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Are defined contribution pension schemes socially sustainable?

A conceptual map from a macroprudential perspective

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ABSTRACT

If the combined retirement income, provided by public and private defined contribution (DC) pension schemes, falls below socially acceptable standards, there is a political risk that consensus seeker policymakers could yield to pressures to commit future fiscal revenues. These contingent liabilities, when incorporated in markets' expectations, are bound to create spillovers on sovereign risk, with negative feedback loops on the capital adequacy of banks and of other intermediaries, owing to losses on their government paper. Among the causes of reduced annuities out of the final assets in DC pension funds is an equity risk premium much lower than the commonly values advertised by the industry and by policymakers. From a macroprudential perspective, this political risk should be taken into account in stress tests assessing banks' resilience to financial shocks.

Keywords: pensions, equity risk premium, political risk, sovereign risk, stress test.

JEL classification: D10, G23, H55, J14.

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I. INTRODUCTION

From a macroprudential perspective, stress tests, aimed at assessing the resilience of bank systems facing macrofinancial risks (Greenlaw *et al.* 2011), should include, at least conceptually, the direct and indirect effects of public and private pension schemes on financial stability. These effects have in fact a bearing on the capital adequacy of banks and other financial institutions, because the political risk of increases in fiscal outlays, to avoid that retirement income falls below a socially acceptable level, is bound to affect sovereign risk. Political risk is here defined as the risk that policymakers, to gain the consensus of the electorate, yield to pressures to modify ex post the rules underlying the functioning of pension schemes – criteria of eligibility to benefits, prudential portfolio allocation rules -, and commit debt-financed fiscal outlays or legislate to shift retirement savings from funded private schemes to public pay-as-you go (PAYG) systems (as indeed happened in Argentina and in East-European countries in recent years; EIOPA 2011).

Political risk so defined does not include the insurer's risk of a State selling protection to Defined Benefit (DC) private pension schemes that guarantee predetermined returns on subscribers' investment, as proposed for instance in Grande and Visco (2010).

The main arguments advanced in this paper to back up the claim of the rising importance of this specific political risk and of the feedback loops with sovereign risk are four.

First, a standard dynamic inconsistency argument. Ex ante financial sustainability of PAYG notional DC public pension schemes and of DC private pension funds is not *per se* sufficient to avoid likely requests of remedial fiscal outlays when retirement income turns out to be too low for socially accepted "subsistence wages". Replacement rates for PAYG notional DC public pension schemes, that is the post-retirement income, expressed as a percentage of a worker's pre-retirement income, are projected to fall in next decades, even for full career workers (Grech 2010 for EU countries). Moreover, the starting point of these projections is a condition of financial fragility for people in retiring age. In the EU-15, for instance, the elderly (65+) have a higher risk-of-poverty rate – below 60% of median equivalised income after social transfers - than both children and working age population (20% against respectively 18% and 15% between 2005 and 2008); EPC-SPC-EC (2010). In Italy, with a reformed public pension system broadly endorsed by the EU Commission for its financial sustainability, the net (i.e. taking out income and payroll taxes) replacement rate,

out of public notional DC pension schemes, under the best assumption of regular contributions on average work income during the standard 35-40 years long working full career, decreases from 82 per cent in 2010 to 71 in 2060; it falls from 95 to 57 per cent for self-employed ones (MEF 2011). As for DC private pension funds in the Australian experience, 'there are a number of groups with relatively low levels of superannuation who need further assistance and encouragement to save if they are to achieve even a modest standard of living in retirement' (Clare 2008, quoted in Wise and Ntalianis 2011, p. 19).

Second, large defined benefit (DB) or hybrid (with predetermined or guaranteed returns) private pension funds create in some countries a potential too-big-to-fail issue, given the size of their (negotiable) assets relative to domestic financial markets. A potential recourse to public funds boosts central government contingent liabilities and therefore affects negatively sovereign risk, with direct and indirect spillovers on banks' financial stability, via their holdings of "safe" – and hence with low or even null regulatory capital requirements - government bonds, as well as funding costs (CGFS 2011a, b).

Third, private DC pension funds can originate contingent liabilities, because of the waning "risk free" status associated with government bonds of advanced countries and of the reduced equity risk premium even for long holding periods, at least on data for the last thirty years. One likely consequence of these findings is that young workers will be discouraged from the membership in private pension funds, unless tax benefits overwhelm participation costs and psychological ones, such as the rules on age before being eligible to benefit of accumulated contractual savings. On both accounts, political risks of contingent liabilities increase: an insufficient lifetime contribution to the second pillar of the pension system, following the taxonomy of World Bank (1994), is bound to generate a reduced retirement income on top of the public one; tax expenditures to incentive membership mean lower fiscal revenues.

Fourth, to counteract an already unsustainable public debt to GDP dynamics, especially for most advanced States after the economic crisis sarted in 2007 (IMF 2011), private DC pension funds may be pressured, or even legislated, especially when they are in the accumulation phase, to finance long term investment projects, in order to boost home country's growth. The ensuing potential reduced returns could be invoked to justify compensatory public funds, with the aim of guaranteing at least the same final asset, to be annuatized, that an unconstrained portfolio allocation would have allowed.

Paragraphs II-V expand the four arguments; paragraph VI draws some implications on financial education and on stress exercises from a macroprudential perspective; paragraph VII concludes.

II. FINANCIALLY SUSTAINABLE BUT UNSUSTAINABLE DC PENSION FUNDS

A DC private pension scheme is by definition financially sustainable, because the final asset, including the returns on contributor's (and his employer's, for an employee) investments, is actuarially equivalent to the present value of annuities over the expected retirement period. A PAYG pension scheme, like the ones introduced in Sweden and Italy in the Nineties and in Poland in 2003, is financially sustainable because it mimics a DC private pension scheme, but only up to a point. The key difference is that financial sustainability is compromised if the contractual return rate, which is not a market one, but is determined by a law provision, is unrelated to the effective GDP per capita growth, which is the basic determinant of the contributing capacity of active workers. In addition, annuities can be computed with lagged data for life expectancy, disregarding the likely upwards trend (for the Italian case, see COVIP 2011).

The key characteristic of funded private DC schemes, namely the transfer of financial risk on subscribers, may result in a retirement income, computed given the market value of accumulated contributions in the final year, below socially acceptable standards, even under the assumption of universal membership of active workers in non mandatory schemes[1]. The causes can be manifold: a shortened contribution period and/or low contributions, because of a late employment and/or an early exit from the labor market and/or a working career with several discontinuities. In addition, the assumption of an universal participation of all active workers is far stretched in non mandatory schemes, especially for the younger ones facing a projected shrinking replacement rate out of the first (public) pillar. For instance, in Italy, the coverage is of only 23% of workers in 2010; the percentage falls however to 17% for 35-

[1] Within the 34 OECD countries, nearly half have some type of mandatory private pension arrangement, mainly of the defined contribution type. Among the countries with mandatory and quasi-mandatory private DC schemes are Sweden, Poland; Mexico; the USA, the UK, Germany, Italy, Canada fall in the voluntary camp (OECD 2011).

years old or younger workers (COVIP 2011)[2]. Among the causes of a low coverage are liquidity constraints, low financial education, meagre returns in financial markets in recent years. In Italy, since they were instituted in 1999 and up to 2010, the occupational pension funds and open pension funds have achieved average annual returns (net of management fees and taxes) of 3.1 and 2.3 per cent respectively, almost a half of the average return on government bonds; Bank of Italy 2011).

The implied low replacement rate, out of public and private pension schemes, undermines the credibility of a no-recourse to public finances because of the ex ante financial sustainability of DC private and of notional DC public schemes. Both public and private (but legislatively mandated and tax-incentived) schemes are in fact liable to a political risk - a textbook case of dynamic inconsistency - when consensus seeking overwhelms financial stability in the utility function of short-sighted policymakers. As put by Grech (2010, p. 2): ’There is an increasing risk that if the pension system does not fulfill public expectations, and/or older people find that they did not make appropriate saving and working decisions, the State could be forced by voters to reverse reforms and spend more on social transfers‘.

III. PRIVATE PENSION FUNDS AS LARGE INSTITUTIONAL INVESTORS

Assets of private defined benefit (DB) pension funds are larger than annual GDP in countries such as Norway or the Netherlands, or close to a half of GDP in countries such as the UK, the USA and Ireland. Assets of combined DB and DC private pension funds are above 60% of GDP and one sixth of total financial system assets also in Australia and Switzerland (CGFS 2011b, Graph 1 and Table 2).

Large DB pension funds, with tens of thousands eligible pensioners, are bound to raise expectations of public money infusions in case their obligations could not be fulfilled. A too-big-to-fail syndrome, especially when sponsoring firms are financially weak and cannot be further squeezed, to avoid fire sales of funds’ assets with procyclical effects, is likely to lead to expectations of public subsidies.

Similar too-big-to-fail issues emerge for DC pension funds, especially when they offer hybrid or guaranteed returns investment options. Indeed, the authorities can be expected

[2] These estimates are actually upward biased, because the numerator includes all pension plans, even if a single worker has subscribed several plans.

to provide a backstop to either DB or DC large pension funds, in order to let these long term institutional investors act as contrarians, when sellers' herding increases liquidity risks in financial markets.

In turn, political risks embedded in pension schemes, because of contingent liabilities for central government, impact directly on pension funds' expected returns, through the valuation channel of public and – via rating downgrade cascades - corporate bond holdings. Valuation effects on government bonds are particularly important because of the usual home bias for investment in domestic government bonds, be it customary and/or regulatory induced. Doubts, after the subprime and the euro crises, on the risk free status of government bonds issued even by USA in the dollar area[3] and Germany in the euro area – AAA, stable outlook, in the Standard&Poor's rating metrics - impairs one of the underpinnings of a life-cycle portfolio allocation for pension savings, namely a stable classification of financial instruments by risk. In fact, according to a life cycle rule of thumb, the portfolio share in low risk government bonds should rise with working age, in order to gradually dampen returns volatility while approaching the exit from the labour market. These very recent developments amplify the effects of the likely reduced regulatory role of bond ratings, embedded in all financial reforms enacted o proposed after the subprime crisis, in the USA (Dodd-Frank Act) and in the EU (following the recommendations in De Laroisière 2009). The end result is to question entrenched market practices that have relied on the widely held assumption of a "safe" bucket of investment grade bonds, where safe often meant that fund managers felt entitled to exempt themselves from the task of a close examination of the credit risk embedded in the securities they bought.

Overall, the financial risk borne by individuals when they become members of a private DC scheme and choose an investment option fitting their risk profile is bound to increase if the risk characteristics of key instruments such as government and corporate bonds become blurred, thus causing a likely greater reliance on public support when the effective annuities are determined. Moreover, a higher political risk creates a negative feedback loop with sovereign risk, should the attempt to protect from the latter reduce the willingness to subscribe government bonds. The consequent higher State funding costs would in fact worsen public debt sustainability conditions.

[3] The USA, for the first time, were downgraded by S&P in August 2011 and put in the watch list by Moody's in July 2011.

IV. EQUITY RISK PREMIUM AND PRIVATE PENSION FUNDS

The main rationale, assumed as a unquestioned background fact in the financial literacy literature (for a recent example, van Rooij *et al.* 2011), to advocate the membership of a private DC pension fund is the opportunity of earning the equity risk premium, defined as the difference between the total return rates of a stock market index and of a market index of government bonds, thanks to the reduction of participation costs to equity markets for an individual worker (Guiso *et al.* 2002). The equity risk premium prices the risk of a comparatively higher volatility of equity returns. Indeed, the annualized realized equity risk premia relative to long term domestic government bonds were equal to 4.5 percentage points in the USA and 3.9 in the UK over the period 1900-2010; the standard deviations were on average for 19 countries, during the period 1900-2010, almost twice for equities compared to bonds (Dimson *et al.* 2011). Another key stylized fact is that, in the USA, a positive annualized real return rate on equities is associated with an holding period of at least twenty years (Dimson *et al.* 2002)[4]. These historical findings provide the underpinnings for the widely held assumption in the industry, and explicitly laid out also in policy papers[5], that participating to private pension funds helps an individual to exploit the equity risk premium, because his investment horizon as a future pensioner is far longer than the minimum required holding period to earn positive real returns on equities.

Over the time window 1980-2010, however, Dimson *et al.* (2011) find that the annualized real total return on US government bonds was equal to 6%, barely below the 6.3% earned by equities; similar results hold in the UK, where the annualized return on government bonds was 6.3%. Over the 1986-2010 investment horizon, the average realized equity risk premium was even negative, -0.8%, considering bond and equity portfolios returns in dollars of 19 advanced countries (0.9% in the USA and 1% in the UK; Table 1).[6] Average returns between the two classes of financial instruments converged during a period of disinflation at first and of a stable and low inflation thereafter. This set of events raised considerably bond total real returns, because of falling nominal interest rates in the early period and hedging

[4] In the Italian case, not even a forty years holding period would be associated with a positive real return (Mediobanca 2009).

[5] The Irish Government Green Paper on Pensions, issued in 2007, reports assumed nominal equity risk premium estimates going from a lower bound of 4.5% to 7% (Stewart 2011).

[6] The weights to combine national performances are domestic market capitalization for equities and GDP for bonds. The 19 countries represent almost 90% of global stock market value.

properties against deflation subsequently, and of opportunities for portfolio diversification in a period with several stock market crises.

These findings differ dramatically from secular trends but cannot be easily dismissed invoking an eventual mean reversion, because they were computed over an holding period of quarter of century, long enough to be relevant for the investment strategy of a new subscriber to a pension fund. They therefore raise doubts about the validity of a life cycle rule of thumb for portfolio allocation: an all-equity investment strategy does not appear worthwhile, even in the early stages of a worker's career, compared to a safer all-bonds. In addition, and more fundamentally, they question the traditional and stronger rationale for subscribing to private DC pension funds, instead of relying only on public pension schemes (with the added benefits of economies of scale in transaction costs compared to smaller private funds). Against the backdrop of a required protracted fiscal consolidation for most advanced countries, as a shield against markets' doubts on looming sovereign risks because of the public debt to GDP ratio increase since the subprime crisis, tax expenditures aimed at boosting the membership in private pension funds, with implied losses in fiscal revenues, should therefore be closely assessed as to their effective social net benefits.

V. PENSION FUNDS AS LONG TERM INVESTORS IN REAL ASSETS

Unsustainable public debt dynamics can be counteracted through GDP growth. To this end, run-proof private DC pension funds could be picked by policymakers as growth-enhancing long term finance providers, especially when in the accumulation phase, as it happens for funds started in Sweden and Italy at the end of last century. Growth-enhancing finance could mean either direct investment – in firms' controlling rights acquisitions or in project financing of infrastructures or in real estate - or delegated investment through mandates to private equity funds and start-up and other venture capital specialists. Compared to banks and other institutional investors, with short term liabilities, up to the extreme case of sight deposits, unleveraged pension funds could commit resources on long-term, investment, better able to incorporate technical progress and thus enhance total factor productivity, for reasons similar to those spelt out in the literature debating on long-sighted bank-centric systems vs short-sighted market-centric ones (e.g. von Thadden 1995).

A scarcity of specialized operators and thin capital market segments are likely however to make it difficult in most countries to pursue the option of delegated investment, the one that would fit a separation between the task of a pension fund, acting as a principal, of

funds collection and portfolio strategic allocation, and the task of delegated investors (agents), who should choose how to manage funds under each investment line with own return-risk characteristics.

A direct investment option for portfolio allocation, when combined with an investment home bias, either because of regulatory or political constraints, so to restrict the geographical asset diversification of pension funds, would amplify the likelihood of pressures on policymakers to divert funds to help firms or sectors in troubles. The likely consequences of disregarding a proper economic assessment of the profitability prospects on the accumulation of the final assets to annuatize would therefore justify potential requests by eligible pensioners for future compensatory public funds.

VI. IMPLICATIONS FOR FINANCIAL EDUCATION FROM A MACROPRUDENTIAL PERSPECTIVE

To promote young workers' participation in private pension funds adequate information is warranted on replacement rates with public pension schemes and on how to add annuities to the public retirement income.

The often neglected implications of complex feedbacks between political risk in the area of pension schemes and sovereign risk, even when considering countries assumed almost by definition to be issuers of risk free government bonds, make it however a hard task to inform in a sufficiently simple way even financially literate workers.

Against the backdrop of a protracted fiscal consolidation - meaning *inter alia* a shrinking replacement rate out of PAYG pension schemes - as a pre-requisite to fend off doubts on public debt sustainability in most advanced countries, a low coverage of private pension funds would increase the gap between (socially adequate) expected and effective combined retirement income. A first normative implication, that participation be mandatory, is likely to be however hardly implementable, exactly because fiscal consolidation means that the State is unlikely to be able to divert resources to ease liquidity constraints on potential (young) contributors. A second and more interesting implication for pension fund members, to be clearly focused on in financial education programs, is that non contractual life cycle savings should raise. A larger accumulated total wealth would help shielding a pensioner's standard of living from financial markets shocks that could reduce the assets to annuatize

when eligible for retirement. This prescription is even more relevant when considering that a sober assessment of the equity risk premium should dampen the expected returns on contractual savings invested in DC private pension funds. Finally, requests for fiscal outlays should be resisted, because the likely negative feedback loops on sovereign risk would compromise also the financial stability of banks and other intermediaries, through mark-to-market losses in their holdings of government paper, with negative spillovers on the real economy growth.

A medium term macroprudential conceptual framework is warranted in order to be effective in spelling out to even poorly financially literate workers potential endogenous financial risks of public and private pension schemes, in particular through the politically-driven creation of contingent liabilities. The task of providing empirical content to this macroprudential perspective, admittedly requiring highly subjective, country-specific, hypotheses, would be a natural follow-up of the focus on pension funds' role in financial stability pioneered in the September 2004 issue of the GFSR (IMF 2004).

Interestingly, an important contribution is research work underpinning the September 2011 issue of the Fiscal Monitor (IMF 2011) on early warning systems on the fiscal sustainability risks, associated with a government's possible inability to roll over its actual and contingent liabilities, following Cottarelli (2011). Baldacci *et al* (2011) find that, among twelve indicators for the Fiscal Indicators index, the third one for comparatively strong signaling power is the change in long-term public pension expenditure, an indicator that should measure budget pressures from pension expenditures[7].

Building on the conceptual map proposed in this paper, budget pressures should be computed in a more inclusive way, taking into account, possibly with triggering thresholds, contingent liabilities arising from the gap between socially accepted minimum retirement income and the one effectively provided combining DC public and private pension schemes, for different assumptions on excess returns of funds' portfolios over government bonds. To make operational the proposal, the "subsistence" level could be proxied by the means-tested government provided age pension. In addition, a distinction should be introduced, when evaluating the adequacy of private savings, between countries with voluntary rather than mandatory private pension DC schemes.

[7] More precisely, expressed as in percent of GDP, is the change in projected expenditures 40 years ahead relative to the base year.

VII. CONCLUSIONS

Stress tests to assess the resilience of bank systems to macrofinancial risks should consider, at least conceptually, the political risk of contingent liabilities for the central government, arising from the attempt of consensus seeker policymakers to avoid that retirement income falls below a socially (at least in their electorate view) acceptable level. The likely increase in sovereign risk would impact on the capital adequacy of banks and other financial institutions, with negative feedback loops on the real economy.

The main conclusions of the discussion of the arguments supporting the claim of the rising importance of this specific political risk, are two.

First, and more fundamental, the basic message in a financial literacy initiative is that non contractual savings during the working age should raise, to help offsetting the effects of financial shocks on the final assets to annuatize. A sober perspective on returns offered by the membership in DC private funds is warranted, to avoid disillusions on the standard of living, and consequent pressures on policymakers for remedial debt-financed fiscal outlays.. A necessary building block along these lines is a careful assessment of the expected equity risk premium.

Second, in early warning systems on fiscal stance sustainability, budget pressures should take into account, possibly with triggering thresholds, contingent liabilities arising from the gap between socially accepted minimum retirement income and the one effectively provided combining DC public and private pension schemes, under different assumptions on excess returns of funds' portfolios over government bonds. A promising approach to operationalize this conceptual framework could be to proxy the "subsistence" level with a means-tested government provided age pension; as for the excess returns of funds' portfolios, country specific realized equity risk premia could be considered, together with required holding periods for realized positive real returns in equities.

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Table 1

Realized equity risk premium (annualized rates, %)

periods	**USA**		**UK**		**Italy**		**19 countries (weighted average)**[a]	
	vs gov. bonds	vs gov. bills	vs gov. bonds	vs gov. bills	vs gov. bonds	vs gov. bills	vs gov. bonds	vs gov. bills
2001-2010	-3..9	0..3	-1..3	-0.1	-7.3	-5.2	-4.0	1.5
1986-2010	0.9	5.5	1.0	3.4	-3.7	0.8	-0.8	4.5
1961-2010	2.6	4.4	3.4	4.5	-1.9	0.4	1.2	4.0
1900-2010	4.4	5.3	3.9	4.3	3.7	5.8	3.8	4.5

Source: Dimson, E. *et al.* (2011).

[a] The weights to combine national performances are domestic market capitalization for equities and GDP for bonds. The 19 countries represent almost 90% of global stock market value.

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