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Winners and losers in the first generations after structural social security reform: the Uruguayan case

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Abstract. In the 1990s, several Latin American countries privatized their social security schemes to a greater or lesser extent. The main reason for these reforms was the dearth of public PAYG systems. As yet, there is no consensus on how these reforms stand to affect pensions. We focus on the Uruguayan case, where the first generations of the new regime are due to retire soon. Some workers will receive lower pensions than those with similar income and labor histories but who retired under the "transitional" regime. Meanwhile, others will receive higher pensions. We present simulations to help understand the specifics of the problem and identify potential winners and losers.

Keywords: Retirement; social security; old age pensions; working class; Asociación Nacional de AFAP de Uruguay; Uruguay.

Acronyms

AFAP	Pension fund management company (Administradora de fondos de ahorro previsional)
Art.	Article
BCU	Central Bank of Uruguay (Banco Central del Uruguay)
BPS	Social Security Institute (Banco de Previsión Social)
IMS	Average Salary Index
INE	National Institute of Statistics (Instituto Nacional de Estadística).
PAYG	Pay-as-you-go

1. Introduction

In the 1990s and the first half of the 2000s, twelve Latin American countries applied structural reforms to their social security systems (Mesa-Lago, 2004). These changes, modeled on the Chilean reform of 1981, privatized the pre-existing public pay-as-you-go (PAYG) systems to a greater or lesser degree, substituting them with individual accounts managed by private institutions.

The main justification for the reforms was the deficits in the public PAYG systems. These financial problems were exacerbated in some systems by lax withdrawal conditions, in conjunction with generous benefits and demographic factors. However, there is no consensus that financial problems were the main or sole motive behind the changes in the social security systems (Madrid, 2002; Brooks, 2005).

There is likewise no agreement on the effect that the reforms will have on future pensions (see, for example: World Bank, 1994; Feldstein, 1999; Fehr, 1999; Shulz, 2000; Orenstein, 2011). Basically, the amounts received as pension payments to individual accounts depend on: the commissions charged by the fund managers; the return obtained on accumulated funds; the amounts saved in individual accounts, and over what period; and the years over which the pension is expected to be collected.

In the early years, the structural reforms faced some major challenges. One of these was the financial costs of the transition from a PAYG system to one of total or partial capitalization. These costs were associated with the downsizing of the public PAYG pillars, which occurred more quickly in the case of social security revenues than expenditures. This is the challenge, given its undeniable importance, on which the attention of analysts has been primarily focused.

Another key challenge, but one that has not attracted quite so much attention in the literature, concerns what to do about those workers who had already paid into a pure PAYG system when the reforms were introduced. Some countries, following Chile's lead, issued recognition bonds for contributions already made under the previous system. But Uruguay followed a different path, introducing a special, transitional regime intended to cover workers who had spent the majority of their working lives under the old regime. The transitional regime was restricted to workers who were 40 years old or above when the reform came went into effect. Those aged 39 and below at the time were assigned to a mixed regime composed of a PAYG and an individual savings pillar.

At present, those covered by this mixed regime are nearing the minimum retirement age. Some individuals within this cohort have calculated that their retirement benefits will be lower – in some cases, significantly so – than workers with similar occupational backgrounds who belonged to the transitional regime. The Uruguayan case is indicative of the challenges facing pension systems when it comes to providing equal treatment to different generations in the context of structural reforms. More specifically, it demonstrates the limitations and risks of a particular way of addressing the matter of transition generations. In this article, we analyze the problems associated with the "Uruguayan-style" solution and review a possible alternative, which consists of full recognition of contributions made prior to the reform.

In the next section, we briefly describe Uruguayan social security laws, as well as some data about the first generations that are due to collect their pensions under the post-reform rules. Thereafter, in the third section, we present some simulations for analysis of the differences between pensions under the new mixed regime and those under the transitional regime; to this end, we set out typical profiles of those who receive lower pensions in the mixed regime, while also showing that some workers in this cohort receive lower pensions than they would have done under the transitional regime, describing their earnings profiles; later, we compare the results of several generations. Then, to round off the section, we discuss the conceptual nature of the problem. In the final section, we present our concluding comments.

2. The structural reform of social security in Uruguay and the transition generations

The social security reform approved in 1995 (Law 16713, Ley de Seguridad Social, 1995) was no mere parametric adjustment, since the financing system was also amended to create a new mixed system. In this new regime, pensions are disbursed by the pre-existing public PAYG system overseen by the Social Security Institute (Banco de Previsión Social, BPS) and a new private individual capitalization pillar overseen by pension fund management companies (AFAP).

As a general rule, all workers whose monthly earnings are below the threshold established by law (5,000 May 1995 Uruguayan pesos, roughly equivalent to US$ 1,700 in 2017 US dollars) are affiliated solely to the public PAYG system. However, they can take the option of depositing half of their personal contributions into an individual account, and receiving a bonus payment in their public pension. The remaining workers are obliged to pay into both pillars, receiving a public pension for their payments up to the first threshold, and an annuity based on accumulations in their individual accounts. Contributions comprise 15% of personal earnings, and have a ceiling established by law (25,000 1995 Uruguayan pesos, equivalent to approximately US$ 5,100 in 2017 dollars).

The reform also changed several parameters that affect pensions in the public pillar: the minimum female retirement age was brought in line with that of males – 60 years of age – thereby adding five years to women's working lives; the years of contribution required to receive the ordinary pension was increased from 30 to 35; and replacement rates were made more sensitive to retirement age and years of contribution, thus increasing the incentives for postponing retirement.

To ensure a gradual transition from the previous retirement regime – governed by the Institutional Act 9 of 1979 – to the new mixed regime, the 1995 reform law provided for a "transitional regime." Under this provision, "transitional" workers continue to contribute exclusively to the public PAYG pillar, which has a similar design to the previous system, but incorporates the changes applied to the parameters of the new regime (including, as noted: the new female retirement age, replacement rates, years of contribution, and so forth). The law mandated the integration into the transitional regime of BPS-affiliated workers who, as of April 1, 1996, were aged 40 or over, were not retired, and were not yet entitled to retire.

The first generations of workers covered by the mixed regime – those aged 39 or less as of April 1996 – are now 50 or older, and thus approaching retirement age. Some of these workers find that the pension they receive under the mixed regime is inferior to that collected not long ago by workers with a similar occupational background but who, being slightly older, fell under the transitional regime. Our analysis centers on this group.

At present there are 234,335 people aged between 51 and 60 who are affiliated to the individual accounts pillar, accounting for 17% of all AFAP affiliates (Banco Central del Uruguay, BCU, 2017a). Of the workers in this age bracket 138,151 are presently contributing, representing 17% of the total number of contributors. Almost 60% of this group have earnings that correspond entirely to the first pillar, who are not required to affiliate with an AFAP but choose to do so, or who had crossed the threshold at an earlier date.

According to stimulations carried out by República AFAP (2015), 30% of affiliates in this age bracket would receive a higher pension in the transitional regime than the mixed regime.[1] The percentage increases significantly

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1 According to BCU (2017a) data, República AFAP is the management company with the largest number of affiliates, accounting for 45% of all system contributors. Moreover, 47% of affiliates, and 55% of contributors aged between 51 and 50, are registered with this institution. In addition,

with individuals' earnings, and slightly with worker age. República AFAP estimates that less than 1% of the individuals who have affiliated with an AFAP voluntarily – that is, they are not legally obliged to do so – would benefit from withdrawal. For intermediate income levels, the percentage of workers who would stand to benefit from such a change rises to 60%, while practically all high-earning workers would be better off under the transitional arrangements. However, the percentages of workers who would be favored by switching to the transitional regime falls when retirement postponement scenarios are taken into account.

3. Simulations

We present two sets of simulations. The first corresponds to stylized cases that facilitate understanding of the problem, while the second includes more realistic cases, developed in detail. For these simulations, we use modified versions of the programs presented by Forteza & Ourens (2012), who apply social security regulations to the scenarios we have chosen. Thus, we can determine whether the results of the simple simulations still hold in more complex cases. In so doing, we also analyze both the effects of low-income individuals opting to contribute to both pillars, as well as the sensitivity of the results at income and cohort levels.

3.1 The problem as seen through simple simulations

3.1.1 Some workers receive less through the mixed than through the transitional regime (pure PAYG)

In Table 1, we present a simple example that illustrates the problem. It concerns a high-income worker who received a monthly salary of 120,000 Uruguayan pesos throughout his working life (around US$ 4,000).[2] This income is 10.7 times greater than the country's statutory minimum wage in 2016, and 6.5 times higher than the average per capita household income, according to the National Institute of Statistics (Instituto Nacional de Estadística, INE). At this income level, the worker is required to pay into both pillars, up to the full amount of his salary, and will retire at 60 years of age after working for 35 years without interruption. The individual was 59 years old in 2016 and, thus, 39 when the mixed regime came into effect.

it has the largest number of high- and middle-income affiliates and contributors: 32% and 36%, respectively, representing twice as many individuals as all other AFAPs put together.

2 2016 Uruguayan pesos, updated by way of the Average Wage Index (Índice Medio de Salarios, IMS).

We make the assumption that he accumulated 3,684,000 pesos in savings in his AFAP (US$ 120,000).[3]

Table 1
Pension received under the mixed and transitional regimes; case: high-income 59-year-old worker (monthly salary in thousands of 2016 Uruguayan pesos)

	Mixed regime	Transitional regime
Earnings	120	120
1. "Solidarity" pillar		
Basic pensionable earnings	44	120
Replacement rate (technical)	0.5	0.5
Maximum pension[(1)]	36	53
BPS pension	22	53
2. Individual savings pillar		
Pension savings fund	3,684	-
Annuity	15	-
3. Total pension (BPS + AFAP)	37	53

Notes: nominal earnings; that is, after social security and tax deductions. Earnings are assumed to be constant in real terms throughout the working life.
[(1)] Current maximum pension (see: Banco de Previsión Social, BPS, n.d.).

In the mixed regime, the first 44,000 pesos in earnings correspond to the PAYG pillar administered by the BPS, while the remaining 76,000 falls under the individual savings pillar overseen by the AFAPs. All employer and personal contributions up to this first 44,000 pesos go toward the contribution pillar. The remainder of the personal contribution is accumulated in the individual savings fund.

The PAYG pillar pays out a pension calculated as a percentage of average pensionable earnings. This percentage, known as the technical replacement rate, is 50% in the case considered in Table 1 (corresponding to an individual who retires at 60 years of age, having contributed for the statutory 35 years). The average earnings under this pillar, or the "basic pensionable earnings," is 44,000 pesos in this example. Thus, the monthly pension paid out by the intergenerational solidarity pillar is 22,000 pesos (around US$ 750).

We assume that the personal contributions paid into the individual savings fund amount to a total of 3,684,000 pesos (approximately US$

3 The savings of US$ 120,000 are roughly what would be expected of a 59-year-old worker with this income level in 2016. In the more detailed simulations presented in the following tables, we perform accurate calculations of the pension savings that, given the labor histories and rates of return observed over this same period, different types of workers may have accumulated.

120,000) by the time this worker turns 59. The worker uses this fund to acquire a life annuity; that is, a contract with an insurance company that provides a pension through to death. According to current BCU regulations, insurance companies must pay no less than 4.2 pesos for every 1,000 pesos accumulated in the fund.[4] We assume a payment of exactly this amount. Thus, the annuity received by the worker in this example is approximately 15,000 pesos (around US$ 500).

Thus, this worker will receive a full pension, payable by the BPS and the insurance company, of 37,000 pesos (US$ 1,250).

If this same worker were assigned to the transitional regime, purely PAYG, the worker would be covered entirely by the solidarity pillar. Thus, the earnings corresponding to this pillar would be 120,000 pesos. The basic pensionable earnings would be the same amount, resulting in a pension of 60,000 pesos (the replacement rate remaining at 50%); but in this case, the maximum pension is applicable to those who retire under the transitional arrangements (approximately 53,000 in 2016 Uruguayan pesos, or US$ 1,800). Thus, the mixed regime pays a pension of 16,000 pesos (more than US$ 500) less than would have been the case under the transitional regime. This difference is equivalent to 30% of what would have been obtained under the latter regime.

The pension works out lower under the mixed regime compared with the transitional regime primarily because basic pensionable earnings are considerably lower in the case of the former than the latter. In this example, the annuity only partially offsets the drop in the pension under the solidarity pillar.

3.1.2 The problem does not affect low-income workers

The difference in pension levels identified in the previous section does not occur in the case of low-income workers, who in both cases are covered entirely by the PAYG pillar, with similar parameters. Indeed, the law establishes that those earning below 44,000 in 2016 pesos pay into the solidarity pillar alone. The replacement rate, basic pensionable earnings and, thus, the pensions are equal under both regimes. In Table 2, we present a similar example to that of Table 1, the only difference being that the worker now has relatively low earnings: the salary is now 40 thousand pesos (US$ 1,350), roughly 3.5 times the current statutory minimum wage and two times the average per capita household income, according to the INE. These

4 This minimum amount varies by sex and age.

workers neither win nor lose under the mixed regime in comparison with the transitional one.

Table 2
Pension received under the mixed and transitional regimes; case: low-income 59-year-old worker (monthly earnings in thousands of 2016 Uruguayan pesos)

	Mixed regime	Transitional regime
Salary	40	40
1. "Solidarity" pillar		
Basic pensionable earnings	40	40
Replacement rate (technical)	0.5	0.5
Maximum pension	36	53
BPS pension	20	20
2. Individual savings pillar		
Pension savings fund	0	-
Annuity	0	-
3. Total pension (BPS + AFAP)	20	20

Note: nominal earnings; that is, after social security and tax deductions.

3.2 Detailed simulations

The examples presented in the previous section are highly stylized and, more importantly, the main result – that the annuity does not offset the difference in pensions between the mixed regime and the transitional regime for the high-income worker in Table 1 – is based on the assumption that the total accumulated in the fund is 3,684,000 in 2016 pesos (approximately US$ 120,000). Obviously, if the fund were sufficiently large, the mixed regime could yield the same or a higher pension level than the transitional regime. However, the fund of US$ 120,000 is roughly what a 59-year-old worker with these earnings could have been expected to receive in 2016, having contributed since the system was implemented when the worker was 39. In the more detailed simulations presented below, we perform accurate calculations of the pension savings fund that different types of workers may have accumulated, given labor histories and the actual rates of return observed between the start of the system through to the present.

Another aspect we did not take into account in the previous simulations was the option that low-income workers have of contributing voluntarily to an AFAP. Article 8 of Law 16713 (1995) established that workers with monthly earnings equal to or less than 5,000 in May 1995 pesos (roughly equivalent to 44,000 in 2016 pesos) can opt to pay half of their personal contributions into an individual savings fund. Should they do so, 50% of their basic pensionable earnings go to the PAYG pillar. Thus, although workers' personal contributions to the intergenerational solidarity pillar are halved under this option, their basic pensionable earnings are only reduced by 25%.

In the case of workers who take the Art. 8 option, the mixed regime can provide different results from the transitional one. Depending on the parameters, workers can end up with better results under one regime or the other. But if the worker makes the right choice – that is, by contributing only to the individual savings pillar when the results are better under this option – the mixed regime yields the same or better results than the transitional one for these workers.

Of course, a worker might take the Art. 8 option in the belief that it will be the most worthwhile, only for this not to prove to be the case. But this is because Art. 8 may not turn out to be *a posteriori* beneficial in some instances, rather than because the mixed regime necessarily gives less favorable results than the transitional one. The situation is thus quite different from that affecting middle- and high-income workers, where there is an appreciable and predictable drop in pension payments, and no possibility to opt out.

3.2.1 The problem affects middle- and high-income workers

In Table 3, we provide an overview of the results of simulations in which we consider workers with three income levels. As with the simple example in the previous section, the workers start working at the age of 25, make uninterrupted social security contributions, and retire at 60 years of age. We now assume that real income increases with age at a rate of 1% per year, ending up 40% higher at the time of retirement than it was when first starting work. At 59 years of age, the salaries of the high-, middle-, and low-income workers are 20,000, 80,000, and 20,000 pesos, respectively. In the mixed system, contributions paid into the pensions savings fund are capitalized at a real annual rate of 4%, broadly equivalent to the rate yielded by funds managed by AFAPs between the start of the system (1996) and the present day (2016),[5] discounting AFAP commissions and the compulsory insurance premium, for which we use a rate equivalent to 20.8% of contributions in both cases.[6] In the case of workers with an income of 40,000 pesos or less,

5 Because the analysis for this group of workers is *ex post*, we did not perform an interest rate sensitivity analysis.

6 According to BCU data, the average system commission in the so-called accumulation subfund was 3.12% of pensionable income in 2015, representing 20.8% of personal contributions, equal to 15% of pensionable earnings (see: BCU, 2017b).

we consider both those who decided to pay into the PAYG pillar alone, and those who preferred to contribute to both pillars (per Art. 8).

Table 3
Pension under mixed and transitional regimes by income level and option to contribute per Art. 8 of Law 16713 (monthly amounts in thousands of 2016 pesos)

Employment earnings	Mixed regime		Transitional regime
	Does not contribute per Art. 8	Contributes per Art. 8	
20	10	11	10
80	29	Not applicable	40
120	36	Not applicable	54

Notes:
- Nominal earnings; that is, before social security and tax deductions; nominal amounts (according to income brackets, maximum pensions, etc.) adjusted by average salary index.
- Assumptions: workers who were 59 years of age and had a salary of 20,000, 80,000, or 120,000 pesos in 2016; real earnings rise with age at an annual rate of 1%; workers contribute continuously between the ages of 25 and 59 and retire at the age of 60; rate of return in individual savings account equal to the 1996-2015 average of 4%.

A worker who is earning 120,000 pesos by the end of his working life will obtain a pension of approximately 36,000 pesos under the mixed system, 67% of the 54 thousand earned by the transitional system;[7] these figures are similar to those from the example in Table 1. Under this system, a worker who earns 80,000 pesos will receive a pension of 29,000 pesos: approximately 73% of the 40,000 pesos to which the worker would be entitled under the transitional regime.

Therefore, low-income workers achieve the same result under both the transitional and mixed regimes if they opt not to contribute to an AFAP. But if the worker does decide to contribute to an AFAP (per art. 8), the pension under the mixed regime will be some 10% higher than under the transitional one.

We also performed a sensitivity analysis of the age-earnings profile, based on the income-level salary curves estimated by Peña (2005), drawing on data pertaining to social security contributors in Uruguay. No significant differences were found.

7 This worker obtains the maximum under the transitional regime, which as at May 2016 was 53,448 pesos. The worker in the example was 59 years of age in 2016, and collected the first pension in 2017. We assume that the maximum pension, as in other legal limits, is adjusted by the average salary index and that this increases by a real annual rate of 1%, so the first pension payment received by this worker is somewhat greater than the 2016 ceiling.

These results therefore show that not all workers in this cohort lose out on pension income under the mixed regime. The problem is restricted to middle- and high-income workers. Low-income workers are not affected, and can even benefit under the change.

It should be taken into account that the workers simulated have full contribution histories. Uruguayan studies show that contribution histories are subject to frequent interruptions, especially those of the most vulnerable workers (Bucheli, Ferreira-Coimbra, Forteza, & Rossi, 2006; Bucheli, Forteza, & Rossi, 2010; Apella, Fajnzylber, Forteza, Grushka, Rossi, & Sanroman, 2011; Lagomarsino & Lanzilotta, 2004). Under these conditions, Forteza & Rossi (2013) show that a PAYG system does not always translate into greater benefits than a capitalization one, since the former requires more rigid conditions of eligibility. In this particular case, low-income workers with fragmented histories may benefit to a greater extent under the mixed regime by contributing to both pillars. In so doing, they would gain access to a pension at 65 years of age, even if they had accumulated few years of service.

3.2.2 The problem affects older workers in the mixed system

The annuity available from the insurer will be directly dependent on the amount accumulated in the pension savings fund. This amount, in turn, depends on the monthly contributions, but also – and fundamentally – on the periods over which these contributions are made and capitalized. The workers in the examples given in the previous sections made social security contributions for 35 years, but were only able to pay into their pension savings fund for 20 years, since this possibility did not previously exist. This problem will gradually be attenuated in the coming generations.

In Table 4, we present simulations for workers of different ages in 2016, including three cases of individuals currently aged between 50 and 60 – the *cincuentones*, or fifty-somethings – and one 25-year-old. All of them contribute between the ages of 25 and 59 and retire at 60, but while the oldest in the group will have paid into the pension savings fund for 20 years; the 55-year-old will have done so for 25 years; the 50-year-old for 30 years; and the 25-year-old for 35 years. Since we established that the proportionally greatest losses are recorded in the high-income sectors, we selected individuals in this bracket for the simulations.

Table 4
Pension received under the mixed and transitional regimes by generation: high-income workers (monthly incomes in thousands of 2016 pesos)

Age in 2016	Initial pension		Effective replacement rate(1)	
	Mixed regime	Transitional regime	Mixed regime	Transitional regime
59	36	54	0.34	0.53
55	41	56	0.38	0.53
50	49	59	0.43	0.53
25	71	75	0.49	0.53

Notes
- Nominal earnings; that is, before social security and tax deductions; nominal amounts (according to income brackets, maximum pensions, etc.) adjusted by average salary index.
- Assumptions: workers earn 120,000 pesos at the age of 59 (for younger generations, the level is corrected by the average salary index); workers contribute continuously between the ages of 25 and 59 and retire at the age of 60; rate of return in individual savings account is equal to the 1996-2015 average.
(1) The effective replacement rate is the percentage of the most recent take-home pay received and covered by the first pension payment; it differs from the technical replacement rate, which applies to basic pensionable earnings.

As is to be expected, the differences in favor of the transitional regime decrease in inverse proportion to contributor age, confirming that it is the *cincuentones* who are disproportionately affected by the reform.[8]

Utilizing Peña's (2005) age-earnings curves, the qualitative results do not change, even though according to logic the benefit levels will, especially in the case of younger individuals.

3.2.3 Pension differences are reduced if retirement is postponed

In all of the above examples, we assumed that the workers retired at 60 years of age. If retirement is postponed, pension payments from both the inter-generational and the individual savings pillars will increase. The pensions paid by the BPS go up primarily because replacement rates increase with retirement age and years of service. Meanwhile, the annuity increases due to the growth in the fund accumulated, and because the amount per unit disbursed by the insurance company increases with retirement age (based on an expectation of fewer years of payouts). Depending on the parameters, the postponement of retirement can increase one pension more than another.

8 Moreover, according to estimations by República AFAP (Noguez, 2009), the real long-term interest rate could be higher than that recorded between 1996 and 2015, so the results under the mixed regime for workers currently aged 25 might be better than those shown in Table 5. If we assume a real interest rate of 5% per year, as projected by Noguez, the 25-year-olds in Table 5 will have a starting pension of 58,000 pesos, representing an effective replacement rate of 56%.

In Table 5, we present the simulated pension for workers who retire at 60 years of age, and for those who retire at 65. To study the cohort in which the differences between the transitional and mixed regime are the greatest, we return to high-income workers who were 59 years of age in 2016.

Table 5
Pension received under the mixed and transitional regimes by retirement age: high-income workers (monthly earnings in thousands of 2016 pesos)

Retirement age	Initial pension		Effective replacement rate(1)	
	Mixed regime	Transitional regime	Mixed regime	Transitional regime
60	36	54	0.34	0.53
65	52	57	0.48	0.53

Notes:
- Nominal income; that is, before social security and tax deductions; nominal amounts (according to income brackets, maximum pensions, etc.) adjusted by average salary index.
- Assumptions: workers who in 2016 were 59 years old, and earning 120,000 pesos. They contribute continuously between the ages of 25 and 59. Rate of return in individual savings account equal to the 1996-2015 average.
(1) The effective replacement rate is the percentage of the most recent take-home pay received and covered by the first pension payment; it differs from the technical replacement rate, which applies to basic pensionable earnings.

Table 5 shows that the difference in favor of the transitional regime decreases with retirement age. The pension under the mixed system is 67% of that under the transitional regime at 60 years of age, and 92% at 65 years of age. The gap closes with retirement age, because there is a marked, concurrent increase in annuity.

In the case of the simulations based on Peña's (2005) age-earnings profiles, there were no differences, except for an increase in actual replacement rates at 65 years of age. This is because the earnings profiles of high-income individuals is inverted U-shaped, falling sharply in the case of older adults.

3.2.4 Recognition of years paid into the BPS before 1996

Many current *cincuentones* had contributed for several years before the reform assigned them to the PAYG pillar alone. However, for the purposes of calculating the pension to be paid by the BPS, and pursuant to the provisions of Law 16713 (1995), only contributions of up to 5,000 in 1995 pesos – around 44,000 in 2016 pesos – are recognized. Table 6 shows the pension that would be received by the worker simulated in Table 1, if his contributions prior to 1996 were fully recognized.

Table 6
Retirement under the mixed regime, with partial and total recognition of contributions prior to 1996 and the transitional regime (monthly amounts in thousands of 2016 pesos)

Employment earnings	Age in 2016	Mixed regime, with recognition of contributions prior to 1996		Transitional regime
		Partial	Total	
20	59	11	11	10
80	59	29	41	40
120	59	36	63	54
120	55	40	59	56
120	50	45	55	59

Notes:
- Nominal income; that is, before social security and tax deductions; nominal amounts (according to income brackets, maximum pensions, etc.) adjusted by average salary index.
- Assumptions: workers contribute continuously between the ages of 25 and 59 and retire at the age of 60; rate of return in individual savings account is equal to the 1996-2015 average; low-income workers select the option provided for by Art. 8 of *Law 16713* (1995).

From Table 6, it can be seen that if the BPS recognized all contributions made before the social security reform, the *cincuentones* would receive considerably larger pensions. The oldest workers would benefit the most, since they contributed for more years prior to the reform. In the simulations presented, workers aged 55 and 59 in 2016 would receive even higher pensions under the mixed regime, with full recognition of contributions made prior to 1996, than they would under the transitional regime. Recognition of contributions paid in before 1996 has less of an impact in the case of younger individuals, given there will be less years to recognize.

It should be noted that the differences observed with partial and total recognition of contributions prior to the reform are due solely to the variation in the pension disbursed under the public PAYG pillar.

Moreover, for low-income workers (those earning 20,000 pesos in 2016) there are no differences between the mixed regime and recognition of contributions because, given their level of earnings, all of their pensionable earnings fall under the mixed regime.

3.3 Discussion

According to our analysis, there is a group of workers affiliated with Uruguay's main retirement and pension program, belonging to the first cohort covered by the mixed regime introduced in the 1995 pension reforms, who receive slightly lower pensions than other workers with very similar contribution histories. The reform seeks to restore financial sustainability to the system and, thus, to reduce benefits and/or increase contributions. With the advent of the so-called transitional system, an attempt was made to distribute the burden of the change across all groups, but, as our analysis shows, some workers in the first cohorts of the mixed system receive less favorable treatment than other workers with similar incomes but from different cohorts.

This group is made up of individuals born after April 1956 who contributed to the social security system before the reform was implemented, with a pensionable salary greater than 5,000 in 1995 pesos in (approximately US$ 1,700 at present rates). Workers with the same contribution history, but born shortly after this date, receive pensions under the transitional system that can be as much as 50% higher. Younger generations of workers with similar contribution histories, and who entered the job market after the mixed regime had been introduced, also receive more favorable treatment.

The relatively low expected pensions of these workers is due to non-recognition of part of their contributions. Under the mixed regime, workers pay into the PAYG pillar for earnings up to approximately US$ 1,700, and, based on these contributions, basic pensionable earnings – that is, the average of the contributing earnings used in pension calculation – is calculated, averaging around $1,700. Thus, contributions made by workers under the mixed regime before April 1996, and which exceed US$ 1,700, are not recognized in the calculation of their pension. To quantitatively evaluate the effect on pensions of partial recognition of contributions, we present simulations of the pensions that these workers would receive if their contributions were fully recognized. In some of the examples, the worker receives just 57% of what he would have obtained given total recognition of his contributions.

It should be noted that the phenomenon we identify is not a natural result of any inherent progressiveness of the public pension system. It is to be expected that high-income sectors will receive a lower return on their contributions than lower earners in a pension system whose objectives include reducing old-age income inequality. But what we compare here is individuals with similar income levels, and we find significant differences in the pension payments. The losers identified here are therefore not those with high incomes in general, but a particular subgroup corresponding to the first generations covered by the mixed regime. Collectively, this subgroup was likewise not particularly privileged before the reform. Indeed, the 1995 reform marked the first time that Uruguayan social security distinguished between those born before and after April 1956. Thus, it is not possible for this subgroup to have had any special privileges.

That said, our analysis clearly shows that any "solution" involving an increase in the pensions of this group in particular, without altering other aspects of the system, will entail a loss of progressiveness. It is also clear that any upward adjustment in the benefits of this group without a concurrent reduction in those of other groups, or an increase in contributions, will affect the system's financial sustainability.

4. Final comments

Concerns surrounding the amounts received in pensions following the social security reforms of the 1990s, and their subsequent adjustments, are common to all countries concerned (Alonso, Sánchez, & Tuesta 2014; Cetrángolo & Grushka, 2004; Escóbar & Gamboa 2014; Mesa-Lago 2016; Shelton 2012; Wong, 2013).

In the Uruguayan case, some intermediate generations have been hit particularly hard by the reform. Under the current regulations governing Uruguay's pension and retirement system, middle- and high-income workers from the first generations covered by the mixed regime will receive considerably lower benefits than those from other generations with similar incomes and employment histories. These workers were slightly less than 40 years old when the mixed regime came into effect, and are now *cincuentones* nearing minimum retirement age.

When the individual savings system came into being, this cohort had already been contributing to an exclusively PAYG regime for several years. However, the reform law stipulated that retirement under the PAYG pillar would be calculated on the basis of earnings covered starting from the new regime. For middle- and high-income workers, the new basic pensionable earnings under the PAYG pillar are appreciably lower than that which applied before the reform, and through which they contributed for several years. Contributions made in these early years of their working lives are not being fully taken into account. In turn, the period available for these workers to pay into their pension savings fund was markedly shorter than that enjoyed by subsequent generations.

It should be borne in mind that these inter-generational differences are diminished with postponement of retirement. While not strictly obligatory, the new system has strong incentives to remain active for longer. However, it should be recalled that in this study we have simulated individuals with complete contribution histories. The problem of low pensions is made significantly worse when the contribution density drops and early interruptions in contributions have a marked effect on the individual savings system.

This study seeks to contribute to a better understanding of the issues under discussion. In any case, it is important to take into account that the reform approved in 1995 sought, among other things, to restore the financial stability of a system that was on a clearly unsustainable course. This necessarily meant that some groups of workers would receive lesser benefits and/or make more sizable contributions than previous generations.

Apparently, the aim was to ensure that the burden was increasingly borne by younger generations; the thinking was probably that they were further from retirement and thus had more time to adapt to the new rules of play. However, a group of intermediate generations, those now known as the *cincuentones*, now appear to be bearing the brunt of the changes. The current middle- and high-income *cincuentones* will receive less favorable treatment than their elders, but also than their younger counterparts.

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