ABSTRACT
In the face of rapid population ageing, most OECD countries have undergone or are considering substantial reforms of their pension systems. This paper investigates the outcomes of a process of gender-blind pension reform, that is designing a pension system assuming an idealised (a-gendered) worker/consumer. The paper specifically deals with the case of Italy, in light of the extraordinary high number of pension reforms that took place there, and of their far-reaching and highly representative nature.
We find that recent reforms in Italy have not been gender-neutral. Rather, starting from a situation providing strong incentives towards women’s commitment to unpaid work, reforms in 1990s tried to establish equal treatment of women and men, removing households’ financial gains from having only women doing all the unpaid work. Unfortunately, the short-run implications of this policy may be seriously worrying, as women may have not enough time to accumulate a decent pension annuity. A temporary counter-balancing policy may be needed if we are to avoid women’s poverty and dependence in old age. However, the most recent reform reversed the virtuous trend by establishing new positive discriminations in the eligibility criteria, thus preventing household’s expectations from departing from the old division of social roles.

JEL CLASSIFICATION : J16, H55, H31

KEYWORDS: Equal Opportunities, Pension System, Gender Roles
INTRODUCTION

With its Communication “Working together, working better” (EC, 2005), the European Commission proposed three main goals for European pension policy, to be pursued within the Open Method of Coordination (OMC): sustainability, adequacy and modernisation. Within the latter is to be comprised the need for pension systems to “meet the aspirations for greater equality of women and men”, as well as the urgency to address the issue of older women’s high at-risk-of-poverty rates.

However, a previous Joint Report on Adequate and Sustainable Pensions (EC, 2003) had already remarked that the two mentioned objectives, i.e. fighting women’s poverty in old age and pursuing the equality “of aspirations”, may indeed conflict. This possibility was not thoroughly examined, but reported in the summary of the Swedish National Strategy Report: “arguing that compensation in social insurance systems for gender differences on the labour market will merely serve to reinforce traditional gender roles [...] and] might act as a financial incentive for maintaining traditional gender roles and discourage men from taking career breaks.” (EC, 2003, p. 94).

Eventually, with the crucial contribution of Nordic countries, to cope with the issue a two-sided policy was agreed upon within the OMC. In the short run, the prime objective (from a gender perspective) is to provide effective support to the consumption capability of old men and women; in the long run, equality of opportunities is sought, possibly implying no redistribution between men and women.

In this paper we argue that, within the current state of affairs, in terms of gender roles, demographic trends, labour market and macroeconomic dynamics, the two sides of this policy may constitute the two poles of an emerging trade-off. Indeed, without a significant redistribution from men (or from the younger generations) to the older generations of women, their consumption capabilities are likely to fall in many cases below the poverty line, for a conspicuous number of years.

Considering the case of Italy, we focus on benefit cuts in unfunded public pensions. These are particularly important in Italy as in the foreseeable future public pensions will continue here to represent a very high proportion of income in old age: above 90% for the lowest decile of the income distribution, and very slowly decreasing for the higher deciles (OECD, 2003a and 2003b).1

Italy is a very good case study, as its several pension reforms (namely, the 1992 “Amato”, 1995 “Dini”, 1996 “Prodi”, 2004 “Maroni”, 2008 “Damiano” reforms) followed a trend similar to many OECD countries, with the introduction of a second

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1 As mentioned, the second and third pillars are respectively the occupational (i.e. collective) and private (individual) arrangements: they are fully funded and almost mandatory for dependent employees. We will not consider them due to their marginal role in sustaining consumption capability. Although they are projected to considerably increase in the amount of savings collected, after the reforms they will substitute the old system of severance payments: their increase will only partially provide additional resources to the retired, and public pensions are projected to retain their crucial role in the foreseeable future; see RGS (2010).
and a third private pre-funded pension “pillars” (respectively constituted by collective and individual pension plans), along with the substantial cut of unfunded public pensions. Concerning the latter, a notionally defined-contribution (as described below) regime was established, although the system remained of a Pays-As-You-Go (PAYG) type, exhibiting near actuarial fairness and very low redistribution, by tightening the “Bismarckian” link with the labour market.

As mentioned, the threats for the system’s sustainability were addressed exclusively by cutting prospective benefits, with no intervention of the side of contributions. This paper focuses on the expenditure side of the system as well, although we acknowledge that the financing side may exhibit several gender biases, due, for example, to its distributive aspects.

From a gender perspective, the main questions to be addressed are (i) to what extent gender unbalances arise from the design of the pension system, as opposed to what is “imported” from the wider economic context; and (ii) if it is appropriate and economically efficient for the pension system to correct the income inequalities arising from external sources.

Concerning the first issue, our analysis highlights that, in the case of Italy, the risk of poverty and of a return to dependence in old-age is to a large extent due to women’s disadvantage in the formal labour market, coupled with the tight linkage between labour market performance and pension benefits (typical of the Welfare regimes à la Bismarck).

Concerning the second issue we show that, of the mentioned European two-sided strategy for sustainable and adequate pensions, only the second part has been pursued in Italy, i.e. the long-run goal of granting neutrality of the system and equality of treatment between men and women. As it turns out, Italian women cannot expect to maintain adequate levels of consumption without being the receipt of a transfer from some related breadwinner man. However, if we are to take seriously the above-mentioned Swedish position, it is doubtful whether this situation should be coped with by changing the pension system.

The paper develops as follows: the first section sketches the institutional background of Italy’s pension system and the several reforms that modified it. The second section discusses the possible sources of inequality between men and women within the pension system, using Italy as a relevant example. The third section provides an analysis of the gender impact of Italy’s pension reforms with respect to the benefit formula, while the fourth section deals with the issue of gender-specific minimum retirement ages. The last section concludes.

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2 For a thorough discussion of Italy’s pension system and recent pension reforms see Cesaratto (2009).
1. THE INSTITUTIONAL BACKGROUND

Social Insurance eligibility can be obtained in Italy via old-age pensions, disability benefits and survivor pensions. For sake of simplicity we will consider only old-age pensions: on one hand, disability pensions are perceived as being part of social assistance rather social insurance, and their role in shaping gender roles may consequently be considered as small. On the other hand, survivor pensions, being proportional to the former spouse’s pension, are considered in Italy as being of derivative nature, as a part of the payment benefiting the survivor person but formally accruing to the late spouse, on grounds of he/she having “bought”, through contributions, a life insurance within the public system. Due to the well-known differences in life expectancy and in the average age at marriage, survivor pensions are disproportionally paid to women. However, due to their derivative nature, survivor pensions exert a negative impact on gender roles, confirming a woman’s dependence on her male breadwinner, even after the latter’s death. Thus, in the remainder of the paper we focus on women’s old-age pension as the prime source of their “own” income, and of financial independence, leaving for the conclusions the larger issue of integrating survivor pensions in the analysis.

Next to Social Insurance, Social Assistance (SA) is also provided by the very same public pensions Authorities, due to their ready access to labour-income data. Indeed, in Italy there is no clear distinction between Social Assistance (that in principle should be financed by general taxation) and Social Insurance (financed by workers’ contributions). Concerning the elderly, two major SA instruments are to be found: i) a contributory minimum pension, providing a pavement up to which all pension payments are adjusted, provided that the old-aged exhibit a past work history of some length; ii) a means-tested reduced contributory pension, that only requires five years of contribution and aims at providing a minimum income to almost all the elderly. As it is the case of disability pensions, these social payments are not perceived as a right of the citizen, but rather as solidarity-based instruments of poverty relief. In the following analysis Social Assistance will be ignored, with the aim to highlight the distributive features proper of the pension system.

As documented for example by Gronchi (1995) and Gronchi and Aprile (1998), up to 1992 Italy’s pension system was very complex and unfair. Far-reaching redistribution was implied by a vast number of different rules, governing the minimum pensionable age and the amount of pension’s annuity, but this redistribution was rather opaque and often unreasonable. For example, employees were (and are) treated differently form the self-employed, employees in the public sector differently from employees in the private sector, men differently from women. Furthermore, specific categories (e.g. workers in the national railway corporation) were granted unjustified privileges, possibly as a result of a nepotistic use of the Welfare State for political and electoral aims.

In the wake of a serious currency and financial crisis, in 1992 the Government drastically inverted the course, trying to establish more uniform rules with a first structural (though gradual in its coming into force) pension reform. Among the main features of this “Amato” Reform, worth roughly 4% of GDP each year when fully phased-in, are the switch to indexation to the growth rate of prices, in the place of
wages, and the abolition of a number of privileges (e.g. for public sector employees).

A new reform, aimed at definitively stabilising pension expenditure as a ratio of GDP was passed in 1995 (the so-called “Dini” Reform), which - again on a very gradual basis - established uniform rules for men and women, and introduced a new formula for the calculation of benefits, simulating the financial investment of contributions while confirming the PAYG nature of the system. Among its major goals, the 1995 Reform aimed at establishing actuarial fairness, i.e. the equality between the capitalised value of the flow of pension contributions and the present value of the flow of pension payments. Actuarial fairness has two main advantages: it implies that the system pays a same internal rate of return on contributions for all workers, thus granting real equality of treatment, and it allows workers to decide when to retire, on the basis of actuarial adjustment to their pension systems that would lower monthly payments if retiring earlier.

The new system introduced in 1995, re-branded notionally defined-contribution (NDC) was adopted at the same time in Sweden, and constitutes a reference point for the OECD and World Bank’s pension policies. It is worthwhile to investigate this formula into some detail, in order to question the apparently gender-neutral character of the design of pension systems.

Then, in 1997 a third reform was passed, with the only aim to shorten the transitory phase established by the previous two ones, and in 2004 a fourth one: the “Maroni” Reform. Although even the last one was originally conceived only to speed up the pace of transition, it in fact set up very high minimum retirement ages, thus limiting workers’ actual freedom to choose their age of retirement. Disregarding the principles of neutrality and incentive (through actuarial corrections) of the 1995 Reform, the aim of the reformers in 2004 was to mandate a higher age of withdrawal from the labour force. Thus, this reform may prove less transitory than expected, due its role in shaping expectations, i.e. implying the return to a system were workers do not plan for their retirement, but simply wait for the minimum requirement to be met.

A crucial feature of the 2004 reform, from our point of view, is that (for certain categories of workers) it mandated a gender-specific minimum requirement for the number of years of contribution necessary to obtain an old age pension. In so far as this feature may determine gender-specific expectations, the gender effects of this reform may be relevant, as discussed in section 6. Finally, in 2008 a new minor reform was passed, simply modifying some of the minimum requirements set up by the 2004 reform, without changing its substance.

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3 Indexation is the yearly change in pension benefits after the first year, aimed at preserving the value of pension payments. Indexation to prices keeps the purchasing power of pensions constant in the face of inflation. Indexation to wages allows pensioners to benefit from the growth of living standard enjoyed by workers. If productivity growth is not zero, wages tend to grow more than the inflation rate, and indexation to wages consequently implies higher pension payments in the future than indexation to prices.

4 This minimum age is variable but significantly higher than what is likely to be the current desired age by workers, as can be inferred by a recent survey, analysed by Bottazzi et al. (2006). The only exception is for workers who contributed to the system for more than 40 years.
2. **Women and Men in Italy’s Social Security**

We can relate the whole flow of current old-age payments to the old (pre-1995) system: only a small part of the provisions of the reforms in the 1990s had a direct impact on retirees and older workers (basically, the new regime of indexation). As a consequence, data from the current pension benefits is scarcely informative for the future. However, to show that relevant gender unbalances may be found even in the pension system, it may be sufficient to mention that in 2008 Italy’s women received the majority of old-age payments (53%) but these only accounted for 44% of current pension spending.

Women receive lower average payments for all forms of Social Insurance but survivor pensions, possibly due to four possible causes. Namely, women and men may differ (i) demographically, (ii) in social roles, (iii) in their labour market performance, (iv) in the treatment implied by the Social Security benefit formula. While the first three aspects may be considered external to the pension system, the latter involves its very design, and it will therefore be separately dealt with in the next section.

From a demographical point of view, it is well known that not only women exhibit a higher life expectancy at birth, but this difference is currently increasing with age, becoming substantial at age 60 (Caselli et al., 2003). This implies three sorts of consequences for the design of pensions systems. Firstly, at any retirement age, women are expected to benefit of a longer pension annuity. As actuarial fairness was a goal of the 1995 pension reform, it necessarily implies a smaller annuity unit (i.e. monthly payment) to women, given a same pension wealth’s (PW) present value. Therefore, as poverty measures are generally related to periodic-specific income or consumption, rather than to lifetime wealth, ceteris paribus actuarial fairness implies a higher poverty risk for women.

This point implies a potential conflict between two possible definitions of equity within the pension system: one, featuring equality of benefits (usually leading to flat-rate regimes), the other implying equality of returns (i.e. yielding the same internal rate of return to all receipts).

The second consequence of women’s higher life expectancy is their overrepresentation within survivors’ benefits recipients. Thus, the rate to which survivor benefits are discounted, with respect to the original pension, become a gender-sensitive policy instrument. Finally, and more prominently, a key instrument for gender equality is benefits’ indexation regime, due to women’s over-representation in the older cohorts.

The second mentioned possible cause for gender unbalances in the pension system concerns women’s social role, constituting a major hindrance to their accumulation of pension rights. At the basis of this impediment is the Bismarckian nature of the system, which tightly links benefit entitlements to formal labour market participation. As unpaid work (or, more generally, work in the informal sector) is not counted as “job”, these systems are in fact creating a bipartition of the elderly, between *insiders* and *outsiders*. In Italy, the common household’s division of labour
features women as unpaid caregivers and home keepers even more prominently that in the rest of Europe, with Italy’s female participation rate scoring the second lowest after Malta. Even considering working women, reproductive responsibilities added to centuries-long social traditions, force them to have shorter and discontinuous formal-market careers (see Boeri et al., 2005; Corsi et al., 2008).

As distinguished from the previous point, discrimination and labour market disadvantage should be considered as exerting an impact on gender unbalances in the pension system that is partly independent from the impact of gender roles. Indeed, the social role argument is mainly about labour supply, while labour market performance is mainly about labour demand and its interrelation with supply.

In Italy, women are significantly over-represented among part-time, temporary and flexible workers. On the one hand, these categories of workers are subject to pension contribution at a reduced rate (ideally in order to stimulate labour demand): thus, given the strict proportionality between past contributions and future pensions, they will receive smaller incomes in old age. On the other hand, women’s segregation into these low-paid positions is a good indicator of women’s scarce labour market performance even after they decide to fully participate to it. Two aspects should to be distinguished: women’s difficulty to improve their position and evolve in a dynamic career, and the gender pay gap. Although Italy ranks along with the countries exhibiting the smallest gender pay gaps (17% in 2009), a recent analysis disaggregating earnings differentials highlights that women workers exhibit higher endowments on average (especially higher educational attainments) and, if these were to enjoy the same market returns than men’s, we would observe women’s salaries as being even higher than men’s, by 7.7% on average (see Corsi et al., 2008).

3. GENDER UNBALANCES AND THE BENEFIT FORMULA

3.1 A FRAMEWORK TO INVESTIGATE THE PENSION BENEFIT FORMULA

Under the new (post-1995) regime, in Italy an old-age pension may be obtained in two ways. First, after a minimum of 35 years of contributions and 57 years of age, a “standard” old-age pension can be obtained. As mentioned, benefits are computed on the basis of previous contribution and postponing retirement is rewarded by higher monthly payments, keeping constant the present value of the expected flow of payments. Second, “seniority pensions” accrue to workers after a certain number of years of contributions, independently of their age. The 2004 and 2008 reforms modified the former parameter, gradually raising the minimum years of contribution from 35 to 40. Benefits are computed with the same formula mentioned above.

Since the reforms were made relevant only for the younger generations of workers, we currently observe different categories of workers: some will receive benefits

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5 Such as the proportion of part-time jobs (21 % of women workers, compared to 3.5 % of men) or all the new contracts and positions (so-called co.co.co, 9 % of women / 6.2 % of men, and parasubordinati, 21 % women, 7.7 % men), characterised by smaller wages and smaller rates of contribution (see Borella and Segre, 2008).
computed with the old defined-benefit formula, some with the new notionally defined-contribution formula, some with a mix of the two. However, for the sake of simplicity we will consider the new system as fully phased in.

To illustrate the difference between the two formulas, we consider it useful to introduce a generalisation of pension benefit formulas. For a worker hired in period A and retiring at L, any Bismarck-type old-age benefit formula can be represented as follow (with j as a time index):

\[ p = \alpha \cdot \sum_{j=A}^{L} b_j \cdot w_j \cdot \left(1 + i_j \right)^{-1} \]

where the monthly benefit \( p \) is a weighted average of the life-long monthly salaries \( w \), multiplied by the contribution rate \( b \) and capitalised by a nominal interest rate \( i \). The interpretation of \( \alpha \) depends on the specific regime: its function is however to translate the sum (the virtual capital accumulated during the working life) into an annuity unit (i.e. a monthly payment).

Under the old defined-benefit system, all wages but the last five where not considered (or the last one or the last ten, according to the different categories, in a privilege-distortion fashion discussed above): the respective weight can be assumed as zero. The arithmetic mean of the last few relevant salaries (the so-called “pensionable wage”) was capitalised by a fixed 2% and multiplied by a policy variable \( \alpha \), called Substitution (or Replacement) Rate, representing the fraction of the salary received as pension (therefore being \( b=1/n \) in each period, with \( n \) = number of periods concurring to the pensionable wage).

Due to its intuitive bearing, we will refer to the Replacement Rate also in the context of the new system, with the specific meaning of the ratio between the last salary earned and the first pension payment.

This sort of regime is of the defined-benefit kind because workers would receive a certain benefit, computed only as a function of their past contributions, irrespective of the system’s overall financial viability. Since in fact the social security system has been running a deficit for years, contributions are raised via a transfer from general taxation.6

After 1995, with the “Dini” Reform, all contributions from salaries are capitalised at a fixed rate of 1.5% (close to the current Italian T-Bond long-run nominal interest rate) and summed up to get a Pension Wealth (PW). This is in turn translated into an annuity unit by multiplication by the factor \( \alpha \), now called Annuity Factor (AF). The contribution rate is different among categories of workers (generally 33% for dependent employees, 19% for self-employed and 17% for flexible workers), but

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6 However, due to the mentioned overlapping of social insurance and social assistance instruments, in reality it is incorrect - lacking more information - to attribute the social security budget deficit to the pension system alone.
redistribution has been considerably limited. One of the main goals of the Dini Reform was to gradually establish actuarial fairness (the constancy of the present value of the pension annuity, with respect to the main decision variable, i.e. age at retirement), with the aim to keep the system neutral with respect to workers’ saving and work decisions. Thus, \( a \) becomes here a function of expected residual life, i.e. it increases with age at retirement.

Within this scope, pension eligibility was unified for men and women and for all categories of workers: a 57-65 years old age range was introduced, leaving workers free to choose the moment of retirement in the face of the mentioned actuarial corrections, based on their life expectancy.

The reason for this formula was labelled “notionally” defined-contribution is that in principle \( a \) will be modified every time social security runs a deficit, thus the whole sustainability issue is addressed on the expenditure side, contributions being constant. However, the annuity factor is not worker-specific and is only updated with the evolution of the average life expectancy. Moreover, updating of \( a \) will be based on the objective of eliminating the social security deficit, but only to stabilise aggregate pension expenditure (currently at a level above total contributions) and to grant roughly the same annuity present value to all the subsequent generations.

Overall, this modification of the benefit formula could not have affected the sustainability of the system or the adequacy of benefits, without simultaneously raising contributions and/or cutting benefits. This is clearly implied by the use of a same general formula in equation (1) to represent both systems. Thus, a parametric reform (modifying the values of \( a, b \) or \( i \)) was needed as well.

Raising contributions was politically unfeasible, because in a Bismarckian regime this would amount to increasing firms’ labour costs. Thus the parameters of the new system were set as to equal the old formula for a 62 years old worker with 37 years of contribution. Any value below these two figures would produce lower pension benefits under the new regime. Since the 62-37 values are far from the average professional career in Italy, public spending will be reduced unless workers will start working considerably longer.

Given the current trends, with the 1995 reform a typical worker (i.e. male) has lost 10% of his 1992 replacement ratio, while the 1992 Reform had already drastically reduced the present value of the annuity due to the change in the indexation regime.

### 3.2. The Gender Impact of the Benefit Formula

Due to the gender pay gap, there is a presumption that a regime that softens the Bismarckian relationship between contributions and benefits has some probability of

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7 For example, not the contribution actually paid but “imputed” contributions count for the determination of Pension Wealth, and the difference between actual. Imputed contributions are small but different between different categories of workers.
drifting additional resources towards women. In fact, this applies to Italy’s pre-reforms system, especially due to the possibility for women to retire earlier than men, given contribution years (this feature will be dealt with in section 4).

On the whole, we can distinguish two positive, two negative, and two ambiguous effects of the pension reforms in 1990s:

- **(positive)** The whole working life was made relevant for the determination of the pensionable wage. Thus, the old positive discrimination in favour of the most dynamic carriers (i.e. men’s) was cancelled.

- **(positive)** The introduction of a compound-interest capitalisation mechanism of contributions. By simulating a financial investment, it attached a greater importance to the contributions paid at early phases of workers’ careers. We deem it positive because in Italy women’s participation rates are higher gender and pay gaps are smaller at younger ages (see Figure 1 below).

- **(negative)** The introduction of indexation to prices, in the place of wages. It cut longer annuities’ value more than shorter ones’. Since pensioners do not participate in societies’ improvements in living standards, their relative position falls over time: older pensioners, among whom women are over-represented, loose the most.

- **(negative)** Tightening of the link between contributions and benefits with the introduction of the NDC formula. Women’s discrimination in the labour market is increasingly transferred to the Social Security system.

- **(ambiguous)** By raising the minimum age at retirement to 57 for both men and women, the reforms mandated a postponement of retirement age, comparatively longer for women. However, under the new regime, this also leads to higher benefits, and freedom of choice on the age at retirement was set in the 57-62 age bracket.

- **(neutral)** The use of a unique vector of Annuitation Factors \((a)\) in the terminology used in equation 1, implying a common transformation rule of the total Pension Wealth into annuity units. It has often been considered a favour to women and a somehow unjustified redistribution of resources from men, in the light of women’s longer life expectancy. However, this is a misjudgement, arising from the consideration of a single, a-gendered, ideal consumer/worker. When considering the typical (modal value) person in working age, we see he/she is married. It is thus equitable for men to pay a higher price to “buy” their annuity, as they pay for their wives’ survivor pension as well. Indeed, while men should receive higher monthly payments for their old-age pension, they should pay more to “buy” their wives’ survivor pensions because their survivors exhibit on average longer life expectancy and smaller age at marriage. The equal Annuity Factor is simply a weighted mean, taking into account men’s and women’s
probabilities of being married. Thus, the use of a unique vector does indeed imply redistribution, but only from single persons to married couples, with no gender dimension.

These contrasting features make it difficult to \textit{ex ante} determine the overall impact of the reforms from a gender point of view. For this reason, in the next section we develop a simplified simulation framework to assess the relevance of their compound impact.

It should be recalled that the different features outlined here represent a new set of incentives and will possibly modify social attitudes and preferences, thus leading to further indirect effects. However, due to the intrinsic difficulty for most workers to understand the benefit formula, referred to above, these effects will only partly be considered in section 4.

3.3. A SIMULATION EXERCISE

Preliminarily, it should be pointed out that data on pensions do not represent the position of the elderly in society, their relative standard of living or social inclusion, as these critically depend on living arrangements (especially the dimension of the household, due to economies of scale), other sources of income, net wealth, age-specific costs, etc. Yet, in the light of the great share of public pensions within old citizens’ income in Italy (as documented by OECD, 2003b), especially for the poorer among the old-aged, a \textit{ceteris paribus} reduction in the generosity of public pensions is likely to constitute a major drop in the future standard of living of many households.

Figure 1 shows the age profiles of average yearly earnings for men and women in 2008, as reported by the \textit{Fondo Pensione Lavoratori Dipendenti} (FPLD), i.e. the branch of the Social Security agency that collects all contributions from private sector employees. Since the dataset excludes the self-employed and all civil servants, the implied gender pay gap is different from Eurostat’s official estimations, but the limitation to the FPLD is required by the plurality of pension regimes among the different categories of workers (while the parameters of the benefit formulas remain partially differentiated between categories as well).

\footnote{Thus, the data informs about the age-structure of earnings for a cross-section of workers and are not taken from a longitudinal or panel survey. We assume that it may still be informative because, although it would be incorrect to impute to younger workers the wage developments observed for previous generations (which for example exhibit lower educational levels), we maintain that it would be the same arbitrary to simulate future earnings on the basis of future workers’ endowments and constant labour-market returns to these characteristics.}
In our simulation exercise, we compute the expected pension benefits of an ideal worker, perfectly matching the average case, under the old and the new regime. By “old regime” we mean the pre-1992 defined-benefit regime for private employees; by “new regime” we mean the fully phased in notionally defined-contribution regime introduced in 1995. The 2004 and 2008 reforms only concerned the pace of transition, and will considered in the next section.

By considering the average wage for each age bracket we specifically exclude discontinuities in the employment status, a relevant feature of the formal labour market especially for women, so that our analysis bears an optimistic bias (which will not hamper the emergence of rather worrying results). For example, D’Ippoliti (2010) shows that a two-years break in contributions in the early period of a woman’s career, e.g. the 8th and 9th years, would lead to a decrease in the Substitution Rate between 2% and 3%, depending on age at retirement. Due to the compound interest mechanism, interruptions have a bigger (negative) effect the earlier they take place.

For men and women, we consider the following indicators. The Substitution (or replacement) Rate (SR) is the ratio of the first pension payment to the last salary earned: it is a measure of workers’ ability to preserve their living standards upon retirement. The Substitution Rate is an intuitive and widespread indicator, used for its nature of rough poverty index summarising the percentage change of income due to retirement. However, it should be remarked that pensioners’ income changes considerably during retirement, according to the indexation regime (see discussion below). The Internal Rate of Return (IRR) is the interest virtually earned from the participation to the system, computed assimilating contributions payments to a financial investment and pension payments as the subsequent financial income. It is a measure of the profitability of remaining in the system as compared to allocating

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9 For an estimation of the role of family arrangements and career interruptions on the prospective pension benefits of men and women, see Horstmann and Hüllsman (2009).
the same resources in the financial market: although opting out is allowed in Italy, it is useful to study the choice on age at retirement. Finally, the present value (PV) of Pension Wealth is the present value of the expected flow of pension payments expressed in 2010 € prices. Although less intuitive, this value measures the value of the whole pension annuity (given average life expectancy) as if it was a stock of bonds in workers’ portfolio: it is useful because it allows us to account for changes in the indexation regime.

Concerning the auxiliary hypotheses necessary to carry on our simulations, for the sake of comparability we adopt the values implied by the official simulations on the long-run prospects of social expenditure (RGS, 2010): no inflation; 1.5% constant yearly GDP growth, equal to the constant growth rate of the wage bill; 76 years-old life expectancy for men, 82 for women. Even though pension payments are not fully indexed to prices (depending on the overall individual income), the no-inflation hypothesis allows us to ignore the problem, hence further overestimating women’s benefits.\[10\]

When considering the Substitution Rate, two sorts of result emerge. First, retirement is not allowed before 57, and a direct comparison is thus unfeasible. Second, as it emerges from Table 1, the wave of reforms seems to have caused a projected positive effect for workers retiring after 57. In fact, this result arises from the limits of this intuitive though inaccurate indicator. As a matter of fact, the reforms implied two sorts of savings by cutting pension expenditure: (i) with the 1992 Amato Reform, by modifying the indexation regime (from indexation to wages to indexation to prices), implying that SR is not a good measure of pension wealth, because the indexation of benefits only concerns later payments, after the first one; and (ii) with all other reforms, by mandating a postponement of retirement without compensating workers in full for the shortening of the length of the annuity, i.e. by not proportionally raising monthly payments. What emerges from Table 1 is that men will benefit more, in terms of the first monthly payment received, by postponing retirement.

\[10\] As mentioned, the indexation regime is a gender-sensitive measure because of women’s longer annuity enjoyment.
TABLE 1. SUBSTITUTION RATES

<table>
<thead>
<tr>
<th>Age at retirement</th>
<th>Old Regime</th>
<th>New Regime</th>
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<td>W</td>
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<td>60</td>
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<td>0.820</td>
<td>0.933</td>
</tr>
<tr>
<td>61</td>
<td>0.867</td>
<td>0.878</td>
<td>1.035</td>
</tr>
<tr>
<td>62</td>
<td>0.880</td>
<td>0.889</td>
<td>1.104</td>
</tr>
<tr>
<td>63</td>
<td>0.894</td>
<td>0.900</td>
<td>1.179</td>
</tr>
<tr>
<td>64</td>
<td>0.907</td>
<td>0.910</td>
<td>1.259</td>
</tr>
<tr>
<td>65</td>
<td>0.920</td>
<td>0.920</td>
<td>1.347</td>
</tr>
</tbody>
</table>

Note: Standard old-age retirement not allowed before age 57 under the new regime. Under the old regime, seniority retirement was possible after 35 years of contributions: under the hypothesis that the work career starts at 19, in our simulation it results in eligibility at 54.

These benefit reductions can be investigated by comparing the present value (PV) and internal rate of return (IRR) of the pension annuity before and after the reforms, as shown in Table 2. In order to highlight the loss implied by the reforms, for the new regime we impute hypothetical PVs and IRRs for retirement before age 57 although this is not permitted after the 1995 reform.

For the sake of simplicity, we exclude the value of the survivor pension(s) possibly linked to the old-age ones, because none of the reforms modified this aspect. As a consequence, in our simulations women appear to enjoy higher IRRs under all regimes. Indeed, as mentioned men’s probability of leaving survivors after their death is higher than women’s, and the average value of men’s survivor annuities (i.e. pensions to widows) is higher. Given the 1995 average values of men’s and women’s age at marriage, life expectancy and average value of old-age pensions, the 1995 reform defined a vector of annuity factors \( \alpha \) that precisely imply a same IRR for men and women. However, it should be noted that such variables are subject to change (e.g. in the last decade it would seem that women’s life expectancy grew slightly more than men’s), and this equality will not necessarily hold in the future. Given the impossibility to predict such future evolutions, we exclude survivor pensions from the analysis.

From Table 2, it emerges that women will face smaller losses from the reforms of the 1990s, both in terms of IRR and PV, thus reversing the result emerging in terms of substitution rates.
Table 2. Internal Rate of Return and Loss in the Present Value of Pensions (%)

<table>
<thead>
<tr>
<th>Age</th>
<th>Internal Rate of Return</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Old Regime</td>
<td>New Regime</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>M</td>
</tr>
<tr>
<td>54</td>
<td>3.70</td>
<td>3.19</td>
</tr>
<tr>
<td>55</td>
<td>3.45</td>
<td>2.81</td>
</tr>
<tr>
<td>56</td>
<td>3.22</td>
<td>2.52</td>
</tr>
<tr>
<td>57</td>
<td>2.98</td>
<td>2.23</td>
</tr>
<tr>
<td>58</td>
<td>2.75</td>
<td>1.93</td>
</tr>
<tr>
<td>59</td>
<td>2.52</td>
<td>1.63</td>
</tr>
<tr>
<td>60</td>
<td>2.28</td>
<td>1.32</td>
</tr>
<tr>
<td>61</td>
<td>2.03</td>
<td>0.96</td>
</tr>
<tr>
<td>62</td>
<td>1.76</td>
<td>0.59</td>
</tr>
<tr>
<td>63</td>
<td>1.57</td>
<td>0.30</td>
</tr>
<tr>
<td>64</td>
<td>1.36</td>
<td>-0.20</td>
</tr>
<tr>
<td>65</td>
<td>0.95</td>
<td>-0.64</td>
</tr>
</tbody>
</table>

Note: nominal interest rate = 2.5%

Brugiavini and Peracchi (2003) stress that it is particularly important to notice the decreasing value of IRR and PV as a function of age at retirement. In other words, staying in the PAYG system is not a good financial investment, and for utility-maximising individuals it is profitable to leave the system (i.e. to retire) as early as possible, in order to maximise the financial return from the participation to the system, in order to invest part of the flow of pensions in the financial market, yielding a higher rate of interest. By mandating a higher minimum age at retirement, the reforms limited this possibility, implying a relevant cut in pension annuities. Since before the reforms women were allowed to retire earlier than men, they are going to lose more from this policy. However, since women’s annuities remain longer than men’s, due to their higher life expectancy, the loss appears as proportionally higher for men.

Since after 1995 the financial convenience to participate to the system is the same, i.e. IRRs are equal, the only source of the differences between men’s and women’s substitution rates, as highlighted in Table 1, can be the disparities imported from the labour market.

To evaluate the ex-post relation between the labour market and social security, we compute (in our sample, which we remind only comprises private sector employees) a “gender pay ratio” measured as women’s average earnings as a percentage of men’s, and we compare it with a “gender pension ratio”, measured as women’s average first pension payment as a percentage of men’s. Reference to the first pension payments, rather than the average benefit or the annuities’ present value, is
useful for the analogy with the Substitution Rate: the use of a life-time measure would indeed further lower the gender pension ratio, due to women’s overrepresentation among the older cohorts.

Table 3 compares the results, showing that the old system was partially redistributing from men to women, by implying a gender pension ratio higher than the gender pay ratio found in the labour market. However, this is true only for very high ages at retirement, which are the exception under the old system. The new system is vice versa almost neutral: indeed, upon retirement women lose roughly a half percentage point in the comparison with men’s income, but this quantity is almost constant and should not affect the choice of age at retirement. Thus, it may be said that most gender differences in income at old age arise from the previous differences in labour income.

**TABLE 3. EARNINGS DIFFERENTIALS FOR WORKERS AND PENSIONERS**

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender pension ratio</th>
<th>Difference between gender pension ratio and gender pay ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New</td>
<td>Old</td>
</tr>
<tr>
<td>54</td>
<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>55</td>
<td>0.84</td>
<td>0.84</td>
</tr>
<tr>
<td>56</td>
<td>0.84</td>
<td>0.84</td>
</tr>
<tr>
<td>57</td>
<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>58</td>
<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>59</td>
<td>0.84</td>
<td>0.84</td>
</tr>
<tr>
<td>60</td>
<td>0.84</td>
<td>0.84</td>
</tr>
<tr>
<td>61</td>
<td>0.84</td>
<td>0.84</td>
</tr>
<tr>
<td>62</td>
<td>0.84</td>
<td>0.84</td>
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<tr>
<td>63</td>
<td>0.84</td>
<td>0.84</td>
</tr>
<tr>
<td>64</td>
<td>0.84</td>
<td>0.84</td>
</tr>
<tr>
<td>65</td>
<td>0.84</td>
<td>0.86</td>
</tr>
</tbody>
</table>

Note: gender pay ratio = 0.838

We deem it appropriate to try and estimate the prospective adequacy of the pension system to preserve a decent standard of living for the old aged. Two possible measures are the average pension over average per-capita income, and the average pension over average male wage (at the same age). We compute the two indexes for women (under all the assumptions mentioned above) for the first pension payment: results are displayed in Table 4. It is there shown that by only by postponing retirement old women may preserve a consumption capability similar to male workers. However, given the currently worrisome trends in income distribution, this will still imply an income equal at best to one third of future per capita GDP.
TABLE 4. ADEQUACY OF WOMEN’S PENSIONS

<table>
<thead>
<tr>
<th>Age at retirement</th>
<th>First pension over average male wage</th>
<th>First pension over average GDP per-capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>65 %</td>
<td>21 %</td>
</tr>
<tr>
<td>58</td>
<td>69 %</td>
<td>22 %</td>
</tr>
<tr>
<td>59</td>
<td>73 %</td>
<td>23 %</td>
</tr>
<tr>
<td>60</td>
<td>83 %</td>
<td>25 %</td>
</tr>
<tr>
<td>61</td>
<td>88 %</td>
<td>26 %</td>
</tr>
<tr>
<td>62</td>
<td>94 %</td>
<td>27 %</td>
</tr>
<tr>
<td>63</td>
<td>101 %</td>
<td>29 %</td>
</tr>
<tr>
<td>64</td>
<td>107 %</td>
<td>30 %</td>
</tr>
<tr>
<td>65</td>
<td>115 %</td>
<td>32 %</td>
</tr>
</tbody>
</table>

Furthermore, pensions - as any constant source of income - are subject to a “vintage effect”, i.e. a loss of relative value with respect to social conditions. Indeed, given the official projections of a real GDP and wage growth yearly 1.5%, due to the lack of indexation to wages, the value of pensions will gradually decrease as a percentage of GDP, and getting older will really mean getting poorer. This phenomenon is captured by Figure 2. In the Figure, shifts of the schedules are due to different assumptions on age at retirement, while the downward slope of the schedules graphs the vintage effect. As it emerges, it is unlikely that our “average” woman worker will maintain a decent standard of living without the support of her husband, confirming a condition of dependence also in retirement, or possibly introducing it anew in old age, even after a complete and uninterrupted career in the formal labour market.

FIGURE 2. PENSION BENEFIT AS A PERCENTAGE OF GDP PRO-CAPITA

![Figure 2. Pension Benefit As A Percentage Of GDP Pro-Capita](image-url)
4. THE MINIMUM AGE AT RETIREMENT

To sum up, our analysis suggests that pension reforms in the 1990s brought about a substantial equality of treatment between women and men. They considerably slashed pension expenditure by both mandating a higher age at retirement (without compensating workers with correspondingly higher monthly payments) and by reducing average monthly payments (especially as a function of age at retirement and with the change in the indexation regime). These cuts risk bringing about a concrete risk of poverty in old age: especially for women, due to the already lower labour income.

Both in the political debate and in the literature, references can be found on the opportunity to compensate this “longevity” risk with the privilege of retiring earlier. In all pension regimes were actuarial adjustments do not perfectly compensate for shifts in the age at retirement, retiring earlier implies granting a higher annuity’s Present Value, though enjoyed for a longer time span, possibly with no consequence on annuity units (and consequently on poverty risk rates). For example, Ginn (2004) claims that “[m]oving beyond equal treatment requires policies to reconcile family caring and employment. [...] Until this ‘femtopia’ is reached the pension penalty due to family caring can be reduced by redistributive features in state pension schemes.” (p. 4).

In the EU, according to the MISSOC database, Greece exhibit differentiated minimum age requirements during its transitory phase (after a recent pension reform), Belgium did up to 2009, while Austria and the United Kingdom are formally moving towards equal minimum requirements, but with so slow a pace that full equality will only be reached in 2033 and 2020 respectively. In Italy, a presumably “positive” discrimination towards women was re-introduced with the 2004 “Maroni” Reform, which allowed women to retire earlier than men (at 60 rather than 65), in the case of old age pensions when the minimum threshold of years of contribution (35) is not reached. Although this case applies only to a fraction of the labour force, women are over-represented among these workers, because they have more difficulty in accumulating 35 years of contributions due to career interruptions. The recent 2008 “Damiano” reform confirmed this feature.

On the one hand, by setting smaller minimum requirements, the system allowed for greater flexibility for women in the decision on when to retire. On the other hand, the benefit formula described above implies higher benefits for late retirement: if economic agents were not perfectly rational and forward-looking and/or not fully informed, this would imply a risk for women’s welfare in old age. Indeed, there is some evidence in the literature of agents’ myopia in the specific field of pension planning. Specifically comparing women and men, James et al. (2003) show that women’s smaller age at marriage and higher life expectancy may induce them to retire earlier than what would be “optimal”, to follow their husbands’ condition. Concerning Italy, Bottazzi et al. (2006) show it will take a long time for the great majority of workers to fully understand the dimension of their pension coverage and the functioning of the new system (including the age at which they may be able to

11 Compare Casarico and Profeta (2009).
retire), due to the inherent difficulty of the pension formula and the very long and stratified period of transition. This is particularly true for women, as Boeri and Brugiavini (2008) show.

We maintain that the position held by the 2004 and 2008 reforms is a dangerous one. It is indeed positive to recognise that the market per se is not able to address the issue of conciliation between the housework burden and women’s employment, with the consequent impact on earnings and therefore on women’s ability to contribute to social security. But we maintain that it is a mistake to think that the solution to problem of conciliation is to be found within the social security system, which did not cause the problem. Vice versa, such a late compensation risks establishing an economic rationale for the current division of social roles and of unpaid work within the family. Indeed, not only would it grant a legal recognition and label of rationality to unjust customs and behaviours, but it would also provide financial incentives to it. Indeed, given the higher IRR at younger ages at retirement, it would be in women’s interest (if they were to maximise life-long expected utility) to exploit the “benefit” granted by the 2004 reform, of retiring earlier, possibly to stay at home doing more unpaid work.

After a decade of reforms in the 1990s, it may be said that, at least from a gender perspective, men and women internalised the spirit of equality in the pension system. As shown in Figure 3, while before the reforms women expected to retire two years before men, on average, after the reform they exhibit an average expected age at retirement even slightly higher than men’s (the difference is not statistically significant). Thus, although the 2004 and 2008 reforms only concern a limited number of workers, their impact may indeed be larger, on culture and expectations.

**Figure 3. Expected Age at Retirement Before and After the Pension Reforms of the 1990s**

![Graph showing expected age at retirement before and after pension reforms.](image)

12 For the case of Italy, see Boeri *et al.* (2005), Corsi (2007), Cipollone and D’Ippoliti (2010), and the literature cited there.
5. Concluding Remarks

Italy’s several pension reforms followed a trend similar to many OECD countries, with the introduction of a multi-pillar system, at least partly pre-funded, the partial privatisation of the system and the substantial cut of unfunded public pensions. We focus on this latter feature and by considering only the expenditure side of public pensions we developed a framework to analyse the impact of several measures from a gender perspective.

We claim that Bismarck-type regimes are generally less favourable to women, due to the tight link with the formal labour market they imply. Similarly, the shift from a defined-benefit to a defined-contribution regime implies a stricter proportionality of pension benefits and previous earnings, which, given their smaller labour income, may induce a risk of poverty in old age for women. The consideration for the whole career, in the place of a few last years of contribution, is assumed to be a positive measure due to the smaller pay gap at younger ages, which is found in Italy’s case, and the same holds for the introduction of mechanisms simulating a compound capitalisation of contributions in the place of simple capitalisation. Due to women’s longer life expectancy, rules governing survivor pensions, and especially indexation rules appear as a major gender-specific policy instruments.

Overall, due to the compound and contrasting impacts of these many features, an a priori assessment of Italy’s pension reforms from a gender perspective can hardly be reached. Thus, we developed a simple simulation exercise to assess the ex post impact of the reforms.

Our results suggest that the reforms were substantially able to reach their goal of granting equal treatment to women and men within the pension system, by neutralising the previous positive discrimination. However, this goal was reached at the cost of imposing an extra burden on women, in the form of mandating higher age of withdrawal from the labour force (with a longer delay than men), and reducing monthly payments that were already low for women.

Given current expectations and observed patterns, these measures are likely not to be counterbalanced by the postponement of retirement, with the result of considerably increasing the poverty risk of future old men, but especially old women. However, how this poverty risk should be tackled remains an open question.
REFERENCES


