

From PAYG to Funding in Italy: A Feasible Transition?

by Onorato Castellino and Elsa Fornero*

1. Introduction

Even after the Amato (1992) and Dini (1995) reforms,¹ the Italian pension system is fundamentally based upon a PAYG scheme, the funded component being so far negligible. The system is highly unbalanced (benefits exceed contributions by about 4 per cent of GNP), and its current rules will lead to financial equilibrium only about 2050.

This paper argues that a mixed system, consisting of a PAYG scheme and of a complementary fully funded one, can be considered superior to either “pure” extreme, and that, notwithstanding its undeniable difficulties, the transition towards such a system should be pursued in Italy.

The argument for a partially funded system is examined in sections 2 and 3, while section 4 assesses the extent of the current imbalance in the Italian PAYG scheme and the size of the burden it imposes on taxpayers.

Sections 5 and 6 consider two alternative transition paths to a mixed system. Section 5 assumes no further changes in the present PAYG rules and examines the prospects for a complementary funded scheme, financed by future flows to “severance pay” funds (“Trattamento di Fine Rapporto”, or TFR). Section 6 suggests a more innovative scenario where the current payroll tax rates are lowered for new cohorts and the amounts thus made available mandatorily diverted to funding.

The aim of sections 5 and 6 is to establish orders of magnitude and to relate the problem to general economic policy. Given the financing assumptions of the new schemes (future TFR flows in section 5 and part of the payroll tax rate for new workers in section 6), both sections necessarily envisage a long and gradual transition process. Section 7 attempts to draw conclusions.

* Dipartimento di Scienze economiche e finanziarie, Facoltà di Economia, Università di Torino. E-mail: castellino@econ.unito.it; fornero@econ.unito.it. This is a revised and updated version of a paper published in *Politica Economica*, January 1997.

¹ The 1992 reform, undertaken on the verge of a confidence crisis, mainly increased the statutory retirement age, cut the benefits formula and abolished indexation to real wages. However, it left the underlying mechanism unaltered and did not affect “seniority pension” rules except in the public sector, where they were particularly generous. Such pensions may be drawn after a given number of working years, irrespective of age, thereby permitting the statutory age limit to be bypassed. Furthermore, this reform was too timid in respect of the transition period. The 1995 reform was more innovative in its long-term design, particularly in substituting the previous (final) wage-related pension formula with a contribution-related one, based on actuarial fairness, and in abolishing the “seniority pension” rules. Yet it also envisaged a very long transition period, and will be fully phased in only after several decades. (Later measures, adopted at the end of 1997 under the Prodi government, further tightened the transition rules for seniority pensions.)

2. The attractions of funding

All over the world the tide has now turned against PAYG social-security systems designed to offer an almost complete coverage of old-age needs. In many cases, these systems had been designed under the influence of the high growth rates of the 1950s and 1960s, without proper consideration of their long-term dynamics. But growth rates are now much lower, while life expectancy is steadily increasing, and most PAYG systems are thought to be in a state of actual or impending crisis.

Many countries have enacted reforms which cut benefits or increase contributions, while in the process putting an end to a number of perverse redistributive flows which had been creeping into their systems. But deeper and more far-reaching reforms have also been implemented or are currently being discussed, tantamount to turning, partly or entirely, from PAYG to funding.²

Why should a funded, or at least a mixed, system be preferable to pure PAYG? The answer is based on three types of arguments. (These do not include the view, which sometimes surfaces in the political debate, that the introduction of a funded component helps to correct the imbalance in the PAYG scheme. This view is mistaken: when cuts in current benefits and accrued rights appear politically unfeasible, or after all feasible cuts have been made, the existing – or remaining – social security debt has to be acknowledged and honoured irrespective of whether a funded component is introduced or not. On the contrary, a shift to capitalization makes the problem more urgent and more acute.)

Funding as a remedy to labour market distortions

The first argument relies on the “deadweight loss” effects of payroll taxes, in terms of reduced labour supply or other distortions (e.g. shifting compensation from cash to untaxed elements). Such effects are quite obvious if the link between payroll taxes and benefits is a weak one. But this is not an essential feature of a PAYG system, and can be eliminated by using an actuarially fair pension formula, such as the one devised for Italy by the Dini reform.

Even assuming that pensions are strictly linked to contributions, however, the mere fact that the implicit return is lower under PAYG than under funding³ implies a higher price for the same annuity when “bought” through the former (of which more below). The difference is equivalent to a pure tax, with the ensuing disincentives on labour supply. This is a stronger argument in favour of funding, but the empirical magnitude of the relevant elasticity is highly controversial, and furthermore the increased taxation, which is necessary, as will be seen, to cover the transition period, has itself a disincentive effect. The labour market distortion argument, although looming large in the literature,⁴ is not decisive in the debate and will not be pursued any further in the present paper.

² PAYG means relying on the contributions of future generations and therefore intrinsically requires government intervention, while funding, in principle, can be either publicly or privately managed. It is however customary to use “private” as an equivalent to “funded”, and the present paper adopts this practice.

³ As is well known, the implicit rate of return of a PAYG system is the rate of growth ($n + g$ for short) of the wage bill (or of GNP, assuming one to be a constant fraction of the other), while a funded system yields the average return of the assets it has accumulated (r for short). On the basis of an almost universal experience (see for instance Abel *et al.*, 1989), the prevailing opinion in the literature is that $r > n + g$.

⁴ See Arrau and Schmidt-Hebbel, 1995; Corsetti and Schmidt-Hebbel, 1995; Feldstein, 1996; Feldstein and Samwick, 1997; Kotlikoff, 1995, 1996.

Funding and aggregate savings

The third argument has to do with the impact of PAYG social security on aggregate savings, and deserves greater scrutiny.

Under reasonable assumptions, it can be shown that the introduction of a PAYG system reduces savings, capital formation and therefore potential GDP.⁵ Conversely, a switch from PAYG to funding, under the same set of assumptions, has the opposite effect.

Let the transition phase from PAYG to funding start at time zero. During the transition, PAYG is gradually abolished and a new funded system phased in. Assume that both past and future pensioners are promised the same level of benefits as under the pre-existing regime.

In a nutshell, this is the expected sequence of events (partial substitution follows a similar pattern). At time zero, thanks to his past working life, the average worker of age t has matured (under the old rules) the right to a yearly benefit (payable after reaching pension age) P_t , while after a full working life he had been promised $P > P_t$. Such a worker is asked to pay, for the rest of his working life, a payroll tax (or insurance premium) to the funded system such that, at the market rate of return, he will accumulate the right to an additional benefit $(P - P_t)$. For new entrants, P_t is zero, and the premium must be such as to accumulate – over an entire working life – the right to an annuity P . In both cases, as required by assumption, benefits do not change as compared with the previous system.⁶

So far, so good. But what about the backlog from the old system – the full benefits for existing pensioners and the P_t component for workers active at time 0? This is a “social security debt” which must be borne by some cohorts: the literature on privatization offers an entire spectrum of suggestions on how and by how many. In a first round of papers, Feldstein (1995b, 1996) proposes the issue of perpetual government bonds; in later papers (Feldstein, 1997, Feldstein and Samwick, 1996, 1997), the solution lies in a (temporary) increase in payroll tax rates. Kotlikoff (1995, 1996) considers an array ranging from proportional and progressive income taxation to payroll taxation, consumption taxation, and debt financing.

On each cohort, therefore, the impact of changing from PAYG to funding is the algebraic sum of two components. The positive one is the higher rate of return it earns on the payroll taxes (or premia) from time zero onwards (in other words, the lower price at which that cohort can buy annuity rights).⁷ The negative one is its contribution to amortizing (or at least paying interest on) the pre-existing social security debt. All the above mentioned solutions (and many possible others) have at least three points in common.

First, at the beginning of the transition phase, at least some (but possibly all) cohorts are worse off than they previously were: they must both bear the heritage of the old system and pay the price for the foundation of the new one. The shorter the repayment period, the heavier is the burden imposed on the relevant cohorts; therefore, a larger debt calls for a longer transition. (The longest transition of all is the issue of an infinitely lived debt, whose interest is paid by all future generations.)

⁵ The literature on this point was originated by Feldstein, 1974; see also Feldstein, 1995a.

⁶ To simplify framework and notations, we have not taken into account the fact that each cohort enjoys a lifetime income and a level of pension benefits greater than the preceding one.

⁷ Cohorts above pension age do not enjoy this component.

Second, since the disposable income of some or all cohorts is reduced (over a number of years), private consumption is also reduced over the same period, which generates an increase of aggregate saving⁸ and investment.⁹

Third, the difference between the return offered by funding (r) and that implicit in PAYG ($n + g$) is of paramount importance. Feldstein, and Feldstein and Samwick, reach astonishing results in comparing the new (funded) with the old (PAYG) steady state because their calculations are based on $r = 9.3$ (or, alternatively, 9) per cent in real terms,¹⁰ while $n + g$ is taken to have been 2.6 per cent in 1960–1994 and is expected to be 2 per cent or less in the future.¹¹ In the long run, with a 9 per cent real return, the projected level of benefits in the U.S. system would only cost a contribution rate of 2.02 per cent, as opposed to the present 12.4 and the expected 16 per cent or more.

Moreover, thanks to the generous yield of funding, the transition is short and easy to bear. In the versions of the model where the transition is financed by raising the payroll tax (Feldstein and Samwick, 1996, 1997), the rate initially increases from 12.4 to a modest 14.4 per cent, then it starts decreasing gently and after 19 years it crosses the 12.4 per cent line, reaching 2.23% in year 75.¹² The transition is such that even the first two generations (meaning parents and children taken together) realize a positive net gain from the switch (Feldstein and Samwick, 1996, p. 34).

A macroeconomic and a microeconomic view are therefore necessarily intertwined within the above argument. When the new steady state is reached, the lower cost of a given annuity or, alternatively, the higher annuity for a given cost imply, at the individual level, higher lifetime income and consumption. In order for this to be possible for the average worker (and therefore for everybody), GNP must increase as compared with the PAYG scenario, and this is feasible only through increased capital accumulation.

Funding and risk

So far, funding and PAYG have been compared under the implicit assumption that both offer certain returns. Obviously, neither does. PAYG, relying on population and productivity increases, is vulnerable both to shocks affecting these parameters and to the political risk of unfavourable legislative changes in the event of major imbalances in the system. Funding may reap the higher yields of bonds and stocks, but is subject to the volatility of these markets (especially of the latter).

As far as funding is concerned, Feldstein and Feldstein and Samwick tackle the question

⁸ Of course, savings by individuals decrease, but this is more than offset, in the aggregate, by the accumulation of pension funds assets. Assume that, in year 1, families pay (through any kind of taxation) the equivalent of the pre-existing payroll tax, plus the premia for the funded system, the latter amounting to 100. As compared with the old system, disposable income decreases by 100; suppose consumption decreases by 70 and private saving by 30. Owing to the accumulation by pension funds (to the amount of 100), aggregate saving increases by 70.

⁹ Keynesian fears that an increase in aggregate *ex ante* savings might generate depression and a GNP decrease never creep into this argument.

¹⁰ See Feldstein, 1995b, p. 16; 1996, p. 3; 1997, p. 15; Feldstein and Samwick, 1996, p. 6; 1997, p. 9. The figure is obtained as follows: the return of a mixed portfolio (60 per cent equity and 40 per cent debt) has yielded about 5.5 per cent *net of taxes* in the post-war period; given an average rate of taxation of 40 per cent, this corresponds to roughly 9 per cent before taxes.

¹¹ See Feldstein, 1995b, p. 16; 1996, p. 3; 1997, p. 3; Feldstein and Samwick, 1997, p. 9.

¹² Feldstein and Samwick, 1997, p. 17. The difference between 2.23 and 2.02 is due to the last survivors of the PAYG era.

either by looking at a certainty equivalent¹³ or by calculating that, given the post-war volatility of U.S. financial markets, a slight increase in the equilibrium payroll tax rate (from 2.02 to less than 3 per cent) is sufficient to reach virtual certainty that the actual annuity will not be less than the targeted one.¹⁴ In either case, these authors conclude that funding dominates PAYG even without considering the latter's uncertain returns.

3. Funding versus PAYG or funding and PAYG?

In the previous paragraph it has been emphasized that the Feldstein *et al.* argument relies heavily on the assumed spread between r (9 per cent or more) and $n + g$ (2 per cent or a little more). The lower the difference, the lower the microeconomic attraction of turning from PAYG to funding and the higher the burden on the transition cohorts.

Are the figures the right ones?

The second figure may be accepted for lack of better information or forecasts on future GNP growth. The first one (9 per cent) is based on the U.S. experience of the post-war period. Three remarks are in order.

First, while a longer view (such as 1802–1992) of U.S. history warrants a similar assumption,¹⁵ international experience is mixed and does not always justify the same degree of optimism (see Goetzmann and Jorion, 1997, and Fornero, 1999, chapter 3). Furthermore, both for the U.S. and the rest of the world, the big question is: to what extent can we rely on the past to forecast the future?

Second, in a neo-classical model, an increased capital stock leads to a lower rate of return. This force must also be taken into account: in one of Feldstein's calculations (1997, p. 16), it reduces the rate of return from 9 to 7.2 per cent.

Third, both PAYG and funding require an administrative machine for collecting contributions (payroll taxes or premia) and paying benefits, but funding needs, in addition, an asset management activity. Returns must therefore be reckoned net of these additional costs. How high are they? Experience shows a wide range (see Diamond, 1994; Davis, 1995, p. 130; Mitchell, 1996; Feldstein 1996, p. 11*n*; 1997, p. 16; Fornero 1999, section 3.9); one may assume that, in an advanced and competitive financial market, these costs reduce the rate of return by 0.5 to 1 per cent.

Two reasons for a mixed portfolio

It may therefore be reasonably argued that the expected return from funding is higher than from PAYG, but the spread is not necessarily as high as Feldstein *et al.* assume. Furthermore, and even more important, there are less optimistic ways of looking at risk. Cochrane (1997, pp. 3–8) and Goetzmann and Jorion (1997) stress the “survival bias” and the

¹³ See Feldstein, 1995b, pp.16–19; 1996, p. 9.

¹⁴ See Feldstein, 1997, p.19, and Feldstein and Samwick, 1997, p. 45.

¹⁵ See Siegel, 1994, p. 11 (mean return for stocks: 6.7 per cent; 1992, p. 230 (mean return for bonds: 3.36 per cent). In comparing Feldstein's figures with other sources, it must not be forgotten that Feldstein (see footnote 10) assumes that pension funds income does not pay taxes (or, equivalently, that pension funds get a rebate equal to the taxes paid at the source on the dividends and interests they perceive).

non-normality which may affect recorded *ex post* returns. Bodie (1990, p. 5) emphasizes that the probability of extremely low final values does not decrease, but actually grows, with the length of the holding period. If so, Feldstein and Samwick's result that a slightly higher payroll tax is sufficient to offset risk, and guarantee the assumed level of benefits, may no longer be warranted.

If the spread between the rates of return of funding and PAYG is positive but not as high as Feldstein *et al.* assume, and if both rates, on top of being uncertain, are not highly correlated, rational behaviour towards risk in an environment of incomplete markets may lead not so much to opting for funding instead of PAYG as to pension portfolio diversification, and thus to a simultaneous participation in the two systems. From a microeconomic perspective, a mixed portfolio may make households better off by offering a risk-return combination preferable to that of a pure portfolio (Fornero, 1995).

Furthermore, in many countries the stock of pre-existing social security debt is as large as 2.5 times GNP. Even under the mildest of transitions (the issue of perpetual explicit debt) this means, at a 3 per cent real rate of interest, an additional tax burden initially amounting to 7.5 per cent of GNP. This burden may be deemed to be so high that no reasonable transition to a completely funded system is feasible in one step, however long.

4. The imbalance in the Italian PAYG scheme

The above analysis may be applied, with due provisos, to the Italian case. On the one hand, it can be argued that Italy is an ideal case for a move to funding, since, according to Rossi and Visco (1994, 1995), the creation of PAYG wealth caused a reduction of about one-third in the national saving rate. On the other hand, given the high level of taxation and the arduous debt reduction strategy currently adopted, it looks unrealistic either to raise taxation as much as is necessary in order to amortize the existing social security debt in full, or to substitute it with public debt proper.

There are reasons and room, however, for partial funding, in order to redress the composition of households' pension wealth. After setting the stage in the present section, the following two suggest a possible strategy towards this aim (and also, in the case of section 6, towards reaping the benefits of increased capital accumulation).

Figures in Table 1¹⁶ point to a sizeable gap between equilibrium and present effective payroll rates (the latter are 32 to 33 per cent for FPLD¹⁷ and public employees and about 15 per cent for the self-employed). As can be seen, notwithstanding the two reforms, only after 2030 will the Italian system gradually move closer to a satisfactory balance.

Table 1 estimates are based on the assumption of a yearly 1.5 per cent GDP growth rate. Since GDP growth affects contributions more than expenditures, a higher rate means a lower imbalance. For instance, a mere increase of half a percentage point implies, in 2030, an equilibrium payroll tax of 44.7 per cent for FPLD and of 25 per cent for the self-employed.

The gap between equilibrium and current payroll tax rates can be bridged in three

¹⁶ Sources: for FPLD and the self-employed, Ministero del Tesoro-RGS, 1995a, p. 86; 1995b, pp.105–107 (simple average between craftsmen and shopkeepers). Annuity values are supposed to be revised every ten years according to current life tables. For public employees, authors' calculations and projections on the basis of Monorchio, 1994, p. 36. Table 1 does not consider, apart from a few minor pension schemes, the scheme for self-employed farmers, by far the more unbalanced, with equilibrium contribution rates well over 100 per cent.

¹⁷ FPLD stands for "Fondo Pensioni Lavoratori Dipendenti" and covers the great majority of, although not all, private employees.

Table 1:
Equilibrium payroll tax rates (per cent)

Years	FPLD (private employees)	Self-employed	Public employees
1995	47.3	15.5	45
2000	44.3	19.9	48
2010	42.6	27.5	45–50
2020	43.8	29.8	45–50
2030	47.9	28.4	45–50
2040	42.7	24.5	?
2050	34.1	21.5	?

different ways (or by any combination of them): (i) a cut in benefits; (ii) an increase in contribution rates; (iii) recourse to government financing (general taxation or public debt proper).

After the Amato and Dini reforms (see footnote 1), which were stretched to the limit of political consent, and the additional pruning by the Prodi government (1997), there appears to be limited room for new interventions. Two possible exceptions are the speeding up of the transition from the wage-related to the contribution-related formula and some further restrictions on seniority pension entitlements.¹⁸

As for solution (ii), there surely is a political as well as an economic upper limit to the payroll tax rate. Although this cannot be precisely identified, there is an undisputed conviction that, with Italian rates at world record heights, further increases are hardly feasible, except for independent workers (whose present rate is less than half the employees').¹⁹

While hoping that Parliament will find the determination and the support to enact some further cuts to benefits, in the rest of this paper we assume solution (iii) as the basic scenario.²⁰

The size of the burden on government finance is shown in Table 2.²¹ On the assumption

¹⁸ On the opposite side, the abolition of real-wage indexation carries the risk that the growing gap between pensioners' and workers' incomes might spur a political call for reform-defeating (and cost-increasing) legislative corrections (see Gronchi, 1996, pp. 123–126; Ministero del Tesoro-RGS, 1996, pp. 11 and 36).

¹⁹ The new system of actuarial fairness implies that employees are already compulsorily saving for retirement almost a third of their (labour) income, i.e. a level more or less corresponding to the "rule of thumb" for an adequate old age provision. Given that annuities do not normally exhaust pensioners' portfolios, higher rates would hardly be coherent with any reasonable consumption allocation over the lifetime.

²⁰ It must be noticed that, up to the Dini reform, the Treasury has automatically financed any amount of deficit.

²¹ Columns 2, 3 and 4 have been calculated as the product of: (a) the difference between equilibrium and effective tax rates (33 per cent for employees and 18 per cent in 2000 and 20 per cent thereafter for the self-employed), measured as a percentage of the former, and (b) the ratio of pension expenditures to GDP (Ministero del Tesoro-RGS, 1995a, p. 86, for FPLD; 1995b, pp. 105 and 107, for the self-employed; 1996, p. 96, for public employees). For independent farmers, calculations are based on: the current deficit as a percentage of GDP (0.8 for 1996); the (pre-1995 reform) projections of deficit increases for 1995–2010 (INPS 1993, p. 168); the assumption of a small decrease (0.2 percentage points every ten years) in the subsequent periods, due to the projected reduction in the number of insured and pensioners (INPS, 1993, p. 162).

Table 2:
PAYG imbalance as per cent of GDP

Years	FPLD (private employees)	Self- employed	Independent farmers	Public employees	All schemes
1995	2.27	—	0.70	0.95	3.92
2000	1.80	0.10	0.90	1.06	3.86
2010	1.54	0.40	1.10	1.05	4.09
2020	1.73	0.53	0.90	1.10	4.26
2030	2.36	0.45	0.70	1.15	4.66

of unchanged benefits and contribution rates (with the sole exception of an increase from 15 to 20 per cent in the rate for independent workers) and a constant yearly GDP growth rate of 1.5 per cent, the gap grows from 3.92 to 4.66 per cent of GDP between 1995 and 2030.

As already mentioned, the solution is sensitive to variations in GDP growth rates resulting in higher increases in employment and the wage bill. This sensitivity analysis is however beyond the scope of this paper, which only aims at setting orders of magnitude.

5. Financing a complementary funded scheme by switching severance pay contributions

Under the assumption that the PAYG deficit will mainly be financed by the general budget (see section 4 above), the funded component of a mixed pension system can be introduced in two different ways:

- (1) in a *conservative* scenario, the PAYG scheme is kept at the above-mentioned payroll tax and replacement rates, but is supplemented by a funded component financed through new savings flows or through the diversion of existing ones;
- (2) in a more *innovative* scenario of partial “privatization”, workers are offered the choice of “contracting out” of the public system, with a reduction of the payroll tax rate and the compulsory diversion of the difference to funded pension funds.

With the Dini reform fully phased in, replacement rates – owing to the new contribution formula and actuarial fairness – will be proportional to the payroll tax and therefore lower for the self-employed than for employees.²² This differential coverage implies greater incentives to privately funded pensions for the former than for the latter. The present paper, however, deals exclusively with employees (by far the largest group of workers) for two reasons: first, the main source of financing for the new pension funds will realistically be a switch from TFR,

²² These differences are due to the different historical evolution of the two regimes, but have scarce rational basis. Furthermore, since the return from PAYG is lower than from funding, the higher PAYG coverage of employees is unfair to them.

a deferred integral part of employees' compensation;²³ second, the higher payroll tax rate for employees leaves room for future reductions and for a parallel compulsory switch to pension funds.

The innovative scenario can be implemented either through: (2a) an overall reduction of all present and future benefits, or (2b) a strict application of the contribution method, involving a reduction of benefits only for the cohorts affected by the payroll rate reduction. In the latter case, a new imbalance will emerge in the transition period, which again will have to be financed by general taxation.

For reasons mentioned in the previous paragraph, a generalized reduction in benefits – over and above the one required for the correction of the present imbalance – appears to be unfeasible and has therefore been disregarded. Actual options are thus limited to (1) and (2b).

As for option (1), present legislation allows and apparently encourages not only the switch to pension funds of TFR flows but also further employees' and employers' contributions. The latter benefit from fiscal incentives, although only within limited amounts and conditional on the parallel pension funds' destination of TFR flows.²⁴

In this scenario, participation in pension funds is not compulsory; these flows will therefore be determined by the employee's advantages relative to alternative investment opportunities (i.e. the status quo in the case of TFR).

The worker's choices are examined in a recent paper (Fornero, 1996), which simulates results for various parameter combinations in order to measure the degree of fiscal incentives to pension funds granted by present legislation. The simulation exercise assumes that:

- employers will consent to a switch of future TFR flows only as part of a pay deal;²⁵
- employers will make further contributions to pension funds only on condition that total labour costs remain constant; such contributions will therefore be traded against pay rises;²⁶
- pension funds will invest in (mainly government) bonds whose yields are subject to a flat tax rate (12.5 per cent);²⁷

²³ TFR stands for "trattamento di fine rapporto". It was originally devised as an insurance scheme against involuntary loss of employment, but it gradually evolved into a form of deferred compensation, irrespective of the specific cause of job termination. TFR works as follows: 6.91 per cent of each year's gross wage is credited to the "TFR fund" (a liability in every firm's balance sheet); a very low, and in the past even negative, real interest rate is yearly credited to the fund. When an employee leaves the firm for whatever reason, he cashes his TFR; workers are entitled to early withdrawals only to finance house purchase or to cover exceptional medical expenses. This means forced saving for the workers as well as availability of low cost finance for the firm. The aggregate size of the fund is estimated in the neighbourhood of 200 trillion lire, i.e. about 10 per cent of GDP.

²⁴ TFR follows an EET taxation scheme, i.e. contributions and accruing interests are exempt, while the final payment is taxed (at less than standard rates). Further contributions to pension funds by employers and employees are deductible up to a yearly ceiling (the lower between 2 per cent of gross compensation and 2.5 million lire). Altogether, then, the maximum contribution rate fiscally encouraged is 10.91 per cent: the TFR rate, plus 2 per cent from the employee, plus 2 per cent from the employer. Independent workers are allowed deductions up to the lower between 6 per cent of their income and 5 million lire.

²⁵ More specifically, since TFR funds represent for firms a cheaper source of financing than other forms of debt, the hypothesis is that employees agree, at the pension fund starting year, to a wage settlement that compensates the firm for the higher costs resulting from the diversion of future TFR flows.

²⁶ However, since these further contributions are largely exempt from payroll taxes (being subject only to a "solidarity" rate of 10 per cent instead of the full 41 per cent), each lira renounced – up to the deduction limits – by the worker translates into an equivalent (in terms of labour costs) contribution to pension funds of about 1.3 lire.

²⁷ The hypothesis understates returns from pension funds since they can also invest in higher yielding equities; on the opposite side, administrative costs are disregarded.

- the alternative to employee and employer contributions is represented by a (collective) life insurance scheme;²⁸
- on reaching pension age, workers choose to draw the maximum lump sum allowed under present law (50 per cent of final capital), while receiving the residual as an annuity.

Various parameters influence the implicit net-of-tax return rate and therefore the choice between, on the one hand, joining a pension fund and, on the other hand, maintaining the status quo for TFR and choosing an insurance policy instead of employer and employee contributions. The most important parameters are: marginal tax rates applying to working and pension periods, length of pension fund participation, and inflation rates.

The main conclusion of Fornero (1996) is that, in spite of incentives offered by the Dini reform, present legislation is not particularly favourable to pension funds. As can be seen from Table 3 (where i , the nominal interest rate, is always assumed to be 3 per cent plus the rate of inflation), joining a pension fund is unambiguously convenient only for high marginal tax rates and for short participation periods.

The net global benefit has been “normalized” by expressing it as a percentage of the capitalized value which, at the same dates, would have resulted had the individual chosen not to join the pension fund, i.e. maintained his TFR rights and bought a life insurance instead of directly contributing and having the employer contributing to the pension fund.

The net benefit correlates positively with the individual’s fiscal rates and negatively with inflation rates and with participation length. The first correlation – due to the deductibility of contributions – implies a regressive fiscal effect (only mitigated by the upper limits on allowances) and thus greater incentives to pension funds for higher income levels. It is scarcely justifiable within a pension system in which the PAYG public component is actuarially fair and has lower (and possibly much lower) returns than the funded one. The second correlation is inevitable as long as nominal (as opposed to real) yields are taxed, while the interest rate accumulating on TFR is not taxed. The third – which is also a consequence of taxation – appears largely inconsistent with the aim of encouraging pension funds, by their nature based on long-term programmes.

The implicit return rate, however, is not the only relevant parameter in the decision to

Table 3:

Net benefit from participating in a pension fund (contribution rates: 6.91% from TFR + 2% employee’s + 2% employer’s)

Years	Low tax rates				Intermediate tax rates				High tax rates			
	<i>i</i>				<i>i</i>				<i>i</i>			
	4%	6%	8%	10%	4%	6%	8%	10%	4%	6%	8%	10%
10	1.91	1.01	0.13	-0.73	4.39	3.61	2.84	2.08	6.46	5.65	4.86	4.09
20	0.48	-1.53	-3.50	-5.43	3.62	1.75	-0.16	-2.09	5.67	3.88	2.12	0.40
30	-1.02	-4.25	-7.46	-10.62	2.61	-0.63	-3.98	-7.39	4.86	1.97	-0.89	-3.72
40	-2.62	-7.22	-11.80	-16.32	1.33	-3.56	-8.62	-13.78	3.99	-0.14	-4.27	-8.37

²⁸ Life insurance policies seemed the proper term of comparison because, like pension funds, they are meant to provide annuities during retirement; on a collective basis, they can charge administrative costs not much higher than those of pensions funds.

join a pension fund; other factors, not always easily quantifiable because of their subjective nature, must also be taken into account. Factors weighing against pension funds include the continuing high level of social security coverage, at least for private employees, the low propensity traditionally shown by households towards annuities, and the legal limits on the amount that can be drawn as a lump sum. Factors in favour of pension funds include the lively interest raised by their introduction as a new financial alternative and a new instrument in industrial relations, as well as fear of further cuts in social security.

The overall consideration of these elements makes it impossible to reach any definite conclusion on the future development of pension funds. A back-of-the-envelope calculation of possible developments is however performed in Table 4, which shows a tentative forecast of the ratio of pension fund assets to GDP.

Table 4 assumes that: (a) all – but only – new workers join a pension fund and completely switch their TFR flows to the new system; (b) no further contributions are made to the funds by either employers or employees; (c) per capita GDP growth rate is 1.5 per cent; (d) the working population is constant, with a complete turnover in 40 years.²⁹ It can be seen that after ten years, even using a very high real interest rate (4 per cent), total assets of funds would be a mere 3 per cent of GDP. Only after 30 years would they reach the 25–30 per cent region, which shows that – in any reasonable conservative scenario – decades are necessary to attain a ratio which many European and North-American countries have already reached (Davis, 1995, p. 55).³⁰

*Table 4:
Pension funds' reserves from TFR diversion (as a
per cent of current GDP)*

Years	Interest rates		
	2%	3%	4%
10	2.8	2.9	3.0
20	10.8	11.6	12.3
30	24.4	26.9	29.9
40	43.8	50.1	57.9

6. Financing a complementary funded scheme through a contracting-out clause

The “contracting-out” hypothesis can be implemented in several ways. At one extreme, the PAYG tax rate may be reduced for all cohorts; at the opposite extreme, such a reduction may be limited to new cohorts. Only the second case is considered here, since it appears more practicable and more straightforward.

The process can be assumed to start in year one (2000?). Beginning from such a year, new

²⁹ It is further assumed that the yearly TFR flow is constant at 2 per cent of GDP, i.e. the 1995 level. (1995 gross wages and GDP were 510.000 and 1.771.000 billion lire respectively.)

³⁰ Although the hypotheses are entirely arbitrary, it is difficult to think of a more optimistic scenario. True, there will certainly be contributions by employees and employers, and many older workers will also join; but not all the TFR flows of new entrants will be diverted, and part of the funds' asset will be cashed in advance to finance house purchase and medical expenses.

cohorts will pay, say, a 25 per cent payroll rate instead of the current 33 per cent, with a corresponding reduction of future pension benefits (in accordance with the contribution method). Former cohorts will pay the old rate until the end of their working life, and then receive the previous level of pension benefits.

To simplify the exercise, a 40-year working life and a 20-year pension period are assumed, with constant annual inflows into, and outflows from, the labour force and the pensioned population. As shown in Table 5,³¹ the flow of payments to the PAYG system decreases gradually until year 40 (when all active cohorts are subject to the 25 per cent payroll rate). Benefits do not change over 40 years and then decrease from year 41 to year 60 (when all pensioned cohorts receive benefits proportional to the lower rate).

As compared with the status quo, the transition therefore creates an additional gap between contributions and benefits over a 60-year period. The gap increases during the first 40 years, reaching an order of magnitude of 2 per cent of GDP, and then gradually decreases, dropping to zero after 20 more years.³²

The choice of a reduction of 8 percentage points (from 33 to 25) is of course quite arbitrary, but the figures offer an idea of the relationship between the extent of the permitted contracting out and the magnitude of the additional tax (or public debt) effort involved. Three additional points should be stressed.

After the first round, a second one (say, a further reduction of the PAYG tax rate from 25 to 18 or 20 per cent) could follow: but the aggregate time horizon involved is stretched over more than one century!

Table 5 assumes that lowering the PAYG tax rate from 33 to 25 implies (in due course)

*Table 5:
Effects of (partial) contracting out (8 percentage points of current payroll tax rate, from 33 to 25%)*

Years	Contributions (status quo = 100)	Benefits (status quo = 100)	Deficit (as a % of GDP)
10	93.9	100	0.50
20	87.9	100	1.00
30	81.8	100	1.50
40	75.8	100	1.90
50	75.8	89.1	1.00
60	75.8	75.8	—

³¹ Calculations are based on Ministerio del Tesoro-RGS estimates (1995a, p.86, and 1996, Table 4.12). In the period 2000–2030, pension expenditures will fluctuate around 7 per cent of GDP for FPLD and around 3.25 per cent for the public sector; including minor employees schemes brings the aggregate share to 11 per cent. Contributions cover about three-quarters of expenditures. Column 4 figures up to year 40 are thus obtained by multiplying the complement to 100 of column 2 by 0.11 and then by 0.75; figures for further periods – in which expenditures will also decrease – are similarly estimated.

³² The transition period is even longer if the tax rate applying to new cohorts is lowered gradually and not by a one-step measure.

lowering PAYG benefits by the same percentage. But this does not take into account the greater return from funding. Suppose that funding offers twice as many benefits for a given tax (or premium). The PAYG benefits to the new cohorts may thus be reduced by 16/33 (and not only by 8/33) while granting them the same level of aggregate benefits (from PAYG + funding) as previously offered by the PAYG system. At the end of the first round, then, lower payroll taxes and lower benefits do not offset each other in the PAYG scheme, but benefits have decreased more than taxes, and the balance may be used for a further switch from PAYG to funding.

While the order of magnitude of pension funds assets accumulated in the contracting out scenario is similar to the one emerging from Table 4,³³ there is an important difference between the two. The reliance on TFR diversion essentially means reallocating a given supply of saving,³⁴ while, in the contracting-out case, increased taxation (if only, in the case of debt financing, for paying the future interest flow) and the connected reduction in households' disposable income raise the likelihood of a positive effect on saving.

7. Conclusions

A relevant recourse to general taxation is necessary to cover the imbalance in the Italian PAYG scheme, as it emerged from the Amato and Dini reforms.

A supplementary funded component may be introduced in Italy through the switching of other savings such as TFR flows. The process, which has not been given (so far) strong fiscal incentives, can only be very slow; decades are required in order to accumulate assets of amounts comparable with most of the other advanced countries.

The process can be strengthened by a partial contracting-out clause. In order not to renege, even partially, on existing promises, this must necessarily be diluted over a long period of time and financed either through a sharp increase in taxation or through the issue of new government debt.

These burdens are offset by considerable advantages for future generations, stemming from the larger expected returns on the funded component and from more savings and accumulation. One further reason for partial funding lies in a diversified pension portfolio, involving a better risk-return combination; this same reason, of course, rules out complete privatization.

Both the nature and the order of magnitude of the efforts involved have been assessed. It is our conviction that the transition from PAYG to a mixed system cannot be considered as a mere, however important, economic policy measure, but as a sort of constitutional pact involving a number of generations, a pact which should appear as soon as possible in the Italian political agenda.

³³ This is because the yearly accumulation of TFR (6.91 per cent of earnings) is close to the assumed reduction of the payroll tax rate (8 percentage points), and both apply to the cohorts entering the labour force after the process begins.

³⁴ Although employees' and employers' contributions are also incentivated, it is highly debated whether this kind of measure effectively increases saving. See, for instance, Gale and Scholtz, 1994 and Poterba, Venti and Wise, 1996.

REFERENCES

- ABEL, A., MANKIW, G., SUMMERS, L. and ZECKHAUSER, R., 1989, "Assessing Dynamic Efficiency: Theory and Evidence", *Review of Economic Studies*, 52, pp. 1–20.
- ARRAU, P. and SCHMIDT-HEBBEL, K., 1995, "Pension Systems and Reform – Country Experiences and Research Issues", Policy Research Working Paper, no. 1470, The World Bank, June.
- BODIE, Z., 1990, "Shortfall Risk and Pension Fund Investment Policy", Boston University Working Paper, no. 90-43, June.
- CAMERA DEI DEPUTATI – Servizio bilancio dello Stato, 1996, "Gli effetti finanziari di medio-lungo periodo della riforma del sistema pensionistico obbligatorio", Roma, June.
- COCHRANE, J., 1997, "Where is the Market Going? Uncertain Facts and Novel Theories", NBER Working Paper, no. 6207, October.
- CORSETTI, G. and SCHMIDT-HEBBEL, K., 1995, "Pension Reform and Growth", Policy Research Working Paper, no. 1471, The World Bank, June.
- DAVIS, E., 1995, *Pension Funds*. Oxford: Clarendon Press.
- DIAMOND, P., 1994, "Insulation of Pensions from Political Risk", NBER Working Paper, no. 4895, October.
- FELDSTEIN, M., 1974, "Social Security, Induced Retirement and Aggregate Accumulation", *Journal of Political Economy*, 82, October, pp. 905–926.
- FELDSTEIN, M., 1995a, "Social Security and Saving: New Time Series Evidence", NBER Working Paper, no. 5054, March.
- FELDSTEIN, M., 1995b, "Would Privatizing Social Security Raise Economic Welfare?", NBER Working Paper, no. 5281, September.
- FELDSTEIN, M., 1996, "The Missing Piece in Policy Analysis: Social Security Reform", *American Economic Review – Papers and Proceedings*, 86, May, pp. 1–14.
- FELDSTEIN, M., 1997, "Transition to a Fully Funded Pension System: Five Economic Issues", NBER Working Paper, no. 6149, August.
- FELDSTEIN, M. and SAMWICK, A., 1996, "The Transition Path in Privatizing Social Security", NBER Working Paper, no. 5761, September.
- FELDSTEIN, M. and SAMWICK A., 1997, "The Economics of Prefunding Social Security and Medical Care Benefits", NBER Working Paper, no. 6055, June.
- FORNERO, E., 1995, "Totally Unfunded versus Partially Funded Pension Systems: the Case of Italy", *Ricerche economiche*, 49, pp. 357–374.
- FORNERO, E., 1996, "I Fondi Pensione – Rendimenti comparati e scelte previdenziali", *Rivista italiana degli economisti*, 3, December.
- FORNERO, E., 1999, *L'Economia dei Fondi Pensione*. Bologna: Il Mulino.
- GALE, W. and SCHOLTZ, J., 1994, "IRAs and Household Saving", *American Economic Review*, December, pp. 1233–1260.
- GOETZMANN, W. and JORION, P., 1997, "A Century of Global Stock Markets", NBER Working Paper, no. 5901, January.
- GRONCHI, S., 1996, "Sostenibilità finanziaria e indicizzazione: un commento alla riforma del sistema pensionistico", *Economia italiana*, 1, January–April, pp. 115–156.
- INPS – Istituto Nazionale della Previdenza Sociale, 1993, *Le pensioni domani*. Bologna: Il Mulino.
- KOTLIKOFF, L., 1995, "Privatization of Social Security: How it Works and Why it Matters", NBER Working Paper, no. 5330, October; also in Poterba, J. (ed.), *Tax Policy and the Economy*. Cambridge (Mass.): NBER, 1996.
- KOTLIKOFF, L., 1996, "Simulating the Privatization of Social Security in General Equilibrium", NBER Working Paper, no. 5776, September.
- MINISTERO DEL TESORO – Ragioneria generale dello Stato (RGS), 1995a, "Il progetto di riforma del sistema pensionistico pubblico presentato dal Governo: le tendenze di medio-lungo periodo del FPLD", June, annex to Camera dei Deputati (1996), pp. 71–87.
- MINISTERO DEL TESORO – Ragioneria generale dello Stato (RGS), 1995b, "Il progetto di riforma del sistema pensionistico pubblico presentato dal Governo: le tendenze di medio-lungo periodo del Fondo Artigiani e Commercialisti", August, annex to Camera dei Deputati (1996), pp. 88–108.
- MINISTERO DEL TESORO – Ragioneria generale dello Stato (RGS), 1996, "Tendenze demografiche e spesa pensionistica: alcuni possibili scenari", in: *Conti pubblici e congiuntura economica*, Quaderno no. 9, June.
- MITCHELL, O., 1996, "Administrative Costs in Public and Private Retirement Systems", NBER Working Paper, no. 5734, August.
- MONORCHIO, A., 1994, "Audizione del Ragioniere Generale dello Stato presso la XI Commissione permanente della Camera dei Deputati," Rome, 7 September.

- POTERBA, J., VENTI, S. and WISE, D., 1996, "Personal Retirement Saving Programs and Asset Accumulation: Reconciling the Evidence", NBER Working Paper, no. 5599, May.
- ROSSI, N. and VISCO, I., 1994, "Private Saving and Government Deficits", in Ando, Guiso and Visco (1994), *Saving and the Accumulation of Wealth*. Cambridge: Cambridge University Press, pp. 70–105.
- ROSSI, N. and VISCO, I., 1995, "National Saving and Social Security in Italy (1954–1993)", Rome, Banca d'Italia, *Temi di discussione* no. 262, December.
- SIEGEL, J., 1992, "The Real Rate of Interest from 1800–1990. A Study of the U.S. and the U.K.", *Journal of Monetary Economics*, 29, pp. 227–252.
- SIEGEL, J., 1994, *Stocks for the Long Run*. Chicago: Irwin.