



PENSION NOTES

No. 18 - JULY 2017

A longevity insurance to contribute to financing old-age pensions in the Individually-Funded Systems

Executive Summary

One of the risks faced by retirees in the defined contribution (DC) systems, is survival beyond the age indicated in the life expectancy tables. This is what is known as individual longevity risk, which is assumed by individuals with lower pensions in the programmed withdrawal (PW) mode, or by the life insurance companies when individuals retire in the life annuity (LA) mode.

Estimates in the case of Chile indicate that 31% of individuals enrolled in the individually-funded system will outlive their savings once the system matures. This reality therefore makes it desirable to seek mechanisms for establishing a longevity insurance that would cover the risk of outliving one's savings.

Longevity insurance basically involves a fixed monthly payment protected from inflation, if the individual is still alive after a certain age (the insurance ceases payments when the individual dies). This insurance is financed by individuals who live less than the average for their age group, and assigns these resources to covering the financial deficit of individuals who live longer than the average.

The longevity insurance would be paid throughout the active lives of workers, and would cover pensions after a certain advanced age (85, for example), through the purchase of a deferred life annuity on retirement.

Among other benefits, this insurance enables increasing pensions under any of the two traditional pension modes (PW and LA) at the official retirement age. This increase is due to the fact that the greater longevity period is

financed with this insurance. In Chile, increases in the initial pension ranging from 12,5% in the case of LA for men, and 25.6% in the case of PW for women, have been observed.

One of the main issues currently being discussed in Chile is whether this solution would be more efficient if it focused only on pensioners in the PW mode (rather than establishing a universal longevity insurance). There has been a recent pension reform proposal in El Salvador, which includes a longevity insurance in its design. There is ongoing discussion on reforms to the private pension system in Peru, but a new pension mode (Staggered Life Annuity), very similar to a longevity insurance, was introduced in May last year.

Introduction

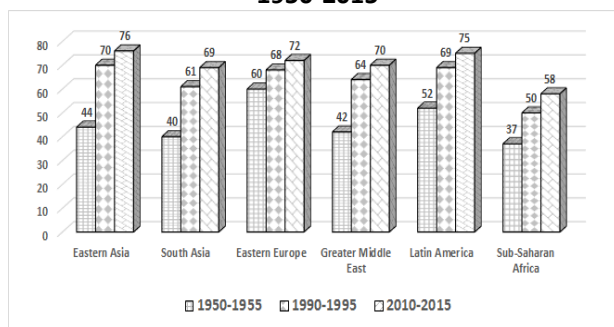
Increasing longevity, measured in life expectancy increases, is a source of concern to the population that will start retiring in the next few years. It is therefore especially relevant to have instruments that will enable addressing the negative effects of longevity on the pension amounts that individuals can finance when they outlive their savings, in the stage commonly known as the "advanced old age." This short article describes a type of instrument that enables addressing this situation: longevity insurance. It also briefly outlines the discussion to date in some countries that have proposed the introduction of a mechanism of this type: Chile, El Salvador and Peru.

Context: increasing longevity and informal labor markets

One of the core objectives of pension systems is to smooth out the differences between consumption in active life and retirement. This objective is very difficult to achieve in the context of increasing longevity (higher life expectancy) and the maintenance of retirement ages, since additional years of retirement must be financed with the same level of savings, making it difficult to finance adequate pensions in future.

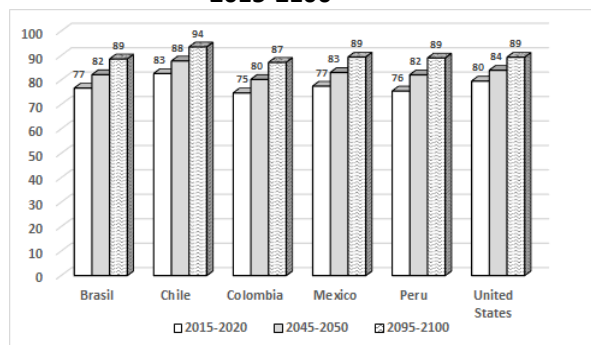
Indeed, according to United Nations data, life expectancy at birth has rapidly increased worldwide in the last couple of decades (see Table 1). Graph 2 projects future life expectancy in a subset of countries of the Americas. As can be seen, the projections show an increasing trend in this variable, ranging up to a maximum of 94 years (in Chile).

Graph 1.
Life expectancy at birth
1950-2015



Source: United Nations Population Division (2015 review).

Graph 2
Projections of life expectancy at birth
2015-2100

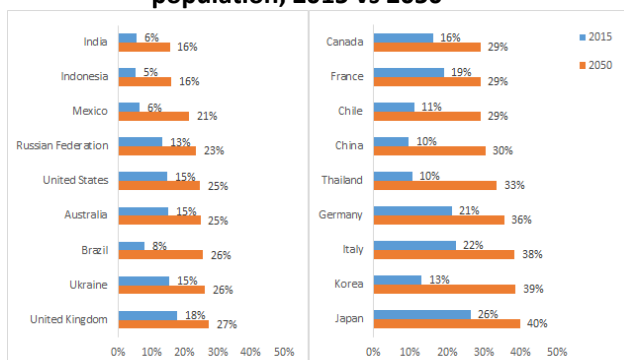


Source: United Nations Population Division (2015 review).

Scientific advances and improvements in the living conditions of the population will only further increase longevity. For example, according to the projected distribution of ages of death in the United Kingdom in 2007, people would live to a maximum of 110 (CLAPES UC, 2017). This 110-year limit would eventually increase in the longer term.

On the other hand, the demographic weight of the elderly population will increase in all latitudes from now to 2050 (see Graph 3), so there will be increasing pressure on public budgets for financing the pensioners of the PAYGO systems, particularly among groups that are unable to self-finance a contributory pension.

Graph 3
Individuals over 65 as a % of the total population, 2015 vs 2050



Source: World Population Prospects 2015, United Nations.

Complementing the above, according to CELADE, 50 years ago there were 7 people at retirement age (over 65) for every hundred at working age in Latin America; today, that

number has risen to 11, and in another 50 years it will be approximately 30.

In addition to greater longevity and a greater number of individuals at retirement age, is the fact that labor markets in Latin America are highly informal, and salary levels are relatively low, due to which the ability to finance adequate old-age pensions would appear to be limited. According to the ILO (2010), informality in the labor market is approximately 54.8% in Latin America.

Tranquility in old age is threatened by the risk of individual longevity.

There are multiple risks faced by workers in the DC systems, including: low contributions during working life; fluctuations in the value of the investments of the pension funds; survival beyond the life expectancy indicated in the life expectancy tables (risk of longevity in the PW mode); and the risk of insolvency of the institution paying the pension (the life insurance company, in the case of a life annuity).

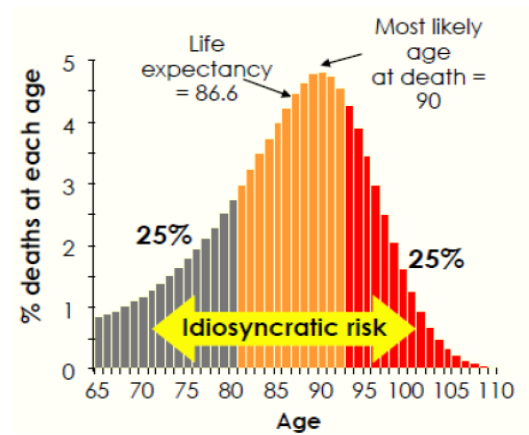
The longevity risk can be diversifiable or not. The former is the individual risk, in which each individual is unaware of the extent of his own life. In this case, a sufficiently broad pool enables diversifying the risk and paying benefits based on the average life expectancy, so that regardless of the extent of any individual's life, it is possible to guarantee the payment of a benefit for life, with this benefit being financed with the contributions of those who live less than the average lifespan. The non-diversifiable risk, on the other hand, is the one that affects the entire population, so it is not possible to create a pool for sharing this risk (Bernstein et. al., 2015).

When discussing individual longevity risk (diversifiable), it is worth mentioning that the period in which living expenses must be covered after retirement (without paid work), is highly uncertain for each individual, and could be very extensive (CLAPES UC, 2017). The yellow bar in Graph 4 shows that there is high

probability of living longer than the average of other individuals of our same age. Covering the cost of this additional period requires more economic resources, the magnitude of which is undetermined for each individual.

In the case of DC plans, this longevity risk is assumed by the individual who receives a reduced pension (when choosing a pension in the PW mode); or by the life insurance company, when the worker retires in the LA mode.

Graph 4
Uncertainty regarding the post retirement expense period: 65-year-old men
(Projected distribution of the age of death in the UK in 2007)



Source: CLAPES UC, 2017.

Mortality credits

According to Bernstein et. al (2015), with respect to the diversifiable risk, there are the so-called "mortality credits," which are an important source of financing of LAs, especially at advanced ages (see Graph 5). The main source of financing of the few individuals who reach advanced old age are the resources not spent by those who die at younger ages. In LA, the life insurance companies must cover the added risk of longevity, and use part of these mortality credits to do so¹.

¹ Other surpluses of such credits are used to pay life annuity pensions to advanced old age survivors.

The former “Tontine” (1693) pension mode operated in a different way. The added risk of longevity was shared collectively and those who lived longer received the mortality credits of those who did not reach an advanced old age (Milevsky, 2015).

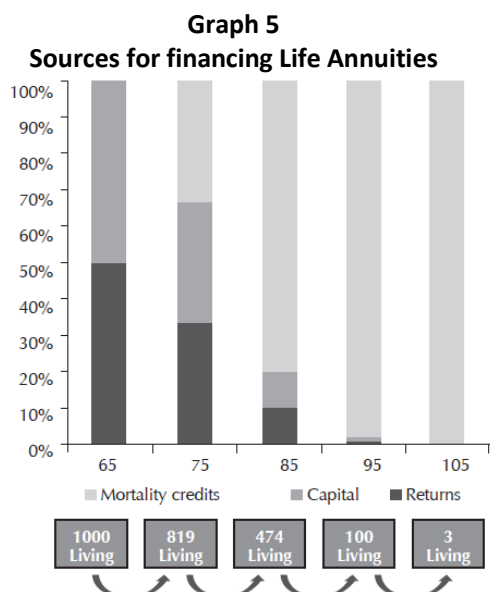


Illustration for the case of a man without beneficiaries with a rate of 2,43
Source: Bernstein et. al., 2015.

In this point, it is interesting to note that if the official retirement ages are not increased, the part of the financing originating in mortality credits will progressively diminish.

Traditional pension modes and coverage of the longevity risk

Among the traditional pension modes existing in the DC systems, only the life annuities provided by the life insurance companies include a longevity insurance. The PW mode, on the other hand, does not offer longevity insurance².

² In Chile, the PW pensioners of the individually-funded system who are in the Solidarity Pillar (non-contributory) and whose pensions are substantially higher than the Basic Solidarity Pension (BSP), have partial longevity risk coverage, since in this case their pensions may decrease, but will never be less than the Basic Solidarity Pension (BSP). Should members of this group have opted for a life annuity, they would be fully protected against longevity risk (Iglesias A., 2017).

In the case of life annuities, the AFPs transfer the funds accumulated in the individual accounts of members to the life insurance companies, due to which they lose the ownership of those funds. The life insurance companies pay a monthly pension to retirees until their death and, subsequently, to the legal survival pension beneficiaries, assuming 100% of the longevity risk of the pensioners and their legal beneficiaries (FIAP, 2015).

In the programmed withdrawal mode, on the other hand, members receive a monthly pension charged to the balance of their individually-funded accounts. The pension amount is recalculated annually based on the characteristics of the pensioner and his legal survival pension beneficiaries (mainly age and gender), current mortality tables, the interest rate (assumed return in future years) and the accumulated balance in the individually-funded account. Thus, in this pension mode, members retain ownership of the accumulated balances in their individual accounts³, but they must assume 100% of the longevity risk (as well as the investment risk) or they will only have partial coverage of this risk if they have a State subsidy ensuring a minimum pension.

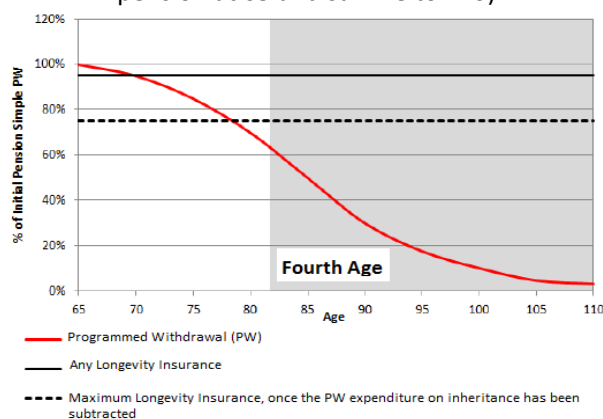
By its very nature, therefore, PW has a decreasing pension amount profile when individuals exceed the average life expectancy, which defeats the purpose of a Social Security system, which is to provide stable benefits over time. In this mode, pensioners’ funds could also be entirely exhausted, negatively impacting their standard of living. Graph 6 shows the amount of the PW pension paid to advanced old age pensioners, and it can be seen that the pension decreases progressively as they get older. At 85, the average PW pension drops to half of its initial amount (at age 65).

A significant percentage of workers will be left without longevity risk coverage for having

³ Should the pensioner die, the remaining balance will be used for paying the survival pension to his beneficiaries, and if there are no beneficiaries, any remaining funds will be paid as an inheritance.

chosen the PW mode. Estimates in the case of Chile indicate that 31% of individuals enrolled in the individually-funded system will be left without longevity insurance once the system matures (Iglesias A., 2017). This reality therefore makes it desirable to seek mechanisms for establishing a longevity insurance that would cover the risk of outliving one's savings.

Graph 6
Simple PW pension amounts⁴, taking into account the recalculation of pensions with age
 (men without spouses, who start receiving a pension at 65 and survive to 110)



Source: CLAPES UC, 2017.

Longevity insurance versus savings

A good analogy for understanding "longevity insurance," is the risk of a house burning down (CLAPES UC, 2017). Fire insurance is the ideal solution for compensating the financial damage caused by a fire, provided that the price or premium charged by the insurer is close to the technical cost (i.e., the probability of damage, multiplied by the amount of the damage caused by the accident). It would be much more expensive to cover the risk of fire by accumulating savings in banks, since one would have to accumulate sufficient savings to buy the property again in case of an accident, i.e. it would require very high savings that would demand huge sacrifices in monthly expenditure. Returning to the insurance, if the

fire does not occur, the insurance premium paid will help to cover the compensation for other insured families who do suffer an accident.

Longevity insurance operates in a similar way. It features a fixed monthly payment protected from inflation, while the individual is alive (the insurance ceases payments when the person dies). This insurance is financed by individuals who live less than the average for their age group, and assigns these resources to covering the financial deficit of individuals who live longer than the average. It also takes into account the interests that can be earned in between. The strategy of reducing the level of expenditure or consumption from age 65, in order to cover the maximum longevity possible (but highly unlikely) and live to 110 years, for example, would be much more expensive.

As in the case of a fire, no one knows if a specific individual will have to absorb the financial cost of living longer than average. Thus, insurance treats all individuals equally from an ex-ante standpoint. At the same time, longevity insurance adapts to individual needs, because it provides larger pension amounts to those who live longer, who are the ones that must cover expenses for a greater period of time.

The role of a Longevity Insurance

Bernstein et. al (2015), in a study conducted for FIAP, discuss the potential of longevity insurance for increasing replacement rates (in Chile, Colombia, Mexico and Peru), under the structure of a deferred life annuity, in order to obtain the greatest possible advantage through the use of mortality credits in the financing of pensions.

This longevity insurance would be paid throughout the active lives of workers, and would cover pensions after a certain advanced age (85, for example), through the purchase of a deferred life annuity on retirement. The mortality credits generated between ages 65 to 85 would be the main source of financing for

⁴ Refers to a PW pension without special coverage conditions.

this deferred life annuity. Credits after age 85 would also be important, and to a lesser extent, those generated between 20 and 65 years of age. Thus, workers can access all of their pension savings to finance the first stage of their old age (between 65 and 85), in which the probability of survival is much higher, leaving the later stage (after 85) to be financed with this insurance.

A mandatory longevity insurance of this nature, is what one would traditionally expect from an insurance (Bernstein et. al., 2015). I.e., that the amount of the premium paid is generally small compared to the benefit obtained in case of the occurrence of the covered event.

When applying a longevity insurance in the PW mode, benefits are calculated by modifying the mortality table at the age at which the insurance is triggered. Individuals selecting this mode can have variable payments between 65 and 84 years of age, depending on the return of the pension funds, but later on (for example, after 85 years of age, if the insurance is triggered at that age) they will receive a constant payment, since the insurance ensures a minimum pension amount, or floor.

Should a worker choose to retire in the life annuity mode, he will obtain a fixed pension amount throughout his retirement, regardless of the age at which he dies, but part of the benefit will be financed by the longevity insurance, providing greater benefits in retirement.

The aforementioned authors found that this longevity insurance:

1. Enables covering the longevity risk for the entire population contributing to the system.
2. Enables increasing pensions in any of the two traditional pension modes (PW and LA). This increase in pensions at the official retirement age is due to the fact that a longer period of longevity can be financed with the insurance.

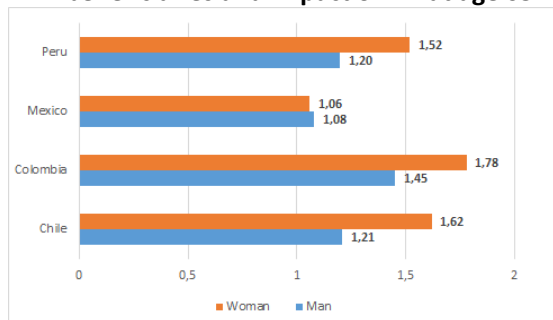
3. Enables optimizing financing from contributions in the active stage, in order to finance LA pensions after a certain advanced age.
4. Avoids adverse selection. This refers to the fact that individuals with greater survival probabilities are more inclined to opt for deferred PW pensions, which finally ends up generating higher pension costs.
5. It generates an ample "pool" for financing pensions at advanced ages.
6. It prevents resources collected from this greater contribution from being assigned to survival or inheritance benefits.
7. In programmed retirement, which currently does not provide coverage of the longevity risk, this system would enable incorporating this coverage.
8. It enables more efficient use of resources, since it could contribute to complement the coverage of the non-contributory pension programs for more vulnerable seniors, reducing the pressure on State funding.

The cost of longevity insurance

In their study, Bernstein et.al. (2015) calculate the cost of the insurance, considering the purchase of deferred life annuity at the age of 65. In one of the estimates, they assume that the coverage is 70% of the pension calculated at the time of the official retirement age, and that the insurance starts paying pensions at 85 years of age.

The cost of the insurance thus defined, as a percentage of the salary fluctuates between 1.08% (Mexico) and 1.45% (Colombia) for of men, and between 1.06% (Mexico) and 1.78% (Colombia) for women (see Graph 7).

Graph 7
A 20-year-old individual in 2015; without beneficiaries and impact on LA at age 65



Note: Assumes start of insurance payments at age 85 and replacement rate covered with the insurance at initial retirement = 70%.

Source: Bernstein et. al (2015).

Graph 7 shows that in three of the four countries analyzed, the cost for women is higher than for men, explained by the fact that women generally have greater life expectancy. Another aspect worth highlighting is that insurance is relatively more expensive in those countries where the contribution rate to individual accounts is high, which is also due to the fact that a greater benefit is financed.

Note:
 providing
 Source: B

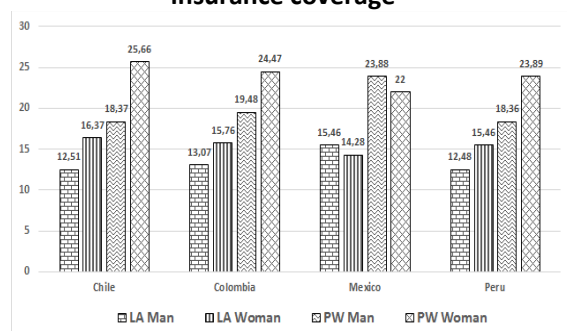
Increase in pensions

Considering the same assumptions used for estimating the cost of the insurance, the authors calculated pension increases at the regular retirement age and found that they increased more than they would have increased with an increase in the contribution rate equivalent to the cost of the insurance. The changes in the initial programmed retirement and life annuity pension (without beneficiaries) are shown in Graph 8, in which one can observe increases in the initial pension between 12.51% in PW for men in Chile, and 25.66% for a LA for women in the same country. As can be seen, the contribution of longevity insurance is greater in PW than in LA, since mortality credits are already being used in the latter case⁵.

⁵ The impact is greater in the case of the PW with beneficiaries (not shown in Graph 6), since it enables using the mortality credits of the retirement stage for paying pensions, without

The authors found that the increase in the first PW payment is 40% higher than the amount that would have been achieved by an increase in the contribution rate equivalent to the cost of the insurance, in addition to a base pension after 85 years of age (as opposed to what happens today in this pension mode, in which the amount continues to diminish, with the possibility of depleting the balance).

Graph 8
% increase in the pension (PW and LA without beneficiary) at age 65, with longevity insurance coverage



Note: assumes that the insurance will start paying at age 85, 70% coverage with respect to the initial pension.

Source: Bernstein et. al (2015).

Transition and institutional framework

The full effect of a longevity insurance is generated in the long term, since the premium that funds the calculated pension levels is intended for a contribution horizon of 45 years.

This implies considering a transition period for enforcing the system, which will enable future generations that retire to obtain higher benefits, and insurance for covering this risk. Financing must be transparent and be evaluated within the context of fiscal needs and the impact on the labor market of different alternative measures.

The alternatives for achieving the above include, for example, establishing a gradual process in the level of benefits to be financed,

assigning further resources to the payment of pensions, but rather assigning them to providing higher pension amounts to the originators.

also ensuring tripartite financing of the premium (employer, employee and State). This can be implemented through a default mechanism whereby future pensioners automatically allocate a percentage of their balance to financing the insurance, with the option of not receiving it. Should this option be exercised, there must be very clear information regarding the benefits that will not be perceived.

With regard to the institutional framework, the insurance could be managed by the AFPs during the active phase and by insurance companies during the passive phase.

Discussion and proposals in some countries

Since Solange Berstein initially presented her proposal in 2014 for the creation of a longevity insurance to the Chilean Pension Reform Commission, created in that year, and subsequently with the formalization of the proposal through a study commissioned by FIAP (Berstein et. al, 2015), the discussion on the need for such instruments has been initiated in several countries.

Part of the discussions and proposals in Chile, El Salvador and Peru are reviewed below.

1. Chile

According to Iglesias A. (2017), some of the criticisms to the proposed longevity insurance model are the following⁶:

- i) Advanced old age pensions are regressive, since the life expectancy of lower-income workers is lower than that of higher-income workers.
- ii) "Universal longevity insurance" is not required, but rather what is required is to focus the solution only on pensioners in the PW mode.

According to CLAPES UC (2017), the idea would be to create a new mandate (Protected Programmed Withdrawal, PPW), which would make it mandatory to have a longevity insurance which would start paying life annuity pensions when the individual reaches advanced old age (82-85), and in which the amount of the advanced old age pension would not be less than 80% of the initial pension (without including means of inheritance different to survival pensions). The other part of the balance would be used to acquire a temporary income (which would be paid from age 65 to 82-85).

The life annuity pension that would start being paid from age 82-85 would be provided through a countrywide mutual longevity insurance (or through a life annuity variable), and not by life insurance companies. This is due to the fact that when the insurance companies determine the cost of an insurance purchased by a 65-year-old member, which will start making fixed payments when he turns 85 (20 years later), without having adequate statistical information on national mortality at an advanced old age, they cover themselves by imposing high safety margins, which entail reductions in the amounts of advanced old age pensions. This implies that the fixed life annuities offered by the insurance companies should be excluded from this possibility.

Individuals with a PW pension who reach advanced old age, would be granted a "lifelong supplement" financed with an increase in the mandatory contribution rate for old age pensions, as a percentage of taxable income, free of tax (not notional), from the current 10% to 14%, and to 15% in 20 years (CLAPES UC, 2016).

⁶ These criticisms were made at the time by Guillermo Martínez, Gonzalo Edwards, Juan Pablo Contreras and Augusto Iglesias.

2. El Salvador

In February 2017, the Citizens Pensions Initiative (CPI)⁷ submitted its proposals for a comprehensive reform of the country's pension system. The proposals include providing sustainability and financing to stable and lifelong pension benefits. To do so, a mechanism has been put forward that covers the longevity risk of the members of the Pension Savings System (SAP; this is the mandatory individually-funded system).

The idea consists in modifying the methodology for calculating PW, distributing the balance of the individual account over a period of 20 years, and then granting a pension equivalent to the one that was being paid, funded with a "Lifetime Pension Reserve" (LPR).

The creation of the LPR responds to the proposal for creating a longevity insurance within the equity of the Pension Fund, belonging exclusively to its members. This reserve would finance the following benefits.

- a. Transfer Certificates and pensions of members who opted out⁸, when the balances of their individual accounts were exhausted.
- b. Minimum old age, disability and survival pensions.
- c. Mandatory lifelong pensions of members after their balances have been exhausted. These would be the advanced old age pensions financed with the longevity insurance.

The LPR would initially be financed with 5% of the proposed mandatory old-age pension

⁷ The CPI is an initiative launched in July 2016, comprising the Committee of Workers in Defense of the Pension Funds of El Salvador (COMTRADEFOP), the National Association of Private Enterprise (ANEP), the Salvadoran Foundation for Economic and Social Development (FUSADES) and the Salvadoran Association of Pension Fund Managers (ASAFONDOS).

⁸ This refers to the state's obligation to members who chose to enroll in the individually-funded system, and who have acquired rights in the public PAYGO system.

contribution rate of 15%, gradually diminishing to 2% (the remaining contribution will go to the individual account, the payment of the disability and survival insurance and the management fee).

In the proposal, the longevity insurance is funded with 0.5% of wages in 2017, but this percentage will rise gradually to reach a maximum of 2% of wages.

3. Peru

Since 2015, the Association of Private Pension Fund Managers (AAFP), has considered the possibility of establishing a longevity insurance, similar to the structure proposed by Berstein et.al. (2015)⁹. The reform to the private pension system is still being discussed.

Nonetheless, a new pension mode, Staggered Life Annuity (SLA) has been in effect since May 8, 2016, for those members of the AFPs who retire at the official retirement age. This product is very similar to a longevity insurance.

This pension mode comprises two periods in which the pension is paid. In the first period, there is no programmed withdrawal, but rather a life annuity in which the retiree can choose the initial period in which he wishes to receive a higher pension (from 1 to 15 years, or 20 years maximum), whereas in the second period, the retiree may choose to receive a pension equal to 50% or 75% of the pension received in the first period. There was a similar setup previously, but the first period could only last a maximum of 5 years.

This pension mode is entirely managed by life insurance companies. It also only applies to retirement pensions of any kind, in soles or American dollars, adjusted at 2% per year.

⁹ Sources: <http://peru21.pe/opinion/giovanna-priale-afp-se-convertir-asesor-previsional-2257201>; <http://www.andina.com.pe/agencia/noticia-asociacion-afp-propone-creacion-seguro-longevidad-para-elevar-monto-pensiones-549568.aspx>

Another feature is that the SLA can be combined with guaranteed periods of 10 or 15 years, provided that the first period has the same duration as the chosen guaranteed period.

The SLA is currently offered by 5 insurance companies: Protecta, Rimac, Sura, Pacifico and InterSeguro.

References

CLAPES UC. (2016). "[Proposal for advanced old age: new protected programmed withdrawal](#)"

CLAPES UC. (2017). "[Social protection in advanced old age: 13 measures](#)"

Berstein, Solange et al. (2015). "[The role of Longevity Insurance in Latin America: cases of Chile, Colombia, Mexico and Peru](#)"

FIAP (2015). "Pension modes in the individually-funded systems: evaluation and proposals for improvement" ([Pensions Note No. 6](#)).

Iglesias, Augusto (2017). Presentation for the Instituto Libertad y Desarrollo Seminar "**Pension insurance for advanced old age.**"

Milevsky, Moshe (2015). "King William's Tontine; Why the Retirement Annuity of the Future Should Resemble its Past." Cambridge University Press.

ILO (2010). Statistics on total informal employment in 2010.

The information contained in this report may be fully reproduced by the media. The comments and statements contained herein should only be considered guidelines of a general nature for increasing pension culture.

Queries: FIAP. Address: Avenida Nueva Providencia 2155, Torre B, Piso 8, Of. 810-811, Providencia. Santiago, Chile

Phone: (56) 2 23811723, Extension 10. **E-mail:** fiap@fiap.cl.

Web site: www.fiapinternacional.org