

**Assessing the implications  
of long term care policies in Italy:  
a microsimulation approach.**

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Abstract

This paper estimates the future characteristics of the long-term disabled in Italy and the evolution of total public expenditure for long-term care. The future dynamics of ltc expenditure in Italy is of particular relevance for two reasons: the limited and insufficient level of public expenditure currently targeted to the disabled, and the perspective in the next few decades of one of the most rapid ageing processes in the world.

The analysis is carried out using a dynamic microsimulation model that estimates the evolution for the next five decades of the social and economic structure of the Italian population. After an analysis of the future structure of the pool of the disabled population, we consider two alternative hypotheses for the dynamics of public expenditure in ltc: the simple continuation of the current rules, and a significant increase in the generosity of public schemes, in order to satisfy the mounting pressure coming from households. We also compute the implicit tax rates needed to raise the required resources.

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## *1. Introduction*

The Italian population is currently experiencing one of the most rapid ageing processes in the world. The percentage of people aged over 60 over the whole population, at 19.5% in 2005, is projected to rise to 28.0% in 2030 and to 34.4% in 2050 (Istat 2003). This process is very likely to have profound implications on the future sustainability and composition of public expenditures. One of the most relevant consequences of population ageing will be the increase in the number of the disabled elderly, and therefore in long term care expenditures.

The Italian social protection system devotes an insufficient amount of resources to the financing of ltc services (Gori 2006). There is no national ltc fund of the type introduced by many countries in the last few years, for example in Germany and in Japan (Antz et al. 2007, Fukui and Iwamoto 2006). The frail elderly, which represent the bulk of the disabled population, are assisted mainly by informal care provided by family members or private providers, most of them coming from East Europe, often operating in the black market. The institutionalisation rate is low when compared to international standards, and falling in recent years. At home care services, provided directly by local authorities or by non-profit organisations, have a significant diffusion only in the Northern part of Italy.

The ageing of the baby boom generation is not the only factor that may produce an ltc crisis in the future of Italy and other advanced countries. Important demographic changes will probably translate into a reduction in the availability of informal care for the future disabled. The strong decline in fertility rates means that in the following decades the elderly will be able to rely on a falling number of children. Rising divorce rates are producing an increase in the number of elderly living alone. The increasing labour force participation rates of women has positive impacts on the sustainability of public finances, but will reduce the availability of female adults willing to provide care for their parents, both elderly and children.

Very often the emergence of a permanent disability is not only a traumatic event for the whole family, but also a source of severe financial problems, given the high costs of formal care. The seriousness of the problem of ltc provision for public finances will strongly depend also on the future evolution of disability rates among the elderly. In the last few years a falling trend for disability rates among the elderly has been observed in Italy (Istat 2007a), as well as in other developed countries (Manton et. al., 2006). If this trend persists, it will reduce future ltc costs, *ceteris paribus*. On the other hand, not only it is very risky to extrapolate this trend to the future, but the costs of formal care for each assisted person will probably rise, due to the increase in life expectancy and the risk of spending a long final period confined in bed.

In the context of this background, the paper has two aims.

The first is to offer a projection for the next four decades of the number of disabled persons in Italy and a description of their changing demographic characteristics. There are by now numerous studies that make projections of ltc expenditures in the distant future, up to 2050 or even 2100, for many advanced economies (Oecd 2006, Comas-Herrera et al. 2007, Fukui and Iwamoto 2006). Most of these studies, however, are mainly conducted on a macro level, computing cell means of the number of disabled people and ltc expenditures. Usually, they project to the future the current disability rates for various age and gender groups. We present a set of projections computed on the basis of a dynamic population model that simulates the future evolution of the life-cycle events of a sample of microdata of individuals representative of the Italian population.

The main advantage of this model is the possibility to observe the future changes in the socio-demographic characteristics of disabled people, a topic so far not considered by the projection studies applied to the Italian case (Rgs 2006, Comas-Herrera et al. 2007). It is therefore possible to check for changes in the composition of their families, or in their living standards. One strong element of worry, for example, is the possibility of a marked decline in the average size of the households where the disabled live, with the consequence of a reduced availability

of informal family support. With a complete microdata model, we are able to track the life course of each disabled person, and to check whether, for example, there will be an increase in the number of disabled elderly living alone, thereby necessitating more formal care and ltc expenditure by the state.

The second objective of the paper is to estimate, building on the projections of the number of the disabled belonging to various gravity levels, the future cost of ltc public expenditure in Italy. We perform two simulations. The base simulation simply projects to the future the expenditure level implied by the current institutional setting, introducing an ltc fund that would ideally replace all forms of cash or in kind public transfers currently targeted towards the disabled, without changing the total public ltc expenditure in the starting year of the simulation. The alternative simulation assumes a significant increase in the amount devoted to ltc expenditure, reflecting the growing awareness in public opinion that current ltc provision is strongly inadequate to meet the needs of the disabled and their relatives.

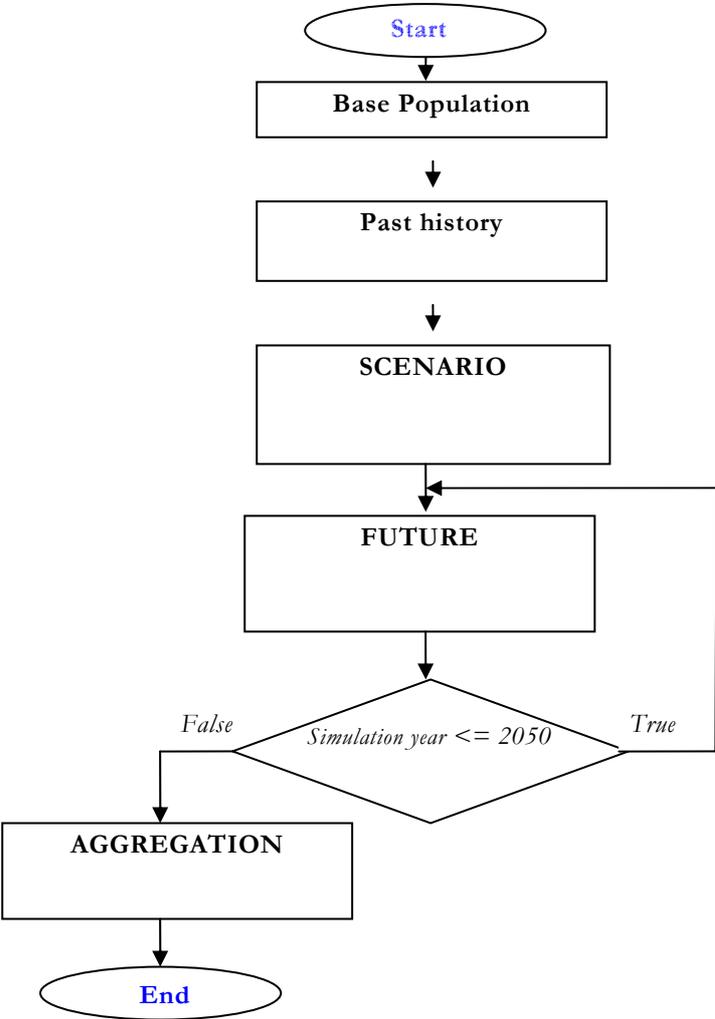
Section 2 describes the main characteristics of the dynamic microsimulation model used to perform the analysis; section 3 provides a picture of some of the most relevant changes that will affect the group of the disabled in the future; in section 4 we study the dynamics of total public ltc expenditure and how population ageing will increase its burden on future workers and pensioners.

## *2. The dynamic microsimulation model*

All simulations presented in this paper are carried out using CAPP\_DYN, a dynamic microsimulation model of the Italian population developed at the Centro di Analisi delle Politiche Pubbliche (Capp), a joint research centre for the analysis of public policies of the Universities of Modena and Bologna. The model simulates the main characteristics of the Italian population from 2005 to 2050.

The structure of the model is represented in Fig 1: there is an initial base population, a second block which estimates past earnings of the currently active population, a simulation cycle which determines the future evolution of the population, and a final output where all annual cross-sectional data are aggregated into a single panel.

Fig. 1 - The structure of CAPP\_DYN



The initial population is taken from the 2002 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<sup>1</sup> 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 implemented with the aid of Monte Carlo processes. A set of transition matrices and econometric models are used to produce transition probabilities, so as to produce for each individual a lifetime pattern of education, work career, personal and family income, 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. 2.

The simulation starts with a set of demographic modules (mortality, fertility, net migration, household formation, divorce). Then a module for educational choices follows. The next module deals with the labour market participation decisions and the estimation of earnings. 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 in order 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 pension system<sup>2</sup>.

A series of exogenous variables is 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

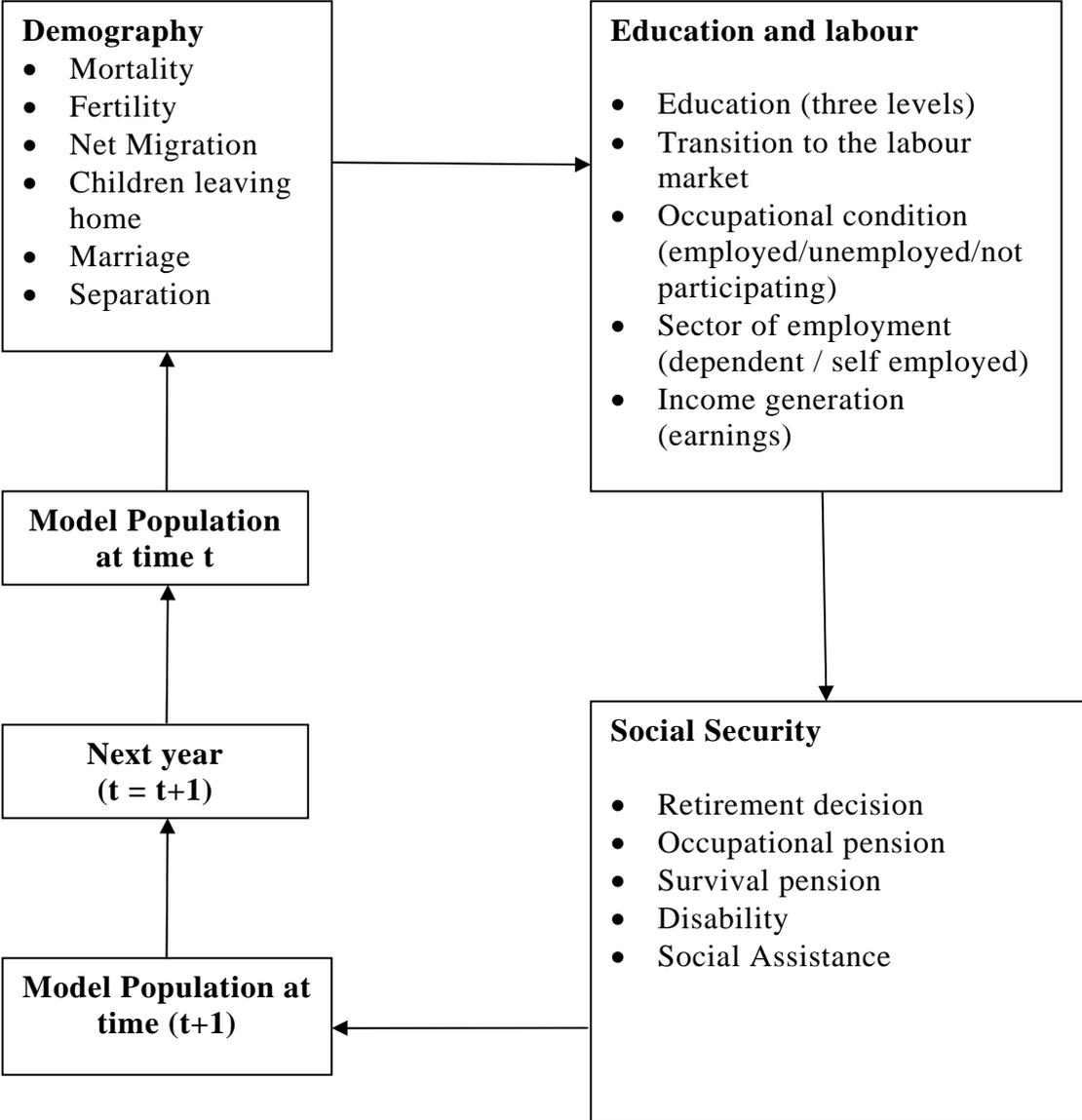
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<sup>1</sup> The unit of simulation is the individual but we keep information on family structure and on its changes through time.

<sup>2</sup> The model does not compute completely disability pensions.

heterogeneous over a relatively large set of demographic and economic characteristics which enables the model to treat a series of interesting issues (distributive in particular) that cannot be dealt with cell based or representative agent models.

Fig. 2 - The modules of CAPP\_DYN



The primary database for CAPP\_DYN is 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 from 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 given by the inverse 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<sup>3</sup>. 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 matches the corresponding distribution of the Italian population.

Many other sources of information 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. Transitions in the labour market are derived from a multinomial logit estimation on a pooled sample of the 1993-2003 waves from the Quarterly Labour Force Survey carried out by Istat. Survival probabilities, fertility rates and net migration hypotheses, which are used to define demographic the evolution of the population, are taken from the ISTAT official forecasts of the Italian population for the period 2005-2050 (Istat 2001).

The most important exogenous variables used in the simulations are real per capita income growth and real per capita earnings growth. 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

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<sup>3</sup> The SHIW\_02 survey counts 8001 households and 21,400 Individuals.

therefore not necessarily 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 base economic hypotheses. All monetary variables are in constant 2002 Euro prices.

### *The disability module*

The simulation of the disability condition is based on external information extracted from the Survey on health conditions and use of health services, that the Italian statistical institute carries out every five years on a sample of more than 100,000 individuals of all ages<sup>4</sup>. Currently, the most recent microdata available to researchers outside Istat are still those of the survey carried out in 1999/2000, but for the final version of the paper we plan to use the data from the more recent survey conducted in 2005. The survey collects, for each interviewed person, information about the ability to perform, without the need of being helped by others, some basic activities of daily living like bathing, eating, dressing. There are 19 questions of this type, that can be grouped into four areas of disability: being unable to go out of home, having serious difficulties in movements, in everyday activities, in communicating abilities. A person is defined, for example, disable in performing everyday activities if he has reported a serious difficulty in at least one of the questions that fall under this area. For each of the four areas, we therefore end up with a dummy variable, taking the value of one if the individual is disabled in performing that set of activities.

On the basis of this classification, we have distinguished three levels of disability, depending on how many of these dummy variables take the value of one: low disability level if the person is disable in only one of the four groups of variables, middle level if two dummies are one, severe disability in case of three or four areas of disability.

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<sup>4</sup> The questions regarding the ability to perform the activities of daily living are asked to those aged 6 years or more.

In order to attribute to each individual of the simulation database a disability status, we have performed on the 1999/2000 Health survey an ordered probit estimation where the dependent variable can assume four different levels: no disability (95.4% of total sample), low disability (2.3%), middle disability (1.3%), severe disability (0.9%). The explanatory variables are socio-demographic characteristics common to the Health survey and to the database of the microsimulation model: age, gender, education level, geographic area, etc.

On the basis of the results of this regression, we select in each year, with the aid of a Monte Carlo process<sup>5</sup>, which individuals are disabled, on the basis of the imputed probability of being disabled. If a person is attributed the disability status in year  $t$ , he cannot go back to the no-disability status, but, if the level of disability attributed is lower than the most serious one, he can be attributed a worse status in any subsequent year, until death<sup>5</sup>.

Among those who belong to the group of the most severely disabled, and who have also been disabled for more than three years, we randomly select a subsample to be hosted in nursing homes, consistent with official estimation of the number of people recovered in Italy (Istat, 2007b).

### *3. Projecting the number and characteristics of the disabled*

For the present time, we use the Monte Carlo method only to select those who are attributed the status of being disabled, while the percentage of people belonging to each disability level is exogenously fixed so as to reproduce in the simulated data a distribution of the disability rates, by classes defined in terms of age and gender, which is similar to those observed in the Istat survey on health conditions. In this version of the paper, therefore, the disability rates for various age groups are fixed, and the total disability rate increases simply because the population is growing older. The final version of this paper will endogenize also the total shares of the

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<sup>5</sup> The conditional probabilities of death for the disabled are equal to those of the rest of the population with the same age and sex.

disabled in the simulated population, depending not only on the reduction in mortality rates, but also on other changes in the socio-demographic characteristics of the population that are correlated with the probability of being disabled, like for example the increase in education levels. It is likely that the impacts of these changes on the share of the disabled out of total population will, however, be of second order with respect to the effects produced by the ageing process.

Table 1 shows the projection of the distribution of the total Italian population among four classes: those who are not disabled, and those who belong to the three different levels of disability described above.

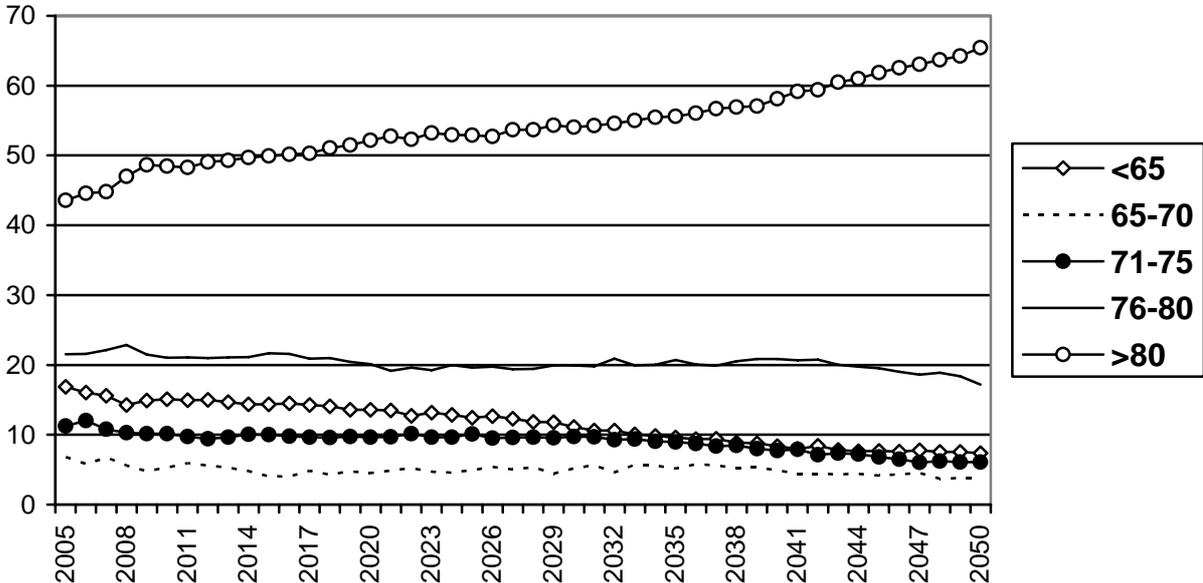
*Tab. 1 - Number and percentage of persons with disabilities*

year	% not disabled	% disabled low level	% disabled intermediate level	% disabled worst level	% disabled worst level in nursing homes	% disabled out of total population	% disabled out of population aged 25-64	Average age of the disabled
2005	94.3%	2.6%	1.6%	1.6%	0.4%	5.7%	8.4%	73.7
2010	93.5%	2.8%	1.8%	1.8%	0.4%	6.5%	9.6%	75.2
2020	92.6%	3.2%	2.1%	2.1%	0.4%	7.4%	11.2%	77.1
2030	91.3%	3.7%	2.5%	2.5%	0.5%	8.7%	13.8%	78.6
2040	89.8%	4.2%	3.0%	3.1%	0.6%	10.2%	17.1%	80.3
2050	88.6%	4.6%	3.4%	3.5%	0.6%	11.4%	19.3%	81.8

During the 45 years of the simulation, the total percentage of the population affected by disability problems will double, from 5.7% in 2005 to 11.4% in 2050. The increase will be particularly strong for those suffering from the most severe disability level, whose share more than doubles over the simulation period. Consequently, also the ratio between the number of disabled and the number of people in working age will significantly increase: today there are 12 persons aged from 25 to 64 for each disabled, in 2050 this number will fall to 5.. The average age of the disabled will significantly rise, by about 8 years over the whole period. Much of the increase in the average age of the frail population is taking place in the first half of the projection period, due to the aging of the baby boom generation.

Fig. 3 presents the evolution over time of the percentage distribution of the disabled by their age classes. The share of the over-80s is projected to rise significantly over the period, from less than 50% to nearly 70%. This parallels the increase in the average age of the disabled. Since the severity of the disability condition tends to worsen with age, this factor will surely produce an increase in total ltc spending.

*Fig. 3 - Distribution of the disabled by age class (in %)*



The number of years of life spent in a condition of disability will increase significantly during this period, assuming no changes in the disability rates for age classes and gender (Fig. 4).

*Fig. 4 - Average number of years spent in disability by the disabled*

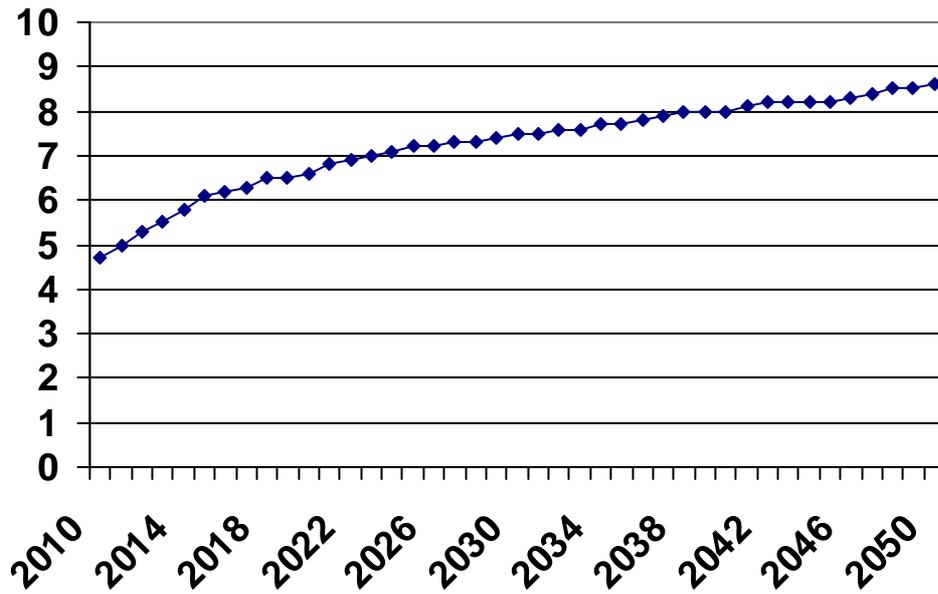


Fig. 5 shows that the disabled of the future will be much less able than those of today to rely on informal care provided by their children, for the basic reason that they will have much less children than the those who currently need care. Today 60% of disabled may rely on at least two children, but this share will fall to slightly more than 30% at the end of the period. The generation born in the 1950s is the first that has significantly reduced its fertility behaviour with respect to the previous generations. When its members will become disabled, around 2030, many of them will therefore have only one child that could potentially provide assistance.

*Fig. 5 - Distribution of the disabled by the number of their children (in %)*

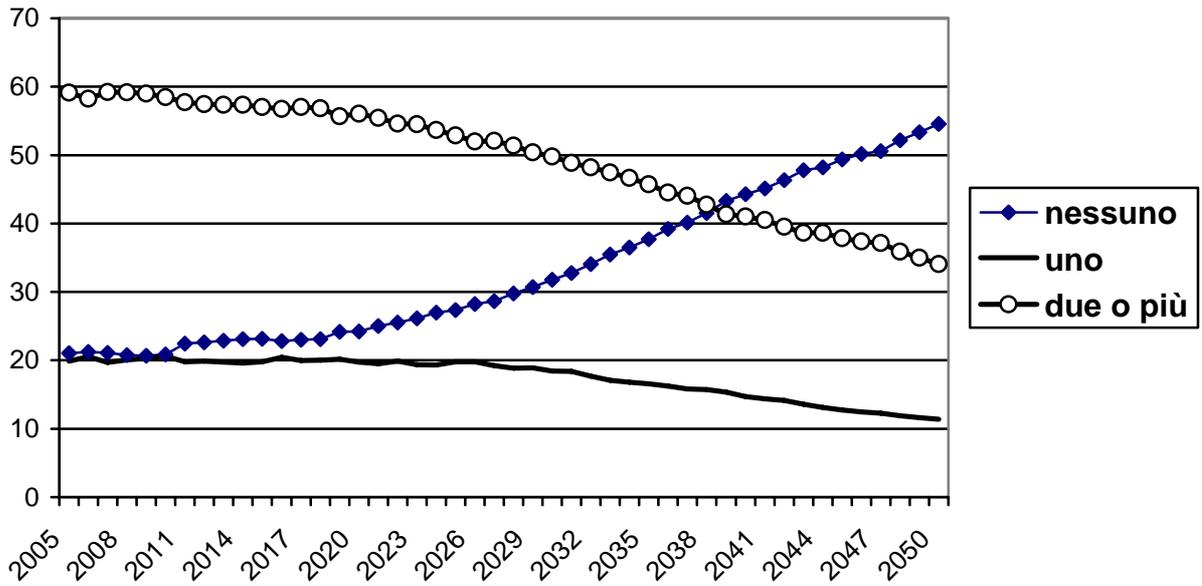
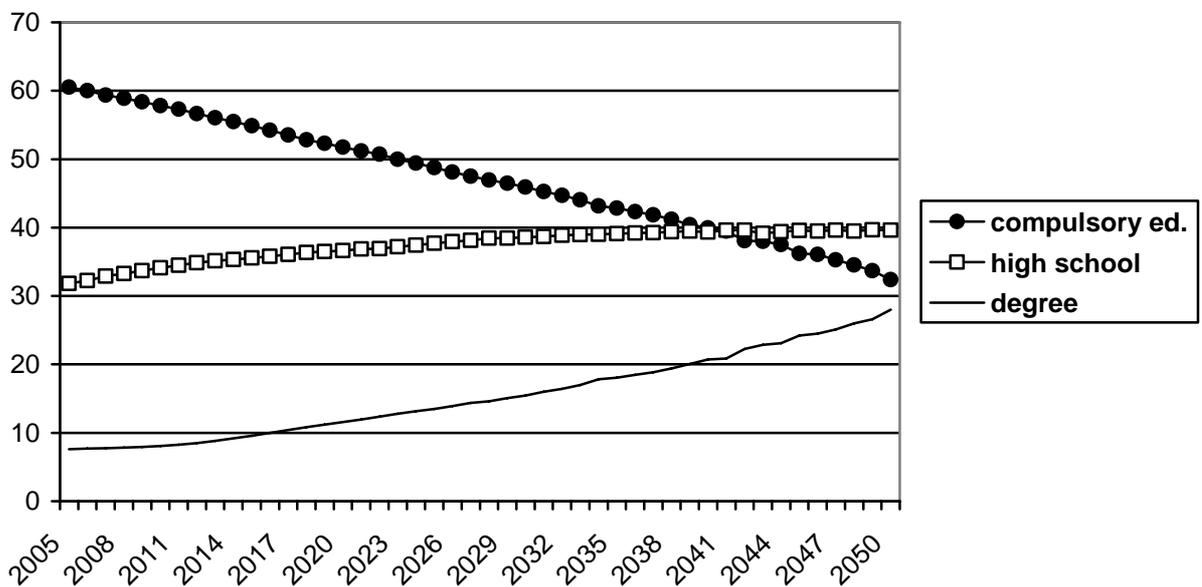


Fig. 6 - Distribution of the children of the disabled by education level (in %)

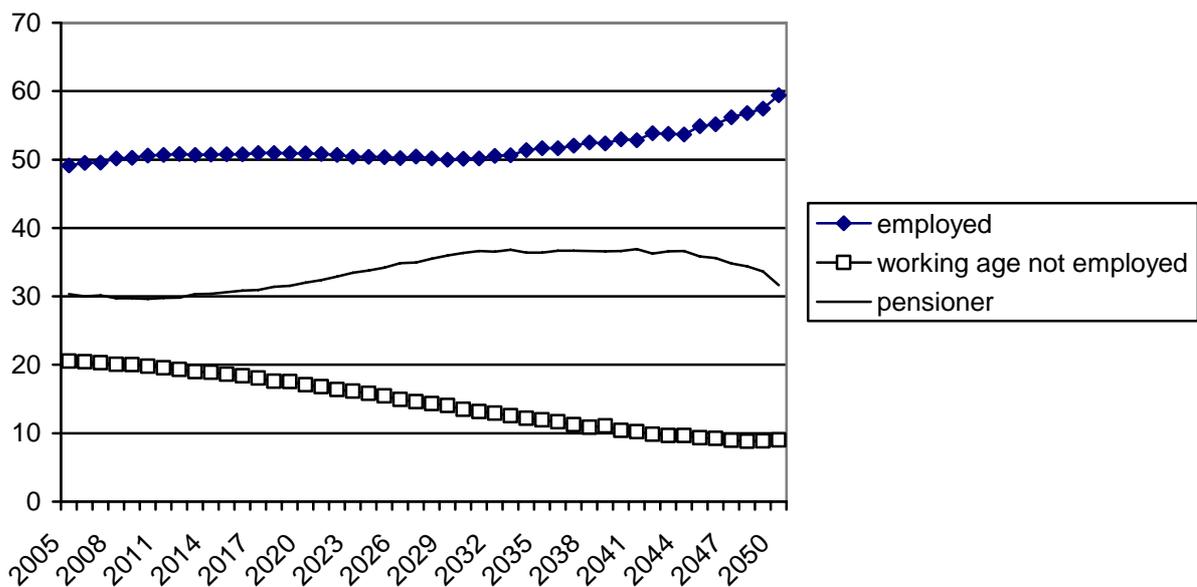


These children, however, will not only be less numerous than today, but will be also much less willing to provide informal care, because they will be more and more educated, therefore more productive and with an increasing opportunity cost

from providing care (Fig. 6), and also more involved in formal work outside home (Fig. 7).

It is worthwhile to stress that the growth in the employment rate among adult women and people aged 55-64, necessary to assure in the future the sustainability and the adequacy of the social security system, might cause a reduction in the aggregate amount of the informal care, that currently, together with private assistance provided mainly by immigrants, substitutes a well structured (public) insurance system against the risk of disability.

*Fig. 7 - Distribution of the children of the disabled by occupational condition (in %)*



#### *4. Projecting the costs of long term care*

In this section we perform two simulations of the future cost of public expenditure for ltc. We do not consider the presence of possible interrelationships between the changing characteristics of the disabled in the future and public expenditure, for the main reason that it is very difficult to imagine how public

provision will react to changes in the composition of the group of the disabled. In principle, it is even conceivable that no change in the structure of social expenditure will take place. We consider this case as our base simulation. More generally, the reaction of public policies to the demographic crisis may take many forms, which cannot be anticipated now. We therefore consider a second scenario, where the government reacts to the increase in disability rates shown in section 3 with an increase in the value of the resources transferred to the frail people.

Both scenarios can in principle be rationalised as the introduction of a ltc fund, which in one case simply incorporates current schemes without changing their structure and expenditure level, while in the other case it increases the amount of the resources involved. We can imagine that this fund is financed through a tax collected on a base that is some variant of national income<sup>6</sup>.

The set up of an ltc scheme poses two main sets of problems. From a long run perspective, the most interesting questions concern the financial sustainability of the fund and its distributive features over the life-cycle. Due to the ageing process and the worsening dependency ratios, the number of beneficiaries of the fund will increase, while the tax base from which the contributions to the fund are collected will shrink, unless an exceptional increase in productivity will take place. It is therefore crucial to verify whether the fund is sustainable through time. This problem can be studied properly only with a dynamic simulation model able to project in the long run (at least a few decades) the whole structure of the population and therefore both the amount of tax receipts and the evolution of the number of likely beneficiaries, given the trends in demography and in the lengthening of expected life.

During the last decade, many advanced countries have created specific social security programs, based on targeted contributions, in order to finance the establishment of ltc funds. In Italy, current programs towards the elderly are financed out of general taxation, and the debate about the opportunity of

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<sup>6</sup> In fact the distribution of the burden of such a tax is a very important issue. At this stage of the work we decided not to consider alternative options, which will be the subject of future research.

establishing a specific ltc fund with an autonomous financing scheme is gaining momentum, but so far without translation into practice.

The first of our two simulations assumes the invariance of current policies towards ltc, and provides an estimate of the rising burden of ltc expenditure on gdp and the public budget. Although relevant, however, the expenditure level provided by the current institutional setting is still insufficient to guarantee a reasonable coverage for the needs of the disabled (Gori, 2006). We therefore study also the implications of a possible new ltc scheme, with a more generous funding than that allowed by the very fragmented institutes of today. This new scheme would incorporate the current amounts of expenditure in ltc, and would provide different transfer levels according to the kind of care received (at home or residential). Its set up is based on a calibration with current expenditure levels, so as to give it a realistic path over time. We analyse the evolution of the fund over time, and the tax shares, with respect to Gdp, that should be imposed in order to reach an equilibrium level in the short run and over a longer period.

If current ltc expenditures are financed on a pay-as-you-go basis, and if the government wants to maintain a balanced budget for the fund in each year, then the increase in the number of the disabled implied by the ageing process would force the government, during approximately the next four decades, to raise each year the tax rate to be applied. This increase may translate in an expansion of total public expenditure, or may crowd out other voices of the budget. Alternatively, the government could impose each year a fixed tax rate, at a level consistent with the intertemporal long-run equilibrium of the fund, until the end of the demographic crisis. This choice involves the creation, in the first period of life of the fund, of a surplus, that after a first accumulation phase will then be subsequently reduced during the peak of the demographic crisis, to finally disappear together with the baby boom generation. We estimate the levels of the tax rates that should be applied to ensure a balanced budget for the fund both on a year-by-year basis, and on an intertemporal setting.

The base simulation is conducted under the assumption that the present institutional setting for ltc will remain unchanged in the future. The starting point is therefore the reconstruction of current expenditure levels.

According to official estimates recently provided by Rgs (2006), public expenditure in Italy towards the disabled in 2005 was about 22 billion euro (1.6% of gdp). It can be divided in three parts: a) “health care costs”, amounting to about 12 billion euro, a component that includes both residential expenditures and the provision of drugs, psychiatric assistance, visits by doctors, etc.; b) 8 billions for a cash transfer called “Indennità di accompagnamento” (attendance allowance), targeted to dependent people and not means tested, amounting to nearly 500 euro per month in 2006, irrespectively of the level of disability; c) 2 billions in transfers in kind, mainly formal housing assistance provided by municipalities, generally subject to a test of means.

In our simulations, the expenditure on ltc that we project is composed of its whole amount for points b) and c), and of only the part of point a) that is not strictly related to health expenditure, because health care costs are a component of social expenditure on health and will be in any case provided by the public sector irrespectively of the future organization of the ltc system.

Public expenditure on ltc that forms the basis for our simulations therefore corresponds to 1.2 percentage points of gdp in 2005, a figure very similar to that computed for the starting period of the simulation by other projection studies (Oecd 2006, Comas-Herrera et al., 2007).

After the identification of the pool of disabled among the microunits of the model, we assign different amounts of cash-equivalent transfer to each of the three disability levels. Those belonging to the least serious level are assumed to receive only in kind housing assistance at the local level. They can of course receive also other care by private providers or relatives, but these forms of care do not generally imply a public contribution. We therefore attribute to each person belonging to the first level a sum of money corresponding to the ratio of

total expenditure for housing assistance and the numerical consistence of the low-gravity disabled.

Each of the disabled belonging to the second and third level receive the attendance allowance. This assumption generates a number of beneficiaries in the simulated data which is very close to the real number of beneficiaries of this cash transfer in 2005 (1.4 million). Finally, those belonging to the third level who are resident in nursing homes receive a much larger amount of money, i.e. 2000 euro per month, corresponding to the public contribution to residential costs.

In the second, alternative simulation we make only one change: we double the transfer received by those belonging to the second and third level who are not institutionalised from 500 euro per month to 1,000 euro per month. This amount corresponds to a weighted average of the value of the cash and in kind transfers provided by the German ltc fund in 2005 (Arntz et al., 2007), and more generally would signal a significant increase in the attention of public policies towards the disabled. In both simulations, the per capita expenditure levels are projected to increase yearly at the same rate of real gdp.

Our results are, at this stage, still preliminary. In fact we do not model any kind of tax or contribution, but simply estimate the cost of different ltc programmes in terms of gdp.

Fig. 8 shows the dependency ratio, computed as the ratio between the number of disabled and the sum of the number of workers and pensioners. It nearly doubles over the simulation period even if on the denominator we compute the number of pensioners. In fact, as we show in the micro analysis of section 3, this is due to the rapid growth of the number of individuals aged more than 80 years, who have very a high probability to become disabled.

*Fig. 8 – Evolution of the dependency ratio*

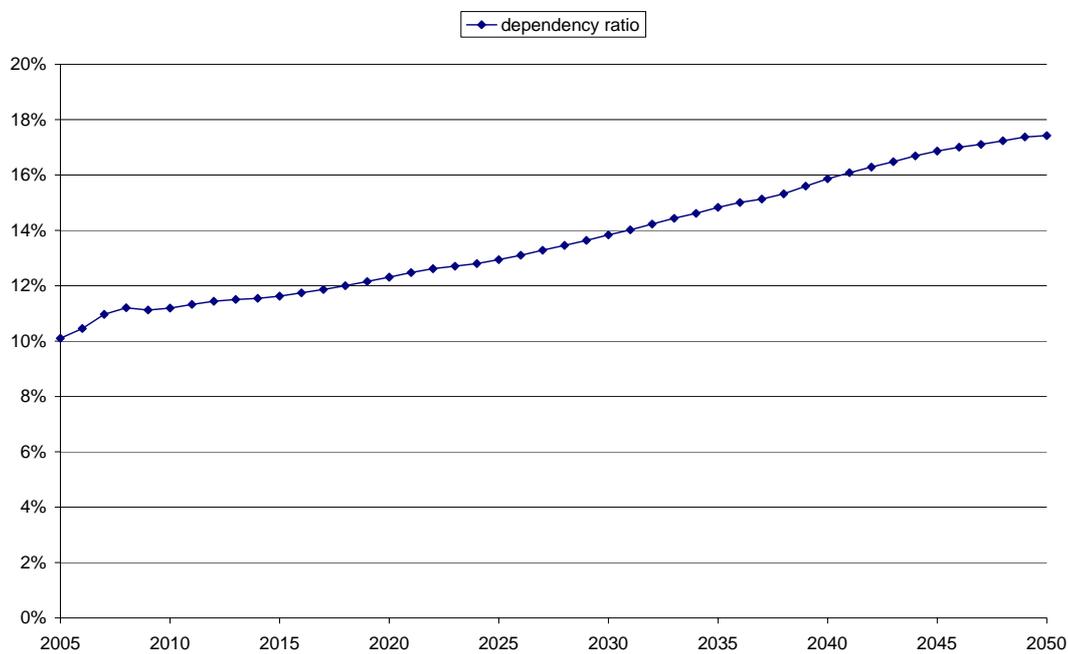
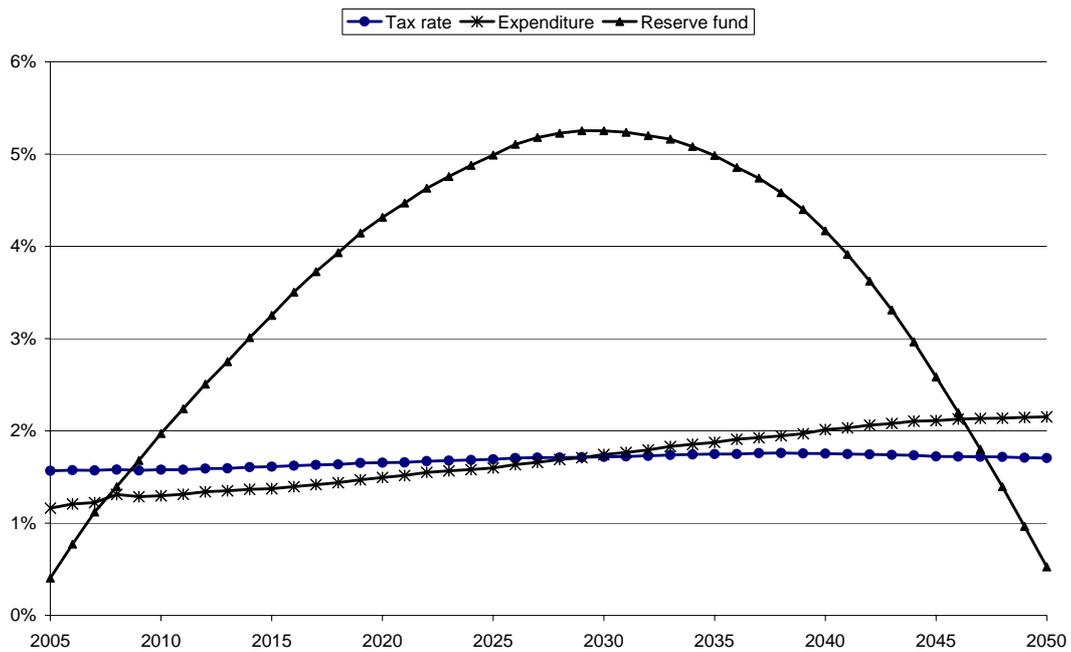


Fig. 9 reports the dynamics of expenditure, taxation and the reserve fund in the first scenario, i.e. the base case. All values are expressed as percentages of gdp.

*Fig. 9 – First (base) scenario: tax rate, total expenditure and trust fund on gdp*



Note: All values are measured as a share of yearly Gdp

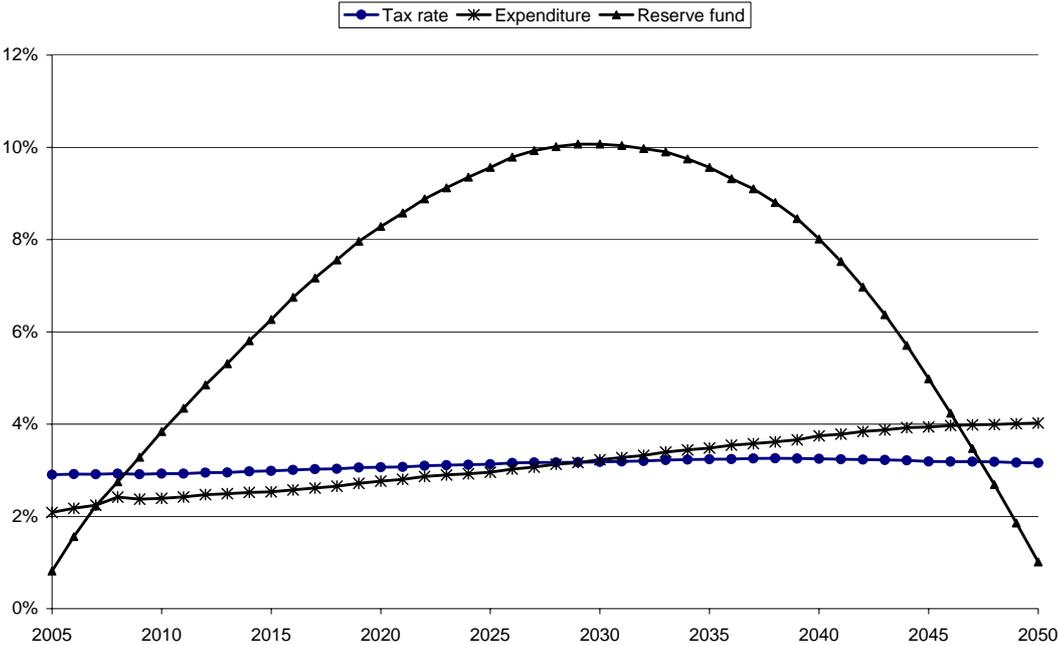
The expenditure for ltc, which in fact measures also the share of gdp that the government should collect so as to finance the fund on a pure pay-as-you-go basis, increases constantly from 1,2% of gdp in 2005 to 2,2% in 2050. This is therefore also the implicit tax rate of ltc public expenditure on gdp that must be applied to maintain year by year the fund in perfect equilibrium between receipts and transfers.

As an alternative, setting the tax rate, in terms of gdp, at a higher level in the first part of the simulation, we allow the model to compute the evolution of a reserve fund which, in the second part of the simulation, assures the constancy of the tax rate in spite of the growing dynamic of the expenditure. In other words, a constant tax rate allows future younger and adult generations to pay a lower tax when they will be old, and imposes on the currently old a burden greater than that implied by a pure paygo financing scheme, therefore reducing their “free-lunch” advantage. The reserve produced in the first years, invested by hypothesis with a net interest rate fixed at a constant level of 2%, would reach a peak in 2030, to slightly more than 5% of gdp. These funds will then be spent to

finance the needs of the baby-boomers. If the tax base for financing ltc is given by the sum of gross earnings and pensions from work (ie excluding assistance pensions), the tax rate needed to balance a growing yearly expenditure will increase from 1.7% in 2005 to 3.9% in 2050. The corresponding constant tax rate that should be imposed in each year is 3%.

The second scenario (Fig. 10), fixing the initial per capita expenditure at a higher level, requires a more relevant financial amount of resources. The dynamic evolutions of the tax rate, of total expenditure and of the reserve fund are graphically similar to those presented above. The levels of all ratios are however always higher, reaching nearly 4% of gdp in the case of total yearly expenditure and 10% of gdp for the peak of the reserve fund. The corresponding equilibrium tax rates on workers and pensioners would be increasing from 3.1% to 7.3% in the case of tax rate variable for each year, and 5.6% in the case of the constant rate that feeds the trust fund.

Fig. 10 – Second (“German”) scenario: tax rate, total expenditure and trust fund on gdp



## *5. Conclusions*

Using a dynamic microsimulation model, the paper tries to shed some light on the future characteristics of the Italian disabled and on the trend of ltc expenditure.

In terms of the methodology used, we plan to make the disability rate fully endogenous, like for example in Johnson et al. (2007), and to project also the types of care that the disabled of the future will demand. The new Istat Survey on Health is particularly suited to these aims, also because it contains a section on informal care and, for the first time, some information on the economic well-being of the household.

Turning to the results, the demographic transition will produce a strong increase in the number of elderly disabled, and a marked reduction in the number of relatives on which they will be able to rely for assistance. Changes in the education level of the population and in the labour market, with an increase in participation rates of women, will reinforce these tendencies.

In the second part of the paper we tested, in a very simplified context, the likely evolution of the ltc expenditure in the face of the expected ageing process. The results show that, even if the current low and insufficient level of average ltc expenditure would be maintained in the future, the tax rate of a pay-as-you-go ltc public fund paid by workers and pensioners should increase from 1.7% to 3.9% at the end of the simulation period (2050). In the case of a desirable increase in the average expenditure for ltc from 500 to 1,000 monthly Euros at 2005, prices the same tax rate should increase from 3.1% to 7.3%. In both cases the creation of a reserve fund would spread the burden over time, setting the constant tax rate respectively at 3.2% and 5.1%. Given the current high levels of taxation on labour income, the political acceptance of such a policy could be obtained only if it were accompanied by a general revision of the comprehensive design of the Italian social security system.

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