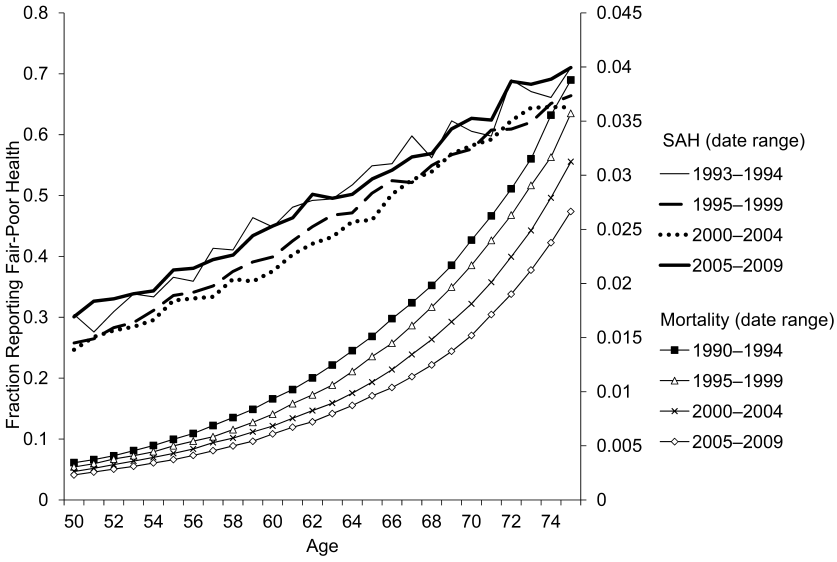

Fig. 6.3 SAH and mortality for men age fifty to seventy-five (1993 to 2013)

1993 reduced substantially the incentives to retire early that were embedded in the preexisting pension system, but this shift toward longer working life did not affect the age sixty-five and older, despite the historically high life expectancy in Italy.

Figure 6.3 presents trends in mortality and self-assessed health (SAH) for men age fifty to seventy-five over the past four decades, based on authors' calculations from the General Household Survey ([ISTAT] "Multiscopo") and the Human Mortality Database. This figure shows the well-known age gradient in mortality as well as the general trend over time toward lower mortality rates, which is quite remarkable in Italy. In 1990–94 men age sixty experienced an annual mortality rate of 1 percent, in the 2005–09 period that mortality rate is not reached until age sixty-five. Similarly, men age sixty-eight in 1990–94 had a mortality rate of 2 percent, a rate that applied to men age seventy-two in 2005–09. Improvements in SAH are not so evident from the figure, probably because the data are noisier and the time span is not long enough to appreciate such a change. Unfortunately, there are no population-wide surveys in Italy where SAH is recorded earlier than 1993. Moreover, the self-assessed health question changed from the 2008 wave: the 1 to 5 Likert scale was reversed and relabeled. As a result, the ISTAT General Household Survey reports lower average SAH in more recent cohorts. Roughly 40 percent of men age sixty report themselves to be in fair or poor health

in 1995–99; in 2005–09, 40 percent of men age fifty-eight report to be in fair or poor health (at sixty, 45 percent are in fair/poor health in these later periods). Looking at yearly data rather than five-year aggregates, there is a clear shift from 2008 onward toward fair and poor health due to the question change. Improvements in SAH are therefore underestimated compared to other studies in this volume.

A first general conclusion that can be drawn from figure 6.3 is that in Italy—as in many other countries—health deteriorates with age and that health (or at least life expectancy as recorded in the Human Mortality Database) at any given age has improved over time, while figure 6.1 shows that older men's labor force participation fell until the beginning of the twenty-first century and has been rising since then. In the analysis that follows, we effectively bring together these trends in labor force participation and health as we explore how much individuals today could work based on the employment-mortality patterns experienced by previous cohorts.

6.2 Estimating Health Capacity to Work Using the Milligan-Wise Method

The first set of results builds on the methodology developed in Milligan-Wise (2012), which looks at the relationship between mortality and employment that existed at an earlier point in time along with current mortality data to generate an estimate of individuals' ability to work at older ages. The counterfactual experiment is based on the idea that, other things being equal, in principle people today could work as much as people with the same mortality rate worked in the past. While mortality is not the best health measure to relate to productivity, it has several advantages: it is defined consistently across countries, and data on mortality is available over a long period of time for the entire population at single ages for single years. Since general data limitations on health are particularly severe in Italy, the measures of health-work capacity derived from mortality experienced by the Italian population are of special interest in this volume.

The mortality data used for this analysis come from the Human Mortality Database, and the employment data is from two sources: the MARSS database provided by ISTAT for the period 1977–2003 and Eurostat from 1983 until 2012. Despite the different databases, figures 6.1 and 6.2 show how the common periods overlap almost perfectly. The reason is that both data sets are based on the Labour Force Survey, therefore linking the two series is an innocuous assumption, which allows us to consider the period 1977 through 2010, with the start year chosen to correspond to that used in Milligan and Wise (2012). The analysis is quite straightforward, as it requires mapping an employment-mortality curve, which displays the employment rate at each level of mortality for a given year, then repeating this for other years and making some calculations based on comparisons of the different

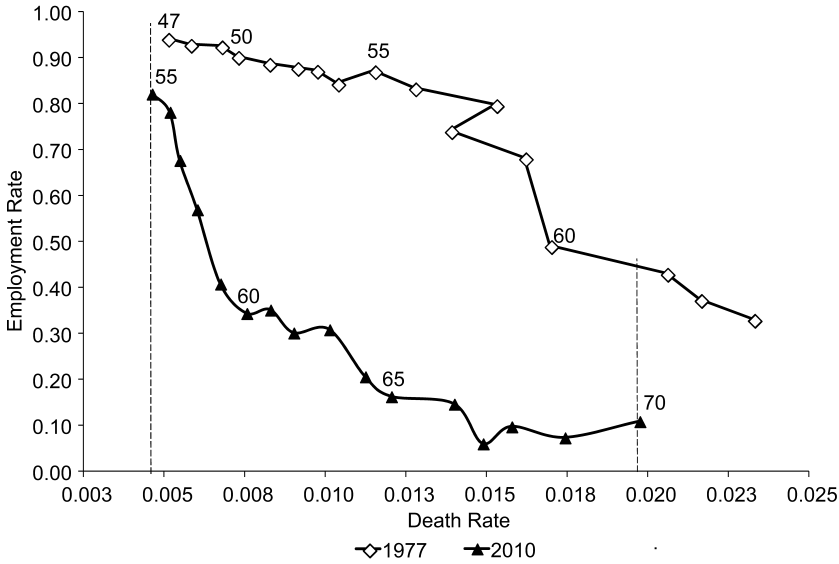

Fig. 6.4 Employment versus mortality (2010 versus 1977)
Source: Italian National Bureau of Statistics (ISTAT) MARSS data for 1977, and ISTAT data from the General Household Survey for 2010.

curves. As noted earlier, we conduct this exercise for men only, as the large increases in women's labor force participation over time make it difficult to interpret the results for women.

Our approach is illustrated in figure 6.4, which plots the employment-mortality curve for men in 2010 and in 1977. In 2010, the one-year mortality rate for fifty-five-year-old men was about 0.5 percent, and the employment rate at this age was 82 percent. In 1977, forty-seven-year-old men had a mortality rate of 0.5 percent. This reflects the mortality improvements over time discussed in the previous section. In 1977, the labor force participation for forty-seven-year-olds was 94 percent. Thus, if men in 2010 had the same employment rate as did men in 1977 with the same mortality rate, the employment rate of fifty-five-year-olds would have been 12 percentage points higher, 94 percent instead of 82 percent.

In table 6.1, we extend this exercise through age sixty-nine, asking how much more men could have worked over the age range fifty-five to sixty-nine in 2010 if they had worked as much as men with the same mortality rate worked in 1977. At age fifty-five, an additional 12 percent of men could have worked, which generates an average 0.12 additional work years. At age fifty-six, an additional 16 percent of men could have worked for an additional 0.16 work years. Repeating this analysis at each subsequent age through age sixty-nine and cumulating the amounts, we arrive at a total potential additional employment capacity of 7.4 years. This is equivalent on the graph

Table 6.1 **Additional employment capacity in 2010 using 1977 employment-mortality relationship**

Age	Death rate 2010	Employment rate 2010 (%)	Employment rate in 1977 corresponding to death rate of 2010 (%)	Additional employment capacity (%)
55	0.00462	82.15	93.98	11.82
56	0.00517	78.19	94.10	15.92
57	0.00548	67.73	93.51	25.78
58	0.00602	57.01	92.84	35.83
59	0.00674	40.84	92.61	51.77
60	0.00755	34.39	89.85	55.45
61	0.00829	35.19	88.70	53.52
62	0.00901	30.16	87.98	57.83
63	0.01012	30.88	85.48	54.60
64	0.01123	20.65	86.55	65.90
65	0.01204	16.32	85.57	69.25
66	0.01399	14.69	74.64	59.94
67	0.01488	6.06	78.23	72.17
68	0.01577	9.77	73.36	63.59
69	0.01742	7.38	48.35	40.97
Total years		5.31411		7.3434948

to integrating between the two curves from one vertical line to the next. As the average amount of employment between ages fifty-five and sixty-nine in 2010 is 5.3 years, an additional 7.4 years would represent a massive 139 percent increase over the baseline years of work.

It is worth noting that this method implicitly assumes that all mortality gains can translate into additional work capacity. This may not be the case if workers are living longer but are not in good health in those additional years of life. The relationship between mortality and morbidity changes over time has been the subject of a number of recent studies. As noted above in figure 6.3, we find that the share of individuals reporting themselves to be in fair or poor health at a given age has not been steadily increasing over time.

A second concern is that an additional year of life does not necessarily translate into a full additional year of work. If we use the same benchmark as in other chapters, whereby the share of life spent in work should be two-thirds of total life, one could multiply the figure above by two-thirds, arriving at an estimate of 4.9 years rather than 7.4 years (for simplicity, we do not make this conversion for the numbers reported below).

Another issue that arises in implementing this method is the choice of year to use for comparison to the present. In figure 6.5, we replicate the analysis from figure 6.4 but use 1995 as a comparison year rather than 1977. At

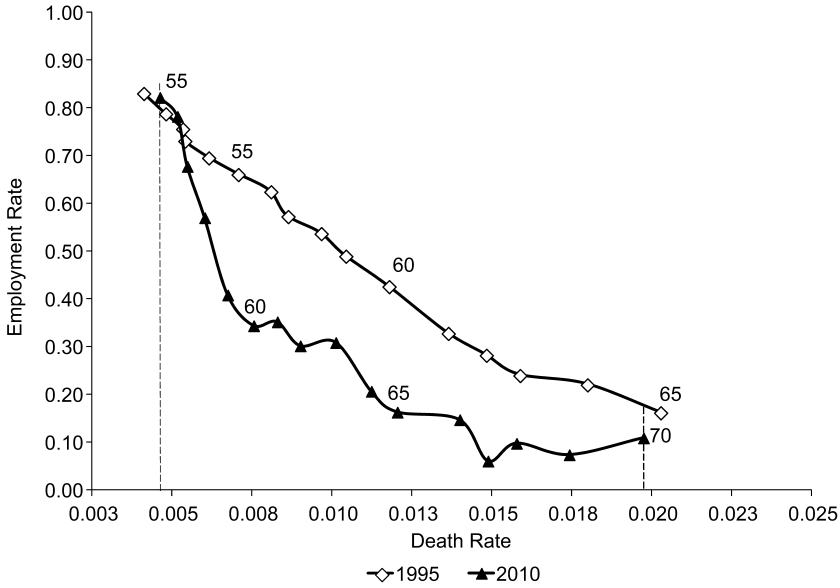

Fig. 6.5 Employment versus mortality (2010 versus 1995)

Source: Italian National Bureau of Statistics (ISTAT) MARSS data for 1977, and ISTAT data from the General Household Survey for 2010.

every age, the mortality rate is lower in 2010 than in 1995, consistent with earlier discussions. However, employment rates are higher in 2010 than in 1995—at age sixty-two, for example, the employment rate was 30 percent in 2010 versus 28 percent in 1995. Although employment at a given age has increased over time, it has not increased by enough to keep up with mortality increases, and for that reason the 1995 employment-mortality curve still lies above that for 2010, but the gap between the two curves is less than that between the 2010 and 1977 curves. Using 1995 as the comparison year, the estimated additional employment capacity from ages fifty-five to sixty-nine is 2.6 years, which is substantially smaller than the estimate of 7.4 years that we obtain when we use 1977 as the comparison year.

In figure 6.6, we show the estimated additional employment capacity as a function of the base year used. For base years close to 2010, the estimated additional employment capacity is small, as we are essentially asking if men with a given mortality rate in 2010 worked as much as men with the same mortality rate did in, say, 2008, and how much would they work. The difference between the two years is not large because neither mortality nor employment changes much over a short period of time. But as shown in the 1995 and 1977 examples, when we look back over a longer period of time, the estimated additional capacity is much larger. This is both because mortality has improved over time, as the 1995 example illustrates, and because

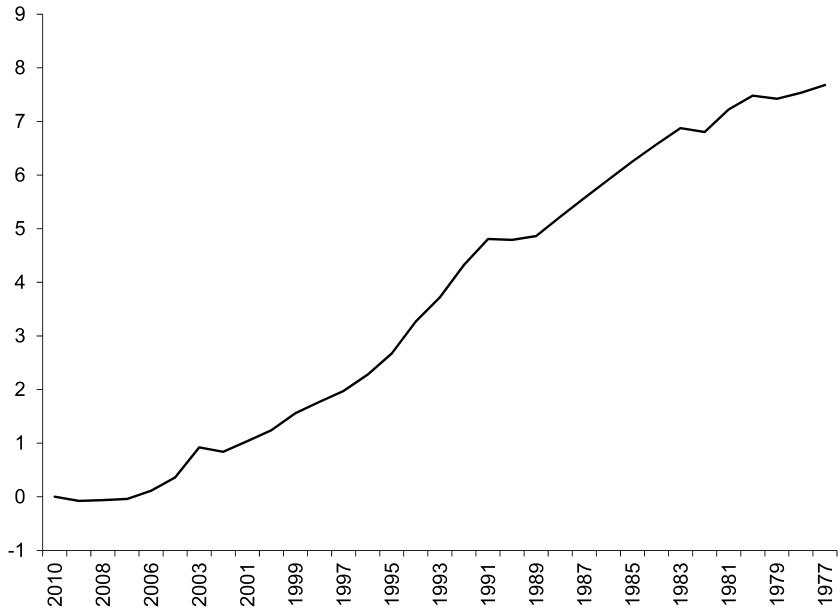

Fig. 6.6 Estimated additional employment capacity by year of comparison

employment rates today are lower than they were in the late 1970s and early 1980s (though higher than in the mid-1990s), as seen in the 1977 example.

To sum up, our estimates based on the Milligan-Wise method suggest a significant amount of additional work capacity for Italy, particularly if we take the 1970s as a benchmark. We estimate that the additional capacity from ages fifty-five to sixty-nine is 7.4 years using the 1977 employment-mortality curve as a point of comparison, or 2.6 years using 1995 as the base year. To change the assumption that an additional year of life expectancy translates into an additional year of work capacity, one can apply a fractional factor to these estimates—using the logic that the share of life spent in work and retirement should remain roughly constant, for example, would suggest multiplying these values by two-thirds.

This method is also informative about the ability of older individuals to work at specific ages. This can be seen from table 6.1, using 1977 as the comparison year. This analysis suggests that at ages sixty to sixty-four, an additional 58 percent or so of men could be employed (as the table indicates that an additional 55.4 percent could be working at age sixty, an additional 53.5 percent at age sixty-one, an additional 57.8 percent at age sixty-two, etc.); at ages sixty-five to sixty-nine, an additional 61.3 percent or so of men could be employed. These estimates can be compared to the results we generate using the next method.

6.3 Estimating Health Capacity to Work Using the Cutler et al. Method

We now turn to the second method of estimating health capacity to work, following Cutler, Meara, and Richards-Shubik (2012). In this method, we address the following question: If older individuals in a given state of health worked as much as their younger counterparts, how much would they work? Implementing this method involves a two-step process. First, we run regressions to estimate the relationship between health and employment, using a sample of workers young enough so that their employment decisions should not be affected by the availability of social security (public pension) benefits. We choose to focus on workers age fifty to fifty-four, who are still many years away from old age pension eligibility and should also be too young to qualify for early retirement schemes: the age fifty-four cutoff is chosen for comparability with the other studies in this volume, even though a small selection of workers in Italy would in the past qualify for early retirement pensions even in their early fifties. For the second step, we combine the regression coefficients along with the actual characteristics of individuals age fifty-five to seventy-four to predict the older individuals' ability to work based on health.

The data used in the analysis is the Survey of Health, Ageing and Retirement in Europe (SHARE). SHARE began in 2004 as a longitudinal study of individuals age fifty and older and their partners, with biannual interviews; in the years since, the study has been refreshed with younger cohorts in order to provide a representative survey of individuals older than age fifty. Currently, data through 2012 (wave 5) is available; we use data from waves 1–2 and 4–5 in the baseline analysis, since wave 3 is a retrospective interview and does not allow evaluating health transitions from wave 2 to wave 4. SHARE is ideally suited for a study such as this one because of the rich data on health, as well as data on employment and demographics. We use a sample of 573 male and 929 female person-year observations for the regressions; a further 4,252 male and 4,963 female person-year observations are used in our simulations of work capacity.

As in all other chapters, we estimate regressions of the following form:

$$\text{Employment}_i = \beta_0 + \beta_1 \text{health}_i + \beta_2 X_i + \varepsilon_i,$$

where Employment is a dummy equal to 1 if the individual is employed and health is a comprehensive set of health measures, including dummy variables for self-reported health status, limitations on physical activity, limitations on activities of daily living (ADLs) and instrumental activities of daily living (IADLs), individual health conditions, being over- or underweight, and being a current or former smoker. We also include variables for educational attainment and marital status. We estimate this equation as a linear probability model.

We estimate an alternative version of this regression model where the full set of health variables is replaced by a single health index value, as put forward in Poterba, Venti, and Wise (2013). The idea is to construct a health index based on twenty-four items, including self-reported health diagnoses, functional limitations, medical care usage, and other health indicators. To do so, one first obtains the first principal component of these indicators, which is the "weighted average of indicators where the weights are chosen to maximize the proportion of the variance of the individual health indicators that can be explained by this weighted average" (Poterba, Venti, and Wise 2013, 300). The estimated coefficients from the analysis are then used to predict a percentile score for each respondent, referred to as the health index. An individual's health index value typically will vary by survey wave, as updated health information is incorporated.

It is worth noting some of the key assumptions underlying our analysis. First, we assume that there are no unmeasured or omitted dimensions of health. If there were, health might be declining more rapidly with age than reflected in the health variables we have, and our estimates of ability to work at older ages could be overstated. We address this concern by including a comprehensive set of health variables, as well as by using a health index that is likely a good reflection of overall health. Second, our approach implicitly assumes that the health-employment relationship that exists for younger individuals (age fifty to fifty-four) is the same as that for older individuals (age fifty-five to seventy-four). For example, if younger workers were concentrated in white-collar jobs and older workers in blue-collar jobs, then it might be easier for a younger worker with a health problem to continue working than it would be for an older worker with the same health issue; this would lead us to overstate the ability of older individuals to work. Finally, if there is a large amount of "discretionary" (non-health-related) retirement among our sample of younger individuals, we would estimate a lower health capacity to work than what might actually exist. We have chosen a relatively young sample for the estimation to try to avoid this problem.[1] There are other assumptions underlying our analysis, which we made mainly in order to improve efficiency of the estimates, or are specific to the Italian data set. We will discuss them in detail at the end of this section.

Summary statistics for the male and female samples are shown in tables 6.2A and 6.2B. The share of employed men falls from 85 percent at ages fifty to fifty-four to 65 percent at ages fifty-five to fifty-nine, 27 percent at ages sixty to sixty-four, 5 percent at ages sixty-five to sixty-nine, and 2 percent at ages seventy to seventy-four. Employment rates for women are 56 percent at ages fifty to fifty-four, 37 percent at ages fifty-five to fifty-nine, 11 percent at ages sixty to sixty-four, 2 percent at ages sixty-five to sixty-nine,

1. We also acknowledge that health may be endogenous in the regressions we run if employment status has a causal effect on health.

Table 6.2A **Summary statistics, men**

	Age group				
	50–54	55–59	60–64	65–69	70–74
In labor force	0.94	0.73	0.32	0.07	0.02
Employed	0.85	0.65	0.27	0.05	0.02
Health_exc	0.16	0.11	0.09	0.09	0.06
Health_vgood	0.24	0.21	0.17	0.14	0.11
Health_good	0.44	0.46	0.43	0.39	0.38
Health_fair	0.14	0.17	0.24	0.30	0.34
Health_poor	0.02	0.04	0.06	0.09	0.11
Gali	0.15	0.22	0.27	0.38	0.44
Mobilit2	0.22	0.26	0.33	0.42	0.51
Mobilit3	0.04	0.07	0.10	0.17	0.22
ADLany	0.03	0.03	0.05	0.06	0.10
IADLany	0.02	0.03	0.05	0.08	0.12
Eurod	1.87	1.88	1.94	2.26	2.39
Heartat	0.04	0.06	0.09	0.13	0.16
Stroke	0.01	0.02	0.02	0.04	0.04
Cholester	0.13	0.17	0.19	0.24	0.24
Lungdis	0.03	0.04	0.05	0.07	0.12
Cancer	0.01	0.02	0.03	0.03	0.04
Highblpr	0.21	0.31	0.34	0.45	0.46
Arthritis	0.06	0.09	0.14	0.18	0.20
Diabetes	0.04	0.08	0.11	0.17	0.15
Osteopor	0.00	0.01	0.01	0.01	0.02
Alzheimer's	0.00	0.00	0.00	0.01	0.01
Back	0.31	0.36	0.38	0.41	0.40
Asthma	0.02	0.01	0.01	0.01	0.04
Underweight	0.00	0.00	0.00	0.00	0.00
Overweight	0.49	0.50	0.54	0.54	0.52
Obese	0.14	0.17	0.17	0.18	0.16
Smokerform	0.22	0.31	0.36	0.43	0.46
Smokecurr	0.34	0.30	0.27	0.19	0.14
Educ_lessthHS	0.54	0.56	0.63	0.71	0.79
Educ_hs	0.33	0.30	0.25	0.19	0.13
Educ_somecollege	0.02	0.03	0.03	0.03	0.02
Educ_collegemore	0.10	0.10	0.10	0.07	0.06
Married	0.81	0.89	0.90	0.88	0.86
Occ_bluecollar	0.30	0.34	0.35	0.41	0.43
Occ_lowskill	0.12	0.13	0.11	0.13	0.14
Occ_homemaker	0.00	0.00	0.00	0.00	0.00
Pencov	0.78	0.81	0.89	0.91	0.93
Obs.	582	951	1,086	1,155	1,060

Table 6.2B **Summary statistics, women**

	Age group				
	50–54	55–59	60–64	65–69	70–74
In labor force	0.60	0.41	0.12	0.02	0.00
Employed	0.56	0.37	0.11	0.02	0.00
Health_exc	0.11	0.09	0.07	0.05	0.03
Health_vgood	0.25	0.18	0.14	0.10	0.08
Health_good	0.40	0.39	0.41	0.39	0.30
Health_fair	0.20	0.27	0.30	0.35	0.42
Health_poor	0.04	0.07	0.08	0.11	0.17
Gali	0.26	0.31	0.37	0.45	0.55
Mobilit2	0.34	0.44	0.52	0.61	0.73
Mobilit3	0.13	0.18	0.25	0.33	0.46
ADLany	0.03	0.05	0.06	0.09	0.14
IADLany	0.06	0.07	0.12	0.14	0.22
Eurod	2.76	2.89	2.97	3.20	3.50
Heartat	0.03	0.03	0.05	0.08	0.10
Stroke	0.01	0.01	0.02	0.02	0.03
Cholester	0.11	0.20	0.24	0.27	0.31
Lungdis	0.02	0.04	0.03	0.05	0.08
Cancer	0.04	0.04	0.04	0.05	0.05
Highblpr	0.19	0.28	0.36	0.47	0.51
Arthritis	0.15	0.22	0.27	0.29	0.35
Diabetes	0.04	0.06	0.09	0.12	0.15
Osteopor	0.03	0.07	0.08	0.09	0.11
Alzheimer's	0.00	0.00	0.00	0.00	0.01
Back	0.39	0.46	0.53	0.54	0.60
Asthma	0.02	0.02	0.02	0.02	0.02
Underweight	0.02	0.01	0.01	0.01	0.02
Overweight	0.31	0.35	0.37	0.40	0.39
Obese	0.13	0.15	0.19	0.20	0.20
Smokerform	0.16	0.19	0.18	0.14	0.14
Smokecurr	0.23	0.21	0.15	0.13	0.08
Educ_lessthHS	0.55	0.64	0.71	0.79	0.83
Educ_hs	0.28	0.23	0.18	0.13	0.11
Educ_somecollege	0.05	0.04	0.03	0.03	0.02
Educ_collegemore	0.11	0.09	0.07	0.05	0.03
Married	0.84	0.85	0.82	0.76	0.67
Occ_bluecollar	0.13	0.15	0.20	0.21	0.24
Occ_lowskill	0.16	0.14	0.16	0.16	0.18
Occ_homemaker	0.23	0.29	0.24	0.29	0.29
Pencov	0.62	0.62	0.71	0.74	0.78
Obs.	950	1,239	1,377	1,293	1,054

and negligible at ages seventy to seventy-four. The health measures show a decline in health with age. The share of men in fair or poor health rises from 16 percent at ages fifty to fifty-four to 45 percent at ages seventy to seventy-four. Values for women are similar but slightly higher, 24 percent at ages fifty to fifty-four and 59 percent at ages seventy to seventy-four. This reflects the known result that women live longer but report themselves to be in worse health.

Turning to some of the other health measures, the share of men with more than one limitation on physical activity rises from 22 percent at ages fifty to fifty-four to 51 percent at ages seventy to seventy-four, while values for women are somewhat higher, 34 percent at ages fifty to fifty-four and 73 percent at ages seventy to seventy-four.[2] The share of individuals with limitations in ADLs rises from 3 percent to 10 percent for men across the five age categories, and from 3 to 14 percent for women; the share with limitations in IADLs shows a similar trend, rising from 2 to 12 percent for men and from 6 to 22 percent for women.[3] Finally, the share of individuals with diagnosed medical conditions also rises with age. Back pain and high blood pressure are the most common ailments, rising for men from 31 and 21 percent at ages fifty to fifty-four to 40 and 46 percent at ages seventy to seventy-four. Potentially more serious health conditions such as cancer and stroke also rise with age. The relevance of these statistics for our analysis is that they show that health deteriorates with age, so if our regressions suggest a strong relationship between health and employment, then the predicted share of individuals that are employed (estimated in the second step of our analysis) will decrease with age, as health declines.

Tables 6.3A and 6.3B display estimated regression parameters for the all health variables and health index versions of our model, respectively. Table 6.3A shows that there are statistically significant effects of some health variables on employment. For example, relative to men in excellent health, men in poor health are 39 percentage points less likely to be in employment. Some of the individual health conditions are associated with statistically significant decreases in the probability of employment of up to 32 percentage points, such as having experienced a heart attack or a stroke.

In the version of the model with the health index, Table 6.3B, the index is a statistically significant determinant of employment. Results from other chapters in this volume confirm that the index functions well as a summary statistic for health. This evidence, coupled with the lack of significance of

2. The full set of activities includes: (a) walking 100 meters; (b) sitting for about two hours; (c) getting up from a chair after sitting for long periods; (d) climbing several flights of stairs without resting; (e) climbing one flight of stairs without resting; (f) stooping, kneeling, or crouching; (g) reaching or extending your arms above shoulder level; (h) pulling or pushing large objects like a living room chair; (i) lifting or carrying weights over ten pounds/five kilos, like a heavy bag of groceries; and (j) picking up a small coin from a table.

3. ADLs include: dressing, walking across the room, bathing, eating, and getting in/out of bed; IADLs include managing meals, groceries, and medication.

Table 6.3A Employment regressions, all health variables

Men 50–54			Women 50–54		
Variable	Coefficient	Std. err.	Variable	Coefficient	Std. err.
Health_vgood	–0.0028	0.0450	Health_vgood	–0.0115	0.0537
Health_good	–0.0357	0.0421	Health_good	–0.0440	0.0521
Health_fair	0.0179	0.0575	Health_fair	–0.1477	0.0638*
Health_poor	–0.3956	0.1175***	Health_poor	–0.0477	0.1035
Gali	0.0062	0.0471	Gali	–0.0185	0.0414
Mobilit2	0.0345	0.0422	Mobilit2	–0.0075	0.0403
Mobilit3	–0.1197	0.0849	Mobilit3	0.0199	0.0619
ADLany	–0.1827	0.0983	ADLany	0.1826	0.0951
IADLany	0.0156	0.1292	IADLany	–0.1286	0.0706
Eurod	–0.0072	0.0085	Eurod	0.0030	0.0070
Heartat	–0.3257	0.0751***	Heartat	–0.2324	0.0967*
Stroke	–0.2502	0.1238*	Stroke	–0.1769	0.1581
Cholester	0.0650	0.0417	Cholester	0.0592	0.0495
Lungdis	–0.0552	0.0853	Lungdis	–0.0076	0.1064
Cancer	–0.2083	0.1306	Cancer	–0.0302	0.0839
Highblpr	0.0682	0.0364	Highblpr	–0.0351	0.0413
Arthritis	–0.0650	0.0624	Arthritis	–0.0317	0.0493
Diabetes	–0.1151	0.0687	Diabetes	–0.0557	0.0813
Osteopor	0.2152	0.3497	Osteopor	0.1128	0.0862
Alzheimer's	0.0000	(omitted)	Alzheimer's	0.0000	(omitted)
Back	0.0156	0.0337	Back	–0.0121	0.0364
Asthma	0.0078	0.1107	Asthma	–0.2061	0.1113
Underweight	0.1426	0.3275	Underweight	0.0454	0.0976
Overweight	0.0229	0.0308	Overweight	0.0106	0.0348
Obese	–0.0864	0.0463	Obese	–0.0051	0.0485
Smokerform	–0.0299	0.0367	Smokerform	–0.0148	0.0425
Smokecurr	0.0110	0.0321	Smokecurr	0.0028	0.0374
Educ_lessthHS	–0.0481	0.0307	Educ_lessthHS	–0.2985	0.0355***
Educ_somecollege	0.0739	0.0947	Educ_somecollege	0.1165	0.0718
Educ_collegemore	0.0968	0.0490*	Educ_collegemore	0.1404	0.0532**
Married	0.1602	0.0364***	Married	–0.1182	0.0408**
_Cons	0.7824	0.0545***	_Cons	0.8733	0.0659***
Obs.	573		Obs.	929	

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

most of the health conditions in table 6.3A, lead us to focus on the results from table 6.3B in the discussion below.

In tables 6.4A and 6.4B, we report the results of our simulation exercise. This table shows (for men and women in five-year age groups from age fifty-five to seventy-four) the actual and predicted shares employed (the latter calculated as described above by combining the coefficients from the regression analysis and the characteristics of these individuals), and the difference between these, which we term the "estimated additional work capacity." For ease of exposition, key values are also reported in figures 6.7 and 6.8.

Table 6.3B Employment regressions, PVW index

Men			Women		
Variable	Coefficient	Std. err.	Variable	Coefficient	Std. err.
PVW	0.0023	0.0006***	PVW	0.0015	0.0006**
Educ_lessthHS	–0.0679	0.0312*	Educ_lessthHS	–0.3138	0.0347***
Educ_somecollege	0.0930	0.0967	Educ_somecollege	0.0954	0.0713
Educ_collegemore	0.1060	0.0502*	Educ_collegemore	0.1581	0.0525**
Married	0.1733	0.0362***	Married	–0.1288	0.0404**
_Cons	0.5744	0.0611***	_Cons	0.7264	0.0587***
Obs.	570		Obs.	919	

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Focusing on the results obtained using the PVW health index, we predict the share of men employed to be 86 percent at ages fifty-five to fifty-nine, 84 percent at ages sixty to sixty-four, 81 percent at ages sixty-five to sixty-nine, and 80 percent at ages seventy to seventy-four. These projections decline with age because health declines with age and our regression coefficients reflect a strong association between health and employment. However, the share of men actually working declines much more quickly with age than do our predictions, from 65 percent at ages fifty-five to fifty-nine to 26 percent, 5 percent, and 2 percent in the older age groups. As a result, we estimate that the additional capacity to work is substantial and rising sharply with age, from 21 percent at ages fifty-five to fifty-nine (based on the fact that we predict that 86 percent of men will work, but only 65 percent do) to 58 percent at ages sixty to sixty-four, 77 percent at ages sixty-five to sixty-nine, and seventy to seventy-four. Results using the model including the health index instead of the full set of health variables are quite similar. In terms of the results for women, both the predicted and actual share working are substantially lower than those for men, while the estimated work capacity numbers are lower in absolute terms and fairly constant but for the lower age group: 15 percent at ages fifty-five to fifty-nine, 38 percent for ages sixty to sixty-four, and around 44 percent across the other age groups.

It is useful to compare these results to those obtained using the Milligan-Wise method, where the analysis (done for men only) suggested that employment could be about 58 percentage points higher at ages sixty to sixty-four and about 61 percentage points higher at ages sixty-five to sixty-nine if people today worked as much as people with the same mortality rate worked in 1977. These values are comparable to the 58 and 77 percent numbers found here. Given how different the two methods employed in this chapter are, it is striking that they generate results of roughly similar magnitude, at least for ages up to sixty-five.

Table 6.4A **Simulation of work capacity based on regressions with all health variables**

Men					Women				
Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)	Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)
55–59	934	64.78	84.93	20.15	55–59	1,220	36.80	52.00	15.19
60–64	1,046	26.48	82.55	56.07	60–64	1,340	10.90	48.25	37.35
65–69	1,114	4.85	77.43	72.58	65–69	1,266	1.98	44.59	42.61
70–74	1,016	2.37	74.14	71.78	70–74	1,020	0.29	42.14	41.85

Table 6.4B **Simulations of work capacity based on regressions with PVW index**

Men					Women				
Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)	Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)
55–59	927	64.72	85.91	21.18	55–59	1,206	36.90	51.90	15.00
60–64	1,036	26.64	84.41	57.77	60–64	1,328	10.93	48.90	37.98
65–69	1,111	4.86	81.82	76.96	65–69	1,257	1.99	45.98	43.99
70–74	1,010	2.38	79.87	77.49	70–74	1,009	0.30	44.00	43.71

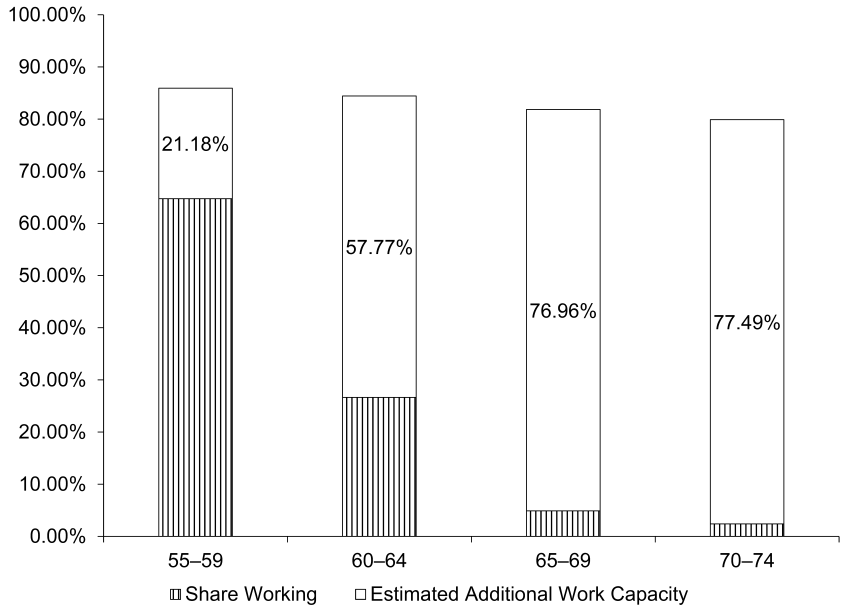

Fig. 6.7 Share of men working and additional work capacity by age

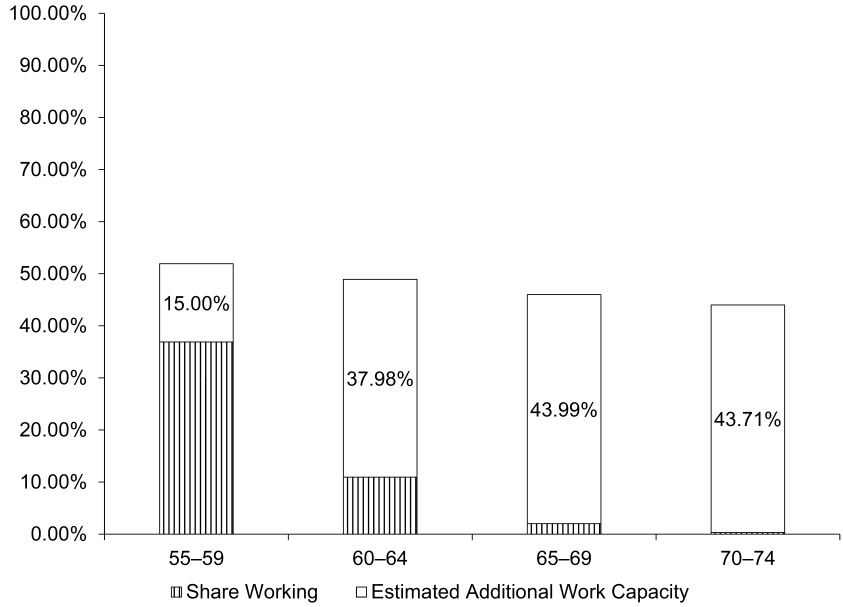

Fig. 6.8 Share of women working and additional work capacity by age

Our estimates reflect population averages, and may mask substantial heterogeneity in the ability to work longer. In particular, less educated and lower-income individuals may have less potential to extend their work lives because they are in worse health or have jobs where employment is more sensitive to health status. In the case of the Milligan-Wise analysis, it is unfortunately not possible to explore how the employment-mortality relationship has changed over time by education group or income group because Italian mortality records do not include that information. Bohacek et al. (2015) use SHARE to estimate the education gradient in mortality dividing education level into "low educated" and "high educated." Despite the low sample sizes, results for countries where mortality records are available by educational level are consistent across the different data sources. Regarding Italy, the authors find a relatively small education gradient for Italian men, and a somewhat larger premium for women.

For the present analysis, however, we can estimate work capacity separately by education. We reestimate the regression model separately by education group, which allows the relationship between employment and health to differ by education group—as might be the case, for example, if workers with less education are concentrated in blue-collar jobs where it is more difficult to continue working once one experiences a health problem than it would be in the white-collar jobs held by more highly educated workers.[4]

Our simulations of work capacity by education group are shown in table 6.5 and in figures 6.9 and 6.10. Unfortunately, data limitations force us to define only two education groups: less than high school, and high school degree or more. The actual and predicted share working varies substantially by education group—for example, the actual and predicted share working among men ages fifty-five to fifty-nine are 78 and 92 percent for those with a high school degree versus 54 and 80 percent for less than high school. These differences lead to an estimated additional work capacity for men at ages fifty-five to fifty-nine, which is 13.6 percent higher for the poorly educated. There is no difference in the additional capacity in the sixty to sixty-four age group, while the sign of the difference is inverted for the older age groups: estimated work capacity is 9 percent higher for the more educated in the sixty-five to sixty-nine age group and 11 percentage points higher for the seventy-one to seventy-five. For women, there is a 1 percentage point difference by education level in the estimated work capacity in the younger age group: the less educated women age fifty-five to sixty have an estimated work capacity of 15 percent, while the more educated of 14 percent. The difference in this age group, as in all the others, is on the level of both actual

4. We also generate results by education in a simpler way, continuing to use a common set of regression coefficients for all education groups but reporting the actual share working, predicted share working, and estimated additional work capacity separately by education group. The results of this exercise are qualitatively similar to those in table 6.5.

Table 6.5 **Work capacity by education (regression by education group)**

	Men, all health variables model			Men, PVW model		
Education	Actual % working	Predicted % working	Estimated work capacity (%)	Actual % working	Predicted % working	Estimated work capacity (%)
			Age 55–59			
Less than HS	54.18	80.08	25.9	53.93	80.99	27.1
More than HS	78.33	91.28	13.0	78.47	91.96	13.5
			Age 60–64			
Less than HS	21.65	78.24	56.6	21.88	78.95	57.1
More than HS	34.45	89.70	55.3	34.46	92.00	57.5
			Age 65–69			
Less than HS	3.41	74.21	70.8	3.43	77.08	73.6
More than HS	8.41	86.38	78.0	8.41	90.93	82.5
			Age 70–74			
Less than HS	1.50	71.07	69.6	1.51	75.31	73.8
More than HS	5.58	86.76	81.2	5.61	90.68	85.1
	Women, all health variables model			Women, PVW model		
Education	Actual % working	Predicted % working	Estimated work capacity (%)	Actual % working	Predicted % working	Estimated work capacity (%)
			Age 55–59			
Less than HS	22.32	37.08	14.8	22.76	38.31	15.6
More than HS	62.65	75.51	12.9	61.78	76.18	14.4
			Age 60–64			
Less than HS	6.91	39.90	33.0	6.86	38.45	31.6
More than HS	21.39	78.78	57.4	21.11	75.17	54.1
			Age 65–69			
Less than HS	1.07	37.15	36.1	1.01	38.24	37.2
More than HS	5.34	77.34	72.0	5.62	75.74	70.1
			Age 70–74			
Less than HS	0.25	37.00	36.7	0.24	38.16	37.9
More than HS	0.63	80.32	79.7	0.61	74.74	74.1

Note: Actual percent working in all health and PVW models vary due to differences in sample size.

and predicted employment: among the women age fifty-five to fifty-nine, 23 percent of the less educated are actually working versus 62 percent of the more educated. The predictions are 38 percent and 76 percent, respectively. As we move to older age groups, actual employment rates fall while predicted employment rates remain basically constant in both education groups. The estimated work capacity rises first at 32 percent and then stabilizes at 37 percent for the less educated, age sixty to sixty-four, sixty-five to seventy, and seventy-one to seventy-five, respectively, while it is 54 percent, 70 percent, and 74 percent among the more educated in the three age-corresponding groups.

As we mentioned earlier, the estimates we used to simulate work capacity

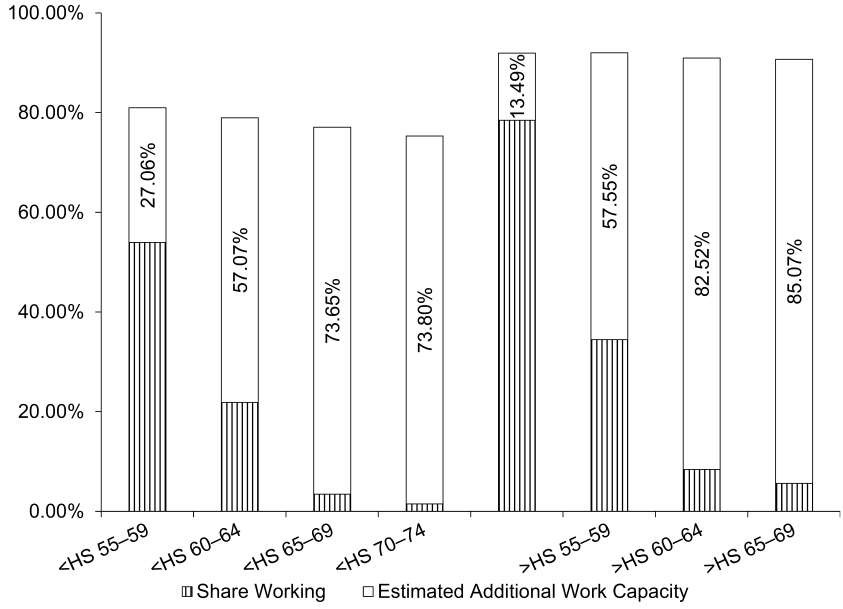

Fig. 6.9 Share of men working and additional work capacity by age and education

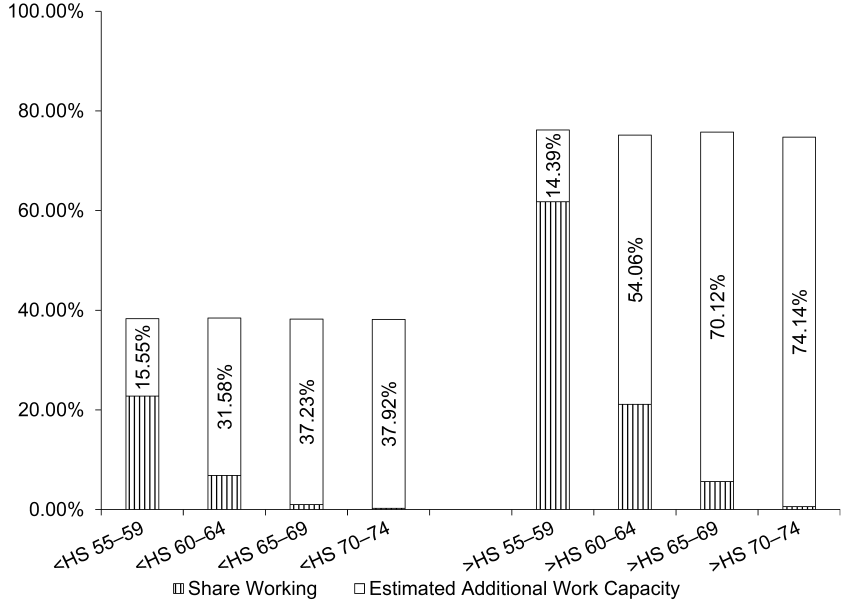

Fig. 6.10 Share of women working and additional work capacity by age and education

of older cohorts are based on assumptions common to the other contributions of this book, and some additional assumptions specific to the Italian data. First and foremost, we pooled data from 2004, 2006, 2010, and 2012 to obtain a sample large enough to compute reliable estimates. The underlying assumption is that the relation between health and retirement decision remains constant over time. A first concern relates to self-assessed health, which is included both as an explanatory variable and as a component of the health index: since the subjective evaluation of own health may vary with age, the relation between self-reported health and employment varies over time (waves). Hence, we estimated both versions of the model excluding self-assessed health from the set of regressors: work capacities are virtually unaffected compared to the reported results. Yet, a second concern related to the choice of pooling data from different waves is that the economic crisis may have changed the relation between health and retirement for individuals age fifty to fifty-four in 2010 and 2012. Therefore, we reestimated the model based only on the precrisis period (waves 1 and 2). The sample size reduces dramatically: the regressions (reported in tables 6A.1A and 6A.1B) are run with at most 262 observations for males and 413 for females. This reduction leads to a loss of significance of the PVW health index, but in the regression that includes all health conditions taken separately, most of the regressors that were significant in table 6.3A are still significant. Turning to estimated work capacity, using only waves 1 and 2 leads to flatter profiles by age: as an example, in the baseline estimations we estimated a 22 percent excess work capacity for males age fifty-five to fifty-nine using the PVW index estimations, rising to 58, 76, and 77 percent for the sixty to sixty-four, sixty-five to sixty-nine, and seventy to seventy-four ages. Using only precrisis data, the figures are 32 percent, 62 percent, 75 percent, and 77 percent, respectively. A similar picture emerges looking at women, splitting by education or moving to estimates obtained including all health variables (tables 6A.2A and 6A.2B and tables 6A.3A, 6A.3B, 6A.3C, and 6A.3D).

The difference in estimated work capacity using only the first two waves may be attributed either to the changed economic conditions or to differential labor force participation across cohorts. The surge of the economic crisis may have induced individuals to postpone retirement and stay longer in the labor market, thus the higher estimated unused capacity resulting when limiting the analysis to the precrisis sample can be the result of a lower average labor force participation. Such an effect is not separately identifiable from a cohort effect induced by the sampling scheme of SHARE: waves 4 and 5 include a refresher sample, which allows the survey to be representative of the entire age fifty and older European population in each interview year. As the panel sample ages, the new observations are mainly individuals from younger cohorts with a higher labor attachment. Again, limiting the analysis to waves 1 and 2 leads to a lower average labor force participation. Finally, a third explanation is that the difference in estimated work capacity

observed restricting the sample to waves 1 and 2 may simply reflect a lack of precision due to the limited sample size. In order to rule out the latter, we pooled samples of individuals from all SHARE countries observed in waves 1 and 2, we ran the same regression including a full set of country fixed effects, and obtained simulations for Italy based on these estimates. Estimated work capacity is by and large unchanged compared to the estimates obtained using only the small Italian sample of waves 1 and 2.

A second point that may be particularly relevant for Italy is that the estimation sample includes individuals who never worked in their lives. Those individuals never faced a retirement decision, but they can define themselves as retired. The relation between health and being "retired" can be very different for this subset of individuals. While this is a negligible fraction of the surveyed population in the United States, a substantial proportion of Italian women in the relevant cohorts never participated in the labor force. Excluding these women reduces the sample from 929 to 704 observations (tables 6A.4A and 6A.4B). The difference in sample size is much more limited for males. Excluding individuals who never worked allows us to include occupational dummies in the regression. Occupational dummies turn out to be significant for women, not for men. Nevertheless, the higher education dummy loses statistical significance in this specification for women. The PVW index, though still significant, is now estimated less precisely. Looking at table 6A.5, we can observe that estimated work capacity for males is virtually unchanged, while it is substantially higher for older cohorts of women.

The overall impression is that our baseline estimates lead to conservative estimates of work capacity compared to alternative sets of results, which account for the specific characteristics of Italy.

6.4 Changes in Self-Assessed Health by Education Level over Time

In this section, we show how SAH has evolved over time for those with different levels of socioeconomic status (SES) in Italy. We follow standard practice and use education as an indicator of lifelong SES, and account for cohort differences in educational attainment by relating individual education to that of individuals born in the same year.

Figure 6.11 shows the distribution of educational attainment by birth cohort; data for men and women are aggregated in the figure because results are similar for both genders. For cohorts reaching age fifty in 1995 (born in 1945), the median individual had a middle school degree and more than 75 percent of individuals had less than a high school education. This changes rapidly over time. By 2005, the median fifty-year-old is still at the middle school level, but more than 40 percent of the individuals in the same cohort have a high school degree.

The horizontal lines on figure 6.11 show how the education quartiles are defined. For the 1995 cohort of fifty-year-olds, for example, the lowest

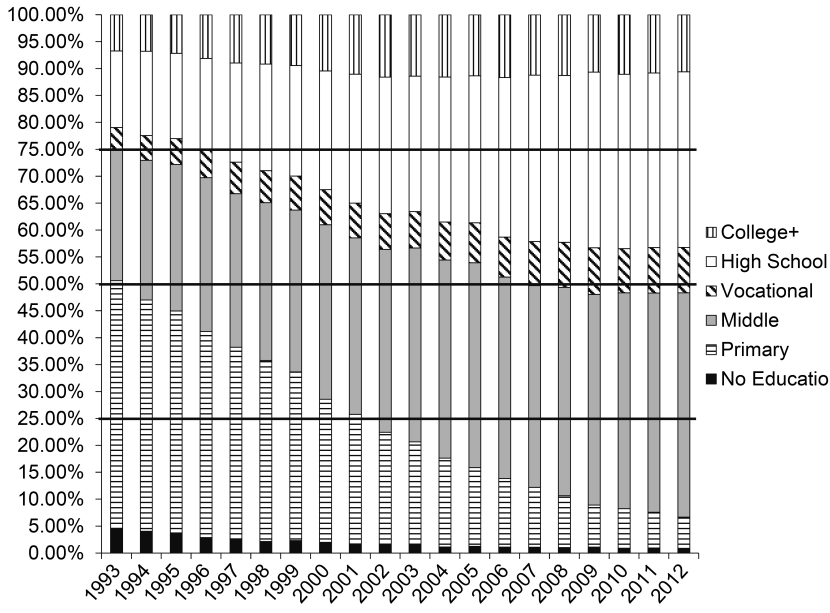

Fig. 6.11 Distribution of years of education completed by cohort (by year cohort attained age fifty)

quartile includes all of those with no or primary school education. The next quartile includes the rest of the primary school group and some of the middle school graduates. The 3rd quartile largely consists of those with a middle school degree, while the top quartile includes the remainder of high school graduates and everyone with some college or more education. In the 2005 cohort of fifty-year-olds, the lowest quartile includes some middle school graduates and everyone with primary school, while the third quartile includes only vocational training and high school graduates. The key point is that the educational composition of the population changes over time, even in a relatively short time window as the one we consider. That is why we focus on education quartiles to have a consistent measure of the less and more educated.

In figure 6.12, we plot the share of individuals who report themselves to be in fair or poor health by age for two different time periods, 1993–1999 and 2000–2007, separately, by education quartile. The data for these figures comes from the ISTAT General Household Survey, and are aggregated over seven years for greater precision. The familiar negative relationship between age and health is evident from the figures, as is the fact that health is better among the higher education quartiles. What interests us particularly is the evolution of SAH over time across education quartiles. In the case of Italy, we do not find significant improvements in health over time in any educa-

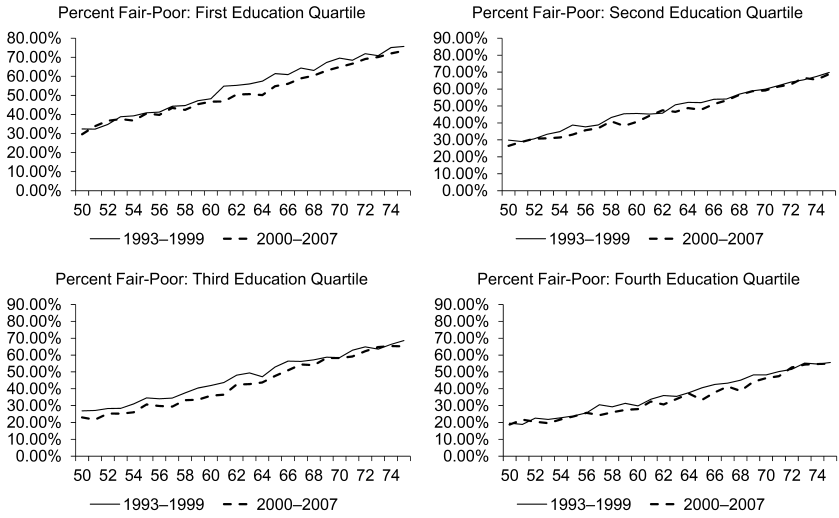

Fig. 6.12 Percentage in fair or poor health by education quartile

tional quartile, but for older individuals in the first education quartile. This may be due to the relatively short time period that we have data for: ISTAT General Household Survey report data on self-assessed health covering the period 1993–2012, but in the 2008 questionnaire the question changed limiting the comparable data to fourteen years in all, from 1993 until 2007.

6.5 Discussion and Conclusion

The Italian public pension system has undergone several reforms over the past quarter century aimed at increasing the effective retirement age and making the whole system of support to the older population sustainable in both the short and long run. One of the features of these reforms has been an explicit link of public pension eligibility to life expectancy, on the assumption that working lives can be extended at a similar pace as longevity increases. Critics of these reforms have claimed that work beyond a certain age is made hard or even impossible by health deterioration and other physical impediments (such as limited mobility).

In this chapter we have used data from different sources (official statistics from ISTAT, as well as the Italian component of the Survey on Health, Ageing and Retirement in Europe) to assess the validity of this widely voiced criticism to the goal of longer working lives.

First of all, we have assessed how much individuals could work now if people with a given mortality rate today worked as much as those with the same mortality rate in the past. Next we have estimated how much individuals could work, if older individuals with a given health status worked

as much as their younger (fifty to fifty-four) counterparts with the same health status. Both methods suggest substantial additional work capacity, of the order of a potential employment increase of 56–58 percent of the population at ages sixty to sixty-four and of 61–69 percent at ages sixty-five to sixty-nine. We have investigated the heterogeneity of work capacity, and found greater work capacity among more educated individuals as compared to the less educated, at least for individuals age sixty or more.

Appendix

Table 6A.1A Employment regressions, all health variables, precrisis waves

Men 50–54			Women 50–54		
Variable	Coefficient	Std. err.	Variable	Coefficient	Std. err.
Health_vgood	–0.077	0.069	Health_vgood	–0.042	0.087
Health_good	–0.123	0.062*	Health_good	–0.092	0.082
Health_fair	0.023	0.087	Health_fair	–0.263	0.099**
Health_poor	–0.520	0.182**	Health_poor	–0.091	0.159
Gali	0.017	0.071	Gali	0.025	0.058
Mobilit2	0.106	0.063	Mobilit2	0.024	0.055
Mobilit3	–0.197	0.120	Mobilit3	0.035	0.090
ADLany	–0.045	0.160	ADLany	0.417	0.140**
IADLany	–0.323	0.186	IADLany	–0.116	0.093
Eurod	–0.008	0.014	Eurod	0.018	0.010
Heartat	–0.346	0.098***	Heartat	–0.199	0.139
Stroke	0.048	0.349	Stroke	–0.223	0.208
Cholester	0.083	0.064	Cholester	0.097	0.075
Lungdis	–0.081	0.122	Lungdis	0.003	0.122
Cancer	–0.172	0.190	Cancer	–0.022	0.126
Highblpr	0.084	0.053	Highblpr	–0.015	0.057
Arthritis	–0.022	0.079	Arthritis	0.001	0.062
Diabetes	–0.286	0.106**	Diabetes	–0.093	0.152
Osteopor	0.165	0.371	Osteopor	0.161	0.089
Alzheimer's	0.000	(omitted)	Alzheimer's	0.000	(omitted)
Back	–0.004	0.051	Back	–0.032	0.053
Asthma	0.062	0.117	Asthma	–0.202	0.112
Underweight	0.000	(omitted)	Underweight	0.012	0.200
Overweight	0.026	0.047	Overweight	0.003	0.049
Obese	–0.023	0.066	Obese	0.115	0.072
Smokerform	–0.134	0.056*	Smokerform	–0.043	0.063
Smokecurr	0.018	0.050	Smokecurr	0.040	0.056
Educ_lessthHS	–0.135	0.046**	Educ_lessthHS	–0.468	0.052***
Educ_somecollege	–0.045	0.173	Educ_somecollege	–0.051	0.103
Educ_collegemore	0.067	0.071	Educ_collegemore	0.073	0.088
Married	0.110	0.054*	Married	0.015	0.061
_Cons	0.941	0.082***	_Cons	0.789	0.099***
Obs.	262		Obs.	413	

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 6A.1B **Employment regressions, PVW index, precrisis waves**

Men			Women		
Variable	Coefficient	Std. err.	Variable	Coefficient	Std. err.
PVW	0.002	0.001	PVW	0.000	0.001
Educ_lesst~S	–0.112	0.046*	Educ_lesst~S	–0.457	0.050***
Educ_somec~e	0.071	0.175	Educ_somec~e	–0.065	0.101
Educ_colle~e	0.109	0.074	Educ_colle~e	0.118	0.087
Married	0.160	0.054**	Married	–0.025	0.059
_Cons	0.655	0.088***	_Cons	0.785	0.085***
Obs.	260		Obs.	407	

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 6A.2A **Simulations of work capacity, all health variables, precrisis waves**

Men					Women				
Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)	Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)
55–59	428	52.80	82.10	29.30	55–59	552	25.54	45.80	20.26
60–64	445	20.45	78.95	58.50	60–64	582	6.53	42.77	36.24
65–69	467	6.00	71.61	65.61	65–69	513	1.75	39.74	37.99
70–74	389	1.54	62.86	61.32	70–74	364	0.00	39.01	39.01

Table 6A.2B **Simulations of work capacity, PVW index, precrisis waves**

Men					Women				
Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)	Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)
55–59	424	52.83	84.75	31.92	55–59	545	25.50	45.30	19.79
60–64	440	20.45	82.58	62.12	60–64	578	6.57	41.52	34.94
65–69	467	6.00	81.38	75.38	65–69	507	1.78	39.75	37.97
70–74	388	1.55	78.34	76.79	70–74	360	0.00	35.95	35.95

Table 6A.3A Work capacity by education (single regression)

Education	Men, all health variables model			Men, PVW model		
	Actual % working	Predicted % working	Estimated work capacity (%)	Actual % working	Predicted % working	Estimated work capacity (%)
			Age 55–59			
Less than HS	41.73	73.70	32.0	41.43	78.52	37.1
More than HS	68.79	94.06	25.3	69.19	93.68	24.5
			Age 60–64			
Less than HS	17.04	71.85	54.8	17.26	77.81	60.5
More than HS	28.36	94.69	66.3	27.82	93.47	65.6
			Age 65–69			
Less than HS	3.50	65.43	61.9	3.50	76.88	73.4
More than HS	13.01	87.03	74.0	13.01	92.80	79.8
			Age 70–74			
Less than HS	1.22	58.19	57.0	1.22	75.36	74.1
More than HS	3.33	85.00	81.7	3.39	92.63	89.2

Note: Actual percent working in all health and PVW models vary due to differences in sample size.

Table 6A.3B Work capacity by education (single regression)

Education	Women, all health variables model			Women, PVW model		
	Actual % working	Predicted % working	Estimated work capacity (%)	Actual % working	Predicted % working	Estimated work capacity (%)
			Age 55–59			
Less than HS	13.39	31.77	18.4	13.33	30.58	17.2
More than HS	52.63	76.98	24.4	52.35	78.04	25.7
			Age 60–64			
Less than HS	5.11	32.45	27.3	5.16	30.84	25.7
More than HS	11.36	78.48	67.1	11.36	78.12	66.8
			Age 65–69			
Less than HS	0.96	31.22	30.3	0.98	30.97	30.0
More than HS	5.15	77.77	72.6	5.15	77.61	72.5
			Age 70–74			
Less than HS	0.00	34.39	34.4	0.00	31.23	31.2
More than HS	0.00	82.00	82.0	0.00	76.47	76.5

Note: Actual percent working in all health and PVW models vary due to differences in sample size.

Table 6A.3C Work capacity by education (regression by education group)

	Men, all health variables model			Men, PVW model		
Education	Actual % working	Predicted % working	Estimated work capacity (%)	Actual % working	Predicted % working	Estimated work capacity (%)
			Age 55–59			
Less than HS	41.73	71.44	29.7	41.43	78.97	37.5
More than HS	68.79	92.10	23.3	69.19	92.63	23.4
			Age 60–64			
Less than HS	17.04	66.64	49.6	17.26	78.58	61.3
More than HS	28.36	91.98	63.6	27.82	92.21	64.4
			Age 65–69			
Less than HS	3.50	58.61	55.1	3.50	77.83	74.3
More than HS	13.01	87.66	74.7	13.01	90.74	77.7
			Age 70–74			
Less than HS	1.22	53.27	52.1	1.22	76.46	75.2
More than HS	3.33	88.45	85.1	3.39	90.11	86.7

Note: Actual percent working in all health and PVW models vary due to differences in sample size.

Table 6A.3D Work capacity by education (regression by education group)

	Women, all health variables model			Women, PVW model		
Education	Actual % working	Predicted % working	Estimated work capacity (%)	Actual % working	Predicted % working	Estimated work capacity (%)
			Age 55–59			
Less than HS	13.39	32.95	19.6	13.33	31.43	18.1
More than HS	52.63	77.84	25.2	52.35	76.25	23.9
			Age 60–64			
Less than HS	5.11	32.96	27.9	5.16	31.95	26.8
More than HS	11.36	80.42	69.1	11.36	74.83	63.5
			Age 65–69			
Less than HS	0.96	32.27	31.3	0.98	32.45	31.5
More than HS	5.15	82.81	77.7	5.15	76.62	71.5
			Age 70–74			
Less than HS	0.00	34.02	34.0	0.00	33.20	33.2
More than HS	0.00	82.12	82.1	0.00	74.68	74.7

Note: Actual percent working in all health and PVW models vary due to differences in sample size.

Table 6A.4A **Employment regressions, all health variables excluding those who never worked in their lives**

Men 50–54			Women 50–54		
Variable	Coefficient	Std. err.	Variable	Coefficient	Std. err.
Health_vgood	–0.0086	0.0447	Health_vgood	–0.0415	0.0532
Health_good	–0.0455	0.0417	Health_good	–0.0243	0.0522
Health_fair	–0.0062	0.0572	Health_fair	–0.0874	0.0664
Health_poor	–0.4336	0.1201***	Health_poor	–0.0914	0.1027
Gali	0.0292	0.0470	Gali	–0.0615	0.0427
Mobilit2	0.0464	0.0418	Mobilit2	–0.0062	0.0414
Mobilit3	–0.0621	0.0864	Mobilit3	0.0734	0.0662
ADLany	–0.2191	0.0974*	ADLany	0.1778	0.0985
IADLany	–0.0071	0.1310	IADLany	–0.1138	0.0776
Eurod	–0.0043	0.0084	Eurod	0.0090	0.0073
Heartat	–0.3331	0.0741***	Heartat	–0.2941	0.1110**
Stroke	–0.2579	0.1221*	Stroke	–0.3366	0.1584*
Cholester	0.0677	0.0417	Cholester	0.0171	0.0511
Lungdis	–0.0694	0.0845	Lungdis	–0.0565	0.1058
Cancer	–0.2226	0.1296	Cancer	–0.0319	0.0847
Highblpr	0.0742	0.0363*	Highblpr	–0.0700	0.0429
Arthritis	–0.0380	0.0623	Arthritis	–0.0062	0.0524
Diabetes	–0.1226	0.0678	Diabetes	0.0202	0.0942
Osteopor	0.1161	0.3457	Osteopor	0.1515	0.0915
Alzheimer's	0.0000	(omitted)	Alzheimer's	0.0000	(omitted)
Back	0.0092	0.0333	Back	–0.0202	0.0374
Asthma	–0.0003	0.1093	Asthma	–0.2663	0.1158*
Underweight	0.1045	0.3230	Underweight	–0.0216	0.0911
Overweight	0.0281	0.0306	Overweight	0.0418	0.0364
Obese	–0.0864	0.0459	Obese	0.0339	0.0519
Smokerform	–0.0236	0.0363	Smokerform	–0.0805	0.0412
Smokecurr	0.0113	0.0319	Smokecurr	0.0165	0.0385
Educ_lessthHS	–0.0202	0.0326	Educ_lessthHS	–0.0837	0.0388*
Educ_somecollege	0.0736	0.0933	Educ_somecollege	0.0636	0.0662
Educ_collegemore	0.0900	0.0486	Educ_collegemore	0.0633	0.0492
Married	0.1443	0.0364***	Married	–0.0715	0.0409
Occ_bluecollar	–0.0388	0.0340	Occ_bluecollar	–0.2651	0.0486***
Occ_lowskill	–0.0635	0.0467	Occ_lowskill	–0.2124	0.0430***
_Cons	0.7993	0.0546***	_Cons	0.9680	0.0650***
Obs.	569		Obs.	704	

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 6A.4B **Employment regressions, PVW index excluding those who never worked in their lives**

Men			Women		
Variable	Coefficient	Std. err.	Variable	Coefficient	Std. err.
PVW	0.0020	0.0006**	PVW	0.0012	0.0006*
Educ_lessthHS	–0.0603	0.0310	Educ_lessthHS	–0.1942	0.0362***
Educ_somecollege	0.0951	0.0957	Educ_somecollege	0.0502	0.0678
Educ_collegemore	0.1052	0.0497*	Educ_collegemore	0.1033	0.0499*
Married	0.1571	0.0363***	Married	–0.1152	0.0420**
_Cons	0.6070	0.0614***	_Cons	0.8325	0.0616***
Obs.	566		Obs.	697	

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 6A.5A **Simulations of work capacity, excluding those who never worked in their lives, all health variables**

Men					Women				
Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)	Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)
55–59	928	65.09	85.65	20.56	55–59	851	51.59	71.37	19.79
60–64	1,028	26.65	84.03	57.38	60–64	966	14.80	68.53	53.73
65–69	1,103	4.90	79.11	74.22	65–69	842	2.85	65.48	62.63
70–74	1,003	2.30	76.09	73.79	70–74	689	0.44	61.41	60.97

Table 6A.5B **Simulations of work capacity, excluding those who never worked in their lives, PVW index**

Men					Women				
Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)	Age group	No. obs.	Actual % working	Predicted % working	Estimated work capacity (%)
55–59	921	65.04	86.45	21.41	55–59	844	51.54	71.46	19.92
60–64	1,019	26.79	85.18	58.39	60–64	958	14.82	69.17	54.34
65–69	1,101	4.90	82.77	77.87	65–69	837	2.87	67.36	64.49
70–74	998	2.30	80.98	78.68	70–74	685	0.44	65.67	65.23

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