



The impact on workers of the parametric changes in the PAYGO programs¹

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¹ Document Drawn up by FIAP. The estimates of the “impact” of these changes on workers were performed by Augusto Iglesias, FIAP’s External Consultant with the PrimAmerica Consultores pensions model (loaded with the Chilean life expectancy tables).



I. Introduction

The impacts of the recent international financial crisis on the individually funded programs have been widely reported and analyzed. The considerable drops in the profitability of the pension funds and their possible effects on the pensions of different groups of members have been particularly highlighted, without considering that the investment returns of the individually funded systems must be viewed in a long term horizon, since the benefits will be paid in the same term. It is wrong to get caught up in short term assessments, since they are influenced by contextual situations, as occurred in 2008.

Nonetheless, it is important to point out that the effects of the crisis have also severely affected the traditional “PAYGO” systems, which as a result of increased unemployment and lower (or zero) salary growth have seen their incomes diminished and their financial deficits increased. This situation has been aggravated by demographic trends which have had an even more detrimental effect on the financial situation of the PAYGO programs. In response to these trends, many PAYGO programs have had to adjust their main parameters to shore up pension expenses, with an even more detrimental effect for workers who are members of these types of systems in comparison to members of individually funded systems. The purpose of this document is to highlight the costs these changes entail for workers.

The following stand out among the adjustments observed in the PAYGO systems:

A) Increase in the contribution rate

Between 1995 and 2005, 57 countries increased their contribution rates in their PAYGO Systems. Some examples are: the Check Republic, Denmark, Germany, Finland and Holland.

Some recent and future trends:

- i) **Romania:** as of February 1, 2009, social security contributions increased by 1%.
- ii) **France:** as of January 1, 2009, employers started contributing an additional 2% to social security.
- iii) **Germany:** the law foresees an increase of 2 percentage points in the contributions to the PAYGO system (from 20% to 22%) by 2030.
- iv) **Estonia:** the changes can be seen in Chart No. 1.



Chart No. 1

Contribution rate		Prior to June, 2009	June 1, 2009, to Dec. 2010	2011	2012
Second Pillar	Employer	4%	0%	2%	4%
	Employee (1)	2%	0%	1%	2%
	Total Second Pillar	6%	0%	3%	6%
Total PAYGO system		20%	20%	18%	16%

(1) Case in which the employee opts for reducing contributions to the second pillar as of June 1, 2009. If employees opt for continuing to contribute to the second pillar in this period, they will receive a 6% contribution from the employer in their individual accounts and 14% to the first public pillar from 2014 to 2017, only if the economic situation allows it.

Source: FIAP.

- v) **Lithuania:** as of July 1, 2009, the employee's contribution rate to the second pillar was reduced from 3% to 2% of gross salary until 2010 and will increase to 5.5% in 2011 and 6% between 2012 and 2014, reaching 5.5% in January 2015 (previously, in January, 2009, this rate had been reduced from 5.5% to 3%).

B) *Legal increase in the retirement age*

Between 1995 and 2005, 18 countries increased the retirement age. Examples: Austria, Belgium, Cyprus, Estonia, Greece and Italy.

Some recent and future trends:

- i) **Austria:** the retirement age for women will increase gradually from 60 to 65 between 2024 and 2033.
- ii) **Belgium:** as of 2009, the retirement age for women will increase from 64 to 65.
- iii) **The Check Republic:** the retirement age for men and women has increased by two and four months each year for men and women, respectively, since 1996. The aim is to achieve a retirement age of 65 for men, childless women and women with up to 1 child and between 62 and 64 for women with more than one child, by 2030. The calendar for retirement age increases will remain the same as until now.
- iv) **Denmark:** the retirement age for men and women will increase from 65 to 67 between 2024 and 2027.
- v) **Germany:** the retirement age for men and women will increase from 65 to 67 between 2012 and 2029.



- vi) **Hungary:** on May 11, 2009, parliament approved a law which, among other things, will increase the retirement age from 62 to 65, six months per year, as of 2012 and until 2017. The change affects workers born in 1957 or thereafter.
- vii) **Israel:** by law, the retirement age will increase gradually (according to date of birth) from 65 to 67 for men and from 60 to 64 for women as of 2004.
- viii) **Italy:** the minimum retirement age for men increased from 57 to 60 in 2008, will increase to 61 as of 2010 and will be 63 by 2013. The retirement age for women will be kept at 57, but the government has recently introduced a bill of law that will increase the retirement age of women in the public sector to 65.
- ix) **Turkey:** for individuals insured as of September, 1999, the social security retirement age is 60 for men and 58 for women, whereas for individuals insured before that date, the retirement age varies from 41 to 56. By 2048 the retirement age will increase gradually from 58/60 to 65/65 and the contribution density requirements for retiring will be increased.
- x) **United Kingdom:** the standard age for obtaining a State pension (65) will be implemented prior to 2020 and will increase gradually to 68 for men and women by 2024 and 2046.
- xi) **Australia:** the government intends to gradually increase the pension age from 65 to 67 by 6 months every 2 years between July 1, 2017 and July 1, 2024.
- xii) **Japan:** the Employees Pension Insurance retirement age has increased gradually from 60 to 65. In retirement plans sponsored by companies, the standard retirement age will be extended gradually from 60 to 65 between 2006 and 2013.
- xiii) **Singapore:** the government's long term objective is to increase the retirement age from 62 to 67 for men and women, but no laws have yet been passed.
- xiv) **South Korea:** the standard retirement age will increase from 60 to 61 in 2013 and thereafter will increase by one year every 5 years to reach a standard retirement age of 65.

C) Adjustment of other parameters in the benefits formula, such as:

- Reducing the replacement rate (pension/salary ratio).
- Increasing the minimum number of years of contributions to have the right to access a pension.
- Reducing the percentage of pension accrual.



- Adjusting the number of years taken into account for calculating the reference salary.
- Changing the pension indexing mechanism.

Between 1995 and 2005, 28 countries adjusted the benefits formula in order to reduce fiscal expenses. Examples: The United Kingdom, Spain, Slovenia, Portugal and Brazil.

Recent examples:

- i) Austria:** in 2003, the public pension accrual percentage was reduced from 2% to 1.78%.
- ii) France:** the number of years of contributions for receiving a full pension will increase from 37 to 41 years as of 2012.
- iii) Hungary:** on May 11, 2009, parliament approved a law which, among other things:
 - (1) Eliminates the so-called “13 months pension” – equal to a complete pension month – to replace it with a pension bonus linked to economic growth. The bonus, which ranges between 20,000 and 80,000 forints (between US\$ 101.3 and US\$ 404.66), based on the economic growth rate, will be paid out after the GDP reaches 3.5%.
 - (2) Changes the way pensions provided in the PAYGO system are indexed, as seen in Chart No. 2.

Chart No. 2

If the GDP:	The pensions of the PAYGO program will be adjusted according to		This means
	IPC	Salary increases	
Is below 3%	100%	0%	100% indexation based on the GDP
Is between 3% and 4%	80%	20%	Mixed indexation: 80% GDP and 20% salary growth
Is between 4% and 5%	60%	40%	Mixed indexation: 60% GDP and 40% salary growth
Is higher than 5%	50%	50%	Mixed indexation: 50% GDP and 50% salary growth

Source: FIAP.



- iv) **Latvia:** as of July 1, 2009, the monthly amount of retirees' pensions was reduced by 10% and that of working retirees' pensions was reduced by 70%. The benefit reductions will be in force until 2012.

II. Analysis and quantitative estimates

1. Summary

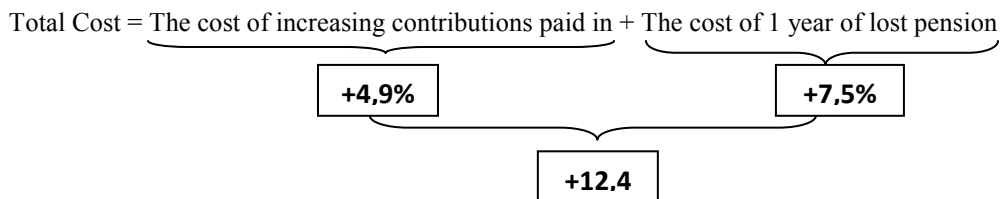
In this section, the cost for workers of parametric changes in the PAYGO systems is quantified. The calculation assumptions are: (i) men and women start contributing at age 23; (ii) men retire at 65 and women at 60; (iii) men and women earn a salary of US\$ 1000 that grows by 2% per year; (iv) the contribution density is 90% for men and 80% for women; (v) the initial contribution rate is 10% of gross salary.

The results show that:

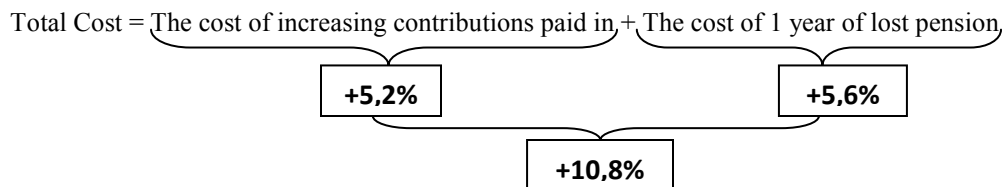
1. **Increasing the contribution rate to the PAYGO system by 1 percentage point generates an increase in total contributions paid in of approximately 10% (for men and women).**

2. **Increasing the retirement age by one year:**

- i. ***In the case of men:* generates a cost for them of 12.4% of the contributions they would have paid if the system had remained unchanged, which is equivalent to a drop of 0.51 percentage points of profitability in the individually funded system.**



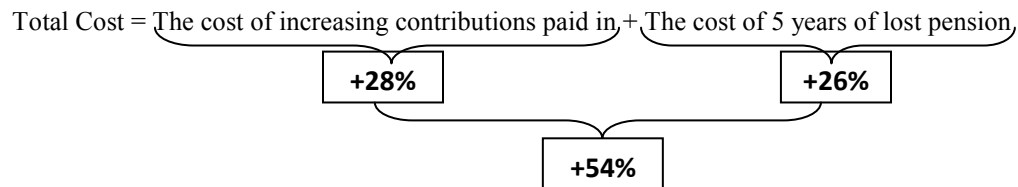
- ii. ***In the case of women:* generates a cost for them of 10.8% of the contributions they would have paid if the system had remained unchanged, which is equivalent to a drop of 0.65 percentage points of profitability in the individually funded system.**





3. Increasing the retirement age by 5 years:

In the case of women: generates a cost for them of 54% of the contributions they would have paid if the system had remained unchanged, which is equivalent to a drop of 2.1 percentage points of profitability in the individually funded system.



4. Increasing the minimum number of years of contribution in order to have the right to a pension, at the expense of starting to contribute one year earlier.

- i. **In the case of men:** if they start contributing at age 22 instead of 23, it generates a cost for them of 4.9% of the contributions they would have paid in if they had started contributing at 23.
- ii. **In the case of women:** if they start contributing at age 22 instead of 23, it generates a cost for them of 6.1% of the contributions they would have paid in if they had started contributing at 23

2. Analysis

2.1 *The financial crisis and its effect on the PAYGO systems*

The impacts of the recent international financial crisis on the individually funded programs have been widely reported and analyzed. The considerable drops in the profitability of the pension funds and their possible effects on the pensions of different groups of members have been particularly highlighted.

Nonetheless, it is important to point out that the effects of the crisis have also severely affected the traditional “PAYGO” systems, which as a result of increased unemployment and lower (or zero) salary growth have seen their incomes diminish and their financial deficits increase. This situation has been aggravated by demographic trends which have had a particularly negative effect on the financial situation of the PAYGO programs.



2.2 The response of the PAYGO systems: parametric reforms

In response to the aforementioned trends, many PAYGO systems have had to adjust their main parameters, principally for the purpose of containing pension expenses. The following stand out among the observed adjustments:

- **Reduction in pension amounts.** See for example the cases of Hungary (page 5, separate paragraph C) iii) (1)] and Latvia [page 6, separate paragraph C) iv)]
- **Changes in the way pensions are indexed.** See for example the case of Hungary [pages 5 and 6, separate paragraph C) iii) (2)]

2.3 The costs of the parametric reforms

The effects of the aforementioned changes on the levels of pensions to be received are direct and therefore do not merit further comments.

Nonetheless, the recent reforms to the PAYGO programs also include other kinds of changes which, even though they do not have a direct effect on the level of pensions to be received, do entail significant increases in the cost of the respective programs for their members.

Outstanding among these changes are the extension of the retirement age and the increase in the number of years of contribution required for having the right to a pension.

A very simple way of illustrating the impact of these changes on workers is by comparing the total amount of contributions they would have paid in if the conditions prior to the reforms had been maintained with the total amount of contributions they must pay in after their introduction. Since some of these changes do not affect the pensions to be received, the simple comparison of the contributions paid in for having the right to receive a similar benefit provides us with a simple and illustrative measure of the negative impact these reforms have on the participants in the respective programs. When there is an effect on pensions, the estimate of this additional cost must be added to the prior cost.

For such purposes, the future value of the contributions at the time of retirement will be calculated in situations with and without reforms and the possible effects of the respective reforms on the pensions to be received will be assessed. In order to take into account the “time value of money,” we will assume that the contributions could be built up at a rate of 3%. Moreover, as the reforms affect workers of different ages in different ways, depending on how close they are to retirement, we



will only compare the situation of those who have participated in the pension system throughout their lives, first under the conditions prevailing prior to the reforms and then under the reformed conditions.

a) Increase in the contribution rate

Many countries have recently increased the contribution rate in their PAYGO systems. See for example the cases of Romania, France, Germany, Estonia and Lithuania (see pages 2 and 3, separate paragraph A)

Higher contribution rates increase the cost of the respective systems for workers without this translating into greater benefits. The impact on costs can be significant. Let us take, for example, the cases of a man and a woman who start contributing at age 23, retire at age 65 and 60 respectively, earning a salary of US\$ 100 per month that grows by 2% per year with a contribution density of 90% for the man and 80% for the woman.

- If the original contribution rate was 10%, at age 65 the man would have paid in a total of US\$ 13,509 in contributions and the woman would have paid in US\$ 9,365 (future values at 3%).
- Conversely, with a contribution rate of 11%, the contributions paid in by the man would have been US\$ 14,860 and those paid in by the woman US\$ 10,301 (future values at 3%). Thus, logically, the increase in the contribution rate entails a proportional increase in the cost of the contributions paid in during their active lives.

In the cases of countries which increase the contribution to the PAYGO system while reducing the contribution to the individually funded system (when both programs are mandatory), the cost of the lower pension in the individually funded program must be added to the prior cost.

b) Increase in the retirement age

As a result of both the financial crisis and longer term demographic trends that work against the PAYGO systems, a significant number of countries have also opted for increasing the retirement age. See for example the cases of Germany, Australia, Austria, Belgium, South Korea, Denmark, Hungary, Israel, Italy, Japan, the United Kingdom, the Check Republic, Turkey and Singapore (see pages 3, 4 and 5, separate paragraph B).

The increase in the retirement age has two negative effects on workers. On the one hand, it increases the amount of contributions that must be paid in during their working lives. On the other hand, the number of years in which a pension is



received is reduced. The magnitude of these effects, especially the second one, can be significant.

Let us take, for example, the same two previous cases, namely a man and a woman who start contributing at age 23, retire at 65 and 60, respectively, earning a salary of US\$ 100 that grows by 2% per year, with a contribution density of 90% in the case of the man and 80% in the case of the woman.

- As we have seen, if the contribution rate is 10%, at age 65 the man would have paid in a total of US\$ 13,509 in contributions and the woman would have paid in US\$ 9,365 (future values at 3%).
- If the retirement age is extended to 66 for the man and 61 for the woman, the contributions paid in by the man would increase to US\$ 14,173 (an increase of US\$ 664, equivalent to a higher contribution cost of 4.9%) and those paid in by the woman would increase to US\$ 9,854 (an increase of US\$ 489, equivalent to 5.2% of the contributions she would have paid in if the system had remained unchanged).

Furthermore, the lost year of pensions would be worth approximately US\$ 1,006 for the man (equivalent to a cost increase of 7.5%) and US\$ 518 for the woman (equivalent to a cost increase of 5.5%)². In summary, the total cost of increasing the retirement age by one year for the man is US\$ 1,679 (equivalent to 12.4% of the contributions he would have paid if the system had remained unchanged) and US\$ 1,007 for the woman (equivalent to 10.8% of the contributions she would have paid if the system had remained unchanged).

A man who retires at 66 (and not at 65) pays a cost in terms of higher contributions and lower pension equivalent to a drop of 0.51 percentage points in profitability (0.51%). A woman who retires at age 61 (and not at 60) pays a cost in terms of higher contributions and lower pension equivalent to a drop of 0.65 percentage points in profitability (0.65%)³.

- If the retirement age is extended to 65 for women, contributions paid in would rise to US\$ 12,008, with an increase of US\$ 2,643 (equivalent to 28% of what they would have contributed up to the age of 60). Furthermore, the five lost years of pensions would be worth approximately US\$ 2,443 for

² The calculation is performed applying the life annuity formula in the individually funded program. The real value of the lost pensions will depend on the formulas applied by the PAYGO system of the respective country. The “lost pension” cost for the woman is lower since the absolute value of her pension is lower (she contributes for fewer years than the man), and, since she retires earlier her reference salary is lower – the man’s salary keeps rising between ages 60 and 65).

³ Estimates are for individuals who have contributed throughout their working lives under the corresponding conditions.



women (equivalent to a cost increase of 26%)⁴. Therefore, increasing the retirement age for women would entail a total cost for them of US\$ 5,086 (equivalent to 54.3% of the contributions they would have paid if the system had remained unchanged).

Women who retire at 65 (and not at 60) pay a cost in terms of higher contributions and lower pensions equivalent to a drop of 2.1 percentage points in profitability (2.1%)⁵.

c) Increases in the minimum number of years of contributions for having a right to a pension

Another type of adjustment that impacts on the cost of the PAYGO systems has been the increase in the number of years of contributions required for having a right to a pension. For example, in France the number of years of contributions required for receiving a full pension will increase from 37 to 41 years as of 2012 [see page 5, separate paragraph C) (2)].

The costs of this change for workers can be estimated with a methodology similar to the one used in the previous case. The difference is that the greater number of years of contribution can be at the expense of the number of years of pension, or a higher contribution density throughout the active working life or beginning to contribute at an earlier age or a combination of all the above.

Let us suppose that the retirement age does not change but contributions begin a year earlier (at age 22). In this case, the impact on the cost of contributions paid in will be similar to that estimated for the case of contributions paid in since the age of 23, but with the retirement age extended by one year:

- As previously mentioned, if the original contribution rate was 10% and contributions started being paid at age 23, at retirement age men would have paid a total of US\$ 13,509 in contributions and women would have paid US\$ 9,365 (future values at 3%).
- If, on the other hand, contributions started being paid at age 22, the total contributions paid in by men at retirement age would be US\$ 14,173 and those paid in by women would be US\$ 9,938 (future values at 3%). In other words, this change increases the cost of the program for men by 4.9% and for women by 6.1%.

⁴ The calculation is performed applying the life annuity formula in the individually funded program. The real value of the lost pensions will depend on the formulas applied by the PAYGO system of the respective country.

⁵ Estimates are for individuals who have contributed throughout their working lives under the corresponding conditions.



Alternatively, if the new requirement is met with a higher contribution density and contribution payments begin at age 23, maintaining the retirement age at 65/60, then:

- The total amount of contributions paid in by men at retirement age would be US\$ 13,830 and those paid in by women would be US\$ 9,618 (future values at 3%). This implies a 2.4% increase in the cost of the program in the case of men and a 2.7% increase in the case of women.