

# Developing Future Social Protection Systems Retirement Income

Sustainability, Risks and Challenges of Current Retirement Income Schemes



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## Preface

Social security systems around the world – in developed countries and emerging markets alike – are facing substantial challenges as a result of changing demographics, fiscal constraints, economic instability and volatile financial markets. There is a need to not only address the long-term problems associated with these challenges, but also take short-term action.

Many developing countries are confronted with the challenge of introducing or expanding social protection systems and subsequent design options. This has a huge impact on the financial services industry as its products and services may help to mitigate these challenges. At the same time, the financial services industry itself is strongly affected by this adverse environment. Different strategies and solutions for social protection systems exist, mostly depending on historical legacies.

While there is a need for reform in many countries, there is also a clear opportunity to learn from successful models. Even though the problems have been known for a long time, and a variety of reform proposals exist, the political cycle can be rather short term. Against this backdrop, reforming social protection systems is a challenging task. It requires foremost intertemporal consistency based on a sustainable intergenerational social contract. There also must be greater clarity and a new social compact about the relative responsibilities of the state, community, private enterprise and the individual.

The need for reform goes beyond short-term political sparring, and there will surely be increased focus on disparities between different national solutions. Solutions currently provided by the financial services industry are certainly not a panacea, but there are potential benefits derived from a long-term partnership between the financial services industry and the public sector.

As the entire social security protection system topic would by far go beyond the scope of one report, this paper will focus on retirement income and, in particular, on the sustainability and risks of pension systems. It does not discuss coverage and income adequacy in retirement, nor financing of healthcare in old age. Although these are very important topics, they are much broader than this report could do justice given the constraints with respect to time, length and resources.

The World Economic Forum's Financial Services Team would like to convey its sincere gratitude to the industry and international organization experts convened in the project's Operational and Steering Committees who contributed valuable input to this report. We especially wish to thank Craig Aitchison, Daniel Hofmann and Daniel Ryan who served on the project's editorial working group. Special thanks also go to Richard Jackson for his extensive support of the editorial working group, and we thank Allianz and Swiss Re for providing data and insights based on their previous analyses and publications. We hope that you find this report insightful and a helpful reference for understanding the current risks and challenges for various stakeholders in retirement income schemes.

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The members of the Steering Committee and the Operational Committee support most of the recommendations and views expressed in this report. However, they do not all necessarily agree on every detailed point. The opinions expressed are personal and do not necessarily reflect the position of their organizations.

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# 1 Executive Summary

Economic growth is a fundamental basic requirement to secure sustainable retirement incomes. However, the current global financial crisis has shown once again that market-based economies have and will always experience business cycles and at times severe financial market disruptions.

The past has also shown that in order to secure the living standard of retirees, the incomes of the retired population have to draw from diversified sources. This report focuses on the sustainability of the various sources – or pillars – of current retirement systems, and it analyses the inherent risks arising from various challenges, such as demographic changes, economic business cycles and financial market volatility.

This report builds on an amended four-pillar system that was first published by the World Bank. In chapter 3, each pillar is assessed on basic economic indicators chosen to evaluate the fiscal sustainability of the pillar under consideration in 36 countries. A simple “traffic light” system grades the indicators, illustrating the sustainability of each particular pillar.

**Based on the pillar analysis, the report offers four main conclusions:**

1. No pillar is free of either fiscal sustainability challenges or income adequacy deficiencies; all countries will eventually have to cope with pillar weakness.
2. While demographic challenges and fiscal sustainability issues are most visible in the typically government-funded (pay-as-you-go) Pillar 1, Pillar 2 (employer-sponsored pension funds) and Pillar 3 (individually funded saving schemes) make individual retirees more vulnerable to longevity and investment risks. Effective design of retirement schemes shall combine in a complementary and consistent way a portfolio of measures in the different pillars with the aim to minimize risks, expand coverage where appropriate and necessary, and ensure benefit adequacy as well as financial sustainability.
3. In Pillars 2 and 3, longevity and investment risks will increasingly be shifted to individual retirees. However, in most cases, retirees are ill-prepared to absorb and manage these risks.
4. Among the many stakeholders, the financial services industry, and in particular insurers and pension providers, will have to play a key role in providing solutions that increase the capacity and manage the risks of Pillars 2 and 3.

The challenges facing retirement systems around the world may sound insurmountable, but there is no reason for despair. Time and the marvels of compound interest work in favour of courageous and prudent policy-makers. Small and judicious changes implemented today will reap big dividends in the future. Yet, changes will become reality only if the stakeholders of current retirement income schemes change their attitude and commitment. To secure a sustainable system, improved collaboration of all stakeholders is mandatory.





## 2 Retirement Income – The Global Challenge

### 2.1 Challenges of Diverse Economies

Retirement systems around the world are under pressure. In both advanced market economies (AMEs) and emerging market economies (EMEs), rising life expectancy and declining fertility – in short, ageing populations – are throwing into question the financial sustainability and societal acceptance of current retirement schemes. With an absence of fundamental and credible reforms, many countries may sooner than later reach the limits of providing adequate financial security for their retired populations without placing an undue and ultimately inequitable burden on younger generations.

While the looming demographic challenge facing retirement systems has been known for a long time, the current financial crisis has exacerbated the problem and raised the urgency of reform. The prices of financial and real assets – the backbone of all funded pension schemes – have sharply declined and are only in a few cases approaching pre-crisis levels.

Most AMEs suffered severe recessions from which recoveries have been slow. This in turn has undermined the tax base that supports pay-as-you-go (PAYG) pension systems. In light of continued deleveraging, particularly in the banking sector (but also in countries where the household sector has been over indebted), real economic growth is likely to remain subdued for an extended period, stifling the wealth creation needed to support future retirement payments. Meanwhile, the run-up in public indebtedness in many AMEs has further limited the fiscal room that governments have to adjust to rising retirement costs as populations age.

The challenges are not limited to advanced market economies. They also include emerging market economies (EMEs) and developing countries, where retirement systems are either still in their infancy or have not been developed at all. While many developed countries “got rich before they got old”, there is the risk that some emerging countries are getting old before getting rich. Also, in many emerging economies, social protection, including retirement support, is restricted to a small, privileged population.

The challenge these countries face is thus different than that facing AMEs. They must broaden their social protection systems to provide inclusiveness while ensuring that they remain sustainable. This will require putting in place adequate state-financed social protection floors, while at the same time gradually implementing higher levels of coverage based on a balanced portfolio of pillars one through four.

It requires also appropriate market structures and regulatory frameworks that encourage individual savings and funded retirement systems provided by the private sector.

### 2.2 The Five Pillars of Modern Retirement Systems

It has become customary to describe the modern retirement system as an edifice built on several pillars. For the purpose of this analysis, a five-pillar system is presented that expands on an earlier contribution by the World Bank.<sup>1</sup> Pillar 1 is the expanded successor to the first social protection scheme developed in the late 19th century; the other four pillars complement the first pillar.

The initial plans were comprised of purely redistributive protection schemes managed by governments and financed through taxes or social security contributions. Over time, two major closely linked challenges of public social security schemes have become apparent. Ageing populations are increasingly questioning the financiability of the PAYG systems designed by earlier generations, which in the typology developed below comprise the first pillar.

To maintain the government's pension promise, present and future generations would have to shoulder an increasingly stifling tax burden up to the point where the economic feasibility as well as the social and political acceptance of ever larger tax payments may no longer be assured. The fiscal sustainability risk might undermine the capacity of the PAYG-based retirement systems to provide an adequate income replacement for the elderly at some point in the future. Consequently, the fiscal and political constraints of public protection schemes require that they be complemented by private sector initiatives. These private initiatives – the second and third pillars – can alleviate the pressures on the first pillar while making a contribution to retirement incomes.

However, pillars one through three are not sufficient to describe the complexity of global retirement schemes. In certain countries, but especially in emerging market economies and in developing countries – where public or private retirement schemes are either in their infancy or not yet developed – non-contributory minimal assistance to the poor is provided. This support comprises Pillar 0.

Finally, it has become clear that the challenges of longevity can only be met through the extension of work life and the inclusion of part-time work schemes for the formally retired. Thus, Pillar 4 calls for a set of labour market policies that puts a premium on labour market adaptability and recognizes the changing dynamics of ageing societies.

In certain cases, the fourth pillar may include also support provided by extended families, typically seen in developing countries with extended informal sectors and underdeveloped public and private retirement schemes. However, the dynamics of family support are entirely different from the set of labour market policies typically discussed as Pillar 4 contributions. Moreover, family support, similar to PAYG systems (and different from the funded schemes of Pillars 2 and 3), puts a burden on the young. This report will be concerned mainly with labour market policies as constitutional elements of Pillar 4 and discuss extended family support only in passing.

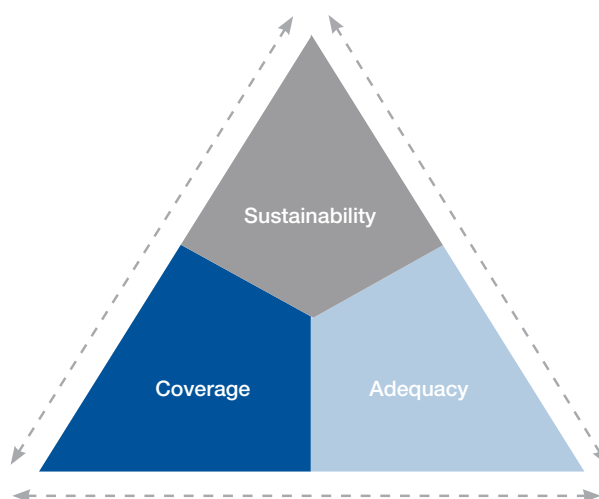
The table below provides a synopsis of the five pillars developed for this analysis. A detailed discussion of pillars one through four is presented in Chapter 3. Policies related to the fourth pillar are likely to cut across and have implications for; all other pillars (the extension of the work life, for example, will relieve actuarial funding pressures on Pillars 1 and 2). They will be discussed in more detail in Chapter 5. Although crucially important, especially in emerging markets economies and developing countries, Pillar 0 will not be discussed in more detail in this study.

**Table 1. The five pillars of modern retirement systems**

PILLAR	ESSENTIAL CHARACTERISTICS
Pillar 0	Non-contributory minimal assistance to the poor; typically means-tested
Pillar 1	Public (government) pension (social security) schemes to provide for basic needs; contributory and redistributive and typically financed on a pay-as-you-go basis
Pillar 2	Private occupational pension schemes (sponsored by employers) to supplement pillar 1; can be voluntary or mandatory (i.e. required by the state) and can comprise defined benefit (DB) or defined contribution (DC) plans
Pillar 3	Individual savings to provide for future withdrawals and/or annuities in various forms; can be voluntary, but often enforced by the state
Pillar 4	A set of labour market policies to extend work life and enable more part-time work for the formally retired; informal family support as additional dimension

Certain retirement schemes developed by individual countries do not always fit neatly into the five pillars as defined in Table 1. In 1980, for example, Chile's old-age, disability and survivor pension system was changed from a PAYG to a fully funded system run by private sector pension funds. The funding mechanics make the Chilean solution a functional equivalent of Pillar 3. However, it was clearly meant as the equivalent of the Pillar 1 scheme it replaced. In 2008, Chile's pensions were reformed again to correct for deficiencies of the then almost 30-year-old system. One main reform element comprised the introduction of a tax-funded solidary pension in the form of a social protection floor to support elderly citizens who do not have access to a private pension on a defined minimum level.<sup>2</sup>

**Figure 1. The trade-offs in old age provisioning**



By placing the focus on fiscal sustainability, the study does not focus on the other two corners of the retirement income triangle – coverage and income adequacy. They are closely connected and constitute in many ways difficult trade-offs. A study by the Center for Strategic and International Studies (CSIS),<sup>3</sup> for example, found that three of the seven highest-ranking countries with respect to fiscal sustainability are among the seven lowest-ranking countries with respect to income adequacy. Similarly, four of the seven highest-ranking countries with respect to income adequacy rank lowest with respect to fiscal sustainability. These rank reversals suggest that political choices may have engendered problematic trade-offs between income adequacy and fiscal sustainability. These findings are also supported by a 2012 Allianz study.<sup>4</sup>

Providing broad coverage may also require difficult trade-offs. Switzerland, for example, has achieved near universal coverage in the first public pillar.<sup>5</sup> But universal coverage comes at the price of modest benefits characterized by low dispersion. The maximum public pension is about 40% of average earnings while minimum benefits amount to

20%. And because minimum public benefits are below the official poverty line, they are supplemented with means-tested benefits. However, it is important to recognize that the total income of Swiss retirees does not depend only on modest public benefits. In addition to the first pillar, Switzerland has introduced a compulsory, extensively funded occupational pillar that aims at achieving a 60% to 70% replacement rate for most workers.

These examples illustrate that resolving the tensions inherent in the retirement income triangle require difficult trade-offs extending over all pillars. It would be naïve to assume that universal coverage, adequate incomes and fiscal sustainability could be achieved on the basis of only one pillar. At the same time, there is no reason for favouring one pillar over another, and there may be good political reasons to prefer the bulk of retirement incomes to come from publicly funded pillars.

This study, however, argues that public PAYG retirement funding systems may eventually become fiscally unsustainable for demographic reasons and should consequently be complemented by additional pillars. The study also recognizes that ageing-related sustainability issues tend to be more challenging in advanced market economies than in the demographically younger emerging markets. For these reasons, the study focuses on AMEs rather than EMEs, bearing in mind those EMEs and low-income countries in particular are still in early stages of building retirement income systems.

### 2.3 Stakeholder Roles and their Expectations

To tackle the challenges posed by ageing and the fiscal limitations of government, future retirement systems will have

to be based on balanced contributions from all five pillars.

The core of this text is on pillars one through three. The interaction – essentially statutory or contractual obligations and payment flows under pillars one through three – between the various stakeholders are depicted in Figure 1. The major stakeholders comprise (i) working and retired individuals, (ii) employers as pension plan sponsors, (iii) the financial services industry and (iv) governments. These stakeholders are either offering and managing, or contributing and benefiting from, the pillars one through three.

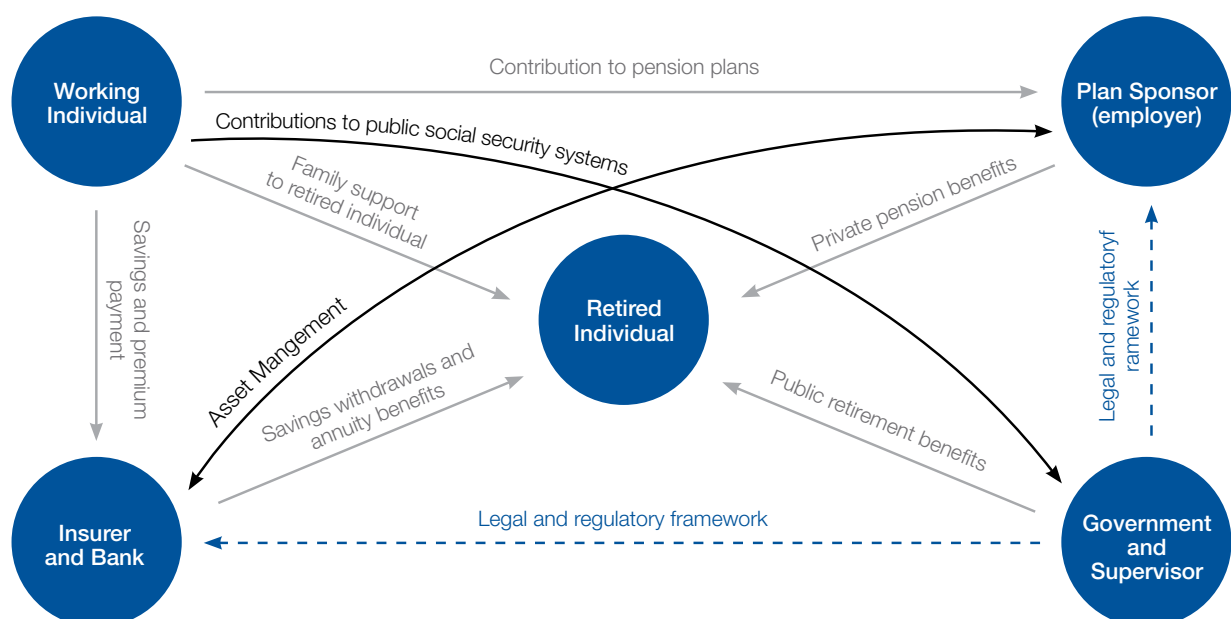
Essential in a full developed retirement system, **working individuals** are making contributions to: (i) a public social security system, (ii) individual savings and retirement accounts managed by banks and/or insurers, and (iii) pension schemes sponsored by employers. The latter provide, either voluntarily or mandated by governments, defined benefit (DB) or defined contribution (DC) pension schemes, which are typically managed through banks or insurers as independent asset managers.<sup>6</sup>

The **retired individual** in turn derives benefits from the government in the form of social security payments, from the private pension provider in the form of pensions, and from banks and insurers in the form of saving withdrawals and annuity benefits.

The **financial services industry** – for the purpose of this text comprised of banks and insurers – has the task of creating suitable products for retirement savings. In addition, it provides asset and risk management services to the employer-sponsored pension schemes offered by the private sector.

**Governments** not only provide for the first pillar (social security) of retirement financing; they also have an

Figure 2. Interaction flows between Pillars 1, 2 and 3



important role in setting the regulatory framework for sound and stable financial markets. While supervisors used to be primarily concerned about policyholder protection (the micro-prudential dimension of supervision), the current financial crisis underscored that micro-prudential supervision should be embedded in a broader systemic context. It must be complemented by macro-prudential surveillance designed to identify the build-up of systemic risk and mitigate adverse consequences.

The roles and expectations of the various stakeholders arising from this web of interactions are summarized in

Table 2 (See Appendix) and Table 3 below, which should be read horizontally.

The entries in each cell summarize what one particular stakeholder expects from another stakeholder. One striking insight is that the private sector – households, employers and the financial services industry – expect governments to provide for a high degree of financial stability. Yet, it is precisely the absence of financial stability brought home by the current financial crisis that threatens to erode the viability of future retirement systems. Financial market risk materialized abruptly in the loss of financial wealth accumulated in individual savings

**Table 3. Stakeholder expectations**

<div>EXPECTATIONS ADDRESSED TO</div> <div>EXPECTATIONS FROM</div>	Households (Working and retired individuals)	Plan sponsors (Employers)	Financial services industry (Banks and insurers)	Government and regulators
Households (Working and retired individuals)		<ul style="list-style-type: none"> <li>Offer pension plans that are portable across firms and jurisdictions (currently not possible under certain DB plans)</li> <li>Provide assistance and support for financial literacy training and individual behaviour management</li> <li>Offer incentive programs to encourage individual retirement savings (such as 401K match)</li> </ul>	<ul style="list-style-type: none"> <li>Offer broad range of transparent, sustainable and portable retirement products</li> <li>Provide fair and trustful customer relations and quality of advice</li> <li>Foster realistic expectations based on prudent investment strategies</li> </ul>	<ul style="list-style-type: none"> <li>Maintain an adequate zero pillar safety net for workers/retirees not covered under pillar one</li> <li>Maintain integrity and stability of social security system, including fiscal stability as not to jeopardise sovereign solvency or put future retirees at risk of sudden benefit cuts</li> <li>Provide incentives that foster retirement saving to complement pillar one</li> <li>Ensure price stability as not to penalise savers</li> <li>Define and enforce the regulatory framework for voluntary and mandatory pension plans</li> </ul>
Plan sponsors (Employers)	<ul style="list-style-type: none"> <li>Join voluntary pension plans</li> <li>Acquire financial literacy and start early retirement saving</li> <li>Employees to be accountable and responsible for their own retirement income; employer-sponsored plans will only contribute to, but not fully cover future retirement income adequacy</li> </ul>		<ul style="list-style-type: none"> <li>Provide transparent, easy to understand, reliable, cost efficient and risk return-based products that are portable across firms and jurisdictions</li> <li>Provide asset and risk management and admin services for pension portfolios and group pension plans</li> </ul>	<ul style="list-style-type: none"> <li>Enable private-sector options to complement unfunded social plans</li> <li>Provide a predictable tax and regulatory environment for the creation and management of individual saving and pension plans</li> </ul>
Financial services industry (Banks and insurers)	<ul style="list-style-type: none"> <li>Acquire financial literacy and assume responsibility for retirement income planning</li> <li>Develop a culture of retirement saving</li> <li>Make realistic risk assessments and act responsibly to mitigate potential risks arising from investment decisions</li> </ul>	<ul style="list-style-type: none"> <li>Provide and actively promote group pension plans that are portable across employers and jurisdictions</li> <li>Position the financial services industry as an ally in overall retirement provision</li> <li>Meet high standards of fiduciary responsibility</li> </ul>		<ul style="list-style-type: none"> <li>Provide a stable regulatory and macro-financial environment that allows for long-term planning and provision of pre- and post-retirement products</li> <li>Provide actuarially sound projections on future retirement provisions covered by the state</li> <li>Provide tax incentives to encourage saving for the longer term</li> </ul>
Government and regulators	<ul style="list-style-type: none"> <li>Acquire financial literacy and assume responsibility for retirement income planning</li> <li>Join voluntary pension plans, increase saving and review attitude to debt</li> <li>Be accountable and responsible for retirement income planning as fiscal space of the state may eventually be exhausted</li> </ul>	<ul style="list-style-type: none"> <li>Offer pension plans that enhance and complement public protection plans</li> <li>Ensure plans are portable across firms and jurisdictions</li> <li>Offer flexible employment schemes that integrate individuals either full-time or part-time after the regular retirement age</li> <li>Maintain a prudent investment approach to protect the solvency of pension plans</li> </ul>	<ul style="list-style-type: none"> <li>Maintain a prudent investment approach to protect the solvency of the retirement product promise (incl. financial discipline and ethical behaviour)</li> <li>Ensure plans are portable across firms and jurisdictions</li> <li>Innovate products and solutions</li> </ul>	

Table 4. Risks borne by various stakeholders in a three-pillar system

	Business cycle risk	Fiscal risk	Inflation risk	Longevity risk	Investment risk
Pillar 1 Government	<ul style="list-style-type: none"> <li>• Taxpayer (but also working and retired individuals)</li> </ul>	<ul style="list-style-type: none"> <li>• Taxpayer</li> </ul>	<ul style="list-style-type: none"> <li>• Taxpayer</li> </ul>	<ul style="list-style-type: none"> <li>• Taxpayer</li> </ul>	<ul style="list-style-type: none"> <li>• Taxpayer</li> </ul>
Pillar 2 Employer	<ul style="list-style-type: none"> <li>• Working and retired individuals</li> </ul>		<ul style="list-style-type: none"> <li>• Plan sponsor (if DB plan includes inflation adjustment)</li> <li>• Retired individual</li> </ul>	<ul style="list-style-type: none"> <li>• Plan sponsor (under DB plan)</li> <li>• Retired individual</li> <li>• Taxpayer (if underfunded DB plan by government agency)</li> <li>• Insurer if DC plan converted to annuity</li> </ul>	<ul style="list-style-type: none"> <li>• Plan sponsor (under DB plan)</li> <li>• Retired individual (under DC plan)</li> <li>• Taxpayer (if underfunded DB plan covered by government agency)</li> <li>• Insurer if DC plan converted to annuity</li> </ul>
Pillar 3 Individual	<ul style="list-style-type: none"> <li>• Working individual</li> </ul>		<ul style="list-style-type: none"> <li>• Retired individual</li> </ul>	<ul style="list-style-type: none"> <li>• Retired individual</li> <li>• Insurer (for fixed annuities)</li> </ul>	<ul style="list-style-type: none"> <li>• Retired individual</li> <li>• Insurer (for fixed annuities)</li> </ul>

and pension funds. These losses are now borne by current and future retirees.

Moreover, to reduce fiscal deficits and future debt loads, a number of governments have announced or implemented plans to adjust replacement rates and reduce social security benefits. While designed to provide for more fiscal stability, the measures place the burden of, and the risks associated with, retirement provisioning on individual households. The risks associated with Pillars 1-3 are discussed in the next sub-section.

## 2.4 Pillars and Associated Fiscal, Longevity and Investment Risks

Retirement financing schemes extend over very long time horizons. Working individuals may make payments into social security systems, pension schemes and individual retirement plans for more than 40 years, and they subsequently expect to receive benefits and draw from the accumulated funds for an extended period. These long time horizons introduce a number of risks.

1. Economies are subject to business cycles, which can make lifetime employment impossible.
2. Financial markets tend to suffer periodic crises. The investment risk associated with these crises reduces, at least temporarily, the value of accumulated funds and jeopardizes the feasibility of the original retirement financing plan.
3. Rising life expectancy introduces longevity risk, i.e. the risk that an individual may outlive his or her retirement funds.
4. And there is fiscal risk, i.e. the risk that pose constraints to the governments' ability to maintain the social security promise.

The incidence of these four major risks<sup>7</sup> is summarized in Table 4. While the impact on various stakeholders is diverse, the table underscores that a shift from Pillar 1 to Pillars 2 and 3 introduces also a shift in risks to be borne by stakeholders other than the taxpayer. Longevity and investment risks may accrue to both pension plan providers and insurers. And all three pillars expose households (either as working and retired individuals or tax payers) to all four major risk categories.

As Table 4 illustrates, the risks associated with Pillar 2 and Pillar 3 do not always fall on those stakeholders that are well prepared to assume and manage these risks. On the one hand, insurers have an opportunity to manage longevity risk by assuming mortality risk (i.e. the risk that policy-holders die prematurely). In a well-constructed and well-diversified portfolio, mortality risk would then mitigate longevity risk, reducing the overall risk to manageable proportions. To reduce investment risk, banks and insurers can run large investment portfolios that are diversified over many financial asset classes and geographies.

Households, on the other hand, are in most cases ill-prepared to absorb any of these risks, and they are particularly challenged with respect to longevity and investment risks. This creates a challenge for the financial services industry. Pillars 2 and 3 can only be viable and acceptable complements to Pillar 1 if banks and insurers are ready to assume and manage substantial parts or all of the risks currently borne by individuals. The implications of this challenge and a range of potential solutions are discussed in Chapter 5.

It should be self-evident that the mitigation of the risks enlisted in Table 4 is often also an issue of public policy.

Business cycle, fiscal and inflation risks are best addressed with a macroeconomic policy mix. The provision of an environment fostering sustainable growth and stable financial markets is one of the most important public goods – and arguably the best risk mitigant – that governments can provide. A stable economy rooted in price stability, for example, enhances the efficiency of the price system because it cuts through the fog of inflation. And low inflation enhances corporate sector or microeconomic efficiency, which in turn reduces the political demand for costly governmental intervention in support of unenviable enterprises. In that sense, sound macroeconomic policies in support of price stability and growth will go a long way towards enhancing the sustainability of retirement income systems.

## Notes

- 1 World Bank's Pension Reform Primer. For more information, contact the Social Protection Advisory Service, The World Bank, 1818 H Street, NW, MSN G7-703, Washington, DC 20433, USA, <http://www.worldbank.org>.
- 2 Chile's Pension Reform After 20 Years. For more information, please contact the Social Protection Advisory Service, The World Bank, 1818 H Street, NW, MSN G8-802, Washington, DC 20433, USA.
- 3 Jackson, Richard, Neil Howe and Keisuke Nakashima. *The Global Aging Preparedness Index*. 2010. Washington, DC: Center for Strategic and International Studies.
- 4 Deville, Volker. *Global Demography: Generations and their Future*. July, 2012. Munich: Allianz SE.
- 5 Queisser, Monika and Dimitri Vittas. *The Swiss Multi-Pillar pension System: Triumph of Common Sense?* August, 2000. Development Research Group, The World Bank: Washington DC.
- 6 In a defined benefit (DB) pension plan, the employer-sponsored pension fund promises a specified monthly benefit on retirement (amount depends on e.g. salary income, tenure of service and age). It is "defined" in the sense that the formula for computing the payments is known in advance. In contrast, in a defined contribution (DC) plan, the pension payments are based on accumulated investments funded by employer and employee contributions. A crucial difference between DB and DC plans is the distribution of investment or financial market risk. Whereas the investment risk of DC plans reside with the retiree (or an insurer, if the retiree converts the accumulated funds into an annuity), it is shouldered by the employer-sponsored pension fund in the case of funded DB plans.
- 7 There are, of course, other risks, such as mortality and regulatory risks.

## 3 Review of Current Retirement Funding Pillars

The focus of this chapter is on the comparison of retirement systems in a small number of selected countries. This is done on the basis of four of the five pillars introduced in the previous chapter. Pillar 0 is excluded, not because this pillar is not important, but rather to keep the analysis on those pillars where demographic and fiscal challenges are most pressing and where solutions must be developed and implemented.

In the following chapter, a number of indicators are introduced to evaluate the fiscal sustainability of each of the four pillars under consideration. The bulk of the indicators are contemporaneous. But, in a few cases, forward-looking indicators are tabulated to highlight intertemporal challenges. What may look sustainable and adequate today may no longer be sustainable – and therefore provide no guarantee for future adequacy – if one accounts for straightforward arithmetic of demographic change.

### 3.1 Introducing Indicators for Pillars 1 through 4

Pillars 1 through 4 are represented by a small number of indicators chosen to reflect fiscal sustainability and income adequacy associated with each individual pillar. The two categories – sustainability and adequacy – should always be analysed jointly, and particularly so in the analysis of Pillar 1. To be truly adequate, any Pillar 1 system must also be sustainable. If the fiscal stability of the system is not ensured, future beneficiaries may find that its adequacy is mere pretence when rising costs force governments to make reductions in promised benefits.

The indicator choices were made on the grounds of two criteria. First, the indicator must have explanatory power. Second, from the many possible indicators that met the first criterion, indicators were then chosen that were readily accessible from publicly available statistics. This ensures transparency while making the analysis also replicable.

To serve the latter two goals, sophisticated data transformation was refrained. One exception is an indicator representing household savings. National income statistics typically report household savings that are distorted by income inequality. Lower income households tend to save less of their disposable income than upper income households, which implies that the reported mean savings ratio (expressed in per cent of disposable income, for example) tends to be much higher than the median savings ratio would be.

Unfortunately, median savings ratios are hard to obtain.

And that is the reason why a Gini index-corrected savings ratio was introduced to account for possible distortions in the reported savings ratio due to income inequality.<sup>8</sup>

While the definition of the four pillars under consideration may be compelling, the assignment of particular indicators to certain pillars can be open to judgment. A case in point is the market capitalization of publicly listed companies in Pillar 2. This indicator was introduced as proxy for the depth of local capital markets. The logic behind this indicator is that only deep, and by extension liquid, capital markets will provide a sufficiently large menu of financial instruments in which retirement savings can be invested. Hence, it makes sense to have this indicator associated with the second pillar because pension funds must always be invested in a broad array of liquid assets. But the same logic applies also to the investment of household savings, and the market capitalization indicator could equally well be associated with the third pillar.

It would be tempting to aggregate the information assembled in Table 5 in the appendix or in the pillar tables below to create overall country scores and rankings. However, these kinds of exercises are always fraught with methodological problems, and the authors decided to refrain from making such a ranking. Thus, the primary goal of this chapter is to highlight current and, where appropriate, future deficiencies in each of the four pillars. For this perhaps somewhat narrow purpose, a simple “traffic light” system is sufficient, with green, amber and red assigned to the individual indicators highlighting fiscal sustainability and income adequacy. Thus, pillar tables per country provide a comprehensive visual image of the retirement financing challenges that each country covered by this report is facing.

### 3.2 Fiscal Sustainability and Income Adequacy in the Four Pillars

The following offers a brief discussion of the rationale behind each indicator chosen to illustrate the challenges in the four pillars. The discussion is illustrative only and does not endeavour to be comprehensive. The full table for all pillars is provided under Appendix 6.2, whereas the rationale behind the colour coding is outlined under Appendix 6.3.



### Pillar 1 (Government – Social Security)

**Old-age dependency ratios:** The two indicators serve to illustrate the demographic challenge caused by ageing. Since demographic challenges are already “baked in the cake” (today, the cohort retiring in 2040 is 30 years old), it was straightforward to provide an old-age dependency ratio for 2040 (Note: The old-age dependency ratio gives a first approximation of the challenge of sustaining Pillar 1 commitments – *ceteris paribus*).

**Total public benefits to the elderly:** These indicators serve too as proxy for income sustainability of current and future retirement systems.<sup>9</sup> The public benefit indicators take

into account the generosity of systems, and thus go beyond the old-age dependency ratio. A country with a very costly Pillar 1 system may have a big projected benefit burden even though it is not due to age all that much. Conversely, a country that is due to age, a lot may have a smaller than expected future benefit burden, either because the pillar system is not very generous to begin with or because the government has enacted reforms that limit the future growth in benefit costs.

**Debt-to-GDP ratio and tax burden:** The two indicators were chosen to indicate the capacity of countries to accommodate a rising old-age benefit burden. The debt-to-GDP ratio measures the capacity of governments to borrow,

### Pillar 1 (Government Social Security)

COUNTRY	PILLAR 1					
	OLD-AGE DEPENDENCY RATIO (60+/20-59) (2010)	OLD-AGE DEPENDENCY RATIO (60+/20-59) (2040)	TOTAL PUBLIC BENEFITS TO ELDERLY (TPbTE); IN % OF GDP (2007)	GROWTH IN TPbTE, 2007-2040 IN % OF GDP	NET DEBT/GDP IN % (2011) *GROSS AS NET NOT AVAILABLE	REVENUE BURDEN IN % OF GDP (2010)
ADVANCED ECONOMIES						
Australia	34.3 ●	55.0 ●	8.9 ●	6.0 ●	8.2 ●	31.8 ●
Austria	41.2 ●	75.0 ●	N.A.	N.A.	52.1 ●	48.1 ●
Belgium	43.3 ●	67.0 ●	N.A.	N.A.	81.4 ●	48.6 ●
Canada	35.0 ●	62.6 ●	8.3 ●	6.4 ●	33.1 ●	38.4 ●
Czech Republic	37.6 ●	67.1 ●	N.A.	N.A.	*40.5 ●	39.3 ●
Egypt	15.8 ●	27.7 ●	N.A.	N.A.	64.3 ●	25.1 ●
France	43.6 ●	64.6 ●	16.6 ●	6.8 ●	78.8 ●	49.5 ●
Germany	46.9 ●	83.7 ●	15.8 ●	5.9 ●	55.3 ●	43.6 ●
Greece	43.3 ●	75.5 ●	N.A.	N.A.	165.4 ●	39.7 ●
Hong Kong SAR, China	28.6 ●	76.5 ●	N.A.	N.A.	*33.8 ●	22.5 ●
Italy	48.6 ●	88.8 ●	18.0 ●	6.6 ●	99.6 ●	46.0 ●
Japan	59.2 ●	97.2 ●	14.1 ●	4.3 ●	126.4 ●	29.6 ●
Netherlands	40.1 ●	71.4 ●	12.0 ●	11.2 ●	31.7 ●	45.5 ●
Portugal	42.3 ●	83.8 ●	N.A.	N.A.	97.3 ●	41.4 ●
Spain	38.5 ●	81.9 ●	14.3 ●	11.8 ●	57.5 ●	36.2 ●
Republic of Korea	25.9 ●	80.8 ●	3.4 ●	10.7 ●	32.9 ●	22.7 ●
Sweden	48.1 ●	62.9 ●	15.7 ●	3.5 ●	-18.2 ●	49.8 ●
Switzerland	40.6 ●	78.8 ●	9.8 ●	7.6 ●	25.9 ●	32.8 ●
United Kingdom	42.2 ●	58.0 ●	12.1 ●	6.1 ●	76.6 ●	36.4 ●
United States of America	33.8 ●	52.9 ●	8.9 ●	7.4 ●	80.3 ●	31.7 ●
EMERGING MARKET AND DEVELOPING ECONOMIES						
Brazil	18.4 ●	43.7 ●	8.8 ●	11.6 ●	36.4 ●	35.4 ●
Chile	23.5 ●	51.3 ●	6.0 ●	1.5 ●	-8.7 ●	23.3 ●
China	20.4 ●	56.5 ●	2.8 ●	5.2 ●	*25.8 ●	21.3 ●
Hungary	39.7 ●	62.2 ●	N.A.	N.A.	78.6 ●	45.2 ●
India	14.5 ●	27.4 ●	1.9 ●	1.6 ●	*67.0 ●	18.7 ●
Indonesia	14.6 ●	38.1 ●	N.A.	N.A.	*24.5 ●	17.0 ●
Mexico	17.3 ●	40.8 ●	2.4 ●	2.7 ●	40.3 ●	21.7 ●
Poland	32.4 ●	61.7 ●	10.1 ●	3.8 ●	25.7 ●	37.5 ●
Romania	34.5 ●	65.5 ●	N.A.	N.A.	*33.0 ●	32.3 ●
Russian Federation	29.1 ●	51.4 ●	5.8 ●	4.4 ●	*12.0 ●	35.5 ●
South Africa	14.0 ●	21.3 ●	N.A.	N.A.	35.1 ●	27.5 ●
Turkey	16.2 ●	38.7 ●	N.A.	N.A.	31.3 ●	33.1 ●
LOW INCOME ECONOMIES						
Bangladesh	12.9 ●	28.4 ●	N.A.	N.A.	N.A.	11.5 ●
Ethiopia	12.6 ●	15.8 ●	N.A.	N.A.	20.5 ●	17.3 ●
Nigeria	12.7 ●	13.6 ●	N.A.	N.A.	10.4 ●	20.0 ●
Pakistan	13.6 ●	20.5 ●	N.A.	N.A.	56.9 ●	14.4 ●
SOURCE	UN 2010 MEDIUM VARIANT	UN 2010 MEDIUM VARIANT	CSIS 2010	CSIS 2010	IMF 2011	IMF 2012
	● < 33.0	● < 33.0	● < 6.0	● < 3.0	● < 60.0	● < 40.0
	● > 33.0 > 66.0	● > 33.0 > 66.0	● > 6.0 > 12.0	● > 3.0 > 6.0	● > 60.0 < 90.0	● > 40.0 < 50.0
	● > 66.0	● > 66.0	● > 12.0	● > 6.0	● > 90.0	● > 50.0



whereas the tax burden to GDP ratio measures the ability of governments to cover rising benefit costs by further expanding revenues. It would have been comparatively easy to provide also estimates for future debt-to-GDP ratios. However, such estimates are always dependent on assumptions and thus subject to judgmental issues, and this chapter refrains from including them.<sup>10</sup>

## Pillar 2 (Sponsored by Employers)

**Assets of pension funds:** This indicator relates the preparedness of funded retirement financing under Pillar 2

schemes. It is an indicator of the system's size, and hence of its relative importance or adequacy.

**Funded pension benefits:** These indicators are proxies for income adequacy and to some extent sustainability, assuming that fully funded benefits will be more sustainable *ceteris paribus* than an equal amount of benefits based on PAYG funding.

**Market capitalization of listed companies:** This is a proxy measure for the depth of capital markets under the implicit assumption that better developed capital markets are an important prerequisite for expanding or putting in place Pillar 2 systems.

## Pillar 2 (Sponsored by Employers)

COUNTRY	PILLAR 2			
	ASSETS OF PENSION FUNDS IN % OF GDP (2010)	FUNDED PENSION BENEFITS IN % OF GDP (2007)	FUNDED PENSION BENEFITS IN % OF GDP (2040)	MARKET CAPITALISATION OF LISTED COMPANIES (2008)
ADVANCED ECONOMIES				
Australia	89.0 <span>●</span>	3.4 <span>●</span>	9.1 <span>●</span>	63.6 <span>●</span>
Austria	5.4 <span>●</span>	N.A.	N.A.	17.5 <span>●</span>
Belgium	3.8 <span>●</span>	N.A.	N.A.	33.0 <span>●</span>
Canada	64.7 <span>●</span>	5.1 <span>●</span>	7.8 <span>●</span>	66.7 <span>●</span>
Czech Republic	6.3 <span>●</span>	N.A.	N.A.	21.7 <span>●</span>
Egypt	2.4 <span>●</span>	N.A.	N.A.	52.7 <span>●</span>
France	0.2 <span>●</span>	0.3 <span>●</span>	0.5 <span>●</span>	52.7 <span>●</span>
Germany	5.4 <span>●</span>	0.7 <span>●</span>	2.7 <span>●</span>	30.6 <span>●</span>
Greece	0.0 <span>●</span>	N.A.	N.A.	26.5 <span>●</span>
Hong Kong SAR, China	34.7 <span>●</span>	N.A.	N.A.	617.0 <span>●</span>
Italy	4.6 <span>●</span>	0.9 <span>●</span>	2.4 <span>●</span>	22.6 <span>●</span>
Japan	25.2 <span>●</span>	2.0 <span>●</span>	2.7 <span>●</span>	66.4 <span>●</span>
Netherlands	128.5 <span>●</span>	5.2 <span>●</span>	10.8 <span>●</span>	44.5 <span>●</span>
Portugal	11.4 <span>●</span>	N.A.	N.A.	27.3 <span>●</span>
Spain	7.9 <span>●</span>	0.6 <span>●</span>	1.6 <span>●</span>	59.4 <span>●</span>
Republic of Korea	4.0 <span>●</span>	0.4 <span>●</span>	1.0 <span>●</span>	53.1 <span>●</span>
Sweden	9.6 <span>●</span>	2.7 <span>●</span>	6.3 <span>●</span>	51.9 <span>●</span>
Switzerland	113.7 <span>●</span>	4.5 <span>●</span>	7.7 <span>●</span>	171.4 <span>●</span>
United Kingdom	88.7 <span>●</span>	4.0 <span>●</span>	5.0 <span>●</span>	70.3 <span>●</span>
United States of America	70.5 <span>●</span>	5.6 <span>●</span>	8.0 <span>●</span>	82.5 <span>●</span>
EMERGING MARKET AND DEVELOPING ECONOMIES				
Brazil	14.5 <span>●</span>	0.9 <span>●</span>	3.0 <span>●</span>	35.7 <span>●</span>
Chile	67.0 <span>●</span>	1.8 <span>●</span>	4.6 <span>●</span>	61.8 <span>●</span>
China	0.7 <span>●</span>	0.0 <span>●</span>	1.2 <span>●</span>	N.A.
Hungary	14.6 <span>●</span>	N.A.	N.A.	12.0 <span>●</span>
India	0.2 <span>●</span>	0.2 <span>●</span>	1.1 <span>●</span>	52.7 <span>●</span>
Indonesia	1.6 <span>●</span>	N.A.	N.A.	19.4 <span>●</span>
Mexico	12.7 <span>●</span>	0.3 <span>●</span>	1.4 <span>●</span>	21.3 <span>●</span>
Poland	15.8 <span>●</span>	0.0 <span>●</span>	3.1 <span>●</span>	17.0 <span>●</span>
Romania	0.9 <span>●</span>	N.A.	N.A.	10.0 <span>●</span>
Russian Federation	1.9 <span>●</span>	0.0 <span>●</span>	1.4 <span>●</span>	23.9 <span>●</span>
South Africa	N.A.	N.A.	N.A.	179.4 <span>●</span>
Turkey	2.3 <span>●</span>	N.A.	N.A.	16.1 <span>●</span>
LOW INCOME ECONOMIES				
Bangladesh	N.A.	N.A.	N.A.	8.4 <span>●</span>
Ethiopia	N.A.	N.A.	N.A.	N.A.
Nigeria	6.9 <span>●</span>	N.A.	N.A.	24.0 <span>●</span>
Pakistan	0.0 <span>●</span>	N.A.	N.A.	14.3 <span>●</span>
SOURCE	OECD	CSIS PROJECTION	CSIS PROJECTION	WORLD BANK WDI
	<span>●</span> > 50.0	<span>●</span> > 4.0	<span>●</span> > 4.0	<span>●</span> > 50.0
	<span>●</span> > 25.0 < 50.0	<span>●</span> > 1.0 < 4.0	<span>●</span> > 1.0 < 4.0	<span>●</span> > 25.0 < 50.0
	<span>●</span> < 25.0	<span>●</span> < 1.0	<span>●</span> < 1.0	<span>●</span> < 25.0

### Pillar 3 (Individual Savings)

**Household savings:** This is a proxy gauging the adequacy of individual savings. To correct for possible distortions in the reported savings ratios caused by unequal income distribution, an alternative Gini index-corrected measure is introduced (see also explanation under 3.1).

**Financial assets:** This is a straightforward measure to evaluate the current preparedness of individual households in each country.

### Pillar 3 (Individual Savings)

COUNTRY	PILLAR 3		
	HOUSEHOLD SAVINGS IN % OF GDP	HOUSEHOLD SAVINGS IN % OF GDP (GINI CORR)	FINANCIAL ASSETS IN % OF GDP (USD) 2009
<b>ADVANCED ECONOMIES</b>			
Australia	4.5 ●	2.9 ●	3.1 ●
Austria	11.5 ●	8.2 ●	2.2 ●
Belgium	11.7 ●	7.9 ●	3.2 ●
Canada	4.0 ●	2.7 ●	2.9 ●
Czech Republic	5.7 ●	4.2 ●	0.7 ●
Egypt	N.A.	N.A.	N.A.
France	11.7 ●	7.9 ●	2.5 ●
Germany	11.7 ●	8.4 ●	2.2 ●
Greece	N.A.	N.A.	1.2 ●
Hong Kong SAR, China	N.A.	N.A.	N.A.
Italy	8.0 ●	5.1 ●	2.6 ●
Japan	2.3 ●	1.7 ●	4.8 ●
Netherlands	5.9 ●	4.1 ●	3.6 ●
Portugal	-0.8 ●	-0.5 ●	2.1 ●
Spain	6.6 ●	4.3 ●	1.6 ●
Republic of Korea	2.9 ●	2.0 ●	1.5 ●
Sweden	11.2 ●	8.4 ●	2.8 ●
Switzerland	11.7 ●	7.8 ●	6.1 ●
United Kingdom	-2.8 ●	-1.8 ●	3.3 ●
United States of America	5.5 ●	3.3 ●	3.5 ●
<b>EMERGING MARKET AND DEVELOPING ECONOMIES</b>			
Brazil	N.A.	N.A.	N.A.
Chile	7.4 ●	3.6 ●	N.A.
China	N.A.	N.A.	N.A.
Hungary	2.7 ●	1.9 ●	0.7 ●
India	N.A.	N.A.	0.3 ●
Indonesia	N.A.	N.A.	N.A.
Mexico	10.2 ●	5.3 ●	0.7 ●
Poland	0.8 ●	0.5 ●	0.5 ●
Romania	N.A.	N.A.	1.0 ●
Russian Federation	N.A.	N.A.	0.1 ●
South Africa	N.A.	N.A.	N.A.
Turkey	N.A.	N.A.	0.3 ●
<b>LOW INCOME ECONOMIES</b>			
Bangladesh	N.A.	N.A.	SMALL ●
Ethiopia	N.A.	N.A.	N.A.
Nigeria	N.A.	N.A.	N.A.
Pakistan	N.A.	N.A.	N.A.
SOURCE	OECD	OECD / WDI / CALC	OECD / ALLIANZ
	● > 10.0	● > 5.0	● > 3.0
	● > 5.0 < 10.0	● > 3.0 < 5.0	● > 1.0 < 3.0
	● < 5.0	● < 3.0	● < 1.0

### Pillar 4 (Work-Life Extension)

#### Labour force participation rates, effective and formal retirement ages:

These indicators are all proxies for the sustainability given the demographic challenge of ageing. They also factor into the overall adequacy of the retirement system, since working longer can supplement or substitute for Pillar 1 benefits. To keep the presentation to observed

statistics, the chapter refrains from reporting indicators related to policies either announced or implemented designed to introduce labour market reforms. While such reforms must be part and parcel of solutions to increase the sustainability of future retirement systems, their intended impact would be difficult to quantify.

### Pillar 4 (Work-Life Extension)

COUNTRY	PILLAR 4		
	LABOR FORCE PARTICIPATION RATE (AGED 60-74) IN 2011 - ALL	EFFECTIVE RETIREMENT AGES	FORMAL RETIREMENT AGES
<b>ADVANCED ECONOMIES</b>			
Australia	40.8 ●	64.8 ●	65.0 ●
Austria	12.8 ●	58.9 ●	65.0 ●
Belgium	10.6 ●	59.1 ●	60.0 ●
Canada	32.4 ●	63.4 ●	65.0 ●
Czech Republic	15.7 ●	62.0 ●	61.0 ●
Egypt	N.A.	N.A.	N.A.
France	10.8 ●	59.1 ●	60.5 ●
Germany	20.9 ●	61.8 ●	65.0 ●
Greece	15.3 ●	61.9 ●	57.0 ●
Hong Kong SAR, China	N.A.	N.A.	N.A.
Italy	11.6 ●	61.1 ●	59.0 ●
Japan	42.8 ●	69.7 ●	65.0 ●
Netherlands	23.0 ●	62.1 ●	65.0 ●
Portugal	N.A.	67.0 ●	65.0 ●
Spain	16.8 ●	61.8 ●	65.0 ●
Republic of Korea	45.3 ●	70.3 ●	60.0 ●
Sweden	33.1 ●	66.0 ●	65.0 ●
Switzerland	33.2 ●	65.7 ●	65.0 ●
United Kingdom	27.6 ●	64.3 ●	65.0 ●
United States of America	38.8 ●	65.5 ●	66.0 ●
<b>EMERGING MARKET AND DEVELOPING ECONOMIES</b>			
Brazil	40.9 ●	N.A.	N.A.
Chile	40.8 ●	66.9 ●	65.0 ●
China	28.5 ●	N.A.	N.A.
Hungary	8.3 ●	60.0 ●	60.0 ●
India	35.8 ●	N.A.	N.A.
Indonesia	N.A.	N.A.	N.A.
Mexico	40.2 ●	72.2 ●	65.0 ●
Poland	28.7 ●	61.7 ●	65.0 ●
Romania	N.A.	N.A.	N.A.
Russian Federation	11.9 ●	N.A.	N.A.
South Africa	19.2 ●	N.A.	N.A.
Turkey	N.A.	62.8 ●	44.9 ●
<b>LOW INCOME ECONOMIES</b>			
Bangladesh	N.A.	N.A.	N.A.
Ethiopia	N.A.	N.A.	N.A.
Nigeria	N.A.	N.A.	N.A.
Pakistan	N.A.	N.A.	N.A.
SOURCE	OECD	OECD	OECD
		Average age at exit (men)	Formal exit age (men)
	● > 30.0	● > 65.0	● > 65.0
	● < 30.0 > 20.0	● > 62.0 < 65.0	● > 62.0 < 65.0
	● < 20.0	● < 62.0	● < 62.0

### 3.3 Interpreting the Traffic Lights

The remainder of this chapter offers a few conclusions based on a reading of the traffic lights presented in the tables under point 3.2. Sample countries are grouped according to the country classification as developed over the years by the International Monetary Fund.<sup>11</sup> The lack of numerical values particularly in the low-income country category, but also a number of emerging market and developing economies, underscores that retirement systems in these countries are still in their infancy. Thus, the policy implications developed below relate predominantly to advanced economies. While the traffic lights in the tables may be bewildering, two conclusions are straightforward:

- No pillar is free of either fiscal sustainability challenges or income adequacy deficiencies
- No country is above the fray; all countries will eventually have to cope with pillar weakness

One corollary of these two points is the recognition that there are no silver bullets to secure the financial future of retirement systems. Promoting one pillar at the expense of another would most likely produce solutions that are neither fiscally sustainable nor capable of securing income adequacy. Consequently, the financial future of retirement systems can only be secured on the basis of solutions that extend beyond one pillar. At the same time, there is no compelling reason that sustainable retirement systems must necessarily be based on PAYG funding. Indeed, a robust Pillar 0 coupled with robust Pillars 2 and 3 may provide equally desirable outcomes with respect to coverage, fiscal sustainability, and income adequacy.

Similarly, no single country has ready-made solutions to offer. Aside from the fact that each country is idiosyncratic in its demographic, political and institutional make-up, each country has pillar-weaknesses. Solutions must be addressed in each country's institutional cultural context and cannot necessarily be adopted without modification by other countries. Again, the financial future of retirement systems can be secured by drawing from the experience of individual countries. But prudent policy-makers will be well advised by adopting only elements and not the total of existing country models.

A closer examination of the tables reveals also the considerable demographic challenges manifest in Pillar 1. They are present in all AMEs and absent in only a handful of EMEs. Challenges related to ageing do obviously exist also in other pillars (most notably in Pillar 4 as mentioned above). In a number of countries, Pillar 1 is also fraught with fiscal sustainability challenges (they are even more dramatically highlighted in studies projecting debt-to-GDP ratios well into the future<sup>12</sup>). Sustainable retirement financing solutions should consider combining Pillars 1, 2 and 3 on complementary and consistency basis.

However, the Pillar 2 table shows that in most countries assets of pension funds are severely underdeveloped. A similar observation holds also for the depth of capital markets, indicating that many countries are ill prepared to draw on Pillars 2 and 3 as complement for Pillar 1.

Consequently, fostering a conducive environment for stable capital market development would appear to be a top priority of policy-makers. This requires not only the creation of an institutional framework with appropriate and sufficiently tough financial market regulation, but also a universe of well capitalized firms that are capable and willing to offer the broad range of financial products needed to support the viability of future retirement solutions.

Finally, the selected Pillar 4 indicators underscore that, based on current readings, only a few countries are comparatively free of challenges. For all other countries, there is plenty of scope for changes in labour market policies to extend, for example, the work life and enable more part-time work for the formally retired. A set of possible recommendations is offered in Chapter 5.

### Notes

- 8 The Gini coefficient, or Gini index, is a statistical dispersion measure that quantifies the inequality of income distributions. The higher the value of the Gini coefficient, the more unequal the income distribution.
- 9 These growth rates are derived on the basis of official projections published by government agencies. The data used draws on work done by CSIS in *The Global Aging Preparedness Index*. 2010.
- 10 Jackson, Richard, Neil Howe and Keisuke Nakashima. *The Global Aging Preparedness Index*. 2010. Washington, DC: Center for Strategic and International Studies.
- 11 See for example the IMF's 2012 World Economic Outlook, p. 177-180.
- 12 Jackson, Richard, Neil Howe and Keisuke Nakashima. *The Global Aging Preparedness Index*. 2010. Washington, DC: Center for Strategic and International Studies.

## 4 Risks, Challenges and Opportunities of Current Retirement Income Systems

The rapid ageing of populations throughout the developed and developing world presents us with significant challenges in producing sustainable systems of retirement income provision during a period of significant uncertainty, not only in terms of future market returns but also in the extent to which future life expectancy might increase.

The World Economic Forum's Global Agenda Council on Ageing Societies published in January 2012 a report – *Global Ageing Populations: Peril or Promise* – that highlights the challenges associated with retirement and healthcare provision as well as opportunities for intergenerational solidarity. Society can benefit from the knowledge, expertise and capabilities of older generations; working and living environments can be modified through innovation in technology and attitude.

It is, however, important to highlight the multidimensional nature of the risks that are faced by current retirement income systems. In this chapter, risks resulting from trends in key categories is considered. These categories are related to trends in demography, political environment, employment, behaviour, economics and finance. The most important risks in each category in Table 6 have been presented, and each risk is examined in turn with respect to possible consequences, likelihood of occurrence, and severity of impact and existence of potential mitigating factors.

The information in respect of likelihood and impact is separately colour coded whereby green represents the lowest likelihood or impact and red the highest. The principal pillars that would be affected by each of the individual risks is further highlighted. This continues our prior examination of which key stakeholders bear the risks in respect of the different pillars.

By looking at Table 6 as a whole, it is clear that the overwhelming majority of risks discussed in more depth in the rest of this chapter are not remote possibilities and could have significant impact on individuals, companies and society in the developed and developing world.

### 4.1 Demographic Trends and Challenges

*The Global Demographic Trends and Social Security Reform*<sup>13</sup> report notes that demographic trends across regions in the world are unsynchronized. Most countries in the developed world face quantitatively similar demographic trends and the same thorny issue of how to reform a strained PAYG pension system. The developed world will experience dramatic demographic changes throughout the 21st century. The most important projected demographic events are further

increases in old-age life expectancy and low fertility rates compounded by the imminent retirement of the baby boom generation.

In contrast, in the developing world, large-scale social security systems are absent and the demographic trends are markedly different. In particular, old-age dependency ratios are less than half than in developed countries: 8% compared to 18% in 2000, and are projected to converge to 35% only after 2100. Roughly speaking, the demographic transition in developing countries lags the one in developed countries by seven or eight decades. The two key challenges and risks above are compounded by increasing family dispersion as generations are less able to support one another.

A risk inherent in all pension systems, regardless of their nature, is life expectancy. In a defined contribution system, it is the member who assumes at least part of the longevity risk. The contribution rate is generally fixed, as is the legal age at which an individual can retire. If there is a large increase in the populations' longevity during a worker's active life, it is probable that when one retires, the accumulated savings will result in a lower pension than the person may have previously expected.

It is possible for a worker to postpone retirement to achieve a higher pension. However, in that case the longevity risk occurs in the form of modifying the retiring age. Whether through a lower pension or a higher retiring age, the life expectancy risk is still present. Nonetheless, once retirement has taken place, the individual may transfer the longevity risk to an insurer by purchasing a life annuity.

There is still the risk that the insurer will become insolvent during the future lifetime of the individual, which may result in non-payment of the pension or reliance on state or industry guarantees. For individuals in poor health at retirement, the purchase of a standard product to insure against the risk of living longer will not be particularly attractive. In the United Kingdom for instance, one can see increasing segmentation of the market with products described as enhanced or impaired annuities that reflect the likely life expectancy of the individual.

### 4.2 Employment Trends and Challenges

The performance of any pension system in terms of final pensions and sustainability will depend largely on the amount and frequency of contributions. In a defined contribution system, pensions depend to a very large extent on the contributions paid during the worker's active life. If a worker

Table 6. Risk perspective table

CATEGORY	RISKS AND CHALLENGES	POSSIBLE CONSEQUENCES	IMPACT	LIKELIHOOD	PILLAR	RISK MITIGATION
Demography	Further increases in old age life expectancy	Increased pension and healthcare costs	●	●	1,2,3	Higher taxes, higher contributions, lower benefits & later retirement
	Low and declining fertility rates	Increasing old-age dependency ratio challenging sustainability of public pension systems	●	●	Mainly 1	Comprehensive pro-birth strategy & increased immigration
	Increasing family dispersion	Retired population more dependent on public support or private pensions	●	●	1,2,3	Filial responsibility for long-term care needs & recognition of value of childcare from grandparents
	Prolonged survival with chronic health problems, most particularly dementia	Higher healthcare and social costs	●	●	1,2,3	Continued investment in R&D for neurological disease & new paradigms for providing care
Employment	Increasing imbalance of income distribution against rising living costs	Increasing proportion of population without capacity to save	●	●	1,2,3	Increase progressive nature of benefits & taxations systems
	High unemployment rates (before and after retirement)	Insufficient old age protection for person with long unemployment history and inability to increase retirement income through work after retirement	●	●	1,2,3	Increase progressive nature of benefits & taxations systems
	Workers without coverage through not being forced to contribute	Insufficient old age protection for person that did have an income that supported a minimum living standard during their working life	●	●	1,2,3	Lower costs of formal work and introduce compulsory pension provision where absent
	Increasing flexibility of working life by choice or to meet childcare needs	increased difference between pension and employment income or challenge sustainability of Defined Benefit Schemes	●	●	1,2,3	Promote pension provision & communicate implications of work balance choices
	Multiple and unclaimed accounts	Retirees cannot claim their funded assets	●	●	1,2,3	Better legal foundations including bilateral and multilateral treaties to insure the portability of pensions between plans and across jurisdictions
Economic/ financial risks	Systematic low market performance	Inadequacy of funds to support retirement	●	●	2,3	Diversification or hedging strategies to address uneven growth & recognition of need for greater provision
	Insolvency and poor performance of pension funds	Inadequacy of funds to support retirement because of operating and investment risks	●	●	2,3	Regulation and supervision of pension fund managers and establishment of insolvency funds
	No financial market for longevity risk	Barriers to those wishing to transfer longevity risk	●	●	2,3	Standardised contracts and metrics to promote the development of a market (for example as promoted by the Life and Longevity Marketing Association)
	Volatility of both stock market returns and interest rates.	Individuals unable to retire on planned date either due to volatility of financial markets or temp. low interest rates making annuities unexpectedly expensive	●	●	2,3	Extend transfer period to less risky asset classes and promote optionality and flexibility over choice of retirement dates
	Inflation and deflation	Inadequacy of funds to support retirement through devaluation of assets or asset shock in response to fiscal collapses	●	●	2,3	Co-ordinated activities by central banks over monetary supply
	Theft and fraud	May impact the integrity and solvency of pension plans	●	●	1,2,3	Strengthen governance and audit procedures
Political environment	Political perspective often too short term, when a long term economic strategy is necessary	Governments not recognising issues of sustainability in funding of existing pension systems, and not dealing with these early	●	●	0,1	Achieve cross-party consensus position on future pension strategy & increase support for research on pension policy
	Younger population groups not engaged in discussion on retirement income	Governments protect the interests of retirees at the expense of younger population groups	●	●	1,2,3	Working population should get more involved before retirement
Individual behaviour	Some populations do not save enough due to poor financial knowledge/ awareness or low trust in retirement schemes	Inadequacy of funds to support retirement	●	●	2,3	Improve tax incentives and influence savings culture. For those populations that already have a culture of saving, ensure that savings vehicles represent appropriate investments
	Leakage of retirement funds e.g. choosing to take portion as lump sum payment	Inadequacy of funds to support retirement	●	●	2,3	Limit early use of retirement funds through combination of incentives and compulsion over annuitisation
	Individuals underestimate future life expectancy	Inadequacy of funds to support retirement	●	●	2,3	Open discussion and promotion of research into likely increases in future life expectancy

contributes continuously on the basis of his or her real wage, the possibilities of obtaining an adequate pension increase vary significantly. Especially in emerging countries, the large informal sector is exempt from contributions while in developed countries more and more sectors are not forced to contribute.

But, it is not only the continuity and amount of the contributions that matter; the time at which these are made is also important. In a funded defined contribution system, the contributions made during the early years of the working life have a significant impact on the final benefit. This is due to the effect of compound interest on these savings over a long period of time. In a defined benefit scheme, individuals will often have to make a minimum number of contributions to have the right to receive a pension and the benefit depends on the final salary. The sustainability of a defined benefit is therefore dependent on whether early funding is consistent with salary increases and likely future life expectancy.

Pension portability both within a country with multiple providers and one country's retirement system to another as employees are moving from employer to employer or one country to another is a major and growing issue. In some countries there is a large proliferation of inactive or dormant accounts which members are either unable to legally claim or consolidate and even where allowed, many fail to initiate due to inertia and lack of awareness or complexity. This can result in major administrative inefficiency and individuals not maximizing their pension outcome. Australia has almost three accounts for each employee with 6 million lost and unclaimed.

Accordingly, countries need to ensure effective portability both from fund provider to fund provider within a country as well as from one country to another. This should include not just the legal right of a member to exercise portability, but also establish an "auto" solution or default where they fail to make a decision. Australia is adopting auto-consolidation of inactive accounts and regulatory change has recently occurred to permit two-way movement between Australia and New Zealand. The United Kingdom is also currently developing policy on multiple accounts consolidation.<sup>14</sup>

The issue is also being widely discussed in the European Union and in developing countries where their citizens are employed in other countries as temporary labour entrants. A common European pensions market would be a benefit for individuals, and bilateral agreements between countries are important to develop. Ultimately, however, global protocols will be required.

### 4.3 Economic and Financial Trends and Challenges

Another decisive element in the amount of pensions provided by a funded system are the returns obtained by the investments made with pension fund resources. Nevertheless, a higher expected return always has a higher associated investment

risk, so it is important to consider the probability distribution associated to particular investment strategies over the course of the worker's life cycle. In the case of a defined benefit scheme, reserves to match liabilities are also subject to investment risk. The risk is largely assumed by the sponsor of the plan. However, depending on the design of the system or financial sustainability of the system there could be an impact on members.

In the case of a defined contribution scheme, the pension fund administrator should have a long-term objective to maximize the expected value of the pension subject to an acceptable dispersion around that expected value. However, in many cases, there are incentives to achieve a better return in the short term. This may result in a risk that is greater than the one considered optimal or could result in taking decisions that do not necessarily correspond to the final objective. At the same time, in the management of third-party funds there is always a potential conflict of interests that has to be regulated. On the one hand, these are mandatory savings, part of a country's social security. On the other hand, most of those enrolled in the system have too little financial knowledge to be able to monitor the performance of their own funds. This is known as fiduciary risk.

Finally, in a funded system, there is always the possibility or, in some cases, the obligation, to transform the accumulated savings into a life annuity on retirement. This involves a considerable reinvestment risk due to the changes that occur in interest rates. A larger or smaller pension may be obtained with the same balance in the individual account, depending on the level of interest rates at the moment when the person purchases the life annuity.

Whichever pension system is in place, inflation risk is present and needs to be mitigated. In the case of a defined contribution scheme, this risk is assumed by the member and real returns should be considered to assess the performance of a pension fund. Nevertheless, at retirement, indexed annuities may be available and the inflation risk can be transferred to an insurance company. In a defined benefit scheme, how the inflation risk is shared by the provider, the member and the government would depend on the specific design.

In a defined contribution scheme, when the worker retires, he or she has the possibility of purchasing a life annuity in an insurance company. In this case, there is also a direct solvency risk that would affect the payment of benefits. This is because in the case of bankruptcy of an insurance company, the pensions would form part of the commitments to be paid out in the liquidation process, with the possibility of there being insufficient resources to pay them out.

Wherever there is solvency risk, there may be industry or state guarantees that could take on all or part of the owed pension pay-outs. At the same time, in many cases the



government plays an active role in providing pensions in the majority of the world's economies. Therefore, the possible risk of government insolvency can also be included among solvency risks, whether concerning the direct provision of benefits or as guarantor in the case of insolvency of the private actors.

There is always operating risk in every industry that has to be taken on board. In the case of the pension system, these are once again of special importance, not because the risks are greater than in other industries, but because members are less alert and less well-prepared to detect possible operating problems from the moment when the contribution is paid in until the benefits are calculated and paid out.

#### 4.4 Political and Socioeconomic Trends and Challenges

The following passages are based on the International Monetary Fund's 2011 report, *The Challenge of Public Pension Reform in Advanced and Emerging Economies*:

Public pension reform will be a key policy challenge in both advanced and emerging economies over the coming decades. If governments do not recognize issues of sustainability in funding of existing pension systems and do not deal early enough with them, many existing systems will remain unsustainable. Furthermore, there is a risk that they do not prioritize investment in social protection more broadly (including pensions) as a way to reduce poverty and inequality.

Many economies will need to achieve significant fiscal consolidation over the next two decades. Given high levels of taxation, particularly in advanced economies, fiscal consolidation will often need to focus on the expenditure side. As public pension spending comprises a significant share of total spending, and is projected to rise further, efforts to contain these increases will in most cases be a necessary part of fiscal consolidation packages. Some pension reforms, such as increases in retirement ages, can raise potential growth. While the appropriate level of pension spending and the design of the pension system are ultimately matters of public preference, there are several potential benefits for countries that choose to undertake pension reform.

The appropriate reform mix depends on country circumstances and preferences, although increasing retirement ages has many advantages. It is important that pension reforms do not undermine the ability of public pensions to alleviate poverty among the elderly. Raising retirement ages avoids the need for further cuts in replacement rates on top of those already legislated, and in many countries the scope for raising contributions may be limited in light of high payroll tax burdens. Longer working lives also raise potential output over time. In many advanced economies there is room for more ambitious increases in statutory retirement ages in light of continued gains in healthy life expectancy, but this should

be accompanied by measures that protect the incomes of those who cannot continue to work.

Women live longer than men and are expected to continue to do so, although healthy life expectancy is more similar between the sexes. The equalization of retirement ages between the sexes in many countries through greater increases in women's retirement age is being observed. In emerging economies, where pension coverage is low, expansion of non-contributory "social pensions" in the form of social protection floors could be considered, combined with reforms that place pension systems on sound financial footing, including rising the statutory age of retirement. Where average pensions are high relative to average wages, efforts to increase statutory ages could be complemented by reductions in the generosity of pensions. Where taxes on labour income are relatively low, increasing revenues could be considered, and all countries should strive to improve the efficiency of payroll contribution collections.

#### 4.5 Behavioural Trends and Challenges

In a defined contribution scheme, individuals often have the possibility of making choices; they sometimes can even switch from a defined contribution to a defined benefit and vice versa. The value of these decisions depends to a large extent on the ability of these individuals to take informed decisions with awareness of the consequences. In general, contribution to at least one of the pillars that fund pensions is mandatory. In the case of a contributory pillar of mandatory individual funding, the amount contributed may also be insufficient for the expectations of those retiring. That is why there are also voluntary savings instruments to supplement the pension. However, the decision to use these savings vehicles, and how much to deposit, is an individual decision.

In general, there is short-sightedness in individual decisions. In fact, this is the justification for making contribution mandatory, as one comes up against the risk of savings being insufficient to fulfil expectations and inertia; failing to make a decision. Moreover, if the decision is made to save over and above the mandatory part, or even with regard to the mandatory savings, people must decide who will administer those savings. This is also an important decision, which must be based on the attributes offered by the various administrators. These attributes include the management of investments, for which one can evaluate historic yield, the relative risk of the portfolios and investment policies. The other important attribute is cost, for which one needs to compare the price charged by each administrator. Finally, one should consider the service provided by the different suppliers. All these characteristics must be evaluated. A poor decision in this area can result in lower yield, higher risk, higher costs or a lower quality of service than expected.



If an administrator is offering different investment alternatives, deciding to enter a fund with 80% in equities or one that invests exclusively in fixed income is a decision of high impact on expected returns and risk. Moreover, it is possible that a person is changing constantly from one type of fund to another, depending on the performance of the markets. This may produce a positive result in terms of accumulated savings if sensible decisions are taken. However, it is also likely that these decisions will not be the most appropriate and will have a negative effect on the funds. If one bears in mind that it is very difficult to predict market performance and that there is generally a considerable lack of financial information among savers, decisions of this type represent a very important risk.

## Notes

13 Attanasioy, Orazio, Sagiri Kitaoz and Giovanni L. Violantex. *Global Demographic Trends and Social Security Reform*. April 2006.

14 Department for Work & Pensions (UK). *Change your job, take your pension with you*. December 2011.



## 5 Stakeholders' Outcomes

The challenges and trends confronting pension systems will require a response from all stakeholders. There is no single blueprint for success, but it is becoming clear that all stakeholders need to take positive action. The challenges facing pension systems may be daunting; however, all stakeholders taking incremental steps will enable pension systems to continue to grow in sustainability and coverage. This section outlines some potential responses for stakeholders to consider.

### 5.1 Employers

Employers will continue to play a critical role in facilitating an individual's participation in pension systems. The involvement of employers in sponsoring pension systems also creates the opportunity for greater efficiency and lower costs.

Given that one way members can improve their retirement income is through extending their working lifetime, it is recommended that employers consider more flexible working arrangement for employees who are past formal retirement dates. This would include the need to allow employees past the formal retirement age to continue to belong to retirement saving arrangements, and possibly contribute to those arrangements. Employers may require legislative support to enable continued membership of retirement plans by employees past retirement age.

It is also expected that employers will have a growing role in delivering financial awareness and education programmes to employees. As a key funder of many supplementary pension systems, there may be a growing expectation by individuals that employers provide them with the information and training required to make proper retirement saving decisions.

### 5.2 Individuals

Individuals will become more involved in managing their pension and retirement savings schemes. Their level of involvement would be affected by the design of the pension systems in place. Where the individual fails to make a decision, the use of default solutions should be adopted as part of the solution set. A defined contribution system would put investment and longevity risks and thus the onus of ensuring sufficient levels of retirement provision on individuals. They should be clear on what amount of retirement savings is required and how invested funds will secure their required level of income in retirement.

It is also more likely that individuals will need multiple sources of income in retirement, including a state pension, private provision and possibly income from work. It is recommended that financial advice be carefully regulated to ensure that it is delivered efficiently and free from conflict of interests, as individuals could require increasing levels of support. Consideration can also be given to the degree to which product providers should be giving support and advice to individuals for retirement savings.

### 5.3 Government

In securing sustainable retirement financing the role of governments is two-fold. First, they are important providers of retirement incomes through Pillars 1 and in the implementation of social protection floors, and they often provide back-stop guarantees for underfunded pension schemes offered by the private sector. The second and equally important role is the provision of a public good by creating an environment fostering sustainable growth and stable financial markets. This second role has microeconomic and macroeconomic as well as domestic and global dimensions.

Cases in point are macro and microeconomic policies to raise employment levels and extend the work life of employees. Improving the level of employment would help reduce the dependency ratio and ease funding strains, especially in partially funded pensions and PAYG systems. Of course, rising levels of unemployment have the reverse effect and are thus particularly worthy of attention. Further, measures that stimulate economic growth and broaden the tax base of the state may also be helpful. Reforming systems to allow individuals to work beyond traditional retirement ages and thus supplement their own income can also be considered. However, the degree to which this is successful depends on current employment levels and the ability of employers to accommodate this kind of labour flexibility.

Despite measures mentioned above, it is becoming evident that the current generation of retirees will probably enjoy the most generous retirement benefits relative to future generations. A combination of favourable demographics and long-term investment returns has led to high levels of pension being available. As demographic trends continue, and economic growth falters, it is unlikely that these levels of benefits can be sustained, and so current state pension systems will need to review the benefits that can be promised.

It is recommended that governments also encourage the development and growth of supplementary pension provision, where individuals are able to provide for their retirement through alternatives to a state pension. This is a key area where all stakeholders need to work in concert to optimize the eventual retirement income that individuals can enjoy.

Many models exist for a supplementary pension system, and it is recommended that careful consideration be given to the design elements of the system in place. For example, the system could be defined contribution in nature. In a funded defined contribution system, unlike PAYG or a funded defined benefit system, the contributions made during the early years of the working life are decisive with respect to the final benefit. This is due to the impact on these savings of the compound interest generated over a long period of time.

While this allows individuals to benefit from good investment performance, it also transfers investment risks and the risk of under provision for retirement onto the individual, and relies on the assumption that an individual is able to make regular contributions to their retirement savings throughout a long working lifetime. Groups that are not able to do this become vulnerable to financial market shocks and under provision. Further, a defined contribution system can be seen as penalizing those individuals who were unable to secure sufficient work, by providing them with inferior protection in retirement. It would thus seem that care should be taken with a purely defined contribution system. However, defined contribution could play a useful role as part of a larger pension system.

Defined benefit arrangements may be better suited to providing income protection to lower income individuals and individuals with broken employment records. Through the mechanism of cross-subsidization, a defined benefit system can redistribute provision for retirement, improving the consistency of benefits and potentially giving broader coverage. However, current demographic and economic trends mean that defined benefit systems would offer lower benefits than in the past. There is also the growing reluctance of state and employers to accept the risk of underfunding, particularly with future investment performance becoming uncertain.

In both defined benefit and defined contribution systems, despite the strongest prudential and supervisory oversight, occasional theft and fraud of member investments can occur. Although rare and limited to a very small proportion of members and investment assets for those affected, it can have a very serious impact. Further, such events usually attract significant negative commentary by participants, media and policy-makers that undermine public confidence in the system as a whole. An effective and timely compensation provision should be considered in these circumstances.

In reviewing and promoting a supplementary pension system, it is recommended that the particular savings culture be taken into account. In some cultures, retirement provision is viewed as a personal responsibility for the individual. In these cases, a pension system can provide the means by which an individual can provide for their retirement, but the ultimate success of provision lies with the individual. Other cultures may view retirement provision as a collective responsibility, where each individual contributes to and then benefits from the collective provision. Taking the retirement savings culture into account also allows a better understanding of the culture and behaviour changes that may be required to make a supplementary pension system more effective.

There are also many cases where pension systems are currently sustainable, but offer low coverage or low benefits to individuals. An ageing population increases the need to broaden and deepen pension benefits for individuals. However, this needs to be done in a way that does not jeopardize the long-term sustainability of the system, particularly if coverage is improved by the introduction or improvement of a state pension.

Government can also review supplementary pension systems, particularly where provision through employers or by individuals is on a voluntary basis. Experience has shown that voluntary participation in pension systems usually fail to provide adequate coverage. Individuals tend to prioritize immediate consumption needs over long-term savings (often despite campaigns to raise awareness of the need to provide adequately for retirement).

Various forms of intervention are available to promote higher coverage, ranging from rebalancing and reviewing tax incentives offered to encourage retirement savings, to compelling a minimum level of retirement saving for employed individuals (either directly or via their employers). Another option is to “nudge” individuals into retirement savings through auto-enrolment programmes, where individuals are automatically enrolled in a retirement savings vehicle and have to actively opt out if they wish to stop saving for retirement.

In determining the appropriate level of intervention, it is recommended that government is cognizant of current savings rates of individuals, the degree to which compulsion is constitutional, the maturity of the financial services industry, the impact of a compulsory retirement savings contribution on employers, as well as the expected level of compliance (and fraud) and government's ability to manage these.

Further, government has a key role in driving more efficient delivery of pension systems. Despite years of operation, productivity and efficiency, gains appear to be low. Consideration should be given to issuing clear standards of governance, tightening management, setting cost standards, improving focus on performance and promoting innovation in an effort to optimize efficient delivery of pension systems.

## 5.4 Financial Services Industry

The private sector and, in particular, insurance solutions, can make a major contribution to meeting the challenge of providing for retirement through the pooling and diversification of risks across populations and geographies. Such risks include asset protection, inflation risk and longevity risk. However, the capacity of traditional insurance will likely not be sufficient to meet all future needs. Hence, traditional insurance will have to be complemented by non-traditional, likely capital market-based solutions, such as the securitization of longevity risks. Banks can help facilitate the global connectivity among various pension retirement systems. In developing countries, such as in Asia where most of the wealth and retirement products are distributed by banks. Moreover, they can play an important advisory role to provide retirement planning.

Currently, a range of insurance products exist that allow households and pension funds to manage various aspects of risk. A strong annuity market is an important contributor to retirement security. Annuities allow the investor to purchase a defined income stream in exchange for an upfront premium. The annuity allows for the insurance of longevity risk, and to varying extents, depending on product design, can also provide protection against inflation and investment risk.

Fixed annuities provide a payment that either remains level or increases in a predetermined way. In low inflation environments, a level annuity may provide reasonable protection, but they remain susceptible to erosion from inflation. This is a growing risk in an environment where pensioners are living longer.

Another popular fixed annuity is one where the pension payment increases in line with a specified, national measure of consumer inflation. These annuities provide pensioners with protection from inflation and longevity and thus can give a high degree of certainty of retirement income. However, in environments where real interest rates are low, this level of protection can prove expensive.

Variable annuities seek to share risks between policy-holders and the insurer in some way. Both investment and mortality risks can be shared, which reduces the cost of the insurance, but also exposes pensioners to some level of inflation risk.

While defined benefit pension funds create their own pools for risk diversification, they too can benefit from annuities and other insurance products. A pension's buy-out involves the pension fund transferring all or a portion of existing pensions and accrued service of active members to an insurer. The insurer thus takes over the liability towards the pension fund member or pensioner, relieving the sponsoring employer of the impact of longevity or investment risks.

A pension's buy-in leaves the liability to pensioners and members in the fund, but involves the pension fund re-insuring

these benefits with an insurer. The pension fund holds a policy which offsets the liabilities toward its members and pensioners.

Some funds may wish to retain longevity risk, but mitigate investment risks. Liability-driven investments allow funds to reduce investment risk through adopting an asset portfolio that closely matches behaviour of the benefit liability, particular to movements in interest rates.

There is also growing demand for specific longevity insurance, where investment risk is retained by the policy-holder, but they are insured against improvements in mortality of pensioners. Longevity swaps allow an investor to transfer the financial impact of pensioners living longer than expected to an insurer. Ideally, these products require greater support from the capital markets.

While a range of insurance products are available to households and pension funds, further innovation is required to deal with longevity risk. The potential financial impact of this longevity risk is enormous. Each additional year of life expectancy raises pension liabilities by about 4-5%.<sup>15</sup>

To enable the financial services sector to manage longevity risk more effectively, it is important to encourage the transfer of longevity risk from the insurers to the capital markets. By increasing the scope of the capital markets and allowing securitization of longevity risk, greater diversification across geography and demography can be achieved. In addition, more efficient pricing of longevity risk is enabled.

Regulators thus have an important part to play in ensuring a strong, viable insurance sector, and in eliminating constraints that may stifle the necessary innovation required to meet the challenges faced by the industry. Regulators can encourage adequate capital controls and ensure protections are in place by insurers, look to minimize regulatory arbitrage across the insurance and pension industry, and ensure that accounting and other disclosure requirements foster effective insurance solutions.

Further, the challenges that pension systems face are leading to the financial services industry being called upon to foster and enable better provision by individuals and provide more efficient delivery. Particularly in geographies where there is a strong reliance on a defined contribution approach to retirement provision, industry faces a twin challenge of providing products that are simpler and cheaper for individuals while providing customer experiences that are better, more engaging and supportive. This requires innovation at a product level (and including protection), as well as at an operating model level.

Consolidation often results in lower margins. Government can assist by framing clear governance requirements, standardizing requirements, and simplifying regulatory and legislative frameworks. The financial services sector thus needs to respond innovatively. The development of safe

products and solutions that can support supplementary pension provision and diversify risks such as investment volatility and longevity, while providing a customer experience that is compelling, are required.

The financial services industry will also face greater responsibility to educate and empower individuals. This can be done through better disclosure of product information and costs, using easy to understand communication, improved customer experiences and engagement, cost-effective distribution of advice and flexibility around channels of communication.

### 5.5 All Stakeholders Part of Solution

The goal of deploying sustainable pension systems that continue to provide broad coverage and adequate levels of cover is an increasingly challenging and necessary one. The impacts of an ageing population, economic and financial challenges, and rising socioeconomic needs affect all systems. What is becoming more evident is that the success of future systems lies in how well all stakeholders work together to address the challenge, rather than relying on solely on government.

All stakeholders should work together towards consensus when deciding which system is optimal for their country. Each stakeholder has specific expectations. Some expectations of different stakeholders might coincide, for example, the demand for public risk coverage both from the employer and the individual side. However, in most cases the expectations will differ significantly in nature and extent. Also, expectations might change during the life cycle of an individual. People in their early 20s have different experiences and expectations than people approaching retirement age. As a result, the investigation of the intergroup relationships within the pension system in a country is very important in building an effective retirement environment.

Protection systems will still have to support social solidarity. There must be a social protection floor, but individual benefits also will have to be balanced. Therefore, reforms of protection systems should have broad legislative support and be backed by all groups represented in a country.

The challenges facing retirement systems in AMEs and EMEs may sound insurmountable. No single system can serve as blueprint waiting to be universally adopted. But there is no reason for despair. Time and the marvels of compound interest work in favour of courageous and prudent policy-makers. Small and judicious changes implemented today will reap big dividends in the future. It is time for all stakeholders of financial retirement systems to secure this future.

## Notes

- 15 *A mature market: Building capital market for longevity risk*. September 2012. Swiss Re Europe.

## 6 Appendix

**Table 2. Stakeholder roles**

	Pillar 1 – Government	Pillar 2 – Employer	Pillar 3 – Individual
Households (Working and retired individuals)	Contributor: Contribute to governmental social security schemes, employer-sponsored plans, and individual retirement savings		
		Retirement Planner: 1. Avail themselves to the resources, programming and training intended to help insure long term financial security; 2. Become educated about what constitutes reliable "good" advice; 3. Assume that income earning careers may extend far beyond current norms; 4. Make planning for 'retirement' a lifelong exercise	
		Investor: 1. Invest in products to match personal needs and investing sophistication; 2. Become educated about what constitutes reliable "good" advice	
Plan sponsors (Employers)	Financial Educator: Help motivate/educate employees to save sufficiently for their retirement: 1. inform employees through suitable media about retirement income protection topics; 2. use internal financial services department (if existent) to support employees in the decision for suitable products; 3. include retirement income planning in apprenticeship		
	Contributor: Make contributions to social security schemes and employer-sponsored plans	Benefit / Administrator: When employer exercises this role directly  Investor: Invest in products that match the needs of employers and beneficiaries	
Financial services industry (Banks and insurers)	Sponsor / Provider: Need to improve financial inclusion by broadening distribution channels: 1. Offer mobile banking channels for regions with large unbanked populations; 2. Cooperate with other institutions (like post offices) to ensure payments; 3. Offer prepaid solutions		
	Financial Educator: 1. Improve financial literacy (concrete example: Citi foundation which offers voluntary literacy programs; online tutorials)		
	Asset Custodian; Investment Manager; Market Maker: Provide liquidity in the markets		
		Financial Advisor: Create 'advice' models that scale in order to provide financial advice to all individuals - deliver objective, quality, independent advice	
		Benefit / Administrator: When contracted to third party provider  Provider of Investment and Retirement Products: 1. Adhere to high governance and risk management standards to insure stability in the financial markets; 2. Provide clear disclosures on risk, fees and conflict of interests on retirement products; 3. Provide products that serve an array of customers with varying levels of sophistication; 4. Offer broad range of retirement products that insure longevity risk and support higher saving rate for retirement; 5. Provide national systems which simplify transfer and tracking of retirement assets as employees change employers and programs	
Governments and regulators	Tax and Spending Policy Maker: To incentivize the desired behaviour of individuals, the financial services industry and employers		
	Financial Educator: Provide direct educational materials or programs and change school curriculums regarding financial literacy		
	Custodian of the Economy: Provide stable macroeconomic and financial environment		
	Financial Educator: Create education and financial literacy standards that speak to financial planning across the lifespan		
	Market Regulator: Build and maintain sound financial markets and strong institutions to regulate them; Create and monitor disclosure standards		
	Regulator of Benefit Program Design: 1. Provide sound regulation which includes appropriate incentives and supports for both employers and individuals to responsibly plan for retirement; 2. Ensure retirement income on a global perspective; 3. Create regulatory incentives which allow individuals to add voluntary contributions; 4. Maximize the share of the workforce participating in contributory systems (whether public or private) through mandates, incentives, or both; 5. Create education and financial literacy standards that speak to financial planning across the lifespan, not just at point of retirement; 6. Create certification standards that allow consumers to access the appropriate professional advice; 7. Provide incentives for individuals to increase their savings rates; 8. Avoid requirements that create an asset/liability mismatch risk		
	Sponsor / Provider: 1. Provide adequate support for vulnerable populations; 2. Provide an adequate non-contributory floor of old age protection		Sponsor / Provider: 1. Provide infrastructure to employees for additional voluntary contribution (in case employer has its own pension plan); 2. Help close protection gap for employees by providing pension plans within the bounds of economic possibility; 3. Support employees who transfer from other companies with their pension plans; 4. Ensure that the retirement security programs they offer will provide adequate income security if the employees follow recommendations
	Sponsor/Provider: Provide an adequate contributory benefit to satisfy basic post-retirement security		
	Benefit / Administrator		
	Asset Custodian: e.g. US Social Security Trust Fund		
	Investment Manager: If pre-funding and investment management retained		

## 6.2. Country Clustering Table

COUNTRY	PILLAR 1						PILLAR 2
	OLD-AGE DEPENDENCY RATIO (60+/20-59) (2010)	OLD-AGE DEPENDENCY RATIO (60+/20-59) (2040)	TOTAL PUBLIC BENEFITS TO ELDERLY (TPBTE); IN % OF GDP (2007)	GROWTH IN TPBTE, 2007-2040 IN % OF GDP	NET DEBT/GDP IN % (2011) *GROSS AS NET NOT AVAILABLE	REVENUE BURDEN IN % OF GDP (2010)	ASSETS OF PENSION FUNDS IN % OF GDP (2010)
ADVANCED ECONOMIES							
Australia	34.3 ●	55.0 ●	8.9 ●	6.0 ●	8.2 ●	31.8 ●	89.0 ●
Austria	41.2 ●	75.0 ●	N.A.	N.A.	52.1 ●	48.1 ●	5.4 ●
Belgium	43.3 ●	67.0 ●	N.A.	N.A.	81.4 ●	48.6 ●	3.8 ●
Canada	35.0 ●	62.6 ●	8.3 ●	6.4 ●	33.1 ●	38.4 ●	64.7 ●
Czech Republic	37.6 ●	67.1 ●	N.A.	N.A.	*40.5 ●	39.3 ●	6.3 ●
Egypt	15.8 ●	27.7 ●	N.A.	N.A.	64.3 ●	25.1 ●	2.4 ●
France	43.6 ●	64.6 ●	16.6 ●	6.8 ●	78.8 ●	49.5 ●	0.2 ●
Germany	46.9 ●	83.7 ●	15.8 ●	5.9 ●	55.3 ●	43.6 ●	5.4 ●
Greece	43.3 ●	75.5 ●	N.A.	N.A.	165.4 ●	39.7 ●	0.0 ●
Hong Kong SAR, China	28.6 ●	76.5 ●	N.A.	N.A.	*33.8 ●	22.5 ●	34.7 ●
Italy	48.6 ●	88.8 ●	18.0 ●	6.6 ●	99.6 ●	46.0 ●	4.6 ●
Japan	59.2 ●	97.2 ●	14.1 ●	4.3 ●	126.4 ●	29.6 ●	25.2 ●
Netherlands	40.1 ●	71.4 ●	12.0 ●	11.2 ●	31.7 ●	45.5 ●	128.5 ●
Portugal	42.3 ●	83.8 ●	N.A.	N.A.	97.3 ●	41.4 ●	11.4 ●
Spain	38.5 ●	81.9 ●	14.3 ●	11.8 ●	57.5 ●	36.2 ●	7.9 ●
Republic of Korea	25.9 ●	80.8 ●	3.4 ●	10.7 ●	32.9 ●	22.7 ●	4.0 ●
Sweden	48.1 ●	62.9 ●	15.7 ●	3.5 ●	-18.2 ●	49.8 ●	9.6 ●
Switzerland	40.6 ●	78.8 ●	9.8 ●	7.6 ●	25.9 ●	32.8 ●	113.7 ●
United Kingdom	42.2 ●	58.0 ●	12.1 ●	6.1 ●	76.6 ●	36.4 ●	88.7 ●
United States of America	33.8 ●	52.9 ●	8.9 ●	7.4 ●	80.3 ●	31.7 ●	70.5 ●
EMERGING MARKET AND DEVELOPING ECONOMIES							
Brazil	18.4 ●	43.7 ●	8.8 ●	11.6 ●	36.4 ●	35.4 ●	14.5 ●
Chile	23.5 ●	51.3 ●	6.0 ●	1.5 ●	-8.7 ●	23.3 ●	67.0 ●
China	20.4 ●	56.5 ●	2.8 ●	5.2 ●	*25.8 ●	21.3 ●	0.7 ●
Hungary	39.7 ●	62.2 ●	N.A.	N.A.	78.6 ●	45.2 ●	14.6 ●
India	14.5 ●	27.4 ●	1.9 ●	1.6 ●	*67.0 ●	18.7 ●	0.2 ●
Indonesia	14.6 ●	38.1 ●	N.A.	N.A.	*24.5 ●	17.0 ●	1.6 ●
Mexico	17.3 ●	40.8 ●	2.4 ●	2.7 ●	40.3 ●	21.7 ●	12.7 ●
Poland	32.4 ●	61.7 ●	10.1 ●	3.8 ●	25.7 ●	37.5 ●	15.8 ●
Romania	34.5 ●	65.5 ●	N.A.	N.A.	*33.0 ●	32.3 ●	0.9 ●
Russian Federation	29.1 ●	51.4 ●	5.8 ●	4.4 ●	*12.0 ●	35.5 ●	1.9 ●
South Africa	14.0 ●	21.3 ●	N.A.	N.A.	35.1 ●	27.5 ●	N.A.
Turkey	16.2 ●	38.7 ●	N.A.	N.A.	31.3 ●	33.1 ●	2.3 ●
LOW INCOME ECONOMIES							
Bangladesh	12.9 ●	28.4 ●	N.A.	N.A.	N.A.	11.5 ●	N.A.
Ethiopia	12.6 ●	15.8 ●	N.A.	N.A.	20.5 ●	17.3 ●	N.A.
Nigeria	12.7 ●	13.6 ●	N.A.	N.A.	10.4 ●	20.0 ●	6.9 ●
Pakistan	13.6 ●	20.5 ●	N.A.	N.A.	56.9 ●	14.4 ●	0.0 ●
SOURCE	UN 2010 MEDIUM VARIANT	UN 2010 MEDIUM VARIANT	CSIS 2010	CSIS 2010	IMF 2011	IMF 2012	OECD
	● < 33.0	● < 33.0	● < 6.0	● < 3.0	● < 60.0	● < 40.0	● > 50.0
	● > 33.0 > 66.0	● > 33.0 > 66.0	● > 6.0 > 12.0	● > 3.0 > 6.0	● > 60.0 > 90.0	● > 40.0 < 50.0	● > 25.0 < 50.0
	● > 66.0	● > 66.0	● > 12.0	● > 6.0	● > 90.0	● > 50.0	● < 25.0



6.2. Country Clustering Table, *continued*

PILLAR 2, <i>CONTINUED</i>			PILLAR 3			PILLAR 4		
FUNDED PENSION BENEFITS IN % OF GDP (2007)	FUNDED PENSION BENEFITS IN % OF GDP (2040)	MARKET CAPITALISATION OF LISTED COMPANIES (2008)	HOUSEHOLD SAVINGS IN % OF GDP	HOUSEHOLD SAVINGS IN % OF GDP (GINI CORR)	FINANCIAL ASSETS IN % OF GDP (USD) 2009	LABOR FORCE PARTICIPATION RATE (AGED 60-74) IN 2011 - ALL	EFFECTIVE RETIREMENT AGES	FORMAL RETIREMENT AGES
<b>ADVANCED ECONOMIES, <i>CONTINUED</i></b>								
3.4	9.1	63.6	4.5	2.9	3.1	40.8	64.8	65.0
N.A.	N.A.	17.5	11.5	8.2	2.2	12.8	58.9	65.0
N.A.	N.A.	33.0	11.7	7.9	3.2	10.6	59.1	60.0
5.1	7.8	66.7	4.0	2.7	2.9	32.4	63.4	65.0
N.A.	N.A.	21.7	5.7	4.2	0.7	15.7	62.0	61.0
N.A.	N.A.	52.7	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
0.3	0.5	52.7	11.7	7.9	2.5	10.8	59.1	60.5
0.7	2.7	30.6	11.7	8.4	2.2	20.9	61.8	65.0
N.A.	N.A.	26.5	N.A.	N.A.	1.2	15.3	61.9	57.0
N.A.	N.A.	617.0	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
0.9	2.4	22.6	8.0	5.1	2.6	11.6	61.1	59.0
2.0	2.7	66.4	2.3	1.7	4.8	42.8	69.7	65.0
5.2	10.8	44.5	5.9	4.1	3.6	23.0	62.1	65.0
N.A.	N.A.	27.3	-0.8	-0.5	2.1	N.A.	67.0	65.0
0.6	1.6	59.4	6.6	4.3	1.6	16.8	61.8	65.0
0.4	1.0	53.1	2.9	2.0	1.5	45.3	70.3	60.0
2.7	6.3	51.9	11.2	8.4	2.8	33.1	66.0	65.0
4.5	7.7	171.4	11.7	7.8	6.1	33.2	65.7	65.0
4.0	5.0	70.3	-2.8	-1.8	3.3	27.6	64.3	65.0
5.6	8.0	82.5	5.5	3.3	3.5	38.8	65.5	66.0
<b>EMERGING MARKET AND DEVELOPING ECONOMIES, <i>CONTINUED</i></b>								
0.9	3.0	35.7	N.A.	N.A.	N.A.	40.9	N.A.	N.A.
1.8	4.6	61.8	7.4	3.6	N.A.	40.8	66.9	65.0
0.0	1.2	N.A.	N.A.	N.A.	N.A.	28.5	N.A.	N.A.
N.A.	N.A.	12.0	2.7	1.9	0.7	8.3	60.0	60.0
0.2	1.1	52.7	N.A.	N.A.	0.3	35.8	N.A.	N.A.
N.A.	N.A.	19.4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
0.3	1.4	21.3	10.2	5.3	0.7	40.2	72.2	65.0
0.0	3.1	17.0	0.8	0.5	0.5	28.7	61.7	65.0
N.A.	N.A.	10.0	N.A.	N.A.	1.0	N.A.	N.A.	N.A.
0.0	1.4	23.9	N.A.	N.A.	0.1	11.9	N.A.	N.A.
N.A.	N.A.	179.4	N.A.	N.A.	N.A.	19.2	N.A.	N.A.
N.A.	N.A.	16.1	N.A.	N.A.	0.3	N.A.	62.8	44.9
<b>LOW INCOME ECONOMIES, <i>CONTINUED</i></b>								
N.A.	N.A.	8.4	N.A.	N.A.	SMALL	N.A.	N.A.	N.A.
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
N.A.	N.A.	24.0	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
N.A.	N.A.	14.3	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
CSIS PROJECTION	CSIS PROJECTION	WORLD BANK WDI	OECD	OECD / WDI / CALC	OECD / ALLIANZ	OECD	OECD Average age at exit (men)	OECD Formal exit age (men)
● > 4.0	● > 4.0	● > 50.0	● > 10.0	● > 5.0	● > 3.0	● > 30.0	● > 65.0	● > 65.0
● > 1.0 < 4.0	● > 1.0 < 4.0	● > 25.0 < 50.0	● > 5.0 < 10.0	● > 3.0 < 5.0	● > 1.0 < 3.0	● < 30.0 > 20.0	● > 62.0 < 65.0	● > 62.0 < 65.0
● < 1.0	● < 1.0	● < 25.0	● < 5.0	● < 3.0	● < 1.0	● < 20.0	● < 62.0	● < 62.0

### 6.3 Pillar Indicators – Colour Coding Rationale

There are many ways to construct a vulnerability table for the four pillars under consideration. Rather than replicating work done elsewhere, the main objective of this paper is to highlight the challenges to the sustainability of Pillar 1. Failing to maintain its sustainability would have far-reaching economic and social ramifications, particularly in advanced market economies. For the purpose of this work, Pillars 2 through 4 are considered as supplements or substitutes for Pillar 1. They can help ensure its adequacy without creating a fiscal burden. Thus, the indicators chosen for Pillar 1 measure fiscal sustainability, whereas the indicators for Pillars 2 through 4 reflect the robustness of the respective pillars in their role as complement to Pillar 1.

#### Pillar 1

**Old-age dependency ratio (OADR):** This demographic indicator measures the number of people in the traditional working years (aged 20-65) relative to the number of elderly (aged 65 and over). A high OADR tends to signal fiscal stress due to increasing public pension and healthcare payments. OADRs exceeding 66% is marked in red and those below 33% in green. These thresholds are admittedly arbitrary. However, a broad look at the experience of countries to date suggests that financing adequate retirement systems, and especially PAYG Pillar 1 systems, becomes challenging with an OADR of more than roughly one-third and can be expected to become very difficult with an OADR of more than two-thirds. Measures to mitigate fiscal stress due to rising OADRs include (i) raising mandatory retirement ages, (ii) reducing public pensions under Pillar 1, (iii) encouraging employer-sponsored pension schemes (Pillar 2) and private retirement savings (Pillar 3), and (iv) a broad range of labour market (immigration) and family support policies (such as child support), which would be captured in Pillar 4.

#### Total public benefits to the elderly (TPBtE):

A robust Pillar 1 may help ensure income adequacy for the elderly. However, providing an adequate income for the elderly out of public funds cannot be divorced from fiscal sustainability issues. The higher the TPBtE is as a share of GDP, the greater is the tax burden on working-age adults. In recent years, a number of OECD countries have initiated reforms to stabilize public pension expenditures as a share of GDP (see also chapter 3.2 for the measures to mitigate fiscal stress due to rising OADRs). In light of these developments, red warning flags are raised where TPBtEs are in excess of 12% of GDP and where the indicator's growth between now and 2040 exceeds 6%. Likewise, a green flag is assigned to a TPBtE share of less than 6% and a growth rate of less than 3%. It should be stressed that fiscal burden is only an issue for Pillar 1 and is not pertinent to Pillar 2 and Pillar 3 schemes. Certain countries made political choices to provide

the majority of benefits through public schemes based on PAYG and funding contributions that may well turn out to be fiscally unsustainable.

**Debt-to-GDP ratio:** This indicator measures the fiscal room of countries that have to accommodate high or rising TPBtEs by borrowing. A low debt ratio means that even a rapidly TPBtE burden may not be a great concern. Conversely, a high debt burden means that even modest growth may threaten fiscal sustainability. The lower reference point is the 60% debt-to-GDP ratio laid down as one entry criterion in the Maastricht conditions. Countries with debt-to-GDP ratios lower than 60% are marked green. The upper reference point of 90% is based on research showing that countries with debt-to-GDP ratios in excess of 90% (marked red) tend to experience reduced growth rates and sovereign solvency crises.<sup>16</sup> Reduced growth also implies that these countries are no longer able to stabilize their debt-to-GDP ratios.

**Revenue burden in % of GDP:** Like the debt indicator, the revenue burden indicator measures the fiscal room that governments have to accommodate rising TPBtEs, in this case by raising taxes. It is not meant as a judgement on the optimal size of the public sector, but simply refers to the potential fiscal room for raising new revenues. There is no clear benchmark for the revenue burden to become economically stifling. A large part of revenues are taxes. Studies examining the relation between taxes, the size of the public sector and economic growth have shown that while tax incentives (or likewise tax-induced distortions) matter, it also matters whether taxes are raised efficiently and to what use public expenditures are directed. That said, the tax and revenue burden must also be politically acceptable. A reading of history suggests that tax and revenue burdens up to 40% of GDP appear to be politically acceptable in most countries (marked green), whereas revenue burden in excess of 50% (marked in red) begin to create both political and economic concerns.

#### Pillar 2

**Assets of pension funds in % of GDP:** This indicator measures the Pillar 2 preparedness of countries. A ratio in excess of 50% indicates that a country is reasonably well prepared (colour code green), whereas ratios below 25% indicate room for improvements (colour code red).

**Funded benefits in % of GDP:** Similar to the first indicator in Pillar 2, this indicator expresses also a country's preparedness with respect to Pillar 2. The distribution of indicator data suggests a clear segmentation with most countries showing considerable room for improvement.

**Market capitalization of listed companies:** This indicator is a proxy for the depth and sophistication of local capital markets. Pension funds and individual savers require

a broad range of financial products in which to invest and that can be traded in liquid markets. A ratio in excess of 50% indicates that a country is reasonably well prepared (colour code green), whereas ratios below 25% indicate room for improvements (colour code red).

### Pillar 3

#### Household savings in % of GDP (uncorrected and

**Gini-corrected):** Saving for retirement is a complex undertaking with the outcome depending on time (years dedicated to saving), income growth during working years, investment yields, desired income replacement level, inflation and the amount of expected public retirement benefits (just to mention a few key factors). A recent study on financial planning in the US shows that a 30-year old individual earning US\$ 40,000 with no previous savings and desiring to save for an 80% income replacement level would have to save 10% of net income.<sup>17</sup>

It is difficult to determine how micro-level saving studies should translate into an optimal aggregate household savings rate. However, a number of studies suggest that household tend to save less than what would be required to maintain the pre-retirement living standard after retirement. Moreover, economic models of saving suggest that, given the longevity challenge, aggregate saving should increase in line with the lengthening of retirement years.

In light of these considerations, and to provide a conservative estimate, it is suggested that to achieve an adequate retirement income, the uncorrected household savings ratio should be higher than 10% (colour code green). An uncorrected savings ratio of less than 5% would in contrast place the country in the colour code red.

The reason behind providing a **Gini-corrected savings ratio** takes as a starting point that high-income households tend to save a larger share of their disposable income (i.e. income net of taxes and other contributions) than low-income households. Thus, national income data give a distorted picture of savings when income inequality is high. In those countries, the mean savings ratio is always higher than the median savings ratio. Unfortunately, median savings ratios are rarely reported, if they are reported at all. For these reasons, the paper offers a correction that accounts for income inequality. The conversion formula is simple. Let  $S$  denote the savings ratio (household savings in % of GDP) as reported by national income statistics, and  $GV$  be the Gini coefficients as reported by the World Bank, then the Gini-corrected savings ratio  $S\text{-corr}$  becomes  $S\text{-corr} = S(1-GV/100)$ .

Thus, countries with a highly unequal income distribution will have a lower Gini-corrected savings ratio than countries with a more equal income distribution, indicating that the bulk of the population in unequal societies is likely not saving enough for retirement purposes.

**Financial assets in % of GDP:** This ratio sets the financial assets per capita in correlation to the Gross Domestic Product (GDP) per capita and serves as an indicator for the wealth of individuals of a country.

### Pillar 4

**Labour force participation rate (aged 60 to 74):** This indicator is based on the recognition that extending part- and full-time time employment opportunities for older workers will make an important contribution toward increasing the sustainability of financial retirement schemes. This study takes as benchmark the employment rate (aged 15 to 64), which for the average of OECD countries is about 65%. Based on this, one could consider as desirable (colour-code green) an employment rate in excess of 30% (which is roughly half the employment rate of the working population), whereas an employment rate of less than 20% would be colour coded red.

**Retirement ages (formal and effective):** This indicator takes as starting point that the formal retirement age of 65, which is the unachieved norm in most advanced market economies, is no longer in line with the longevity challenges. Consequently, the bar for a green colour code is set at the retirement age of 67, whereas retirement ages below 63 will be colour coded in red.

### Notes

16 Reinhart, Carmen and Kenneth Rogoff. *This Time Is Different: Eight Centuries of Financial Folly*. New Jersey: Princeton University Press, 2009.

17 Ibbotson, Robert and James Xiong, Robert P. Kreitler, Charles F. Kreitler, Peng Chen. National Savings Rate Guidelines for Individuals. *In FPA Journal*, 2007.



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