PENSION NOTES

Global trend: The unsustainability of the PAYGO systems drives individually-funded mechanisms

Executive Summary

The fiscal and demographic pressures faced by PAYGO systems worldwide have driven a number of changes in their parameters, reflecting their deep unsustainability issues. This has led a number of countries to successfully implement individually-funded mechanisms to improve pensions, a trend that will continue in the future.

The first part of this document addresses those emblematic countries that have made the most parametric changes in their PAYGO systems in the last decade, namely Greece, Portugal, the United Kingdom, Nicaragua, Russia, Italy, France, Brazil and Spain. Government expenditure on the public PAYGO systems in these countries accounts for 12% of GDP on average, the system deficit is 2.7% of GDP and demographic trends show that ever fewer active workers can finance a retiree's pension, dropping from just over 11 in 1950, to 2.4 by 2060. Another way of visualizing the strong demographic change is that in order to maintain pension amounts and conditions over time, countries would have to increase their contribution rates by almost 5 times, on average, which is clearly impractical.

There have been numerous changes in the countries analyzed, ranging from 4 (e.g. In the UK and France) to 7 (e.g. in Greece). One must consider the profound magnitude of the reforms, which eventually worsen the conditions of pensioners. For example, contribution rates have increased to levels exceeding 30% of workers' salaries (Nicaragua and Russia), or that workers must now contribute for up to 53 years to access a full pension (Nicaragua).

All of the above lead to the following conclusion: (i) There is no denying the unsustainability of the PAYGO systems; (ii) Countries have therefore been forced to systematically conduct parametric reforms; (iii) The PAYGO systems have failed to deliver their promised benefits; and finally (iv) All of these parametric changes entail a considerable social and political cost, adversely affecting the well-being of the adult population.

The second part of the document provides a detailed account of the individually-funded mechanisms implemented in a number of emblematic countries with high levels of individual funding, i.e. with individually-funded and private funds exceeding 25% of their GDP. The countries examined are Australia, Canada, Chile, Denmark, Israel, the Netherlands, New Zealand, the United Kingdom and the United States.

The replacement rate percentage paid by private systems for an average worker in these countries is very high, ranging from 32% in New Zealand to 100% in Australia and Chile. The individually-funded private funds, on the other hand, range from 27% of GDP in New Zealand to 199% of GDP in Denmark. The success of implementing these mechanisms is evident on observing that the countries with the highest savings, achieved through the individually-funded system, rank in the top 6 of the Mercer 2020 Index.

From this second part of the study it can be concluded that: (i) Individually-funded mechanisms have been incorporated in different ways worldwide, with significant levels of capitalization, with funds amounting to a weighted average of 82% of GDP in OECD countries; (ii) These higher levels of capitalization will help countries to shore up the depleted replacement rates provided by the PAYGO systems, improving their sustainability; and (iii) The incorporation of individually-funded mechanisms has been successful, as evidenced in their ranking in Mercer's index.

I.   Introduction

Ongoing population aging, caused by rising life expectancy and declining birth rates, means that there will be ever fewer active workers financing the pensions of retirees.

This situation, which will become more acute in coming decades, is generating increasing financial unsustainability in the public PAYGO systems, further exacerbated by high informality rates (54% of total employment in Latin America), which in practice means that the number of workers contributing to financing current pensions is significantly lower.

The unsustainability of the PAYGO systems forces them to permanently modify their key parameters, increasing the retirement age and contribution rates, introducing stricter conditions for accessing pensions and/or adjusting the benefits formula/level, infringing their promise to provide workers with defined benefits.

This situation is strongly encouraging the search for new capitalization mechanisms to help complement the depleted and increasingly low replacement rates provided by the public PAYGO systems.

Many countries that were unable to assume the expenses entailed in the transition to an individually-funded system, for fiscal reasons, have had to complement the pensions deficit in their PAYGO systems with public funds, thus creating unmanageable fiscal pressure.

Added to the above is the long-term "hidden cost" of promised future pension obligations, the present value of which is known as "implicit debt," which in some countries more than quadruples their GDP.

The indebtedness and fiscal pressures of these countries have occurred despite constant parametric changes (see Figure 1), to keep their PAYGO schemes afloat.
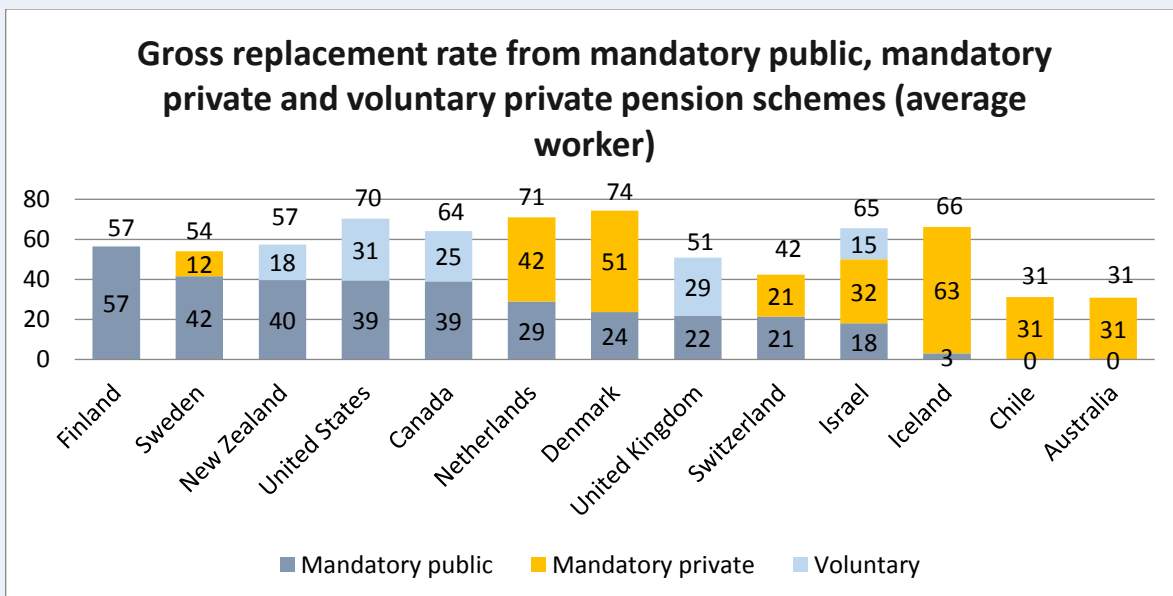
Figure 1

Countries that have made adjustments to the
PAYG system parameters: 1995-Dec. 2020
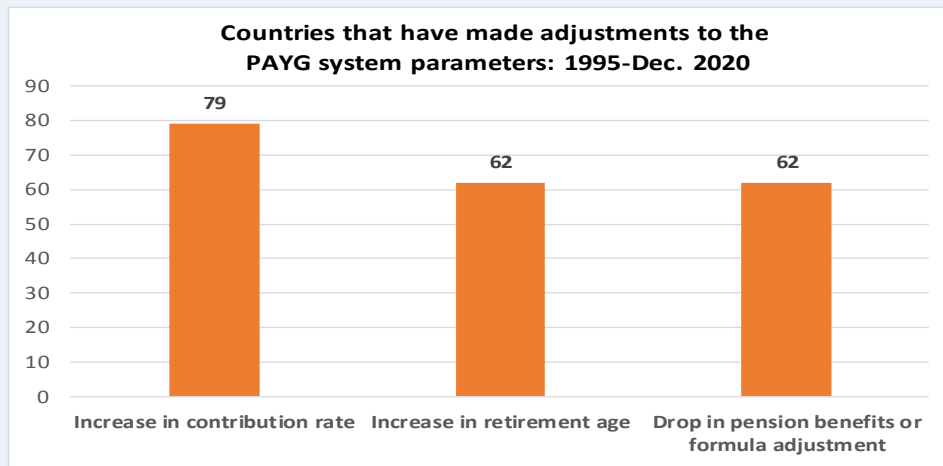
Due to the reduction in pension amounts that retirees will continue to experience in the PAYGO systems, a significant number of OECD countries have introduced individually-funded components.

In fact, the current replacement rate (RR), defined as the pension amount as a proportion of the last wage received, is 40% for the OECD PAYGO systems. If pensions financed by individually components are added, the RR increases to 55%.

As can be seen in Figure 2, the RR paid for by private systems is very important in an increasing number of developed countries, and is a key factor in countries ranking at the top of the Mercer Index, such as the Netherlands, Denmark, Israel and Australia.

Figure 2

Gross replacement rate from mandatory public, mandatory private and voluntary private pension schemes (average worker)

On observing the OECD countries with individually-funded and private fund levels of more than 25% of GDP (high), it can be seen that they all rank high in the Mercer 2020 Index (see Figure 3). Moreover, this group includes all the countries ranking in the top 6 positions of this index.

Figure 3

Assets in funded and private pension plans (as a % of GDP)
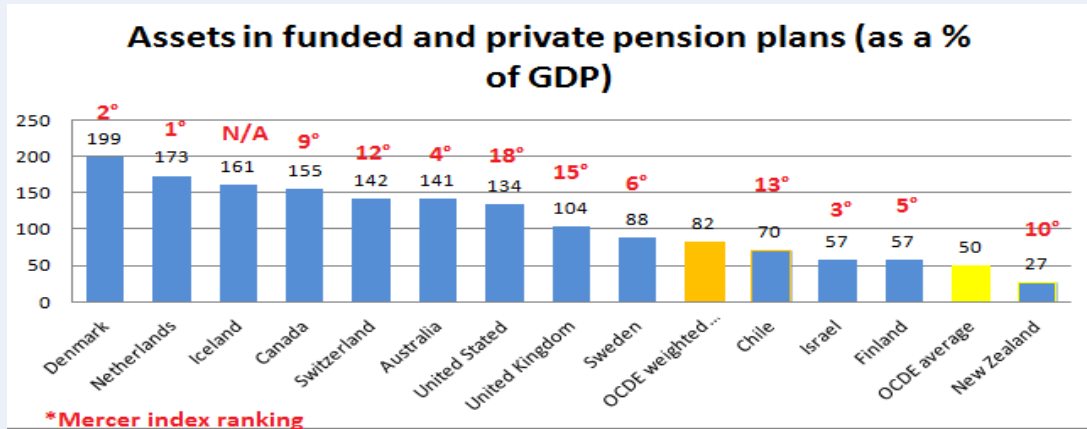
Source: FIAP, based on Pensions at a Glance 2019 (OECD) and Mercer CFA Institute Global Pension Index 2020; data on funds as a percentage of GDP, for 2018, or the last available date.

The parametric changes that a number of countries, such as Greece, Portugal, the United Kingdom, Italy, France, Spain, Russia, Brazil and Nicaragua, have had to make to temporarily alleviate the finances of their PAYGO systems, together with an analysis of the fiscal and demographic pressures faced by those countries, will be presented below.

Subsequently, a second part of the analysis will describe the individually-funded mechanisms incorporated by a number of countries in whose economies pension funds are currently extremely important for shoring up the depleted replacement rates that will be provided over time by the PAYGO systems.

II. Iconic examples of countries that have made major changes to the parameters of their PAYGO systems

Based on previous FIAP research[1], this section discusses the countries that have made the most changes to the parameters of their PAYGO systems between 2009 and 2020, due to the fiscal and demographic pressures they face.

To this end, the evolution and projections of the following four variables were considered for the countries with the greatest changes. First, the tax expenditure on public PAYGO system pensions (% of GDP). Second, the deficit of the public PAYGO system (income from contributions minus system expenditure, as a % of GDP). Third, the "Funding Ratio" of the public PAYGO system, which measures the percentage of the public PAYGO system debt covered by the assets of this system. Fourth, the old age dependency rate, measured as the number of active workers per retiree (population between 15 and 64 vs. population aged 65 and over). Table 1 shows these four indicators for each one of the selected countries.

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[1] FIAP (2020). "Parametric Reforms in the Public PAYGO Pension Programs 1995 – December 2020."

Table 1

Fiscal and demographic indicators for PAYGO systems in selected countries

Country	Average annual fiscal expenditure on pensions in the PAYGO system (% GDP) (1)	Average annual fiscal deficit of the PAYGO system (% GDP) (1)	Average Funding Ratio of the PAYGO system (%) (2)	Old age dependency rate (No. of active workers per retiree) (3)	
				1950	**2060**
Greece	12%	0.5%	-	9.6	1.7
Portugal	14%	2%	-	9.1	1.8
United Kingdom	8%	-	91%	6.2	2.5
Nicaragua (a)	3.1%	2.2%	-	19.4	4.1
Russia (b)	10.8%	-	-	13.5	2.8
Italy	17%	5.9%	-	8.1	1.7
France	15%	2.8%	-	5.8	2.3
Brazil (c)	13%	4.8%	-	18.6	2.7
Spain	13%	0.4%	-	9.2	1.6
Average	**12%**	**2.7%**		**11.1**	**2.4**

(1) Source for European countries: FIAP based on "The 2018 Aging Report: Economic and budgetary projections for the 28 EU Member States (2016-2070), European Commission." For European countries, average fiscal expenditure and the deficit for the 2016-2060 period.

(2) Source: FIAP based on "OECD Pension Market in Focus 2019."

(3) Source: FIAP based on "United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1.". The "Potential support ratio (15-64/65+)" variable is used, based on the unchanged estimate.

(a) Nicaragua: The table shows the fiscal public pensions expenditure for 2010 and the fiscal deficit of 2019 (Source: PENSIONS OVERVIEW: LATIN AMERICA AND THE CARIBBEAN © OECD, WORLD BANK and IDB 2014; https://www.iniet.org/wp-content/uploads/2020/03/Nicaragua-Presentation-en-INIET-9-3-2020..pdf; https://www.elibrary.imf.org/view/IMF002/24388-9781484305645/24388-9781484305645/24388-9781484305645_A001.xml?language=enandredirect=true).

(b) Russia: The average fiscal expenditure shown considers the years 2015 and 2050 (Source: Global Aging 2016: 58 Shades of Gray).

(c) Brazil: The average fiscal expenditure shown considers the years 2015 and 2050 (Source: Global Aging 2016: 58 Shades of Gray). The deficit is from 2017 (Source: https://www.economist.com/the-americas/2017/02/25/reducing-brazils-pension-burden).

As can be seen, the fiscal expenditure of the public PAYGO system in the sample of countries examined, is 12% of GDP, on average, whereas the system deficit is 2.7% of GDP. In these countries, moreover, demographic trends show that ever fewer active workers finance a retiree's pension, from just over 11 in 1950, to 2.4 by 2060. Another way of visualizing the strong change in the dependency rate, is that in order to maintain pension amounts and conditions over time, countries on average would have to increase their contribution rates by almost 5 times, which is clearly impractical.

Below are the results found, by country.

Greece

European Commission projections show that the average annual tax expenditure on pensions in the PAYGO system between 2016 and 2060, is 12% (increasing trend up to 2040, and declining thereafter to 2060), while the average deficit in the same period is around 0.5% of GDP (decreasing trend to 2035 and growing thereafter to 2060). The old age dependency rate, in turn, shows an extremely negative trend, from almost 10 active workers per retiree in 1950, to 1.7 in 2060.

Faced with this bleak fiscal and demographic outlook, the government's response has been to curtail pension spending by making the adjustments shown below (see Table 2).

Table 2
Greece: Most relevant parametric changes in 2009-2020

Variable	Description	Date of approval and/or enforcement
Retirement age increase	**From 60 to 65 for women** (gradual), from 2011 to 2013, equaling the retirement age of men	Passed in June 2010
	65 to 67 for men and women (gradual, for accessing a full pension); **adjusted in accordance with life expectancy since 2020**.	Passed in Nov. 2012
Stricter conditions for accessing pensions	**Increase** in the **minimum number of years of contributions** required for accessing a full pension, **from 37 to 40 years, as of 2015.**	Passed in June 2010
Pension adjustments	**Pensions have been pegged to variations in the CPI since 2014** (rather than changes in public PAYGO pensions) and are calculated **based on the average full working career salary** (The best 5 years of wages in the last 10 years prior to retirement were previously considered).	Passed in June 2010
	Pensions were frozen in 2011-2013 (i.e. They maintained their 2010 level, since they were not indexed).	Passed in June 2010.
	As of January 2013, pension amounts greater than USD 1,299 were reduced by 5%-15% (depending on income level)	Passed in Nov. 2012.
	The **pension freeze** approved in Jun. 2010 **was subsequently extended** until 2015, and then until 2022 (this means that there have been no pension adjustments for CPI or inflation, **between 2010 and 2022**).	Passed in Nov. 2012. and later in May. 2017

Source: see Appendix.

Portugal

In this country, there is an estimated average annual expenditure of 14% of GDP in the PAYGO system (relatively stable trend over the years), with a deficit of 2% of GDP, on average (rising until 2040 and declining thereafter to 2060). Meanwhile, the evolution of the old age dependency rate shows that in 1950 there were just over 9 active workers per retiree, and that by 2060 that figure will shrink to 1.8.

These circumstances have forced the government to make adjustments to the fundamental variables of its PAYGO system, shown below (see Table 3).

Table 3
Portugal: Most relevant parametric changes in 2009-2020

Variable	Description	Date of approval and/or enforcement
Retirement age increase	**From 65 to 66 for men and women**. Workers may retire at 65 with a full pension if they are "legally prevented" from working beyond that age (early retirement was suspended in May 2012).	Approved in Dec. 2013; effective as of Jan. 2014.
	From 66 to 66 years and 3 months (automatic increase tagged to the increase in life expectancy).	Approved in April 2016; in force as of Jan. 2017.
Pension adjustments	**Modification of the Sustainability Factor** for calculating the pension as of 2015 (now based on **life expectancy in 2010** and not 2006), which implies a **12% reduction in the initial pension** (instead of a 5% pension reduction under the previous rule).	Approved in Dec. 2013; in force as of Jan.2015.
	Freezing of public pensions in 2011 (i.e. Pensions remained the same as in 2010, since they were not indexed).	Approved in 2010
	Introduction of a special tax for pensions over USD 1,985 per month as of 2011.	Approved in 2010

Source: see Appendix.

United Kingdom

In this case, the average annual fiscal expenditure is lower than that of the preceding countries, but is also a significant percentage of GDP: 8%, with a relatively increasing trend over the years. If one looks at the financing ratio, in turn, one finds that, on average, 91% of the public PAYGO system's debt is covered by the assets of this pension system (relatively stable trend over the years). However, the evolution of the old age dependency rate is negative, as in all the countries analyzed: from 6.2 active workers per retiree in 1950, to 2.5 in 2060.

The government decided to address fiscal and demographic pressures, making the following adjustments to its public PAYGO system (see Table 4).

Table 4
United Kingdom: Most relevant parametric changes in 2009-2020

Variable	Description	Date of approval and/or enforcement
Retirement age increase	**From 66 to 67 (gradual), for men and women**, between 2026 and 2028 (8 years earlier than what was originally established).	Approved in May. 2014.
	From 67 to 68 (gradual), for men and women, between 2037 and 2039 (the previous timetable envisaged increasing it between 2044 and 2046).	Approved in July 2017.
Stricter conditions for accessing pensions	**Increase in the minimum number of years of contributions required for accessing a full pension, from 30 to 35 years.**	Approved on May.2014, effective as of Apr. 2016.
Pension adjustments	**Pensions will be adjusted annually only by the average increase in wages** (previously adjusted annually by wage growth and inflation, with a minimum increase of 2.5% per annum).	Approved on May.2014, effective as of April 2016.

Source: see Appendix.

In addition to these adjustments, the government decided to improve pension savings levels thus underpinning the replacement rates provided by the public system, through the implementation of an automatic enrollment mechanism in voluntary individually-funded savings plans, as of 2012. This is an emblematic case, as it was the first country to massively include this public policy in its pension system. The mandatory minimum contribution to this system has been 8% of total salary as of April, 2019 (3% by the employer, 4% by the worker and 1% by the State). The implemented system is considered highly successful, since more than 10 million workers were automatically enrolled as of June 2020, and 91% of them remain in the system (only 9% decide to opt out). Studies indicate that the system has also convinced small and medium-sized enterprises (SMEs) and lower income individuals to save for retirement.

Nicaragua

The information available for this country, one of the two Latin American countries of the sample analyzed, indicates that government expenditure on public PAYGO system pensions in 2010 was 3.1% of GDP, which is higher than in Central American countries with older systems, greater coverage and additional benefits (e.g. Costa Rica 2.8% and Panama 3%)[2]. Studies also show that the PAYGO pension system had a deficit in 2013 (0.1% of GDP), which had to be financed from public reserve funds. The deficit is estimated to have increased to 2.2% of GDP in 2019, and reserves would have already run out by 2019-2020. Finally, looking at the demographic variable, there is a drastic reduction in the number of active workers that support a retiree: from 19.4 in 1950 to 4.1 in 2060, which will further aggravate the financial imbalance of the system in the future.

Faced with these tremendous fiscal and demographic pressures, the country was forced to make significant adjustments, which had enormous social and political repercussions, reflected in the massive protests against them. The adjustments were implemented, despite strong social opposition (see Table 5).

Table 5
Nicaragua: Most relevant parametric changes in 2009-2020

Variable	Description	Date of approval and/or enforcement
Contribution rate increase	**From 25.5% to 31.25% in total** (for companies with more than 50 employees).	Approved in Jan. 2019, in force as of Feb. 2019.
Stricter conditions for accessing pensions	**Increase in the number of years of contributions** required for accessing a full pension, **from 40 to 53.**	
Pension adjustments	**Pensions are now calculated based on the average salary of the last 7.8 years (formally the last 5.2 years).**	
	Less generous pension calculation formula. **The pension is now 20% of the average monthly salary of the insured, plus 1% for every 52 weeks of contributions exceeding 150 (previously the pension was 37% of the average monthly salary + 1.15% for every 52 weeks of contributions exceeding 150,** for people with average incomes of more than twice the minimum wage). The formula adjustment **is expected to reduce pension amounts** for most new retirees **by 30% to 40%.**	
	The full pension replacement rate was reduced from 80% to 70%.	
Tax ceiling adjustment	**The tax ceiling was eliminated, so workers will contribute on their full salary.**	

Source: see Appendix.

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[2] Source: https://www.iniet.org/wp-content/uploads/2020/03/Nicaragua-Presentacion-en-INIET-9-3-2020..pdf

Russia

Available information shows growing tax expenditure on the pensions of the public PAYGO system, increasing by more than 3 percentage points between 2015 and 2050, amounting to 12.4% of GDP in that year (average expenditure is in the order of 10.8%). The old age dependency rate, in turn, shows a significant decline, from 13.5 active workers per retiree in 1950 to 2.8 in 2060.

These pressures have justified the adjustments made to the public PAYGO system, which are summarized below (see Table 6).

Table 6
Russia: Most relevant parametric changes in 2009-2020

Variable	Description	Date of approval and/or enforcement
Contribution rate increase	**From 26% in 2010 to 34%,** as of 2011.	Approved in July 2009; effective as of Jan.2011.
Retirement age increase	**60 to 65 for men and 55 to 60 for women (**by 1 year per calendar year), as of 2019.	Approved in Oct. 2018, in force as of Jan. 2019.
Stricter conditions for accessing pensions	**Gradual increase** in the **minimum number of years of contribution**s required to qualify for a full pension, **from 6 to 15 years** by 2024 (at least 5 years of contributions were required prior to the reform).	Approved in 2014; in force as of Jan.2015.
Pension adjustments	**Pension indexing** pegged to inflation was suspended for working pensioners, as of **the second half of 2016** (the measure is still in effect to date).	Approved in Aug. 2016.

Source: see Appendix.

Italy

This country has the largest average pension expenditure in the public PAYGO system, bordering on 17% of GDP (rising trend until 2040, and declining thereafter until 2060). It also has the largest deficit of the sample: 5.9% on average (increasing trend until 2040 and declining thereafter until 2060). The old age dependency rate also shows a negative evolution: there were 8.1 active workers per retiree in 1950, but there will be only 1.7 by 2060.

These pressures, as in other countries, have made it necessary to make the following adjustments (see Table 7).

Table 7
Italy: Most relevant parametric changes in 2009-2020

Variable	Description	Date of approval and/or enforcement
Retirement age increase	**61 to 65 (one-off) for women in the public sector**, (equal to the retirement age for men in the public and private sectors).	Approved in July 2010; in force as of Jan.2015.
	65 to 66 (men) and 60 to 62 (women), in all sectors, as of 2012; the retirement age for men and women has **automatically increased** in accordance with variations in **life expectancy, as of 2013**. In 2018, retirement ages for men and women were set at age 66. The retirement age for men and women then rose to 67 in 2020. It is estimated that **the retirement age will be 69 years and 9 months by 2050**.	Approved in Dec. 2011; effective as of Jan.2012.
Stricter conditions for accessing pensions	Stricter requirements were established for early retirement. Previously, it was available: (i) for those aged 62 or more who had contributed for 35 years; and (ii) for those who had contributed for 40 years, regardless of age. **As of 2012, early retirement has only been available to men with 42 years and 1 month of contributions, and for women with 41 years and 1 month of contributions.** These requirements have been automatically linked to life expectancy increases as of 2013.	Approved on Dec.2011, in force as of 2012.
Pension adjustments	**Pensions greater than USD 1,825,** were frozen (i.e. not indexed to inflation) in **2012 and 2013.**	Approved in Dec. 2011.

Source: see Appendix.

France

This country boasts the second highest level of average expenditure on its public PAYGO system, after Italy: 15% of GDP (moderately rising trend until 2030, declining thereafter to 2060). The average deficit, 2.8% of GDP, is the same (increasing trend until 2030, declining thereafter until 2060). The old age dependency rates, as in other countries, shows a negative trend: from 5.8 active workers in 1950, to 2.3 in 2060.

These trends have forced the government to make significant adjustments to its system, as shown below (see Table 8).

Table 8
France: Most relevant parametric changes in 2009-2020

Variable	Description	Date of approval and/or enforcement
Contribution rate increase	**Gradual, from 6.75% to 7.05% (workers) and 8.4% to 8.7% (employers),** from 2014 to 2017.	Approved in Dec. 2013; in force as of 2014.
Retirement age increase	**60 to 62 years** for men and women (**minimum retirement age**), **and 65 to 67 years** for men and women (**full pension**).	Approved in Nov. 2010; in force as of 2018.
	Acceleration in the retirement age increase calendar approved in 2010. With this change, the retirement age for men and women will increase by 4 months per year, from 60 to 62 (for reduced early pensions), and from 65 to 67 (for full pensions), **as of 2017** (instead of 2018).	Approved in Dec. 2011; in force as of 2017.
Stricter conditions for accessing pensions	**Increase in the number of years of contributions** required for accessing a full pension, **from 41.5 to 43 years,** gradually from 2020 to 2035 (the increase in this requirement from 40 to 41.5 years by 2020, was approved in 2003).	Approved in Dec. 2013; in force as of 2020.

Source: see Appendix.

It is worth mentioning that the French government was so convinced that adjustments were needed to ensure the sustainability of the pension system, that in 2019 it proposed reforming the PAYGO system by incorporating individual funding mechanisms. The proposal consisted in merging the 42 existing PAYGO systems, and also creating a system in which workers can purchase "points" with their contributions throughout their working lives. The purchase price of these "points" would increase in line with the average wage. On reaching retirement age, the accumulated points would allow workers to calculate their pensions, so that each $ contributed would grant them the same rights, regardless of the system they are enrolled in. However, this reform was ultimately not passed.

Brazil

In this country, the data show growing fiscal expenditure on the pensions of the public PAYGO system, increasing by more than 7 percentage points between 2015 and 2050, amounting to 16.8% of GDP in that year (average expenditure is in the order of 13%). The old age dependency rate, in turn, shows a tremendous drop from nearly 19 active workers per retiree in 1950, to 2.7 in 2060.

These pressures have undoubtedly influenced government decisions to adjust the parameters of its public PAYGO system, as can be seen below (see Table 9).

Table 9
Brazil: Most relevant parametric changes in 2009-2020

Variable	Description	Date of approval and/or enforcement
Retirement age	**Minimum retirement age of 62 for women and 65 for men** [**previously,** there was no minimum retirement age, and **women could only retire after 30 years of contributions, and men after 35 years].**	Approved and in force as of Nov. 2019.
Stricter conditions for accessing pensions	Rule **"85/95"** is applied, so that **the sum of the worker's age and number of years of contribution should be equal to or greater than 85** points, for women, and equal to or greater than **95 points for men** (for example, if a 55-year-old woman contributed for 30 years, she is entitled to a full pension). The law includes an increase of one point in the rule every two years, from 2018 to **2026, when the formula will be "90/100"**(i.e.in order to access a pension, the sum of the person's age and number of years of contributions must be 90 for women, and 100 for men).	Approved and in force as of June 2015.
	Increase in the minimum number of years of contribution required for accessing a full pension, from 15 to 20 years for men (remaining unchanged for women, at 15).	Approved and in force as of Nov. 2019.
Pension adjustments	The **monthly old-age pension as of Nov. 2019 is 60% of the worker's average monthly salary, plus 2% for each year of contributions** exceeding15 years (for women) or 20 years (for men). **Previously, the monthly pension was 70% of the worker's average monthly salary** plus 1% for each year of contributions. Furthermore, the average monthly salary used to calculate the pension is now based on the entire working life and not on 80% of the highest wages.	Approved and in force as of Nov. 2019.

Source: see Appendix.

Spain

In this country the projections show an average annual expenditure in the PAYGO system in the order of 13% of GDP (increasing trend until 2045, declining thereafter until 2060), whereas the deficit is at an average of 0.4% of GDP (declining surplus trend through 2030, growing deficit between 2035 and 2045, and declining deficit between 2050 and 2060). Meanwhile, the evolution of the old age dependency rate shows that in 1950 there were 9.2 active workers per retiree, dropping to 1.6 by 2060.

Thus, this scenario has forced the Spanish government to make significant parametric adjustments to its PAYGO system, as shown below (see Table 10).

Table 10.
Spain: Most relevant parametric changes in 2009-2020

Variable	Description	Date of approval and/or enforcement
Retirement age increase	**65 to 67 (gradual), for men and women** between 2013 and 2027.	Approved in Aug. 2011; in force as of Jan. 2013.
Stricter conditions for accessing pensions	**Gradual increase in the minimum number of years of contribution required**, **from 15 to 25 years** by 2022 (reduced pension), and **from 25 to 38.5 years** by 2025 (full pension).	Approved in Aug. 2011; in force as of Jan. 2013.
Pension adjustments	Introduction of the "**Sustainability Factor,**" which links the pension to the evolution of life expectancy.	Approved in Dec. 2013; it should have been applicable as of 2019, but has been postponed **to date**.
	Introduction of the "**Revaluation Index,**" which resets pensions with a minimum of 0.25% and a maximum ceiling equal to the previous year's CPI + 0.5%, if the economic situation allows.	Definitively approved in Dec. 2013; effective as of Jan. 2014. In practice, **however, revaluation has exceeded this index as of 2019.**

Source: see Appendix.

Conclusions of this section:

1. **There is no remedy for the unsustainability the PAYGO systems**. Aging (characterized by higher life expectancy and lower birth rates) and high levels of work informality, have made the PAYGO systems financially unsustainable, since the revenue from contributions is not enough to cover pensions expenditure. Thus, countries have had to allocate a significant part of their budget to cover pension payments, generating unmanageable fiscal pressures.

2. **As a result of the financial unsustainability of the PAYGO systems, countries have been forced to systematically carry out parametric reforms** over the years, in order to ensure their financing only temporarily. Hence, once funding becomes unsustainable again, governments have had to implement new parametric reforms to keep the system afloat. Making such reforms incessantly cannot be sustainable or viable, by any reckoning.

3. **The PAYGO systems have broken their promise regarding the pensions they will provide**. In many cases, retirement ages and contribution rates have been raised, while establishing stricter conditions for accessing pensions, adjusting benefits formulas to make them less generous or simply reducing the replacement rates that the system provides. Due to all the above, these systems have continuously broken their promise of benefits to workers.   In the countries we analyzed:

    (i) The retirement age has been increased to 68 (UK), with adjustments being automatic in some cases, depending on increases in life expectancy (Greece, Portugal, Italy).
    (ii) The contribution rate has increased to levels exceeding 30% of the worker's salary (Nicaragua, Russia).
    (iii) In order to access a full pension, workers must now contribute for at least a greater number of years, starting with 40 in Greece, 43 in France, and up to 53 years in Nicaragua.
    (iv) The basis for calculating pensions is now less generous, since instead of considering the years with the highest wages, the salary throughout working life is considered (Greece, Norway, Brazil).
    (v) The pension calculation formula is also less generous, since it is indexed only by inflation (Greece) or only by wage growth (UK).
    (vi) Pensions could not be adjusted for inflation for several years (Greece, Portugal, Italy), thus losing their value in real terms.
    (vii) Reductions in the order of 10 to 17 percentage points have been made in the replacement rate (Brazil and Nicaragua, respectively), as well as reductions in pensions of between 5% and 15% (Greece, Portugal).

4. **All of these parametric changes entail a considerable social and political cost, adversely affecting the well-being of the adult population**. For example, increasing contribution rates can negatively affect employment levels, formality, and wages. Also, reducing or freezing replacement rates has a negative impact on lower-income retirees, which can increase inequality and poverty within the adult population.

III. Description of pension systems in countries with high levels of individual funding

The unsustainability of the PAYGO systems has led countries around the world to adopt individually-funded mechanisms, which have become the dominant trend, particularly in those countries ranking high in the Mercer Index.

The analysis considers the most emblematic countries with significant levels of individual funding (individually-funded private pension funds above 25% of GDP; see Figure 3).

Australia

The Australian pension system comprises 3 pillars:

First pillar: universal, non-contributory public pension.

Second pillar: contributory, individually funded, occupational and mandatory (Superannuation Guarantee), approved in 1992

Third pillar: Voluntary savings (Retirement Savings Accounts), offered by banks and life insurers; approved in 1997.

The second pillar may be privately or publicly managed, with a wide variety of types of pension funds (i) employer-sponsored corporate funds; (ii) industry funds, open only to employees in a particular industrial sector; (iii) public sector funds, covering public sector employees; (iv) retail funds offered to the public and employers by financial service providers; and (v) small funds (less than five members), in which each member is also a trustee of the fund.

Below are some key parameters of the Australian pension system.

Contribution rate	9.5% to the second pillar
Individually-funded funds, managed as a % of GDP	140.70%
Retirement age	65 for men and women (will rise to 67 by 2023)
Percentage of the total gross replacement rate paid by the private system for an average worker	100%
Mercer's index ranking	4°

Source: Pensions at a Glance 2019 (OECD).

Canada

The system consists of three pillars:

First Pillar: Universal Fixed Pension (Old Age Security Program)

Second pillar: income-related pension (Canada Pension Plan) financed under PAYGO and collective individually-funded systems.

Third pillar: Voluntary Individually-funded plan. Comprises Registered Pensions Plans (RPP), approved in 1957 and Registered Retirement Savings Plans (RRSP)

Registered Pension Plans (PTR): Occupational plans, accumulated by the employer or Jointly by the employer and employee. They can be defined-benefit, defined-contribution or hybrid. Contributions are tax deductible.

Registered Retirement Savings Plans (RRSP): Individual state-assisted savings system; plans are offered by banks and insurers. Contributions are tax-exempt until withdrawal and can be made up to age 71, at which point they must be converted into a pension. Workers can make contributions of up to 18% of their wages.

Below are some key parameters of the Canadian pension system.

Contribution rate	9.9% to the public system
Individually-funded funds, managed as a % of GDP	155.2%
Percentage of the total gross replacement rate paid by the private system for an average worker	39%
Mercer's index ranking	9°

Source: Pensions at a Glance 2019 (OECD).

Chile

The system consists of three pillars:

First Pillar: public, focused on lower-income people; non-contributory. Known as the solidarity pillar.

Second pillar: mandatory private contributory system based on savings and individual funding, approved in 1981

**Third pillar:** private voluntary savings system with tax incentives.

Pension Fund Managers (AFPs) are private companies responsible for collecting and managing the funds corresponding to second pillar pension contributions.

Below are some key parameters of Chile's pension system.

Contribution rate	12.38% to the second pillar[3]
Individually-funded funds, managed as a % of GDP	70.2%
Retirement age	60 for women and 65 for men
Percentage of the total gross replacement rate paid by the private system for an average worker	100%
Mercer's index ranking	13°

Source: Pensions at a Glance 2019 (OECD).

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[3] Fee includes disability and survival insurance costs.
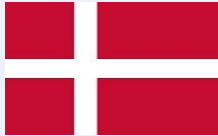
Denmark

First pillar: a basic universal public pension and complementary benefit for low-income pensioners, both tax-financed; and a mandatory defined contribution collective savings pension plan (**ATP**), approved in 1964

Second pillar: voluntary, privately managed individually-funded occupational plans (**AMP**), created between 1989 and 1991

Third pillar: fully voluntary complementary pension plans.

The ATP is publicly managed. The AMP is privately managed.

Below are some key parameters of the Danish pension system.

Contribution rate	In the ATP (mandatory), it is a fixed amount that varies by the number of hours worked. In the AMP (voluntary), contribution to occupational plans ranges from 10% to 18%, with an average value of 12% (2018).
Individually-funded funds, managed as a % of GDP	198.6%
Retirement age	65 for men and women. It will increase to 67 between 2019 and 2022, and to 68 by 2030 (men and women).
Percentage of the total gross replacement rate paid by the private system for an average worker	69%
Mercer's index ranking	2°

Source: Pensions at a Glance 2019 (OECD).

Israel

In the second half of the 1990s, it was decided that the occupational pension system would be defined contribution by 2008. Contribution to this system became mandatory for dependent and independent workers in 2017.

Type of system: There are two main components: one public, managed by the National Institute of Social Security (defined benefits) and another one privately managed (defined contribution). There are 3 pension savings instruments: Social Security funds, insurance managers and pension funds (the most common).

Below are some key parameters of Israel's pension system.

Contribution rate	In the public system, the contribution rate varies depending on the nature of the income (dependent, independent, unemployed worker) and can range from 3.5% to 17.8%. The contribution rate in the private system is 12.5% (2016).
Individually-funded funds, managed as a % of GDP	57.4%
Retirement age	Women 62 and men 67.
Percentage of the total gross replacement rate paid by the private system for an average worker	72%
Mercer's index ranking	3°

Source: Pensions at a Glance 2019 (OECD).

Netherlands

The pension system consists of three pillars:

First pillar: General Old-Age Pensions Act (AOW): paid to all those at the official retirement age, financed with taxes.

Second pillar: Voluntary private occupational pensions, but accumulated by the vast majority of employees in the country, connected to a particular industry or company. This second pillar may be declared mandatory in some industries by the Ministry of Social Affairs and Employment. They can be defined benefit or defined contribution. There are certain intergenerational transfers.

Third pillar: Individual banking or insurance products with tax benefits up to a certain value. Important for people who do not save in the second pillar as self-employed workers. Individually funded.

The government has announced a reform of the pension system that will introduce individual pension accounts, defined contributions, life-cycle pension funds, the end of guaranteed pensions, and a replacement rate target of 75% of the average salary after 40 years of service. The reform is expected to come into effect in early 2022.

Below are some key parameters of the Netherlands' pension system.

Contribution rate	18% to the public system. The contribution to occupational programs depends on the fund; the typical values are 7.7% by the employee and 14.8% by the employer (2018)
Individually-funded funds, managed as a % of GDP	173.3%
Retirement age	65.
Percentage of the total gross replacement rate paid by the private system for an average worker	59%
Mercer's index ranking	1°

Source: Pensions at a Glance 2019 (OECD).

New Zealand

First pillar: New Zealand Superannuation, a tax-funded public system, not subject to income or employment status.

Second pillar: Private non-subsidized occupational plans and Kiwisaver, a private voluntary occupational savings system with automatic enrollment, subsidized by the government, which was implemented in July 2007.

The first pillar is government-managed. The Kiwisaver and other occupational schemes are privately managed.

Below are some key parameters of the New Zealand pension system.

Contribution rate	The mandatory rate is 0%; however, when opting for Kiwisaver, one can choose between different rates such as 3%, 4%, 8% or 10% of gross salary.
Individually-funded funds, managed as a % of GDP	27.4%
Retirement age	65 years for the first pillar
Percentage of the total gross replacement rate paid by the private system for an average worker	32%
Mercer's index ranking	10°

Source: Pensions at a Glance 2019 (OECD).

United Kingdom

First pillar: non-contributory, granted by the so-called "Pension credit" to Low income individuals over 65.

Second pillar: two main systems coexist: (a) a defined contribution public pension system (single-tier state pension (STP) system; (b) a private defined contribution occupational pensions system with defined benefits, with automatic enrollment (NEST); approved in 2008.

Third pillar: complementary voluntary savings.

In the private occupational pension system, pension plans can be offered and managed by different entities: life insurers, savings banks, banks, real estate investment companies. The NEST self-enrollment scheme is administered directly by the NEST Corporation, which was established by law as an independent public body.

Below are some key parameters of the UK pension system.

Contribution rate	As of April 2019, the minimum contribution rate is 8% (3% employer; 4% worker; 1% state) to the private system (automatic enrollment).
Individually-funded funds, managed as a % of GDP	104.5%
Retirement age	65 in Pension Credit, for men and women
Percentage of the total gross replacement rate paid by the private system for an average worker	57%
Mercer's index ranking	15°

Source: Pensions at a Glance 2019 (OECD).

United States

The American Pension System is structured as follows:

Public old age system, survival and disability, financed mainly under a PAYGO system that provides income-proportional pensions and pensions to low-income individuals (Social Security).

Voluntary private system with defined contribution plans, defined benefit and hybrids. Defined contribution plans have dominated in recent years. Some examples of the latter are 401 (k) (occupational) and IRA (Individual Retirement Accounts).

401 (k): An occupational plan that allows employers and employees to make deferred tax contributions to the pension plan; approved in 1996.

IRA: An individual plan that gives employers with fewer than 100 employees the option to contribute to their employees' pension using a simplified method. Anyone with labor-related income qualifies for an IRA.

Below are some key parameters of the US pension system.

Contribution rate	12.4% to social security
Individually-funded funds, managed as a % of GDP	134.4%
Retirement age	In the public system, from 62 to 67, with increased benefits when retirement is delayed
Percentage of the total gross replacement rate paid by the private system for an average worker	44%
Mercer's index ranking	18°

Source: Pensions at a Glance 2019 (OECD).

Conclusions in this section:

1. Looking at international evidence, it is clear that the sustainability issues of PAYGO systems worldwide have led to the incorporation of individually-funded mechanisms in a large number of countries. Although these mechanisms have been incorporated in a variety of ways, there have been significant levels of capitalization, with funds amounting to a weighted average of 82% of GDP for OECD countries.

2. These higher levels of capitalization will help countries shore up the depleted replacement rates that will be provided by the PAYGO systems, i.e. improve their sustainability.

3. Countries that have incorporated individually-funded mechanisms have been successful, which is evident by observing their ranking in the Mercer index, driven mainly by improvements in their financial sustainability sub-indexes.

Appendix

Sources for parametric changes

Greece
https://www.ssa.gov/policy/docs/progdesc/intl_update/2010-08/index.html#greece
http://www.ssa.gov/policy/docs/progdesc/intl_update/2011-08/index.html#greece
http://www.ssa.gov/policy/docs/progdesc/intl_update/2012-12/index.html#greece
http://eleconomista.com.mx

Portugal
http://www.ssa.gov/policy/docs/progdesc/intl_update/2012-05/index.html#portugal
Global Retirement Update AON, April 2016
USAID, Global Experience in Pension Reform; September, 2014
https://www.ssa.gov/policy/docs/progdesc/intl_update/2014-06/index.html
http://www.ssa.gov/policy/docs/progdesc/intl_update/2014-03/2014-03.pdf

United Kingdom
USAID, Global Experience in Pension Reform; September 2014.
www.lavanguardia.com
https://www.ssa.gov/policy/docs/progdesc/intl_update/2018-11/index.html#unitedkingdom

Nicaragua
http://www.ssa.gov/policy/docs/progdesc/intl_update/2014-02/2014-02.pdf
https://www.ssa.gov/policy/docs/progdesc/intl_update/2019-03/index.html#nicaragua
https://www.laprensa.com.ni
https://www.elnuevodiario.com.ni

Russia
http://www.ssa.gov/policy/docs/progdesc/intl_update/2009-09/index.html#russia
http://images.respond.aonhewitt.com/Web/AonHewitt/Global Retirement Update--October 2013.pdf
http://www.ipe.com/new-pensions-law-goes-into-effect-in-russia/10000715.article
https://www.ssa.gov/policy/docs/progdesc/intl_update/2015-02/index.html
http://www.aon.com/attachments/human-capital-consulting/Global_Retirement_Update--September_2016.pdf
https://www.ssa.gov/policy/docs/progdesc/intl_update/2018-10/index.html#russia
https://pfr.gov.ru/en/press_center/~2018/01/09/151028

Italy
https://www.ssa.gov/policy/docs/progdesc/intl_update/2010-09/index.html#italy
https://www.ssa.gov/policy/docs/progdesc/intl_update/2012-01/index.html#italy
Active Social Security Magazine "How is the sustainability factor applied in Europe?"
https://www.missoc.org/missoc-database/comparative-tables/

France
https://www.ssa.gov/policy/docs/progdesc/intl_update/2010-12/index.html#2010reform
https://www.ssa.gov/policy/docs/progdesc/intl_update/2012-02/index.html#france

Brazil
https://agenciabrasil.ebc.com.br/es/politica/noticia/2015-06/gobierno-publica-nuevas-normas-para-pensiones-de-jubilacion
https://www.ssa.gov/policy/docs/progdesc/intl_update/2019-11/index.html#brazil

Spain
https://www.ssa.gov/policy/docs/progdesc/intl_update/2013-01/index.html
https://www.lamoncloa.gob.es

Sources for the implementation of individually-funded systems

Australia: https://www.oecd.org/pensions/private-pensions/42565480.pdf

Canada: https://www.oecd.org/els/public-pensions/PAG2017-country-profile-Canada.pdf

Chile: https://www.oecd.org/els/public-pensions/PAG2019-country-profile-Chile.pdf

Denmark
https://cccp.uni-koeln.de/fileadmin/wiso_fak/wisosoz/pdf/REBECA/Denmark_Pension_eng.pdf
**https://obtienearchivo.bcn.cl/obtienearchivo?id=repositorio/10221/28219/1/BCN_Sistema_de_Pensiones_en_Dinam
arca_PMP.pdf**

Israel
https://www.oecd.org/els/public-pensions/PAG2019-country-profile-Israel.pdf

Netherlands:
https://www.pensionfundsonline.co.uk/content/country-profiles/the-netherlands
https://www.pensioenfederatie.nl/website/the-dutch-pension-system-highlights-and-characteristics

New Zealand
https://www.pensionfundsonline.co.uk/content/country-profiles/new-zealand
https://www.oecd.org/els/public-pensions/PAG2019-country-profile-New-Zealand.pdf

United Kingdom
https://www.oecd.org/els/public-pensions/PAG2017-country-profile-United-Kingdom.pdf

United States
https://www.oecd.org/pensions/private-pensions/42575094.pdf