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Worldwide Drivers, Trends, and Challenges**

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ABSTRACT

Global Pension Systems and Their Reform: Worldwide Drivers, Trends, and Challenges^{*}

Across the world, pension systems and their reforms are in a constant state of flux driven by shifting objectives, moving reform needs, and a changing enabling environment. The ongoing worldwide financial crisis and the adjustment to an uncertain “new normal” will make future pension systems different from past ones. The objectives of this policy review paper are threefold: (i) to briefly review recent and ongoing key changes that are triggering reforms; (ii) to outline the main reform trends across pension pillars; and (iii) to identify a few areas on which the pension reform community will need to focus to make a difference. The latter includes: creating solutions after the marginalization or, perhaps, demise of Bismarckian systems in countries with high rates of informality; keeping the elderly in the labor market; and addressing the uncertainty of longevity increases in pension schemes.

JEL Classification: G23, H55, I3, J21, J26

Keywords: population aging, longevity, financial crisis, multi pillar pension systems, social pension, NDC, MDC

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1. Introduction

The outlook on global pension systems and their reforms since the early 1990s has changed markedly over time; the most recent reassessment is triggered by the ongoing global financial crisis and its implications for funded and unfunded pensions.

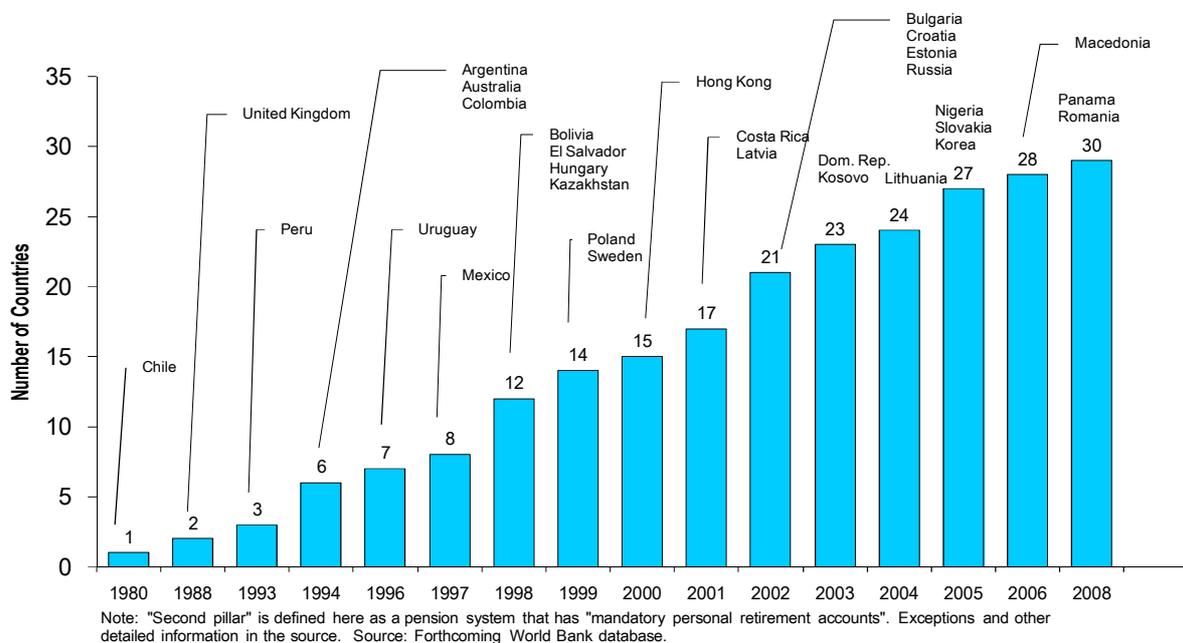
After the fall of the Iron Curtain and the move in Central and Eastern Europe from central planning to market economies, the future for pension systems for some experts and policy makers appeared bright and fairly certain once the initial crisis was overcome: transferring main parts of retirement income provisions from the public sector to the private sector (i) to address fiscal unsustainability and projected further population aging and (ii) to accelerate financial market development was expected to trigger higher economic growth to co-finance some of the transition costs. This policy vision emerged from various sources: the successful Chilean pension reform and similar reform attempts in Latin America; the seminal 1994 World Bank publication that proposed a multi-pillar pension scheme with a significant shift from publicly managed, unfunded defined benefit (DB) schemes to privately managed, fully funded defined contribution (DC) schemes (World Bank 1994); and general enthusiasm and optimism for more market and financial intermediation instead of public intervention. This policy vision caught on in many countries: between 1988 and 2008, twenty-nine countries followed Chile's example, with systemic reforms and establishment of a main funded pension pillar (Figure 1). Before the financial crisis hit, even more countries were poised for reform (e.g., Ukraine) and some will still do (e.g. Czech Republic).

The worldwide reassessment of the policy approach to pension system reform is broadly the result of three changes: a readjustment of objectives (such as a refocus on basic protection for the vulnerable elderly); moving reform needs (such as recognizing the urgency of addressing the effects of population aging and deferred retirement ages); and perceived and actual changes in enabling environments (such as more realistic views about the capacity of funded schemes to manage risks, the achievable rates of return, and the fiscal restrictions to finance transition deficits). This reassessment has led to reform reversals in a few countries (e.g., Argentina, Hungary, and Slovakia) and to temporarily or permanently reduced funded pillar contributions in others (e.g., Estonia, Latvia, and Poland), but not to a global rejection of the

funding or the DC approach. The reassessment has strengthened the push for alternative or complementary reform approaches, such as Non-financial (or Notional) Defined Contribution (NDC) and Matching Defined Contribution (MDC) schemes. While these new approaches should help move pension systems towards greater coverage and sustainability, there are a number of issues that still await solutions, such as addressing the uncertainty about longevity increases.

Against this background, the structure of this policy review paper is as follows: Section 2 briefly reviews recent and ongoing changes that have triggered a reassessment of pension systems and reform approaches; Section 3 outlines the main pension reform trends across pension pillars, and Section 4 proposes a few areas on which the pension reform community will need to focus to make a difference. The latter include: preparing solutions for implementation after the marginalization or, perhaps, even demise of Bismarckian schemes in countries with high informality; keeping the elderly in the labor market; and addressing longevity in pension products. A few pension fund-focused conclusions are presented in Section 5.

Figure 1: Evolution of number of countries with (mandated and funded) “Second pillars” as of 2008



Source: World Bank Pension Data Bank.

2. Changes in Objectives, Reform Needs, and Enabling Environments

Many changes are likely to have influenced the reassessment of what constitutes a good target for pension system reform (see Holzmann and Hinz 2005, Barr and Diamond 2008, and Orenstein 2011). In this section, four key changes are highlighted: the refocus on basic income protection for the elderly; the realization and implications of population aging; acknowledgment of lessons from the global financial crisis; and the re-assessment of achievable rates of return on pension fund assets.

2.1 Refocusing on basic income protection for the elderly

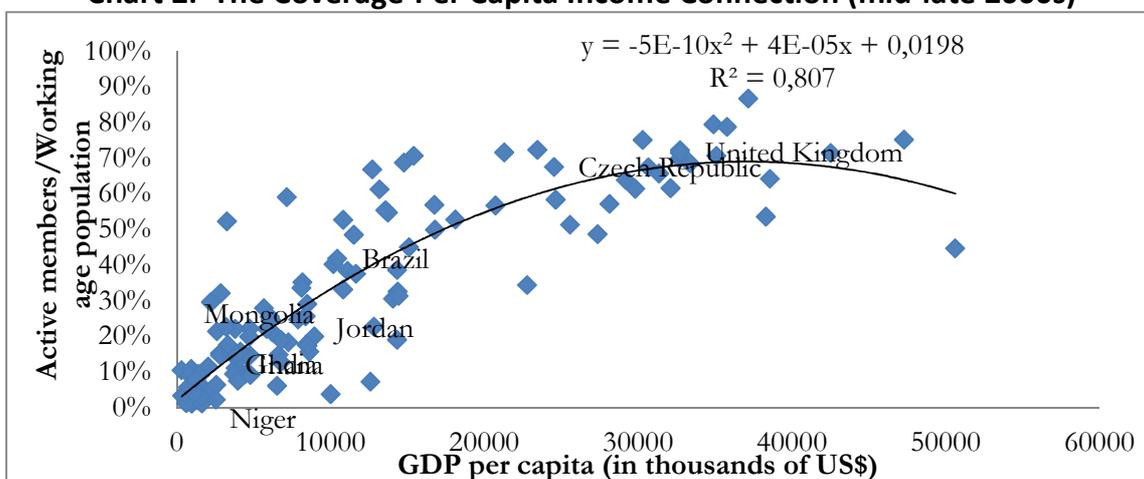
The refocus on basic income provisions for the vulnerable elderly across countries has three distinct but interrelated origins:

- Disappointment by pension reformers with coverage expansion after systemic pension reforms is quite likely the first main reason for redirected attention towards the vulnerable elderly and their income protection. For emerging economies, there were strong expectations that systemic pension reforms (at that time directed towards funded individual account systems) would contribute to a major increase in coverage/reduced informality as the contribution-benefit link tightened and credibility of the scheme increased, financial sectors developed and per-capita income grows. The coverage-per capita income link and a role for interventions is strongly suggested by cross country data (Chart 2). Yet, eight of eighteen countries in Latin America continue to have a pension coverage rate of the labor force below 30 percent, with only moderate improvements in some and largely un-systemic changes in most other countries over the last two decades (see Chart 3, and more in Rofman and Oliveri 2012). As a result, when reform and coverage expectations were not met, countries were forced to consider other approaches to extend coverage (as discussed in the next section).
- Reforms of earnings-related schemes towards a tighter contribution-benefit link limited the capability to redistribute income towards low income groups within the schemes. Furthermore, in high income countries, the coverage in contribution-based systems was being reduced due to lower contribution density, in part because of the difficult transitions into the labor market for

youth, and because of the increasing mobility of workers between formal and informal wage employment and into self-employment, also in OECD countries (Holzmann 2003).

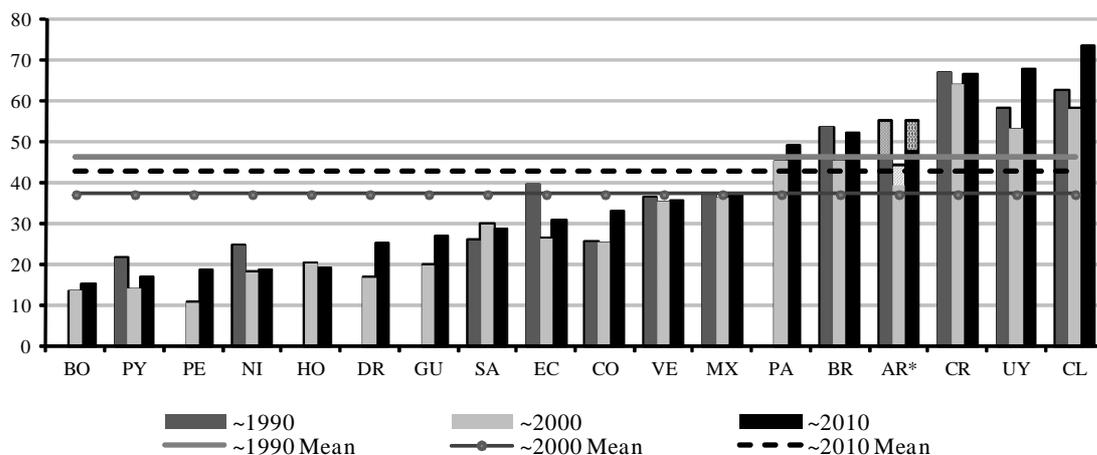
- The International Labour Organization (ILO), which had been sidelined in the discussion about multi-pillar pension reforms and funded pensions, returned with force to the international social policy arena, advocating a “social floor”; i.e., access to essential health care for all, and income protection for the elderly, the unemployed, and children (see ILO 2011). While implementation of basic old age income protection in many low and middle income countries is still awaiting realization, the political push has caught on in development circles.

Chart 2: The Coverage-Per Capita Income Connection (mid-late 2000s)



Source: World Bank Pension Data Base

Chart 3: Coverage of the Economically Active Population in Latin America (1990-2010)



Source: Rofman and Oliveri (2012)

2.2 Realizing the implications of population aging

Individuals and politicians in high income countries are finally waking up to the challenge of population aging. While the message of increased life expectancy, reduced fertility rates, and resultant deteriorating demographic (and system dependency) ratios has been around for some time, it has been largely ignored by politicians and the broader public until recently. Gradually, it has become clear that the effects of population aging on pension systems can only be addressed in three ways: higher contributions, lower benefits, or later retirement; and this applies to both unfunded and funded systems. Individuals and policy makers are also gradually acknowledging that the problem cannot be passed on to future generations, that higher contributions or lower benefits may not be the best approach, and that later retirement/working longer looks like the most natural and best solution. Yet it has also become better understood that simply legislating an increase in the legal retirement age may not be sufficient. Reforms of the pension system to provide incentives for later retirement and policies to keep the elderly in the labor market are required to raise the effective retirement age (see the recent White Paper by the European Commission 2012).

2.3 Effects of the global financial crisis

The financial, then economic, and now sovereign debt crisis that started in 2008 provides some sobering lessons for reformed pension systems which are only gradually being understood and translated into policy actions. Three lessons stand out in particular:

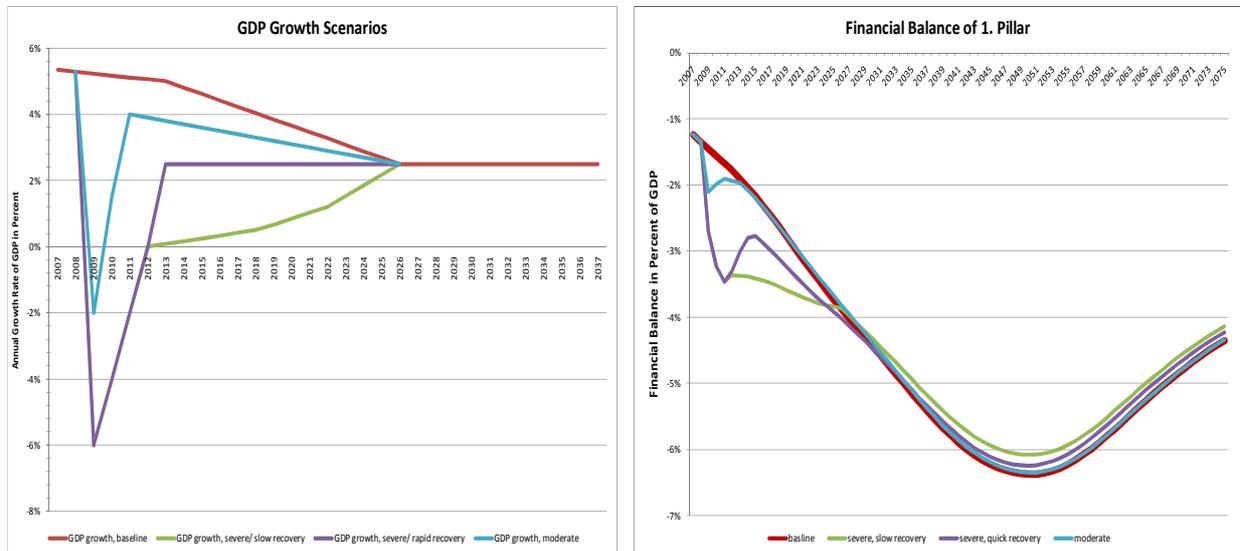
- The fall in GDP below the pre-crisis trajectory and in pension fund asset prices (not yet fully recovered in many countries) made a major dent in the financial situation of mandated pension schemes and individual benefit level, whether unfunded or funded. Under a severe crisis and low recovery scenario, the accumulated system deficits for the former transition economies in Central and Eastern Europe are projected in the low double digit percent of GDP (see Hinz *et al.* 2009). Yet the crisis impacts are still dwarfed by those associated with future population aging and the population effect is particularly strong in the former transition economies. The clear message is that more efforts must be undertaken, and more

quickly, to address population aging and its effect on retirement schemes and public budgets if a future meltdown of pension systems is to be prevented (see IMF 2011).

- The budgetary consequences of the financial crisis render the financing of transition costs for a newly introduced funded pillar more difficult. Cash flow problems, already substantial on their own, are aggravated by the debt accounting under the Maastricht treaty, which takes insufficient account of the fact that with the reform, part of the increased explicit debt merely reflects a reduced implicit pension debt. These financing issues have been used by some countries as an excuse to legally (e.g., Argentina) or virtually (e.g., Hungary and Slovakia) end the funded pillar and to divert the pension fund assets for public debt reduction purposes. Other countries have implemented temporary (e.g., Estonia and Latvia) or permanent (e.g., Poland) reductions in the contribution rate to the funded pillar at the benefit of the unfunded pillar to reduce public deficit and debt (see World Bank 2009). While all reform countries were informed about the fiscal implications of a systemic pension reform, very few, if any, had a well thought-out plan for normal economic situations, let alone one for bad times.
- The temporary¹ fall in asset prices and portfolio composition gave opponents of the systemic reform approach further ammunition (see Orenstein 2011). But it also led reform supporters to review some of the design components and to propose improvements, such as lifecycle portfolios (i.e., a mandated move from an aggressive to a more conservative portfolio as an individual approaches retirement, as is done in Chile), and more flexibility around mandated annuitization to avoid a locking-in of losses (see World Bank 2008).

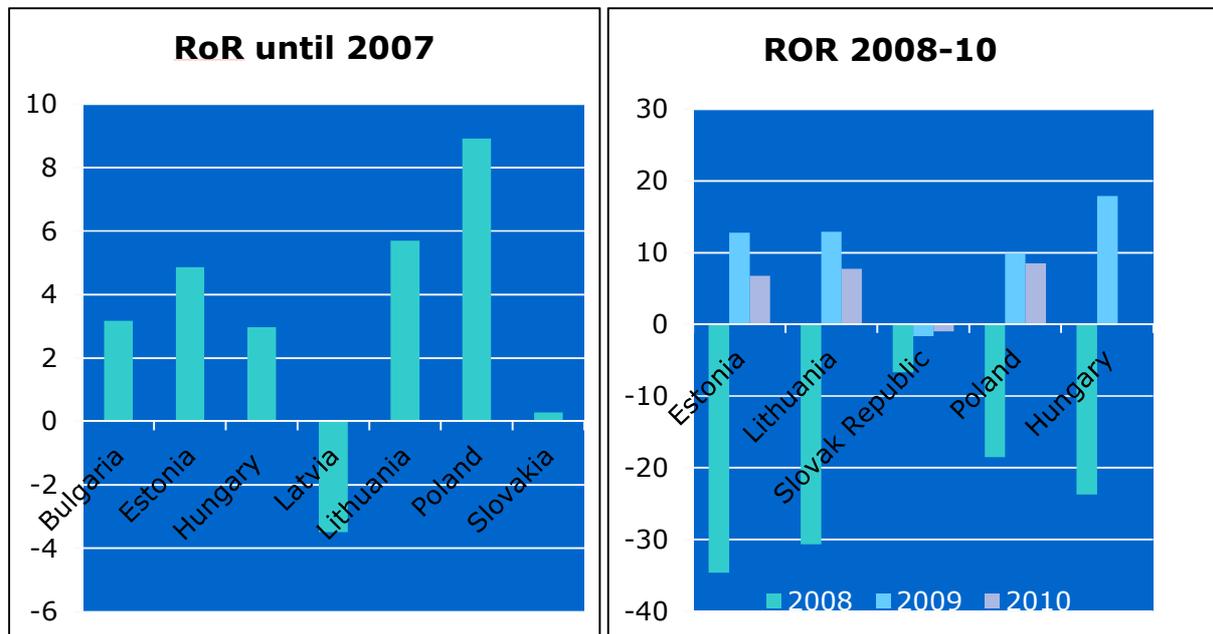
¹ Albeit largely temporary, the situation had not fully recovered by the end of 2010 in OECD countries (OECD 2011b) while pension fund asset to GDP ratios in Asian Pacific countries by end-2010 are well above their 2007 levels (Hu 2012). For the latter this reflects both recoveries in asset prices as well as coverage expansion.

Chart 3: Simulations of Fiscal Impact of Financial Crisis on Synthetic Country in Central and Eastern Europe



Source: Hinz et al. (2009)

Chart 4: Real Rates of Return (RoR) of Pension Funds in CEE before and during Crisis



Source: OECD (2011b)

2.4 Rate of returns on assets

The financial crisis of 2008 and beyond reinforced the already sober expectations for the rates of return of funded (and unfunded) schemes and increased uncertainty regarding regulatory reforms of pension funds (see IPE 2011). The high return expectations of the 1990s were first dampened by the bursting of the dot.com bubble in the early 2000s. The more recent and ongoing stark fluctuations in asset prices, the possible non-existence of an asset with zero risk (i.e., government bonds), and the likely “new normal” future of low real asset return for a protracted period of time create major uncertainties for individuals, policy makers and pension fund profession²; more critically, all this begs the question of the future of the size of funded pension pillars (compared to the unfunded pillars) and possibly even about their very existence. This question is additional to the still unanswered ones about the (international) performance of pension funds on a comparable basis and about how to usefully define such a basis (see Hinz *et al.* 2010). There is some recent evidence that even in countries like Chile the expected rates of return on financial assets may not necessarily surpass the growth rate of wages, which is the rate unfunded systems are able to pay (see Fajnzylber and Robalino 2012).

3. Main Reform Trends across Pension Pillars

The changes in objectives, reform needs, and enabling environments outlined in the prior section have a bearing on the reform trends across the world that can be highlighted through design and implementation innovations in the key pension pillars. The 2005 World Bank definitions and structure (Holzmann and Hinz 2005) are used; this structure separates a “zero pillar” from a “first public pillar” to better differentiate between the poverty reduction/redistributive (zero pillar) and consumption smoothing (first pillar) objectives of public and unfunded schemes. The second pillar refers to mandated funded schemes (DB or DC); the third pillar refers to voluntary funded schemes on an occupational or personal basis.

² The uncertainty in the profession is visible by the topics of conferences (such as the 2012 Asian Pension Fund Round Table on “Managing Risks in a Deleveraging World”) and publications that advise to see uncertainty as an opportunity (such as the recent 2012 Principals Global Investors publication on “Market Volatility: Friend or Foe”).

The fourth pillar offers informal (family), market-based, and public support (e.g., health care) to the elderly that impacts the scope and design of the other pension pillars, and is not discussed herein.

Using the pillar structure to highlight reform trends is motivated by the very broad and increasing support for the multi-pillar pension concept. The structure can be viewed: as an ordering principle for analysis; as a means of risk diversification (with unfunded pillars allocating savings to the pay-as-you-go asset and funded pillars to financial assets); and as recognition that different pillars have varying degrees of importance for the key target groups in a population (e.g., formal sector workers, those employed in the informal sector, and the lifetime poor). For low and many middle income countries, the informal sector is by far the largest group.

Table 1 highlights the basic system architecture for the mandated pillars by World Bank regions. As can be seen, the large majority of countries rely on first pillar schemes (that can be Notional Defined Benefit (NDB), Notional Defined Contribution (NDC), and public DC/provident fund arrangements) and almost half have a zero pillar (100 percent of the twenty-four traditional OECD countries have a zero pillar). Only thirty-two countries have mandated and funded pillars, of which two have a DB structure (Iceland and the Netherlands); the rest have DC structures. The most drastic changes since 1990 is the more than doubling of countries with a zero pillar, the transformation of NDB to NDCs schemes in 8 countries, and the introduction of FDC schemes in 29 countries that mostly complemented and only rarely replaced NDB schemes.

Data in Pallares-Miralles, Romero and Whitehouse (2012) also reveals that in 2011, the majority of countries (sixty) were still operating a separate scheme for civil servants, albeit some progress has been made in recent years to integrate these workers into the general scheme.

Table 1: Basic system architecture by region, 2011 (and 1990)

	Pillar 0		Pillar 1			Pillar 2	
	Targeted	Basic	NDB	NDC	PF	FDC	FDB
East Asia & Pacific	4	3	8	1	10	1	0
Europe & Central Asia	11	4	28	5	0	15	0
High income: OECD	8	9	16	2	0	3	3
Latin America & Caribbean	16	2	29	0	0	9	0
Middle East & North Africa	1	1	17	0	0	0	0
South Asia	3	0	2	0	3	1	0
Sub-Saharan Africa	3	2	30	0	4	2	0
2011 Total	46	21	130	8	17	31	3
Grand Total	67			155			34
1990 Total	20	10	140	0	17	2	3
Grand Total	30			157			5

Notes: NDB/NDC: Notional Defined Contribution Scheme; FDC/FDB: Financial DC or DB scheme; PF: Provident Fund

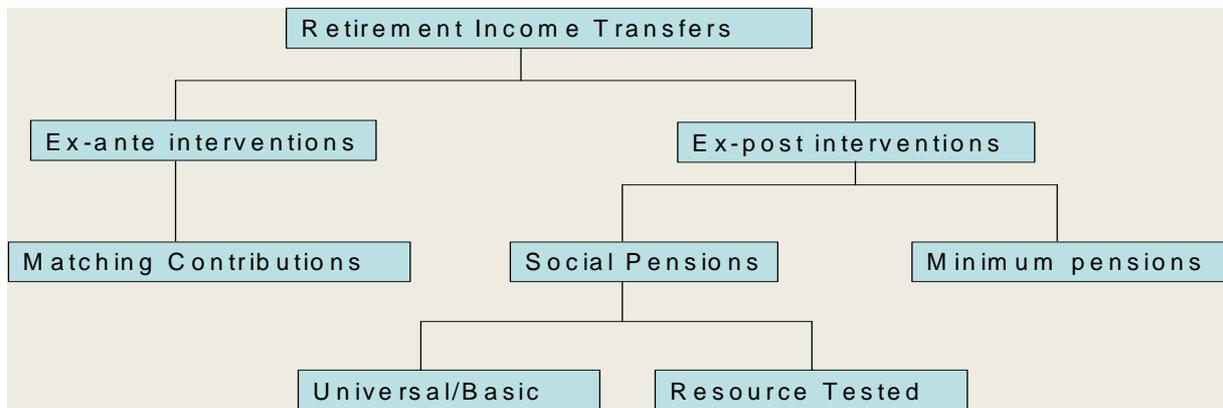
Source: Pallares-Miralles, Romero and Whitehouse 2012, and author.

3.1 Zero pillar

The main objective of the zero pillar is poverty reduction, and as this has become the focus of development policy, its importance has increased over the past two decades (Bloom and McKinnon 2012). In its simplest form, it is part of the social safety net that protects poor and vulnerable individuals of all ages through universal, means-tested, or conditional cash transfers; these instruments have been the revolution in low and middle income countries over the last decade (see Grosh *et al.* 2008). In the more “ear-marked” form of social pensions, zero pillar schemes provide income transfers to the elderly, typically via means-testing for the younger old people, and at times without means-testing for the very elderly. These schemes are now ubiquitous in traditional OECD member countries, and are increasingly but slowly gaining traction in low and middle income countries. An important step to integrate the new zero pillar with the earnings-related (funded) pillar took place in Chile in 2008; this reform is seen as a benchmark (see Rofman, Fajnzylber and Herrera 2008). There are also recent initiatives to implement *ex ante* transfers in the form of matching contributions for informal wage employment workers and the self-employed (discussed further below). Chart 5 offers a

taxonomy of the retirement income transfers, including the guarantee of minimum pensions within the mandated (first or second) pillar.

Chart 5: Taxonomy of First Pillar Retirement Income Transfers



Source: Holzmann, Robalino and Takayama (2009)

The key questions about the zero pillar have changed little but a few new ones have been added. For low and middle income countries, the fiscal affordability, disincentive effects, and administrative issues of universal benefits compared to means-tested approaches remain an evergreen. New to the discussion is the potential role of *ex ante* interventions to address poverty and adequacy issues upstream, and the impact of social pensions on informality and thus coverage under formal earnings-related schemes (discussed below).

3.2 First pillar

The typical mandated, unfunded, and DB-type first public pillar has undergone reforms to various degrees across rich and poor countries. In OECD countries, reforms have been mostly parametric, and have included: a reduction in generosity (such as a lower annual accrual rate); lengthening of the assessment period at times to all contribution periods; the introduction of decrements for earlier and increments for later retirement; and in a number of countries, an increase in the standard retirement age (see OECD 2011a and 2012). Although all of these measures should ensure that the first pillar is sustainable, this seems to have been achieved in some, but not many, countries. In most countries, further parametric reforms are needed to address both population aging-related fiscal as well as labor market- and social policy-related

incentive concerns. The challenge here is to deal with the political discretion that surrounds this type of reform and compromises the long-term solvency of pension schemes.

Against this background, the NDC scheme, a systemic reform innovation that maintains the unfunded character of the public first pillar, is attracting increasing attention in Europe and worldwide. The NDC scheme operates as a DC scheme in accumulation and annuity calculation at retirement, but remains unfunded (except for, perhaps, a reserve fund to address short-term liquidity issues). To achieve solvency, the NDC scheme offers only the notional rate of return that keeps the system solvent and only the annuity amount that is consistent with the remaining (projected cohort) life expectancy at retirement.

This pension reform innovation was introduced in the second half of the 1990s in Italy, Latvia, Poland, and Sweden and has weathered the financial crisis fairly well (see Chłoń-Domińczak, Franco and Palmer 2012). In 2009, Norway legislated a reform now under implementation that mimics many but not all of the NDC features. In 2010, Egypt legislated an NDC reform for which implementation is envisaged for 2013. This reform approach is also under discussion in many EU countries, as well as in countries such as Belarus, China, Lebanon, and Uruguay.

The attractions of the NDC scheme are: the promised solvency even during adverse economic times and under severe population aging; the DC-type incentive structure to address labor market concerns and broader social changes (such as increasing life expectancy and rising divorce rates); and the openness to future partial or full shifts towards Funded Defined Contributions (FDC) schemes once the enabling environment has been created. While promising, the NDC approach is not foolproof, i.e. immune against policy mistakes, and there are still a few conceptual and operational issues that have not yet been satisfactorily solved, such as the design of an effective balancing mechanism, including the measurement of assets and liabilities; the interactions of NDC schemes with other pillars and benefits (e.g., disability and survivor); reliable methods to project cohort life expectancy and equitable approaches for sharing the longevity risks; and defining and establishing the enabling environment for NDC implementation in low and middle income countries (see the recent anthology on NDCs by Holzmann, Palmer and Robalino 2012).

3.3 Second pillar

The mandated and funded DC pillar has been the main innovation in pension reform design since it was introduced in Chile in 1981. While the Chilean reform is considered the most successful benchmark worldwide, very few of the other twenty-nine countries that had introduced second pillars as of 2008 have closely copied its design and implementation; in Europe and Central Asia, only Poland has done so. This may explain some of the variance in outcomes. Other than Chile, no country has conducted such a rigorous analytical evaluation of its second pillar scheme, or introduced reforms to improve existing structures (e.g., introduction of lifecycle funds or an integrated “solidarity pillar,” or measures to reduce costs and fees) based on thorough analysis.

Consequently, many of the smaller and larger changes in countries with systemic reforms represent experimental corrections meant to address issues as they emerged. Three are highlighted:

- The high costs and fees of funded pensions have been a concern since the beginning, as their size presents a major reduction of the future benefit level. Fees amounting to 100 or more basis points lead to a reduction in ultimate benefits of 20 percent and more. Attempts to control costs and fees include: limits and caps; constraints on marketing efforts; innovative differentiated fee limits to create a contestable market; and the creation of clearing houses linked with blind accounts to reduce administrative and marketing costs, and to limit pension funds to an asset management function. While broadly moderately effective, these attempts have not been successful in limiting cost and fees to basis points in the low double digits. And there are conceptual considerations that the current approaches will never be able to meet given the production technology and information asymmetry involved; industrial organization models and investment products are suggested to make it work (see Impavido, Lasagabaster and García-Huitrón 2010).
- At their initiation, pension funds were typically subjected to a “Draconian regime” to avoid early mishaps and a discrediting of the reform approach. Tight regimes included quantitative restrictions on asset classes in which the pension fund could invest. Over time,

the restrictions were relaxed, and in advanced countries, even abandoned. Concurrently, the financial significance of pension funds increased, making them a critical component of the financial market, on par with banks and insurance companies. This led to the extension of risk-based supervision methods, developed originally for bank supervision, to pension funds in a number of developed economies (such as Australia, Denmark, and the Netherlands) but also in emerging economies (such as Mexico). The different approaches applied provide a rich set of information for followers in both emerging and developed countries (see Brunner, Hinz and Rocha 2008).

- Much of the focus on the development of the second pillar in emerging economies in Latin America and Central and Eastern Europe was on the accumulation phase, as the payout phase was not to happen for many years. Yet the payout phase has almost arrived and the reform countries that introduced a second pillar now face the challenge of organizing the payout for retiring workers. This effort entails introducing a well-organized and well-supervised market for retirement products, including marketing activities, and intermediaries. Alternatively, governments could provide the annuity in exchange for handing over the accumulated resources (as is done in Sweden). While some advanced economies (and Chile) provide useful lessons for the structure and operations of annuity markets (see Rocha, Vittas and Rudolph 2011), the features and trade-offs for key products are still little known (Vittas 2011), and financial assets to address inflation and longevity risks are not available (as discussed in the next section).

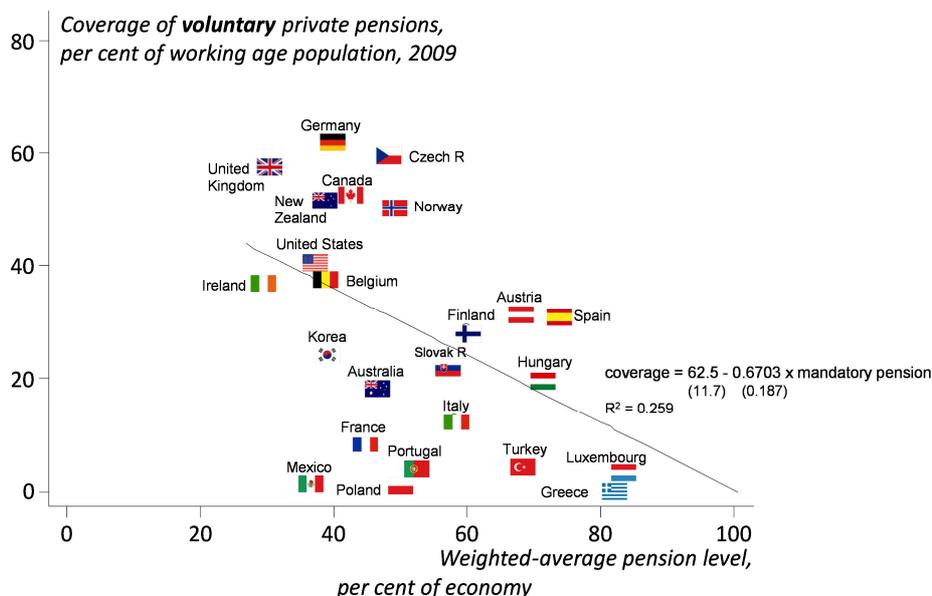
3.4 Third pillar

Establishment of this pillar of occupational or personal voluntary funded pensions has often preceded the creation of the mandated second pillar, but how best to regulate and supervise these schemes remains a challenge across the world. However, this pillar is receiving increasing levels of interest from policy makers everywhere as a means to offer some coverage to those employed in the informal sector in low and middle income countries, and to offer individuals an opportunity to compensate for reduced public generosity with individual saving efforts in high income countries. The links between public generosity and voluntary pension coverage clearly

exists for OECD economies (Chart 6). To motivate voluntary participation, countries are using *ex ante* subsidies in the form of matching contributions (hence, Matching Defined Contribution (MDC) schemes) and/or other nudging devices and advocacy, particularly for informal workers (see Palacios and Robalino 2009). The latter include implementing massive information campaigns and dramatically reducing transactions costs for enrolling and contributing through the use of mobile phones, such as in the Mbao program in Kenya (ISSA 2011).

MDC schemes are well known in the developed economies such as the U.S. (401k scheme), Germany (Rister pension), and New Zealand (Kiwi Saver) for supplementing public benefits. However, MDCs are also gaining traction in emerging economies such as India and China for offering basic benefit coverage. For example, China started pilot schemes for the rural population in 2009, an experiment that was extended to the urban population in 2011. Whether the expectations of these schemes can and will be met is under discussion and review (Hinz et al). This adds to the better known issues of third pillar coverage, such as high administrative costs, lack of good annuity products, and the role and scope of regulation.

Chart 6: Coverage Rate under Voluntary Private Pensions versus Replacement Rate under Public Pension Schemes



Source: Whitehouse, forthcoming.

Overall, the move toward funded pensions through mandated (second pillar) or voluntary (third pillar) arrangements is visible in the size and growth of assets over the last decade for 13 major pension markets from US\$ 14.8 trillion to an estimated aggregate of US\$ 26.5 trillion by end-2011; a record high if measured in absolute terms (Table 2). Pension assets in percent of GDP reached 72.3 %, still below the 2007 level of 78.9 % but also below the 2010 ratio of 75.5 %. The crisis after 2007 left a dent in most but not all countries and regions that has not yet been recovered by end-2011 (Tower Watson 2012). Data for Asia Pacific signal higher ratios of pension assets to GDP in 2010 compared to 2007 in all 10 reviewed economies (Hu 2012).

Table 2: Pension Assets in 13 Major Pension Markets in end-2011

	Total Assets 2011						
	in US\$ bn	in % GDP					
Australia	1,301	96					
Brazil 1/	321	15					
Canada 2/	1,303	78					
France	129	5					
Germany 3/	468	14					
Honh Kong	84	34					
Ireland	101	50					
Japan	3,363	55					Source: Tower Watson 2012
Netherlands	1,046	133					Notes: 1/ Assets include only thos from closed entities
South Africa	227	62					2/ Excludes RRSP
Switzerland 4/	693	115					3/ Pension assets from company schemes only
UK 5/	2,394	101					4/ Only includes total of autonomous pension funds
US 6/	16,080	107					5/ Excludes Personal Stakeholders DC assets
Total	27,510	72					6/ Includes IRAs

Source: Tower Watson 2012

3.5 Centralized public pre-funding

The trend to create and expand public pension reserve funds to support unfunded pillars, to more generally allow for intergenerational consumption smoothing, or to offer a societal cushioning against adverse future events expanded over the last decade to some eighteen OECD countries and a number of other major economies, such as China and Argentina. By the end of 2010, for OECD countries for which funds data are available, public pension reserve funds held US\$ 4.8 trillion (compared to US\$ 4.6 trillion in 2009; Table 3). Given the budgetary

crises in many of these countries, it is doubtful that these funds will receive additional resources or even survive. The situation is likely to be different in resource rich countries with their earmarked reserve funds (such as in Australia and Norway) or in countries with sovereign wealth funds with a pension focus (such as in the Russian Federation). And among a number new resource rich developing countries in Asia (such as Kazakhstan and Mongolia), Latin America (such as Brazil following Chile's copper fund) and perhaps soon also some East and West African countries there is interest in creating wealth funds to address expected future shocks, including population aging. Such funds have a tradition in the oil-rich countries of the Gulf Cooperation Council.

Table 3: Size of public pension reserve fund markets in selected OECD countries and other major economies, 2010

Country	Name of the fund or institution	Founded in	Assets		
			USD billions	% of GDP	% increase
Selected OECD countries					
United States	Social Security Trust Fund	1940	2 609.0	17.9	2.7
Japan (1)	Government Pension Investment Fund	2006	1 312.8	25.9	n.d.
Korea	National Pension Fund	1988	280.4	27.6	16.7
Canada	Canadian Pension Plan	1997	136.0	8.6	13.0
Sweden	National Pension Funds (AP1-AP4 and AP6)	2000	124.7	27.2	8.1
Spain	Social Security Reserve Fund	1997	85.3	6.1	7.3
France (1)	AGIRC-ARRCO	n.d.	71.7	2.7	n.d.
Australia	Future Fund	2006	65.8	5.5	8.4
France	Pension Reserve Fund	1999	49.0	1.9	11.1
Ireland	National Pensions Reserve Fund	2000	32.3	15.9	9.3
Belgium	Zilverfonds	2001	23.3	5.0	4.3
Norway	Government Pension Fund - Norway	2006	23.1	5.6	16.9
Portugal	Social Security Financial Stabilisation Fund	1989	12.8	5.6	2.5
New Zealand (2)	New Zealand Superannuation Fund	2001	11.2	7.9	17.1
Chile	Pension Reserve Fund	2006	3.8	1.9	12.2
Mexico	IMSS Reserve	n.d.	3.6	0.3	-6.7
Poland	Demographic Reserve Fund	2002	3.4	0.7	39.1
<i>Total selected OECD countries (3)</i>			4 848.1	19.6	5.0
Other major economies					
Saudi Arabia	General Organisation for Social Insurance (1,4)	1969	400.0	106.4	n.d.
China	National Social Security Fund	2001	126.5	2.2	10.3
Argentina	Sustainability Guarantee Fund	2007	45.7	12.3	26.4
<i>Total other major economies (3)</i>			572.2	75.9	14.6
Memo item: Sovereign Wealth Funds with a pension focus (5)					
Norway	Government Pension Fund - Global	1990	509.1	122.8	16.6
Russian Federation	National Wealth Fund	2008	88.4	5.9	-2.7

Source: OECD (2011b)

4. Key Challenges Ahead

There are many challenges ahead for pension systems, such as:

- Closing the coverage gap;
- Better integrating old age pensions with other insurance programs, in particular disability and survivor pensions, but also unemployment benefits and severance pay;
- Handling possibly lower future real rates of returns of funded schemes (seen as the “new normal” by some observers) as well as of unfunded schemes (due to projected lower or even negative labor force growth and lower productivity growth in aging economies) with conflicting views and empirical evidence;
- Finding innovative solutions for pension funds to invest abroad to tap into the conjectured higher capital productivity while reducing the savings constraints of low and middle income countries;
- Rethinking financing mechanisms away from contributions when funding legacy costs or redistributive components to reduce labor tax wedges and labor market distortions;
- Overcoming reform resistance, often conjectured to increase as the population ages and as the age of the median voter increases;
- Finding satisfying solutions for the full portability of acquired pension rights across professions, sectors, and countries for an increasingly internationally mobile labor force; and
- Elaboration concepts and defining best practices for reserve funds in resource rich and other countries as an integrated part of intergenerational and solvency considerations.

Section 4 highlights some of these challenges with three key questions: (i) will Bismarckian systems with their mandated and often high contribution rates survive in countries with high informality, and what happens after their marginalization or, perhaps, demise? (ii) how can the elderly be kept in the labor market?; and (iii) how can unknown longevity increases be addressed in the payout phase?

4.1 Preparing for Bismarck’s demise and succession

As discussed above, to address low pension coverage, many low and middle income countries introduced basic provisions in the form of social pensions, still assuming that over time, workers would move towards formal sector employment and participation in a mandated and

earnings-related (funded or unfunded) scheme. Yet in fact, these very provisions (essentially subsidies) risk becoming a tax on formal work and providing individuals with incentives to take informal jobs or move into self-employment while they build up their own retirement provisions (e.g., businesses, houses, financial assets, etc.), knowing that the safety net will be there for them if everything else fails. Such a tendency seems to be particularly pronounced in Latin America, as suggested by recent analytical work (see, e.g., Levy, 2008; Aterido, Hallward-Driemeier and Pagés 2011; and Ribe, Robalino and Walker 2012). If confirmed, this may risk sounding the death knell of Bismarckian systems in many low and middle income countries. But what would a future retirement income scheme look like: Only basic provisions plus unstructured voluntary retirement provisions? Or innovative new schemes in which basic provisions are also based on individual accounts funded across the lifecycle by government and augmented by individual savings supplements of unknown design? Or? Stay tuned ...

4.2 Keeping the elderly in the labor market

There is a growing understanding and emerging consensus among many (but not yet all) policy makers in OECD economies that the solution to the aging problem is to be found in longer labor market participation and hence later retirement of individuals. Thus, there is a willingness to raise the legal retirement age as witnessed in many OECD countries (OECD 2011a and 2012). However, there is not yet full recognition that a legal decision alone will do little to raise the effective retirement age unless major reforms in the labor market take place to allow the elderly to remain productively employed and to provide employers with incentives to keep them employed/offer them jobs. While the basic ingredients are simple to pronounce (i.e., keep them healthy, skilled, and motivated), the policies to do so are less known or implementable across varying cultural contexts. And implementing successful reforms requires reviewing many or all of a country's institutions and regulations, including the incentive structure of the pension system. But unless workers are convinced that they will have a job when they are older, they are likely to oppose a legal increase in the retirement age. While OECD countries have started introducing promising reforms at the firm level to improve labor market opportunities for the elderly (see, e.g., European Centre for the Development of

Vocational Training 2008), any scaling-up or translation to other countries is, for the time being, limited by the lack of sound analytical penetration and rigorous monitoring and evaluation of these innovations.

4.3 Addressing unknown longevity increases during the payout phase

Perhaps the main open design issue for both NDC and FDC schemes concerns the payout phase and how best to address shocks in longevity. The financial, social, and political sustainability of a DC scheme requires translating accumulated savings at retirement into an annuity that takes account of the projected remaining cohort life expectancy, and that has adjustment features that are fair and transparent if the longevity projections turn out to be wrong. At the moment, DC systems do not have reliable projection methods for mortality rates and remaining life expectancies (see, e.g., Alho, Bravo and Palmer 2012). Neither NDC nor FDC schemes have robust methods for distributing the risks if projection errors take place. In FDC schemes that typically use the private sector annuity market, the financial sector provider officially takes the risk, while individuals and/or the government bear the final risk if insurers go bankrupt, but with untested proportions. In NDC schemes run by the rule book, projection errors can be corrected by adjusting the notional interest rate and the annual indexation of pensions – effectively distributing risks between active and retired plan members in specified proportions. For both FDC and NDC schemes, there are several proposals to address the longevity issue through longevity bonds that create an effective hedge against the longevity risks (see Blake, Boardman and Cairns 2010; Palmer 2012). These proposals need further analysis and piloting prior to full implementation, however. Across the world are financial market instruments to hedge longevity risks still virtually non-existent (Roy 2012). Whatever progress can be made in this area, paying attention to population aging and longevity issues forms part the reforms to increase the confidence in public and private sector balance sheets (IMF 2012).

5. Concluding Remarks

Pension systems are in constant flux, and their reforms are driven by shifting objectives, moving reform needs, and changing enabling environments. Over recent decades, this has led to a number of redirections and innovations throughout the world, including: the introduction or

strengthening of basic protection for the vulnerable elderly; the move towards funded and unfunded mandated DC schemes; and increased nudging by governments to encourage benefit coverage and “top-ups” under voluntary and funded provisions.

The move towards pre-funded old age income provisions is now itself under review as fallout of the financial crisis/recession/borderline depression. Areas of concern include the fall in asset prices, the high fluctuations in the rates of return, and the possibility of lower real risk-adjusted rates of return as the “new normal.” Some of the lessons from the crisis are straightforward and easy to implement, such as the move towards lifecycle funds. Others may be more difficult to deal with, such as the outlook to lower rates of return plus higher return rate volatility.

However, such a review is unlikely to ring the death knell of pre-funded old age pensions, if only for the simple reason that the fiscal conditions after the crisis and the fiscal implications of the expected further aging of populations limit both the capacity and the willingness of governments to take care of the whole retirement income task. However, providers of funded provisions will need to work hard to reestablish confidence and to deliver what is promised to keep their share in the retirement income market.

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