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Work Disability
The Effects of Demography, Health, and Disability Insurance

Axel Börsch-Supan

2.1 Introduction

Disability insurance—the insurance against the loss of the ability to work—is a substantial part of public social expenditures and an important part of the social safety net of all developed countries. Like almost all elements of modern social security systems, disability insurance faces a trade-off. On the one hand, disability insurance is a welcome and necessary part of the social safety net, as it prevents income losses for those who lose their ability to work before the normal retirement age. On the other hand, disability insurance may be misused to serve as an early retirement route even if the normal ability to work is not affected at all.

Understanding the trade-off between social safety provision and its misuse is important for the design of a modern social security system that maximizes social safety provision under increasingly tight financial budget constraints (Aarts, Burkhauser, and de Jong 1996). The aim of this chapter is to use the newly collected SHARE data (the Survey of Health, Aging, and

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Retirement in Europe) together with data from its sister surveys in England (ELSA, the English Longitudinal Study on Aging) and the United States (HRS, the Health and Retirement Study) to shed light on this trade-off.

A starting point for this chapter is the striking variation of the expenditures on disability insurance across European countries and the United States (see figure 2.1). This and the two following figures are based on the official figures provided by the European Union, collected as part of the European System of Integrated Social Protection Statistics, which employ a harmonized definition of disability insurance. The data for the United States in figures 2.1 and 2.2 are taken from the Organization for Economic Cooperation and Development (OECD 2003) and uses a comparable definition. Unfortunately, it is only available for 1999.

While the EU15 countries (i.e., the fifteen countries that formed the European Union before its enlargement in 2005) spend, on average, about 8 percent of their social expenditures on disability insurance, it is much higher—about 14 percent—in the Scandinavian countries and also higher in the two Anglo-Saxon countries (about 10 percent in the United Kingdom and the United States). In turn, some countries, such as France, Greece, and Ireland, spend only about 5 percent.

Figure 2.2 shows that this variation is not a matter of rich and poor countries: the order of countries and the range is about the same when correcting for gross domestic product (GDP) differences across countries. The only substantial change is the United States. Since U.S. total social expenditures are about half of what they are in Europe, disability insurance expenditures as percentage of GDP are much smaller in the United States than the share of disability insurance in social expenditures.

Absolute expenditures have risen in all EU15 countries (see figure 2.3). The pattern over time, however, is quite different across countries. Especially Sweden and Denmark exhibit a sharp increase since about the year 2000, while the Netherlands and Finland have about stabilized their very large expenditures on disability insurance until the mid-1990s.

The range of per capital expenditures is enormous, even after correcting for purchasing power differences within the European Union.[1] Sweden and Denmark spend four to five times more on disability insurance than France and the Mediterranean countries. The U.S. spending corresponds to 89 percent of the EU15 average.

The remainder of the chapter is devoted to isolating the causes underlying the large cross-national variation of disability insurance expenditures and the different expenditure patterns over time visible in figures 2.1 through 2.3.

Three causes are commonly mentioned to explain the large variation: demographics, health, and institutions. First, while all European countries are aging, the extent of population varies considerably. Hence, the first

1. This correction includes differential purchasing power in the euro zone.

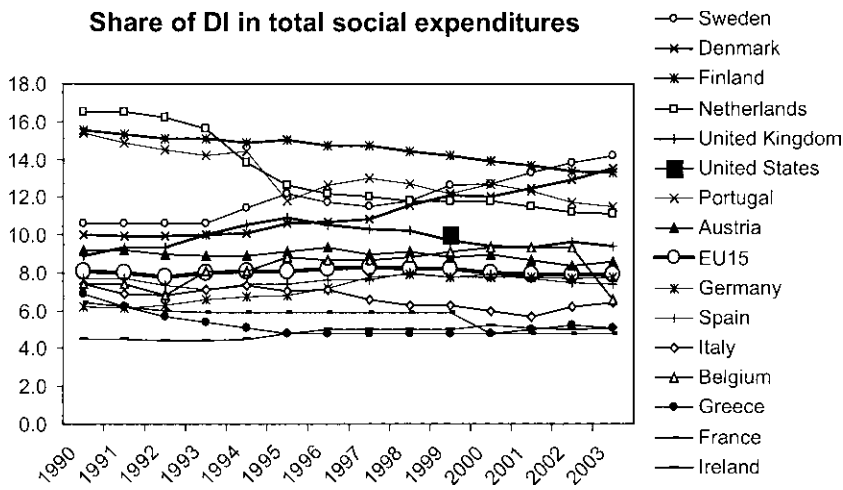

Fig. 2.1 Share of disability insurance expenditures in total expenditures (percentages)
Source: Eurostat Data Archive 2005 and OECD 2003.

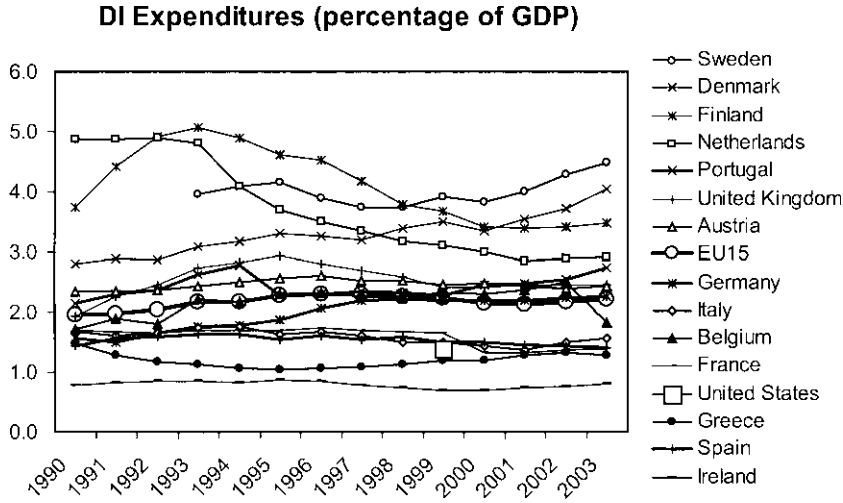

Fig. 2.2 Disability insurance expenditures as percent of GDP (percentages)
Source: Eurostat Data Archive 2005 and OECD 2003.

explanation claims that a country with an older population also has a higher prevalence of disability insurance uptake. A second potential cause for the cross-national variation is international variation in health status. One might hypothesize that in countries that have lower physical and mental health, disability insurance is taken up more frequently than in countries with better health status.

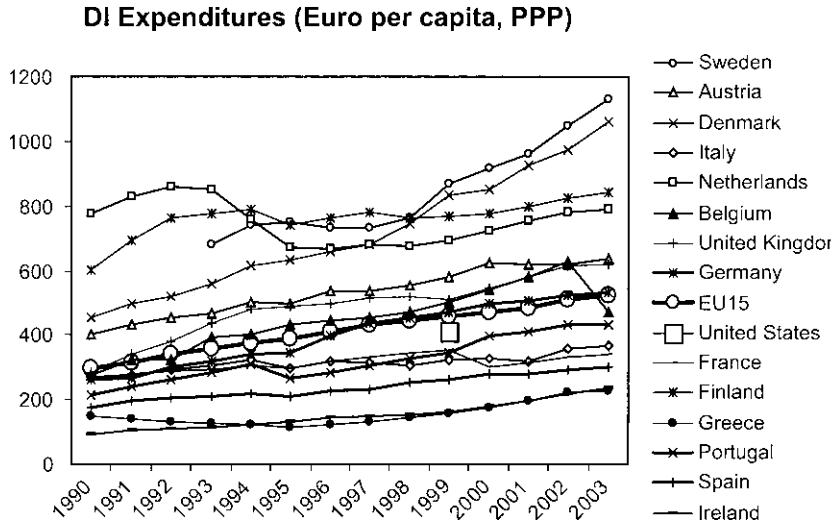

Fig. 2.3 Disability insurance expenditures per capita (Euro, purchasing power parity)

Source: Eurostat Data Archive 2005.

Third, recent studies such as the string of international comparisons by Gruber and Wise (1999, 2004, and 2005) and the OECD study by Blöndal and Scarpetta (1998), based on the Gruber and Wise (1999) methodology, have shown that public old-age pension systems exert large incentive effects which, according to each country's legislation, significantly increase the uptake of early retirement provisions. Similar incentive effects may also arise from disability insurance. Figure 2.4 may indicate that this is the case. It shows early and normal eligibility age for public old-age pension, and the actual average age of withdrawal from the labor force. Some countries have an average withdrawal age that is considerably lower than the earliest eligibility age for old-age pensions. Because few people can afford to retire without public retirement income, disability insurance or other transfer income may fill the gap in these countries. Particular striking examples are Austria, Belgium, and France, where the average withdrawal age is younger than age sixty. But also in Denmark and the United Kingdom, countries with a generally much higher retirement age, the average withdrawal age is below the earliest eligibility age for old-age pensions.

The chapter proceeds as follows. Section 2.2 introduces the Survey of Health, Aging, and Retirement in Europe (SHARE) and describes how we merged comparable data from the English Longitudinal Study on Aging (ELSA) and the U.S. Health and Retirement Study (HRS). The section ends with a set of descriptive statistics characterizing our sample.

The richness of these microdata permits us to estimate regressions that

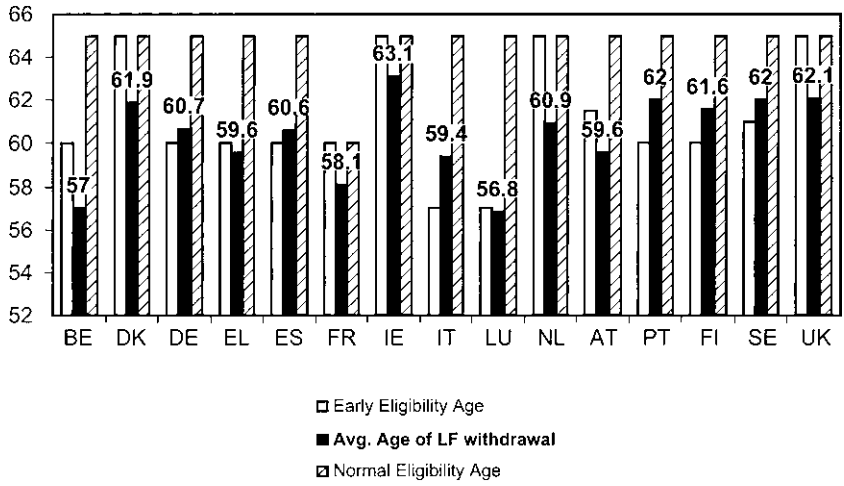

Fig. 2.4 Retirement age in Europe
Source: European Commission (2004).

relate the uptake of disability insurance to demographic and health characteristics of the respondents in these surveys. Section 2.3 reports the result of these regressions, and section 2.4 applies them to a counterfactual exercise: what would disability uptake rates look like if there were no demographic and health-related differences among the twelve European countries and the United States in our sample? As it turns out, demographic and health-related differences across countries do not explain much of the cross-national variation in disability enrolment rates.

Section 2.5 therefore turns to the institutional details of the disability schemes and regresses disability insurance enrollment on a set of institutional variables derived from recent OECD work. Our main result is that more than 75 percent of the cross-national variation can be explained by a parsimonious set of a few variables describing the generosity of, and the ease of access to, disability insurance. Section 2.6 concludes.

2.2 The Data: SHARE, ELSA, and HRS

The SHARE is modeled closely after the U.S. HRS (see Juster and Suzman 1995)—the first survey of this kind—and the ELSA (see Marmot et al. 2003), which followed the lead by HRS. Researchers from HRS and ELSA have been participating in the design process of SHARE at all stages. About two-thirds of the variables in SHARE are identical to variables in ELSA and HRS, and most of the remainder is closely comparable, so one can map these variables into each other. The longitudinal sequence of waves

is synchronized among SHARE, ELSA, and HRS. The SHARE started in 2004 and 2005 when HRS already had five waves, and ELSA started the first reinterview. This is the data on which this chapter is based. In 2006 and 2007 HRS collected its sixth wave, ELSA the third, and SHARE the second wave of data.

The SHARE, HRS, and ELSA are truly multidisciplinary surveys. Variables include health variables (e.g., self-reported health, physical functioning, cognitive functioning, physical measures such as grip strength and walking speed, health behavior, use of health care facilities); psychological variables (e.g., psychological health, well-being, life satisfaction); economic variables (e.g., current work activity, job characteristics, opportunities to work past retirement age, employment history, pension rights, sources and composition of current income, wealth and consumption, housing, education); and social support variables (e.g., assistance within families, transfers of income and assets, social networks, volunteer activities, time use).

The SHARE, as opposed to HRS and ELSA, has one additional dimension. Unlike these one-country surveys, SHARE is ex-ante harmonized cross-national. The first wave in 2004 involved eleven countries, representing Europe's economic, social, institutional, and cultural diversity from Scandinavia (Denmark, Sweden) across Western and Central Europe (Austria, Germany, France, Belgium, the Netherlands, Switzerland) to the Mediterranean (Greece, Italy, Spain). In 2006, additional data came from the Czech Republic, Ireland, Israel, and Poland. The SHARE is the first European data set to combine extensive cross-national information on socioeconomic status, health, and family relationships of the elderly population.

This chapter uses the first release of the SHARE baseline data. It contains 22,777 individuals age fifty and older (including spouses, irrespective of age) in ten countries; see table 2.1 for a detailed breakdown. We augment this sample by the recent release of the Belgian SHARE data.

Table 2.1 shows the unit response rates of SHARE in comparison to other recent multinational surveys in Europe. It compares favorably to the other surveys, although the weighted average (62 percent, unweighted 60 percent) is still lower than what is typically seen in the United States. The appropriate comparison is probably with the newest HRS cohort (the early baby boomers cohort drawn in 2004), which has a response rate at baseline of 69 percent. Earlier, the HRS has experienced much higher, but declining response rates. For the initial cohort of HRS in 1992, a response rate of 82 percent could be achieved, while the samples drawn in 1998 had a response rate of 70 percent. There is no directly comparable response rate of ELSA, since the sample of ELSA was based on those who were successfully interviewed in the Health Survey of England (HSE). The response rate was lowest in Switzerland, which is typical for this country, and highest in France, where the National Institute for Statistics and Economic Studies (INSEE) conducted the survey.

Table 2.1 **Sample size and response rate of SHARE and other European surveys**

	SHARE 2004		Eurostat		Scientific surveys					
							EVS			
	Sample size	Response rate	ECHP 1994	EU-LFS 1996	ESS 2002	ESS 2004	1999–2000	EES 1999	ISSP 2002	Avg.
Austria	1,986	58.1	—	—	—	62.4	77	49	63.9	63.1
Denmark	1,732	63.2	62	75	68	65.1	57	59	66.1	64.6
France	1,842	73.6	79	(a)	—	—	42	44	20.3	46.3
Germany	3,020	63.4	47	(a)	57	50.0	42	49	42.7	47.9
Greece	2,142	61.4	(a)	—	80	78.8	82	28	—	67.2
Italy	2,559	55.1	(a)	—	44	—	68	—	—	56.0
Netherlands	3,000	61.3	(a)	59	68	—	40	30	46.6	48.7
Spain	2,419	53.3	67	(a)	53	54.8	24	—	(a)	49.7
Sweden	3,067	50.2	—	(a)	69	65.8	41	31	57.2	52.8
Switzerland	1,010	37.6	—	—	34	46.9	—	—	32.8	37.9
Total*	22,777	61.8	62.0	63.2	55.6	54.9	46.4	43.9	36.7	50.8

Source: De Luca and Peracchi (2005).

Notes: (a) no prescreening response rate reported, (—) country not in sample, (*) weighted average. ECHP: European Community Household Panel; EU-LFS: European Labour Force Survey; ESS: European Social Survey; EVS: European Values Study; EES: European Election Study; ISSP: International Social Survey Project.

Unit nonresponse was compensated by adjusting the design weights. This was done in a calibration approach. In most countries the weights were calibrated against national population totals stratified by narrow age bands and gender. In two countries more information could be used (including economic status), while in two other countries only the national totals of the fifty and over population, stratified by gender, could enter the calibration of weights. Details are reported by Klevmarken, Swensson, and Hesselius (2006).

The SHARE has made great efforts to deliver truly comparable data in order to permit a reliable study of how differences in cultures, living conditions, and policy approaches are shaping the life of Europeans just before and after retirement. The questionnaire has been translated according to a protocol ensuring functional equivalence and was administered by a Computer Assisted Personal Interview (CAPI) plus a drop-off self-completion part. Interview procedures have been harmonized with the help of a joint case management system. Methodological details of the study are reported by Börsch-Supan and Jürges (2005), and first results summarized in Börsch-Supan et al. (2005). The SHARE data is available at http://www.share-project.org. Further data processing and record matching are still ongoing. A second data release was published in 2007 with more than 30,000 individuals.

This chapter is based on an extract of variables of SHARE 2004, ELSA

2004, and HRS 2004, which include whether a person receives disability insurance or not, basic demographic characteristics, and a broad set of health variables. These health variables include self-reported health; functional status measured by indicators of (instrumental) activities of daily living; a set of mental health questions (including the Center for Epidemiologic Studies Depression Scale [CES-D]) indicating dementia and depression; and physical measurements such as body mass index, walking speed, and grip strength. Most variables are identical in all three surveys. Weight and height (to compute body mass index) are self-reported in HRS and SHARE, while ELSA had interviewers actually measure the respondents. Grip strength is only available in the eleven SHARE countries.

Disability insurance is defined as all branches of publicly-financed insurances against the loss of the ability to perform gainful employment. Table 2.2 lists the institutions in each country by their proper name.

Figure 2.5 shows the enrollment in disability insurance by age for the eleven SHARE countries. Enrollment rises steeply from 4 percent, on average, across all SHARE countries at age fifty to almost 10 percent at age sixty-five. Disability insurance enrollment declines sharply after age sixty-five to a percentage lower than at age fifty. The reason for this sharp decline is that in most countries disability insurance benefits are automatically converted to old-age pension benefits at age sixty-five.

We therefore restrict our analysis to individuals in the time window from

Table 2.2 Disability insurance schemes considered

Austria (AT)	Staatliche Invaliditätspension
Belgium (BE)	Assurance invalidité légale/Wettelijke uitkering wegens arbeidsongeval of beroepsziekte; Pension de maladie, d'invalidité, maladie professionnelle/Wettelijke uitkering wegens ziekte of invaliditeit of tegemoetkoming aan personen met een handicap
Switzerland (CH)	Invalidenrente aus IV, assurance invalidité légale (AI) and Rendità invalidità (AI)
Germany (DE)	Erwerbsminderungsrente and Beamtenpension wegen Dienstunfähigkeit
Denmark (DK)	Offentlig sygedagpenge and offentlig førtidspension
Spain (ES)	Pensión pública contributiva y no contributiva de invalidez/ incapacidad
France (FR)	Prestation publique d'invalidité (AAH, APA)
Greece (GR)	Σύνταξη αναπερίας
Italy (IT)	Assicurazione pubblica di disabilità (anche assegno di accompagnamento) and pnsione pubblica di invalidità o di inabilità
Netherlands (NL)	WAO, Waz of invaliditeitspensioen and Algemene bijstandswet (Abw), IOAW/IOAZ, aanvullende bijstandsuitkering, Toeslagenwet (TW)
Sweden (SE)	Förtidspension (sjukersättning), yrkesskadepension, and sjukbidrag
England (UK)	Incapacity benefits (previously invalidity benefits)
United States (US)	SSDI and SSI disability pension

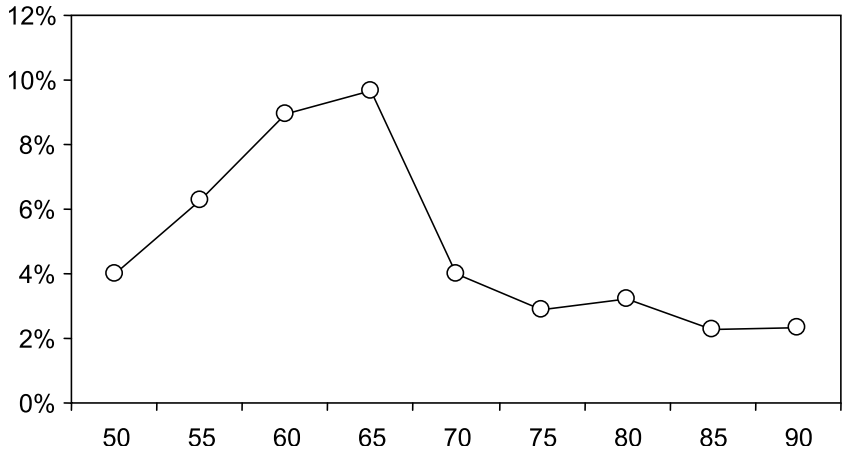

Fig. 2.5 Disability insurance enrollment by age
Note: Percentage of individuals enrolled in disability insurance by age. SHARE 2004. Weighted data.

age fifty to age sixty-five. Our SHARE release covers 15,808 individuals of this age. The ELSA and HRS contribute 6,732 and 4,270 individuals, respectively, to the joint sample, which therefore consists of 26,810 individuals. For joint descriptive statistics, the calibrated weights in SHARE, ELSA, and HRS have been renormalized to give each country equal weight.

Our introductory finding of a striking variation across European countries in the number of persons who receive disability insurance benefits is echoed in the SHARE-ELSA-HRS microdata (see figure 2.6).

We can distinguish four country groups. Very high enrollment rates exist in Denmark, the Netherlands, and Sweden. Between 13 and 16 percent of individuals between fifty and sixty-five years of age receive disability insurance benefits in this first group of countries. The second group has enrollment rates around the average enrollment rate of 7.5 percent. This group consists of Switzerland, Spain, the United Kingdom, and the United States, with the United Kingdom substantially above this average. Here the enrollment ranges from 6 to almost 10 percent. Belgium, Germany, France, and Italy, the third group, have below-average enrollment rates between 4 and 6 percent. In Austria and Greece, less than 3 percent of individuals between fifty and sixty-five years of age receive disability insurance benefits.

Disability insurance enrollment is only slightly higher among men than among women (see table 2.3).

There are, however, striking international differences. In Sweden and Denmark, it is mainly women who contribute to the very high enrollment rates, relative to the rest of Europe. In the Netherlands, the third country with very high enrollment rates, it is the other way around and more men enroll

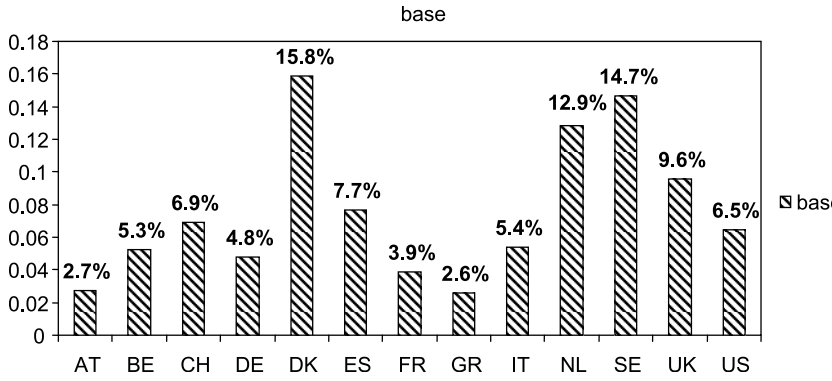

Fig. 2.6 Disability insurance enrollment in Europe, 2004
Note: SHARE 2004, ELSA 2004, and HRS 2004. Age fifty to sixty-five. Weighted data.

Table 2.3 Disability insurance enrollment by country and gender

	Austria	Germany	Sweden	Netherlands	Spain	Total
Male	4.65	6.15	9.39	15.79	11.44	8.40
Female	1.88	3.41	20.12	11.78	5.82	8.00
	Italy	France	Denmark	Switzerland	Belgium	
Male	5.21	4.92	11.18	5.81	6.82	8.40
Female	3.87	2.35	17.20	4.10	4.63	8.00

Source: SHARE 2004. Weighted data.

than women. This may point to institutional features; we will come back to this point in section 2.6.

Self-reported health is much worse among those who are on disability insurance; see the left panels of figure 2.7. While 19.7 percent report poor health among the enrolled, only 2.9 are among the not enrolled. In turn, only 9.8 percent report excellent or very good health among the enrolled, while this share is 42.5 percent among the not enrolled. Nonetheless, it is a striking finding that almost 10 percent report excellent or very good health in spite of being on disability insurance.

The health differences are less pronounced when measured more objectively as grip strength. Respondents use a little machine that they have to press two times with each hand; the maximum is reported in the right panels of figure 2.7. Average grip strength is 38.1 kilograms among the not enrolled, while individuals on disability insurance have lower grip strength of 34.4 kilograms. Grip strength has a fairly large standard deviation (about 13 kilograms), but the difference is statistically significant in this large sample.

The discrepancy between very large self-reported health differences

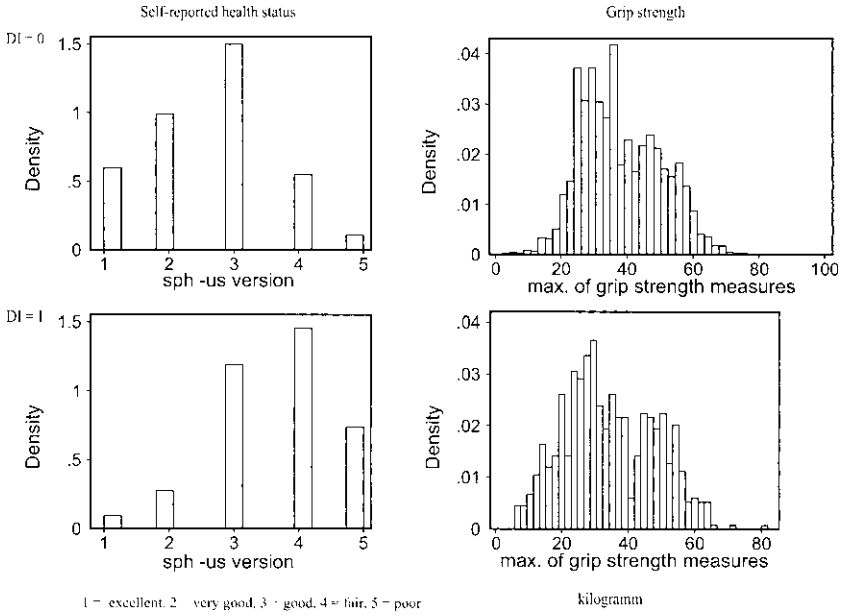

Fig. 2.7 Health by disability insurance status
Source: SHARE 2004. Weighted data.

and significant but less pronounced differences in the more objective grip strength measure may hint at justification bias of self-reported health (Sen 2002). Individuals who have enrolled in disability insurance may justify this by reporting a lower health status than what can be measured more objectively by grip strength.

2.3 Explaining Microdata Variation in Disability Insurance Enrollment

Our aim is to look at which weight each of the three potential causes—demographics, health, and institutions—has in explaining disability enrollment in Europe. We exploit the richness of the SHARE, ELSA, and HRS microdata to relate individual disability insurance enrollment probabilities to three types of variables:

- Demographic characteristics (age and gender)
- A broad set of health measures, ranging from self-reported health to more objective measurements of the functional physical (ADL: activities of daily living, IADL: instrumental activities of daily living) and mental health status (CES-D test battery of mental health).
- A set of variables characterizing the generosity of the disability insurance in each country (coverage, minimum disability level required for

full benefits, benefit generosity, medical assessment, vocational assessment, generosity of unemployment benefits). These variables are taken from Annex A.2.1 in OECD (2003), see the appendix to this chapter for a detailed description.

We run three regressions: a probit model of being enrolled in disability insurance, a Weibull proportional hazards model of the age when an individual enrolls in disability insurance, and finally, a simple linear model for the probability to be enrolled into disability insurance. Table 2.4 presents the results in four blocks: demographic variables, health variables, institutional variables, and interactions among them.

A first finding is the similarity among the three specifications. A second observation is the large unexplained variation. The (Pseudo-)R^2 in the two probability models is slightly higher than 0.25; a quarter of the individual variation in our microdata is not explained in spite of a rich specification of health. The duration model has a somewhat lower explanatory power. This is in line with the findings of OECD (2003) where only little correlation between "medical disability status" and "disability enrollment status" was found.

Demographic variables are jointly significant. Women have a lower probability to enroll into disability insurance, conditional on health. Also this was a finding of OECD (2003). Older age increases to probability to be enrolled until about age sixty-three. We apply a piecewise linear specification, with breakpoints at ages fifty-five and sixty. Notable is the sharp increase in the enrollment probability between ages fifty and fifty-five.

All health variables are strongly significant. Since we do not have grip strength and walking speed in all three surveys, these variables are not included. Including them in the SHARE sample reduces the significance of the self-reported health measure considerably, but leaves the overall results unaffected; this corresponds to the findings reported in figure 2.7. Noteworthy is the significant effect of mental illness, measured by the CES-D battery, conditional on physical health, and the strong effect of instrumental activities of daily living (IADLs) probably picking up work-related disability. Given these functional measures, self-reported health remains highly significant and quantitatively large.

Demographics and health explain, in isolation, about a sixth of the total variation of the linear model. This is not much, and corresponds to the already cited OECD findings.

The institutional variables are also highly jointly significant. Since they are country-specific and thus have much less variation than the microdata, we use the "cluster" specification to correct the t-statistics accordingly. All measures are scored by the OECD from 0 to 5. Coverage measures on a 0 to 5 scale which population groups are eligible for insurance. The highest score is given if disability insurance covers the entire population; the low-

Table 2.4 **Regression results**

	Probit	*z*	Weibull	*z*	Linear	*T*
Female	–0.661	–1.91	0.430	–1.71	–0.078	–1.39
Age < 55	–1.068	–0.58	2.602	0.19	–0.094	–0.31
Age > 60	0.385	0.1	12.949	0.49	0.123	0.25
Age-lin1	0.027	2.05	0.940	–1.84	0.003	2.29
Age-lin2	0.006	0.15	0.955	–0.56	0.001	0.12
Age-lin3	–0.006	–0.09	0.960	–0.45	–0.002	–0.22
SRH-excellent	–0.896	–6.86	0.141	–8.14	–0.063	–2.62
SRH-very good	–0.534	–4.28	0.324	–7.5	–0.041	–2.15
SRH-fair	–0.007	–0.06	1.417	0.68	–0.192	–4.73
SRH-poor	0.361	2.49	2.206	1.55	–0.078	–1.53
CES-D (sum)	0.058	4.88	1.087	4.33	0.008	2.84
ADL (sum)	0.054	1.33	1.052	1.04	0.022	1.9
IADL (sum)	0.221	4.6	1.257	4.42	0.061	3.7
Coverage	0.039	0.68	1.320	1.96	–0.023	–2.19
Min. benefits	0.361	4.39	1.992	3.09	0.036	2.39
Full benefits	–0.184	–2.18	0.616	–2.87	0.003	0.26
Generosity	–0.329	–5.03	0.546	–2.71	–0.028	–3.12
Permanent	0.049	1.87	1.175	2.59	–0.006	–0.81
Medical	0.069	2.71	1.106	1.46	0.006	1.4
Vocational	–0.121	–1.79	0.943	–0.31	–0.040	–3.29
UI-Benefits	0.106	4.02	1.120	1.3	0.022	3.02
covg_fem	0.205	4.87	1.447	4.46	0.027	3.18
minl_fem	0.015	0.15	1.025	0.14	0.000	–0.03
Full_fem	–0.086	–1.17	0.810	–1.71	–0.005	–0.52
geno_fem	–0.018	–0.23	0.908	–0.53	–0.002	–0.2
covg_old	–0.032	–0.92	0.922	–0.99	0.000	0
minl_old	–0.118	–1.65	0.819	–1.08	–0.003	–0.37
full_old	–0.048	–1.12	0.882	–1.25	–0.010	–1.94
geno_old	0.173	2.72	1.353	1.6	0.011	1.32
covg_hfpoor	0.110	5.27	1.008	0.09	0.078	14.63
minl_hfpoor	0.091	2.12	0.918	–0.45	0.072	7.95
full_hfpoor	0.063	1.32	1.430	2.67	–0.024	–2.88
geno_hfpoor	–0.036	–0.95	1.111	0.53	–0.030	–7.68
Constant	–1.827	–0.71	1.256	35.76	0.182	0.49
(Pseudo-)R^2		0.2588		0.1957		0.2667

Note: Based on 9,388 individuals age fifty through sixty-five in SHARE 2004, ELSA 2002, and HRS 2004.

est score if only employees are covered. A broad coverage increases disability enrollment, but the effect is surprisingly small and insignificant. A lenient minimum disability level to claim benefits has more influence on disability insurance uptake and is significant in all three specifications. The generosity of benefits is significant, but with an unexpected negative sign, as is the disability level required for full benefits. The strictness of a medical exam reduces disability uptake. Whether vocational considerations play a

role in the eligibility process or not is insignificant, as is the permanence of benefits.

The last institutional variable measures the duration and benefit level of unemployment compensation, a possible alternative to disability insurance as an early retirement device. It is scored 5 for a short duration and lower unemployment benefits than disability insurance benefits. Indeed, tight unemployment insurance increases disability insurance enrollment in a highly significant and quantitatively important way.

Finally, we also interact the institutional variables with selected demographic and health variables. These interactions explain 20.6 percent of the total variation in the linear model, thus more than demographics and health together. They exhibit some interesting features, especially when compared to the institutional variables alone. They explain some of the surprising findings just discussed. For example, the surprisingly small influence of coverage turns into a very large effect for women and those of poor health. The latter is a straightforward to explain; the former may be a result of the low labor force participation of European women who have difficulties to be eligible for a normal old-age pension and thus may seek disability pensions. This corresponds to the very high female enrollment in some countries (see table 2.3). In Germany, a lenient eligibility to disability insurance for women was explicitly a policy instrument in the early 1980s.

Another example is the generosity variable, which carries an unexpected negative sign in the overall regression, but is strongly positive for the older part of the sample (age sixty and over).

2.4 Counterfactual Simulations: Controlling for Demography and Health

This section predicts what enrollment rates would look like if demographics and health were equal across countries. If demographic differences were the main cause for enrolling into disability insurance, enrollment rates should be very similar after taking demographic differences out. We then go through the same procedure for differences in health status.

Our first step is to normalize disability insurance enrollment with respect to demographic differences across countries. Italy, for instance, has an older population than the European average, while Denmark has a younger population. We use the regression results of table 2.4 to establish the influence of age and gender on disability insurance take up. We then predict, in a counterfactual simulation exercise, which share of our sample individuals would take up disability insurance if all countries had the same age and gender distribution as the average of the SHARE countries. The result is shown in figure 2.8, comparing the counterfactual simulation results to the baseline results depicted in figure 2.6.

Quite clearly, taking account of demographic differences does not make a substantive difference. Italy, featuring the highest average age of individu-

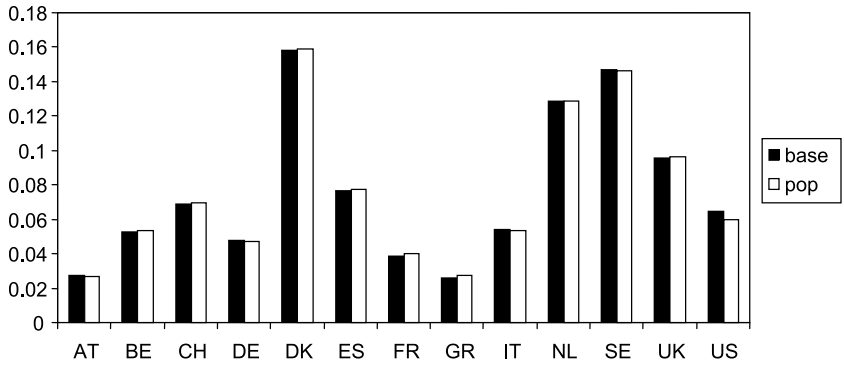

Fig. 2.8 Actual and predicted disability insurance enrollment if age and gender were identical in all countries

Note: Based on linear regression specification in table 2.3.

als between fifty and sixty-five years of age among the thirteen countries, would have a slightly lower disability insurance enrollment if it had the age distribution of the average country. In Denmark, which is younger than average, the opposite would happen. The effects, however, are very small. Demographic differences across Europe cannot explain why the enrollment rates in disability insurance are so different in Europe.

Our second step is, therefore, to account for difference in the health status of the population. The health status differs along many dimensions across countries. A first dimension is self-assessed health. Self-assessed health is relatively poor in Italy and Spain; it is best in Switzerland. One major concern with the self-assessed health ratings, however, is that respondents do not perceive the health self-assessment scale given to them as absolute. Individuals with the same true health status may have different reference levels against which they judge their health. This sheds doubt on the comparability of such measures across countries (e.g., Groot 2000; Sen 2002). We therefore also included more objective measures such as the physical performance in daily activities (e.g., walking or bathing) in the regression reported in table 2.4. In this second dimension, Germany exhibits the most limitations and Greece the least. A third dimension is mental health. Depression, an often named reason for taking up disability insurance, varies quite substantially across the SHARE countries. Spain, Italy, and France show the worst scores on the CES-D depression scale, while Denmark, Germany, and Switzerland have the lowest share of depression cases. Hence, the cross-national variation in health status looks like a good candidate to explain the variation in disability insurance enrollment.

We use the same methodology to correct for the influence of the multidimensional health differences as we did with demographics. We first establish the influence of health on disability insurance take up, and then predict

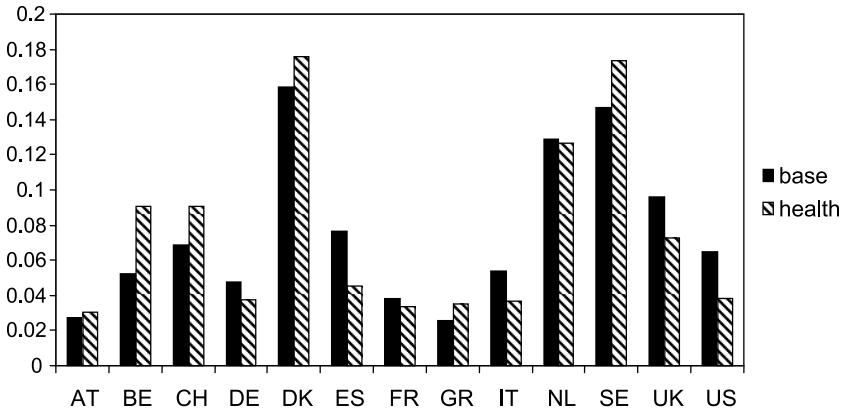

Fig. 2.9 Predicted disability insurance enrollment if health status were identical
Note: Based on linear regression specification in table 2.3.

which share of our sample individuals would take up disability insurance if the health status measured along the aforementioned four dimensions would be identical to the average of our thirteen countries. The results are shown in figure 2.9.

The differences between enrollment rates under the actual and a hypothetically identical health status are now more pronounced. In general, the counterfactual enrollment rates go up in countries with good health, and down in countries with lower health status than the average, as expected. If the Italians and Spaniards had the same health status as the average person in our sample, their disability insurance enrollment would be much lower. The same holds, notably, for the two Anglo-Saxon countries. In Switzerland, Denmark, and Sweden, it would be considerably higher.

If health would be the dominant explanation for disability insurance enrollment, the predicted shares should be equal across countries, once health is identical in all countries. As figure 2.9 shows, this is clearly not the case. There are still pronounced differences. The high enrollment rates in Sweden, Denmark, and the Netherlands, especially, remain either relatively stable after correcting for health differences (Netherlands), or they increase even further (Sweden and Denmark). We conclude that differences in health across Europe cannot explain the cross-national variation in the European disability insurance enrollment; in fact, it is just the opposite. In Sweden and Denmark, enrollment rates are high in spite of a very good health status of the fifty- to sixty-five-year-olds in our sample.

A logical next step is to correct for differences in demographics and health simultaneously, using the same methodology as before. Figure 2.10 shows the results.

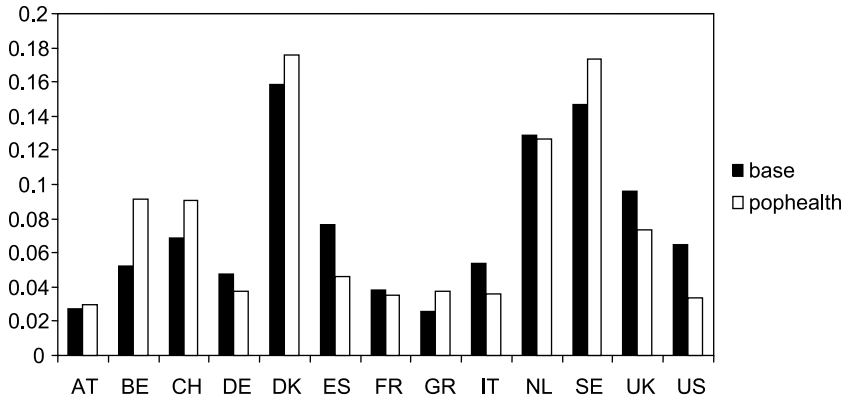

Fig. 2.10 Predicted disability insurance enrollment if age, gender, and health status were identical in all countries

Note: Based on linear regression specification in table 2.3.

The picture changes only slightly from the last one. Hence, counterfactually assigning the same age, gender, and health distributions to all countries does not make the striking variation in the uptake of disability insurance across the thirteen countries go away. The large enrollment rates in Sweden, Denmark, and the Netherlands, especially, must have different reasons than an older population or a worse health status in these countries.

2.5 The Effects of Disability Insurance

By exclusion of the first two of the three popular explanations—demographic and health-related differences—the third popular explanation remains; namely, institutional differences, specifically enrollment and eligibility rules that make disability insurance benefits easier to receive and more generous in some countries than in others. Such rules may create incentive effects similar to those exerted by old-age pensions, which often provide a financial incentive to retire early. In many countries, health requirements for disability insurance eligibility are weak. Under such circumstances, disability insurance may work as a labor market exit route to early retirement (Börsch-Supan 2001). Many countries have established very lenient work disability eligibility rules under the conditions of high unemployment.

Alternatively, the large unexplained variation may include factors not measured by the three sets of variables corresponding to the three main causal attributions: demographics, health, and institutions. Ideally, we would model the entire complex set of eligibility and benefit rules in each country as they apply to each individual in the sample, as the exercises in the Gruber and Wise (1999, 2004, 2005) volumes did. This is a massive project

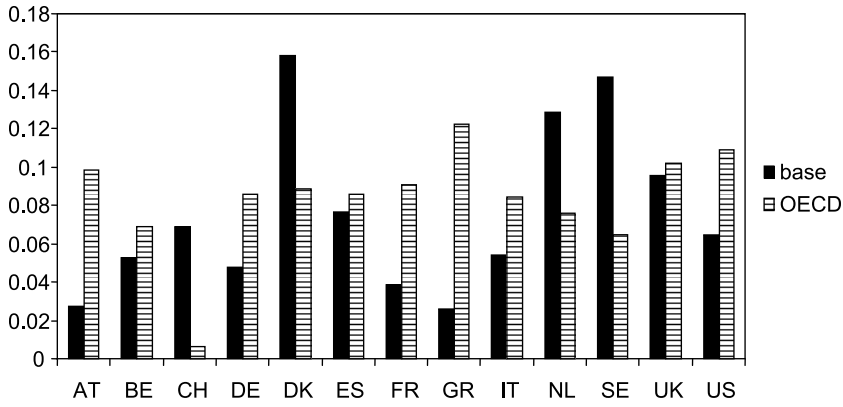

Fig. 2.11 Predicted disability insurance enrollment if eligibility and benefit rules were equally generous in all countries

Note: Based on linear regression specification in table 2.3.

only possible in a large team such as the team assembled by Gruber and Wise. Instead, we employ the institutional indicators provided by OECD (2003) that already entered the regression in table 2.4, and run a third counterfactual simulation that makes these indicators identical for all individuals in our cross-national sample. We then predict the take up outcomes in the same sprit as we did in figures 2.8 through 2.10.

The results are striking (see figure 2.11). The counterfactual simulation holding eligibility and benefit generosity indicators constant produces much more similar disability uptake rates than holding demographics and health constant. The only outlier is Switzerland, where uptake rates would be extremely low under average generosity.

A simple back-of-the-envelope regression confirms the aforementioned results. Regressing the aggregate enrollment rates in the small sample of thirteen countries on five of the previous indicator variables (coverage, minimum disability level required, benefit generosity, medical assessment, vocational assessment) yields an R^2 of 89 percent (adjusted 78 percent) and highly significant coefficients. Hence, more than three-quarters of the cross-national variation in enrollment rates can be explained by the institutional factors embedded in the five OECD indicators.

2.6 Summary and Conclusions

The variation in disability insurance take up rates across European countries is striking. It reaches from some 15 percent of individuals between fifty- and sixty-five-years-old in Denmark, Sweden, and the Netherlands to less than 3 percent in Austria and Greece.

In order to find out which popular explanation is most convincing, we

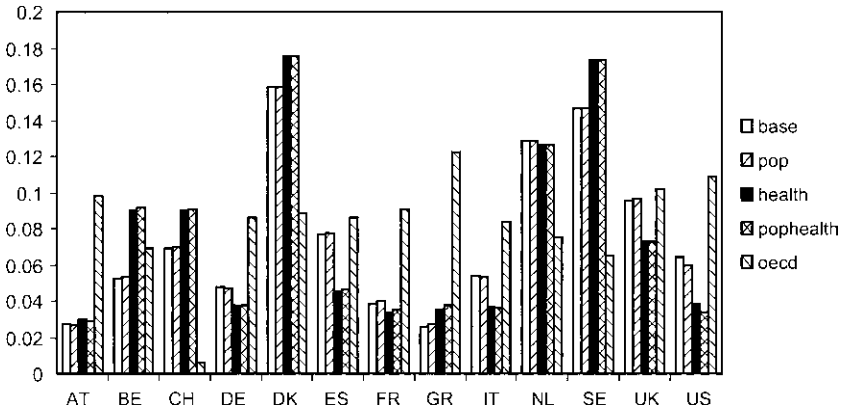

Fig. 2.12 Baseline enrollment rates and counterfactual simulations
Note: Based on linear regression specification in table 2.3.

counterfactually equalize each potential cause among the thirteen countries in our joint SHARE-ELSA-HRS data set and then see whether disability insurance enrollments are also equal. Figure 2.12 summarizes the sequence of our results in a single chart.

Correcting for differences in the age, gender, and health distribution across countries does not explain this striking variation. The large enrollment rates in Sweden, Denmark, and the Netherlands, especially, have different reasons than an older population or a worse health status than in the other European countries.

Institutional factors—some of them creating strong incentives to enroll in disability insurance as an early retirement device—are a more likely explanation. The counterfactual simulation holding eligibility and benefit generosity rules approximately constant (the leftmost bars in figure 2.12) produces much more similar disability uptake rates than holding demographics and health constant.

The most influential institutional variable in our regressions is the minimum level of disability to obtain full benefits. This variable alone explains more than 60 percent of the cross-national variation. It seems to be the most powerful policy variable when countries such as the Netherlands, Denmark, and Sweden want to bring their disability insurance enrollment rates closer to the average European and U.S. level.

Appendix

Table 2A.1 **Definition of the OECD variables used in the regressions of table 2.4**

Dimension	5 points	4 points	3 points	2 points	1 point	0 points
X. Compensation						
x1. Coverage	Total population (residents)	Some of those out of the labor force (e.g., congenital)	Labor force plus means-tested noncontrib. scheme	Labor force with voluntary self-insurance	Labor force	Employees
x2. Minimum disability level	0–25%	26–40%	41–55%	56–70%	71–85%	86–100%
x3. Disability level for full benefit	< 50%	50–61%	62–73%	74–85%	86–99%	100%
x4. Maximum benefit level	RR ≥ 75%, Reasonable minimum	RR ≥ 75%, Minimum not specified	75 > RR ≥ 50%, Reasonable minimum	75 > RR ≥ 50%, Minimum not specified	RR < 50%, Reasonable minimum	RR < 50%, Minimum not specified
x5. Permanence of benefits	Strictly permanent	De facto permanent	Self-reported review only	Regulated review procedure	Strictly temporary, unless fully (= 100%) disabled	Strictly temporary in all cases
x6. Medical assessment	Treating doctor exclusively	Treating doctor predominantly	Insurance doctor predominantly	Insurance doctor exclusively	Team of experts in the insurance	Insurance team and two-step procedure
x7. Vocational assessment	Strict own or usual occupation assessment	Reference is made to one's previous earnings	Own-occupation assessment for partial benefits	Current labor market conditions are taken into account	All jobs available are taken into account, leniently applied	All jobs available are taken into account, strictly applied
x8. Sickness benefit level	RR = 100% also for long-term sickness absence	RR = 100% (short-term) ≥ 75% (long-term) sickness absence	RR ≥ 75% (short-term) ≥ 50% (long-term) sickness absence	75 > RR ≥ 50% for any type of sickness absence	RR ≥ 50% (short-term) < 50% (long-term) sickness absence	RR < 50% also for short-term sickness absence
x9. Sickness benefit duration	One year or more, short or no wage payment period	One year or more, significant wage payment period	Six-twelve months, short or no wage payment period	Six-twelve months, significant wage payment period	Less than 6 months, short or no wage payment period	Less than 6 months, significant wage payment period
x10. Unemployment benefit level and duration	DI > UE level, short duration of unemployment	DI > UE level, long duration of unemployment	Similar levels, short duration of unemployment	Similar levels, long duration of unemployment	DI < UE level, short duration of unemployment	DI < UE level, long duration of unemployment

Source: OECD.

Note: RR = Replacement rate; DI = disability benefit; UE = Unemployment benefit.

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Comment

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The tension between a political desire to maintain welfare state benefits and the fact of rapid population aging generates many of the key problems facing European policymakers. Not only does population aging directly increase the costs of pension, health, and disability programs that benefit the elderly, but economic theory and analysis has shown that these costs may be exacerbated by unintended incentive effects. This point was made dramatically in the cross-national project of Gruber and Wise (1999, 2004, 2005) which showed powerful effects of pension and disability plans on retirement behavior. Their initial analysis, based on country-level administrative and

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