AN AGEING POPULATION: SOLUTIONS FROM FINANCIAL MARKETS[*]

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1. Introduction

Italy is an ancient country, rich in history, art and culture. It also has one of the most rapidly ageing populations in the world. We have all heard about the Medici family, whose most illustrious member, Lorenzo the Magnificent, was not only a great politician and statesman, but also a patron of the arts and a poet. To Italians of my generation he is best known for these verses: *"Quant'è bella giovinezza, che si fugge tuttavia! Chi vuol esser lieto, sia: di doman non c'è certezza"*, that is, in a charming English translation, "Youth is sweet and well, but doth speed away! Let who will be gay, tomorrow, none can tell".[1] Lorenzo was only twenty years old when he succeeded his father as the dominant force in Florence, embarking on a remarkable political career that would make him the arbiter of the balance of power in Italy. And he was just forty-three when he died, the same year that Columbus discovered America.

Today we live much longer lives, but no less uncertain ones: indeed, "tomorrow, none can tell". Living longer, especially if we are in good health and have the resources to enjoy it, is certainly a positive development. Since in all probability we are not descended from the Medici family, or one of similar wealth, we cannot afford Lorenzo's hyperbolic discounting, which borders on moral hazard. We must, instead, plan for our future. This is especially so as the demographic changes we are experiencing pose serious challenges for our public finances and the working of labour markets. These certainly include the need for the reform and adaptation of our pension systems. Indeed, the "pay-as-you-go" (PAYG) public pension system that still covers most of the

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[1] From Lorenzo de' Medici (il "Magnifico"), *Trionfo di Bacco e Arianna*, 1490 (trans. by Lorna de' Lucchi in *An Anthology of Italian Poems 13th-19th Century*, A.A. Knopf, New York, 1922).

Italian population was devised at a time when life expectancy was lower and fertility rates were higher. While a major reform of the public pillar was made in 1995 and refined over the last decade, the development of private pension saving is now particularly important. The percentage of people enrolled in private pension plans is still low, and the pool of assets managed by pension funds is still very small.

2. Demographic trends

The last hundred years or so have seen a spectacular rise in average life expectancy in today's high-income countries. Very considerable, if less spectacular, progress has also been observed in the rest of the world. For a large part this can be ascribed to the exceptional fall in infant mortality. However, in the last half a century there has also been a remarkable increase in life expectancy at old age. This secular rise in longevity has been accompanied more recently by lower fertility rates, with the result that the world population is now ageing very rapidly. This is not only the case for the OECD countries but for several emerging economies as well, most notably China.

The unprecedented rise in longevity has affected Italy perhaps even more than other countries and mortality rates at older ages have dropped very sharply. Between the early 1930s and 2004, life expectancy for males has increased by 6.2 years at the age of 60, 4.7 years at the age of 70 and 2.9 years at the age of 80; for women, it has improved even more, by 9.7, 7.6 and 4.6 years. Life expectancy has increased more in absolute terms for the relatively younger ages, so that the shape of the population pyramid is progressively and significantly becoming more "rectangular". These changes have occurred extremely rapidly in recent decades: about two thirds of the increase in life expectancy of males and about one half that of females took place after 1980.

There are reasons to believe that even these striking figures may underestimate the true improvements. For example, life expectancy is usually calculated using the age-specific mortality rates observed today, instead of estimating them on a cohort-by-cohort basis.[2] This may be one of the reasons for the systematic under-prediction of the number of the elderly, especially the oldest old. New and more sophisticated projection methods have been proposed recently. They appear to have produced significant improvements in projection, but life expectancy gains still seem to be somewhat under-predicted.[3]

[2] See also Morcaldo (2007).
[3] See Lee and Carter (1992) and Tuljapurkar, Li and Boe (2000).

Even if there is consensus that life expectancy will continue to rise in the future (most likely by one to two years per decade), we must therefore acknowledge that there is still a high degree of uncertainty about future longevity. Moreover, lags occur in the production, adoption and disclosure of mortality tables. In particular, cross-country variations in mortality assumptions used by company pension schemes appear at times far larger than the profiles of their members warrant.[4] Indeed, as the 2005 G10 report concluded: "Regulators should promote transparent disclosure of mortality and disability projections and pension actuaries should determine the extent to which these projections reflect actual plan experience and how they model and allow for the uncertainty surrounding these estimates in their funding strategies" (p. 66).

Demographic changes may cause systematic deviations in the number of deaths from their expected values. Unlike random variations around a fixed known mortality probability, this is a collective longevity risk that cannot be diversified across the individuals of a given cohort as it affects all of them in the same way. More sophisticated hedging mechanisms are therefore needed, possibly involving the public sector. Indeed, longevity risks are faced not only by company pension schemes but by public programmes as well.

In Visco (2006) a rough estimate of the risk facing the Italian pension system was computed by considering the extra pension payments that individuals aged 50 years and older would receive if they lived longer than expected (assuming that most of the cost of reforms to correct this effect would be borne by younger individuals). The same percentage improvements observed in life expectancy between 1990 and 2002 were projected from 2005 forward, with the result that the cost of such a shock would be about 10 per cent of the present value of pension liabilities under the current system. This would amount to 22 per cent of 2005 GDP, with an average annual flow of about half a percentage point of GDP for the next decade, and one percentage point in the 2020s and 2030s.

All this clearly points to a need for better and more timely projections. At the same time, because projections are surrounded by a high degree of uncertainty, pension systems should be designed to be robust to uncertainty. They should also be resilient to the economic and political pressures that demographic changes are likely to engender.

[4] See Cass Business School (2005).

As far as public pensions are concerned, the introduction of notional defined contribution (NDC) pension systems in a number of countries, including Italy, goes in this direction. In principle, NDC systems can be designed to calculate pension benefits taking macroeconomic and demographic developments automatically into account. However, regardless of the very long transition period, the Italian pension scheme, in the form it was introduced, differs in some important respects from the prototype of an NDC system. The benefit rules were not designed to be frequently and automatically updated to account for demographic developments and the rate of return on workers' contributions (equal to the rate of growth of nominal GDP) apparently does not grant the actuarial balance of the system at least in the short-to-medium run.[5]

Several changes have been agreed recently between the government and the social partners. While some of the new rules are in line with the NDC philosophy (for example, parameters should be updated every three years instead of every ten and preliminary negotiations with social partners will no longer be needed), others are more difficult to understand (for instance, granting some categories of workers a specific pension benefit-to-wage ratio).

3. Demographic change and pension systems

All pension systems imply a redistribution of real resources from active workers to retirees. While in PAYG systems this is implemented through taxes and social security contributions, in funded systems it is achieved through capital markets, as pensioners use the assets accumulated in their working years to provide for their needs once retired.[6] In both cases, the goods and services consumed by both active workers and retirees are produced by the labour of the former. In a funded system, however, saving and accumulated assets should be greater, leading in principle to a larger amount of resources available.

An expected increase in longevity results in higher old age dependency ratios and narrows the range of possible changes to pension system designs, regardless of the institutional arrangements for intergenerational redistribution. Possible measures include: (i) increasing payroll contributions; (ii) reducing pension payments relative to per capita GDP; (iii) raising the retirement age; and (iv) increasing current saving in order to pre-fund greater future pension expenditures. This

[5] Morcaldo (2007).
[6] The often overlooked fact that the returns achieved in a funded system depend on demographic developments has been highlighted among others by Mirrlees (1997) and the Pension Commission (2004). See also Visco (2002).

last would require both an increase in public saving (reducing budget deficits and raising the share of capital expenditure) and an expansion of the private pillar.

Some of these options have the normative appeal that the current workforce shares part of the burden with future taxpayers. In particular, policies to raise the age at retirement and increase current savings seem preferable, at least for Italy, given that in the future people will not only live longer but will also be active and healthy longer.[7] Moreover, such policies are likely to increase potential GDP and this will help to alleviate the financial consequences of ageing.

All in all, there is a growing consensus among experts and policy-makers that lengthening the average working life and increasing pre-funding are essential to any credible strategy to meet the challenges of ageing.

To increase the effective age of retirement, it is important to reduce the disincentives to work embedded in social security rules**.** PAYG systems are often not neutral with respect to the retirement decision. Indeed, in many social security systems workers' pension wealth (i.e. the discounted value of future pension payments) decreases with age at retirement, generally because of the weak linkage of benefits to lifetime contributions. The NDC system introduced in Italy in 1995 should offset this distortion, as benefits depend on past contributions and on expected longevity at retirement. However, the new system is being phased-in very slowly. Other potential interventions relate to the labour market, for example offering broader training opportunities to older employees, increasing flexibility in age-earnings profiles and improving on employment arrangements.

If we enlarge our framework to account for uncertainty and move beyond the distinction between funded and unfunded pension schemes, a second distinction comes to the fore, namely that between defined contribution (DC) and defined benefit (DB) systems. The two distinctions are independent of one another: unfunded schemes, such as that introduced in Italy in 1995, may well place longevity or even market risks directly on workers; and funded systems may shield workers from risks, placing them on the employer.

[7] Unfortunately, this does not mean that health-related expenditures will be less burdensome. On one hand, scientific and technological progress in the medical field will probably make more disease curable and lead to higher overall expenditures. On the other hand, a large part of medical expenditures is in any case incurred in the very last years of one's life.

These two alternative institutional arrangements allocate the risk of unexpected changes in longevity in very different ways, although upon closer examination the differences appear less pronounced. Under a DC system, workers bear the risk that, prior to retirement, an upward revision in the expected longevity of their generation would increase the cost of purchasing an annuity at the moment of retirement.[8] The risk that an individual's post-retirement longevity will turn out to have been underestimated is instead left on those who sell annuities. This risk can be decomposed in two components: (i) the risk that the insured will live longer than the rest of her/his cohort (this is a proper insurance risk, which by its very nature cancels out if the pool of policies is big enough); and (ii) the risk that the average longevity of an entire cohort will prove to have been underestimated (this is an aggregate risk that cannot be easily diversified away). Of course, a large part of the aggregate longevity risk is likely to be shifted back from insurers to workers via (possibly excessively) high annuity prices, and in practice these high prices are a key reason why many people prefer not to annuitize. The result is that, in a fully DC system, the insured must cope with longevity risk on their own. While, in principle, farsighted agents should respond to risk by working longer and/or by saving more, such virtuous responses are often impeded by institutional obstacles (labour market rigidities, financial market incompleteness) and by bounded rationality or myopia.[9] Indeed, the existing private DC schemes are often perceived by households (especially those of slender means) as too risky and too complex (and perhaps too costly).

DB schemes, by contrast, are meant to protect workers against aggregate longevity risk, but uncertainty about future improvements in life expectancy would affect these systems too. In fact, an unexpected increase in longevity would necessitate either increasing payroll contributions or the public debt. And in either case the burden would be borne entirely by the younger generations. In other words, high longevity risk would translate into high "political" risk: pension promises might not be honoured, as the intergenerational pact on which they rest might prove socially and economically unsustainable, as well as intrinsically unfair.

Occupational DB pension plans are designed to protect employees from longevity (and investment) risks, placing the consequences of any actuarial imbalance on the employer. In this case too, however, workers would be ultimately exposed to longevity risk. The difficulties of recent years are instructive as to possible future developments: questionable investment decisions and

[8] Of course, even if he/she chooses not to annuitize, there will be an unexpected decrease in the ratio between the level of consumption after retirement and consumption before retirement.
[9] As reported by Choi et al. (2001), in a survey of employees 68 per cent of respondents complained that they save too little for retirement, 24 planned to raise their contributions in the future, but only 3 per cent among them actually did so.

adverse financial market developments have opened up a worrisome "funding gap", increasing the present value of liabilities more than total assets. As a result, many sponsors have closed DB funds to new workers or ceased accepting further contributions from those already enrolled. In some cases, workers have suffered from the default of the plans.

To sum up, the great uncertainty surrounding longevity projections creates problems both in DC systems (where individuals and households are left alone to bear longevity as well as market risks) and in DB systems (where entitlements guaranteed by the state and by corporate sponsors might prove unsustainable).

The demand for some form of DB pension schemes is nonetheless very strong.[10] This presumably reflects investors' reluctance to bear longevity risk and investment risk, and suggests that, while it may not be possible to avoid transferring at least part of these risks from the public pension system or employers to workers and households, some form of capital or performance guarantee could significantly stimulate investors' demand for private pension products – provided that more accurate asset/liability management practices are introduced and supervisory oversight is strengthened.

On the supply side, longevity bonds should definitely be encouraged, recent failures notwithstanding. The market for long-dated bonds is also too small relative to the potential demand from institutional investors. The duration of public debt in most countries is quite short (at about 5 years) and the lack of public benchmarks discourages potential private issuers. There is also a shortage of long-term and inflation-linked bonds: the potential demand exceeds supply at least threefold.[11] One could also think of macro-swaps between the pension fund and the health care industries, to exchange their exposure to longevity.

Finally, as asymmetric information and market incompleteness cannot be completely eliminated, governments could step in, acting as insurers of last resort at least for the risk of very large unexpected increases in aggregate longevity. This is a further reason for reducing their role as providers of insurance that could be readily purchased in financial markets.

[10] The introduction of "hybrid products", which share characteristics of both DB and DC schemes, is also often suggested.
[11] See Visco (2006).

4. The development of private pensions in Italy

Since the mid-1990s in Italy the PAYG system has been in a lengthy phase of transition from a standard DB system to a new NDC system.[12] From the very start of the reform process it was clear to policy-makers and experts alike that, in order to achieve an adequate level of retirement benefits, the new public pillar had to be supplemented by a well developed private pillar. The latter consists in two components, occupational and personal pension plans, both voluntary and of the DC type.

The development of the private pension pillar witnessed an acceleration in recent years. One of the goals of the system has been to induce workers to divert contributions from the so-called TFR (a severance payment scheme where worker's contributions are retained by the employer and earn a rate of return of 1.5% plus 75% of the inflation rate) towards private pensions. In order to achieve this objective, the new system includes an automatic enrolment provision, whereby workers are enrolled in the pension scheme 6 months after they are hired, unless they explicitly choose to remain in the TFR scheme. It also significantly reduces the tax burden on private pension savings.

Starting from January 2007, the end-of-period capital accumulated over contributors' working lives is subject to a proportional tax rate that is equal to 15 per cent but can go down to 9 per cent depending on the length of the investment period;[13] in comparison, the lowest personal income marginal tax rate is 23 per cent. Our calculations show that the new Italian ETT system (Exempt, Taxed, Taxed) is considerably more favourable than the EET system prevailing abroad.[14]

The tax benefits of the new system are particularly valuable for high-income workers – with high marginal personal income tax rates – and for young workers, who can benefit from the favourable tax regime for a longer accumulation period. For example, over a 30-year accumulation period the new tax treatment would allow a low-income worker to increase the value of his/her end-

[12] See Franco (2002).
[13] Longer periods imply lower tax rates.
[14] In ETT (Exempt, Taxed, Taxed) systems, workers' contributions to pension funds are tax-exempt, while the other two components of the pension scheme (the returns earned by the pension funds during the accumulation phase and the end-of-period capital) are taxed. In contrast, in EET systems (Exempt, Exempt, Taxed) the first two components are tax-exempt while the end-of-period capital is taxed. The comparison between the two systems depends crucially on the tax rates applied in each stage. The main advantage of the Italian ETT system is represented by the very low tax rate on the end-of-period capital (see Cesari, Grande and Panetta, 2007).

of-period capital by about 24 per cent relative to an otherwise comparable portfolio of financial assets; for high-income workers, the tax benefit would rise to a hefty 70 per cent.[15]

Of course, these tax benefits should not be offset by high costs and fees charged to investors. In Italy, these costs vary substantially across funds, but on average they are still relatively high. Recent analyses show that the total yearly costs of occupational funds – which include management fees, administrative costs and the fees paid to the custodian bank – average about 0.60 per cent. For open pension funds and insurance products the total costs and fees are even higher – 1.4 and 2.6 per cent on average, respectively. The expansion of the net asset value of pension funds may well reduce these costs, due to economies of scale. However, the process is likely to be slow and could be insufficient to lower the level of fees significantly. To speed up and reinforce the process, an increase in competition in the asset management industry, fostered by domestic and international competitors, will be necessary.

In order to enhance competition, full transparency about fees and other product characteristics is also crucial. This would allow workers to choose the funds and products best matching their needs. In this respect, the fact that employers' contributions cannot be transferred out of occupational funds limits workers' mobility and restrains competition in the asset management industry, with potentially significant adverse effects on workers' welfare. Moreover, to improve governance and reduce agency problems between investors and fund managers, the separation between asset management, auxiliary services, and consulting services should be pursued.

The results achieved so far by the new system in terms of participation in private pension funds are fairly encouraging. According to COVIP (the supervisory authority for pension funds), excluding the workers who have adhered to pension plans via tacit consent, in the first six months of 2007 the number of workers participating in some form of supplementary pension scheme rose from 3.3 to 4.3 million. In the same period, the number of participating private sector employees rose from 1.8 to 2.7 million.

There is nonetheless ample room for improvement, as the percentage of enrolled workers remains relatively low. In fact, at the end of June membership rates were equal to only 22 per cent for private sector employees and 28 per cent for occupational funds. As a result of the low membership rates and the short life of the system, the pool of assets managed by pension funds is

[15] See Cesari, Grande and Panetta (2007).

still very small: in 2005 it amounted to 3 per cent of GDP, against an OECD average of 88 per cent. Since then it is likely to have increased by only a few percentage points. In the Netherlands, the leading country in Europe, pension fund assets are 125 per cent of GDP.[16]

The lag that distinguishes our country primarily reflects insufficient information and awareness about the need to supplement public pensions with private schemes, but it is also due to workers' low levels of financial education. The lack of solid trust in the functioning of financial markets is also a factor. But how can we stimulate the growth of this sector?

One critical issue is information. Despite the efforts recently made by the government, surveys show that Italian workers are still not adequately informed on their future pensions. It is therefore crucial to provide workers with additional information about their accrued and perspective pension rights, both in the public and in the private pillar. An example of the benefits of transparent and clear information on the individual rights stemming from the public system is offered by the Swedish experience, where every year workers receive information on their past contributions and the rates of return granted by the system on such contributions. Valuable additional information could include estimates of the final pension benefits under various macroeconomic and demographic scenarios.

Another issue that deserves closer examination is the potential benefit, in a phase of transition of the public pillar towards a DC system, of expanding the different types of guarantees offered on the performance of pension funds. In the current framework, pension funds are required by COVIP to offer an investment line that guarantees the nominal value of invested capital in order to be eligible to collect the contributions of those who have enrolled tacitly. Simulations and developments in the markets show that the costs of offering a broader range of guarantees would not be prohibitive: for example, even with conservative assumptions on market volatility, a capital guarantee in real terms over a 10-year investment horizon would cost 0.7 per cent on a yearly basis.[17] Guarantees that are conditional on particular events (such as long-term unemployment or illness) would imply a significantly lower cost. A low-volatility regime such as the one that has prevailed in recent years would further reduce the cost of guarantees.[18]

[16] See OECD (2006).
[17] The details of the simulation are reported in Cesari, Grande and Panetta (2007).
[18] Although the recent financial turmoil resulted in a marked increase in market volatility, in most markets and asset classes current volatility is still well below the pre-2004 levels.

Yet another way to reduce the costs that workers attach to the shift from the TFR scheme to pension funds would be to allow them to go back to TFR if they changed their mind, although there should be limits on the exercise of such an exit option. Empirical evidence shows that workers' choices are often backward-looking and are affected by herding behaviour. These two factors could determine excessive movements in and out of different investment vehicles and might lead to an unjustified increase in the costs borne by investors.

Customers should not be overloaded with difficult investment choices: the timing and size of contributions and the allocation of assets could be fixed by default rules, allowing a limited menu of options; life-cycle products should be developed to allow portfolio rebalances in line with the changing risk profile of workers as they age.[19] Simplicity and cost-effectiveness are crucial if we want to increase retirement savings among those who most need them. At present, enrolment is particularly low among younger workers, women, and small business employees. In 2005, the membership ratio of younger workers (aged from 14 to 34) was below 8 per cent; that of women was 11 per cent; that of employees of small businesses (fewer 50 employees) was less than 5 per cent.

It is also well known that adverse selection on annuity markets plays a possibly important role in limiting their development. In Italy the fraction of pension capital that is mandatorily transformed into an annuity at retirement is at present equal to 50 per cent of the total capital. An increase in this fraction could perhaps be considered.

Finally, we should not overlook the fact that annuities are the classic answer to longevity risk, but by no means the only one. In reality, they make sense for people whose financial wealth is sufficient to buy them a significant income. As it may take time to accumulate sufficient levels of financial wealth until private pension schemes reach maturity, we should remember that real estate is often for households both a currently consumed asset and a major savings vehicle. Since housing wealth constitutes 60 per cent of Italian households total wealth, which is quite high compared with other high-income countries, instruments which help elderly people to extract liquidity from real estate in an efficient manner, such as reverse mortgage contracts, should become more widespread than they are today.

[19] See Boeri *et al.* (2006) and Merton (2006).

5. Conclusions

Several thousands of years after the Age of the Patriarchs and the Bible saying that God had put a limit of 120 years to human lives, we still do not know whether that will be the biological limit to the human life-span. It is clear, however, that we are now approaching it at a very fast pace. It is also clear that in the last decades longevity projections have been systematically downward biased. This has produced an aggregate longevity risk, one that we will most likely continue to live with.

Ageing populations require reform efforts at all levels. In Italy, not only has there been a major reform of the dominant public pension system, with a long transition period and many adjustments, but important steps have been taken towards developing an efficient private pension pillar. It will take time for a private system to be an adequate complement to the public system, but the road is clearly indicated and we must continue looking for improvements in information, competition, asset management and supervision. To cope with individual and aggregate longevity risks, it seems inevitable to me that we must aim for a better balance between these two pillars of our pension system.

References

Boeri, T., L. Bovenberg, B. Coeuré, B. and A. Roberts (2006), *Dealing with the new giants: rethinking the role of pension funds*, Geneva Reports on the World Economy 8, ICBM-CEPR, Geneva.

Cesari, R., G. Grande, and F. Panetta (2007), "La previdenza complementare in Italia: caratteristiche, sviluppo e opportunità per i lavoratori", *Banca d'Italia Occasional Papers*, No. 8.

Choi, J. J., D. Laibson, B.C. Madrian, and A. Matrick (2001), "Defined contribution pensions: plan rules, participant decisions, and the path of least resistance", NBER working paper No. 8655.

Franco, D. (2002), "Italy: a never-ending pension reform", in M. Feldstein and H. Siebert (eds.), *Social Security Pension Reform in Europe*, University of Chicago Press, Chicago.

Group of Ten (2005), "Ageing and pension system reform: implications for financial markets and economic policies", Report prepared for the Deputies of the Group of Ten by a group of experts chaired by I. Visco, in *Financial Market Trends*, OECD, Paris, November (Supplement 1).

Lee, R.D. and Carter, L. (1992), "Modelling and forecasting the time series of US mortality", *Journal of the American Statistical Association*, September.

Merton R.C. (2006), "Observations on innovation in pension fund management in the impending future", *PREA Quarterly*, Winter.

Mirrlees, J. (1997), "The economic consequences of ageing populations", *Philosophical transactions of the Royal society*, Vol. 352.

Morcaldo, G. (2007), "Pensioni: necessità di una nuova riforma", Banca d'Italia, mimeo.

OECD (2006), *Pensions markets in focus*, No. 3, October.

Pensions Commission (2004), *Pensions: Challenges and Choices*, Stationery Office, London.

Tuljapurkar, S., Li, N. and Boe, C. (2000), "Is there a universal pattern of mortality decline? Evidence and forecasts for the G7 countries", *Nature*, vol. 405 (789).

Visco, I (2002), "Ageing populations: Economic issues and policy challenges", in H. Siebert (ed.), *Economic Policies for Aging Societies*, Springer, Berlin.

Visco, I. (2006), "Longevity risk and financial markets", keynote speech to the 26th SUERF Colloquium, Lisbon.