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Public Pension Systems and the Fiscal Crisis in the Euro Zone

Lessons for Latin America

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Public Pension Systems and the Fiscal Crisis in the Euro Zone

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Abstract

The debt crisis in the Economic and Monetary Union has revealed the need in many member countries to engage in an unprecedented fiscal consolidation process, not only in the short term, but also in the long term. Therefore, the urgent need to accelerate in many cases the reforms of their pension systems with a view to ensuring the sustainability of their public finance over time has been revived. This paper analyzes the circumstances that led to the reforms of the pension systems in Europe and the measures adopted, with a view to extracting some lessons that may be of use for Latin American countries. With this objective, reforms undertaken in Latin America are also described, specifically in Colombia and Peru, which are two cases where the capitalization and distribution systems continue to compete simultaneously. This paper also quantifies and compares the actuarial balance of these countries, which is related to their financial sustainability in the long term.

Keywords: Pensions, fiscal deficit, actuarial debt, Europe, Latin America

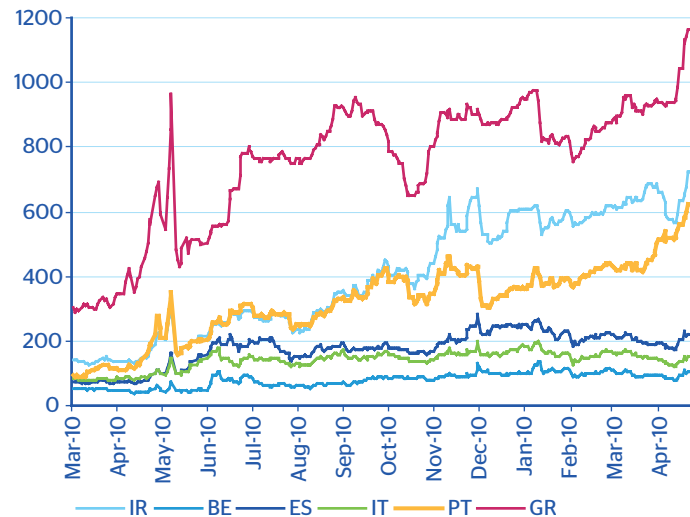
JEL: E32, C22, E27.

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1. Introducción

The debt crisis in the Economic and Monetary Union (EMU) has revealed the need in many member countries to engage in an unprecedented fiscal consolidation process, not only in the short term, but also in the long term. Excessive leveraging, both public and private, has raised doubts in financial markets about the financial sustainability of these countries' public accounts. Debt markets have begun to discriminate against those economies with a high level of deficit and debt and low growth, with an increase in the risk premium that they must pay for new paper issues. This has taken place against a backdrop in which both monetary and exchange rate policies are common in the Euro Zone, and where the main area of differentiation between these countries is fiscal policy. As shown in Chart 1, the risk premium, or spread, against the German bond has increased to 1200 basis points in the case of Greece, 700 points in Ireland, and 600 points in Portugal. These three economies have needed financial bailout from the European Union and the International Monetary Fund to refinance their public debt.

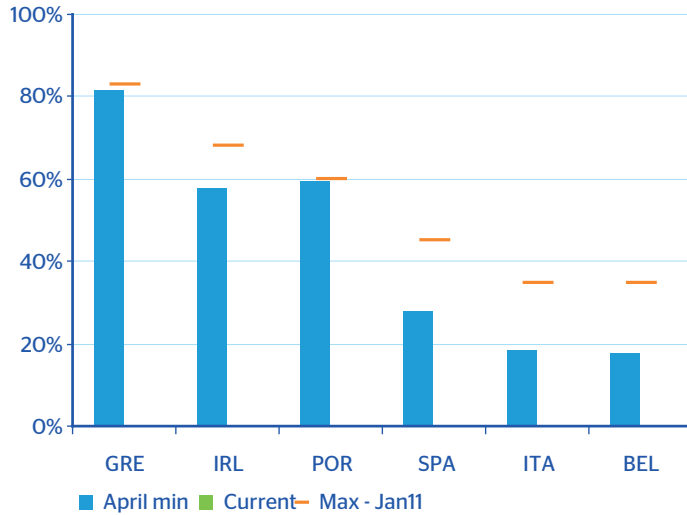
Chart 1
10-year interest rate spread with Germany.



Source: BBVA Research

The seriousness of the problem is such that the probability of default by some so-called peripheral countries (Greece, Portugal, and Ireland) is particularly high, and one of the highest in the world, even higher than in many countries considered to be developing (see Chart 2).

Chart 2
Default probability* according to 5-year CDS

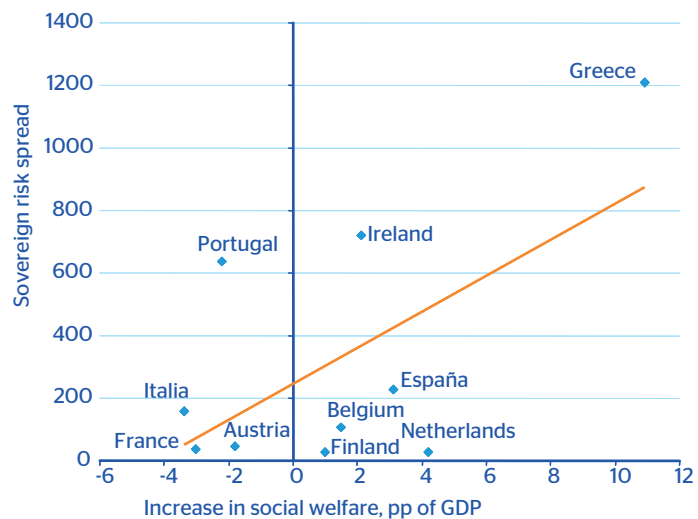


* Tasa de recuperación del 70%
Source: BBVA Research



On the other hand, the market is not only anticipating possible financing problems in the short and medium term. It also appears that possible public financing problems are being taken into consideration, and in particular the long-term prospects of the welfare state due to population ageing. In fact, debt spreads show a positive correlation (0.62) with the increase in public spending in social protection in a projection to 2060 (see Chart 3), a period which extends beyond the maturity of the bonds, but anticipate possible future payment problems.

Chart 3
Relationship of the sovereign risk spread with projections of an increase in social welfare spending to 2060



Source: BBVA Research

Clearly, public spending on pensions represents a high percentage of this increase. For this reason, the urgent need to accelerate in many cases the reforms of their pension systems has been revived, in order to ensure the sustainability of their public finances over time and simultaneously restore market confidence over European sovereign debt. Under these circumstances it is not surprising that one of the commitments that Eurozone countries must fulfill in the so-called Pact for the Euro signed by the Heads of State or Government on March 11, 2009 concerns precisely the need to ensure adherence to the Stability and Growth Pact through the sustainability of public pensions, taking into consideration demographic trends. This Pact for the Euro expressly mentions that EMU countries will need to adapt their pension systems, for instance, by aligning the effective retirement age with life expectancy, increasing the labor market participation rates, limiting early retirement, and encouraging the activity rate among workers over 55².

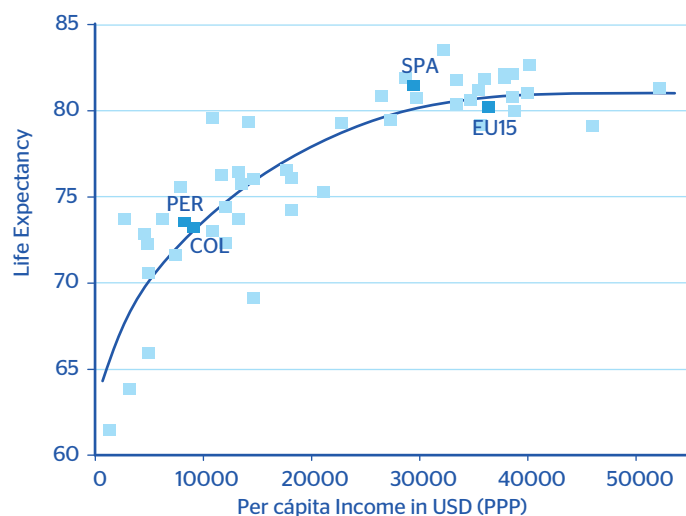
This commitment to include pension system reform in the Pact for the Euro as a way of ensuring their sustainability is due to the fact that one of the most substantial challenges facing European countries over the coming decades is population ageing and its effect on the welfare state, particularly as regards the pension system. All available projections suggest that most countries will have to face the pressure on public spending resulting from increased life expectancy and the retirement of particularly numerous cohorts from the baby boom in the sixties and early seventies, which will be replaced by much less numerous cohorts as a result of the fall in birth rates in recent decades.

Despite the fact that public pension systems have been considered a social conquest of the welfare state, deeply rooted in contemporary European society, significant heterogeneity exists in the characteristics of the pension systems of the various countries, in the reforms undertaken to date, and the in pressure of ageing on public spending, which makes it impossible to talk of a single European pension system model³. However, it is precisely from this heterogeneity that important lessons can be extracted to enable us to take pending reforms in many European countries and apply them to other regions such as Latin America.

Latin American countries, especially those that maintain distribution public pension systems and/or non-contribution social protection schemes, have a lot to learn from what Europe is now facing. It can be foreseen that Latin America will gradually undergo a demographic transition that will become similar to that of Europe (greater per capita income, lower birth rates, and greater life expectancy), which will put pressure on public pension systems that do not adapt the generosity of their policy objectives to the new scenario that will take shape: greater indebtedness, deterioration of economic conditions, financial stress situations, and a greater burden for future generations.

Chart 4

Relationship between per capita income and life expectancy, 2009



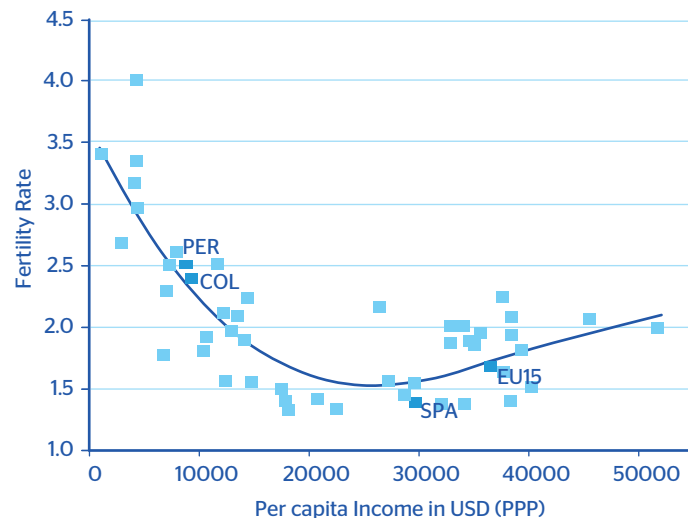
Source: Banco Mundial, 2011

2: See Conclusions of the Heads of State or Government of the Euro Area on March 11, 2011.

3: The existing heterogeneity in the characteristics of European pension systems may be consulted in the detailed analyses offered individually for each of the EMU countries, prepared by the OECD in 2011 and the European Commission in 2009.

Chart 5

Relationship between per capita income and birth rate, 2009



Source: World Bank, 2011

There is a high probability that Latin American countries will undergo a demographic transition similar to developed countries if they continue to achieve sustainable economic growth and if their income per capita gradually increases. This can be seen in Charts 4 and 5, which precisely show the relationship between these countries in terms of GDP per capita and demographic variables (fertility and life expectancy rates) for a sample of 58 countries in 2009, using United Nations and IMF data. The cross-section evidence in Chart 4 shows a very robust growing and concave relationship between per capita income and life expectancy, confirming an abundance of previous results in economic growth literature (see, for instance, World Bank, 1993; Fogel, 1994; or Castelló and Doménech, 2008, as well as the references included in these works). This is one of the characteristics of what is known as the demographic transition of economic development, which has its origins in the work of Malthus (1798). As can be seen in Chart 4, average life expectancy in the EU-15 is over 80 years, while in Latin American countries such as Argentina, Brazil, Colombia, or Peru it is between 72 and 75 years. Another characteristic of the demographic transition is the endogeneity of population growth with respect to the level of development (see, for instance, World Bank, 1984, or Barro and Sala-i-Martin, 1995). Chart 5 shows that the correlation between the fertility rate and per capita income is negative for levels lower than the 30,000 dollars in 2009 PPP. Countries such as Peru or Colombia have fertility rates higher than 2.4 compared to 1.7 in the EU-15. Although it is true that evidence shows that fertility rates increase with the income level from the threshold of 30,000 dollars, this increase is limited and stabilizes around 2. These two empirical facts suggest that pension systems in Latin American countries will foreseeably face higher life expectancy rates and lower birth rates while their per capita income increases, as happened in European countries.

In order to draw out lessons from Europe's public pension systems for Latin America, we will divide this paper into six sections. After this introduction, the objective of the second and third sections will be to offer an overview of the characteristics of pension systems in European countries, of the challenges associated to ageing, and of reforms undertaken and pending, so as to extract some lessons that can be of future use for Latin American countries⁴. The fourth section will examine the experience of Colombia and Peru, two countries where the mandatory private (individual capitalization) and public (distribution) pension systems coexist following reforms undertaken in the mid-90s, but where there are still relevant risks to be monitored. In the fifth section we will make some simulations for the Colombian case, and analyze the economic and generosity bases of the pensions provided by the public and private system so as to identify possible distortions and future consequences. Lastly, the sixth section will list the main conclusions of the study.

4: The countries for which this overall study is conducted are those that initially constituted the EMU. In order to make a more complete comparison and extract some interesting lessons of the reforms undertaken in other European countries, Denmark, Sweden, and the UK have been added to the EMU countries so that the sample used matches that of the EU-15.

2. Pension systems in Europe and their challenges

In Europe, the building of the welfare state, in general, and the spread of the public pension systems, in particular, after World War II was the answer to a growing population of workers with potential to retire for whom it was necessary to ensure a sufficient level of subsistence in a period of economic reconstruction. To this end, European governments soon adopted distribution social security schemes (of the Beveridgiano type) which transferred income from the employed population to those who retired from the labor market after reaching retirement age.

In the 60s and the 80s, the demographic and labor market conditions were favorable thanks to high fertility rates (the baby boom generation) and to the increase in the number of workers (due to women's access to the labor market and to the inflow of immigrants). This favorable evolution of the labor market made it possible to maintain a wide base of contributors to social security in relation to the number of old-age pensioners, who were able to benefit from growing benefits that were compatible with the financial balance of the public pension system.

When demographic and labor market conditions began to develop in a less favorable manner as a result of population ageing, the lowering of the fertility rate to a level below generational replacement, and the increase in life expectancy, forecasts on the financial sustainability of the public pension systems questioned the viability of the distribution systems under the existing levels of generosity, given that the base of the contributing population pyramid was narrowing gradually while retiring cohorts were growing.

Against this backdrop, the current situation is one of high heterogeneity among European countries with regard to the percentage representing spending on pensions over GDP and in terms of the forecasting of the effects of ageing on this expense. To analyze this heterogeneity it is very interesting to take a simple macroeconomic approach such as that used by Jimeno (2000), Doménech and Melguizo (2008), de la Fuente and Doménech (2010 and 2011), or the European Commission (2009), in which pension expenditure in relation to GDP is broken down into various macroeconomic factors according to the following identity function:

(1)

$$\frac{\text{Pension Expenditures}}{\text{PIB}} = \underbrace{\frac{\text{Pop 65+}}{\text{Pop 15-64}}}_{\text{Dependence Rate}} \times \underbrace{\frac{1}{\frac{\text{Employees 15-64}}{\text{Pop 15-64}}}}_{\text{Occupation Rate}} \times \underbrace{\frac{\text{Pensioners}}{\text{Pop 65+}}}_{\text{Coverage Rate}} \times \underbrace{\frac{\text{Average Pension}}{\frac{\text{GDP}}{\text{Employees 15-64}}}}_{\text{Replacement Rate}}$$

As we can see in the previous equation, pension expenditure depends on two types of factors. The first are demographic (dependence rate) and labor market-related (the inverse of the occupation rate and participation of wages in GDP). These elements ultimately depend on individual decisions and environmental factors, as can be the fertility rate, life expectancy, the decision to participate or not in the labor market, and the economic cycle. The second are endogenous or institutional factors, as they may be directly regulated by governments, such as the legal framework to determine the population entitled to receive a pension (eligibility or coverage rate) and the average pension in relation to GDP per person of working age.

As can be seen in Table 1, the level of spending on pensions in 2010 was 10.2% of GDP on average for the EU-15, but with huge differences between the proportion in Italy (14%) and the United Kingdom and the Netherlands (6.6%). With current systems, over the next decades spending is expected to increase to 12.6% of GDP by 2060, i.e. an increase of 2.4 percentage points in the EU-15 average, but again with huge differences between countries⁵. While in some countries the increase is zero or negative (Denmark, Italy, or Sweden), fundamentally as a result of the reforms already implemented to balance their public pension systems, in other countries (Greece, and Luxembourg) it means that the current percentage will need to more than double unless modifications are made to the current system. The resources of public systems are, in general, the result of multiplying tax rates by the contribution bases, which represent a constant proportion of wage income, and which in turn represents a relatively stable proportion of GDP. Therefore, a variation in income offsetting the increase in pension spending forecast in Table 1 and balancing the public systems is not foreseeable.

Table 1

Public spending in pensions as a percentage of GDP in 2010 and projections to 2060

	Change between 2010 and 2060					Spending 2060
	Spending 2010	Dependency rate	Employment rate	Eligibility rate	Replacement rate	
Belgium	10.0	7.4	-0.5	-0.9	-1.3	14.7
Denmark	9.1	6.5	-0.1	-4.9	-1.2	9.2
Germany	10.4	7.9	-0.8	-1.9	-0.3	12.8
Greece	11.7	12.7	-0.6	-0.4	0.7	24.1
Spain	8.4	10.7	-0.9	-0.9	-2.2	15.1
France	13.0	8.4	-0.5	-2.2	-4.7	14.0
Ireland	4.0	5.9	-0.2	-1.5	0.4	8.6
Italy	14.0	10.4	-1.1	-3.2	-6.5	13.6
Luxembourg	8.7	8.4	0.0	5.2	1.5	23.9
The Netherlands	6.6	6.6	-0.2	-1.5	-1.0	10.5
Austria	12.8	9.9	-0.5	-2.6	-6.0	13.6
Portugal	11.4	9.8	-0.6	-1.7	-5.4	13.4
Finland	10.0	8.7	-0.6	-3.1	-1.6	13.4
Sweden	9.5	5.6	-0.4	-0.4	-4.9	9.4
United Kingdom	6.6	4.2	-0.3	-1.4	0.2	9.3
EU-15	10.2	7.7	-0.6	-1.8	-2.9	12.6

Source: Comisión Europea

The contribution of the various rates that appear in equation (1) to this increase in pension spending also reveals a very differentiated evolution between European countries. Exogenous factors show that the effect of ageing will result in an increase in spending by 7.7 points of GDP on average in the EU-15, with the highest increases in Greece (12.7%), Spain (10.7%), and Italy (10.4%). Factors derived from the labor market are expected to have a moderate effect, reducing spending by 0.6 percentage points as a consequence of the planned increase in employment rates⁶. As regards institutional factors, a negative contribution to pension spending is expected as a result of the fall in the eligibility rate (1.8 pp) and the replacement rate (2.9 pp), which imply a decrease in the generosity of the system, but insufficient to offset the effects of ageing.

5: These projections do not include the effects of reforms which have been approved recently (France) or are in the process of being approved (Greece and Spain). Table A1 in the Annex shows that these projections are similar to those made by the OECD, which also suggest a heterogeneous, although significant, increase on average of public spending on pensions as a percentage of GDP.

6: Increases in the employment rate have a temporary effect on the generosity ratio and, therefore, on pension expenditure as a percentage of GDP, given that in the long term these increases in the employment rate lead to an increase in the number of old-age pensioners as a percentage of the population over 65 years old.

One of the conclusions from Table 1 is the gradual ageing of the European population, so that there will always be fewer workers per old-age pensioner to support the distribution system. This increase in the dependency rate can be explained primarily by two factors:

- Retirement during the coming decades of cohorts more numerous (as a consequence of the Baby Boom of the seventies in many European countries) than those of young people joining the work market.
- The ongoing increase in life expectancy. On average for the EU-15, the average life expectancy upon turning 65 for men will increase from 16.9 in 2010 to 20 in 2050 while, for women, it will go from 20.8 to 24.4, as shown in Table 2.

Table 2
Evolution of life expectancy upon turning 65, 1960 and 2050

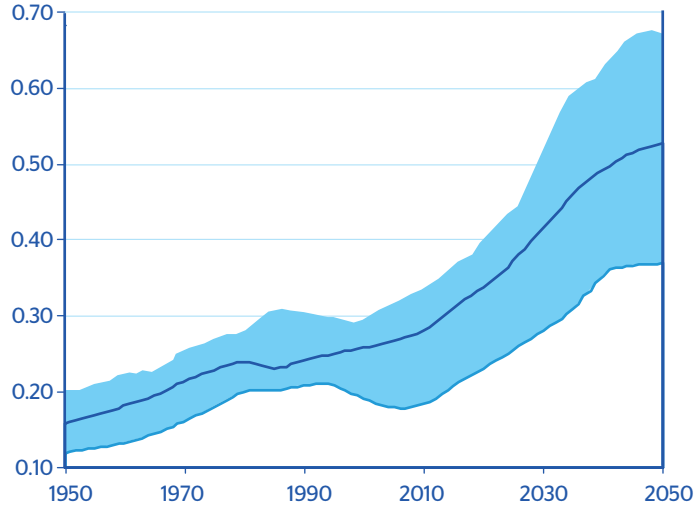
	Women				Men			
	1960	2010-15	2030-35	2050-55	1960	2010-15	2030-35	2050-55
Austria	14.7	20.7	22.6	24.5	12.0	17.5	19.5	21.1
Belgium	14.7	21.4	23.5	25.2	12.2	17.1	19.0	20.6
Denmark	15.3	19.8	21.6	23.0	13.7	16.4	17.8	19.2
Finland	13.7	21.0	22.9	24.7	11.5	16.8	18.3	19.8
France	15.6	22.5	24.3	26.0	12.5	18.2	20.1	21.5
Germany	14.2	20.7	22.6	24.4	12.2	17.0	18.7	20.3
Greece	14.6	19.6	21.8	23.8	13.4	17.0	18.4	19.9
Ireland	14.4	20.6	22.5	24.3	12.6	16.9	18.5	20.0
Italy		21.9	23.7	25.5		17.8	19.4	20.9
Luxembourg	14.5	20.5	22.3	24.1	12.5	16.8	18.8	20.3
The Netherlands	15.3	20.4	22.0	23.5	13.9	17.2	18.3	18.9
Portugal	14.5	20.2	22.1	23.6	12.4	17.3	19.0	20.6
Spain	15.3	21.8	23.6	25.1	13.1	16.3	17.8	19.2
Sweden	15.3	21.1	22.7	24.2	13.7	13.6	15.0	16.8
United Kingdom	15.1	20.3	22.1	23.9	11.9	17.9	19.9	21.4
EU-15	14.8	20.8	22.7	24.4	12.7	16.9	18.6	20.0

Source: OECD and United Nations

Chart 6 shows that this increase in the dependency rate is not a new phenomenon but rather the continuation over time of a trend observed since the mid-twentieth century. In 1950 there were only 16 people over 65 for every 100 persons of working age. This ratio rose to 28 and it is expected that it will nearly double (53) by 2050. Still, the differences between countries are very significant, as shown in Chart 7, based both on the initial situation in 2010 and on the increase in the growth rate up to 2050. Some economies starting from a medium situation, such as the United Kingdom, Sweden, or Denmark, will undergo a significantly lower increase than average. At the other end, Spain, Germany, or Greece have dependency rates that were similar in 2010 to those of the three aforementioned countries, but will see more intense ageing with far greater effects than average on their dependency rates.

Chart 6

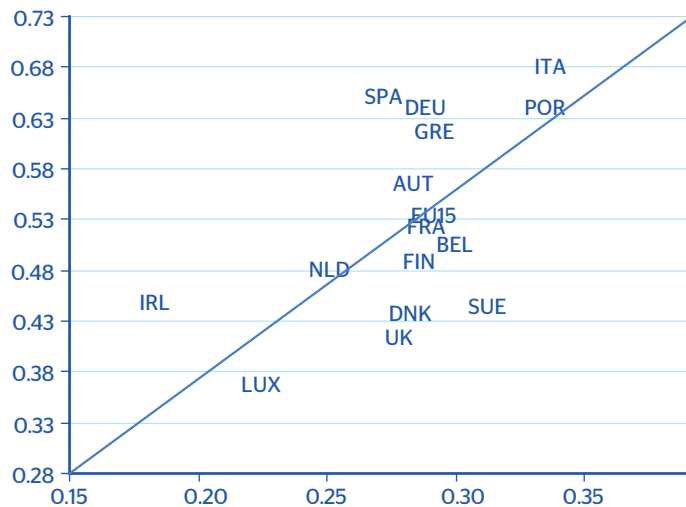
Evolution of the dependency rate in the EU-15, 1950-2050. The line represents the average rate for EU-15, and the interval the maximum and minimum values for the 15 countries in the sample



Source: In-house based on OECD 2011 estimates.

Chart 7

Dependency rate forecast for 2050 (vertical axis) compared to 2010 (horizontal axis) in the EU-15. In the diagonal, the growth rate of the dependency rate matches that of the average in the EU-15



Source: In-house based on OECD 2011 estimates.

In Chart 8, the heterogeneity shown in Table 1 is displayed in an alternative and more compact manner. To this end, equation (1) should be re-written as follows:

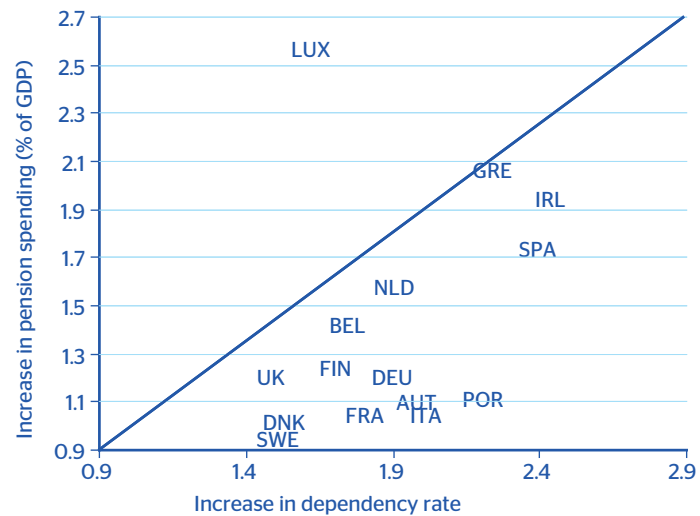
$$(2) \frac{\text{Pension Expenditure}}{\text{PIB}} = \frac{L^{65+}}{L^{16-64}} \frac{(\text{Pension Expenditure} / L^{65+})}{(\text{GDP} / L^{16-64})} = \text{TDEP} * \text{GENQ}$$

where TDEP is the dependency rate and GENQ is the system's generosity, measured in terms of the average pension for people over 65 over the average income of a working age person. In the horizontal axis of Chart 8, the dependency rate for 2050 is shown over that for 2010, so that higher values indicate a proportionally higher increase in the dependency rate. Thus, it can be seen that for Spain, Greece, Ireland, and Portugal it is forecast that the dependency rate will increase by more than half between 2010 and 2050. The vertical axis displays the quotient between public spending in pensions in 2050 as a percentage of GDP and that for 2010.

Luxembourg aside, which is shown in this graph as clearly atypical case, we can see that in the Netherlands, Spain, Ireland, and Greece an increase in public spending on pensions as a percent of GDP of more than 50% is forecast. Except for the atypical case of Luxembourg, all countries are below the diagonal, which indicates that the increase in pension expenditure will be less than that of people over 65 over people of working age. Still, not all countries are proportionally at the same distance from the diagonal, which reflects the fact that they have undertaken reforms with various degrees of intensity and that, therefore, they face the future with very different needs with regard to the reforms which they must implement.

Chart 8

Increase in pension spending (% of GDP) vs. the dependency rate in the EU-15. The scale of the axes indicates the number of times that the 2050 forecast contains the 2010 observation



Source: In-house based on OECD 2011 estimates.

In short, as a consequence of very diverse initial conditions in the building of public pension systems and their response to the challenges of ageing, the EU-15 countries display today a high degree of heterogeneity in the characteristics of their systems. As a result of this heterogeneity in European pension systems, the decreasing tendency in fertility rates over recent decades and the sustained increase in life expectancy will lead to a very disparate increase in public spending on pensions as a percentage of GDP.

3. Reforms in European pension systems

The growing forecasts of public spending on pensions that have been presented in the previous section have been known for some years and some of these trends had already been anticipated in the eighties. Therefore, it is not surprising that a debate has been taking place over recent decades on the need to implement reforms in the public pension systems so as to ensure their sustainability. The proposals that have been put forward with regard to this debate have given rise to varying reactions in the political area over time, with different intensity and effectiveness depending on the country. With these proposals the aim was to protect a system that had been working relatively well for decades and which has been considered a social achievement of the welfare state, deeply rooted in contemporary European society. This social awareness of the generous qualities of the welfare state has determined the reforms that have been implemented in Europe and which differ from those carried out in some Latin American countries.

To reduce the expected increase in public spending on pensions, reforms in social security systems may be carried out basically through two sets of measures:

1. **To avoid the expected increase in the dependency rate** by postponing the retirement age, which increases the contribution period while reducing the benefit period. Half of the European countries have increased their retirement age or are examining how to do so (seven). However, with current forecasts showing that life expectancy after reaching 65 increases by approximately one year or more per decade, increases in the retirement age under recent reforms (generally by two years) will not be enough to offset the expected increase in life expectancy over the next four decades.
2. **To reduce the generosity of the public pension system** by reducing the average pension over the average wage, i.e., the replacement rate⁷. Many of the reforms have introduced automatic mechanisms that correct pensions based on the increases in life expectancy or other factors that jeopardize the system's sustainability (which is known as the sustainability factor). These mechanisms are usually accompanied by incentives so that individuals may decide voluntarily to work longer and earn higher pensions once retired. In terms of the previously analyzed Chart 8, these reforms aim to avoid an increase in pension spending as a percentage of GDP, given the expected increase in the dependency rate, as countries such as Sweden, Italy or Portugal have done with their respective reforms⁸.

In addition, reforms in the public pension systems have also sought to resolve, not always successfully, the existing trade-off between "adequacy" (as per the term used by OECD) of the benefits and "affordability", so that generous pensions may be obtained without jeopardizing the budgetary balance of the public system over time. This can be achieved by taking action on three additional fronts:

1. **Increasing system revenue.** One alternative to the reduction of the system's generosity without jeopardizing its financial balance involves increasing the revenue of the public pension system. The problem with these measures is that, in general, the greater tax burden has distorting effects on economic activity, as shown by Coenen, McAdam and Straub (2008), and Boscá, Doménech and Ferri (2009), for instance. These distorting effects are inversely proportional to the consideration, on the part of workers, that social contributions are deferred income, as demonstrated by Doménech and García (2008), which is more likely in the case of defined-contribution or notional account systems than in the case of defined-benefit systems.
2. **Improving the distribution of income through the establishment of minimum pensions.** These measures seek to avoid social exclusion and the existence of pensioners with income below a given poverty threshold. All European countries have mechanisms to ensure that the first pillar of the pension system works correctly. With this in mind, the reforms implemented, which have reduced the generosity of the public pension system or are going to do so over the coming decades, have also been an attempt to preserve this principle so that this decrease in the system's generosity does not affect pensions below a certain level.

7: Given that, in the long term, the average wage grows at the same rate as productivity per employee and the increase in the number of old-age pensioners as a percentage of people over 65 is similar to the employment rate, the only way to reduce the system's generosity in the long term is to reduce the replacement rate.

8: For each country, the slope of the radial vector in Chart 3 indicates the proportion between the increase in pension spending in relation to the increase in the dependency rate. In terms of the equation (2), the slope of the radial vector shows the change in the system's generosity between 2050 and 2010:

$$\frac{(Pension\ Expenditure / GDP)_{2050} / (Pension\ Expenditure / GDP)_{2010}}{TDEP_{2050} / TDEP_{2010}} = GENQ_{2050} / GENQ_{2010}$$

3. **Introducing and improving incentives to promote voluntary saving.** Some countries have introduced private capitalization systems to complement the public distribution system, in which workers automatically have a pension fund unless they expressly opt out.

Depending on the depth of these reforms, this literature usually makes a distinction between parametric and structural reforms. Parametric reforms introduce small changes in legislation to improve the actuarial balance of the system by increasing the retirement age, reducing the generosity of benefits and/or reinforcing the contributive character of the system, without changing its institutional framework. On the other hand, structural reforms modify the system by introducing a capitalization component that replaces or complements the distribution system. In particular, the mixed capitalization and distribution system is inspired to a great extent by the multi-pillar scheme proposed Holzman et al (2005):

1. Pillar O: universal non-contributive providing a minimal protection level.
2. First pillar: contributive and defined-benefit (proportional to earned work income during work life).
3. Second pillar: contributive and mandatory, defined-contribution (individual savings accounts for capitalization).
4. Third pillar: contributive and voluntary, defined-contribution.

Although the World Bank made this proposal for emerging economies, many developed countries have taken this scheme and adapted it to their national reality. Specifically, many of the reforms implemented have involved modifying the conditions of the first pillar, lowering its benefits and postponing retirement (parametric reforms), and complementing the distribution system with additional contributions to a capitalization account that can be mandatory or voluntary (second and third pillars). Few European countries have opted for a pure capitalization system. One of the reasons explaining the limited success of this system, despite the success achieved in Chile, is the high value that European citizens place on the public pension system, that has ensured for decades sufficient income for many generations of pensioners and is therefore deeply rooted in the welfare state system.

Parametric reforms

Parametric reforms are intended to modify pensions legislation in order to ensure the sustainability of the system through changes in the two institutional factors into which public spending is broken down in equation (1). On one hand, the modification of the criteria for accessing a retirement pension, making it more demanding, and reducing the eligibility rate. On the other hand, by reducing the replacement rate.

The increase in the retirement age that European countries have introduced over recent years, which will foreseeably continue in the future, marks a contrast with the opposite trend observed from the fifties to the early nineties. As can be seen in Table 3, countries such as Ireland, Italy, Luxembourg and Sweden lowered the legal age by up to five years. Naturally, conditions for access to early retirement were much more lenient than those now in place. In the EU-15 as a whole, the process continued to follow the same trend, with the average legal age falling from 64.1 years in the fifties to 62.8 years in the early nineties in the case of men. As for women, there was a different legal retirement age in many countries with respect to that applied to men. In 1958, women in five countries could retire before men (Austria, Denmark, Germany, Italy and the UK). As women started to join the labor market and could contribute for longer periods, and as labor conditions began to even out between both sexes, this difference ceased to make sense and an increasing number of countries have eliminated this divergence. Today, only Austria and the UK maintain a gender difference in the legal retirement age, but there are plans to eliminate it.

Although the legal retirement age might continue to increase over the coming years, it is foreseeable that early retirement will continue to be permitted in all European countries, as is the case today. Although difficult conditions are in place in some countries for access to early retirement, this is not the case in others.

Table 3

Evolution of the retirement age

	1958		1993		2010		2040		Early retirement 2010
	M	W	M	W	M	W	M	W	
Austria	65	60	65	60	65	60	65	65	62m/60w
Belgium	60	60	60	60	60	60	60	60	60
Denmark	65	60	67	67	65	65	67	67	N/A
Finland	65	65	65	65	65	65	65	65	62
France	65	65	60	60	61	61	61	61	56-60
Germany	63	60	63	60	65	65	67	65	63
Greece	57	57	57	57	57	57	60	60	50-60
Ireland	70	70	65	65	65	65	65	65	N/A
Italy	60	55	55	55	59	59	65	65	61
Luxembourg	65		60		60		60		57-60
The Netherlands	65	65	65	65	65	65	65	65	N/A
Portugal	65	65	65	62	65	65	65	65	55
Spain	65	65	65	65	65	65	67	65	62
Sweden	67	67	65	65	65	65	65	65	55-61
United Kingdom	65	60	65	60	65	60	67	67	N/A
EU-15	64.1	62.4	62.8	61.9	63.1	62.6	64.3	64.3	

Source: OECD (2011)

Even in any case, as shown in Table 1, measures to contain the eligibility rate would result in a reduction in pension spending of 1.8 percentage points of GDP per year by 2060 for the EU-15 as a whole. In some countries such as Denmark (-4.9%), Italy (-3.2%), and Finland (-3.1%), the reduction is particularly significant.

With regard to parametric reforms affecting the replacement rate, European countries have opted for two strategies that are not mutually exclusive:

1. Changes in the rules for calculating the number of new pensions.
2. Changes in pension indexing according to sustainability criteria.

Table 4 shows that there are very significant differences between EU-15 countries with respect to replacement rates. For the average worker, the replacement rates are far above the EU-15 average in Denmark, Greece, Luxembourg, the Netherlands, and Spain. Except in the case of Denmark, public pension spending in the other five countries, as a percentage of GDP, is forecast to increase by over 50 percent (Chart 8), so that they have a good margin to avoid this increase by way of making their replacement rate converge with the EU-15 average.

To provide the system with a permanent adjustment mechanism ensuring financial sustainability in the long term without causing political problems, many countries have sought to link eligibility or the replacement rate to objective indicators so that the adjustment is automatic.

Table 4

Replacement rates in the EU-15, first and second pillar

	Multiple individual income compared to the average			
	Median	0.5	1	1,5
Austria	76.6	76.6	76.6	72.3
Belgium	42.6	60.1	42.0	32.7
Denmark	84.7	120.6	79.7	66.1
Finland	57.8	66.4	57.8	57.8
France	49.1	55.9	49.1	41.3
Germany	42.0	42.0	42.0	42.0
Greece	95.7	95.7	95.7	95.7
Ireland	34.9	57.9	29.0	19.3
Italy*	64.5	64.5	64.5	64.5
Luxembourg	90.3	97.9	87.4	83.8
The Netherlands	89.1	93.0	88.1	86.5
Portugal	54.4	63.3	53.9	53.1
Spain	81.2	81.2	81.2	81.2
Sweden	53.8	68.3	53.8	68.7
United Kingdom	37.0	53.8	31.9	22.6
EU- 15	63.6	73.1	62.2	59.2

* In Italy the replacement rate for women is 50.6%

Source: OECD (2011)

Structural reforms

In addition to the parametric changes, some European countries have introduced structural reforms in an attempt to offset the loss of purchasing power that resulted from decreases in the generosity of the distribution system, by way of introducing private contribution plans, either mandatory or voluntary.

In Table 5, more detailed information is shown on replacement rates in the first and second pillars, as well as on the third pillar for those countries for which workers' coverage is at least 40%⁹. Denmark, the Netherlands and Sweden have opted for a distribution system with a 30% coverage rate for the average pension, some twenty percent points below the EU-15 average. In exchange for this low coverage rate, their systems have a second contribution and private pillar, mandatory in Sweden and Denmark, and very widespread in collective bargaining agreements in the Netherlands, which covers over 90% of workers, making it quasi-mandatory.

9: All EU-15 countries have private systems in the third pillar, although except for four of them coverage is lower than 40% of workers; therefore, this information is not shown in Table 5.

Table 5

Replacement rates for the average pension in the EU-15, by pillar

	Pillar		
	First	Second	Third
Austria	76.6		
Belgium	42.0		15.6
Denmark	28.9	50.7	
Finland	57.8		
France	49.1		
Germany	42.0		16.9
Greece	95.7		
Ireland	29.0		37.6
Italy	64.5		
Luxembourg	87.4		
The Netherlands	29.2	58.9	
Portugal	53.9		
Spain	81.2		
Sweden	31.1	22.7	
United Kingdom	31.9		36.7
EU- 15	53.4	44.1	26.7

* In Italy the replacement rate for women is 50.6%
Source: OECD (2011)

In addition, Italy and Sweden have introduced notional account systems in their first pillar, so that upon retirement the notional accrued capital is converted into an annuity. The calculation of this annuity depends on a correction coefficient which is a function of the retirement age of the worker and his or her life expectancy at the time of retirement. The main advantage of the notional account system is that it allows the public pension system to be clear and completely transparent for workers, who know at all times what their accrued capital amounts to, and therefore see the link between payment of their social contributions and the pension system. As argued by de la Fuente and Doménech (2011), this information provided by the notional account systems makes it possible for society in general, and workers in particular to grasp the close relationship between contributions and benefits, and for workers to make timely and informed decisions regarding the best possible way to prepare their retirement.

The combination of parametric and structural reforms

Generally speaking, the experience of reform of the European systems suggests that the best way to address the challenge of aging is by introducing incentives for the voluntary postponement of the retirement age, as well as automatic adjustment mechanisms based on life expectancy, ensuring the financial balance of the public distribution system, complementing their generosity with individual capitalization system (public or private management), as a way to mobilize more resources to fund adequate pensions.

Table 6
Reforms of European pension systems

	Mandatory contribution system	Notional accounts	Benefits linked to life expectancy	Eligibility linked to life expectancy	Optional contribution system
Austria					
Belgium					
Denmark				•	
Finland			•		
France				•	
Germany			•		•
Greece					
Ireland					•
Italy		•			
Luxembourg					
The Netherlands					
Portugal			•		
Spain			•		
Sweden	•	•			•
United Kingdom					•
EU- 15	1	2	4	2	4

Source: OCDE

Table 5 shows the greater presence of mandatory and/or voluntary capitalization schemes to complement replacement rates in various countries. Table 6 shows that most European countries (10 out of 15) have introduced reforms to accommodate the increase in life expectancy and adapt the system's generosity to these increases. The automatic mechanisms included in these reforms affect the system's generosity and in no case is an automatic mechanism envisaged for postponing the retirement age in parallel with the increase in life expectancy. In the EU-15 countries, only Sweden and Italy have introduced a notional account system in which the pension is determined as an annuity based on life expectancy. In other countries, the defined benefit amounts or the legal age required to earn full retirement pension have been indexed to life expectancy. Lastly, several countries allow workers to voluntarily opt for one part of their social security contributions to go to a defined-contribution system.

In sum, what we have described in this section outlines some important points. First, the trends with respect to the implementation of reforms in Europe have been heterogeneous, determined by the urgencies imposed by the economic scenario, institutional elements, and the demographic transition stage. Second, apart from this heterogeneity in the application of solutions and their intensity, they all tend to reduce the system's generosity through parametric or structural reforms, or a combination of the two. Third, we are seeing an increasing trend to leave more space for participation in individual capitalization schemes, whether voluntary or mandatory. Finally, the financial crisis has accelerated reforms in some countries and will surely condition new reforms in line with the unavoidable demographic transitions.

4. Distribution systems in Colombia and Peru

Colombia and Peru, almost simultaneously, have undergone major transformations in their pension systems. In 1994, both countries implemented structural and parametric changes in their retirement saving contribution schemes, through the introduction of an individual capitalization system. According to Melguizo et al (2009), unlike the Chilean model, where the introduction of a defined-contribution component resulted in the end of the defined-benefit mechanism, Colombia and Peru established a pension system that allowed the two saving schemes to coexist. In both systems, under specific rules, workers were allowed to choose between saving in individual savings accounts or making contributions to a typical pay as you go (PAYG) distribution scheme.

It is important to note that the introduction of reforms in both countries came about as a consequence of several factors, not only of an economic and financial nature, but also social and political. Firstly, the pension systems under PAYG schemes in Peru and Colombia were loss-making due to operation rules that were not adapted to reality; the fragmentation of the institutions responsible for administering the resources contributed, and management problems making their long-term perspective unsustainable for realistically meeting the social objectives of providing dignified pensions in the future; and in addition, the foregoing hindered the design of macroeconomic programs providing sustainability to the economy as a whole.

The urgency of undertaking pension reforms created a window of opportunity for making major transformations. Using as a reference the successes that were beginning to become apparent in the Chilean pension model after nearly fifteen years of operation of an individual capitalization system, Peru and Colombia took the model as basis for introducing it within their reform packages. However, as they had left the PAYG model in place as a capitalization alternative, this involved a double challenge. First, to avoid generating distortions in the benefits granted by either system, with the understanding that this was difficult due to the fact that two different saving mechanisms were at hand. Second, to conveniently adapt the parameters of future distribution systems, understanding the macro-fiscal implications of not doing so.

Next, the cases of Peru and Colombia are analyzed separately with the following objectives. First, to understand the characteristics of the reforms undertaken since the nineties. Second, to assess the impact of these transformations from the perspective of fiscal sustainability. Finally, to identify latent factors in the distribution systems that are maintained as future risks for the public finances of these countries. At the end of the section, we will reflect on the tasks that remain pending to continue to balance the PAYG systems, and how the experiences developed in Europe, reviewed in the preceding sections, can be of use.

The pension systems in Colombia and the Average Premium Regime (RPM)

The development of the pension systems in Colombia has taken place gradually since the beginning of last century with the setting up of small institutions or pension savings banks, primarily for the public sector. These started to consolidate further in the forties, with the founding of the Caja Nacional de Previsión Social (CAJANAL—National Fund for Social Security) and subsequently, toward the end of the seventies, with the creation of the Colombian Institute for Social Security-ICSS¹⁰, which started to incorporate the private sector.

Contributions and benefits to the system were different for public and private workers. For instance, in the eighties, state employees could retire with 20 years of service, retirement ages of 50 to 55 years, and average replacement rates of 75%. Meanwhile, a worker in the private sector officially retired at 60 or 55. In both cases the contribution rates were extremely low, a combination that, in the early nineties, generated strong pressures on the public budget, bringing the pension deficit to 4% of GDP (see Muñoz et al, 2009., or Alonso and Llanes, 2010).

When the Colombian pension system found itself in a dire financial situation in 1993, a far-reaching reform was carried out in the system with the enactment of Act 100, which implemented a private

¹⁰: Subsequently known as Instituto de Seguros Sociales-ISS and, later, Colpensiones

saving capitalization component (Solidarity Saving Regime – RAIS) with contributions under the management of Pension Fund Administrators (AFPs), and the consolidation of various public distribution schemes, updating them parametrically, and which became integrated into what is known as the Average Premium Regime (RPM)¹¹. Workers could choose between belonging to one of the two regimes and switch from one to the other under certain conditions. Relevant adjustments were made in the replacement rates, while introducing an equalization between the minimum pension and the current legal minimum wage (SMLV), increasing the value of the former in accordance with the increases established for the latter.

This first reform, although important in terms of promoting the responsibility of individual saving for old age and making it more efficiently managed, was not enough to make fiscal accounts sustainable. On the one hand, there was the recognition of pension debt, through pension bonds, which implied a high but necessary fiscal burden. On the other hand, huge implicit subsidies were being maintained in the pensions for some groups of workers, which was reflected upon comparing replacement rates between the RAIS and the RPM. According to Alonso and Llanes (2010), in 2002 only two out of every ten people of retirement age were covered, and between 42% and 72% of the pensions recognized in the RPM were subsidized, which at the end of nineties represented for the national government spending of nearly 2% of GDP, and it was projected that this burden in the budget would reach 5.5% of GDP by 2019. Parra (2001) estimated that the pension deficit, at present value and 2000 prices, would be between 190% and 200% of GDP.

Table 7

Main characteristics of the major reforms undertaken in Colombia

	Act 100	Act 797, Act 860 and Legislative Act
Membership	Mandatory for dependents	Mandatory for dependents and independents
Contribution rate (IBC < 4SMLV)	13.5% (+1 for more than 4 SLM)	Gradual increase of 0.5% annually. Currently 16%. In the RAIS 11% of the IBC goes to the Individual Account
Retirement age in the RPM-ISS	55W/60M - 2014 57 W 62 M	55W/60M - 2014 57 W 62 M
Replacement rate (min/max) in the RPM-ISS	65% / 85%	55/80% (introduction of a formula)
Minimum number of weeks in the RAIS	1000	1000 (2003) annual increase of 25 weeks up to 1300 (2015) Currently 1200
Administration commission and insurance ceiling in the RAIS	3,50%	3%
Contribution base (min/max)	1 SLM/20 SLM	1SLM / 25 SLM
Settlement base in the RPM-ISS	Last 10 years	Last 10 years
Transfer period	Every three years	Every five years. There can be no changes during the ten years prior to retirement age Creation of FGPM financed by RAIS members

Source: Acts 100 (1993), 797 (2003), 860 (2003) and Legislative Act 01 (2005)

These conclusions led to the undertaking of relevant changes through Acts 797 and 860 in 2003 (see Table 7). The changes designed to improve the integration of independent workers, establish solidarity components and enact new regulations for switching between regimes included key improvements in the financial profile of the distribution model: the contribution rate was increased gradually between 2003 and 2008, RPM benefits were decreased, the replacement rate was reduced to levels between 55% and 80%, and the retirement age was increased for RPM members from 2014 onward. However, the Constitutional Court reversed some of these reforms, lessening the fiscal balancing effects initially hoped for¹². As a result, the exhaustion of ISS reserves in 2004 could not be avoided, and the government had to take on total payment of RPM pensions. Subsequently, through Legislative Act 01 (2005) measures were again put in place to address the financial limitations of the public pension system, with modifications to the distribution pension regimes for branches not included in the RPM, the limitation of pension negotiations through collective bargaining agreements, gradual adjustments to the 14th monthly installment, and ceilings for RPM pensions equivalent to 25 SMLV.

11: The members of the excluded regimes, such as the military, the national police, and the National Fund for Social Benefits of Teachers, among others, were not included in Act 100 of 1993

12: Ruling C-754-04 by the Constitutional Court declared some articles of Act 860 of 2003 relating to the adjustments made to the transition regime unconstitutional; this reversed some of the progress made in terms of the National Government's budgetary adjustments.

With all these modifications, official calculations in 2007 indicated that the actuarial debt of the pension system projected for 2050 will be around 148% of GDP. Although this level implies a significant reduction in relation to levels of nearly 200%, it still represents a challenge (see Table 8).

Table 8
Evolution of the pension deficit (percentage of GDP)

After	Current net value/2007 GDP
Act 100 (1993)	191
Act 797 (2003)	166
Legislative Act 01 (2005)	148

Source: Ministry of Social Security

After these measures were implemented, the pension system was shaped as a structure with special features, depending on the type of retirement scheme chosen by the contributor. Under Decree 4982 (2007), the rate of contribution to the system is 16% of the base contribution income (IBC). However, the percentage earmarked for retirement pension is different between regimes¹³. It should be noted that the contributions to the system for dependent workers are distributed between the employer, who is responsible for 75%, and the employee, who contributes the remaining 25%. Independent workers are responsible for all of their own contributions to the system.

Table 9
Requirements for access to a pension and pension amount in both regimes

Year	Access requirements				Pension amount	
	Number of weeks	Age Women	Age Women	RAIS	RPM-ISS	RAIS
	RPM-ISS					
Before 2004	1000	55	60	Having accrued a balance of 110% of the minimum pension	Formula: 65.5-0.5S, where S is the IBL in number of SMLV. The constant of this formula will increase by 1.5% every 50 weeks of additional contributions to the required minimum	It is a function of the accrued balance in the individual account
2005	1050	55	60			
2006	1075	55	60			
2007	1100	55	60			
2008	1125	55	60			
2009	1150	55	60			
2010	1175	55	60			
2011	1200	55	60			
2012	1225	55	60			
2013	1250	55	60			
2014	1275	57	62			
2015	1300	57	62			

Source: Ministry of Social Security

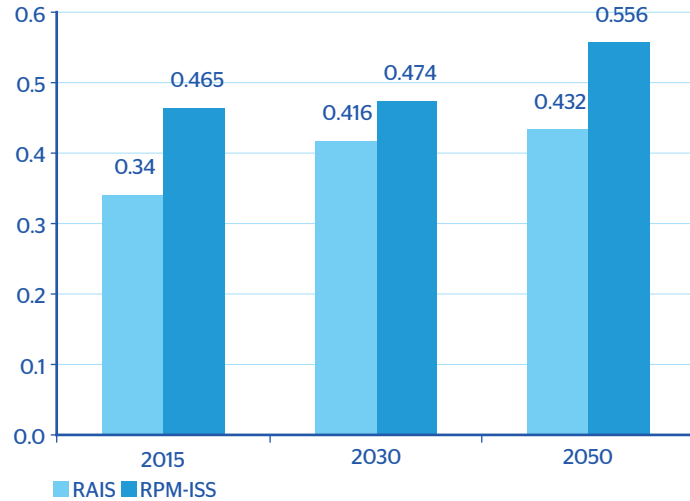
Under the following rules, there are some elements that pose challenges to sustainability. The first element is the gradual increase of life expectancy in Colombia. Looking at the projections for this indicator, the degree of convergence with that for other realities can be seen, which will result in an increase in the contingent pension debt if no adjustments are made to the retirement age or contribution rates so as to offset this risk.

Secondly, there is the topic of updating minimum pensions in keeping with the minimum wage. This is an element of great concern if it is considered that contributions and other parameters of the system are maintained without immediate variation. Finally, the rules for the determination of the replacement rates in the distribution system continue to be quite generous. In addition, this creates a major distortion when comparing with the replacement rates of the individual capitalization system (see Chart 9). This situation currently implies a strong incentive for members to switch from the private system to the Average Premium system, which aggravates the sustainability problems.

13: Indeed, while 11.5% of the IBC is allocated to the individual account in the RAIS, in the RPM, 13% of the IBC goes to a common fund, from which said regime's pensions are paid. The amount corresponding to the difference between the contribution rate of the RAIS (11.5%) and RPM (13%) and the total contribution (16%) is allocated to the payment of administrative costs, insurance premiums and contributions to the MPGF, exclusively for the RAIS, and to disability and survivors' pensions in the RPM.

Chart 9

Average replacement rate in RAIS (Individual Capitalization) and RPM (Distribution)

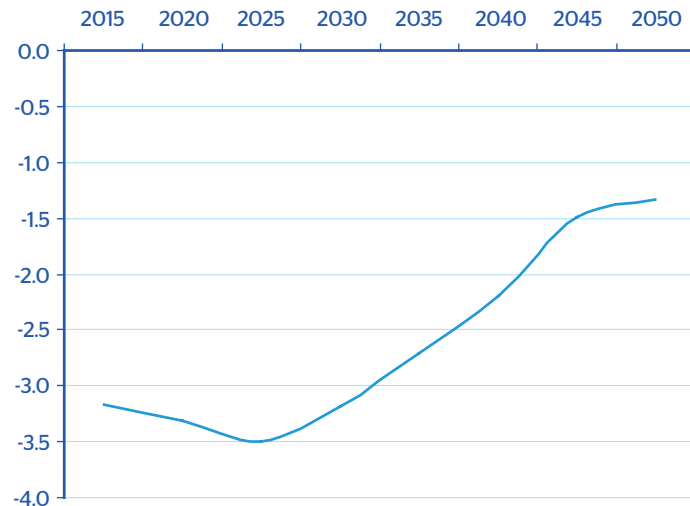


Source: BBVA calculations

Thus, the estimate obtained in the study conducted by Muñoz et al (2009) shows a rather high commitment profile in terms of the actuarial debt, where the aforementioned factors turn into financial restrictions for the distribution system (RPM) in the long term, as shown in Chart 10.

Chart 10

RPM fiscal commitments (as % of GDP)



Source: BBVA calculations

Peru and the public pension system

Pension systems in Peru date back to the beginning of the 1930s, when the first public pension system was created with the 1933 Constitution, as the Mandatory Social Insurance. It was administrated by the National Social Security Fund, and covered risks including illness, maternity, disability, old age and death. Later, through Act 13640 in 1961, the Worker's Retirement Fund was created, which established contributions by workers and employers to said fund based on 2% of their wages in each case. However, a number of significant autonomous pension systems were in effect at the same time. In 1970, the military government mandated the reorganization of the National Worker's Social Security Fund and Employee's Social Insurance (Decree 18421). In 1973, the various existing pension systems were unified to create the National Pension System (SNP) through Decree 19990.

In 1974, based on the aforementioned unification, the government established a new pension regime that would include civil servants not included in Decree 19990 under Decree 20530, which established that as long as certain requirements were met, the groups covered under this Act could retire with special conditions, that included access to pension levels similar to the last payments received, few years of contribution, as well as the updating of pensions based on raises that active public employees would obtain.

By the late eighties, the extensive benefits and reduced contributions –normally implemented to gain political favor– were leading this system to collapse. Inflation, the fall of wages in real terms, the growth of unemployment, and informal employment complicated the problem. To make matters worse, the State’s crisis led to improper handling of resources by the Peruvian Social Security Institute (IPSS). It should be noted that according to a World Bank report dating back to 1994, investments in public pensions generated negative performance of 37% between 1981 and 1988.

After nearly twenty years with a single, state-operated pension system, given the bleak outlook for the SNP, and in a context in which it presented a significant financial imbalance, Decree 25897 created the Private Pension System (SPP) as an alternative to the state pension system in December 1992. As a result of this reform, Peru’s pension system is made up of two primary regimes that operate in parallel: the National Pension System and the Private Pension System. The first of these operates under a distribution scheme and is administrated by the Office of Pension Normalization (ONP), while the SPP that was launched in July 1993 works under an individual capitalization scheme and is managed by Pension Fund Administrators (AFPs). The AFPs are under the supervision of the Superintendency of Banking, Insurance and Pension Fund Administrators (SBS).

Table 10
Comparison between SNP and SPP

	Contribution Rate	Requirements to receive pension	Replacement rate formula
SNP	13% del salario	<ul style="list-style-type: none"> • Be 65 years with at least 20 years of contribution. • Early retirement: Men: 55 years to 30 years of contributions Female: 50 years to 25 years of contributions. 	Currently 50% rate decreases in time to reach 30% in 2038.
SPP	10% of insurable earnings	<ul style="list-style-type: none"> • Be 65 years old. • For early retirement pension calculated on the SPP must be equal to or greater than 50% of average earnings and revenue reported in the last 120 months. 	

Source: BBVA Research

Currently, in the SNP, workers make a contribution of 13% of their wages, and at the time of retirement (65 years of age with at least 20 years of contributions) they receive a fixed benefit subject to minimum and maximum levels. This benefit is determined as a percentage of the benchmark compensation, calculated as the average of the last 60 remunerations, and is paid as 14 pensions per year. According to Bernal et al (2008), it should be noted that in this distribution system, due to the existence of these minimum and maximum pensions, lower-income workers obtain a greater benefit than they would have obtained through personal saving, while higher-income workers have the opposite experience, as the benefit obtained is lower than the one they would be entitled to for their contributions. Early retirement is offered at the age of 50 (for women) and 55 (for men), which requires a greater contribution effort of 25 to 30 years of contributions, respectively, and establishes a deduction from the sum of the pension for each year of early retirement.

The reform of the public system in Peru featured some central elements to provide greater financial sustainability. First, it achieved reasonable recognition of the pension debt for those who switched from the public to the private system through recognition bonds, which provided it with initial support toward the long term¹⁴. Secondly, gradual adjustments were made to the replacement rates. Furthermore, the retirement age was standardized for the entire group to 65 years regardless of gender. Finally, around the middle of the last decade, the closing of the special DL 20530 regime was achieved. In all, this represented a fiscal adjustment that was more ambitious than the Colombian case reviewed previously in this document.

Despite these adjustments, the distribution pension scheme continues to show some fiscal imbalances and, therefore, to generate distortions when benefits under this system are compared to similar contributions made in the alternative distribution system. Bernal et al (2008) provide a simulation with replacement rates offered under the SNP in a scenario before implementing parametric reforms (i.e., base replacement rates of 50% and marginal rates of 4%), and the second simulates the effect of reforms by age group that considers decreasing base replacement rates and marginal rates of 2%, in accordance to the Law. Table 11 shows that in the non-reformed scenario, for each pension monetary unit the members only financed 31%, while the State covered 71% of their replacement rate. With the reform's adjustments, substantial reductions were achieved in the subsidy.

Table 11
Subsidy in the National Pension System

	Age	Years of Contribution	Current replacement rate	Self-funded replacement rate	Subsidy
Without Reform	All	33	102%	31%	71%
	61 or more	33	76%	33%	43%
	55-60	33	71%	33%	38%
With Reform	45-55	33	66%	33%	33%
	35-45	33	61%	33%	28%
	35 or less	33	56%	33%	23%

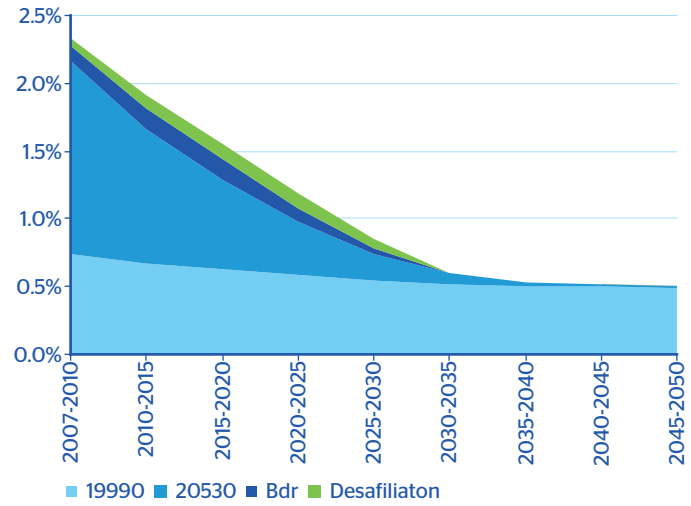
Source: BBVA Research

Thus, according to the projections offered by Bernal et al (2010), we observe that throughout the projected period, the total system deficit will show a downward trend as a result of the extinction of the obligations of the reformed DL 20530 regime, the redemption of recognition bonds and complementary bonds, and the guarantees for a minimum pension and of the Disaffiliation Act. The first case deals with a regime in which most of the population is already receiving a pension, and is no longer open to new workers. The second case corresponds to the cessation of payments for recognition bonds and complementary bonds as SPP members entitled to them begin to receive their pensions and, therefore, there are fewer members who are owed their bond. Finally, the case of disaffiliation (leaving the private system to return to the public system) and minimum pensions represent costs for a given period of time insofar as the beneficiary population is a closed group, since it only applies to those SPP members who were registered in the SNP prior to 1995, and, therefore, are not considered new beneficiaries.

However, although by 2035 these obligations decrease significantly, the deficit is not closed completely, as the one corresponding to DL 19990 prevails. Thus, it is estimated that the operational deficit of this system will go from little more than 0.8% to 0.5% of GDP a year around 2050. At present value, the deficit represents 57.9% of the 2006 GDP, a percentage that, although significant and worthy of attention, is not so high a cost when compared to the situation prior to the reform and to the obligations faced by other countries in the region, such as Colombia.

14: According to Bernal, Muñoz, Perea, Tejada, and Tuesta (2008), the Recognition Bond (BdR) is an obligation on the part of the ONP, on behalf of the Peruvian State, for the contributions made by the workers to the SNP. The issue of this bond prevents members of the SNP who decided to join the SPP from losing the contributions made, and they may continue accumulating funds for their retirement. Calculation of the nominal value is defined as follows and has a cap of S/ 60 000: $BdR = 0.1831 * R * M$, where BdR is the nominal value, R is the average of the last 12 installments, and M is the number of months contributed.

Chart 11
Total pension deficit (percentage of GDP)



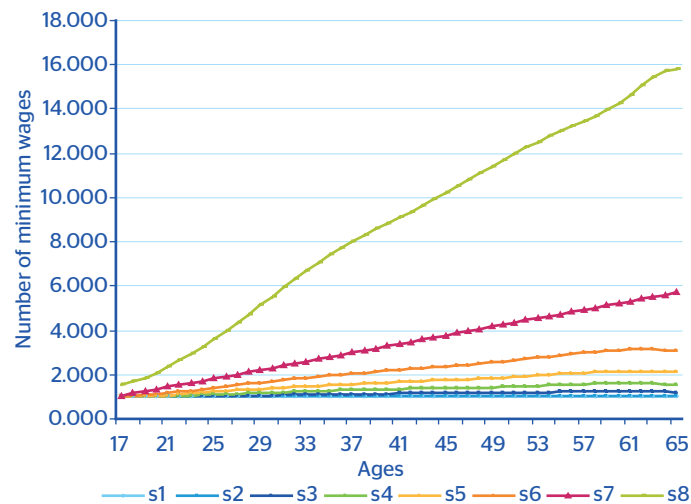
Source: ONP, MEF, SBS, BBVA

5. The actuarial balance of pension systems in Colombia

As we indicated in previous chapters, the Colombian and Peruvian cases are rather particular because the distribution (RPM) and capitalization (RAIS) systems are mutually replaceable. Each member may choose either one and, under certain conditions, switch at any given time. As we mentioned earlier, in addition to the problem of population ageing that will foreseeably be seen in Colombia, there is the situation of the RPM actuarial imbalance, i.e., that its members will receive a pension that is much higher in relation to the contributions made and their life expectancy. Thus, the greater the number of members in the system generating higher pension rights, the greater the financial imbalance will be. This section evaluates the replacement rates that the same type of individuals would hypothetically receive (in terms of average wages and contribution density) under the two existing systems: RAIS (for individual capitalization) and RPM (distribution). Given that RAIS is balanced from an actuarial point of view, the difference in favor of RPM is attributable to the subsidy received by current system members, and which must be defrayed by future generations in terms of more debt. Finally, we compare the generosity of the Colombian system in relation to the European system in order to give a sense of the context in which the reforms have been undertaken in both.

From real data provided by Asofondos, cross-section wage profiles by age and average wage have been built for eight contribution groups in the RAIS (see Chart 12). Under the assumption that these profiles are representative of other longitudinal ones, we can see the huge inequality in income in groups seven and eight with in relation to the other groups. While said groups would reach nearly 6 and 16 minimum wages at the age of 65 in the case of men, the first three groups would barely exceed one minimum wage.

Chart 12
Average wage by levels, men (2010)

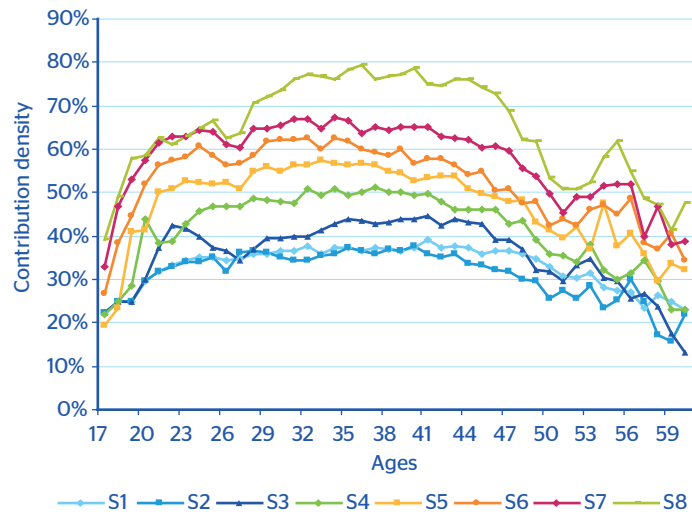


Source: Asofondos

At the same time, and highly related to the average wage profiles, from the previous chart, contribution densities also point to significant differences among the eight levels (See Chart 13). Contribution densities would mark the percentage of time that the person has been working (and therefore contributing to the system). Values lower than 100% would show episodes of unemployment, inactivity, or activity in informal work.

Against values reaching nearly 80% of working days contributed in ages 35-40 in group eight, in group 1 they would not reach a maximum of 40%. This disparity will be transferred automatically to RAIS pensions and increased due to current legislation.

Chart 13
Contribution densities, men by levels (2010)



Source: Asofondos

If we were to take these contributor profiles currently existing in RAIS and apply the calculation rule for RPM pensions as explained in Table 12, we would see that the number of weeks for calculating the pension would not reach the minimum of 1200 that the current law requires for the first six groups, although it is true that for the last one of these the gap is small. Therefore, a large part of the population (the poorest) would be excluded from receiving a pension, although, as we shall see later on, their capitalized contributions would be returned to them.

Pensions for men could reach 6.96 million pesos in group six¹⁵, 22.20 million in group seven, and 61.42 million in group eight. In the case of women, group six would achieve the same amount as for men, while groups seven and eight would reach 16 and 44 million, respectively.

By applying the calculation of an annuity to the same profiles with the official mortality tables and an interest rate of 3.5%, the pensions they would receive and which would be actuarially balanced would be considerably less than those received in the distribution system. For men, group seven would barely reach 10 million pesos, and group eight 25.5 million. For women, these amounts would be 6x and 14 million, respectively.

15: Assuming that the employee completes the minimum number of weeks required.

Table 12

Results of the RPM-RAIS comparative actuarial calculation

Weeks contributed	S1	S2	S3	S4	S5	S6	S7	S8
Men	459.9	712.8	818.9	979.1	1080.4	1193.2	1317.5	1478.8
Women	700.6	782.3	836.6	961.9	1060.2	1182.4	1338.9	1486.8
Average of last 10 wages								
Men	7.0	7.1	8.5	10.8	14.1	20.2	33.3	91.2
Women	7.0	7.0	7.5	8.8	11.1	15.0	23.4	63.2
Average pension (millions of pesos)								
RPM								
Men	Without pension	Without pension	Without pension	Without pension	Without pension	6.96	22.20	61.42
Women	Without pension	Without pension	Without pension	Without pension	Without pension	6.96	15.92	43.94
RAIS								
Men	3.59	3.62	3.93	4.51	5.37	6.90	10.16	25.48
Women	2.48	2.49	2.63	2.92	3.41	4.26	6.07	14.59
Replacement rate								
RPM								
Men						35%	67%	67%
Women						46%	68%	70%
RAIS								
Men	52%	51%	46%	42%	38%	34%	30%	28%
Women	36%	36%	35%	33%	31%	28%	26%	23%

Source BBVA Research

The replacement rate that we would see in RPM in groups seven and eight would be higher, by 36 and 39 percentage points, than the replacement rates obtained in the RAIS in the case of men, and 42 and 46 percentage points in the case of women. These same figures correspond to the subsidy that groups seven and eight would be receiving under RPM.

In conclusion, the RPM system could currently be excluding significant segments of the poorest population by having established pension requirements that they cannot meet. However, those who can do it (higher income groups) are widely subsidized by the system, which implies its actuarial imbalance as a whole.

The profiles of the possible switches from RAIS to RPM would increase the poorest contribution groups, which would not be entitled to a pension, or bring individuals from contribution groups with higher purchasing power that would be widely subsidized in RPM, thereby increasing the system's fiscal deficit.

One way to compare the relative generosity of pension systems is the preparation of the pension-wealth indicator proposed by the OECD (2011). This involves adding the total amount of pension benefits that a pensioner will receive until his or her death and relating it to the average wage in the economy. This index makes it possible to compare the systems by incorporating the replacement rate and life expectancy of each economy.

Table 13

Wealth of pensioners in EU-15 (total pensions received until death/average wage of the economy)

	Men	Women
Austria	9.8	10.7
Belgium	7.0	8.2
Denmark	13.3	15.7
Finland	9.7	11.6
France	9.3	10.5
Germany	7.7	9.3
Greece	15.1	17.4
Ireland	7.5	9.1
Italy	10.6	11.1
Luxembourg	21.8	25.3
The Netherlands	18.0	20.6
Portugal	8.7	10.0
Spain	13.4	15.1
Sweden	10.4	11.7
United Kingdom	5.4	6.4
EU-15	11.2	12.8

Source: OECD 2011

As can be seen in Table 12, today's male pensioners would receive an average of 11.2 average annual wages throughout their life, and 12.8 in the case of women. The most generous country is Luxembourg with 21.8 and 25.3 average annual wages for men and women, respectively.

The same calculation made for groups that could receive a pension in RPM shows that the pension wealth of groups seven and eight for men would reach 29.64 and 82 average wages, respectively. In the case of women, the same groups reach 30 and 83.4 average annual wages, which reflects the extraordinary generosity of the system with these groups in Colombia, only comparable to the case of Luxembourg. Generosity levels of the system that are much lower than the Colombian case have resulted in Europe in major reforms designed to recover the actuarial balance of the distribution system, this being the main pending task that Colombia will need to tackle in the coming years

6. Conclusions

As a consequence of the sovereign debt crisis in Europe, many EU countries have had to implement their public pension system reforms earlier than planned so as to guarantee budget sustainability of public accounts in the long term and regain the confidence of the international financial markets. As explained in this paper, these reforms are the necessary answer to the problem of ageing in European societies. In spite of the fact that it will affect all EU-15 countries more intensely, it will result in highly heterogeneous effects among countries, given that their pension systems have characteristics that differentiate them from each other, among other reasons, because some of them already had undertaken in the past major parametric and structural reforms to deal with ageing-related risks.

As shown at the beginning of this paper, the ageing problem now faced by Europe is a potential risk for Latin American countries as a result of the demographic transition in the process of economic development, so that with the growth of per capita income, life expectancy will increase and it is likely that the birth rate will drop. The European answer to this problem shows that the necessary reduction of the distribution system's generosity (first pillar) must be offset by the strengthening of complementary capitalization systems (second and third pillars).

A second lesson from the European experience is the need to maintain the distribution system in actuarial balance, guaranteeing minimum survival levels to avoid problems of social exclusion and poverty linked to the retired population.

So as to illustrate the comparison between Europe and Latin American countries, we have also analyzed in this paper the pension systems in Peru and Colombia, two countries where the distribution system competes with the capitalization system. From this comparative analysis and from the lessons of the European experience, we can also extract the following lessons. Firstly, pension systems in these countries must improve their coverage and assistance level. Secondly, the actuarial balance of the distribution system is even more relevant than in EU-15 countries, given that its resources are comparatively more scarce as a result of the lower level of coverage of contributors. Thirdly, pension systems in these two countries are facing the challenge of solving major redistribution problems, increasing coverage for the most disadvantaged population groups and eliminating privileges relating to the system in social groups who do not need public subsidies, as seen in their current distribution systems. Finally, coexistence between the distribution and capitalization systems must be implemented by guaranteeing their actuarial balance with the system's own resources, in order to limit distortions and avoid a replication in the future of the negative experience that some European countries have been facing in the current global crisis scenario.

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Appendices

Projections of public expenditure on pensions in the OECD

Table A1

Evolution of public spending in pensions as a percentage of GDP in the EU-15, 2007-2060

	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2060-2010 increase
Austria	12,7	12,8	13,0	13,4	13,8	13,9	13,9	14,0	14,0	13,9	13,6	0,9
Belgium	10,3	10,9	11,8	13,0	13,9	14,4	14,6	14,7	14,7	14,8	14,7	4,4
Denmark	9,4	10,2	10,6	10,5	10,6	10,5	10,4	10,0	9,6	9,3	9,2	-0,2
Finland	10,7	11,8	12,6	13,4	13,9	13,9	13,6	13,4	13,3	13,3	13,4	2,7
France	13,5	13,5	13,6	13,9	14,2	14,5	14,4	14,3	14,2	14,1	14,0	0,5
Germany	10,2	10,1	10,5	11,0	11,5	11,9	12,1	12,2	12,3	12,5	12,8	2,6
Greece	11,6	12,2	13,2	14,8	17,1	19,4	21,4	23,0	24,0	24,3	24,1	12,5
Ireland	4,1	4,3	4,6	5,0	5,4	5,8	6,4	7,1	8,0	8,4	8,6	4,5
Italy	14,0	14,0	14,1	14,3	14,8	15,2	15,6	15,4	14,7	14,2	13,6	-0,4
Luxembourg	8,6	8,9	9,9	12,1	14,2	16,6	18,4	20,7	22,1	23,7	23,9	15,3
The Netherlands	6,5	7,2	7,8	8,4	9,3	10,0	10,3	10,3	10,3	10,4	10,5	4,0
Portugal	11,9	12,1	12,4	12,6	12,6	12,3	12,5	12,8	13,3	13,1	13,4	1,5
Spain	8,9	9,2	9,5	10,1	10,8	11,9	13,2	14,6	15,5	15,6	15,1	6,2
Sweden	9,6	9,5	9,4	9,4	9,5	9,5	9,4	9,1	9,0	9,2	9,4	-0,2
United Kingdom	6,7	6,8	6,9	7,2	7,6	7,8	8,0	7,9	8,1	8,6	9,3	2,6
EU- 15	9,9	10,2	10,7	11,3	11,9	12,5	12,9	13,3	13,5	13,7	13,7	3,8

Source: OECD

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