Social Security Wealth in Italy: 20 Years of Pension Reforms"

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Abstract

JEL Classification: H55, J21, J26, J14

Keywords: pensions, social security, disability, early retirement, unemployment, labor force participation

This paper uses data from SHARELIFE release 1, as of November 24th 2010, and SHARE release 2.5.0, as of May 24th 2011. The SHARE data collection has been primarily funded by the European Commission through the 5th framework programme (project QLK6-CT-2001- 00360 in the thematic programme Quality of Life), through the 6th framework programme (projects SHARE-I3, RII-CT- 2006-062193, COMPARE, CIT5-CT-2005-028857, and SHARELIFE, CIT4-CT-2006-028812) and through the 7th framework programme (SHARE-PREP, 211909 and SHARE-LEAP, 227822). Additional funding from the U.S. National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, Y1-AG-4553-01 and OGHA 04-064, IAG BSR06-11, R21 AG025169) as well as from various national sources is gratefully acknowledged (see www.share-project.org for a full list of funding institutions).

1. Introduction

Italy has undergone several pension reforms aimed at guaranteeing sustainability of the social security system and public finances. These reforms intend to counter-balance the longevity increase – which in Italy has been extremely significant in the last decades (see Brugiavini and Peracchi, 2012 and 2014) - by increasing the old age retirement age, by making early retirement less generous and by introducing actuarially fair adjustments. The other objective that these reforms aim for is to increase labor supply of older workers, particularly in the age group 50 to 65. This explains why it was a priority to change the incentives to retirement and to introduce tighter eligibility conditions for retirement at full benefits or even at partial benefits. Pension reforms in Italy started in the year 1992 (during the Amato government) and several other changes took place in the past twenty years, notably in 1995 (during the Dini government) and more recently in 2011 (during the Monti government).

One feature of the Italian pension system, which was however common to other countries such as Belgium and Austria, is a generous early retirement option. Many generations of workers took advantage of the opportunity to leave the labor force early (as early as age 50 or even 45), and this behavior was widely accepted in society and favored by firms. In fact, early retirement gave the opportunity to lay out workers when the business cycle was at a negative turn in a simple and costless way (Brugiavini and Peracchi 2005).

In this paper we document the effects of two decades of pension reforms by looking at summary measures of pension claims that workers and retirees are entitled to and by focusing on the dynamics of pension provisions. The reference literature is the one of the "option value of work" which provides a framework to look at the retirement behavior of Italian employees and the effect of pension reform on financial incentives to retire or work. These incentives are measured by the value to the worker of working an extra year vis-à-vis leaving the labor force. Unfortunately at this stage we cannot look at all the possible alternative routes to exit the labor force and we will focus on early retirement and old-age. These are by and large the most widely used exit routes in Italy in the relevant years under investigation, however more recently some significant changes can be observed also for disability benefits which will need to be analyzed with some care in future research (see also Alessie and Belloni 2013, Brugiavini and Peracchi 2012)

The basic approach requires calculating the Social Security Wealth, i.e. the present value of future pension claims taking account longevity and conditional on the expected retirement age (eligibility), this has to be computed at each year of age by projecting forward the earnings profile of workers and by applying the appropriate longevity profile. At each age a new calculation is implemented to account for changes in the relevant variables (longevity, earnings, eligibility etc…) and to fully capture the impact of reforms (Gruber and Wise, 2005). In this paper we propose a preliminary descriptive analysis of Social Security Wealth to pinpoint the relevant effects over time and across groups of the Italian population of pension reforms (Blau 2008).

We combine Italian administrative data from the National Institute for Social Security (INPS) with the information on the subsample of Italian respondents in the Survey of Health, Ageing

and Retirement in Europe (SHARE) and data from the Bank of Italy Survey of Households Income and Wealth (SHIW)

This paper is structured as follows. Section 2 outlines the institutional background of the Italian social security system and provides a first description of the data. Section 3 describes the available data in more depth, provides the methodology to construct Social Security Wealth and the Option Value, and presents the empirical estimates. Section 4 concludes.

2 . The Italian Pension System

The Italian pension systems has included for quite some time several institutions to administer public pension programs based on different sectors of the economy: private-sector employees, public-sector employees, self-employed, professional workers.[1] In recent years there has been a partial unification of these programs and currently there is only one institution (INPS) paying out benefits to retirees, but differences persists, for example, in the contribution rate across groups of workers. Funding is on a pay-as-you go (PAYG) basis. Although the system is covering several risks related to old age, death of the worker or disability, we will focus on retirement provisions only.

Italy currently spends 16% of GDP in old-age related provisions that are all within the first pillar compulsory frame as occupational pensions and private pensions are still under-developed.[2] INPS covers about 19 million workers, 12 million of which are private sector employees while the others are different types of self-employed workers. Another 4 million public sector employees and civil servants pay contributions to a separate fund (INPDAP) now also managed by INPS. Workers who paid a sufficient number of contributions can claim, if eligible, an old age pension, which depends on the years of age, and an early retirement pension, which also depends on the worker's career. Until 1992 early-retirement provisions were paid out irrespective of age to retirees with at least 35 years of contribution, or even less for women. The statutory retirement age for old age pensions was initially at 60 for men and 55 for women and the calculation of benefits was "defined benefit/retributory" based on the last years of earnings. To be more specific: both for old age and early retirement pensions, benefits were based on the averages of the earnings over the last five years of work. The initial pension was obtained multiplying the pension basis by a "rate of return" (accrual factor) approximately equal to 2% for each year of contribution (up to a maximum of 80%).

Pension reforms started in 1992 aimed at increasing the retirement age and cutting benefits on an actuarial basis. The 1995 reform redesigned the system by modifying the eligibility rules and by changing the calculation of old age benefits from a defined-benefit (DB) basis to a notional defined-contribution (NDC) basis. However, because these changes were characterized by long transitional period, the immediate effects were not so marked.

An important aspect of the reforms of the 1990s is the grandfathering approach, i.e. a very explicit differential system for older cohorts. While older workers would retire according to the prevailing rues, for younger workers there would be major changes in the calculation of the pension benefits.

[1] In this paper we use social security system and pension system as synonymous. In fact, in Italy, social security is the main source of publicly provided income in old age.

The 1992 pension reform revised the requirements for the old age retirement. The eligibility age was increased gradually by one year of age every two years starting from 1994, until reaching age 65 for men and age 60 for women in the year 2000 (before 1993 it used to be 60 for men and 55 for women). The numbers of years of contribution required for an old-age pension was also increased gradually by one every two years starting from 1993, until reaching 20 years of contributions in 2001. One important change brought about by the 1992-reform, with relevant budgetary implications, was the indexation of pension benefits to price inflation only, rather than to nominal wage growth.

The 1995 reform applied the grandfathering approach by separating three groups of workers depending on their number of years of contribution at the end of 1995: those with at least 18 years of contribution, those with less than 18 years, and new entrants into the labor force. While new rules on eligibility requirements were introduced for all workers, very few changes applied to workers with at least 18 years of contributions in terms of benefit calculations. For newly hired workers the benefit computation method changed completely from DB to DC while for those who were working before 1996 but with less than 18 years of contributions at the beginning of 1996 a mixed system was to be applied.

According to the Dini (1995) reform, along the transitional phase, (due to end in 2032 when all workers were expected to retire under the new rules), benefits were computed on a *pro rata* basis according to the number of years of contributions under the two regimes (contributions paid after 1996 counted under the new regime). During the transitional phase, eligibility for early retirement depended on both age and years of contribution, so that workers could leave the labor force through the early retirement route in 1996 if aged 52 and had accumulated 35 years of contribution. These limits were gradually raised in such a way that, in 2002, eligibility required 57 years of age and 35 years of contribution for both men and women. The minimum age for seniority pensions was legislated to increase until reaching age 40 in 2008 (Table 1).

Table 1 Rules for early retirement in the transitional phase for private sector employees.

Year	Age and years of contribution	Only years of contribution
1998	54 and 35	36
1999	55 and 35	37
2000	55 and 35	37
2001	56 and 35	37
2002	57 and 35	37
2003	57 and 35	37
2004	57 and 35	38
2005	57 and 35	38
2006	57 and 35	39
2007	57 and 35	39
2008	58 and 35	40
2009	58 and 35	40
2010	59 and 36 or 60 and 35 (quota 95)	40
2011	60 and 36 or 61 and 35 (quota 96)	40

The 2011 reform, introduced under the Monti Government and known as the "Fornero reform" because of the name of the Labor Minister of the time, also changed many aspects of the system. First, concerning the calculation of the initial benefits, it reduced the transitional phase of the NDC rule starting in January 2012. While it envisages both the old-age pension and the early-retirement pension, it tightens eligibility requirements. On the one hand, for the old-age pension there will be a gradual increase in the legal age requirement so that by 2018 there will be no difference between men and women, and by 2050 the age requirement will become 69 years and 9 months for all types of workers. On the other hand, for the early retirement option, the reform requires a gradual increase in the number of years of contributions needed to access this pathway (46 years for men and 45 for women in 2050). Moreover, for those individuals whose retirement benefits are computed with the defined benefit method, the law sets a penalty if they retire before the age of 62. The 2011 reform links the adjustment of the age requirement for an old-age pension to the increase in life expectancy according to an actuarially fair principle. Starting with 2019, the adjustment will take place every two years. Table 2 describes these rules.

Table 2. Eligibility requirements after the 2011 Pension Reform

	Age		
Years	**Men**	**Women, private sector**	**Women, public sector**
2012	66 years	62 years	66 years
2013	66 and 3 months	62 and 3 months	66 and 3 months
2014	66 and 3 months	63 and 9 months	66 and 3 months
2015	66 and 3 months	63 and 9 months	66 and 3 months
2016	66 and 7 months	65 and 7 months	66 and 7 months
2017	66 and 7 months	65 and 7 months	66 and 7 months
2018	66 and 7 months	66 and 7 months	66 and 7 months
…	…	…	…
2050	69 and 9 months	69 and 9 months	69 and 9 months

	Years of contribution	
Years	**Men**	**Women, private and public sector**
2012	42 years and 1 month	41 years and 1 month
2013	42 years and 5 months	41 years and 5 months
2014	42 years and 6 months	42 years and 6 months
2015	42 years and 6 months	42 years and 6 months
2016	42 years and 10 months	41 years and 10 months
…	…	…
2050	46 years	45 years

2. Data description

In this paper we make use of three sources of data: administrative records from the INPS archives, the survey data from the Survey of Health, Ageing and Retirement in Europe (SHARE) and from the Bank of Italy Survey on Household Income and Wealth (SHIW).

The **INPS-sample** is drawn from administrative records provided by the National Institute of Social Security[3]. The sample has four components: (i) information on the private sector employees (a stock measure) paying social security contributions recorded at the end of each year; (ii) information on beneficiaries (a stock measure) by type of benefit, regardless of the type of job previously held and labor market participation (hence including individuals with no labor market experience); (iii) information on the flow of new pension and benefit awards at the end of each year, and (iv) a panel of earnings histories which can be linked to the stock information reported in (ii) above. The years which are available to us are from 1985 to 2004. It should be stressed that the information on working histories described in (iv) is available only for a subsample of individuals: those who had any previous attachment to the labor force paying contributions to the social security administration and previously working as private sector employees. Hence, for the stock and flow data we can observe dimensions such as participation to a program (benefit take-up), gender, age and possibly previous occupation. When we link with earnings histories, we also obtain information on previous earnings and contribution histories, and detailed characteristics of the occupation held (only for private sector employees).

In constructing our working sample, we selected only individuals with earnings history (thus excluding, for example, widows who had no earnings ever in their lifetime but could be part of the initial sample) While the INPS data initially included 148,000 individuals, after our selection criteria we ended up with a sample of 81,246 individuals (631,844 records).

A large part of our empirical investigation, is based on the Italian data from **SHARE (Survey of Health geing and Retirement in Europe)**. The survey collects data on European citizens aged 50 and over (and their spouses of any age). Questions posed to the respondents refer to different dimensions of their lives, from economic conditions, labour supply and retirement decisions to health status. Five waves of data are available at the moment: the baseline sample collected in 2004, the first panel wave of 2006, the SHARELIFE (retrospective, life histories) wave (that is entirely panel, with no refresher component), the second and third panel waves of 2011 and 2013 respectively. The total number of countries involved in the first three waves is fifteen (Austria, Belgium, Czech Republic, Denmark, France, Germany, Greece, Italy, the Netherlands, Poland, Spain, Sweden, and Switzerland) and they provide a wide variety of institutional, cultural and economic differences

In this paper we use both the panel component of SHARE for Italy (SHARE-IT sample) and the SHARELIFE component consisting of retrospective information. Through SHARELIFE, we can reconstruct sequences of events relevant to an individual, for example employment spells or transitions into retirement. The initial SHARE-IT sample from the 2004, 2006 and 2011 waves contains 9,125 individuals. As we will explain later, we need to restrict to individuals who took part to wave 3 were respondents are asked to report about their working and contributory career. We then exclude wave 5 data: attrition leads to a small single-country sample over the time spam covered by wave 3 to wave 5.

INPS and SHARE data still are not sufficient to properly look at employment pattern over the last twenty years by cohort and education attainment: the former data source does not contain education attainment, the latter does not cover the entire period of interest and has a limited cohort-education subsamples. We therefore resort to the Labour Force Survey data

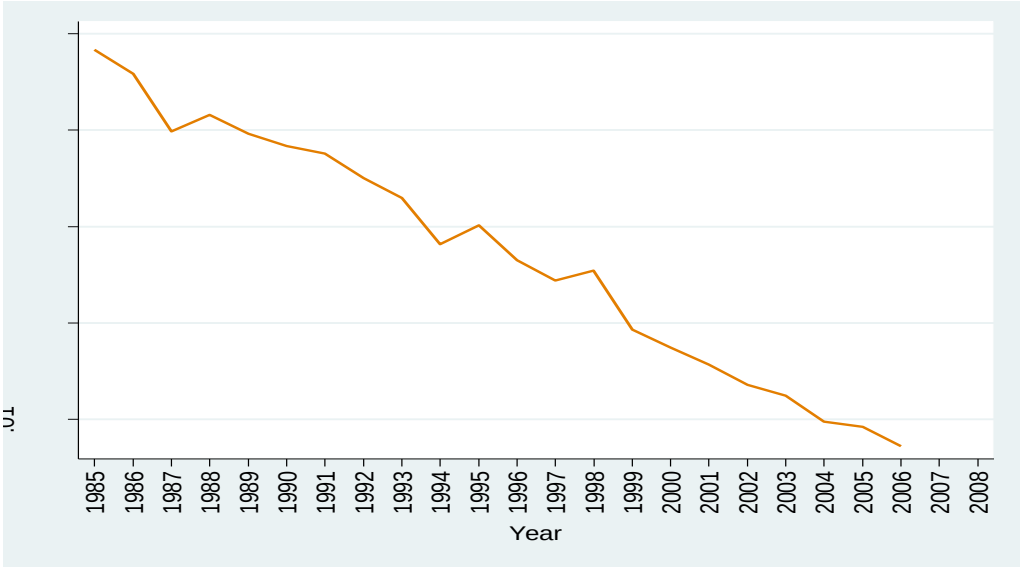
[3] We are grateful to Fondazione Rodolfo Debenedetti for making available to us the INPS sample.

administered by the National Statistical Office (ISTAT) and available through the Eurostat system.

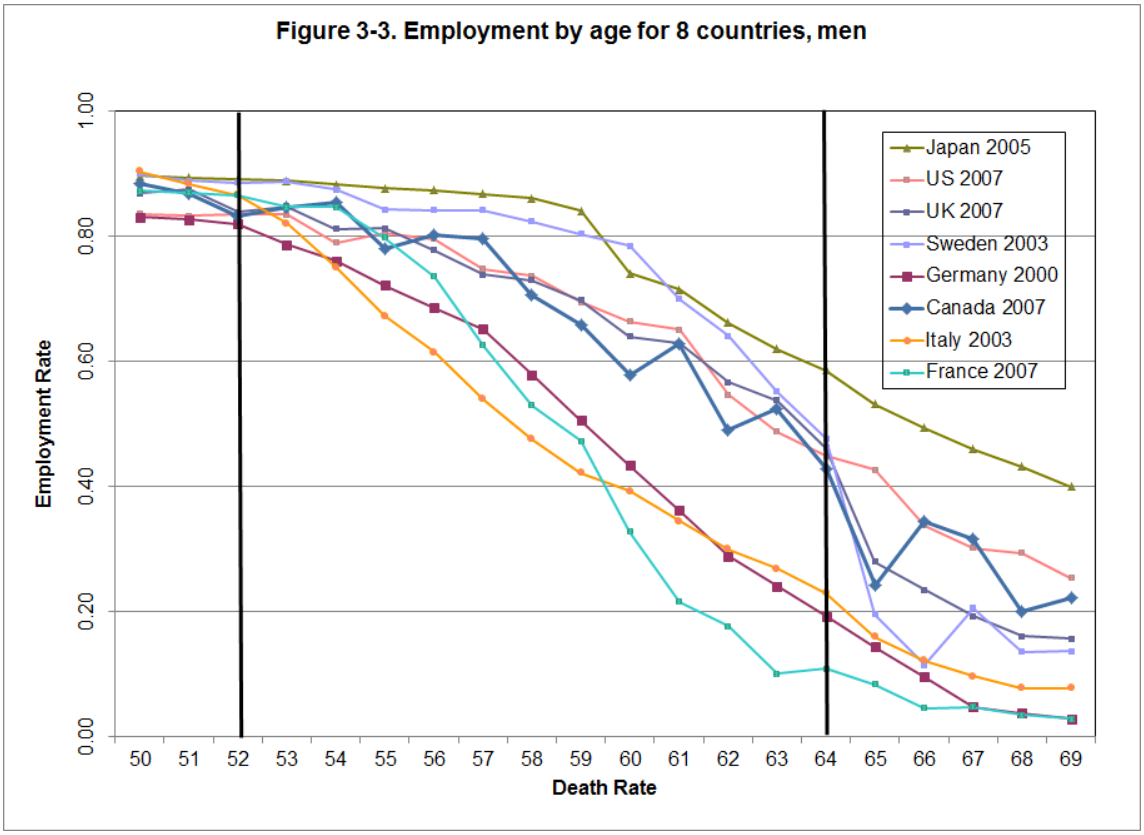
As for longevity, we make use of mortality data for Italy from the **Human Mortality Database (HMD**). The data-base is the result of a joint project by the Department of Demography of the University of California at Berkeley and the Max Planck Institute for Demographic Research n Rostock, and provides data on mortality by gender, age and birth cohort for a large number of countries.

It is useful in this respect to show that very large increase in longevity – if compared with labor supply – for a number of countries.

Figure 0: Mortality rates at age 65 (Human Mortality Database)



Source: Brugiavini, Peracchi 2014



Source: Coile, Milligan and Wise 2014

It is striking how Italy shows a marked decline in the death rate which is not matched by a comparable increase in the employment rate.

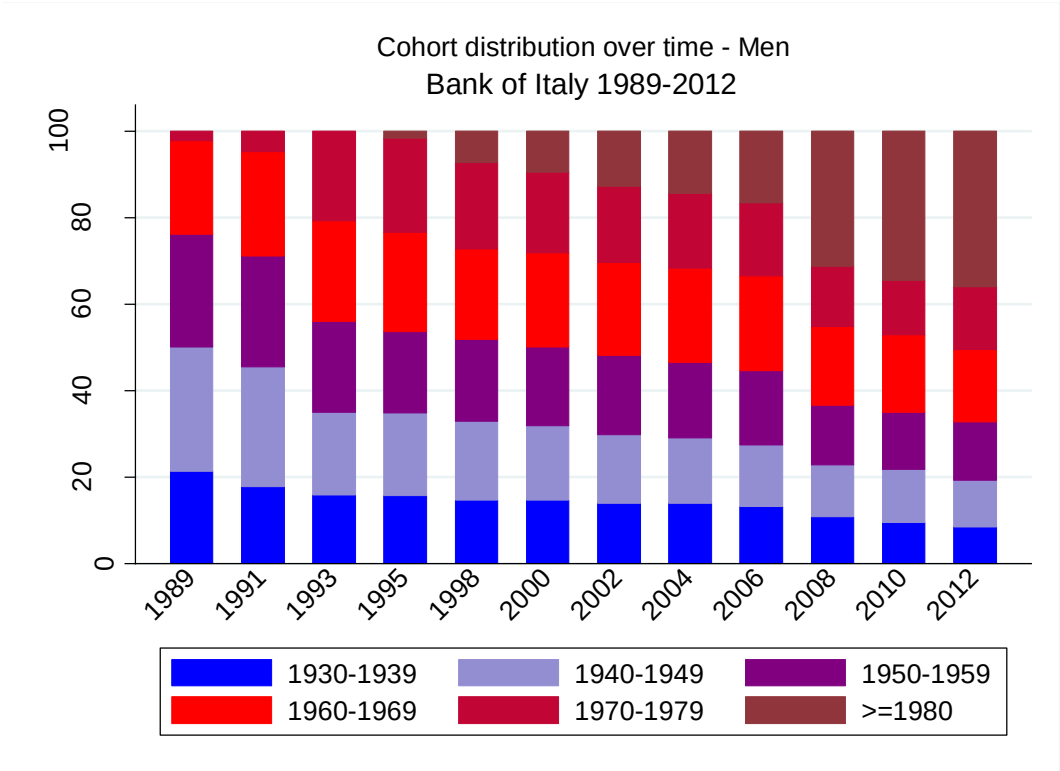
Finally we use the Bank of Italy sample SHIW, the Survey oh Household Income and Wealth, conducted by the Bank of Italy, started in 1977 and was performed annually up to 1987. Since then the survey takes place every two years (with a gap in 1997) and to date the data are available up to 2012. We use the data for the years 1989-2012. Such a time interval gives us the advantage of having rather complete information about the respondents (for the previous years there are missing information (e.g. age(year of birth) or education)) while allowing us to observe the possible effects that the various pension reforms had on the individuals' social security wealth as well as on their expectations about future retirement.

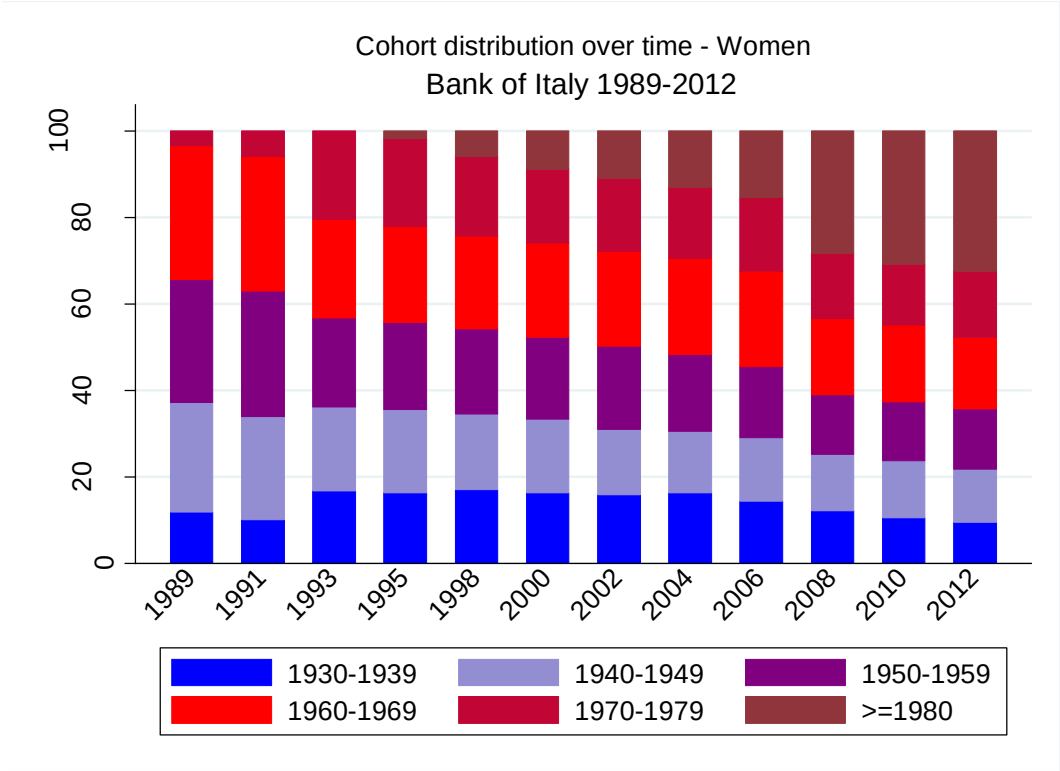
We use both information from the historical archive and data from the annual archives. From the annual archives we keep the information about the age when the individuals started their working career, expected retirement age, the detailed information about their jobs, etc. In computing the social security wealth and the option value of the individuals we only keep those workers that are private or public employees at the time of the interview.

SHIW and SHARE are complementary to some extent for our analysis. SHARE gives us information on the health of the respondents and thus allows us to analyze the influence of health conditions on the decision to retire. SHIW does not collect this information but it has the advantage of involving many more generations of workers and hence highlight intergenerational redistribution..

Although the two samples SHARE and SHIW are very different in many respects and straight comparisons would be meaningless, we provide an overview of the sample distribution for the two surveys in order to highlight the basic difference: for example by cohorts and by education.

Figure 1. Cohort composition of the SHIW sample separately for men and women



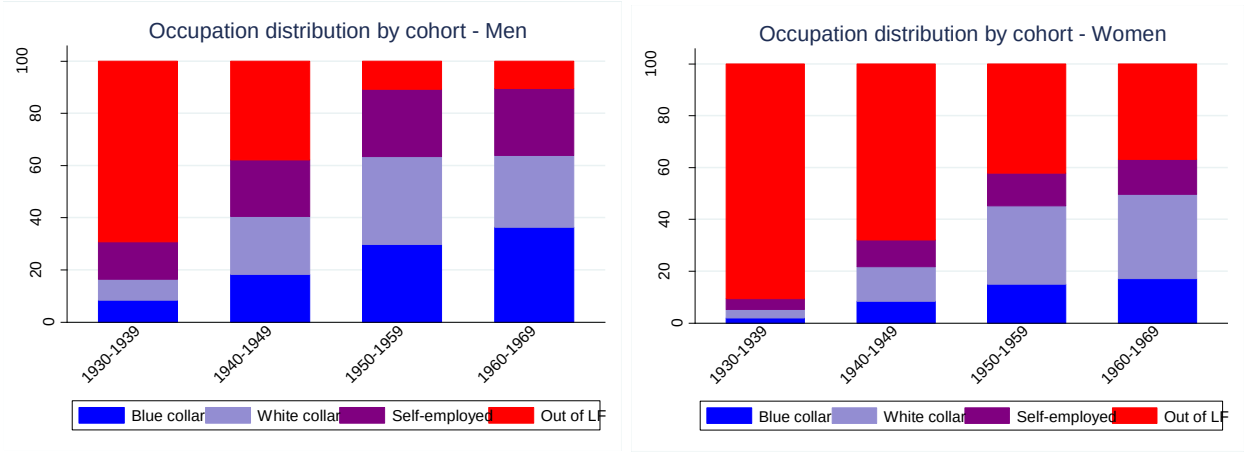


3. Demographic patterns, labor force participation and retirement

Before looking at our estimates of social security wealth it is useful to present some evidence on labor force participation by cohorts and gender. The characteristics of labor force participation are partly affected by the pension reforms (e.g. for the age groups 55 and over), but are also the result of long-trends due to demographic changes, educational changes and productivity changes. In order to provide a full picture embracing more cohorts we make use of the SHIW data for the years 1989-2012.

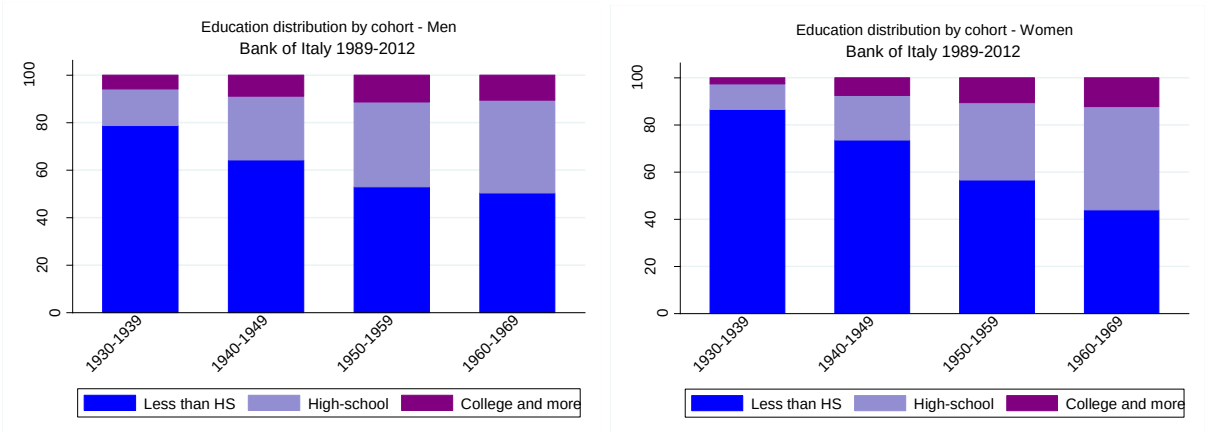
Two patterns emerges: first, both for men and women, labor force participation of cohorts born after 1950 is much higher than labor force participation of older cohorts. Part of the effect is simply due to the period of observation: younger respondents simply did not reach retirement age if not toward the end of the observed time window. On the other hand, this is a prima facie evidence of the reported tightening of eligibility age for cohorts affect by the pension reforms of the last twenty years. The second clear pattern regards labor force participation of women: despite the fraction of women at work in cohorts born after 1950 is twice as large as the fraction of those born before, still no more than 65% of the women report to be in the labour force, a fraction lower than in many other European countries.

Figure 2. Distribution of individuals by cohort and occupation (SHIW)



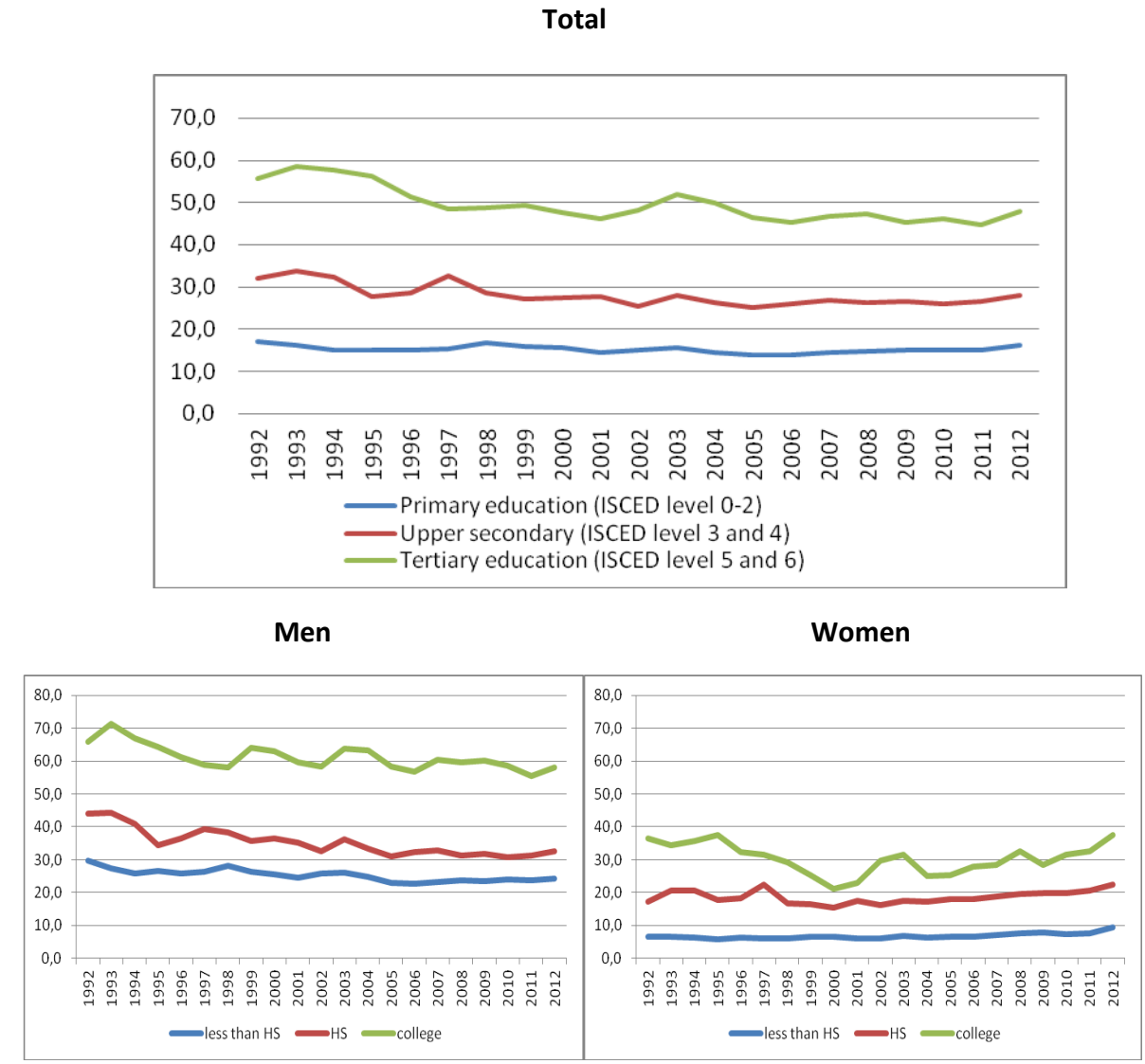
A crucial factor in explaining labor force participation is the educational background of the respondents. Looking at the education distribution by cohorts it is interesting to observe a differential pattern between men and women of the different cohorts. The average level of education increases for younger cohorts, but this is mainly due to a larger fraction of respondents reporting a high school degree, while college education for those born in the sixties remains below 10% for men, and slightly above for women. It is interesting to note that while older cohorts of women had lower educational level, younger cohorts exhibits higher educational attainments than males of the same cohorts. Combining the evidence of the last two sets of graph, a clear picture emerges: younger Italian women do not work, despite their investment in human capital. This is clearly inefficient both from an individual point of view and a social point of view but it could be the response to other feature of the Italian society which we are not addressing in this paper.

Figure 3. Distribution of individuals by cohort and educational attainment (SHIW)



The same picture emerges if men and women labour force participation is compared over time holding fixed the cohort: we look at employment rates by education for the age group 60-64. Because of the limitations of the INPS and SHARE data, we rely on the Italian data from the Labour Force Survey. These data allows us to study variation in employment rates by level of education, distinguishing between primary, upper secondary and tertiary education (see Figure 4).

Figure 4: Employment rate for the age-group 60-64 by level of education (ISCED97 classification)



Source: Labour Force Survey (Eurostat)

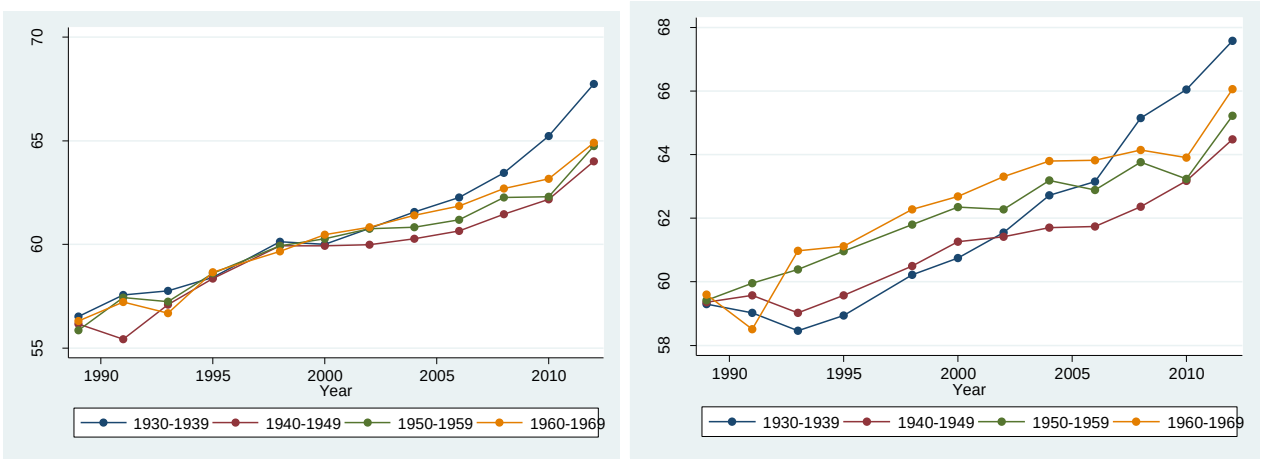
Figure 4 shows the trends in the employment rate by educational level and by gender, focusing on the age group 60-64. Employment rates are always higher for the more educated workers, but they seem to vary over the cycle in a similar fashion for all the educational levels: a decline after the year 1992, a rather stable pattern until the year 2008 and a slight reversal afterwards, with a sudden rise for the highly educated workers after 2011. It is also interesting to note that the growth in the employment rate observed in recent years is almost entirely due to the

contribution of women, particularly educated women, indeed their participation rate increased significantly for those younger cohorts who turned age 60 in the last couple of years. Still, employment rates of educated women remained remarkably low in the last twenty year, again pointing to the loss of productivity induced by low women participation to the labor market.

Figure 5 shows a particular information provided in SHIW where respondents are asked to state the "expected retirement age". While this is a completely subjective measure and is strongly affected by a number of characteristics, it is useful to look at differences by cohorts as this may suggest that individuals understand pension reforms and incorporate them in their expectations.

Figure 5 Expected retirement age by calendar year, men (top panel) and women (bottom panel)

SHIW

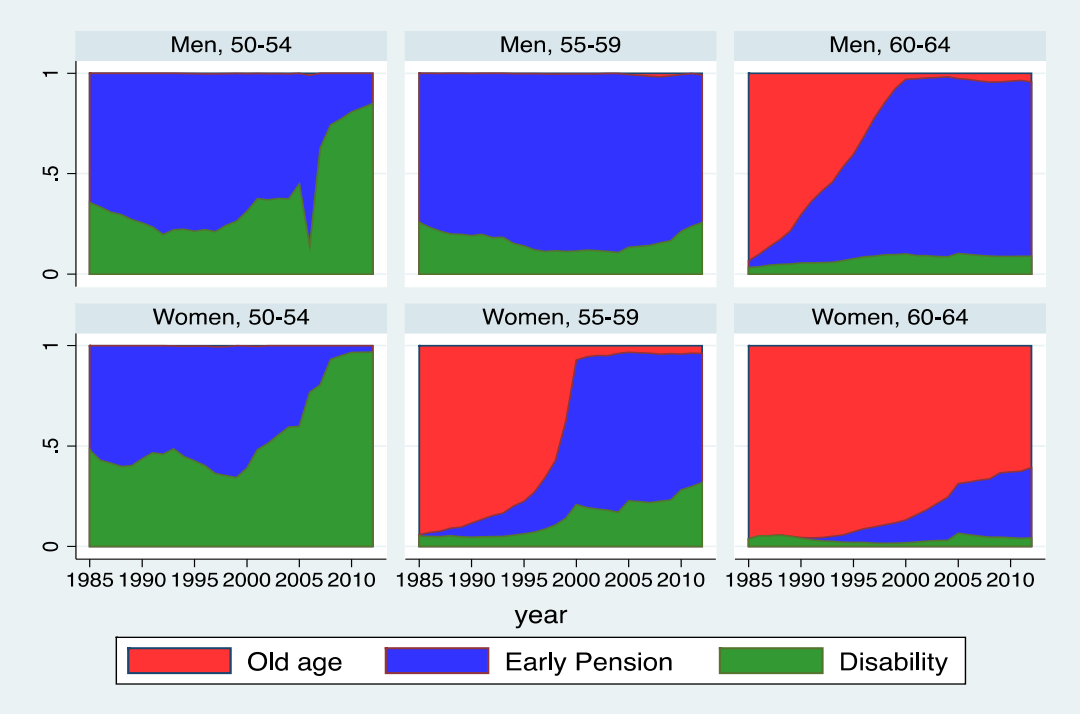


First one can notice a distinct upward trend for all cohorts, largely due to sample compositional effects of those who actually retired over the time span. However different cohorts reacted differently to changes over time, especially for women. For example the older cohort of women shows a sharp increase after the year 2005.

The aim of this paper is to provide a descriptive analysis of how social security changed over time and how fiscal incentives changed for different cohorts as a result of the three main reforms that took place in the last twenty years. This analysis will be limited to old age and early retirement, hence neglecting other pathways to retirement: Brugiavini and Peracchi (2014) highlight the growing importance of disability as an alternative exit route from the labour force. Figure 6, which is taken from the INPS pensioners archive and has been elaborated by Brugiavini and Peracchi (2014) reports the fraction of out of labour force men and women of different age groups by pathway to retirement in different points in time. As it is in many European countries, disability is an important exit rout at younger ages, when old age

retirement is not an option. This is even more relevant in recent years: the tightening of eligibility criteria for early retirement led to an increasing fraction of men and women younger than 55 to exit the labour force via disability. Disability plays a minor role for individuals aged 55 or more. Looking at men aged 60-64 and women five years younger, it is clear the effect of the progressively increasing retirement age: almost all 60 to 64 men who exited the labour force in 1985 went thorugh old age retirement. At the same age in 2005, the vast majority of men exited through early retirement. The same is true for women aged 55 to 60.

Figure 6: Pathways to retirement using stock probabilities, by gender and age group



Source: Brugiavini and Peracchi 2014

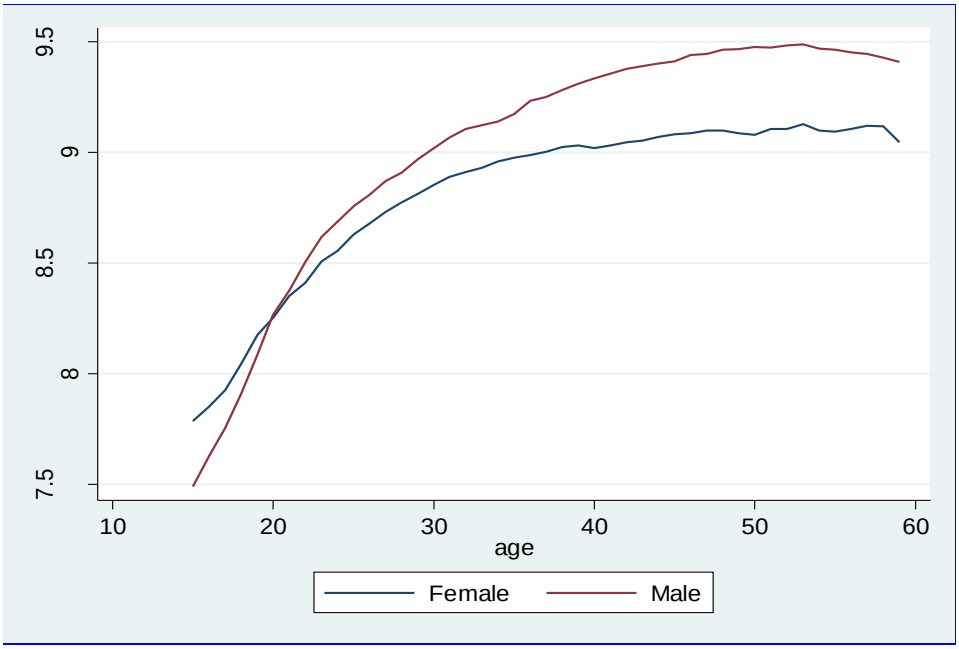
3. Social Security Wealth

The main objective of this paper is to analyze how the incentives to delay retirement, measured by the potential gain from postponing retirement from today's age until some future age, changed in the last twenty years as a consequence of pension reforms.

When an individual retires, he starts receiving a stream of benefits until death. We define as Social Security Wealth at time t, SSW_t, the present discounted sum of the future stream of benefits of an individual that retires at age t. If the person retires one year later, at age t+1, the present discounted sum of his stream of benefits is denoted by SSW_{t+1} The gain from postponing retirement from one year to the next then is given by $SSW_{t+1} - SSW_t$. Notice however that there could be larger gains from delaying retirement by two years or more years. Thus to understand the incentives built into the design of the social security system we must consider all the possible

future benefits associated to all possible retirement ages, and then evaluate whether it is worth retiring today or continue working until a future date. We will then look at a representative individual aged 55 and consider the value SSW would take if for each possible retirement age.

Figure 7 Estimated wage profiles (INPS data)



The idea of the present analysis is to observe how the individuals were affected by the last three major pension reforms (1992, 1995, 2012. For this purpose we analyze the SSW that the individuals can expect at a given age in their decisions. We do this using in parallel SHARE and SHIW data and we try to get more intuition by exploiting the differences between the two databases.

In order to compute the SSW of the individuals we first need to simulate the working career of the individuals in our samples. Due to the diversity of our data we opted for two different methods for SHARE and SHIW data.

SHARE survey in its third wave, SHARELIFE, collects information regarding the history of the entire working life of the respondents. Consequently, we reconstructed the working career of the individuals with all the working and unemployment spells. We observe this way all the years in which the respondents paid contributions as well as all the interruptions in their working life. This fact is extremely important especially for women who are characterized by discontinuous working careers with significant unemployment episodes. In addition, SHARELIFE provides information about the wage at the beginning of every employment spell (job) , the wage at the time of the interview (2008) for the individuals that are still working, and the last wage (for the individuals that retired before 2008). Using all this information we were able to estimate and predict the future wages in order to evaluate the pension benefits and further, the pension wealth of the

persons for all the possible retirement ages. For this purpose we used a fixed effect model that relates the wage to the age, years of contributions and gender.

For the SHIW data we had to consider a different approach since the panel individuals of SHIW is rather limited and even for the panel individuals we do not have the entire retrospective of their working careers. As we did also in SHARE, we kept only the individuals that were private or public employees while dropping the self-employed ones. In order to fill in the wages for the entire working career we firstly generated the annualized gross wage by dividing the wage of each job by the number of months in the job and multiplying by 12. For those jobs that were part-time we considered the number of months declared adjusted proportionally to the number of hours worked. The next step was to estimate and fill in the wages for the entire working career. We did this by estimating the growth rates of the wages separately for men and women, taking into account also the occupation (white-collar, blue-collar) and the age. The estimates were produced using the administrative INPS data for the period 1985-2004 (see figure 6). Finally we applied them to the information available in SHIW. An important issue to be underlined, since it produces significant effects in our results, is that in this process all the individuals were assumed to work full-time. This is an assumption that touches mainly the women whose working career is often characterized by part-time jobs.

Finally, we needed to compute the number of years of contribution, necessary both in order to evaluate the eligibility requirements and to the computation of the pension benefits. To this purpose we used the information regarding the start of the working life (etalav) from the annual archives. For the years or the individuals for which this information is not available we evaluated it using the level of education and assuming that the persons started to work as soon as they completed their education. Finally, we made an extremely important assumption, that is, the fact that the individuals had no interruption/unemployment spells during their working careers. Unfortunately, this is an extremely strong assumption especially for the women and influence our computations in the sense of overestimating the pension benefits/SSW of the women. So, we have to underline from the beginning that our computations based on SHIW data represent an upper-bound of the women's SSW.

We perform the analysis considering transitions into retirement from 2004 to 2011 with the help of SHARELIFE data, in particular we construct year-to-year transitions also for the time intervals between waves.

The advantage of using year-to-year transitions is that, instead of observing a worker just once (between two waves), we follow the worker along all the years between two waves recording her/his actual status in each year. This is a unique feature of the SHARE and SHARELIFE data as there is a full recall of the activities taking place in the time interval between waves as well as the retrospective information back in time. This strategy increases the sample size and provides more accurate information, because in SHARE the time interval between waves is long: one record would not be enough to describe the changes that happen during this period. Nevertheless, we must highlight the fact that the number of transitions is small due to the short panel length of SHARE.

To construct transitions into retirement we use SHARELIFE, since it allows reconstructing the working life of the respondents up to year 2011 (the year of the last available wave). Unfortunately, in wave 3 (2008) there is no question asking if the individual is retired or not, neither which is the retirement year. We only know if the respondent is still working (variable re_047) and hence we recover this information from wave 2 (variable ep329). In order to create year-to-year transitions into retirement, we make use of the following variables in SHARELIFE: re011_ (start of job spell), re026_ (end of job spell), re031_ (reasons left job) and the answer to the question re035_ (situation in after last job). These questions are asked for all job spells during life. The variable "re035_" contains information on the situation after the last job with many alternatives; retired from work, out of the labor force, etc, so we are sure to pick up individuals retired after last job. Considering only transitions means to drop out all records for the years that are subsequent to the transition year into retirement. Because the information on respondents from wave 3 stops in 2008-2009, for those individuals that declare in wave 3 (SHARELIFE) to be still at work we complete their working career with new information on possible retirement from wave 4 (2011) to extend our sample of transitions.

Figure 8 SSW at age 55 by gender for old age retirement (SHARE left – SHIW right)

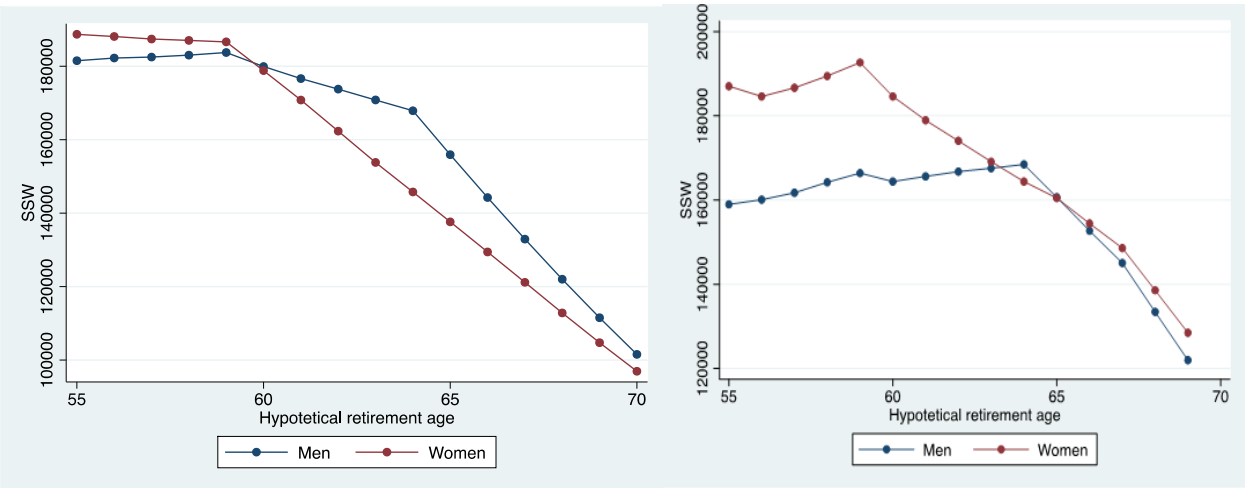


Figure 8 reports the SSW trajectories relative to old age retirement by gender, without distinguishing by cohort: the pattern suggest that there are no incentives to postpone retirement for men, while women reach the maximum level of old age SSW waiting until age 60.

Figure 9 SSW at effective age 55 by hypothetical retirement ages 58, 60, 65 and 70 by year, men old age pension (SHARE)

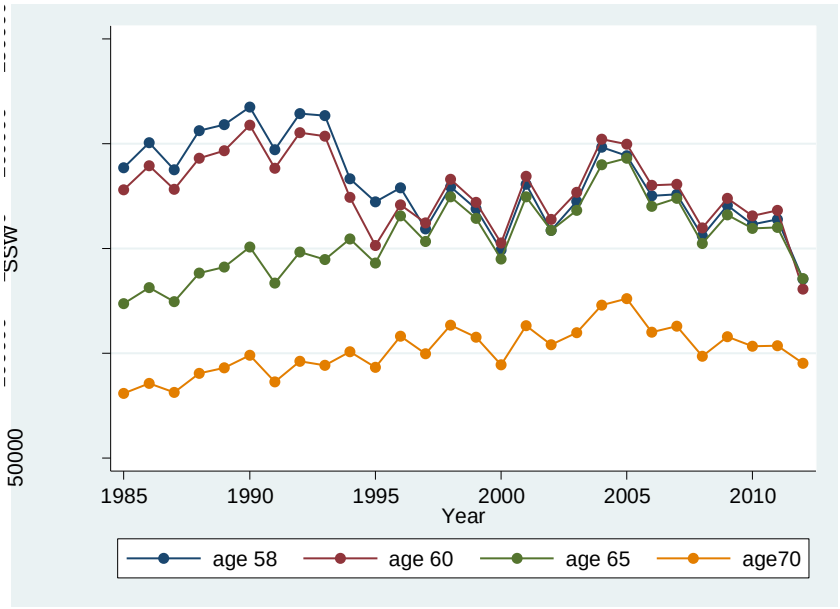


Figure 10 SSW at effective age 55 by hypothetical retirement ages 58, 60, 65 and 70 by year,women old age pension (SHARE)

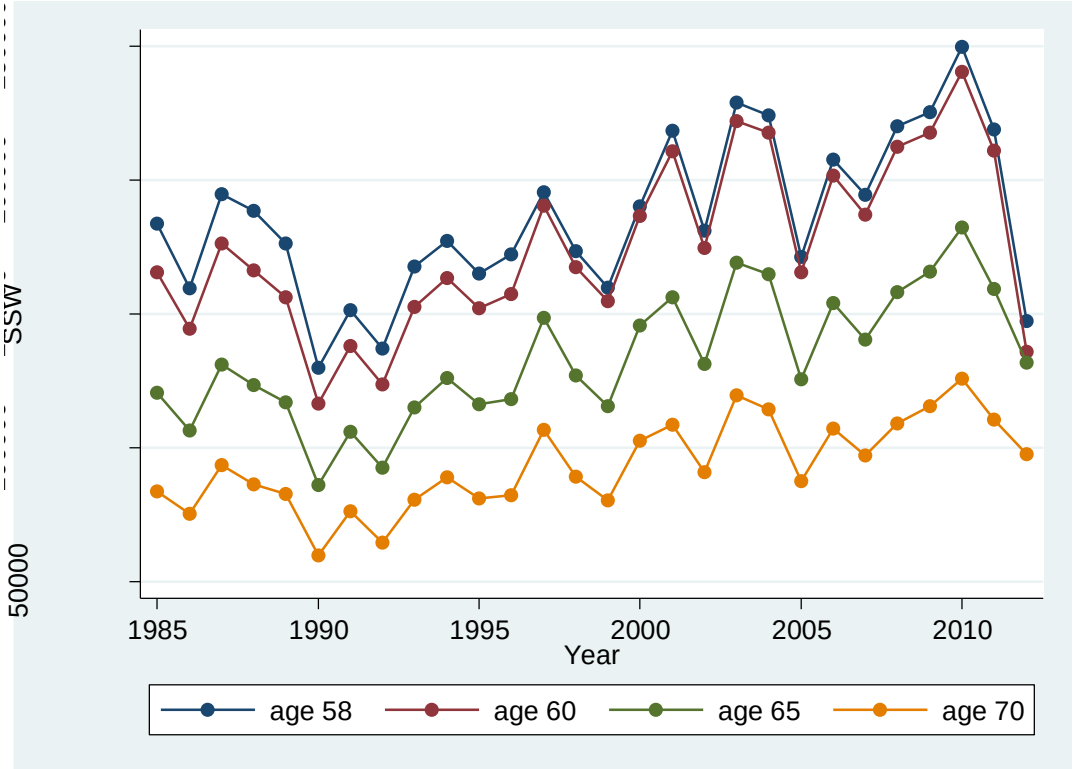


Figure 11 SSW at age 55 by gender for early retirement (SHARE left – SHIW right)

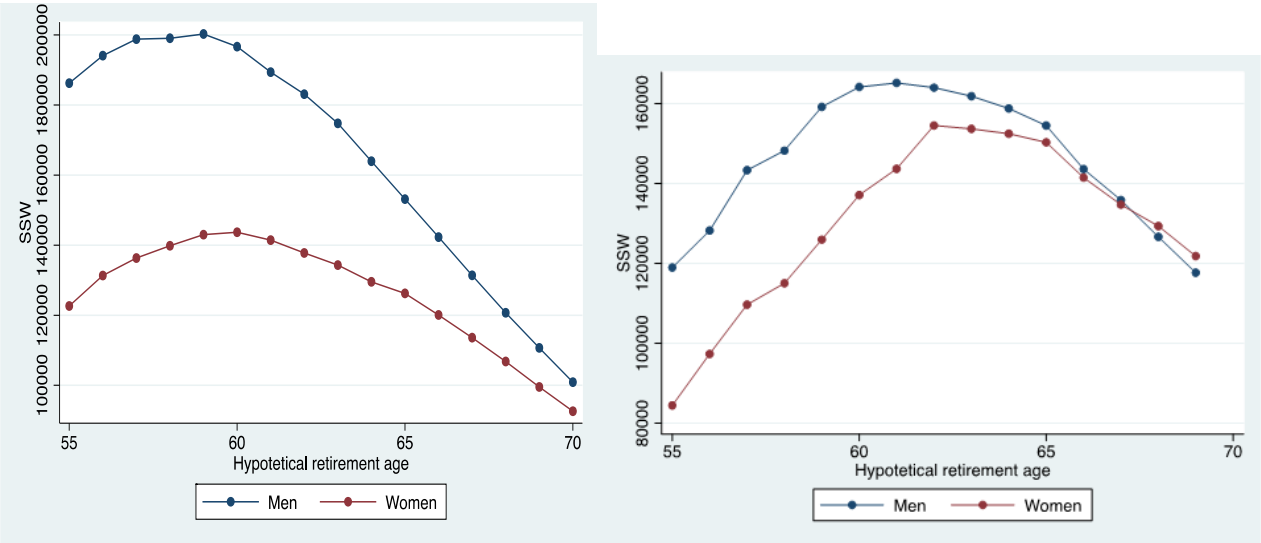


Figure 11 shows our estimate of SSW restricting the attention to early retirement: both men and women aged 55 have an incentive to postpone retirement as SSW is maximized for men at age 59, for women at age 60. Still, it should be clear from the previous sections that this evidence hides important heterogeneities. The reforms hit differently different cohorts, therefore an average SSW trajectory aggregates the incentives due to the rules that each cohort faced, weighted by the cohort composition of the sample, which suggests that it would be useful to move to an analysis by cohort.

Figure 12. SSW at age 55 for hypothetical retirement ages: 58, 60,and 65 men, early retirement (SHARE)

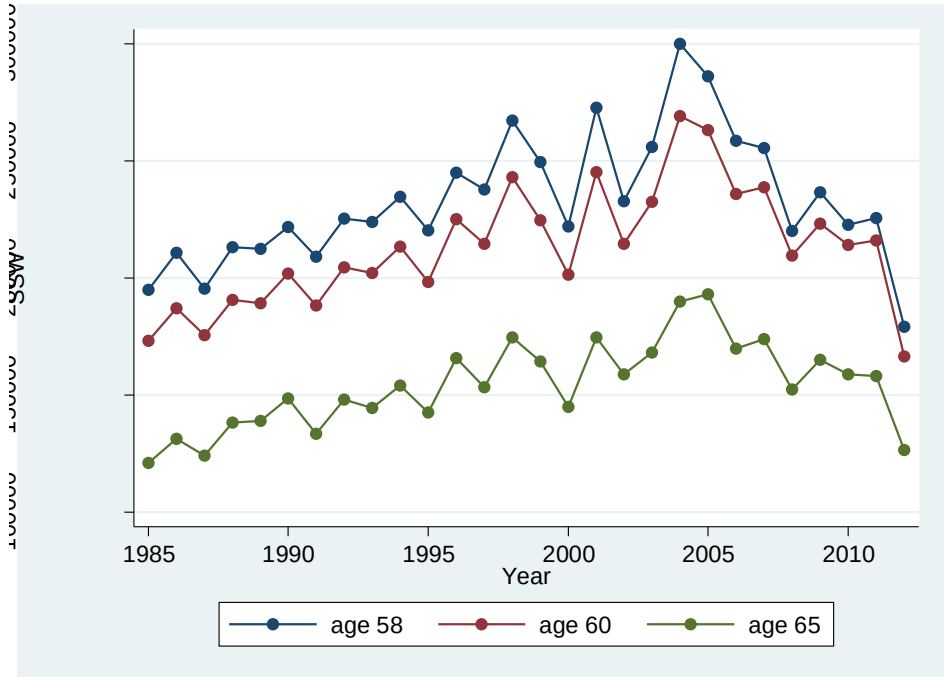
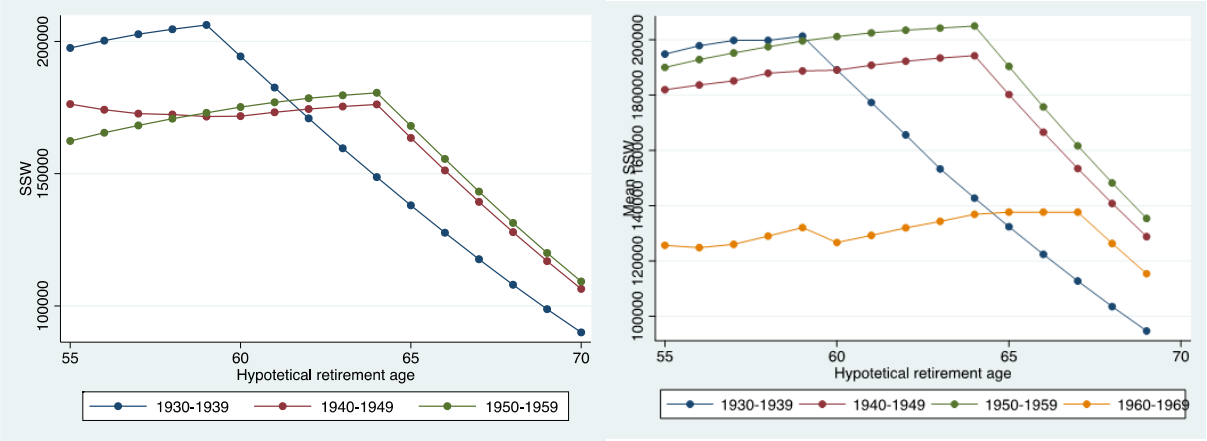
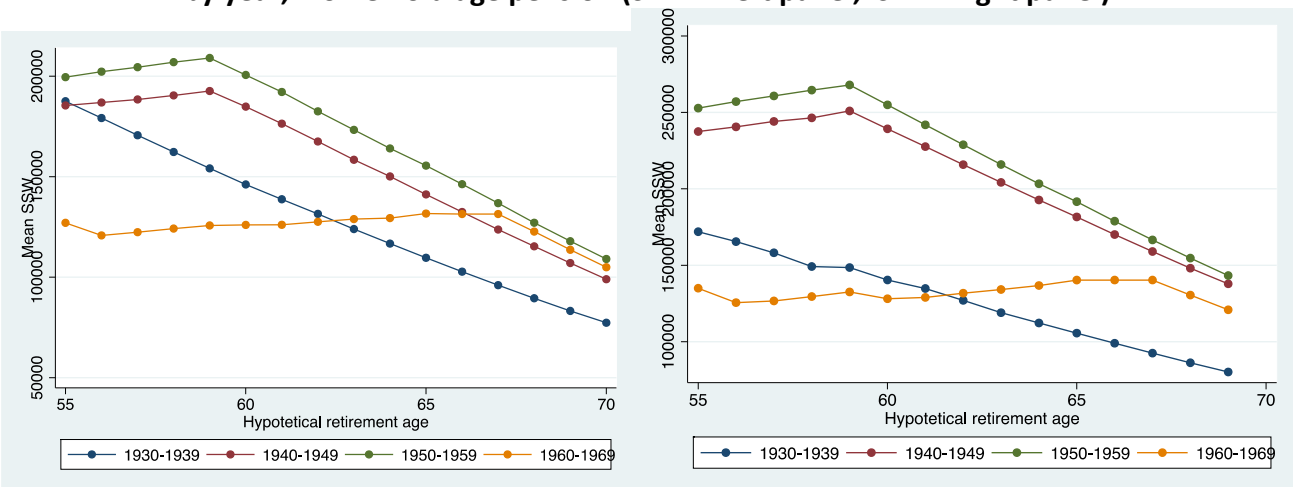


Figure 13. SSW at age 55 by cohort, men, old age (SHARE left-panel SHIW right-panel)



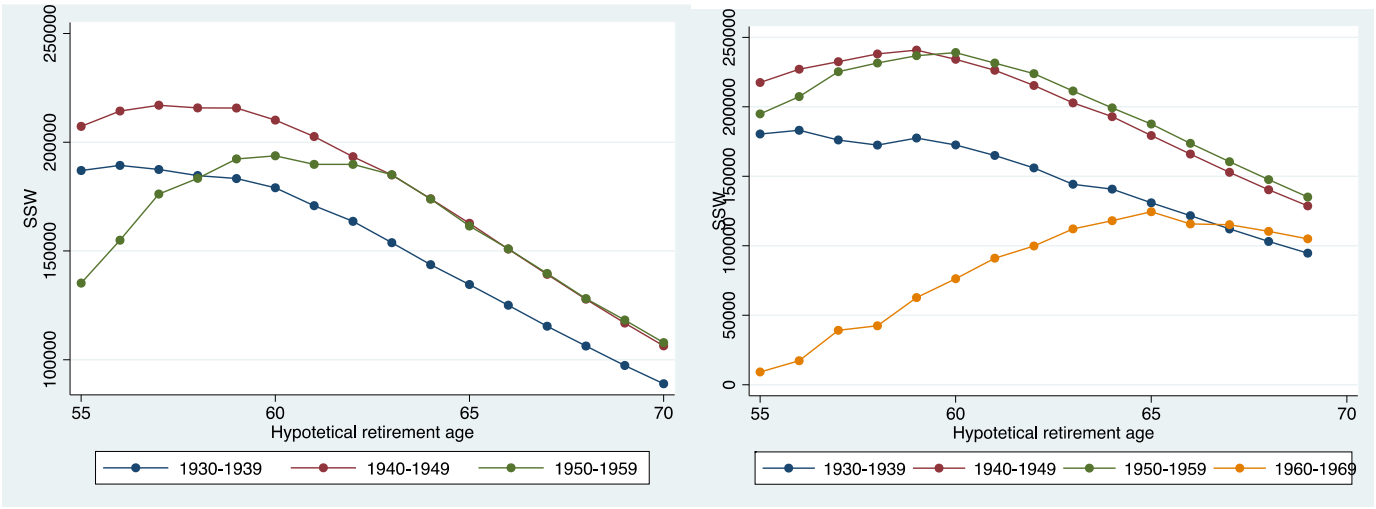
Old age SSW for the older cohort, namely those born before 1939, reaches its peak at age 60 and then declines almost linearly with age. The younger individuals included in this cohort were 53 at the time of the first reform, and thus by-and-large represent the financial incentives faced by Italian men before the pension reform season started. Younger cohorts face similar pattern from age 60 onwards: for both of them there is a clear incentive to postpone old age retirement until age 65. The 40-49 cohort, which is hit by the 1993 reform but not by the 1995 and much less by the 2011 reforms, has a declining incentive profile between age 55 and 65. The result is that SSW at age 55 is very similar to SSW at age 65.

Figure 14 SSW at effective age 55 by hypothetical retirement ages 58, 60, 65 and 70 by year, women old age pension (SHARE left panel, SHIW right panel)



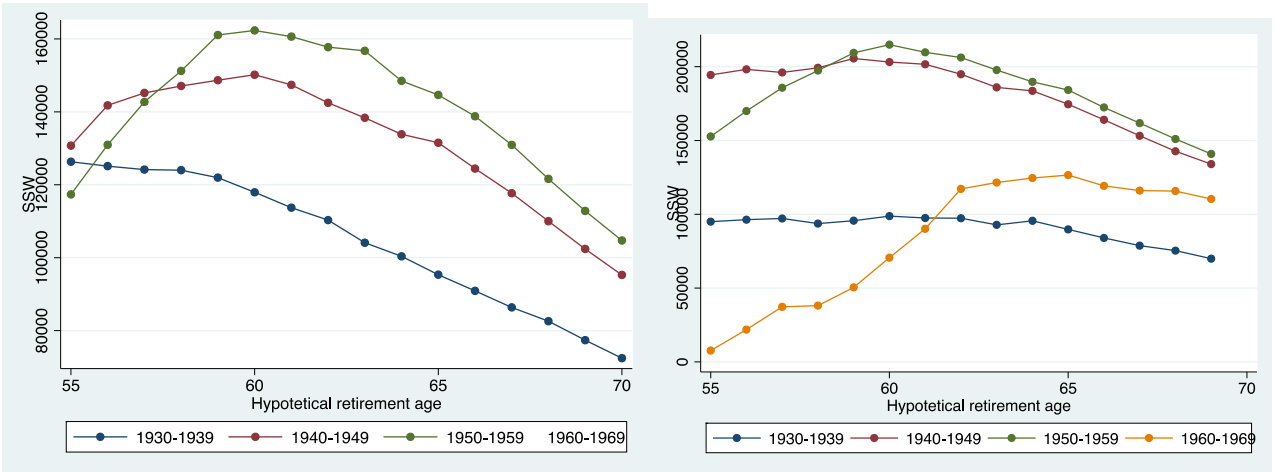
The differential effect of the reforms on different cohorts is even more clear looking at women. While the older cohort has an incentive to retire as soon as possible, the '40-'49 cohort and the '50-'59 cohorts reach their SSW peak at age 59. The cohort born after 1960 has a relatively flat profile until very old age: SSW is significantly lower than the older generations, and the incentive, though limited, is always to postpone retirement.

Figure 15 Ssw at age 55 by cohort, men, early retirement (SHARE left panel, SHIW right panel)



SSW for early retirement has a different pattern by cohort: the older cohort has never an incentive to postpone it: as a matter of fact, those are the individuals who had a strong incentive to retire very early, even earlier than 55, as we explained in section XX. The 1940-1949 faces higher SSW at each age pointing to a more generous early retirement scheme. Still, there is a (limited) incentive to postpone early retirement until age 60. The 1950-1959 faces exactly the same SSW pattern than the younger one from age 63 onwards. For younger ages, SSW is significantly lower and increasing: the incentive scheme in this case is pretty clear. This can be attributed to the 2011 reform.

Figure 16 Ssw at age 55 by cohort, women, early retirement (SHARE left panel, SHIW right panel)



The SSW trajectories for early retirement for women follow a similar pattern than for men: the older cohort has no incentive to postpone early retirement, younger cohorts on the other hand reach the SSW peak at age 60. The inverted U shape is steeper for the younger cohort, that faces a higher penalty on anticipating retirement with respect to the peak age.

4. Option Value

Social Security Wealth is not the only available incentive to retire measure. The benchmark model used for this evaluation is the option value model of Stock and Wise (1990). The model is based on a utility maximization approach, where a forward-looking agent decides at each time the retirement option. The expected utility for the worker from retiring at age r is assumed to be of the form

$$V_t(r) = \sum_{s=t}^{r-1} \pi_{\underline{s}}_{\underline{t}} \ \beta^{s-t} \, Y_s^{\gamma} + \sum_{s=r}^{S} \beta^{s-t} \ (kB^{\gamma}(r))^{\gamma}$$

where *t* is the age (or time) when the worker decides, β is the inter-temporal discount factor, and γ is a parameter of risk aversion. The parameter π captures the probability of survival and demographic projections till the time *s* conditional of being alive at time *t.* One may think of the parameter k as a leisure parameter because it captures the relative preference of benefits from retirement rather than income from work.
The option value of retiring at a specific age *r* is just the difference between the maximum utility for the worker from postponing retiring until some future time (r*) and the utility gained from retiring at age *r*:

$$OV_t(r) = V_t(r^*) - V_t(r)$$

As already mentioned, the original model in Stock and Wise (1991) only considers one pathway into retirement. This is clearly not realistic for Italy, as we have three possible pathways: (i) old age pension, (ii) early retirement, and (iii) disability insurance. In order to estimate the OV incentive on retirement when multiple programs are present, we use a weighted OV measure. For each pathway, we estimate the probability that a person considers that specific pathway along with the associated OV. Then we compute an "inclusive" OV by taking a weighted average of the OVs for each plan, as follows:

$$OV_{inc} = OV_{DI} * w_{DI} + OV_{Early} * w_{Early} + OV_{Old} * w_{Old}$$

As for the parameters in the expected utility function, we set γ=0.75, k=1.5 and the discount rate to 0.03. The weighs for the inclusive OV are generally determined by the relationship between individual attributes and the possibility that a plan was already chosen in the past. In the next two paragraphs, we discuss the way we construct our dataset and how we estimate the weights attached to each pathway into retirement.

Figure 3-3 and 3-4 show the mean OVs for each of the pathways to retirement, separately for men and women, for the cohort born in 1945-49. It is important to stress that the small sample size makes it hard to obtain precise estimates of the OV, particularly for DI recipients and for women. Overall, the OV of delaying retirement is larger under the old-age option than under the early retirement or the disability options. This difference holds for both men and women: workers who consider leaving the labor force through DI or early retirement have a much greater incentive to retire at younger ages relative to those considering the old age pathway. A further point to be noted is that, for men, the OV of the three different pathways tend to converge around age 63, while for women the old age OV and the disability OV converge much earlier, around age 57, although the early retirement OV tends to stay separate and is in fact higher. This suggests that the group of women who potentially qualify for early retirement is a particular subset of the population of working women as they managed to collect a high number of years of contribution.

We replicate the same figures for an earlier cohort of workers born in the years 1940-44. Interestingly, for men things do not change much, while for women we see that the OV of delaying retirement is much higher under the early retirement pathway compared to the old age pathway. Although the sample is too small to draw any inference this result confirms that older women may find it particularly hard to collect an early retirement pension.

Figure 17: Mean OV for men and women , cohort 1945-1949

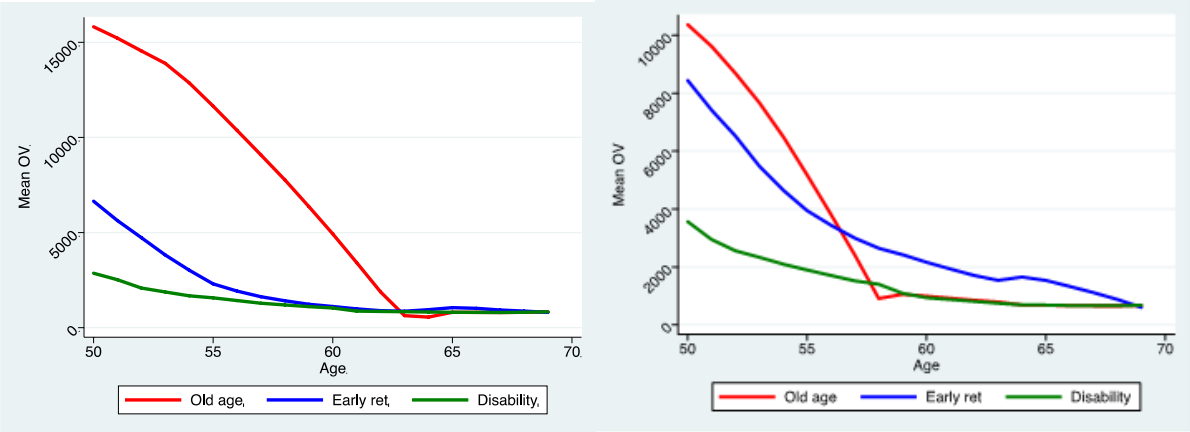
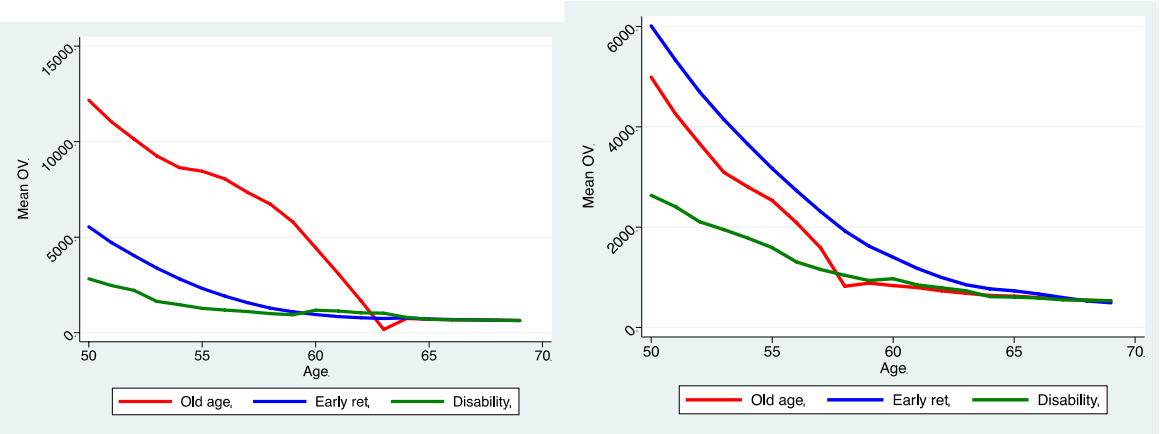


Figure 18: Mean OV for men and women, cohort 1940-1944 (SHARE)



The relationship between the moment of retirement and the OV is certainly more clearly described if we perform a regression in which the dependent variable is the transition to retirement. In what follows we briefly analyze the results of such regressions from Brugiavini, Peracchi (2014). The reason for which we chose these specifications is that they use SHARE data and hence are totally consistent with our study. The dependent variable takes value 1 if the individual retires in that year and 0 if the individual is still working. On the regressors side we have the OV, the age, gender, education, occupation (high-skill, low-skill) and health (is taken into consideration as health quintiles or by considering the continuous value of a PVW health index (The PVW health index aggregates a battery of variables regarding the health conditions of the individual)).

Table 4: Effect of inclusive OV on retirement (estimated probit retirement model - weights based on stocks)

	Model specification							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
OV/10000	-0.037**	-0.047**	-0.038**	-0.049**	-0.039**	-0.049**	-0.039**	-0.050**
	(0.016)	(0.020)	(0.016)	(0.020)	(0.016)	(0.020)	(0.016)	(0.020)
	[-0.019]	[-0.023]	[-0.020]	[-0.023]	[-0.020]	[-0.023]	[-0.020]	[-0.024]
2nd Q	-0.011	-0.010	-0.011	-0.008				
	(0.010)	(0.013)	(0.010)	(0.013)				
3rd Q	-0.004	-0.003	-0.003	-0.001				
	(0.011)	(0.013)	(0.011)	(0.014)				
4th Q	-0.004	-0.004	-0.002	-0.002				
	(0.011)	(0.013)	(0.011)	(0.014)				
5th Q-Best health	-0.021**	-0.025**	-0.020**	-0.023**				
	(0.009)	(0.011)	(0.009)	(0.011)				
Hindex					-0.004*	-0.005	-0.004	-0.005
					(0.002)	(0.003)	(0.003)	(0.003)
Age	0.123***		0.122***		0.124***		0.122***	
	(0.021)		(0.021)		(0.021)		(0.021)	
	-		-		-		-	
Age2	0.001***		0.001***		0.001***		0.001***	
	(0.000)		(0.000)		(0.000)		(0.000)	
Female			0.004	0.008			0.004	0.007
			(0.008)	(0.010)			(0.008)	(0.010)
Married			-0.005	-0.007			-0.006	-0.007
			(0.012)	(0.014)			(0.012)	(0.014)
Educ: High school			0.008	0.009			0.008	0.009
			(0.010)	(0.012)			(0.010)	(0.012)
Educ >High school			0.003	0.003			0.002	0.003
			(0.014)	(0.016)			(0.014)	(0.016)
High skill			-0.002	-0.004			-0.002	-0.004
			(0.010)	(0.012)			(0.010)	(0.012)
Low skill			0.004	0.006			0.004	0.005
			(0.010)	(0.012)			(0.010)	(0.012)
Observations	2,302	2,009	2,302	2,009	2,302	2,009	2,302	2,009
Pseudo R2	0.112	0.112	0.114	0.114	0.110	0.110	0.112	0.112
Age dummies		X		X		X		X
Mean Ret Rate	.0621	.0711	.0621	.0711	.0621	.0711	.0621	.0711
Mean of OV	.3067	.2743	.3067	.2743	.3067	.2743	.3067	.2743
Stf. Dev of OV	.4409	.4245	.4409	.4245	.4409	.4245	.4409	.4245

Source: Brugiavini and Peracchi 2014- based on SHARE data

Notes:

1) Coefficients are marginal effects of a 10.000 unit change in OV from probit models. Standard errors are shown in parenthesis. The effect of a one standard deviation change in OV is shown in brackets.

5. Conclusions

In this paper we analyzed the retirement behavior of Italian employees by looking at two main datasets: the SHARE survey for the years 2004-2012 and the SHIW survey, for the years 1989-2011.

We provide a very preliminary description of a summary stock measure known as Social Security Wealth, which summarizes the rules implicit in the social security system for workers at a given age.

We survey previous work carried out in various papers for Italy based on the SHARE data, particularly the work by Brugiavini and Peracchi (2004, 2012) to show how pension reforms affect pension wealth and at the same time individuals react to financial incentives over and above other demographic variables including health, by changing their retirement decisions.

The limitation of the SHARE data is that it focuses on the individuals aged 50 and over, while in some cases pension reforms affect younger individuals.

Our results are very preliminary, however some interesting pattern emerge, particularly across generations, which document an important intergenerational redistribution taking place.

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