PENSION NOTES

No. 59 - January 2022

Individual funding or PAYGO: The opposing paths of Europe and Latin America

Executive Summary

Santiago Montenegro[1] argues that the funded systems are superior to PAYGO systems, basically for two reasons:

1. **PAYGO systems are pyramid schemes that are unsustainable over time.** These systems were initially funded. However, over time, people began to live longer (greater life expectancy), couples began to have fewer children (reduction in birth rates) and the population began to age.

   Population aging reduces the ratio of active workers vs. senior citizens, which is the key to financing PAYGO systems. In countries such as Colombia or Chile, there were 11 active workers for each senior citizen in the middle of the last century; today there are 5 in Colombia and less than 4 in Chile. This ratio will continue to diminish; by the middle of this century it will be only 2 and by the end of the century, only 1.

   Thus, when today's young people are grandparents, there will not be enough young people to pay their pensions.

2. **The returns of the individually funded system are higher than those of the PAYGO system.** The return of the individually funded systems is the return on investments, whereas in the PAYGO system it is equal to the growth of the wage bill (or growth of the labor force times productivity). The difference between the returns of the individually funded and PAYGO systems is Thomas Piketty's well-known (r - g). In his book "Capital in the 21st century," he discusses the concentration of capital and wealth, precisely because r (return on capital) is greater than g (growth of the labor force times productivity). The experience of all Latin American countries confirms that the returns on capital have been significantly higher than the growth of the wage bill.

Rafael Doménech, in turn,[2] refers to what European countries are doing with their first

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[2] Rafael Doménech has an MSc in Economics from the LSE and a PhD in Economics from the University of Valencia, Spain. He is currently the head of Economic Analysis at BBVA Research and Professor of

PAYGO pensions pillar to face the challenge of aging and what lessons Latin American countries can learn from this. The pressure of aging on the European pension systems is because people are living progressively longer and the post-World War II baby boomer generations (a period with very high birth rates) are beginning to retire. As a result of these two effects, the dependency ratio (measured as the population of 65 and over vs. the population between 20 and 64) in Europe will practically double between 2020 and 2060, causing a strong and negative impact on the finances of the PAYGO systems.

Faced with this situation, they are:

1. **Raising the retirement age**. European countries have initiated reforms to gradually increase the retirement age by 2050, and the changes already agreed will raise it from 63.7 to 66.5, on average.
2. **Reducing the generosity of the pension system.** Almost all European countries have introduced automatic pension adjustment mechanisms that balance expenditure based on the deficit of the pension system, or calculate the initial pension based on life expectancy (when life expectancy increases, the initial pension decreases). Changes have also been made to the pension revaluation criteria, in order to make pensions less generous.
3. **Increasing the wage bill.** Incorporating more people into the workforce and making employment as productive as possible, to increase the revenue of the PAYGO system.

To compensate for the drop in the replacement rate as a result of the reduction in the generosity of the European PAYGO systems, more complementary savings will be needed in the first, second or third pillars.

European countries cannot currently make the transition from a PAYGO to a funded system, due to the very high cost for the State to continue paying PAYGO pensions to an aging population, without receiving the contributions of active workers, which would go to the individual funded system.

It is precisely this contradiction between Europe, which is severely adjusting its PAYGO systems to face population aging and gradually integrating funded components to its pension systems, versus Latin America, which managed to switch from PAYGO to individually funded systems in a timely manner (before the population aged), and where there are concerns regarding the political decisions being taken that aim at weakening the individually funded systems, and even proposals in several countries to fully or partially return to the PAYGO systems, which is the reason for the heading of this Pension Note.

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Introduction:

This Pension Note is based on the presentations by Santiago Montenegro "Individually funded pension systems vs. PAYGO systems in Latin America" and Rafael Doménech "PAYGO pension systems in the current demographic context," both at the 18th FIAP International Seminar.[3].

The comparison of what is happening in terms of pensions in Europe is relevant if one considers that Latin America is experiencing the same demographic changes as Europe, with a difference of several decades. For example, the European and Central Asian birth rates in 1960 are slightly higher than the Latin American rates in 2000, and the same happens with the 1980 European rates compared to the Latin American rates in 2020; i.e., with a difference of almost 4 decades, but with the aggravating factor that labor informality is much higher in Latin America than in Europe, so that only a part of active workers contribute to social security.

Hence, current events in Europe, in terms of pensions, are a good predictor of what will happen in Latin America in a few more decades, possibly more severely, considering the income and formality differences in its labor markets.

The individually funded vs. the PAYGO pension systems in Latin America

In general terms, there are two types of pension systems: PAYGO systems, in which retirees' pensions are paid directly with workers' contributions, a system invented in Germany in the time of Bismarck (1881); and the individually funded systems, in which workers' pensions are financed with the savings they accumulate throughout their lives, plus returns, which according to Nial Fergusson has its origins in the system called Scottish Widows, established by Protestant pastors in Scotland in 1741, and opened to the public in 1812. The modern version of these systems was introduced in Chile in 1981.

The individually funded systems are superior to the PAYGO systems for basically two reasons. First, because the PAYGO systems are pyramid schemes that are unsustainable over time, and conceptually equal to the scandals we have seen in Latin America, such as those involving Alberto Chang or Rafael Garay in Chile, or the DMG pyramid scheme in Colombia. Second, because the returns of the individually funded system are higher than those of the PAYGO system, as Thomas Piketty argues in his book "Capital in the 21st century."

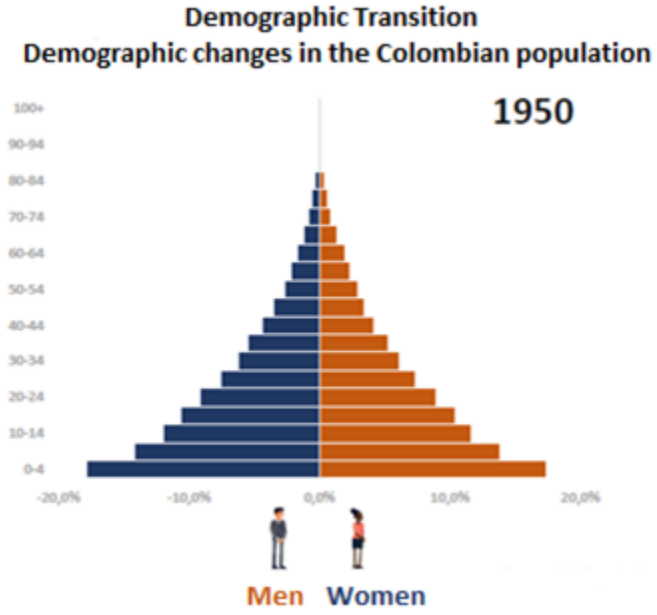
Pyramid Schemes: The PAYGO systems were once funded. However, over time, people began to live longer (greater life expectancy), couples began to have fewer children (reduction in birth rates) and the population began to age. The number of active workers for each pensioner or retiree began to diminish. Today in Chile there are 4 workers for each pensioner. By 2050 there will be only 2, and by the end of the century there will be only 1. According to the United Nations, life expectancy at birth in Latin America was 51 in the middle of the last century; it will be 80 by the middle of this century and 87 by the end of the century. The Latin American population, which in the middle of the last century was

[3] To see the video recordings of these presentations in detail, please visit the following YouTube links: https://www.youtube.com/watch?v=Rfwdr3sqF9o&list=UUVEKehx9fgqy9xId-FFe01A&index=31 and https://www.youtube.com/watch?v=xGK0veNZkyU&list=UUVEKehx9fgqy9xId-FFe01A&index=32. You can also download the presentations in PDF at this link: https://www.fiapinternacional.org/en/seminario/xviii-seminario-internacional-fiap-madrid-espana/

less than 170 million, grew strongly to the current 653 million. It will reach a maximum by the middle of the century and will then begin to diminish steadily.

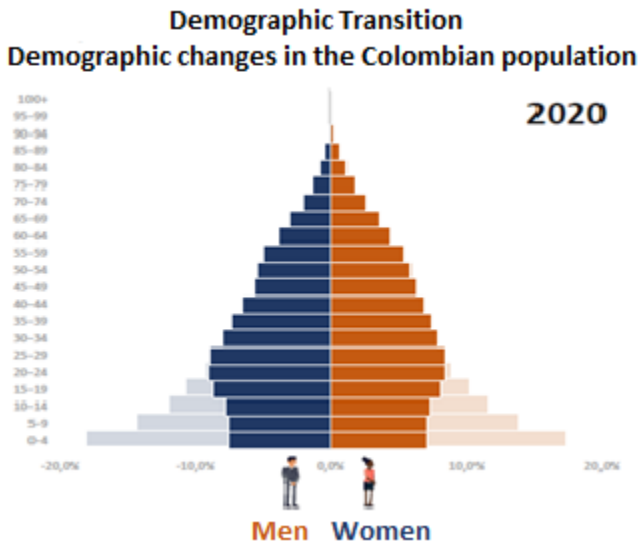
In 1950, the population of Colombia, like the vast majority of Latin American countries, was pyramid-shaped, with many children at its base, many young people in between and very few senior citizens at the top. The upper part began to grow because people began to live longer and the lower part decreased due to the effects of the drop in the birth rate. The 1950 pyramid (see Figure 1) changed, since there are fewer children and many more senior citizens, as shown in Graphs 2, 3 and 4, of 2020, 2059 and 2100, respectively.

Graph 1



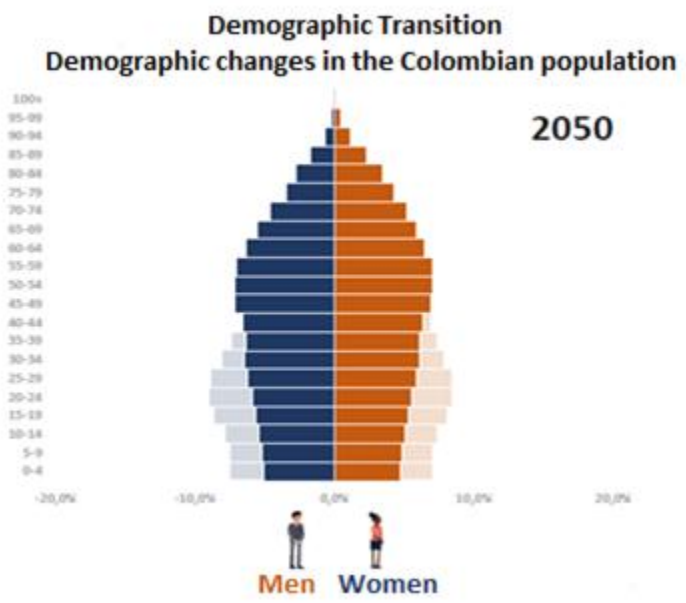
Source: UN Population division (2019).

Graph 2



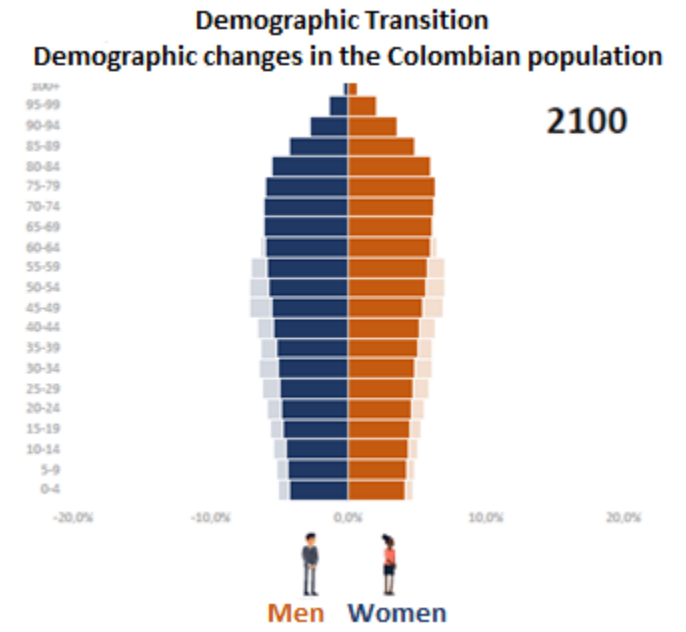
Source: UN Population division (2019).

Graph 3



Source: UN Population division (2019).

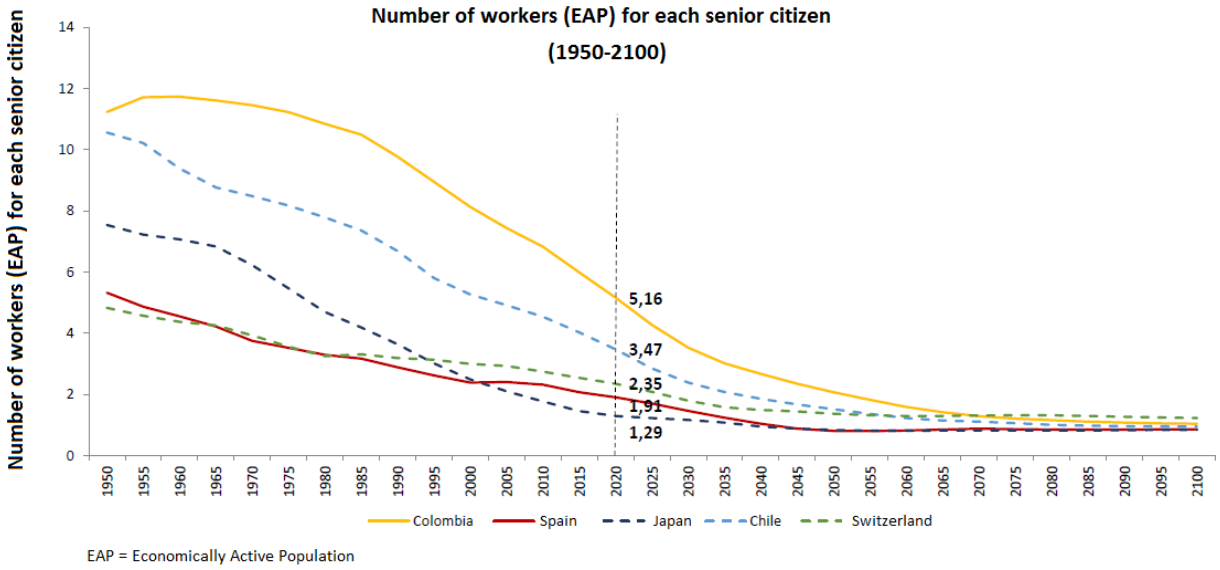
Graph 4



Source: UN Population division (2019).

Another way of visualizing population aging is the evolution of the ratio between the number of active workers (Economically Active Population, EAP) for each senior citizen (see Graph 5). In countries like Colombia or Chile, there was a ratio of 11 active workers for each senior citizen in the middle of the last century. Today it is about 5 in Colombia and less than 4 in Chile. This ratio will continue to diminish; by the middle of this century there will be only 2 and by the end of the century only one active worker per senior citizen, i.e., each active worker must pay the pension of a retiree.

Graph 5



EAP = Economically Active Population

Source: UN Population division (2019).

As the ratio between those who must finance pensions and those receiving pensions decreases, financing becomes impossible, since the contribution rate would have to be significantly increased, pension amounts (replacement rates) would have to be reduced, the retirement age would have to be increased, or the State would have to increase its contributions to cover the growing pension deficit with budget resources.

Thus, when today's young people are senior citizens, there will not be enough young people to pay their pensions. So-called intergenerational solidarity, which sounds so nice, does not exist; it is a hoax, because the PAYGO systems are true financial pyramids, or Ponzi schemes.

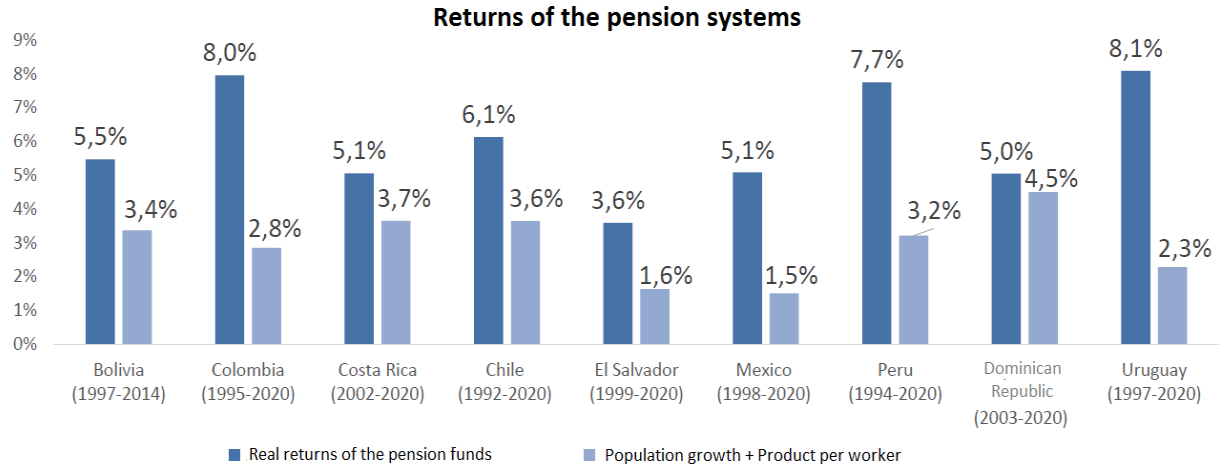
The PAYGO systems are also very regressive in many Latin American countries, since they usually require a minimum number of contributions for being able to access a pension (which does not exist in the individually funded systems) and, those who can retire are the highest-earning and most formal workers. Thus, in countries like Colombia, PAYGO systems not only represent an unsustainable intergenerational transfer, but also a transfer from those with less income to those with more, i.e., a subsidy to the richest.

These figures assume that all active workers contribute, which does not occur in practice in Latin America. Then, if we take labor informality into account when considering the number of workers who actually contribute, the ratio of the number of workers who contribute vs. pensioners in Colombia is reduced from 5 to around 2. This ratio will continue to diminish worldwide due to the so-called digitization of society, the robotization of the internet of things and algorithms, which are replacing human work with robots.

Returns in the individually funded systems are higher than in the PAYGO systems: The second reason why the individually funded systems are superior to the PAYGO systems, is the relative returns of each of these systems. The return of the individually funded systems is the return on investments. PAYGO systems also have a return, namely the growth of the working population plus productivity per worker. The difference between the returns of the individually funded and PAYGO systems is the well-known (r - g) of Thomas Piketty, who in his book "Capital in the 21st century," discusses the concentration of capital and wealth. The book does not extensively address the pensions issue, but mentions and argues that precisely because **r** (return on capital) is higher than **g** (production growth), individually funded systems are superior to PAYGO systems.

Graph 6 shows the relative returns for a number of Latin American countries, in all of which the returns on capital have been significantly higher than the returns from the PAYGO systems estimated in the manner proposed by Piketty.

Graph 6



Source: FIAP and World Bank.

For example, in Colombia the return of the pension funds has been a real 8% per year vs. 2.8% of the growth of the real wage bill, or alternatively, of the growth of the labor force due to productivity. The conclusion of this point is that the individually funded systems can provide better pensions than the PAYGO systems in the long term, and under equal conditions.

Piketty also argues that, in developed countries, such as Spain and the United Kingdom, the transition from a PAYGO to an individually funded system is no longer possible, due to the accelerated aging of their populations, since it would be extremely costly for the State to carry on PAYGO pensions without receiving the contributions of active workers, which would go to the individually funded system. But many Latin American countries managed to switch on time. We have seen that funded components are gradually being integrated into pension systems in Europe and other developed countries.

In the study "Demographic transition, rates of return and replacement rates in funded systems versus PAYGO systems" (CEDE # 15, Universidad de los Andes, 2019)[4] the pension replacement rate by 2050 is calculated as the equilibrium variable for a number of countries, without changes in other variables such as: contributions from the national budget to finance the pension deficit, the retirement age and the contribution rate.

The results are shown in Graph 7, with the dependency rates (the youngest countries to the left and the countries with most aging to the right) on the horizontal axis and the replacement rate calculated as an adjustment variable for maintaining financial balance, on the vertical axis. The solid line is the PAYGO system and the dotted lines show the behavior of the individually funded system for different levels of returns on capital.

Thus, a very young country with a very low dependency rate can pay replacement rates even higher than 100%, comparable to the replacement rates of funded systems with a real interest rate of 5%. It is observed that the replacement rates for countries that are beginning to age are falling in both systems, but with greater intensity in PAYGO systems.

When the dependency rate is high, and only with very low real interest rates (1%), the replacement rates of the PAYGO systems become equivalent to the rates of the individually funded systems.

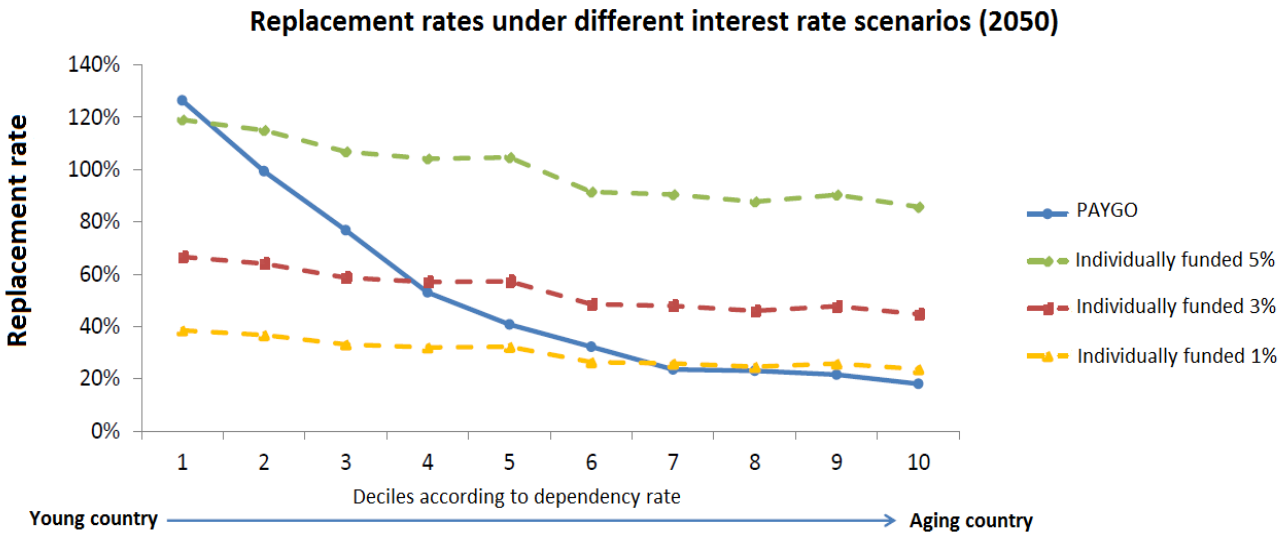
Considering population aging, funded systems beat PAYGO systems in the long-term. This is why there are more and more countries incorporating either individual or collective individual funding components. In 1999 there were only 15 countries with individual funding components worldwide; in 2009 there were 35; and in 2019, 42.

Hence, there is concern in Latin America regarding the political decisions being taken that aim to weaken the individually funded systems, contrary to the opinion of economists and experts. For example, there have been three pension savings withdrawals from pension funds in Chile to date, and Congress is currently deliberating on a fourth withdrawal. In Peru, those who reached retirement age were previously allowed to withdraw 95.5% of their pension savings in a lump sum. A full or partial return to the PAYGO system is being proposed in several countries.

Finally, some considerations regarding the consequences that ending the funded systems in our countries would have, since in addition to making PAYGO pensions unsustainable in the mid/long term, it would have a very negative impact on savings and growth of the economy. In Colombia, the individually funded system is responsible for a permanent growth of half a point of GDP, so by eliminating the individually funded system, there would be less savings, less growth, a devastating impact on the capital market and the allocation of resources of the economy and rising unemployment.

[4] https://repositorio.uniandes.edu.co/handle/1992/41079

Graph 7



Source: Montenegro et al (2019).

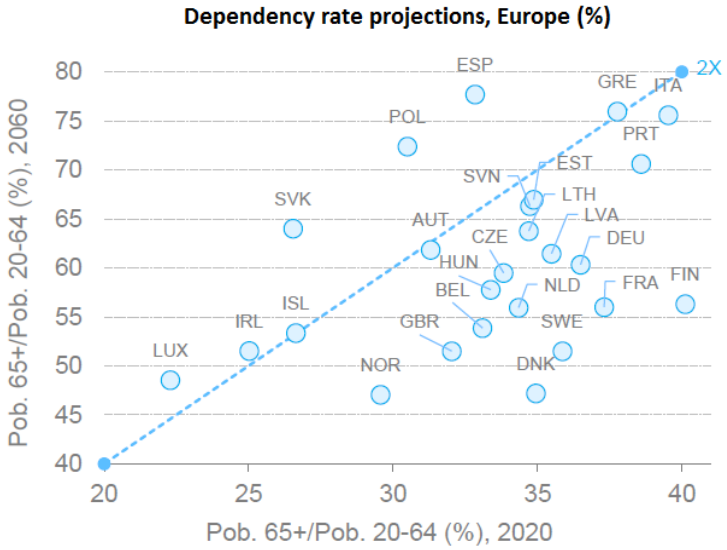
European PAYGO pension systems in the current demographic context

This section addresses the first PAYGO pensions pillar in Europe, its prospects, what European countries are doing to face the aging challenge and what lessons Latin American countries can learn.

One of the advantages in Europe is the economic, social and political project called the European Union, where the knowledge of successful outcomes of some countries serves as guidelines for the gradual changes that must be made in other countries that are further behind in demographic changes. The changes that need to be made are necessary in response to two bits of good news: firstly, we are living longer, and secondly, after the Second World War, especially in the 1950s, Europe experienced a baby boom, with very high birth rates, and those generations are reaching retirement.

Due to these two effects, dependency rates will practically double between 2020 and 2060, as shown in Graph 8.

Graph 8



Source: Doménech (2021).

*Note: ESP = Spain; Pol = Poland; SVK = Slovakia; LUX = Luxembourg; IRL = Ireland; ISL = Iceland; AUT = Austria; SVN = Slovenia; GRE = Greece; ITA = Italy; PRT = Portugal; EST = Estonia; LTH = Lithuania; CZE = Czechoslovakia; HUN = Hungary; BEL = Belgium; GBR = Great Britain; NOR = Norway; NLD = Netherlands; SWE = Sweden; DNK = Denmark; FRA = France; DEU = Germany; FIN = Finland; LVA = Latvia.

The countries on the diagonal of Graph 8, such as Spain, will see their dependency rates more than double, while those that are below the diagonal will see a more moderate increase.

In the PAYGO systems, workers' contributions finance the pensions of retirees. For the system to be self-sufficient, revenue needs to be equal to expenditure. We know that revenue is a relatively stable percentage of GDP, if there are no changes in other variables such as the contribution rate.

Population aging has little practical effect on revenue from contributions in the Gross Domestic Product (GDP) but pension expenditure does, and this can be seen in the following equation:

$$\frac{\text{Pension Expenditure}}{\text{GDP}} = \underbrace{\frac{\text{Pop. 65+}}{\text{Pop.20-64}}}_{\text{Dependency Rate}} \underbrace{\frac{\text{Pensioners}}{\text{Pop. 65+}}}_{\text{Coverage Rate}} \underbrace{\frac{\text{Avg. pensior}}{\text{GDP/employment}}}_{\text{Benefit Rate}} \underbrace{\frac{\text{Pop.20-64}}{\text{Employment}}}_{\text{Inverse of the employment rate}}$$

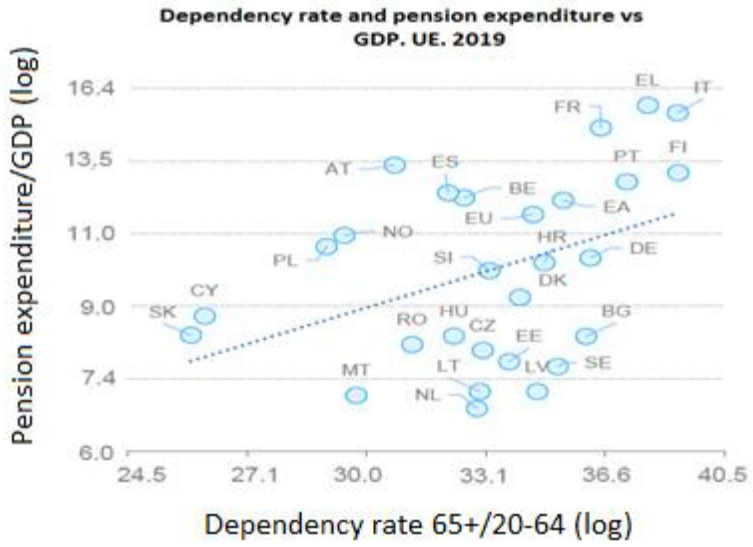
Pension expenditure as a percentage of GDP is proportional to the dependency rate multiplied by the coverage and benefit rates, and inversely proportional to the employment rate. The dependency rate measures the retired population against the working age population; the coverage rate is the number of pensioners vs. the population of retirement age; the benefit rate is the ratio between the average pension and productivity, and finally, a ratio is used that is

the inverse of the employment rate (population of working age vs. employment).

One of the advantages of this break down is that each of these four terms has a unit elasticity, mathematically. This means that if we keep each of the terms in the equation constant, if one of them increases by, for example, 10%, pension expenditure increases in the same proportion (by 10%).

1. Dependency Rate (DR): Graph 9 shows the DR and pension expenditure vs. GDP. European countries show enormous heterogeneity in pension expenditure vs. GDP, from 6.8% in the Netherlands to 15.7% in Greece, both in 2019. DR explains part of these differences (17%); the rest is explained by the other components analyzed below.

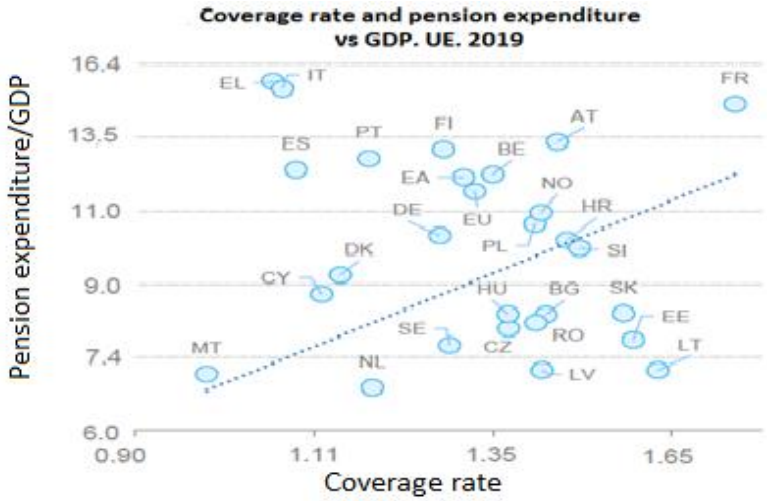
Graph 9



Source: Doménech (2021).

2. Coverage rate (CR): Graph 10 shows the CR and pension expenditure vs. GDP. There are also large differences between countries and the CR explains only 2% of pension expenditure. Countries such as Greece, Spain or Italy have a lower average CR but much higher pension expenditure vs. GDP.

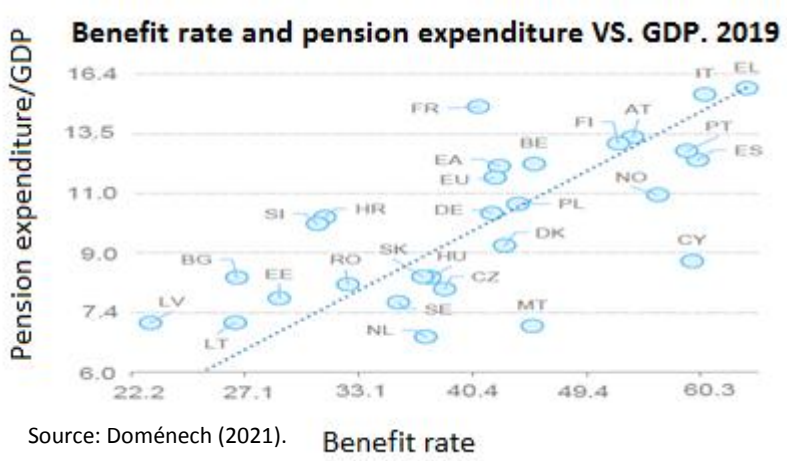
Graph 10



Source: Doménech (2021).

3. Benefit Rate (BR): BR is the variable that most explains pension expenditure vs. GDP (48%) (see Graph 11). Considering that the BR is the average pension vs. the average productivity or the average salary, there are countries such as Spain, Portugal, Greece or Italy in which the average pension vs. this average salary is approximately 60% and others such as Sweden, Holland , Germany and Denmark where it is 40% or less of the average salary.

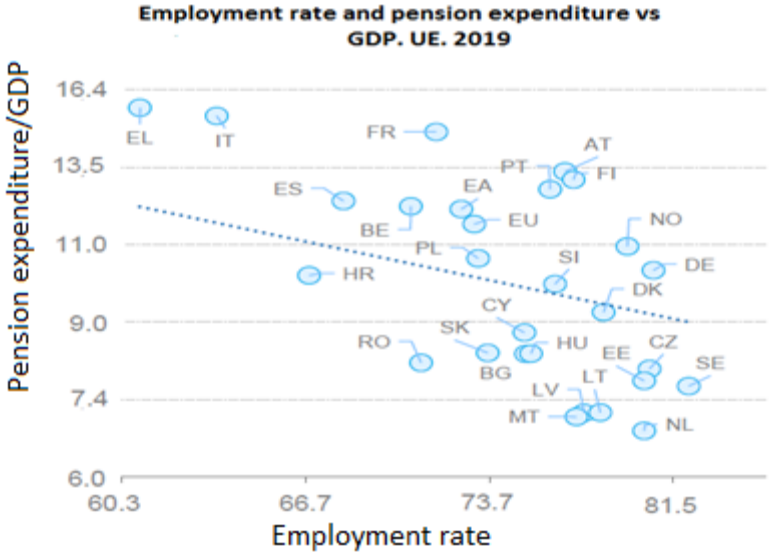
Graph 11



Source: Doménech (2021).

4. The employment rate (ER) is the second most important determinant (see Graph 12), since it explains 39% of the differences in pension expenditure vs. GDP. Differences of more than 20 points are observed in the ER, from 61% in Greece to 82% in Sweden.

Graph 12



Source: Doménech (2021).

The breakdown of pension expenditure vs. GDP in the four previous rates provides lessons regarding the changes that countries should make:

First, reduce the DR by increasing the retirement age. European countries have initiated reforms to gradually increase the retirement age by 2050, and the changes already agreed will raise it from 63.7 to 66.5, on average. The most extreme case is Denmark, which plans to increase the retirement age from 65 to 72. In general, the anticipated increases in the retirement age are still insufficient to compensate for the increase in DR, except in France and Denmark. In Spain, Poland, Ireland or Austria, the difference between the expected increase in the retirement age is 9 years less than that required to maintain the DR.

Second, reduce the BR, known as the generosity of the pension system. Almost all European countries have introduced automatic pension adjustment mechanisms that balance expenditure based on the deficit of the pension system, or calculate the initial pension based on life expectancy, so that the initial pension decreases as life expectancy increases. Changes have also been made to the pension revaluation criteria. In Germany, the Netherlands and Sweden the revaluation of pensions is conditional on the financial balance of the system (in Sweden the revaluation has been negative in some years).

Third, increase the ER, incorporating people into the work force and making employment as productive as possible, in order to increase the revenue of the pension system.

Graph 13 shows the increase in pension expenditure vs. GDP in the next three decades (2019-2050) for each one of the European countries, in terms of Dependency, Coverage, Pension and Employment rates and, in a circle, the total.

Forecasts suggest that pension expenditure vs. GDP will increase by 1.5 percentage points (pp) on average, although with many differences between countries, with a drop of 2 pp in Denmark and an increase of almost 7 pp in Romania.

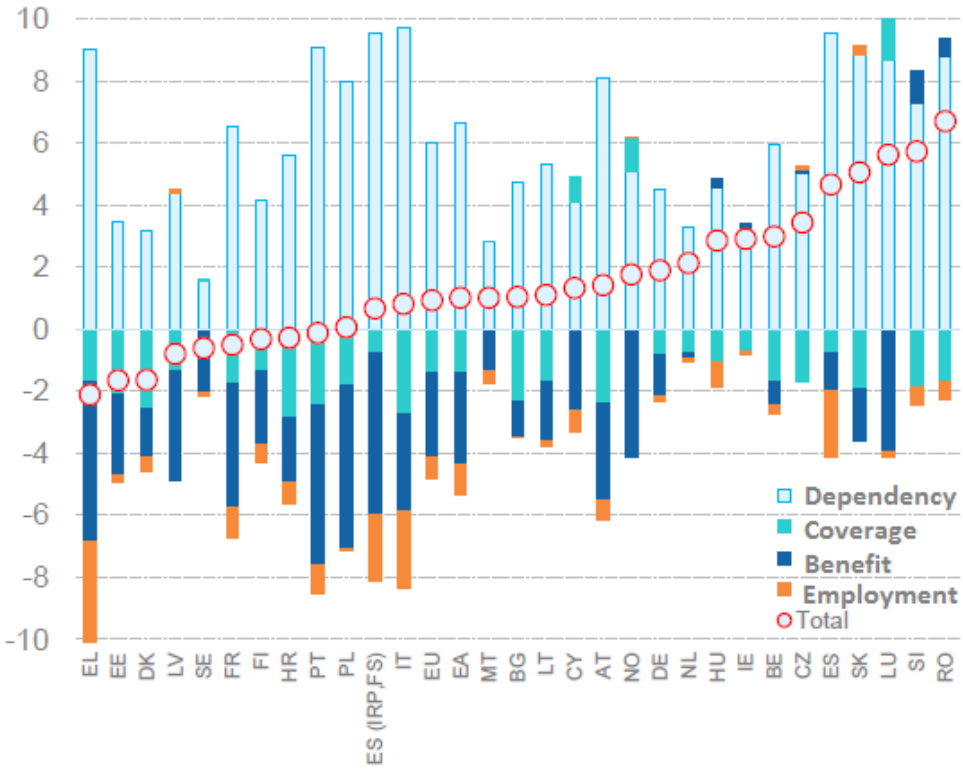
When analyzing the impact of each of these factors, one can see that there is a high increase in all countries, due to the Dependency Rate (around 6pp), as a consequence of population aging, the retirement of the baby-boomers and increased life expectancy. To compensate for this increase, most countries plan to reduce the pension (2.2 pp) and coverage rates (1.3pp) and increase the employment rate (0.7 pp).

In summary, European countries are going to have to make a very important effort in coming years to face the increase in pension expenditure resulting from these two bits of good news, i.e. we are living longer because our life expectancy has increased and very numerous generations are retiring (baby boomers) with a life expectancy greater than previous generations.

Finally, but most importantly, more complementary savings will be needed, because even if the changes required by the PAYGO system are applied, they will provide lower replacement rates in the future. To compensate for this reduction, there is no alternative other than increasing complementary savings in the second (corporate plans) or third (individual plans) pillars.

Graph 13

Increase in pension expenditure from 2019 to 2050, in % of GDP



Source: Doménech (2021).