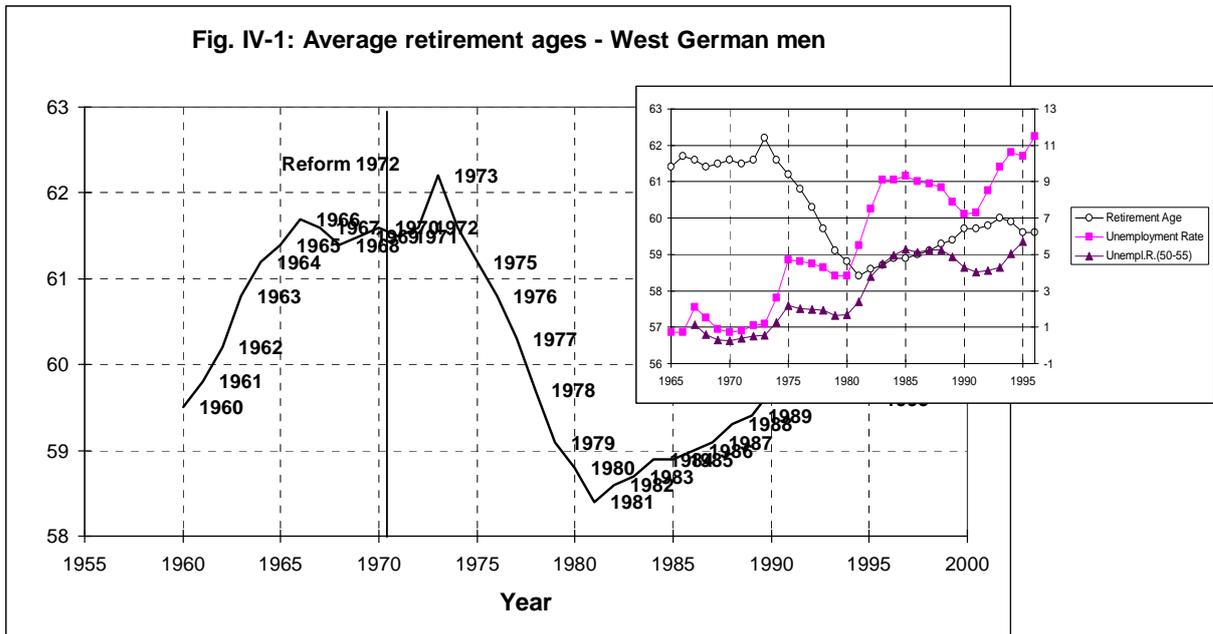


Source: Börsch-Supan (2000) adapted from Gruber and Wise (1999)

Germany provides a striking historical example for the “reasonably exogenous policy changes” that have created this pattern, see Figure 12. The German public pension system with its “flexible retirement” introduced in 1972 tilted the retirement decision heavily towards the earliest retirement 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 12. Immediately after the introduction of “flexible retirement” in 1972, the average retirement age declined dramatically by more than 3 years. We interpret this as a clear sign of a policy reaction. The most popular retirement age switched by 5 years from age 65 to age 60. As a striking example of effective reform, a large part of this decline has been reversed since 1997.

Figure 12: Average Retirement Age in Germany, 1960-2008



Source: Börsch-Supan and Schnabel (2010)

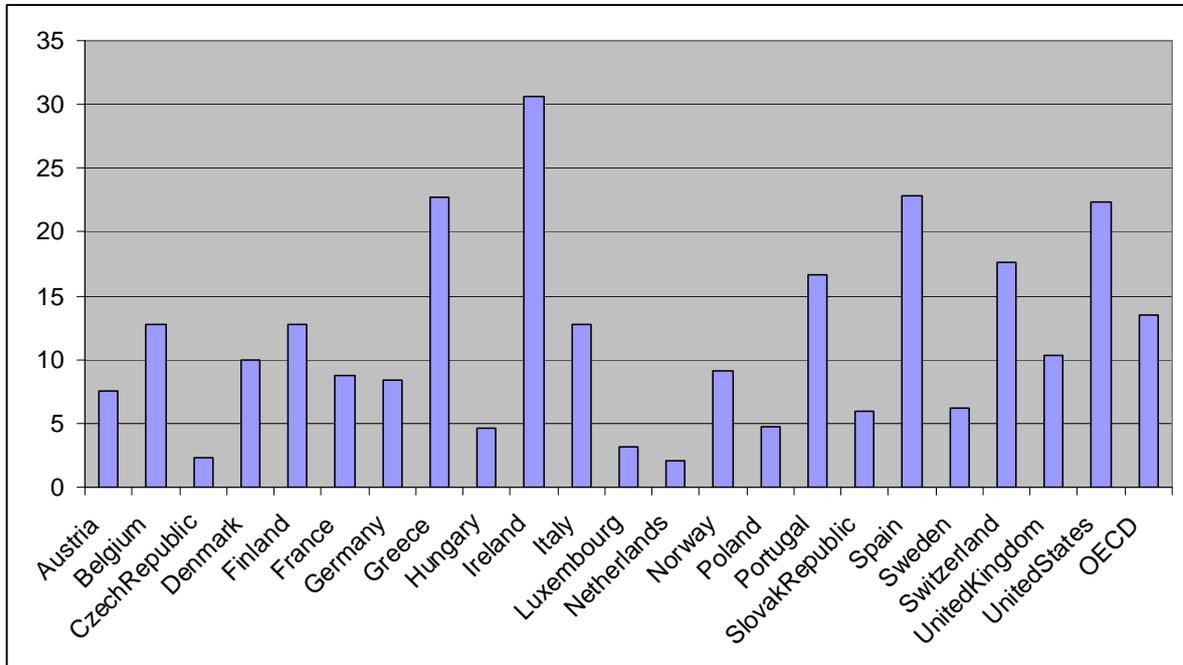
(c) Lack of adequacy and perverse redistribution

Many countries have a minimum pension, either as statutory basic or minimum pension or effective through social assistance mechanisms.³ As Figure 13 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.

³ E.g. in Germany: the tax-financed “Grundsicherung im Alter” which is not part of the German public pension system.

Figure 13: Old-Age Poverty Rates, 2010

(OECD, 2008)



Source: OECD, Pensions at a Glance (2011)

There are, however, three striking exceptions where the old-age poverty rate exceeds 20% of individuals aged 65 and more: Greece, Spain, and Ireland. Ireland spends very little on pensions as we have seen in Figure 3. Greece and Spain, however, have both above average pension replacement rates and a very high old-age poverty rate. 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.

4. Curing the problems

Reform processes are under way in almost all European countries. Some countries reformed early in the 1980s, most countries much later, some not at all. 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 (moving substantial parts of retirement income from public pensions to private savings). Figure 14 presents a synopsis.

Figure 14: 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		

The multitude of reform elements in Europe is partly a result of different systems to start with 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. Reform requires an overhaul of the existing pay-as-you-go systems as well as the re-introduction of private saving as a major source of future retirement income. Neither can the public pension systems alone

provide a sufficient retirement income at reasonable tax and contribution rates, nor can private savings fully substitute for pay-as-you-go pensions.

Public pensions alone will not suffice since the resulting tax and contribution rates from maintaining the current generosity will suffocate economic growth – not necessarily now, but certainly in the thirties and forties of our century (see Figure 15 below). Further increases of the tax and contribution rates are not a policy choice in those EU countries that have high total labor costs, in particular Germany, Austria, Denmark and Sweden.

Transiting pensions entirely to private saving is not a policy option either. 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 which were thinkable 25 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 is always better than monolithity.

A credible reform strategy has thus two reform elements: 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. This first subsection addresses the first, the following subsection the second element. Subsection (c) addresses issues of targeting and poverty alleviation.

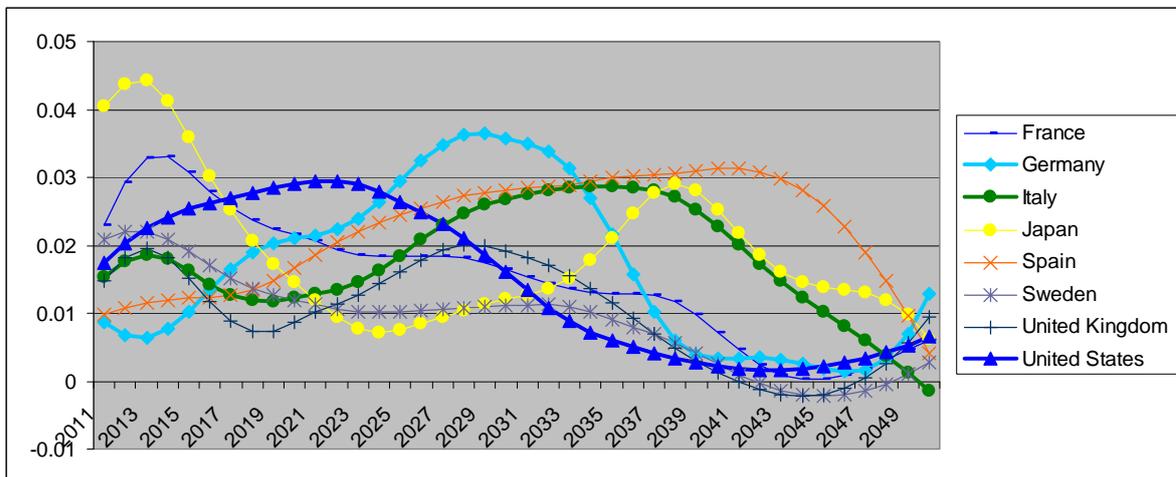
(a) Adapting pay-as-you-go public pension systems

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 and the duration of benefits. 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 far from absorbing all available resources. The dependency ratio deteriorates the financial basis of the pension system at a rate of about 0.2-0.5 percent per annum, calculated as percentage decline of the system dependency ratio, i.e., the number of beneficiaries divided by the number of contributors, approximated by the old-age dependency ratio, Figure 6b.

Figure 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).

This is much less than the long-run averages of productivity growth which is about 1.5 percent per annum. Hence, population aging absorbs between a seventh and a third of future productivity growth but leaves the bulk for real income growth. Pension benefits can therefore rise in real terms in spite of population aging, and all what is required is a growth rate of benefits that remains below the growth rate of wages.

How much benefit increases have to be dampened depends on the speed and the extent of demographic change in each country. 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 so-called “notional contribution 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.

Germany has taken a slightly different approach. A recent reform commission, the so-called Rürup commission, has proposed to extend the benefit indexation formula by a new factor, the so-called “sustainability factor”.⁴ 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), see Figure 10. The latter element is appropriately weighted to achieve the contribution rate targets put by the then labor secretary Riester into German law: a contribution rate under 20 percent until 2020 and under 22 percent until 2030.

Box: Sustainability factor in Germany

<p>Annual Pension Increase</p>	<p>Change in earnings, net of contributions (wage indexation)</p>	<p>Change in system dependency ratio („sustainability factor“)</p>
$PVal_t = PVal_{t-1}$	$\left(\frac{NetWage_{t-1}}{NetWage_{t-2}} \right)^a$	$\left(\frac{SysDepRat_{t-2}}{SysDepRat_{t-1}} \right)^{1-a}$

The German pension indexation („sustainability“) formula

PAYG Budget: $c \cdot w \cdot NWork = p \cdot w \cdot NPens$
=> $p = c \cdot NWork / NPens$

The 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.

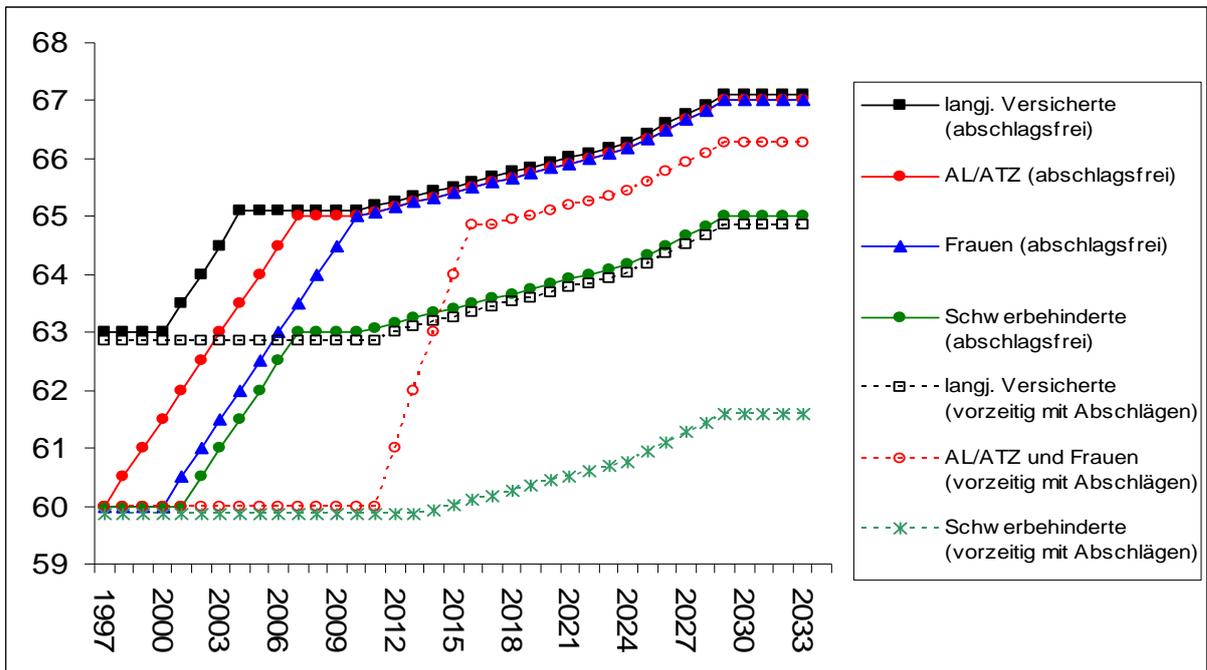
Börsch-Supan and Wilke (2005) describe the differences and similarities between the Swedish and the German reform and points out that the sustainability factor can almost perfectly mimic a national defined contribution system; it is thus a defined contribution system “wrapped” as a defined benefit system. The different “selling approaches” responded to the political economy differences between Sweden and Germany.

The other crucial dimension of pension expenditures is the duration of pension benefits, determined by the difference between retirement age and life expectancy. As pointed out earlier, life expectancy is projected to increase by about 3 years between now and 2030. This increase is expected to be about the same for all European countries. Quite clearly, stopping the trend towards early retirement is one policy necessity; adapting the statutory retirement age to increased life expectancy is another one.

Both steps are extremely unpopular throughout Europe. 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 16.

⁴ Börsch-Supan, Reil-Held und Wilke (2003), Börsch-Supan (2004).

Figure 16: Projected Retirement Age, Germany, 1997-2035



Source: Updated from Berkel and Börsch-Supan (2004).

In addition, Denmark, Germany, France and the UK have enacted increases of the statutory normal retirement age (e.g. Denmark and Germany from 65 to 67 years, UK even to 68 years, while in France only from 60 to 62 years). Most increases are slow and gradual. In Germany, it has started in 2011 with monthly steps such that the retirement age of 67 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, 45 years of contributions will generate a full pension even if these service years are reached before age 65. In some countries, the number of required contribution years is much lower, notably in Greece and Italy, and vary by profession, see the 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 reciprocity. Following the above logic, the required number of service years should also be adapted to the longer life span.

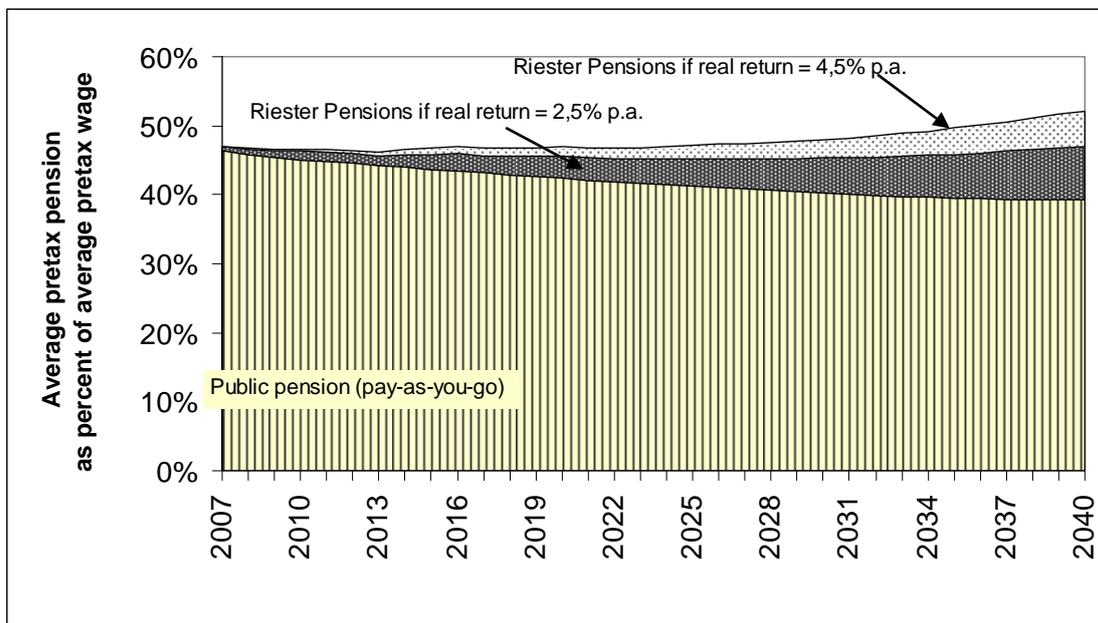
(b) Private saving and pre-funding

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.⁵ A reasonable approach is of course to exploit both mechanisms, in spite of the unpopularity particularly of the first mechanism.

Figure 17 shows how this can work, using the recent German reform proposals as example. Taking account of the increase in the normal retirement age to 67, 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 (Box 3). This projection assumes a private retirement saving rate of 4% from 2009 on. These 4% 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% of gross income can be tax-privileged.

⁵ 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).

Figure 17: Projected Retirement Income Components, Germany, 2002-2040



Source: Börsch-Supan, Bucher-Koenen, Reil-Held and Wilke (2008).

This is important for the early baby boomers. Figure 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% is sufficient to maintain or even to obtain higher retirement income levels than today, but a saving rate of 8% 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 2 has shown the weight of the three pillars in selected European countries. Those countries, which have reformed their pension systems in the 1980s by transiting to multipillar systems (Switzerland, the Netherlands, 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 not be a feasible option anymore for them and only for later generations.

(c) 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.

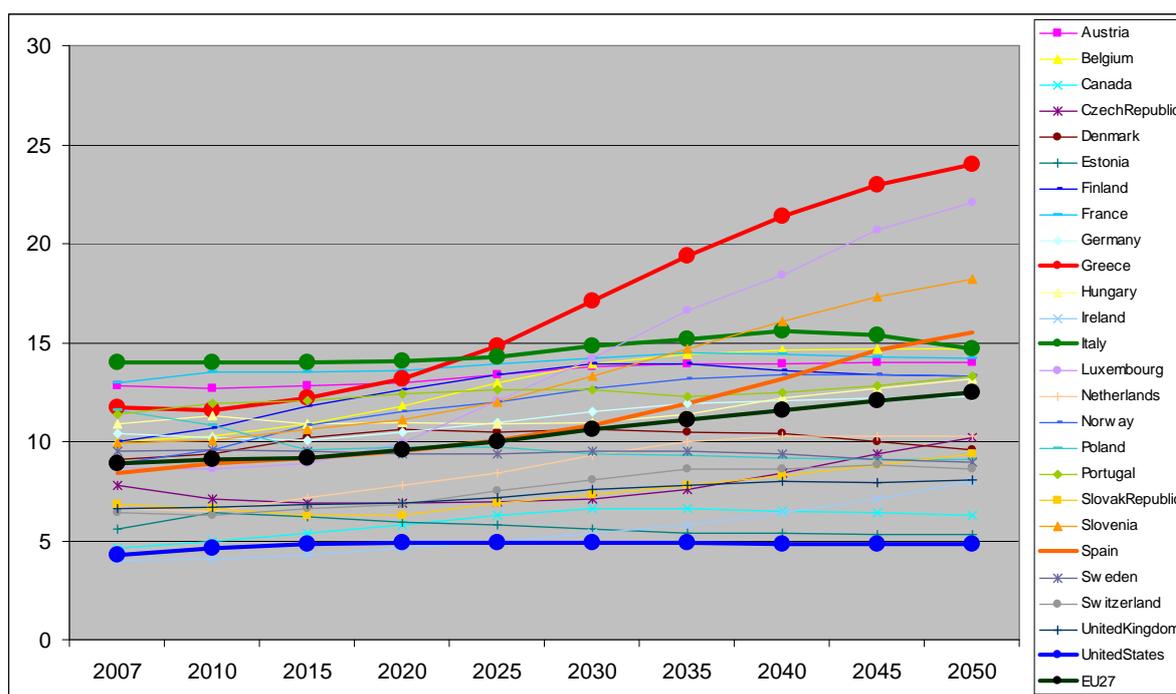
This dilemma between sustainability (macro economic point of view: aggregate fiscal functioning of pension systems) and old-age poverty (micro economic view: distributive issues) can only be solved by targeting policies for those who are in danger of old-age poverty. One instrument are basic and/or minimum pensions, see Table 2. Another instrument is a non-linear (concave from above) schedule linking benefits to contributions (e.g. the PIA/AIME conversion in the US Social Security system).

Some countries have basic or minimum pensions which 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 not existent 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.

5. Implications for fiscal stability

The Economic Policy Committee of the EU, together with the OECD, provide projections on future public pension expenditures, see Figure 18.

Figure 18: Projected Public Pension Expenditures (% GDP), 2007-2050



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

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 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 18 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.⁶ Hence, the Italian system has not yet deeply cut benefits. The new system, however, has a strongly stabilizing influence on pension expenditures, see Section 4.

The OECD has decomposed the projected expenditure increases into four potential causes (old-age dependency, employment rate, take-up ratio, and benefit ratio) according to the following equation:

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

Results are displayed in Table 4:

Table 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, Costello, Diez Guardia, Eckefeldt and Mourre (2008)

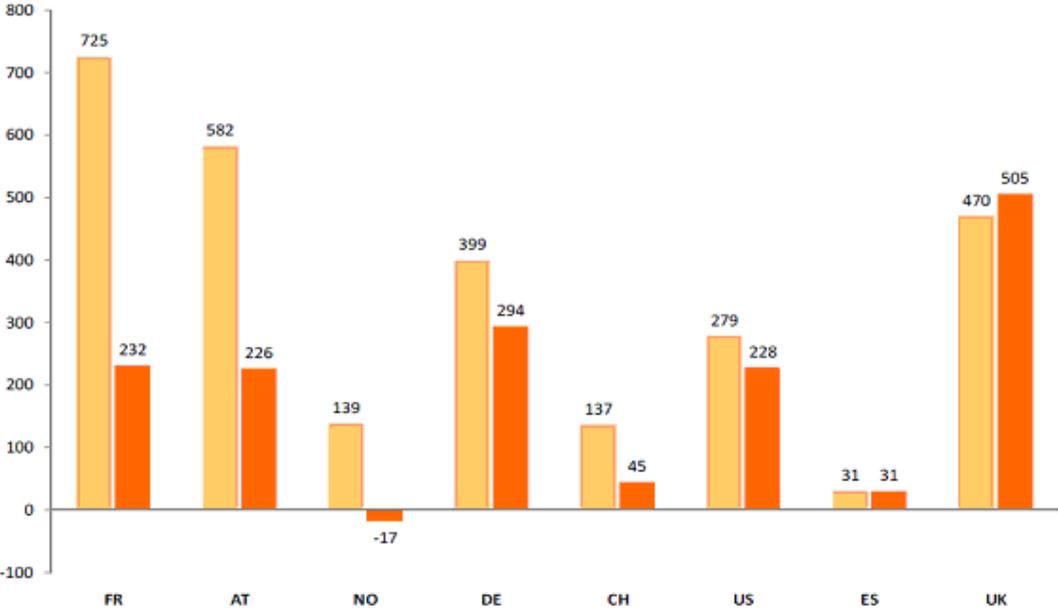
The demographic pressure, measured as the dependency ratio effect, is positive in all countries, especially the Mediterranean countries. Some countries have strong counterbalancing forces, e.g. Sweden and Italy. This is the effect of the automatic stabilizers in the NDC systems,

⁶ I am grateful to Agar Brugiavini for this description.

somewhat weaker in Germany with the sustainability factor and the “pension 67 program”. This mechanisms reduce the benefit and take-up ratios and increase the employment, mainly through later retirement. In other countries, such as Spain (Greece did not provide figures at that time), demographic factors were not or only very little dampened by countervailing policy measures.

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 19 shows the effect of 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 little change in the US and even an increase in the UK.

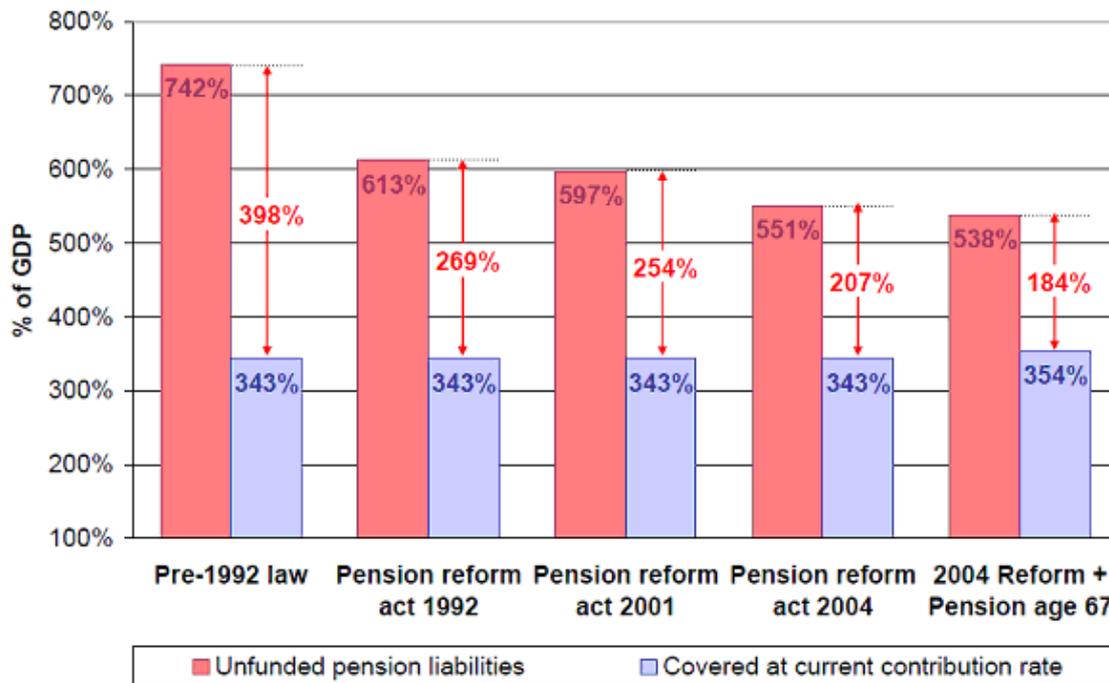
Figure 19: Projected implicit pension debt before and after recent reforms (% GDP)



Source: Moog, Müller and Raffelhüschen (2010)

Werdning (2007) provides a similar calculation for the effects of the various German reform steps, see Figure 20.

Figure 20: Projected implicit pension debt before and after recent reforms (% GDP)

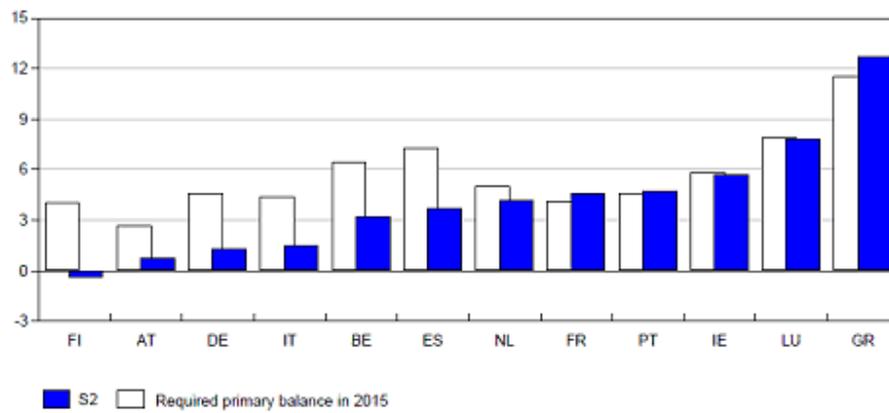


Source: Werdning (2007)

The gap between unfunded pension liabilities and future contributions corresponds to the implicit pension debt of Figure 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 65 to 67. The largest effect was the change from gross to net wage indexation in 1992, and the introduction of the sustainability factor in 2004.

An indicator of long-term fiscal balance which is less sensitive to assumptions about the discount rate and thus timing of events is the so-called “S2 indicator” of 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% of GDP defined in the Maastricht treaty) to be achieved after a certain date. The S2 indicator measures the additional income (primary balance as percent of GDP) necessary to avoid ending up with a higher final level of debt.

Figure 21: Sustainability gap “S2” in selected European countries (% GDP)



Source: Balassone et al. (2009)

Figure 21 shows the precarious situation of Greece, in contrast to the situation in Italy. However, in spite of the reforms e.g. in Italy and Germany, only Finland features a fiscally sustainable pension system according to these calculations among the countries studied.

Carone, Costello et al. (2008) provide the most comprehensive analysis, projecting future government debt under the assumption that the sustainability gap created by pension and health care spending has to be closed by taking up explicit debt. Table 5 presents the results.

Table 5: Projected government debt, 2007-2050

Debt Developments in the "2007" and "Programme" Scenarios
Projected Debt Developments in the EU Member States
(percent of GDP)

Country	Gross Debt	"2007" Scenario			"Programme" Scenario		
	2007	2010	2030	2050	2010	2030	2050
BE	86	75	54	135	74	46	117
CZ	30	34	116	386	30	76	282
DK	26	15	-64	-131	19	-26	-49
DE	65	59	43	89	60	22	38
EE	3	2	-43	-129	2	-41	-123
GR	93	87	90	136	83	33	-7
ES	36	29	-27	41	30	-14	75
FR	64	64	88	173	62	43	70
IE	25	26	33	139	29	58	198
IT	105	101	86	133	99	28	-9
CY	60	39	-31	20	44	18	130
LV	9	10	18	69	6	-29	-52
LT	18	18	27	88	14	-20	-32
LU	7	8	47	197	7	26	155
HU	65	68	113	312	63	70	205
MT	63	57	57	49	53	17	-41
NL	47	44	63	173	41	34	112
AT	60	56	37	57	55	24	25
PL	50	53	27	1	49	-1	-72
PT	64	63	70	168	60	33	74
SI	26	23	56	255	23	45	227
SK	31	31	66	212	30	32	116
FI	35	26	-45	-61	29	-2	36
SE	40	25	-43	-75	25	-57	-105
UK	44	47	92	223	45	59	147
EA	64	60	50	117	59	25	58
EU27	60	56	54	128	55	28	67

Notes: Pension projections were not available for Greece and the rise in age-related expenditure is therefore underestimated. Pension expenditure was projected to rise between 2005 and 2050 by 10.2 per cent in the 2002 update of the Greek stability programme. The aggregate results for the Euro-area exclude Greece and for the European Union (EU27) additionally exclude Romania and Bulgaria. Note that for BE and PL the figures refer to the 2006 SCP assessment, since no 2007 updated stability/convergence programmes were available.

Source: Carone, Costello et al. (2008)

Notably, like in Table 4, Greece did not provide pension figures for this EU-sponsored exercise and reflects therefore a substantial underestimate. It shows the worsening fiscal position of many EU countries due to aging and program design, but also the stable position of the Scandinavian countries. The financial crisis and the debt taken on through stimulus and bank rescue packages have of course worsened the debt situation considerably.

6. Conclusions

The major European pension systems (France, Germany, Italy, Spain) still have some ways to go in order to become financially sustainable. This paper has shown that this goal is achievable with a combination of reasonable policy steps. Italy, for example, has introduced a new entrants system that stabilizes pension expenditures. Sweden with its NDC system has no sustainability gap. Germany has 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. 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 been 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, e.g. in the definition of the conversion rate to an annuity which leave room for political maneuvering. The “dressing” of the reform as a new NDC system did help in the political economy situation in Sweden, 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 which 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” which rules out any nominal benefit reduction, and parts of the dynamic increase in the retirement age has been offset by the introduction of new duration-of-service-rules. By and large, however, pension reforms introducing automatic stabilizers have worked better than those without such mechanisms.

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