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Introduction

1 The basic concept of what was formerly called the Pension Reform Pressure Gauge was developed by Allianz Dresdner Economic Research and first published in Allianz Dresdner Asset Management's "Central and Eastern Europe Pensions: Reform trends and growth opportunities" in 2004. It was further developed and updated in: Allianz Global Investors, 2007: Central and Eastern European Pensions 2007: Systems and markets; Allianz Global Investors, 2007: Asia-Pacific Pensions 2007: Systems and markets; Allianz Global Investors, 2008: Funded Pensions in Western Europe 2008; Allianz Global Investors, 2008: Retirement at Risk: The US pension system in transition. In 2009, we combined the regional results into one report; Allianz Global Investors, 2009: Pension Sustainability Index 2009, International Pension Papers, No. 5 and had it updated in Allianz Global Investors, 2011.

Driven by unfavorable demographic developments and unsustainable, outdated or fragmented systems, pension reform has been at the top of political agendas across the globe for many years now. The reform process in the wide range of countries addressed by this survey differs considerably from country to country. This is why Allianz first introduced the Pension Sustainability Index (PSI)¹, which combines the various characteristics of pension systems with the factors that influence them to help track and evaluate policy changes made in different countries around the world. In addressing the sustainability of a country's public pension system, the PSI can give an indication of a country's need for reforms to maintain long-term financial sustainability. This can be difficult to assess given the many country-specific institutional, technical and legal parameters. There are, however, key variables that impact on the sustainability of national pension systems regardless of a country's distinct parameters. By taking a methodical approach to studying these dynamic variables, the PSI is able to evaluate the long-term sustainability of national pension systems and thus the pressure on governments to reform these.

This edition is an updated and extended version of the 2011 PSI.

Key Results

- Thailand is under the highest pressure to reform. The system has an extremely low retirement age as well as sporadic coverage due to its large informal sector. It has replaced Greece, which improved after its strong reform efforts, as lowest ranking. Brazil comes in as second lowest: with the country's high replacement rate and low effective retirement, its system does not appear to be sustainable in the future.
- At the other end of the table, Australia – with its two-tiered system of lean public and highly developed funded pensions – seems to be most sustainable in the long run. Australia's top position is followed, in order of ranking, by Sweden, New Zealand, Norway, the Netherlands and Denmark.
- Although rankings within the index should not be considered in absolute terms, as they reflect a given country's situation assessed in the context of a broad group of peers, the 2014 PSI does reveal significant changes from 2011. Under the adjusted rankings (comparable to 2011 country list), Greece, Ireland, Luxembourg, Romania, Singapore, Turkey and the US were able to move more than five places upwards in the rankings. A combination of different factors led to this shuffle – in particular, improved aging perspectives, the introduction of pension reforms and an improved economic development that helped take pressure from public finances.
- Croatia, France, Hong Kong, Malta, Slovenia and Taiwan dropped significantly in the ranking. One of the reasons was a new population projection that showed a more rapid aging, in some cases, the given country's delay in implementing major pension reforms.
- The PSI has been regularly published since 2004. The 2014 version has now been expanded to 50 countries; the newcomers are Brazil, Chile, Mexico, Malaysia, Indonesia and South Africa.

Pension Sustainability Index: Overall Results

2 See factors included in the PSI in the paragraph „Methodology and Data“

3 Allianz Global Investors, 2011: Pension Sustainability Index 2011, International Pension Papers, No. 4

4 The old-age dependency ratio is the ratio of the number of elderly people (i.e. aged 65 and over) compared to the number of people of working age (i.e. 15-64 years old).

5 See regional results p. 9ff.

The Pension Sustainability Index (PSI) systematically examines relevant elements of pension systems and the developments that influence them in order to evaluate the pressure on governments to effect reform. To this purpose, 50 countries have been analyzed according to a range of parameters in order to arrive at a country ranking that reflects the long-term sustainability of the pension system in aging societies.

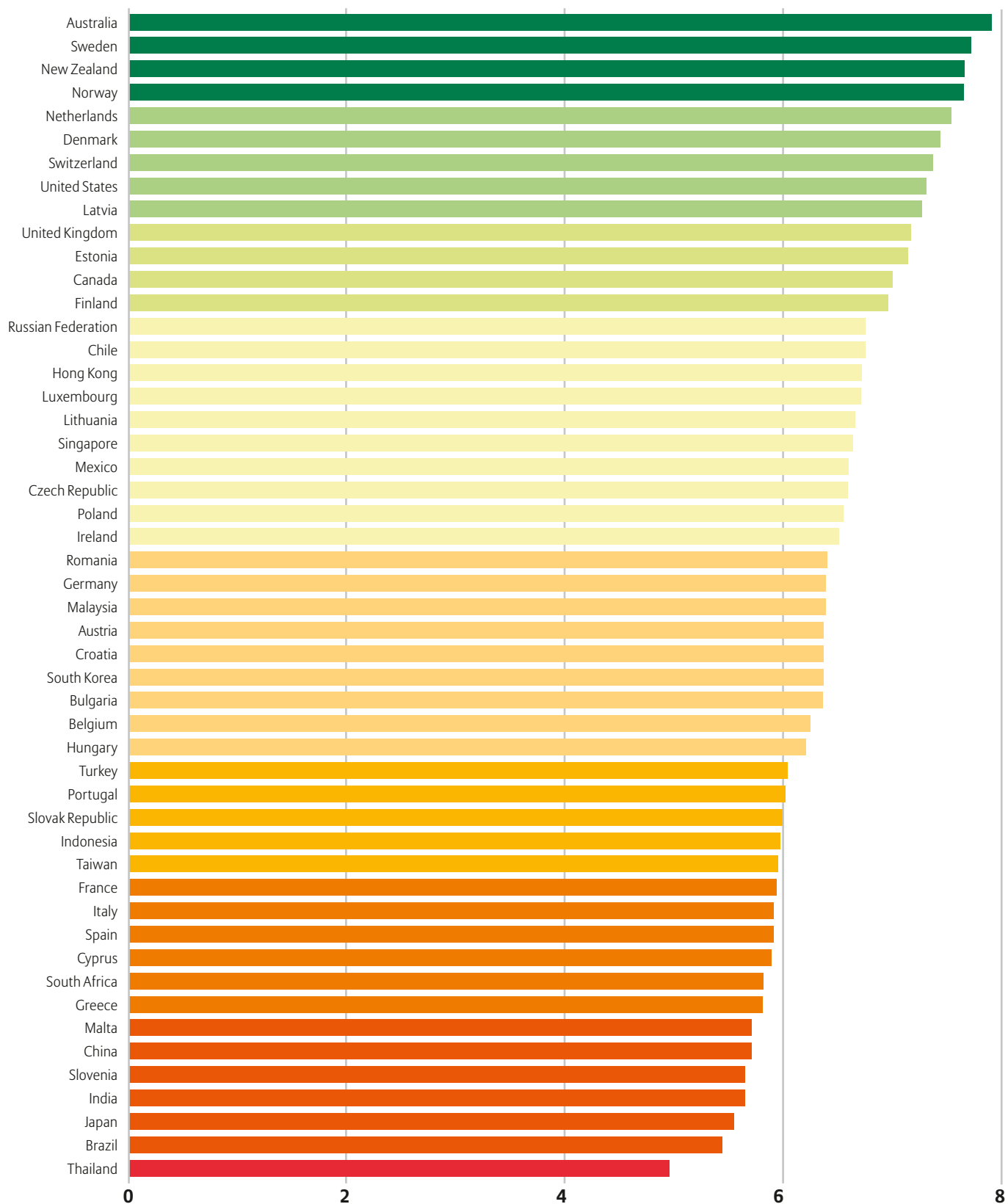
The 2014 PSI takes a slightly different approach than previous studies. The lowest figures on the spectrum indicate the low sustainability of a system, whereas a high value reflects strong sustainability.

In the current study, the pension systems of Thailand, Brazil and Japan were found to be the least sustainable in the long run, though for different reasons. Thailand has an extremely low retirement age, only sporadic coverage, and is aging rapidly.² It probably postponed to tackle the consequences of its aging problem after disastrous flooding and political turmoil brought other issues to the political agenda. Brazil is also aging quickly, and its pension system has a high replacement rate which, combined with early retirement options, will be unsustainable in the long run. Japan comes in at the low end of the ranking because of its very old population and very high sovereign debt level. In consideration of these factors, the pension system is still too expensive, making the need for reform an ongoing concern. Greece, which ranked worst in the 2011 PSI,³ was able to improve due to the drastic reforms stipulated by the International Monetary Fund (IMF) and European Central Bank (ECB) austerity packages. It succeeded in cutting back on pension expenditures with lasting effect. Nevertheless, the high debt level and an old-age dependency ratio (OAD)⁴ well above the European average remain a challenge for the Greek system. This is why Greece did not improve more in the ranking.

Australia lies at the other end of the spectrum. The amount of burden a country's pension expenditures place on public finances is a core sub-indicator in this study. Therefore, Australia's two-tier system combining a lean public with highly developed funded pensions is under the least pressure to reform. Australia success is followed in order by Sweden, New Zealand, Norway and the Netherlands. The western European countries benefit from their comprehensive pension systems based on strong, funded pillars. New Zealand's population is not aging quite as rapidly. Therefore, its pension system – together with a relatively low debt-to-GDP ratio, a moderate pension design and a labor force that tends to work beyond the statutory retirement age – is considered to be basically sustainable for the future.

In the broad middle, there are many countries with very differing systems and pre-conditions: “young” countries with fragmented pension systems challenged by a rapidly aging population; and “old” countries with developed pension systems, which have initiated reforms and are aware of their challenge to monitor the financial sustainability of their old-age provisioning systems. To get a better overview on systems and countries at similar stages of development, we will discuss the country results in further detail on a regional level.⁵

Figure 1: 2014 Pension Sustainability Index*



* Scale from 1 – 10: 10 minor need for reforms, 1 high need for reforms

Source: Allianz Asset Management, International Pensions, January 2014

6 Australia might serve as an example of a country where the question of adequacy might become relevant. On the one hand, there is a small burden on public finances because of the way in which the pension system is set up. On the other hand, people can take out lump sums from their retirement funds to pay off mortgages. This, however, leaves them with reduced means in retirement.

7 European Commission, 2010: GREEN PAPER towards adequate, sustainable and safe European pension systems, COM(2010)365.

8 European Commission, 2012: Pension Adequacy in the European Union 2010-2050. For further information about the scope of the discussion see: Project M 2013: Mind the Gap, Allianz, #14.

9 Population Division of the Department of Economic and Social Affairs of the UN Secretariat, 2013: World Population Prospects: The 2012 revision, median variant.

It should be noted here that, since adequacy of retirement income is not one of this study's sub-indicators, it is also not included in PSI results.⁶ First-pillar pension reforms introduced over the last two decades have brought about drastic changes in the global retirement landscape. Pay-as-you-go (PAYG) systems are moving towards funded systems, defined benefit (DB) towards defined contribution (DC), and family support structures towards more formalized public ones (as is the case in Asia). This raises the question of whether today's workforce will be able to generate enough retirement income to maintain their pre-retirement standard of living, or whether they will be faced with income shortfalls or even old-age poverty. A current focus of public debate, this issue has been put on the political agenda in many countries. It was broadly addressed in the 2010 Green Paper⁷ of the European Commission and in a special report on retirement adequacy in 2012.⁸

CHANGES IN THE PSI SINCE 2011

The calculation of the PSI is based on figures that do not accord significance to small differences in underlying figures for the ranking. Therefore countries with close values should be viewed as a group with similar results, as indicated by their color-coding. Nevertheless, some countries show major changes compared to their 2011 PSI ranking.

Hong Kong, Taiwan, Croatia, France, Slovenia and Malta experienced a significant decline in their ranking compared to their 2011 results, whereas the US, Luxemburg, Singapore, Ireland, Romania, Turkey and Greece improved (see Fig. 2). As a variety of parameters were analyzed, it is not always easy to identify what factors lie behind the change. In a number of countries, active reform efforts made the difference, with Greece and Italy setting an example with massive reforms. In other cases, delays in reforms placed countries such as France at a disadvantage. Differing economic development and recovery also had an effect on pension expenditure and debt figures, leading to a shuffle in the relative position of the countries listed. Last but not least, new projections for the underlying data also influenced the ranking.

For this update, we used the revised version of the UN population projection⁹, which indicated some major changes in the old-age dependency ratio. Regarding Hong Kong, Taiwan, Spain and Cyprus, the UN projected an even faster aging process, with OAD much higher than in the former projection. With demographic developments combined into one sub-indicator, these alterations considerably influence the PSI figures. This change has particularly influenced the shift in Hong Kong's and Taiwan's rankings. A slower aging process was projected for the populations of Singapore, Switzerland, Sweden, Norway, Austria and Russia. For Singapore, however, this was not the only reason for positive change in the ranking. The introduction of a mandatory annuitization of funds helps protect the longevity risk and, as a consequence, reduces the need for the government to take action to avert old-age poverty. Luxembourg also attained a more promising position: its favorable debt situation and better pension expenditure outlook help explain its improvement in ranking.

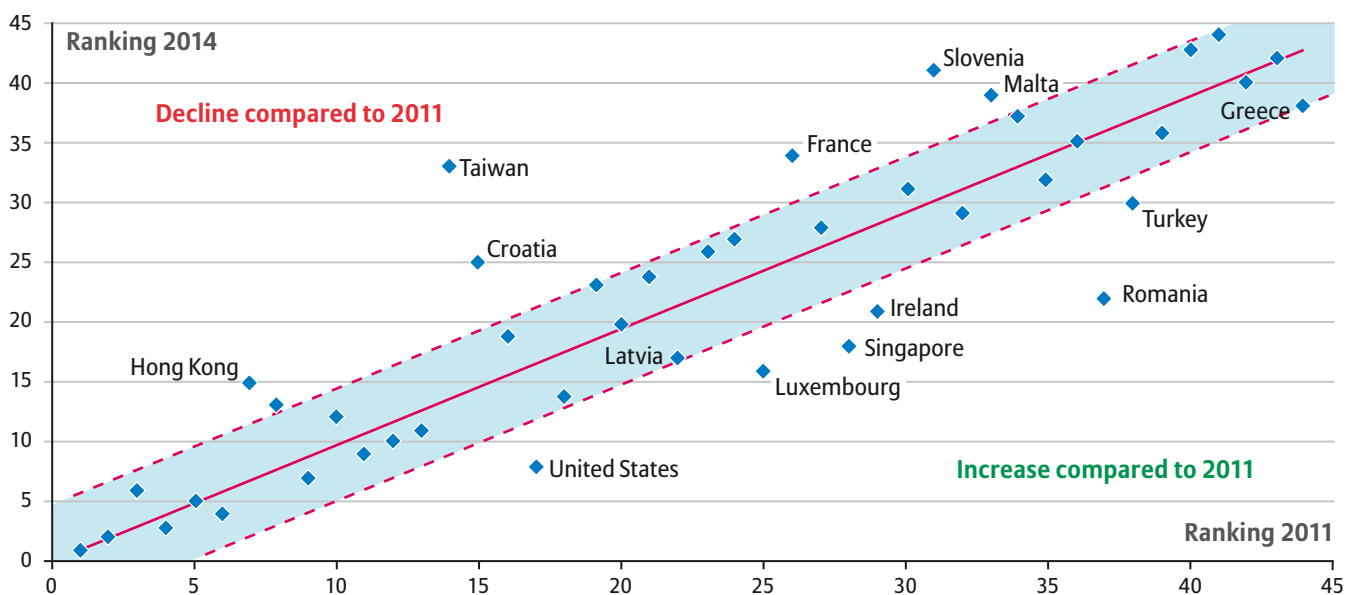
10 European Commission, February 2012: The 2012 Ageing Report: Economic and budgetary projections for the EU-27 Member States (2008-2060). OECD, 2013: Pensions at a Glance 2013. World Bank pension database.

For the purposes of the study, we also consulted the updated version of pension expenditure projections provided by the EC, OECD and World Bank¹⁰. As a result of the financial crisis and ensuing economic slowdown in a number of countries, slow economic recovery and GDP development brought about a decline in overall data. This also had an impact on the overall debt situation, which in turn influenced the sub-indicator “public finances”. Slovenia’s and Malta’s declines derive in part from the pension expenditure projection for the base year – which was higher – as well as the projected change for the next 40 years. A more positive outlook was projected for Romania after it succeeded in increasing its effective retirement age, which favorably influenced the sub-indicator “pension system” and thus its ranking.

We also analyzed the pension-reform process in the countries surveyed. The very drastic transformation in Greece had an impact on pension expenditure and the valuation of pension system parameters, which helped the country improve its ranking. And the strong increase in retirement age in Ireland allowed its ranking to rise. Due to fiscal pressure, countries such as Denmark, the Netherlands and Romania launched their reforms earlier, whereas others are still slow to update their pension systems. Because of this inertia, some countries – France, for example – lost ground in the ranking.

The US has improved its ranking considerably, partly due to worsening OAD in other countries as well as a positive revision of pension expenditure compared with the previous study. But many other countries – particularly in Europe – had higher expenditure figures than in former projections for their base year.

Figure 2: Pension Sustainability Index – Change between 2011 and 2014



Sources: Allianz Asset Management, International Pensions

Regional Results

11 See also “The Italian Lesson” in: Project M 2013: Mind the Gap, Allianz, #14.

12 Retirement entry for people with long contribution history at age 63 without actuarial reductions; extra valuation points for women with children born before 1992.

WESTERN EUROPE AND NORTH AMERICA

Over the last two decades, almost all western European countries have been trimming their public pension systems in an effort to strengthen pension sustainability. One main target of reform was to increase the retirement age. Other measures (e.g. changing the pension calculation, broadening the assessment base, changing the adjustment mechanism) were designed to lower replacement rates. The speed of reform, however, differs between countries. Those which recently introduced major reforms were able to improve in the PSI ranking because of active steps taken, while others lost in comparison due to their passive policymaking.

Malta is at the low end of the list for western Europe, and has also descended in ranking. Its position suffered from a continuing low retirement age while the population’s longevity increases. The UN projected Malta’s OAD in 2050 to be even higher than it did in its previous report, indicating a stronger increase in longevity. Additionally, the EC projected a rise not only in pension expenditure projection for the base year but also for the next 40 years.

Drastic reforms helped Greece to rise above its bottom ranking of 2011. Nevertheless, unfavorable demographics and high sovereign debt prevented its moving further up. Greece still needs to keep an eye on its pension system as though it were watching an upper expenditure level. Surpassing this will trigger calls for further reform.

Italy significantly accelerated its phasing in of reforms by 2012 – a reaction to the looming debt crisis and deteriorating credibility.¹¹ This helped Italy improve in the ranking.

Spain also introduced central reforms but remains within the group of countries that have significant aging and fiscal problems (Cyprus, Greece and Italy). It is still under substantial fiscal pressure due to its drastically aging population. The UN even revised the projection of the OAD of Spain from 62% to 67%, pushing it into the group of the five “oldest” countries – along with Japan, Hong Kong, Korea and Portugal.

Sweden and Norway, on the other hand, benefited from their comparatively solid public finance situation. Norway even succeeded in surpassing the Netherlands due to its better fiscal position. Norway’s high legal retirement age and moderate aging demographic also assisted in awarding the country its high index ranking.

Germany’s median ranking lost a little ground, partly due to the UN’s less favorable population projection. The OAD is expected to increase more than previously projected. Additionally, the EC’s base year pension expenditure projection was a bit higher – as well as the predicted change for the coming 40 years. Germany’s changes to its pension system¹² will bump up the pension expenditure figure accordingly. We factored in these recent changes, which might also be why Germany did not improve its ranking.

13 A baseline first-pillar pension may raise the question of the adequacy of retirement income. It might not deliver a replacement income adequate to sustain a comparable standard of living – particularly for low-income workers – unless there are complementary schemes.

Thanks to a baseline, first-pillar income that keeps its pension expenditures relatively low, as well as a favorable aging trend that is not expected to overstretch public finances, the US has far less cause for concern than many other countries.¹³ The US is expected to have one of the lowest old-age dependency ratios in 2050 (only a few emerging economies will be “younger” by then), with very moderate change between the present and 2050 expected. In the PSI, the US even managed to reach the top 10 overall, partly due to the worsening OAD in other countries and a positive revision of pension expenditure compared with the former study. Most other countries, particularly in Europe, had expenditure figures higher than their older projections for the base year.

Canada compares favorably with most of western Europe and the wide range of countries considered in this study. Taking all sub-indicators into account, Canada’s pension system is quite sustainable. It just misses being placed in the top 10 in the overall ranking.

Figure 3: 2014 Pension Sustainability Index for western Europe and North America



* Scale from 1 – 10: 10 minor need for reforms, 1 high need for reforms

Source: Allianz Asset Management, International Pensions

EASTERN EUROPE

In the last version of the PSI, we highlighted the effects of the financial crisis on central and eastern European countries (CEE). It had a negative impact on both accumulated funds and national economies. Economic growth slumped heavily and put a tremendous strain on public finances with a dramatic rise in debt-to-GDP ratios. We accounted for that effect in the 2011 PSI, but not for the impact on pension expenditure-to-GDP ratios. This effect was included in the revision of the EU Ageing Report 2012, which we used for this PSI update. All CEE countries covered by the Ageing Report exhibit higher expenditure ratios than in the former report; the Czech Republic, the Baltic states and Slovakia even suffered strong upward revisions for the base year. This negatively affects the corresponding parameter in the PSI sub-indicator “public finance”. In the case of Romania, Lithuania and Latvia, the projected, long-term outlook on pension expenditures became much better than before which had a positive effect on the PSI sub-indicator compensating the base year effect. It helped to improve the ranking of these countries. The rise in the effective retirement age in Romania also helped improve its ranking.

Latvia tops the list for CEE countries, just making it into the top 10 in the overall ranking – right behind the US, slightly before the UK. Although its retirement age is still low, the NDC type of benefit calculation gives relief to the financial burden. As the second pillar is mandatory and

Figure 4: 2014 Pension Sustainability Index for selected countries in eastern Europe



* Scale from 1 – 10: 10 minor need for reforms, 1 high need for reforms

Source: Allianz Asset Management, International Pensions

14 Being a “super-aged” country the share of people of age 65 and more is above 21%. See Allianz 2014, Security – Trust – Solidarity Perception of retirement: a cross-country comparison, forthcoming

contribution rates are again increasing after the cuts in 2009, funds from the second pillar will help deliver an income level at retirement which is above the poverty level – which would otherwise put a burden on public finances and long-term sustainability. Latvia improved its overall ranking, due in part to the UN’s more favorable population projection, followed closely by Estonia, which also has a funded pillar to complement retirement income. As in Latvia, ad hoc transfers of the 2nd pillar were resumed in Estonia to build assets back up again to relieve the pressure on welfare assistance. Furthermore, the pension age in Estonia is due to be raised. This last measure was also introduced in Lithuania to ease pension expenditure in the long run (*see above*), which helped to improve its PSI ranking.

At the other end of the list are Slovenia and Slovakia. As previously noted, the pension expenditure projection for their base year was higher – as well as Slovakia’s projected change for the next 40 years. Although the outlook for Slovenia has not worsened, the projected large increase in pension expenditures and lack of reforms put great pressure on the country to update its pension system.

Turkey has improved its ranking mainly due to the rise in retirement age. But its generous pension system will require close scrutiny in the future. Although Turkey’s population is still quite young, its OAD is expected to triple by 2050. It will then be considered super-aged.¹⁴ Turkey will have to put the issue of aging on its political agenda.

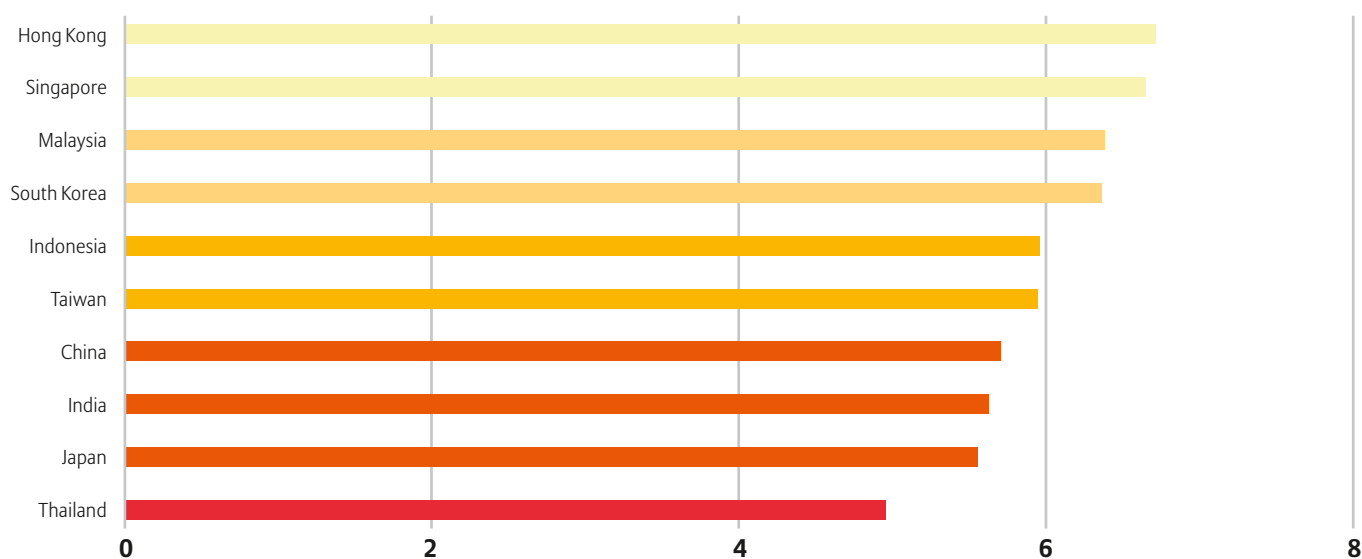
Hungary, Poland, Slovakia and the Czech Republic may be facing an increased risk to their long-term sustainability since they depleted second-pillar pension pots to ameliorate fiscal problems in the short to mid term. The diminished pension pots may subsequently be unable to complement the low level of public pensions they were designed to bolster. This could increase the risk of retirees falling below the poverty level, in which case the state may need to provide welfare assistance, which would become a burden on public finances.

ASIA

The diverse pension situations in Asian countries generate widely varying needs for reform. Emerging Asian markets in particular are undergoing major structural changes. Strong economic growth has led to a prosperous middle class throughout the region. Increased urbanization and a breakdown in traditional family structures, however, have caused extreme socio-economic changes, which are altering the entire retirement landscape. Contrary to Europe, comprehensive pension systems in most of Asia still require further development, and increasing the coverage of the public pension system is still a challenge. Therefore, many Asian governments have started to implement a multi-pillar system by introducing a variety of funded pensions. Countries with a strong, funded pillar rank best in the PSI. The financial burden of the pension system in such cases is low, as people have to rely on their own accumulated assets. This is basically the case in Hong Kong, Singapore and Malaysia. (Fig. 5)

Hong Kong's overall position has dropped in the new ranking due to worsened aging perspectives. The UN population division expects Hong Kong's OAD to reach 67% in 2050 (in contrast to their previous projection of 55), indicating that the aging process has accelerated substantially. This puts increasing pressure on the government to review the system.

Figure 5: 2014 Pension Sustainability Index for selected countries in Asia



* Scale from 1 – 10: 10 minor need for reforms, 1 high need for reforms

Source: Allianz Asset Management, International Pensions

The opposite development was forecasted for Singapore. The OAD is projected to be only 48% in 2050, whereas the former projection was 58. This helped to improve the ranking. In addition, the introduction of mandatory annuitization, which tackles the risk of older people falling into poverty, also had a positive effect on Singapore's ranking.

Malaysia made its debut in this edition of the PSI in the broad middle of the overall ranking – third among the Asian countries included in the study. As the pension system in Malaysia is based on a DC-type of funded system, people have to rely on their accumulated assets for their retirement income. But as people can withdraw their assets at an early age, and there is no mandatory annuitization, the risk of falling into poverty is high, in which case the state has to step in to offer support. Nevertheless, the current setup puts only minor fiscal pressure on the pension system. But because of the parameters used in the PSI, Malaysia's low retirement age and rapidly aging population are particularly responsible for its middle ranking. The same can be said for Indonesia, another newcomer to this study, which ranked fifth among the 10 Asian countries.

The pension system in Malaysia

Since its inception in 1951, the Malaysian pension system has been based on a single-pillar approach. The Employees Provident Fund (EPF), the first public provident fund in Asia, served as a mandatory DC scheme for private sector employees. In 1980, a new pension act replaced the ordinances for public sector pensions and created the civil servants DB scheme, still in place today. Plans to transform the DB scheme, financed mostly through taxes, to a DC scheme exist. Following the Malaysian New Economic Model reforms, the Malaysian retirement system abandoned its single-pillar approach. The private retirement and the deferred annuity schemes were launched in 2012 as a voluntary third pillar. During the same year, the statutory retirement age was raised to 60 years for both men and women.

The pension system in Indonesia

The Indonesian pension system is based on a multi-pillar system in which several social security schemes exist. These schemes are either publicly or privately managed, with publicly managed schemes being mandatory for civil servants (Taspen), as well as the police and armed forces (Asabri). Social security schemes were extended to include private sector employees (Astek) in 1977, and were later transformed into a provident fund in 1992 (Jamsostek). Statutory retirement age is currently set at 55. Civil service pensions are predominantly provided by defined benefit schemes, with defined contribution schemes covering employees in the private sector. Public sector employees may also opt to take part in voluntary supplementary programs; private sector employees may avail of voluntary occupational private pensions. Participation is, however, largely dependent on the given employer's decision. A new DB-scheme, the National Social Security System (NSSS), is expected to be implemented in 2015.

Despite demographics favorable to a good PSI rating, India is still under pressure to reform its pension system. With only 12% of the population covered by any type of formal pension arrangement, extremely low coverage remains the primary challenge for India's pension policy.

Thailand, which scored the worst of all the Asian countries, did not do much better in the overall ranking. Its pension system suffers from an extremely low legal retirement age (55 years). Thailand's political agenda was clearly focused on issues other than pension reform. The country has been facing monumental challenges in tackling the consequences of the worst flooding in 50 years and simmering political unrest.

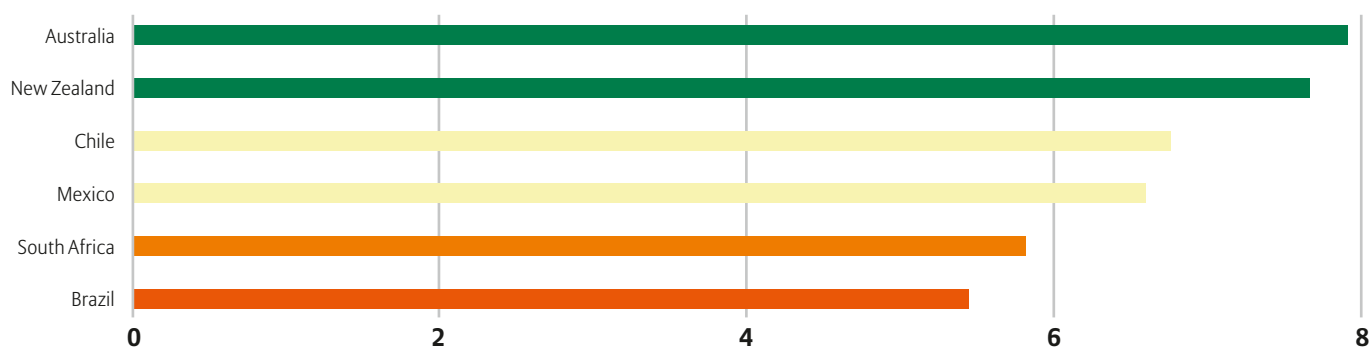
Even though many emerging Asian countries have introduced pension reforms, there is still much work to be done. Japan ranked slightly before Thailand – despite its good coverage. Japan is suffering from the highest OAD in the world. By 2050, it is expected to increase to an unsustainable level of almost 72%, compared to 39% in China. Another factor influencing Japan's unfavorable ranking is its high sovereign debt, which leaves no room for a potential subsidization of the pension system, should it become necessary.

SOUTH AMERICA, OCEANIA AND OTHER

The long-term sustainability of pension systems in South America, Australia, New Zealand and South Africa is as different from country to country as their diverse pension landscapes. In an overall comparison of the 50 countries included in this study, they ranked among the very best and the very worst (*Fig. 1*).

Australia and New Zealand's top rankings have not changed since the previous PSI study. These two countries have well-balanced old-age provisioning structures with baseline public pensions

Figure 6: 2014 Pension Sustainability Index for selected countries in South America, Oceania and other



* Scale from 1 – 10: 10 minor need for reforms, 1 high need for reforms

Source: Allianz Asset Management, International Pensions

15 Being a “super-aged” country the share of people of age 65 and more is above 21%. See Allianz 2014, Security – Trust – Solidarity Perception of retirement: a cross-country comparison, forthcoming

complemented by funded pillars. Combined with favorable demographics and well-managed public finances, these have put them in a good position to provide for their senior citizens.

Brazil’s low-ranked debut in the PSI points to poor long-term sustainability. The reasons for this lie primarily in the pension system itself. Although, like most countries, it has a legal retirement age of 65, the effective retirement age is substantially lower, with men able to draw down their full pension after 35 years of contributions, and women after 30 years. This suggests that men can potentially receive their full pension at age 55, and women at 50. Moreover, the replacement rate is high, and there are 13 payments a year, which puts great pressure on public finances. Brazil may currently be mastering the burden of its pension system because of its young population, but it will have to revise its policies for the future as demographics drastically change. By 2050, the OAD is projected to increase 3.5 times, with a much larger group of people in retirement.

The pension system in Brazil

The pension system in Brazil rests on three pillars. The first pillar is based on a generous mandatory PAYG system called the *Regime Geral de Previdência Social* (RGPS), which covers the private-sector workforce. The legal retirement age is 65 for men and 60 for women, but a full pension can be drawn after 35 contribution years (30 women). The private pension funds, first created during the 1960s, provide voluntary complementary funded schemes, managed by closed and open pension funds. The operating arrangements for these funds were developed in the year 2001 and provide defined benefit, defined contribution and hybrid plans with specific regulations for closed funds, depending on the sponsoring party (labor unions and professional associations can only manage DC plans). With the third pillar, contributions for a personal scheme are tax deductible.

The other three countries new to the PSI are not quite comparable with the rest as they have strong foundations in a funded pillar.

Chile is ranked in the upper third of the PSI. It is close to Russia, Hong Kong and Luxembourg, with the differences between them more or less negligible. But there is a big difference in the pension system itself. The pension system in Chile is based on a funded defined contribution system. It was introduced in the 1980s; accordingly, it has a considerable amount of assets available. People rely on their accumulated resources but, to avoid old-age poverty, the government introduced an additional solidarity pension system for the poorest. As a consequence, the fiscal burden of Chile’s pension system is low, and its overall debt level is one of the smallest of all the countries in the study. This has a positive influence on the ranking. Moreover, current demographics are favorable: Chile has still a low OAD though it already became an “aging” country by the turn of the century.¹⁵ But its population is expected to age as quickly as many other emerging countries. This process will put pressure on the system.

The pension system in Chile

Following the pension reform pact in 1980, Chile was the first country to substitute its PAYG system with a system of individual accounts. The first pillar is based on the non-contributory, basic solidarity pension (paid out to the poorest 60% of the population). Pensions are generally disbursed when the recipient reaches age 65 – with the exception of female pensioners within the second tier, who start receiving their pensions at 60. The second pillar involves mandatory individual accounts managed by private-sector administrators (*Administradora de Fondos de Pensiones*), covering 75.6% of Chile's working-age population in 2011. The third tier of Chile's pension system is a voluntary supplement to retirement income, enhanced by tax-favored financial incentives.

Mexico does not attain quite as good a ranking as Chile's; nevertheless, it does score in the top half of the ranking. Its system provides a flat-rate, PAYG pension, and the country started a mandatory, funded DC system about 15 years ago. As a consequence, although pension expenditures are low and its demographics are similar to Chile's, Mexico's overall debt level is higher, which is partly responsible for its lower ranking. Mexico's OAD is expected to increase rapidly – more than tripling by 2050 and put pressure on system in the long run.

The pension system in Mexico

The pension system in Mexico is made up of three pillars. Following the country's pension reform in 1997, the traditional PAYG system gradually transformed into a fully funded DC system. The first pillar of the new pension system is a targeted tax-financed minimum pension paid out by the government to formerly low-waged earners. In general, pensions are paid out at age 65 after fulfilling the required years of service. The funded pillar is mandatory for all private sector workers and personal retirement accounts are managed by private pension fund managers (AFOREs). Private pension schemes covered 59.5% of the Mexican working age population in 2011. In the third pillar contributions to voluntary retirement savings are tax advantaged.

As a country with a young population, South Africa is under less pressure to prepare for an aging society. It ranks low in the list because of the parameters chosen in the index. South Africa's position indicates that it should think of establishing a more comprehensive system because it will be faced with a growing sector of older people in the future.

The pension system in South Africa

South Africa provides old-age financial support that is non-contributory, means-tested and guarantees the provision of flat-rate pensions to the elderly from age 60 who satisfy residency requirements. This flat-rate payment is tax financed. In addition, there is a wide array of occupation-dependent arrangements, but coverage remains low due to the economic structure of the country (many residents are involved in informal work). Following the country's transition to full democracy in 1994, the pension system was reformed to increase coverage – especially for South Africans living in rural areas and those employed in non-formal jobs.

Methodology and Data

The PSI uses a range of sub-indicators – such as demographic developments, public finances and pension system designs – to measure systematically the long-term sustainability of a pension system. The sub-indicators encompass various parameters for the present status and future outlook of the system (see Fig. 7).

SUB-INDICATOR “DEMOGRAPHICS”:

One of the main burdens on the long-term sustainability of a pension system and a driving force to initiate reform is the aging population. The old-age dependency ratio, which measures the number of people aged 65 or older as a share of the number of people aged 15 to 64 (working age population), gives a clear indication of a country's aging demographics. In the PSI, we consult not only the current but also the future situation. A country with a young population may be at a comfortable stage today, but a rapidly aging society may swiftly place such a country in hardship, as the time horizon to implement reforms is relatively short. We therefore included the parameter OAD in 2050 to reflect the direction of change in each respective country and the urgency for political intervention. The data was taken from the 2012 revision of the UN's “World Population Prospects” (medium variant).

SUB-INDICATOR “PENSION SYSTEM”:

This section of the PSI addresses the parameters of the national pension systems and their future designs. As with PAYG systems, the ratio of retired beneficiaries to the contributors in the workforce is crucial for the financing of the system. Retirement entry age defines and distinguishes these groups. We have therefore included this parameter in the PSI variable spectrum. As there were various early-retirement options in place in many countries, we had to include the legal retirement age as well as the effective one. Both have a strong effect on a country's ranking. For instance, to address the glut of 20th-century baby boomers in western Europe's workforce, many countries initiated early-retirement incentives to relieve the pressure on the job market. The result, however, was that large numbers of people left the European workforce well below the legal requirement age, which then put pressure on public finances. In contrast, other countries raised the legal retirement age in order to lower the old-age dependency ratio – a move that generally has a positive effect on the long-term sustainability of the system.

The amount of retirement income a pensioner receives also has a strong impact on a given system's financial sustainability. By comparing a large number of countries, the differences in replacement rate can indicate how generous a system is designed. We included this parameter, as well as its projected future change.

Over the past two decades, many countries implemented parametric reforms to their pension systems. Apart from increasing the retirement age, they designed measures to lower replacement rates (e.g. changing the pension calculation, broadening the assessment base, changing the adjustment mechanism). In this way, countries sought to improve the long-term sustainability of their pension systems. Therefore, in the sub-indicator “pension system”, we included a qualitative approach for the reform progress. For example, if radical reforms had been introduced in the past

to address dramatic demographic changes, thereby laying the groundwork for a solid and sustainable pension system in the future. In such instances, even though an aging population would normally trigger the need for reform to improve long-term sustainability, planned changes or those already in place would reduce the pressure for further reforms. An increasing retirement age, a reduction in a previously high replacement ratio or the strengthening of the funded system are all indications that reform is in progress. We therefore factored in reforms that have either already been introduced or have been agreed, but not yet carried out.

There is, however, a flip side to reducing replacement rates. When retirement income is too low, old-age poverty becomes an issue. Financing welfare programs may then put more pressure on public finances than any relief gained by lowering the replacement rate. This in turn affects the PSI. Countries that don't have additional funded systems in place to buttress their very low replacement rates will score poorly on this sub-indicator. Therefore, to take this effect into account, we included the importance of the funded system in a country, measured by assets in percentage of GDP, as part of this sub-indicator.

Datasets from the EC's report on aging in 2012 were used for these variables in European countries. Data from the OECD, the World Bank and the Asian Development Bank filled in any information missing on pension parameters. Where necessary, national sources and statistics were added.

Figure 7: PSI Methodology

Sub-indicators	Status	Dynamics
Demographics	Old-age dependency ratio (OAD)*	Change in OAD* until 2050
Pension system	Level of pension benefit from 1st pillar and coverage of workforce	Change in level of pension benefit
	Legal / effective retirement age	
	Strength of funded pillar and reserve fund (as % of GDP)	Reforms passed
Public finances	Pension payments / GDP	Change of pension payments / GDP until 2050
	Public indebtedness / GDP	
	Need for welfare support	

* Ratio of ≥ 65 years of age to 15 to 64 years of age

Source: Allianz Asset Management, International Pensions

16 We reversed the scale in order to align ourselves with a more intuitive perspective: low sustainability = small number; high sustainability = large number. After this change, the new ranking of the PSI can be compared with the ranking in the PSI 2011 but not the figures.

SUB-INDICATOR “PUBLIC FINANCES”

The area of public finances is another of the sub-indicators used in the PSI to rank countries. If pension expenditures are already high, or if a dramatic increase is expected for the coming decades, it will have a negative overall effect on public finances. In a PAYG pension system, the workforce pays contributions into a social security system, which in turn are paid out to retirees. In addition, governments are obliged to provide for their retired civil servants. The parameters considered here are the pension expenditures as a percentage of GDP and what changes are expected by 2050. Moreover, as described in the previous section, we also consider the risk of falling down to poverty levels, when welfare systems have to step in.

Sovereign debt as a percentage of GDP is factored into the PSI to indicate how much public finances can be stretched. The financial crisis and its successive, extensive economic stimulus packages have put tremendous pressure on public finances. This has led to a severe crisis in some European countries, where sovereign debt has exploded in the last couple of years (see *Figs. 13 and 14*) – so much that there is little room left to address increasing old-age expenditures.

The IMF’s world economy database of October 2013 (see *sources*) provided the debt data; the EC’s aging report 2012, as well as statistics from the OECD and World Bank, filled in the pension expenditure data. Where necessary, national sources and statistics were added.

VALUATION

The individual variables of the sub-indicators are given a score of 1 to 10, with 1 indicating the poorest end of the valuation (e.g. high debt ratios, high replacement rates, high old-age dependency ratios or low legal retirement ages) and 10 indicating the best.¹⁶ The variables are combined into a single score between 1 and 10 for each sub-indicator. Subsequently, the sub-indicators are factored together into a final score. A country with an overall score of 1 would indicate there is major need for reform as the system seems largely unsustainable; 10 would indicate no need for reform. Here is an overview of sub-indicators that would weight results positively:

- The national pension system has been designed to meet the needs of an aging society, e.g:
 - the first pillar PAYG system offers moderate benefits and covers a large percentage of the workforce;
 - the legal retirement age is high and/or is linked to life expectancies;
 - funded pillars are in place to provide additional old-age income.
- National demographics do not put much pressure on reform, e.g:
 - the old-age dependency ratio is favorable;
 - any changes in the work-to-retirement balance are expected to be moderate.
- The government is in a position to cushion reform pressures, e.g:
 - public pension payments are low;
 - the state has deep pockets so that it can either take on more debt or increase the burden on the economy to finance rising pension payments.

It is important to note that the PSI uses an intervallic scale to determine the ranking. Since the index does not have a cardinal order or a metric value, results cannot be used for calculations. Therefore minor differences in weightings cannot fully differentiate between countries.

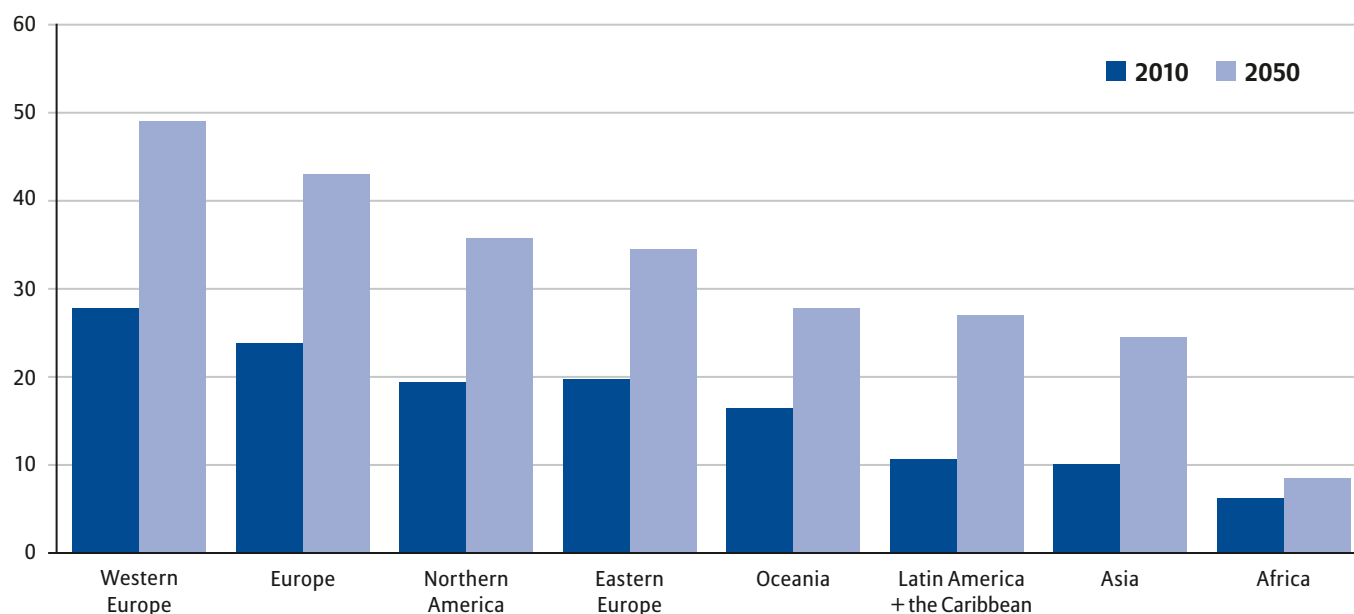
Results for Sub-indicators

DEMOGRAPHICS OF AGING

Although aging populations are a worldwide phenomenon, the status and speed of population aging in various countries can differ substantially. This variation can be analyzed by the old-age dependency ratio. The OAD is already quite high in “older” Europe, which has seen a steady trend towards lower birth rates and increasing life expectancies. To put this into perspective, the OAD is 28% in western Europe, about 10% in today’s “younger” regions (i.e. Asia and Latin America), and even less in Africa. (see Fig. 8). Regions with younger populations, however, will not remain unscathed after the effects of changing demographics and can expect to see rapid change – particularly in Asia and Latin America. The mean population age in countries around the world is expected to spiral between now and 2050, by which time the OAD will have almost tripled in Latin America, more than doubled in Asia, and increased by some 80% in North America and western and eastern Europe.

The rapid change expected in Asia is due to a huge increase in life expectancy, which since 1950 has jumped from 42 to 68 years – the biggest leap of any region in the world. This 26-year leap in longevity compares to increases of 10 in Europe, 10 in North America and 18 in Africa. With an increase of 20 years in longevity, Latin America follows closely behind Asia. Increased life expectancy, however, is not the only problem. Over the last 50 years, Asia has seen a steep decrease in its fertility rate. On average, every woman in Asia gives birth to 2.3 children, roughly 60% less than in 1950. Again, only Latin America is facing such a similarly steep decline.

Figure 8: Old-age dependency ratios* for different World regions (2010 to 2050) [as %]



*Population aged 65 and older to population aged 15 to 64

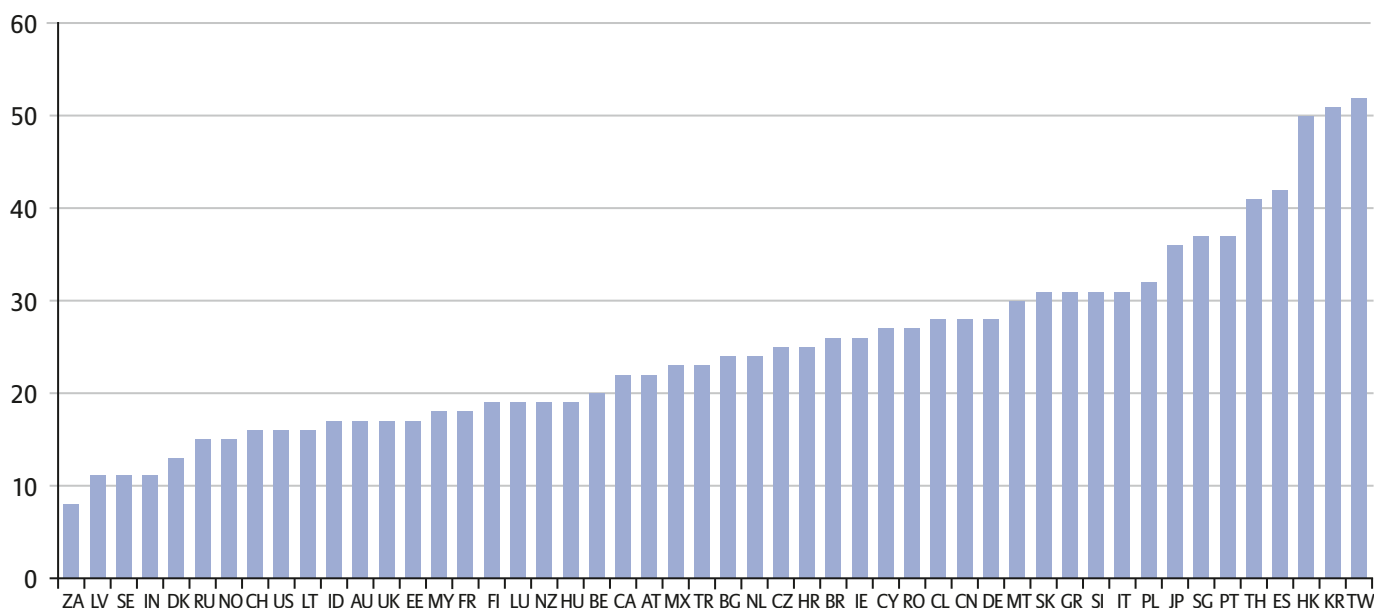
Sources: UN Population Division (2012), Allianz Asset Management

17 For more details on old-age dependency ratios, see Allianz 2014, Demographics in focus II-update, International Pension Issues 1/2014 and Project M online, Demographic Insights 2014.

In taking a closer look at the different regions, it becomes clear that the dynamics of aging differ considerably from country to country¹⁷. For example, with an OAD of 36%, Japan is already considered to be a very “old” country. Nevertheless, its OAD is still expected to double by 2050. This doubling, however, seems less significant when compared with increases in the OAD of “young” Asian countries such as Hong Kong and Singapore, where the ratio is expected to increase fourfold – not to mention Taiwan, Korea and Thailand, where an even greater increase is anticipated. Hong Kong will reach an OAD of 67% – close to Japan’s and more than any European country.

Eastern European countries find themselves in similarly dire straits. Like Japan, most western European countries already have large, older populations, but as baby boomers continue to reach retirement age, these countries’ OAD will increase significantly. Nonetheless, the dynamics are not as substantial as those of Asian countries.

Figure 9: Increase in the old-age dependency ratio until 2050* [as % points]



See p. 28 for abbreviations; *Population aged 65 and older to population aged 15 to 64

Sources: UN Population Division (2012), Allianz Asset Management

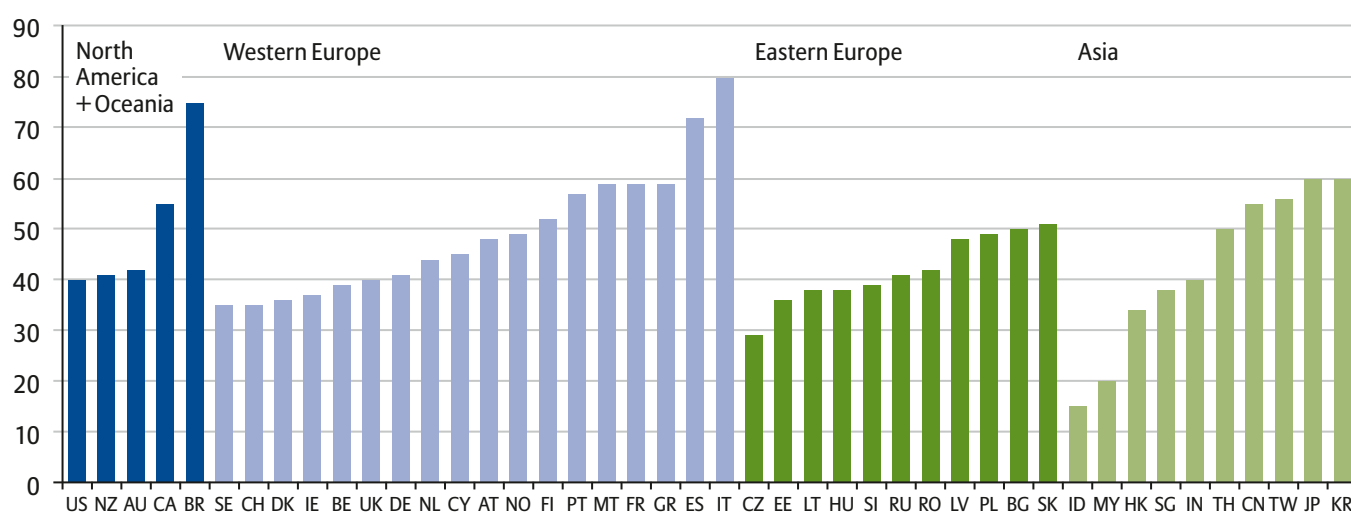
PENSION SYSTEM DESIGNS

Many of the reforms initiated over the past couple of years were designed to lower replacement rates. Upon closer examination, however, two very different approaches begin to emerge. Countries such as the US, Australia, the UK and Ireland have developed a type of bottom-draw pension system. Here, the public pillars cover only the most basic requirements in order to prevent old-age poverty. Any additional income needed to maintain a certain standard of living must be generated through funded sources. The public pillars in continental Europe – particularly in Italy, Spain, France and Greece – take a much more generous approach (see Fig. 10).

The transition from communism to social democracies forced CEE countries to implement fundamental reforms to their pension systems. With the average public pension cut back to a 45% replacement rate, CEE countries have had to initiate either mandatory or voluntary funded pension systems to help fill the gap.

The vast economic differences between emerging and developed countries in Asia have resulted in very diverse pension landscapes. Nevertheless, when a country does begin to introduce a formal pension system, it generally follows the World Bank's recommendation to use a balanced multi-pillar model. Only Singapore chose to operate a one-pillar system with multi-purpose funds that can be used for different purposes, making the pension level very low.

Figure 10: Gross public pension in Europe and selected countries in Asia, North America and Oceania [% of average income]

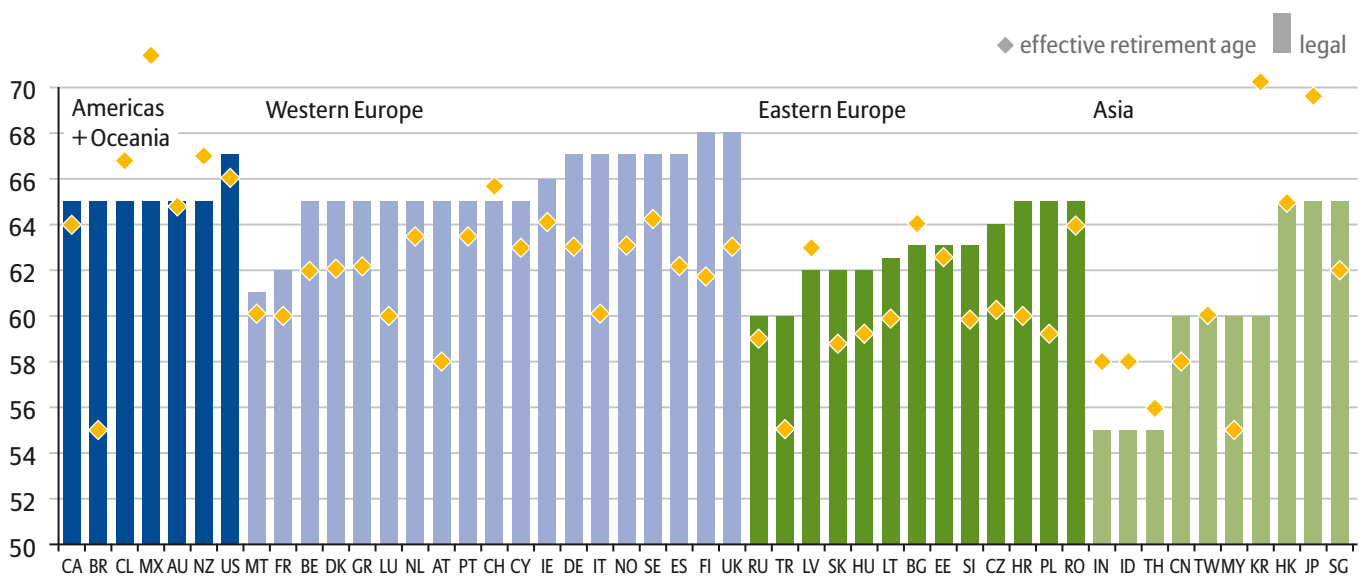


See p.28 for abbreviations

Sources: EU Commission 2012, OECD 2013, Allianz Asset Management

An important parameter in the sub-indicator “pension system design” is retirement age, as it defines the groups of contributors and beneficiaries. Although most countries fix the retirement age at 65 or above, the effective retirement age can differ considerably – as it is the case in Austria, Brazil, Croatia, Finland, Italy, Luxembourg, Malaysia and Turkey (see Fig. 11).

Figure 11: Retirement ages in Europe and selected countries in America, Asia and Oceania – legal and effective [years]



See p.28 for abbreviations

Sources: EU Commission 2012, OECD 2013, National statistics, Allianz Asset Management

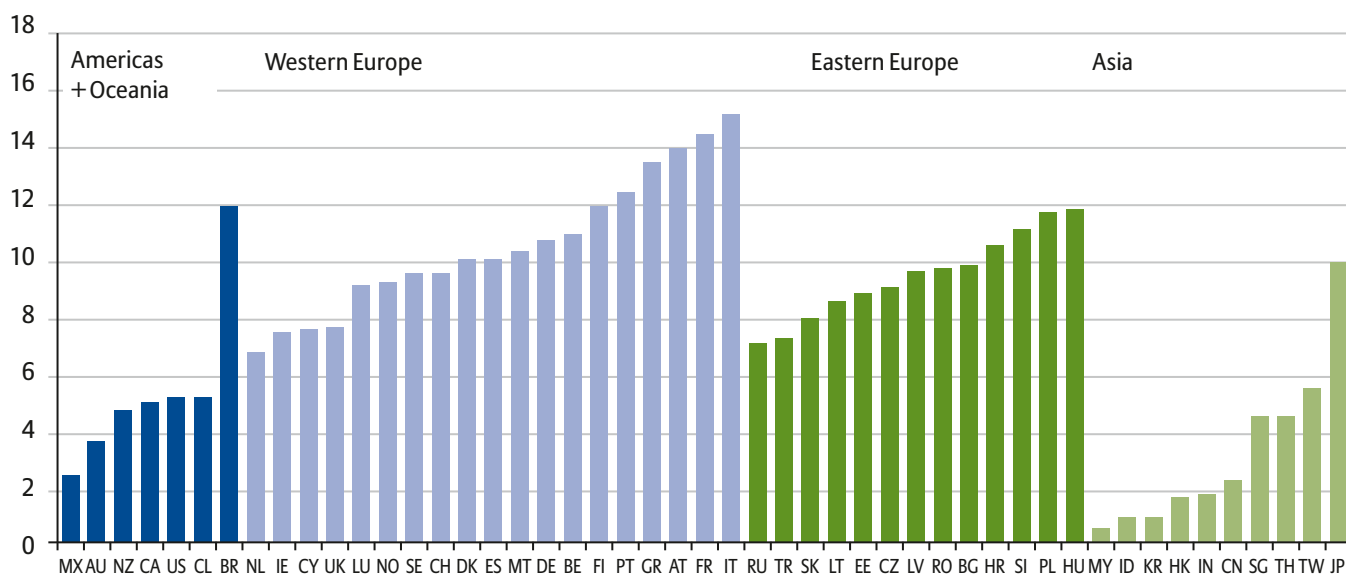
18 European Commission, February 2012: The 2012 Ageing Report: Economic and budgetary projections for the EU-27 Member States (2012-2060).

PUBLIC FINANCES

The issue of public finances represents another sub-indicator the PSI uses in ranking countries. In 2010, the burden of Europe's public pension systems on public finances was already 11.3% of GDP.¹⁸ Since countries with smaller, PAYG systems – such as Australia, Canada, Ireland, New Zealand, the US and most Asian countries – typically have less to finance, they are usually considered to be under less financial stress. Also, countries with a strong focus on the funded pillar – such as Chile, Malaysia, Mexico and Singapore – are in a more comfortable situation with regard to financial pressure. Asia as a whole, however, has yet to initiate comprehensive old-age provisioning systems, thus putting it at greater risk of having to subsidize public welfare programs.

An aging society will naturally cause pension expenditures to increase over the years. In western Europe, the burden of this expenditure is expected to amount to 12.8% of GDP by 2050. Similar future liabilities can be observed in Japan and Brazil. Many governments have already introduced reforms to lower pension levels, thereby decreasing the overall financial burden – particularly in the case of Greece. For the previous regime, projections indicated that an already high level of pension expenditure would double. But after drastic reforms, Greece is steering a course toward a substantially lower level of pension expenditure by 2050 than formerly projected. Nevertheless, the level will still be much higher there than in countries such as the UK and Ireland, which only have a very basic first-pillar system and therefore shoulder a marginal burden, with any increase in

Figure 12: Pension expenditures in Europe and selected countries in Asia, North America and Oceania [as % of the GDP 2010]



See p.28 for abbreviations

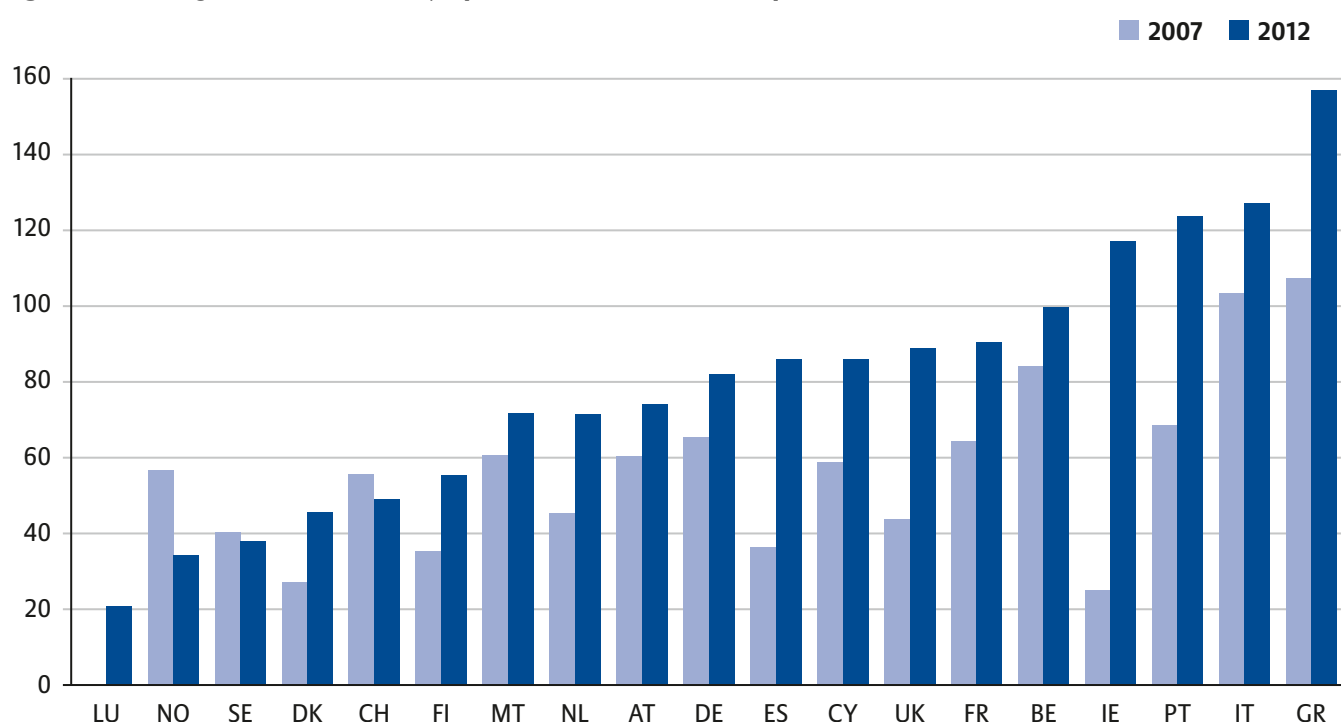
Sources: OECD, World Bank, EU Commission, National Statistics, Allianz Asset Management

expenditure expected to be moderate. Though eastern Europe has similar demographics, their increase in pension expenditures is similarly anticipated to be modest, thanks to the old-age provisioning systems and funded elements put in place when their communist regimes collapsed.

As another aspect of public finances, sovereign debt is factored into the PSI as a percentage of GDP to indicate how much spending can be stretched. The financial crisis – as well as the successive, extensive economic stimulus packages put in place to relieve it – has placed tremendous pressure on public finances. In some countries, sovereign debt has exploded in the last three years (*see Figs. 13 and 14*) – so much that there is little room left to address increasing pension expenditures.

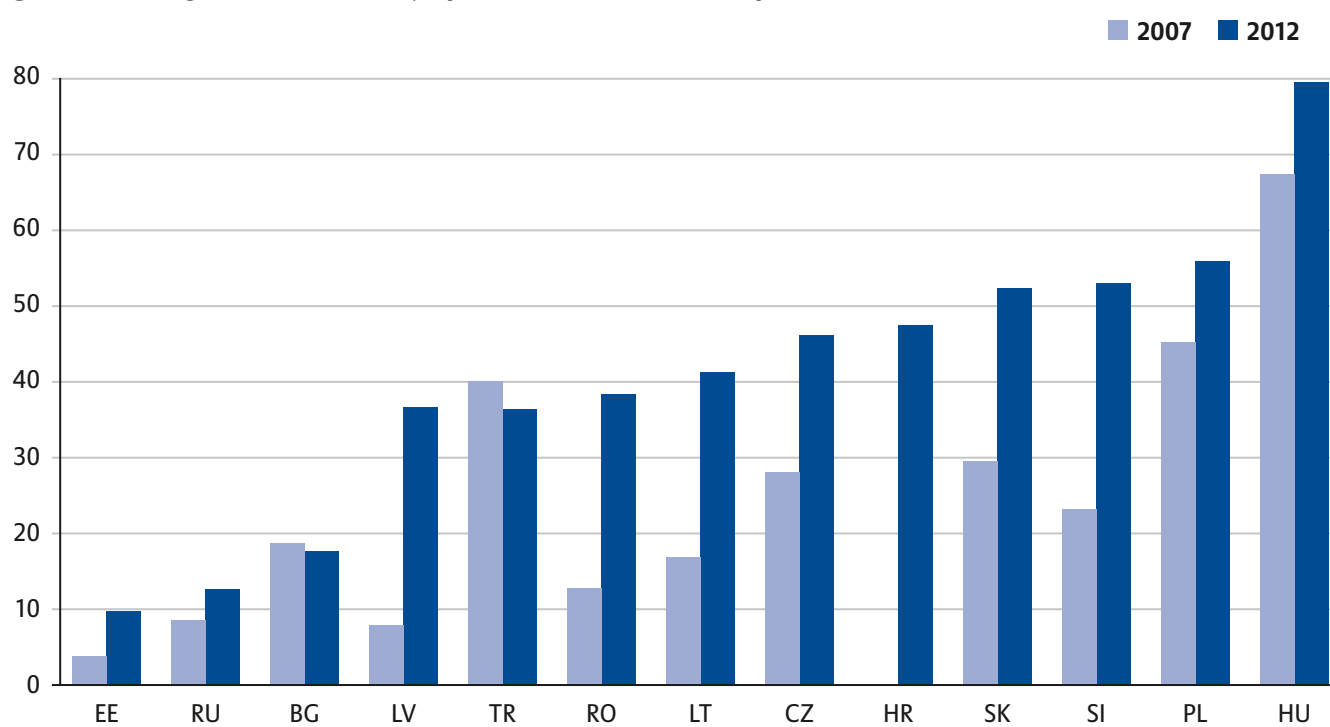
One way to revive PAYG systems is to increase contributions. In fact, increasing contributions and raising taxes can have a favorable impact on a country's ranking. Since contributions and taxes are already high in most countries, however, further increases are likely not to be tolerated, which illustrates the limitations to changing existing pension systems.

Figure 13: Sovereign debt in western Europe [as % of the GDP in 2007 to 2012]



See p.28 for abbreviations

Sources: Eurostat, International Monetary Fund 2013, Allianz Asset Management

Figure 14: Sovereign debt in eastern Europe [as % of the GDP in 2007 to 2012]

See p.28 for abbreviations

Sources: EU Commission, International Monetary Fund 2013, Allianz Asset Management

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Abbreviations

(Country Codes according to ISO 3166-1-alpha-2)

AT.....Austria	LU.....Luxemburg
AU.....Australia	LV.....Latvia
BE.....Belgium	MT.....Malta
BG.....Bulgaria	MX.....Mexico
BR.....Brazil	MY.....Malaysia
CA.....Canada	NL.....Netherlands
CEE.....Central and eastern Europe	NO.....Norway
CH.....Switzerland	NZ.....New Zealand
CL.....Chile	OECD.....Organisation for Economic Co-operation and Development
CN.....China	PAYG.....Pay-as-you-go
CZ.....Czech Republic	PL.....Poland
CY.....Cyprus	PSI.....Pension Sustainability Index
DB.....Defined benefit	PT.....Portugal
DC.....Defined contribution	RPP.....Registered Pension Plan
DE.....Germany	RU.....Russian Federation
DK.....Denmark	RO.....Romania
EC.....European Commission	SE.....Sweden
ECB.....European Central Bank	SG.....Singapore
EE.....Estonia	SI.....Slovenia
ES.....Spain	SK.....Slovak Republic
FI.....Finland	TH.....Thailand
FR.....France	TR.....Turkey
GDP.....Gross domestic product	TW.....Taiwan
GR.....Greece	UK.....United Kingdom
HK.....Hong Kong	UN.....United Nations
HR.....Croatia	US.....United States
HU.....Hungary	ZA.....South Africa
IE.....Ireland	
IMF.....International Monetary Fund	
IN.....India	
ID.....Indonesia	
IT.....Italy	
JP.....Japan	
KR.....South Korea	
LT.....Lithuania	

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