Pension reforms, educational choices and the long term dynamic of the employment in Italy

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(Very preliminary)

Abstract

In this paper we use CAPP_DYN, a population based dynamic microsimulation model to simulate the Italian employed population during the period 2005-2050. We find that the more interesting changes are expected in the composition rather than in the level of the employed population. We investigate main factors that are at work in such changes and we also produce some sensitivity analyses to test our results with respect to different hypotheses regarding the future legal retirement age.

JEL Classification:

1. Introduction

Governments of countries where the population is expected to age in the next decades look with great interest to the evolution and to the composition of the labour force in the long run. As it is well known, Italy has a low fertility rate, life expectancies have increased during last decades and are expected to increase further and only a positive net migration rate has assured the total number of individuals living there not to decrease in the last years. All these factors put a rather pessimistic view on the long term sustainability and adequacy of the social security system, even if several reforms have been enacted since 1992.

The aim of this paper is to forecast the evolution of the employed Italian population during the period 2005-2050. We use CAPP_DYN, a population based microsimulation model developed at Capp (Centro di Analisi delle Politiche Pubbliche) since 2003. The model has a heterogeneous population and therefore it allows a series of distributive analyses that macro-based or cell-based models are not able to carry on.

The paper is organized as follow. In the second subsection we briefly review other works which empirically estimated the dynamic of the Italian employed population in the lung run. In subsection 3 we present the structure of CAPP_DYN. In subsection 4 we present results of the base simulation. In particular we analyse how the composition of the employed population is expected to change and what are main forces that will drive such changes. Subsection 5 finally presents results of sensitivity analysis with respect to legal retirement age.

2. Overview of recent studies

The increase of life expectancy and the low fertility rate will lead Italy, as many other developed countries, to a significant aging of the population. This will on turn have rather negative effects on the sustainability of the social security system.

A counterbalancing effect might derive from an increase in the labour market participation, particularly among women and elders. For example according RTFL data, the Quarterly Labour Force Survey produced by the National Statistics Institute, they were equal respectively to 48.4% and 27.6% in 2003. These effects could be very important in countries like Italy, where both rates are particularly low in international comparisons. Different models confirm this prediction for Italy. Leonbruni and Richiardi (2006), using an agent based microsimuation model of labour supply, find that the Italian labour force, equal roughly to 24 mln. people in 2002, will continue to grow until 2025, when it will peak at 25 mln, starting thereafter to decline to 21 mln individuals in 2050. Apart from the pressure of demography, forces that will explain this dynamic will be a higher female labour force participation, a delay in the beginning of the working period and the effects of pension reform undertaken in the period 1992-2004. On the whole the authors find that, in face of a sharp increase of the *demographic dependency ratio*, the *economic dependency ratio* will only slightly increase in the second part of the simulation period, after 2025. Their conclusion is therefore that pessimistic projections on the long run evolution of the labour force, based on simple extrapolation of current cross-sectional participation rates, may be reduced even if not reversed if cohort effects are explicitly considered.

Similar quantitative results about the evolution of the active and the employed population are obtained in several simulations run with the Ragioneria Generale dello Stato' model, (Rgs 2004, 2005, 2006). In the last disposable simulation, the total number of employed is equal to 24.5 mln people in 2005, it grows to 25.8 mln in 2020 and it decreases to 20.8 mln in 2050[1]. Both Leonbruni and Richiardi's (2006) and Rgs' (2006) models reach much more optimistic estimations than the one produced by Oecd that, in a comparative study about participation rates (Oecd 2004), estimates that the total change in the aggregate participation rates in Italy during the period 2000-2025 will be negative (-1,0%,) even taking into account of a positive cohort effect (+3,0%) and of the expected delay in the average retirement age (+2,5%).

[1] The pure cross-sectional projection in the Rgs model produce respectively 22.5 mln; 22.9 mln and 18.3 mln of employed individuals.

Our study shares some of the hypotheses used in the Leonbruni and Richiardi's work. In particular our simulation model takes into account the long term effect of the increased participation rate among adult women. We also model an extension in the total number of years that current and future young generations will devote to education and we take into account the effects on participation rate among elder workers of pension reforms approved by the Italian Parliament from 1995 onwards. The heterogeneity of the simulated population of CAPP_DYN allows us to make a step further in the analysis of those factors on the dynamic of employment, on its composition and on economic well being of workers and retirees.

3. Factors that might influence the evolution of the labour force growth in next decades

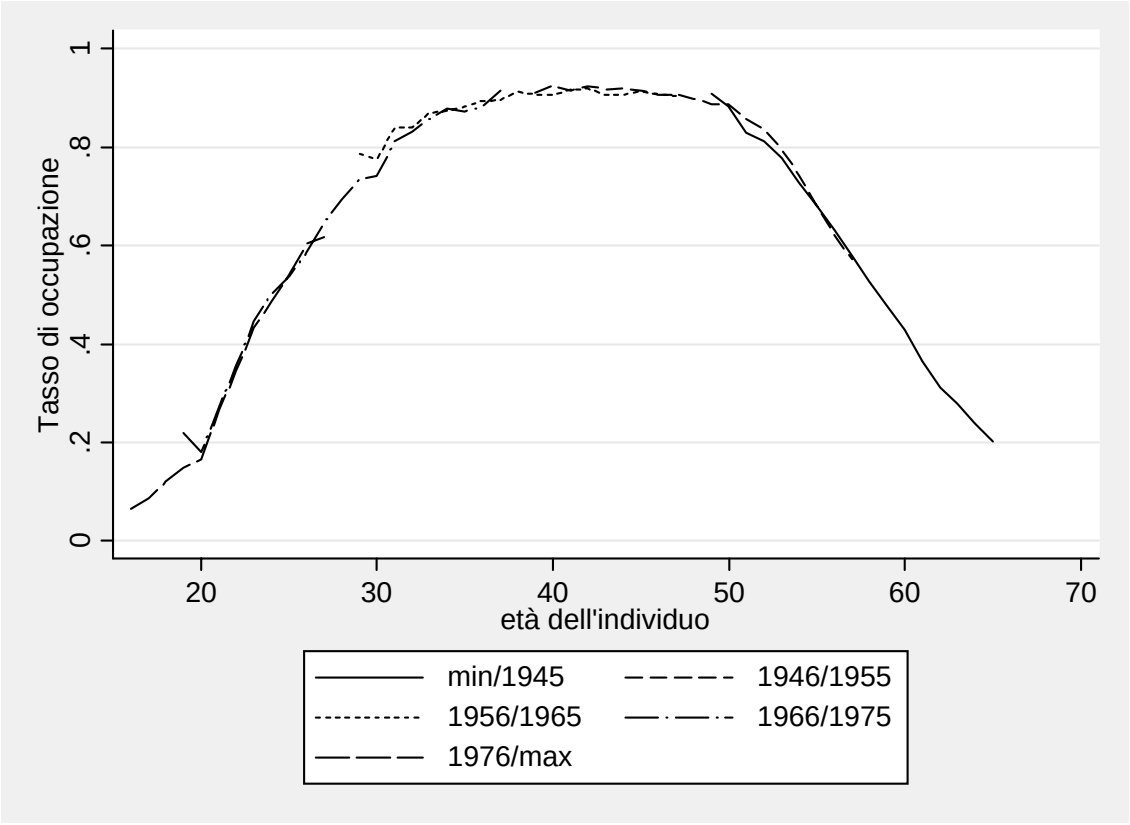
There is a general consensus on the fact that the simple extrapolation of age-related behaviour from cross-sectional data may drive to incorrect estimations of the future aggregate labour supply. A possible strategy to improve the reliability of simulations is to disentangle age from cohorts effects in the behaviour of both the current and the future active population.

In fact this strategy seems quite appropriate in the Italian case: i) during the last two decades adult women have increased their participation rate with respect to the behaviour of former generations; ii) in the same period young generations (both men and women) showed a general trend towards a higher level of education, meaning, among other things, a shift forward in the beginning of the participation in the labour market.

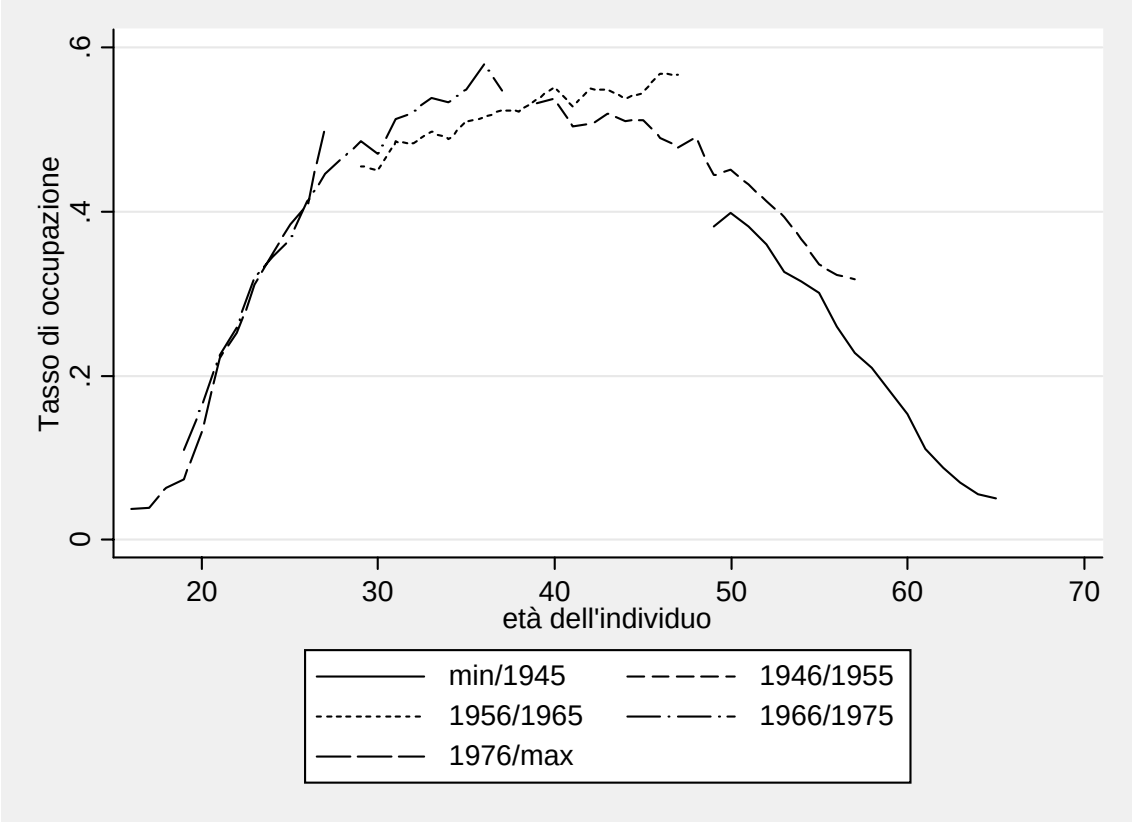
A graphical analysis of the participation rate for different cohorts during the 1993 - 2003 period confirms the presence of a strong positive cohort effect among adult women, as well as the longer stay of young men and women out of the labour market.

Fig. 1: Participation rates by sex and cohort. Source: RTFL 1993-2003.

MEN



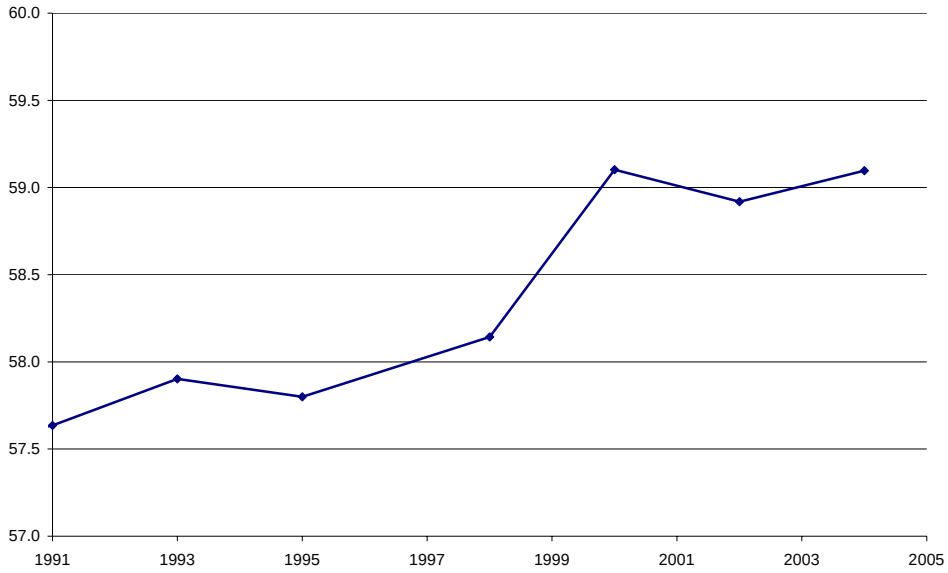
WOMEN



Institutional factors may also play an important role in influencing the dimension and the composition of the future employed population; in particular pension reforms approved after 1995, that have increased legal retirement age, made less generous the legislation for the attainment of the anticipated seniority pensions and, in the long run, almost completely dropped the incentive to retire as early as possible, thanks to the introduction of a almost actuarially fair notional defined contribution system, are expected to have a positive effects on elders participation rate.

Empirical data show that the age at retirement already started to increase. Using a pooling of the Bank of Italy's Survey of Households Income and Wealth (1991-2004) we computed the stated retirement age of new pensioners after the reforms. In figure 2 we report the average retirement age which increased by nearly 1.5 years from 1991 to 2004.

Fig. 2: Age of retirement of new pensioners. 1991-2004. Source: SHIW Historical Archive.



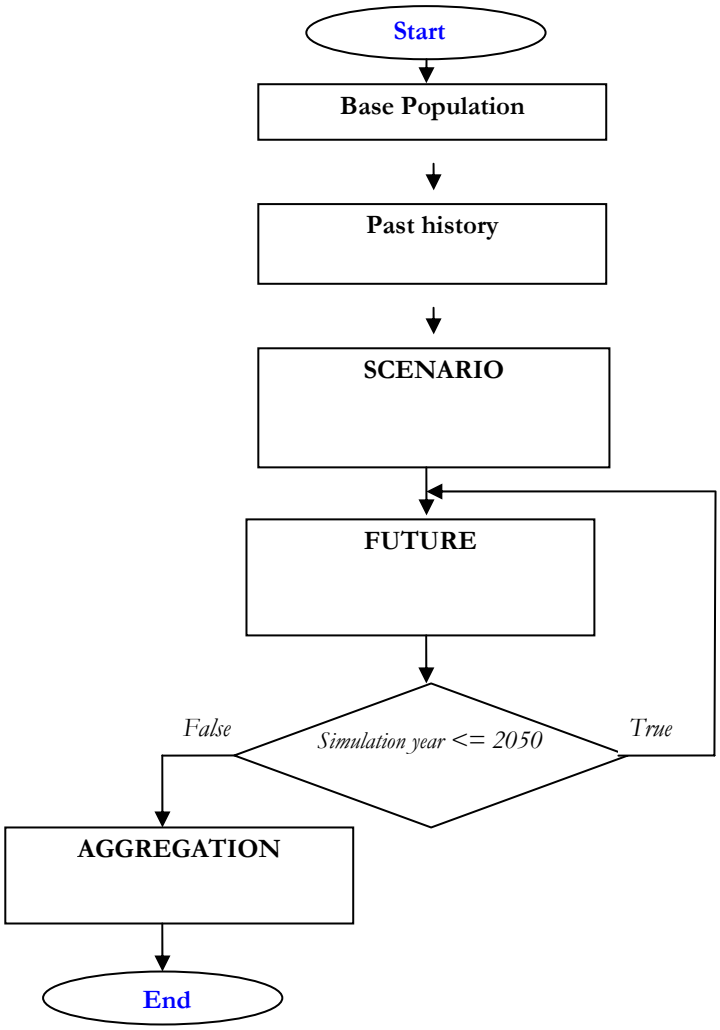
Any long term forecast of the employed population must take into account the likely effects of these factors.

4. The model

CAPP_DYN is a dynamic microsimulation model of the Italian population developed at the Centro di Analisi delle Politiche Pubbliche (Capp). The model simulates the Italian population and their characteristics from 2005 to 2050.

The structure of the model is represented in Fig 3: there is an initial base population, a second block which estimates past earnings of current active population, a simulation cycle, which determines the future evolution of the population, and a final output where all annual cross section are aggregated into a single panel.

Fig. 3: The structure of CAPP_DYN



The initial population is taken from the 2002's wave of the Bank of Italy Survey of Households Income and Wealth (SHIW_02), which has been resampled and inflated. Any simulation extracts randomly a sample of 107,000 households and 270,000 individuals.

All individuals[2] in the sample are subject to a large number of demographic and economic events such as birth, education, marriage, work, retirement, death etc,. Economic and demographic transitions are realized with the aid of a Monte Carlo process. A set of transition matrices and econometric models are used to produce transition probabilities, that are used to project each individual's lifetime pattern in education, work, wage profiles, etc..

CAPP_DYN has a recursive structure consisting in a set of modules executed in a predetermined order. The structure of the modules is depicted in Fig 4.

The simulation starts with a set of demographic modules (mortality, fertility, net migration, household formation, divorce). After that follows a module for educational choices. The next module deals with the labour market participation decisions and the earnings estimation. It is possible, during the individual's lifetime, to change occupational status (full time, part-time, out of the labour market, unemployed). Finally each individual, on the basis of the current pension law, of his/her accrued seniority and of the legal retirement age moves to retirement according to the current law.

Individual income derives from working or from the social security system. For employed people an earnings equation is used to estimate lifetime labour income. For retired individuals we compute occupational, survival and social-flat rate benefits taking into account, as much as possible, the rather complex details of the Italian system[3].

A series of exogenous variables are used to link the evolution of the aggregate labour income to the macroeconomic path of Gdp defined in the scenario.

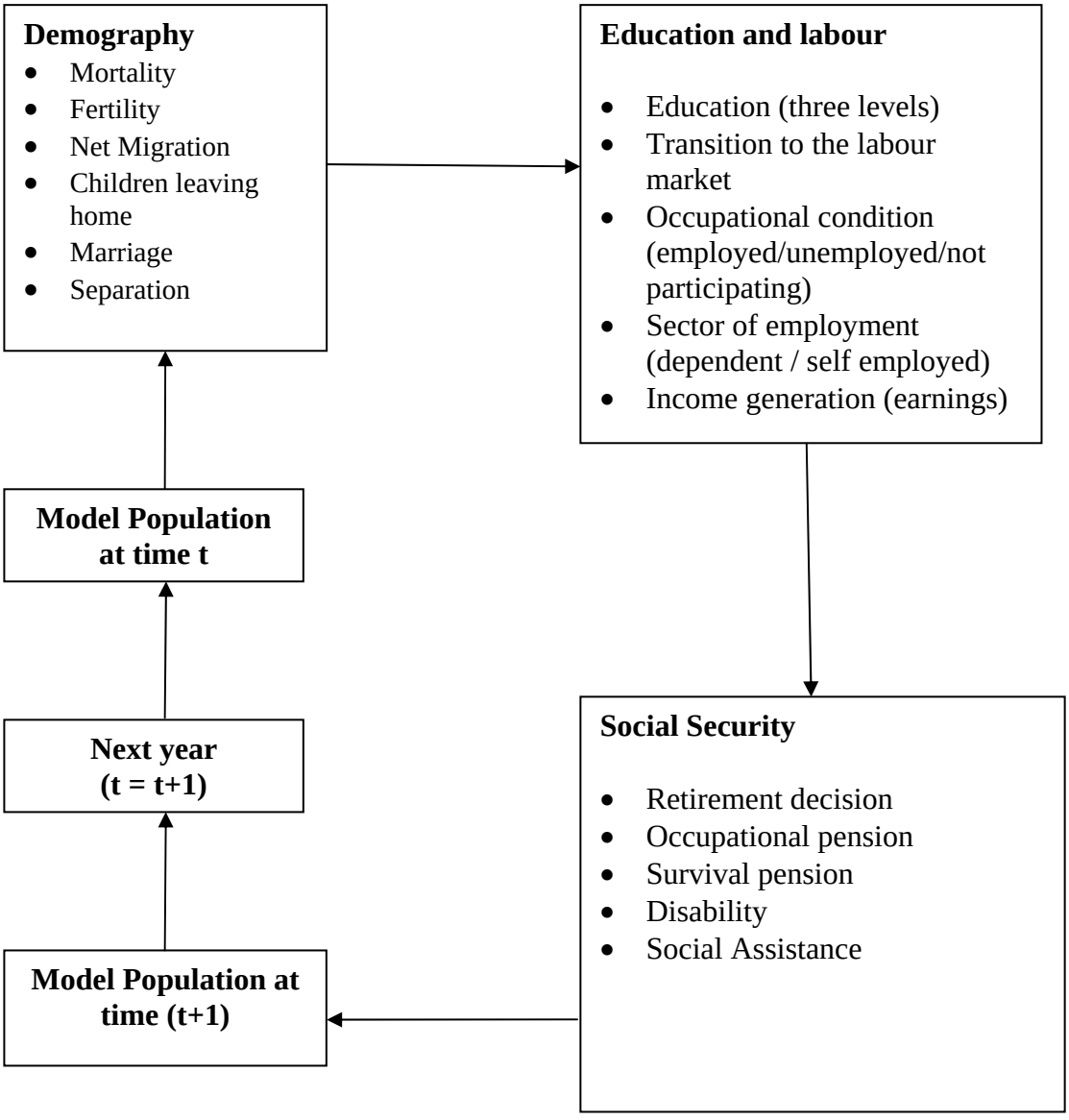
The final result of the model is a panel which aggregates all annual cross sections from 2005 to 2050. Individuals and households of the simulated population are heterogeneous over a relatively large set of demographic and economic characteristics which enables the

[2] The unit of simulation is the individual but we keep information on family structure and on its changes through time.

[3] The model does not compute completely disability pensions.

model to treat a series of interesting issues (distributive in particular) that cannot be dealt with cell based or representative agent models.

Fig. 4: The modules of CAPP_DYN



4.1 Data Issues

The primary database for CAPP_DYN is the 2002's survey of Italian Household Income and Wealth (SHIW_02). The use of a survey as the database of the model has advantages and drawbacks. With respect to dynamic models that are based on a random extraction of administrative data, our dataset has a richer set of information on family composition, educational level, economic status of each observation. On the other hand, the SHIW_02 is based on a stratified sample design. This means that each household has an attached weight being the inverse of the likelihood of its probability of inclusion in the sample. So we need to find a procedure which enables us to treat each observation as though it were a single household. We have used a resampling procedure to generate a very large proportional sample of households[4]. In the process we have made a series of statistical adjustments using Census data, in order to insure that the distribution of demographic and economic characteristics closely match the corresponding distribution of the Italian population.

A series of other sources have been used in the construction of the model. Educational choices and earnings equation are simulated on the 2006's wave of PLUS, a survey data of the Ministry of Welfare devoted to the analysis of the Italian labour market. Transition in the labour market are derived from a multinomial logit estimation on a pool of the Relazione Trimestrale delle Forze Lavoro (1993-2003) waves, the Quarterly Labour Force Survey produced by Istat.. Survival probabilities, fertility rates and net migration hypothesis, which are used to define demographic the evolution of the population, are taken from the ISTAT official forecasts of the Italian population (2005-2050) (Istat 2001).

[4] The SHIW_02 survey counts 8001 households and 21,400 Individuals.

4.2 Assumptions and exogenous variables

The most important exogenous variables used in the simulations are real income growth per capita and real earnings growth per capita. Data are taken from the 2005 model of the Ragioneria Generale dello Stato model (Rgs 2005), which is currently used by the Italian Government to routinely estimate the evolution of pension, health and long term care expenditure with respect to Gdp in the medium-long term. Labour income age-related profiles are endogenous and therefore they are not aligned to Rgs assumption. A special module has been implemented to calibrate the endogenous results of the model in order to make them consistent with the implied economic hypotheses. All variables are in constant 2002 Euro prices.

4.3 A focus on education and occupational choices

In this subsection we focus our attention on the estimation of educational choices and transition in the labour market, two factors that, as we have pointed, will have an important role in the dynamic of the employed population in the next decades.

The model considers three different levels of education. The highest level of education reached by each individual is estimated with an ordered probit model. Data are taken from a sample of individuals of the PLUS 2004 survey with at least 16 years, that have already finished their educational course or still are at the university.

The first column reports estimated coefficients and columns 2-4 contain the marginal effects computed for each possible value of the dependent variable (1: first degree; 2: secondary degree; 3: university degree). The reference group is composed by male individuals, born between 1971 and 1975, living in the north, with both parents having a tertiary educational level.

Tab. 1: Ordered probit estimation on the determinant of educational choices in Italy. Souce: PLUS 2004.

Education(y)	Coefficients	y=Pr(j==1) *0.4214*	y=Pr(j==2) *0.4589*	y=Pr(j==3) *0.1196*
First_degree_m***	-.8062	.2803	-.0655	-.2147
	(.0702)	(.0202)	(.0042)	(.0231)
Sec_degree_m***	-.3054	.1209	-.0680	-.0529
	(.0689)	(.0273)	(.0171)	(.0102)
First_degree_f***	-1.328	.4176	-.0312	-.3864
	(.0554)	(.0121)	(.0090)	(.0196)
Second_degree-f***	-.5229	.2062	-.1235	-.0826
	(.0550)	(.0212)	(.0146)	(.0068)
No_degree_m***	-.3204	.1270	-.0734	-.0536
	(.0581)	(.0230)	(.0151)	(.0079)
No_degree_f***	-.1977	.0782	-.0425	-.0356
	(.0437)	(.0174)	(.0103)	(.0071)
Woman***	.0755	-.0295	.0144	.0151
	(.0211)	(.0082)	(.004)	(.0041)
Center***	.1987	-.0765	.0339	.0425
	(.0287)	(.0108)	(.0043)	(.0066)
South***	.0961	-.0374	.0179	.0195
	(.0232)	(.0090)	(.0042)	(.004)
co_min_1950***	-.4847	.1914	-.1123	-.0790
	(.0404)	(.0155)	(.0104)	(.0055)
co_1951_1960***	-.2435	.0961	-.0515	-.0445
	(.0428)	(.0169)	(.0098)	(.0071)
co_1961_1965**	-.1265	.0498	-.0259	-.0239
	(.0483)	(.0191)	(.0105)	(.0086)
co_1966_1970**	-.1279	.0503	-.0260	-.0242
	(.0457)	(.0181)	(.0099)	(.0082)
co_1976_1978***	.1895	-.0726	.0311	.0414
	(.0419)	(.0157)	(.0058)	(.0099)
co_1979_plus***	.2047	-.0786	.0341	.0444
	(.0387)	(.0145)	(.0056)	(.0090)
_cut1	-2.1282 (.0777)			
_cut2	-.7530 (.0767)			
N	34323			
R^2	0.1347			

The level of education is strongly correlated with the educational level of parents, and with the geographical area Cohorts dummies reveal a positive trends in the scholarization of younger generations. Other things been equal an individual born after 1979 has a greater probability to reach the highest level of education with respect to individuals borne earlier. In the dynamic simulation, estimated coefficients of the regression reported in tab 1 are used to model the educational level of future individuals.

Transition probabilities in the labour market are estimated with a multinomial logit model on RTFL pooled data (1993-2003). The dependent variable in the regressions is the ex-post occupational status: we allow four different conditions, full time and part-time employed, unemployed and not in the labour force. We have

estimated 8 models (four different ex-ante status for each gender). Given the ex-ante (I) status of the h-th individual, conditional probabilities of the ex-post status after a year (J=j) can be represented by the formula:

$$P(J = j \mid I, X_h) = \frac{\exp(X_h \beta_j)}{1 + \sum_{j=1}^{4} \exp(X_h \beta_j)}, \; j = 1, \ldots, 4$$

where j shows one of the possible ex-post status, X_h is the vector of covariates (educational level, age, geographical area of residence, activity sector and cohort dummies) and β_j are the associated coefficients to each final status.

Tab. 1 in the appendix presents results of the estimation. Cohort dummies show a positive trend in the transition from the condition of unemployed/ not in labour force status to a status of employed. They also confirm the increasing participation of adult women.

The model uses estimated coefficients of table 10 in the computation of odds ratios used in the transitions among occupational conditions.

4.5 The retirement decision

The first module in the social security block (see fig. 4) defines the transition from work to retirement. Table 2 in the appendix reports the (complex) evolution of the combinations of age and seniority required by the current Italian law to retire before legal retirement age (60 years for women and 65 years for men) from 2007 to 2016. Afterwards no other changes are expected[5].

We model the retirement decision through a three stages exit rule. First of all the model verifies if conditions for seniority pension are reached. Afterwards it computes

[5] under the notional defined contribution system individuals can retire before the legal retirement age if they have worked for at least 40 years.

the marginal intertemporal gain/loss of the decision to retire[6] and finally it computes the substitution rate between pension benefit and last year earning and compares it with a threshold level equal to 60%, 50% and 40% respectively for individual belonging to the old, the mixed and the new pension system[7]. Only if all three conditions are satisfied the individual is allowed to retire earlier with respect to the legal retirement age. Otherwise retirement will occur when the legal retirement age is reached (60 years for women and 65 year for men) and minimum contributory records are respected (20 years in the old defined benefit formula and 5 years in the notional defined contribution formula)[8].

5. 1 Results of the simulation

In this subsection we present results of a simulation of the evolution and the composition of the Italian labour force in the period 2005-2050, as well as some sensitivity analysis with respect to the legal retirement age.

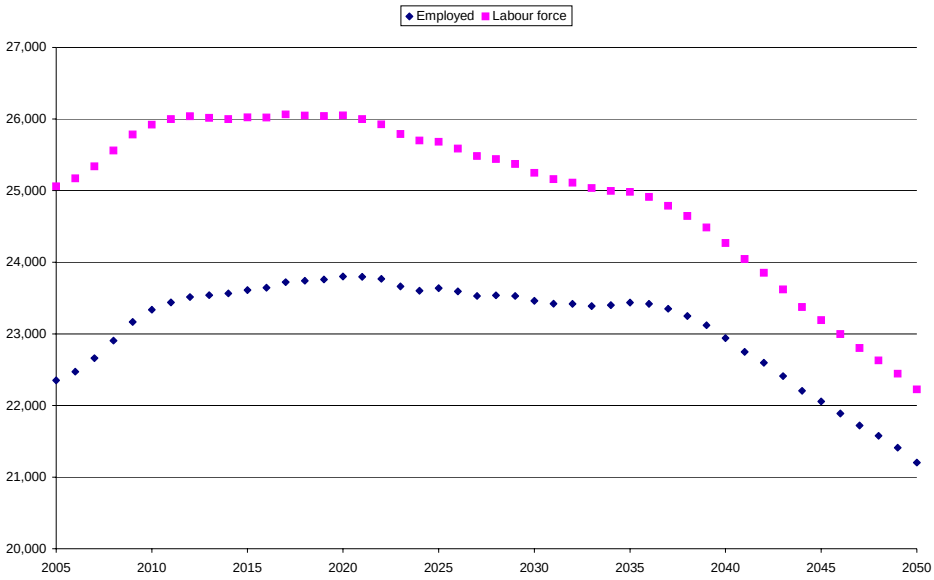
Our base simulation uses the central demographic scenario of the 2001's National Statistical Office projections. The path for real Gdp and wage growth are taken from the Ragioneria Generale dello Stato's model (Rgs 2005). We assume also that cohorts effects in educational choices and labour participation rates, analyzed in the former subsection, will stop at the level estimated for the youngest generation of the base year. With respect to the social security legislation we consider the situation as it were at the end of 2005 (i.e. we do take into account the 2004 last structural reform of the pension system, but we do not consider changes in the legislation occurred after that date).

Fig. 5 shows our forecast for the labour force as well as for the total number of employed in the period 2005-2050[9].

[6] The model compares changes in net social security wealth which are expected from one more year of stay in the labour market with the option of retire immediately.
[7] They are respectively: i) workers with a contributory record equal to or exceeding of 18 years on 31.12.2005; ii) workers with less than 18 years of contributions on 31.12.2005; iii) workers entered in the labour market after 31.12.1995
[8] Therefore the model does not allow employment after the age of 65 for men and 60 for women.
[9] We used a correction coefficient in order to align the model's population in 2002 at the official figures for the total number of Italians in the same year.

The reduction in the difference between the number of active and employed individuals through the observed period is explained by the high probability of young cohorts to move from a condition of unemployed or not in the labour force to a condition of employed (see tab. 1 in the appendix).

Fig. 5: Evolution of the labour force and total number of employed. Thousand of individuals



Both the labour force and the total number of employed grow steadily in the first part of the simulation (2005-2020). After 2020 the situation changes and the model simulates a reduction in both variables which appears to be more noticeable in the last part of the simulation, after 2040. On the whole the lost of workers amounts to 1,1 million individuals. If we consider the difference between the maximum (which occurs in 2020) and the minimum (which occurs in 2050) number of workers simulated by the model, the reduction is equal to 2,6 million individuals, a decrease of around the 11%.

Fig. 6: Percentage annual changes in total employment. 2006-2050.

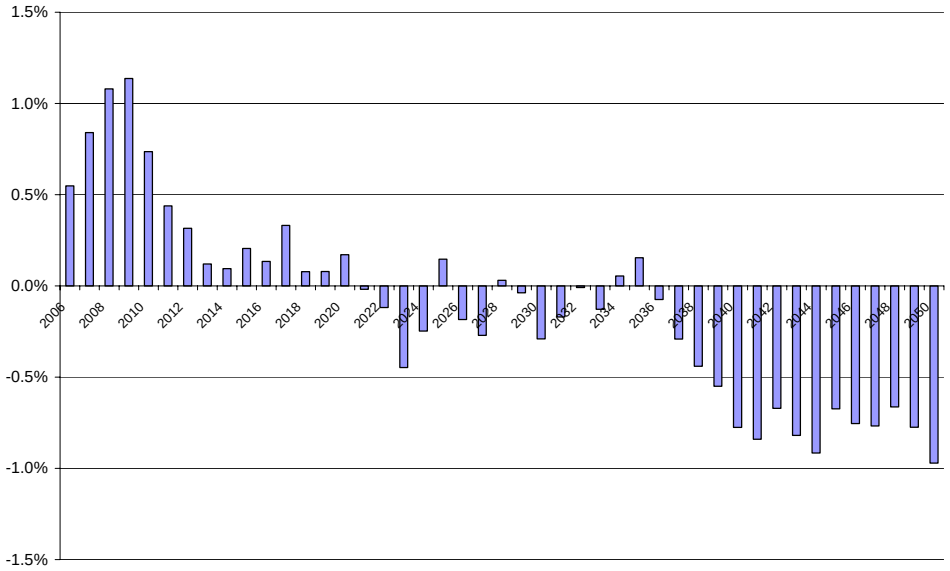
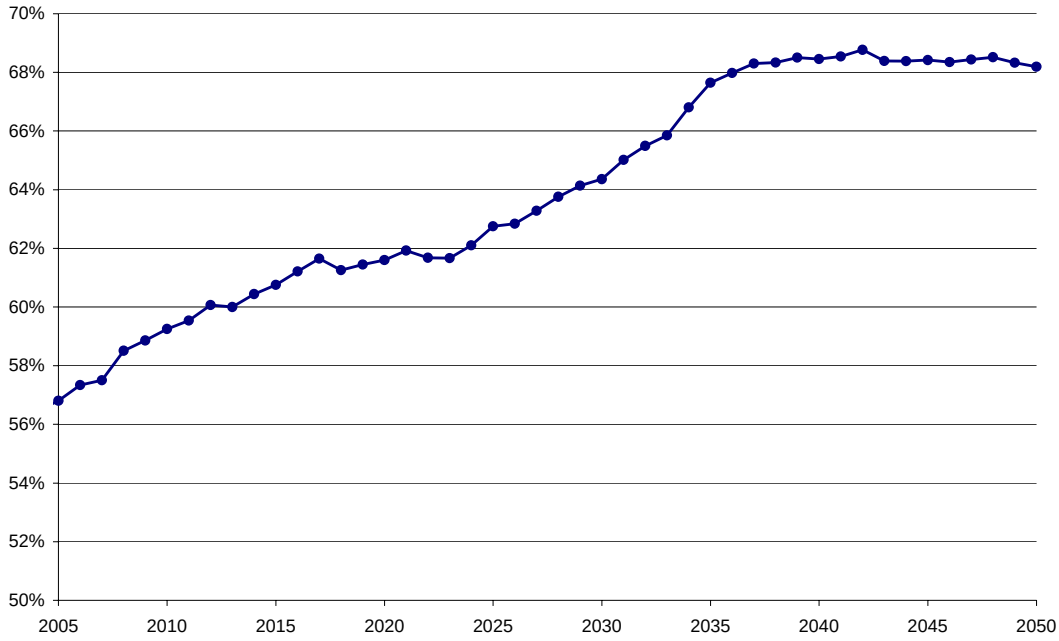


Figure 6 analyses the percentage change in the total employment and it confirms that, in terms of growth, the simulation period can be divided in a first interval (2005-2020) when the growth in the total number of employed is still positive, followed by a 15 years period (2021-2036) when growth is nearly constant. Only in the last 15 years of the simulation there is a clear trend towards the reduction in the total number of employed.

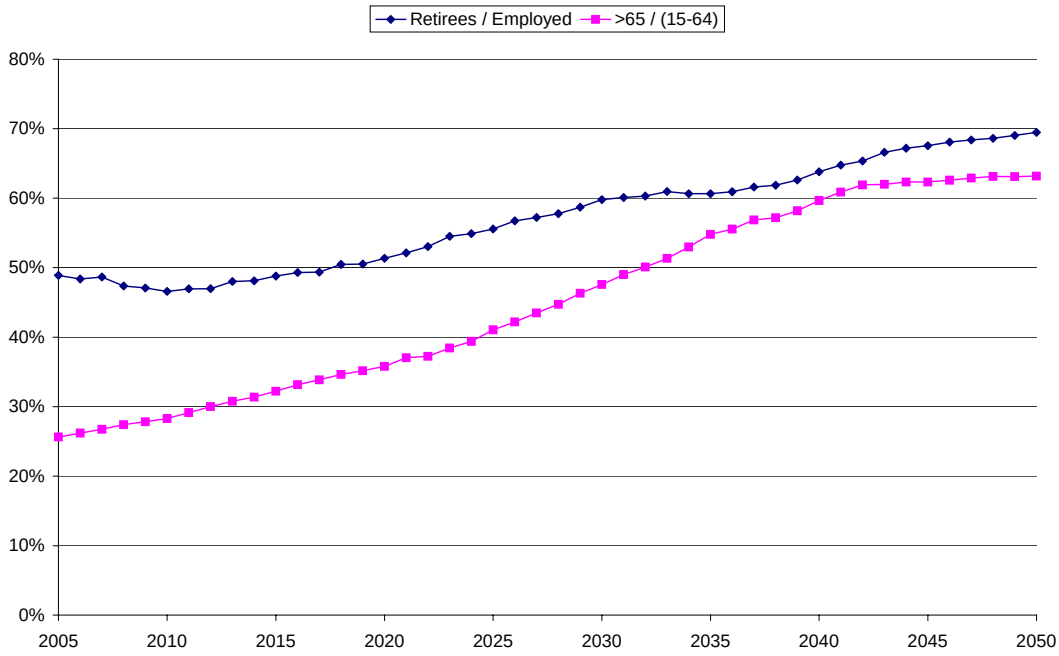
The share of the employed population is expected to increase. As Fig. 7 shows growth of the employment rate is continuous over the whole period, even if it does not allow Italy to respect the Lisbona target. Results do not seem to be very strongly influenced by different demographic scenarios. Therefore we decided not to widen further the analysis in this direction.

Fig.: Total employment rate. 2005-2050.



An important consequence rise of the rising path of the employment rate is that the ratio of retirees over employed is expected to grow at a slower pace than the ratio of old (>65) over adult (15-64) individuals.

Fig. 8: Retirees over employed and old over young. 2005-2050.



The advantage of a population based dynamic microsimulation model with respect to cell-based or macroeconomic forecast models lies in its capacity to describe year by year several social and economic characteristics of the population. In table 2 we report, for some representative years, how the most important of them are expected to change.

Tab. 2: The composition of the simulated employed population

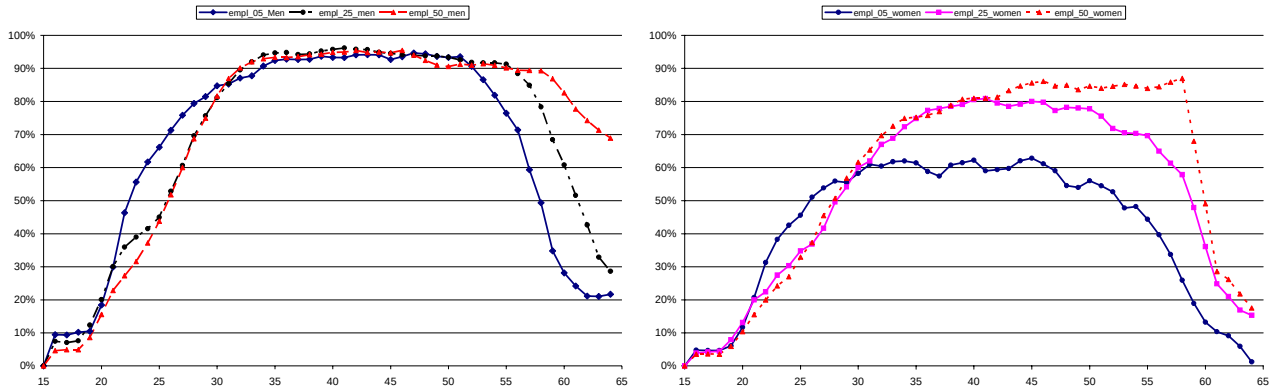
	Sex		*Age*			*Education*			*N. of comp.*			*Nationality*	
Year	***Women***	***Men***	***<=30***	***31/50***	***>50***	***First***	***Second***	***Third***	***<3***	***=3***	***>3***	***Imm.***	***It..***
2005	40%	60%	20%	60%	20%	44%	44%	12%	37%	38%	25%	5%	95%
2015	41%	59%	14%	58%	29%	40%	46%	13%	44%	36%	21%	9%	91%
2025	43%	57%	13%	53%	34%	36%	45%	19%	49%	33%	18%	12%	88%
2035	44%	56%	12%	49%	39%	32%	42%	26%	48%	36%	15%	14%	86%
2050	45%	55%	10%	50%	39%	29%	35%	36%	50%	36%	14%	16%	84%

Women are expected to increase, even if not to a high degree, their weight in total labour force. In fact, as will become clear once occupational rates by age will be analysed, two factors, the different legal retirement age of the current pension law (65 for men and 60 for women) and a lower employment rate in the central part of active lifetime could explain the figures of the first two columns. Much more impressive are changes that occur in the age composition of the employed population. Two factors are worth noticing. First the transition of the baby boom generation towards retirement, that explains the initial growth of the share of "older" workers, which reaches 34% in 2025. Second the transition from education to labour market of the baby boost generations, that reduces the share of "young" workers from 2015 on. Remarkable changes are also expected in the composition of the employed population, by educational level. As in other studies (Leonbruni and Richiardi 2006) we find that the share of workers with a university degree will grow steadily. In our simulation this component will reach 36% of total employed population in 2050. In the second part of the table we show that workers living in "small" household (less than three components) will increase. The opposite is

expected to happen for workers living in "large" households (more than three components), the share of whom will decrease from 25% in 2005 to 14% in 2050. Finally, with respect to the nationality of workers the last two columns show that the share of immigrants will increase up to 16% in 2050.

Expected changes in the composition of the employed population can also be analyzed comparing cross sectional age profiles of occupational rates in different years. Figure 9 show such profiles for years 2005, 2025 and 2050.

Fig. 9: Employment rates, age profiles in 2005, 2025 and 2050.



The higher level of education that current and future young cohorts of both sex will reach, explains the lower level of the employment rate for individuals below the age of 30, in the cross sectional profiles of 2025 and 2050 with respect to the one of the initial simulation. On the other end of the profile, after age 55, the shift in the active period and restrictive effects of pension reforms enacted in last years explain the growth in the rate of employment, which increases over the whole simulation period and is particularly strong for women.

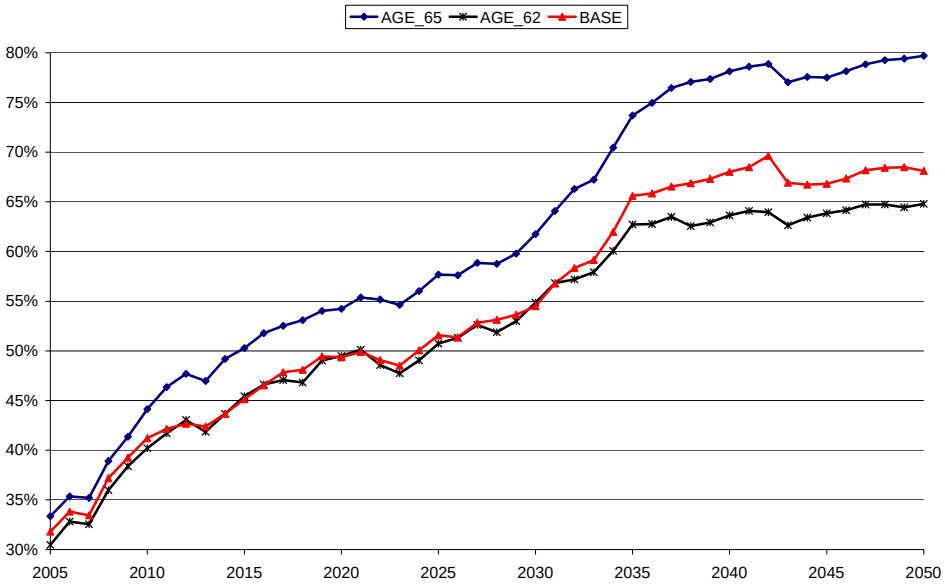
Summing up expected changes in the composition of the employed population appear to be more important than the absolute variation in the number of workers. This point open interesting lines for the empirical research.

5.2 The effects of changing the legal retirement age

Changes in the legal retirement age are often suggested to be an important step towards the construction of a more sustainable and adequate pension system. The current Italian pension law fixes such age at 60 years for women and 65 years for men. In order to test the sensitivity of our results with respect to this institutional parameter we run two alternative simulations, where the legal retirement age is equalized among men and women. In the first the legal retirement age is fixed at the age of 65; in the second at the age of 62.

Effects on the employment rate of the two simulations are presented and compared with the base simulation in Fig. 10. Raising the retirement age to 65 years has a significant effect on total employment rate, whereas the intermediate solution which increases retirement age for women and decreases it for men, worsen the result even with respect to the status quo.

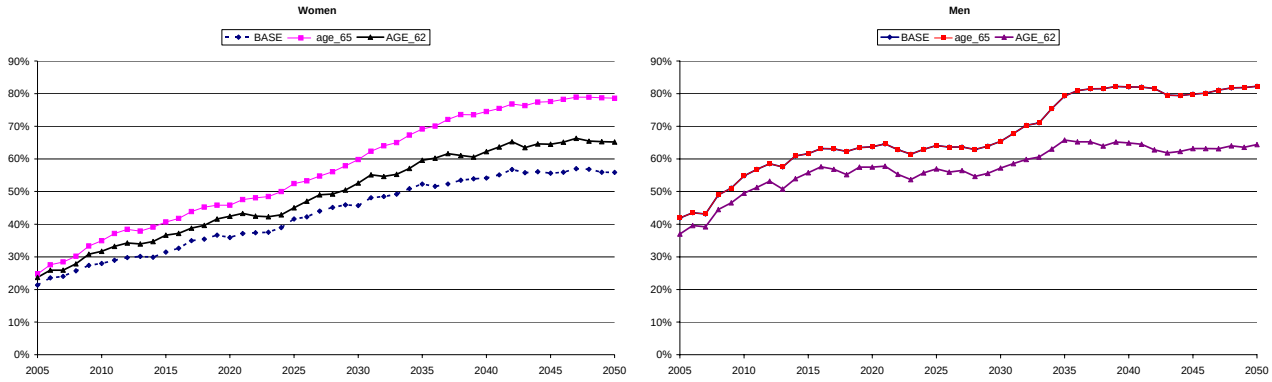
Fig. 10: Total employment rate among elder workers in three different simulation about legal retirement age.



Changes in retirement age have different effects on men and women. Looking at figure 11, where the employment rate for men and women are separately reported, it becomes more clear that the option "62" is not effective because the positive effect on

female employment is more than balanced by the negative of the same reform on men employment rate.

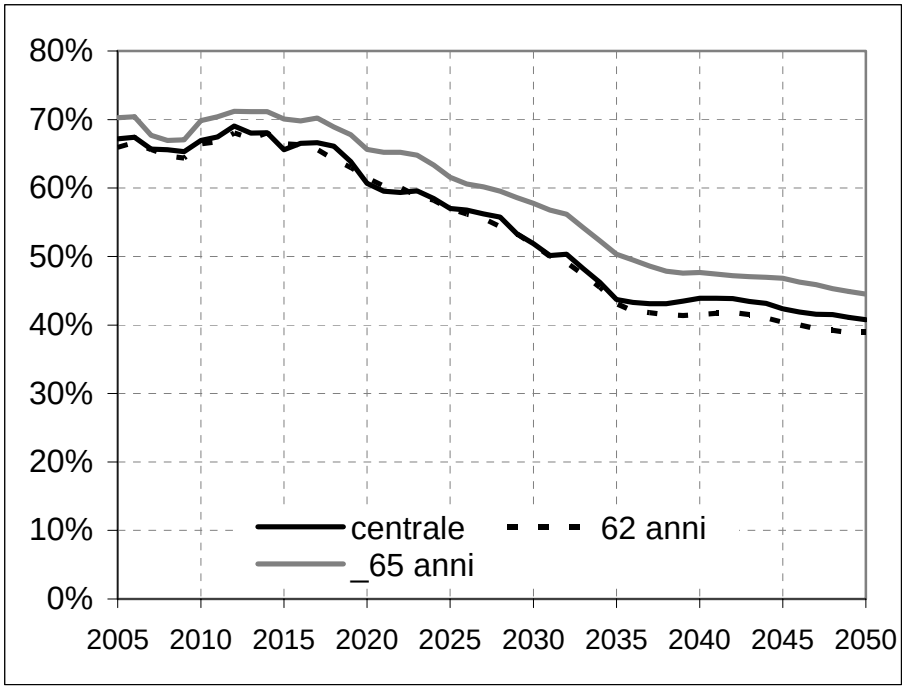
Fig. 12 Employment rate among elder workers by sex in three different simulation about legal retirement age.



CAPP_DYN computes also pension benefits. So it is interesting to compare this three different scenarios in terms of the adequacy that they will insure to future pensioners. Therefore we compute the ratio between gross pension and gross wage in the first year after leaving labour market for all individuals in the sample.

The substitution rate is expected to decline steeply because of the restrictive sign of all changes introduced in the computation formula of future benefits since 1992. The reduction is particularly strong after 2035 when the notional defined contribution system will completely phased in. It can be noticed in this case that raising the retirement age to 65 for men and women would be an instrument to improve the adequacy of the social security system for both men and women.

Fig. 12: The substitution rate between pension benefits and last wage for new retirees. Sensitivity analysis with respect to retirement age.


80%
70%
60%
50%
40%
30%
20%
10%
0%
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
centrale
62 anni
_65 anni

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APPENDIX

Tabella 1.????

WOMEN

	Occupato FT -> Occupato PT	Occupato FT -> NON_OCC	Occupato FT -> INATTIVO	Occupato PT -> Occupato FT	Occupato PT -> NON_OCC	Occupato PT -> INATTIVO
obbligo	0.273***	0.746***	1.109***	-0.482***	0.216	0.657**
diploma	-0.03	0.19	0.253*	-0.418***	-0.025	0.158
_eta	0.069**	-0.04	-0.125***	-0.082**	-0.206***	-0.171***
_eta2	-0.001**	0.00	0.001***	0.001	0.002	0.002**
centro	-0.125*	0.197**	0.13	0.066	0.264*	-0.151
sud	-0.345***	0.965***	0.898***	0.441***	1.329***	0.810***
pubblico	-0.200***	-0.556***	-0.652***	-0.016	0.103	0.024
coniugat	0.540***	-0.432***	1.035***	-0.170**	-0.540***	0.611***
c_48_52	-0.19	-0.346*	-0.321**	-0.363**	0.502	-0.496**
c_53_57	-0.16	-0.692***	-0.328*	-0.472***	0.162	-0.803***
c_58_62	0.08	-0.671**	-0.18	-0.733***	0.138	-1.140***
c_63_67	0.370*	-0.731**	-0.01	-0.898***	-0.227	-0.980***
c_68_72	0.397*	-0.949***	-0.18	-1.020***	-0.482	-0.879**
c_73_77	0.499*	-0.968**	-0.31	-1.133***	-0.923	-1.793***
c_78_max	0.526*	-1.038**	-0.15	-0.825**	-1.311*	-2.005***
_cons	-5.022***	-1.273*	-2.288***	2.368***	2.600*	1.292

	NON_OCC -> Occupato FT	NON_OCC -> Occupato PT	NON_OCC -> INATTIVO	INATTIVO -> Occupato FT	INATTIVO -> Occupato PT	INATTIVO -> NON_OCC
obbligo	-0.711***	-0.642***	0.669***	-1.074***	-0.884***	-1.006***
diploma	-0.386***	-0.533***	0.316**	-0.603***	-0.671***	-0.594***
_eta	0.007	0.118**	0.009	0.102***	0.255***	0.059*
_eta2	0	-0.001	0	-0.002***	-0.003***	-0.002***
centro	-0.692***	-0.750***	-0.295***	-0.067	-0.394***	-0.115
sud	-1.378***	-1.534***	-0.228***	-0.355***	-1.206***	0.297***
coniugat	-0.003	0.299***	1.280***	-0.794***	-0.610***	-1.171***
c_48_52	-0.268	0.005	-0.362*	-0.239*	0.087	0.077

c_53_57	-0.38	0.233	-0.254	-0.371**	0.028	0.011
c_58_62	-0.533	0.491	-0.188	-0.513***	0.316	-0.063
c_63_67	-0.574	0.806*	-0.232	-0.502**	0.618*	0.029
c_68_72	-0.644	0.739	-0.383	-0.533**	0.789**	0.019
c_73_77	-0.543	1.127*	-0.364	-0.424	0.934**	0.152
c_78_max	-0.538	1.222**	-0.319	-0.641*	0.307	-0.007
_cons	0.383	-4.647***	-2.556***	-2.035**	-7.230***	-1.479**

MEN

	Occupato FT -> Occupato PT	Occupato FT -> NON_OCC	Occupato FT -> INATTIVO	Occupato PT -> Occupato FT	Occupato PT -> NON_OCC	Occupato PT -> INATTIVO
obbligo	0.05	0.975***	0.519*	-0.465***	1.040***	-0.225
diploma	-0.207*	0.459***	0.03	-0.481***	0.605*	-0.738
_eta	-0.04	-0.132***	-0.294***	-0.035	-0.027	0.002
_eta2	0.00	0.001**	0.004***	0	0	0.001
centro	0.10	0.276***	0.13	-0.126	0.011	0.447
sud	0.671***	1.342***	0.763***	0.022	0.728***	0.148
pubblico	0.11	-0.655***	-0.298*	-0.689***	-0.104	-0.293
coniugat	-0.367***	-0.594***	-0.772***	0.155	-0.339*	-0.199
C_48_52	-0.05	-0.488***	0.28	-0.24	-0.606	-0.464
C_53_57	-0.06	-0.841***	0.27	-0.221	-1.121**	1.018
C_58_62	0.14	-0.927***	0.52	-0.631*	-0.860*	1.498
C_63_67	0.19	-1.159***	-0.12	-0.693*	-1.355**	1.417
C_68_72	0.38	-1.244***	0.36	-0.876**	-1.266*	1.638
C_73_77	0.44	-1.388***	-0.14	-0.912*	-1.462*	2.154
c_78_max	0.32	-1.551***	0.06	-1.091*	-1.925**	1.581
_cons	-4.187***	-0.15	-0.60	2.399*	-0.025	-5.686

	NON_OCC -> Occupato FT	NON_OCC -> Occupato PT	NON_OCC -> INATTIVO	INATTIVO -> Occupato FT	INATTIVO -> Occupato PT	INATTIVO -> NON_OCC
obbligo	-0.452***	-0.709***	-0.484	-0.952**	-0.283	1.009*
diploma	-0.423***	-0.425*	-0.499	-0.356	0.079	1.269**
_eta	0.072***	0.147**	-0.146**	0.15	0.082	0.216*

_eta2	-0.001***	-0.002**	0.003***	-0.002	-0.001	-0.003**
centro	-0.639***	-0.660***	-0.514**	-0.165	1.372*	0.45
sud	-1.104***	-0.885***	-0.888***	-0.443*	0.982	0.476*
coniugat	0.600***	0.504***	-0.182	0.641**	0.383	-0.311
C_48_52	-0.061	-0.278	0.977**	-0.001	-1.623	0
C_53_57	-0.057	-0.095	1.196**	0.252	1.478	-0.469
C_58_62	-0.082	-0.249	1.761***	-0.209	-0.611	-1.125
C_63_67	-0.081	-0.104	2.151***	0.151	-1.081	0.172
C_68_72	0.076	-0.226	2.042**	0.126	0.017	-0.179
C_73_77	0.15	-0.08	2.070**	0.333	-0.1	0.971
c_78_max	0.115	-0.447	2.656***	1.462	1.092	0.716
_cons	-1.236**	-4.493***	-3.121*	-2.782	-4.988	-5.746*

legenda: * p<0.05; ** p<0.01; *** p<0.001

Note: Occupato FT: Occupato Full-Time; Occupato PT: Occupato Part-Time; NON_OCC: disoccupato, in cerca di prima occupazione; INATTIVO: temporaneamente escluso dalla forza lavoro.
Fonte: Elaborazioni su un campione di 702.249 individui proveniente dal pooling di dati RTFL 1993-2003.

Tabella 2. Griglie di età e anzianità contributiva per l'accesso alla pensione di anzianità 2004-2016

Fino al 2008 il contributivo ha le stesse regole per tutti mentre l'anzianità distingue fra diverse categorie di dipendenti		2004		2005		2006		2007	
		Solo contribuzione	Età + contribuzione	Solo contribuzione	Età + contribuzione	Solo contribuzione	Età + contribuzione	Solo contribuzione	Età + contribuzione
Anzianità	**Dipendenti privati**	38	57.35	38	57.35	39	57.35	39	57.35
	Dipendenti pubblici	38	57.35	38	57.35	39	57.35	39	57.35
	Operai e precoci	38	56.35	38	56.35	39	57.35	39	57.35
	Autonomi	40	58.35	40	58.35	40	58.35	40	58.35
Contributivo (*)		40	57.5	40	57.5	40	57.5	40	57.5
Vecchiaia (retributivo) M			65, 20		65, 20		65, 20		65, 20
Vecchiaia (retributivo) F			60.20		60.20		60.20		60.20

Dal 2006 è completata l'armonizzazione dei requisiti per le pensioni di anzianità dei dipendenti. Dal 2008 scompare l'anzianità per le femmine, fatta salva l'opzione per il contributivo		2008-2009		2010-2013		2014-2015 (**)		dal 2016 (**)	
		Solo contribuzione	Età + contribuzione	Solo contribuzione	Età + contribuzione	Solo contribuzione	Età + contribuzione	Solo contribuzione	Età + contribuzione
Anzianità e contributivo maschi (*)	**Dipendenti M**	40	**60.35**	40	**61.35**	40	**62.35**	40	62.35
	Autonomi M	40	**61.35**	40	**62.35**	40	**63.35**	40	63.35
Anzianità femmine	**Dipendenti F**	40	**non più rilevante**	40		40		40	
	Autonomi F	40		40		40		40	
Contributivo femmine (*)	**Dipendenti F**	40	**57.35**	40	57.35	40	57.35	40	**scompare**
	Autonomi F	40	**58.35**	40	58.35	40	58.35	40	**scompare**
Vecchiaia (retributivo e contributivo(*)) M		65,20 (ret) 65,5 (contr)		65,20 (ret) 65,5 (contr)		65,20 (ret) 65,5 (contr)		65,20 (ret) 65,5 (contr)	
Vecchiaia (retributivo e contributivo(*)) F		60,20 (ret) 60,5 (contr)		60,20 (ret) 60,5 (contr)		60,20 (ret) 60,5 (contr)		60,20 (ret) 60,5 (contr)	

In grigio le variazioni già previste dalla riforma Prodi del 1997
In grassetto le variazioni previste dalla riforma pensionistica del 2004
(*) Contributivo: requisito aggiuntivo per il pensionamento prima dei 65 anni è il raggiungimento di una pensione pari a 1,2 volte l'assegno sociale
(**) Il restringimento dei requisiti nel 2014 e 2016 può essere postposto sulla base di specifiche verifiche dell'andamento dei flussi di pensionamento da svolgersi nel 2013 e 2015