Universidad de la República
Facultad de Ciencias Sociales
DEPARTAMENTO DE ECONOMIA

Documentos de trabajo

Uruguay, Pensions and Fiscal Sustainability

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Documento No. 02/04
Mayo, 2004

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First draft 02/04/04
This version: 25/05/04

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Resumen

Simulamos el presupuesto de la principal institución previsional del país, el Banco de Previsión Social (BPS), desde 1995, el año en que se aprobó la reforma, hasta 2050, cuando el nuevo régimen estará maduro. Realizamos varios análisis de sensibilidad para evaluar cuáles son las variables exógenas y parámetros clave en el desempeño financiero del BPS en el mediano y largo plazo. De acuerdo con nuestras simulaciones, el presupuesto del BPS será muy sensible a las edades de retiro y a la habilidad y voluntad de la institución de controlar que las condiciones requeridas para acceder a los beneficios se cumplen efectivamente. La flexibilidad con que el BPS otorgó estos beneficios en el pasado tuvo efectos significativos en su desempeño, de acuerdo con estas simulaciones. En años recientes, el BPS ha incrementado los controles, con efectos potencialmente significativos tanto en el presupuesto como en el número de individuos que quedan excluidos de los programas contributivos. Estudiamos las obligaciones fiscales contingentes que se asocian al riesgo de que el número de aspirantes a los programas asistenciales crezca debido al endurecimiento de las condiciones en los programas contributivos. También evaluamos algunas alternativas de reforma de los programas no contributivos que, entre otras cosas, ampliarían su actual cobertura.

Abstract

We simulate the budget of the main pension institution of the country, the Banco de Previsión Social (BPS), from 1995, the year the reform was passed, to 2050, when the new system should be mature. We perform several sensitivity analyses to evaluate which are the key exogenous variables and parameters determining the financial performance of the BPS in the medium to long run. According to our simulations, the budget of the BPS will be highly sensitive to the ages of retirement and to the ability and willingness of the institution to control the fulfilment of the required conditions to receive a contributory pension. The flexibility with which the BPS granted these benefits in the past had significant effects on its financial performance, according to these simulations. In recent years, the BPS has tightened the controls, with potentially significant effects on both the budget and the number of individuals excluded from the contributory programs. We study the contingent fiscal liabilities that are associated to the risk that the number of applications to the assistance programs grows because of the tougher conditions in the contributory programs. We also evaluate some alternatives to reform the non-contributory programs that, among other things, would extend their current coverage.

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[2] Anna Caristo, Natalia Ferreira-Coimbra and Gabriel Katz provided an invaluable assistance in this project. Gabriel Lagomarsino kindly helped us to better understand the PIT-CNT proposal to reform the non-contributory-old-age program. Daniel Oks provided useful comments to a previous version. The World Bank financed the study. The author assumes full responsibility for its specific contents.

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1 Introduction

One of the main goals of the reform that introduced savings accounts in the Uruguayan pension system was to put the budget of the public pillar on a sustainable path, and to reduce the burden it represented on the government and ultimately on the taxpayers. In the present paper, we make an attempt to assess whether this goal is being achieved. To this end, we simulate an overlapping generations model in the fashion of Auerbach and Kotlikoff (1987) calibrated to the Uruguayan conditions and with a particular focus on the pension system (Forteza, 2003). We simulate the budget of the main pension institution of the country, the Banco de Previsión Social (BPS), from 1995, the year the reform was passed, to 2050, when the new system should be mature. We perform several sensitivity analyses to evaluate which are the key exogenous variables and parameters determining the financial performance of the BPS. The public pension program is also composed of the army and police retirement services. The budget of these institutions is several times smaller than that of the BPS, but it is still significant since it represents approximately 1.8 per cent of GDP. We provide a very brief account of its recent performance.

The simulations mentioned above make fairly simple assumptions about the non-contributory part of the Uruguayan social security system. Until now, this has been a relatively minor program. However, preventing poverty among the elderly is one of the main goals of public pension systems, and some doubts have recently been raised about the ability of the contributory programs to address this issue in Latin American countries (Gill, Packard and Yelmo, 2003). Besides, there is some concern in Uruguay that the tightening of the conditions to access to the contributory pensions that came with the reform might put the assistance program under more pressure. This means that the assistance program might have to be redesigned to face these new challenges. We consider several options for reform and make an attempt to assess the contingent fiscal liabilities that might be associated to them.

After this introduction, the paper proceeds as follows. In section 2, we briefly describe the current situation of the public pension programs and old-age poverty in Uruguay, trying to put it in a regional perspective. Section 3 contains the results of simulating the overlapping generations model to assess fiscal sustainability in the medium to long run. Section 4 is devoted to the analysis of the non-contributory programs and the alternatives for reform. We present our main conclusions in section 5.

2 Pensions and old-age poverty in Uruguay

A recent study conducted in the World Bank concludes that the reformed pension systems in Latin America have not devoted enough attention to the alleviation of poverty among the elderly (Gill, Packard and Yelmo, 2003). More often than not, reforming countries have settled minimum pensions, but mostly based on a history of previous contributions. Given the low coverage of the pension systems in most countries in the region, the argument goes,

this requirement leaves a significant part of the population excluded, constraining the ability of the pension systems to prevent and alleviate poverty.

According to the same study, pension reforms in Latin America have not succeeded in their attempt at reducing informality and increasing coverage of the pension systems. Reformers argued that the new policies would provide incentives for workers to formalize (World Bank, 1994). The basic idea was that the old systems had a big implicit labour tax component that induced workers to stay in the informal sector. By reducing this implicit tax, the reforms would reduce the distortion, and workers would increasingly move towards the formal sectors. However, there is no conclusive evidence showing significant progress in this front. Gill, Packard and Yelmo (2003) argue that coverage continues being low and has not improved much in several reforming countries. Bertranou, Grushka and Rofman (2001) show that, in Argentina, the share of the population covered by the pension system has decreased after the reform, both in terms of contributors and pensioners. Chile exhibits better performance: the share of employed workers that are actively contributing rose significantly after the reform and there is some evidence that coverage among the elderly has also increased (Arenas de Mesa and Hernández, 2001; Schmidt-Hebbel, 2001).

Poverty among the elderly is also prevalent in several Latin American countries. Gill, Packard and Yelmo (2003) note that, in 1998, the incidence of poverty among the elderly was larger than in other age groups in six out of the eight countries included in the study done by Wodon, Lee and Saens (2002). Therefore, in most Latin American countries, the elderly seem to be a vulnerable group in terms of poverty risk.

The current situation of the elderly in Uruguay is quite different from what was described above. Like other Latin American countries, Uruguay has not developed a large non-contributory program, but the contributory programs are larger than in other countries in the region. Nowadays, total public expenditure in pensions represents 15 per cent of GDP (Ferreira-Coimbra and Forteza, 2004). Besides, the coverage of the pension programs among the elderly is large, at least by Latin American standards (table 1). Almost 90 per cent of the population aged 65 and above receive a pension, and this record has not changed significantly during the last decade. The coverage of recipients is lower and has been reducing in the aftermath of the reform for age groups between 55 and 64, but this is not necessarily a sign of increasing informality. The data suggests that the drop in the percentage of pensioners among these age groups is mostly due to the postponement of retirement. As table 1 shows, the sum of contributors and recipients of the pension system in these age groups has not changed significantly between 1995, the last year of the pre-reformed system, and 2000. The decline in the proportion of pensioners aged 55 to 64 between 1995 and 2000 is countervailed by a similar rise in the proportion of contributors. The decline in the share of pensioners in these age groups has apparently been even stronger during 2001 and 2002, while the share of contributors continued rising. In these

last two years, however, the decline in pensioners outweighs the increase in contributors, probably due to the rise of unemployment and informality during the crisis.[3]

Coverage of the pension system is significantly smaller among younger population and among active workers than among the elderly, and it has been so for many years. Bucheli (2003) reports that approximately two thirds of the employed workers contributed to social security in 2002 in Uruguay, a figure that is well below the coverage of recipients mentioned above.[4] Significant gaps between the proportion of contributors and of recipients of the pension system has also been reported in Argentina, Brazil and Chile (Bertranou, 2001). These gaps can be partially explained by the non-contributory and the survival pensions, but several analysts have pointed out that the gaps are also due to the *flexibility* with which contributory old-age pensions were granted in these countries in the past (Camacho, 1997; Forteza, 1999; Bertranou, 2001; Caristo and Forteza, 2003).

Not only is the coverage of the pension system among the active workers smaller than among the elderly, but it has also been declining in recent years in Uruguay. Bucheli (2003) reports a fall of the rate of coverage of employed workers of about 2.5 points between 1991 and 2000. She also shows that the fall in the share of employed workers that contributed to social security during the nineties is due to the reduction of the proportion of public employment in total employment. Given that the proportion of uncovered workers in the public sector is close to zero, this change in the structure of employment drives the average (public plus private) rate of coverage down. The rate of coverage within each group, i.e. public and private employees, did not change during these years. In any case, the reform does not seem to have contributed to raise the coverage among active workers.

In Uruguay, unlike in the sample of Latin American countries reported by Wodon, Lee and Saens (2002), the incidence of poverty among the aged population is significantly lower and has declined faster than in other age groups during the nineties (table 2). In all age groups, poverty reduced during the first half of the nineties and rose in recent years, following the economic cycle. But the reduction was stronger and the rise less pronounced among the elderly than among other age groups.[5]

The decrease in old age poverty during the nineties coincides with the rise in the purchasing power of pensions that took place in this decade (table 3). The significant decline in the

[3] The 2001-2002 figures should be taken with caution for two reasons: a) there was a change in the methodology of the survey in 2001, b) these years are quite atypical because of the huge crisis Uruguay was passing through.

[4] Comparisons between coverage among the employed and the elderly should be done with caution, for these indexes are not directly comparable. Unlike the coverage rate of the elderly, the index of coverage among the employed does not count all the population in the denominator and is not refered to an specific age group. The proportion of the young population that is contributing to the pension system must be significantly smaller than two thirds, and the gap between contributors and beneficiaries must be larger than what the above mentioned figures indicate. Therefore, even though these indexes can only provide a very rough approximation to the actual gap between contributors and beneficiaries, it seems enough to make the point that a significant gap exists.

[5] Despite of the low incidence of poverty among elderly people, poor old women, specially widows without children, constitute one of the most vulnerable social groups according to World Bank (2001).

rates of inflation during the first half of the nineties caused a rise in the purchasing power of pensions, due to the lagged-indexation rules that were used to adjust pensions. Given the comparatively wide coverage of the pension system among the elderly, the rise in the purchasing power of pensions seem to have had a significant impact on poverty alleviation in this age groups. Gradin and Rossi (2001) show that pensions contributed to ameliorate the polarization of labour income that occurred in the country between 1989 and 1997.

3 The budget of the Banco de Previsión Social (BPS)

As the pensions became increasingly generous during the nineties, the expenditure of the public pension programs rose at a very significant pace (table 4). The BPS is by far the biggest of the three programs and the one that contributed most to the rise of public spending in pensions, but it was the army retirement service the one that grew at a highest rate during this period. Altogether, these programs represent today roughly one half of total government expenditure.

The revenues of the BPS also grew at a higher rate than GDP during most of the nineties. Yet, revenues could not keep the pace with spending and the government had to support the BPS with increasing amounts of financial assistance (table 5). The reform of the pension program that began in 1996 did not immediately curb these expansionary trends, and it was not supposed to do it, given the gradualism that characterizes the Uruguayan reform process. Furthermore, the financial assistance required by the BPS was expected to increase at the inception of the reform (see box 1 for a brief description of the reform).

In recent years, the recession hit the BPS and its performance was much worst than it could be expected in normal conditions. These abnormal macroeconomic environment makes it difficult the assessment of the performance of the reformed system. It is not easy to tell whether and to what extent the substantive increase in the financial assistance required by the BPS in recent years is a temporary phenomenon due to the recession or is a sign that something went wrong with the reform and should be fixed. In this section, we present some simulation results that abstract from the short run macroeconomic fluctuations. The aim is to understand the more permanent and substantive trends that are ultimately crucial for the intertemporal sustainability of the government budget. In the appendix, we do a rough and highly tentative comparison between actual and simulated performance in recent years, trying to disentangle the temporary from the more permanent and substantive trends.

Box 1: The reform of the Uruguayan pension system (law 16.713)

In 1995, the Uruguayan parliament passed the bill for the reform of the main pensions program of the country. By that time, this program served almost ninety per cent of all the pensions paid in Uruguay (Ferreira and Forteza, 2004). Since 1967, this program had been ruled by a public and autonomous-from-the-government body called the Banco de Previsión Social (BPS). The pre-reform program had defined benefits and a pay-as-you-go (PAYG) financial regime.

The reform initiated in 1995 introduced a savings account pillar and modified key parameters of the PAYG pillar. As a general rule, affiliates with wages below a threshold continue being served exclusively by the public-PAYG pillar, unless they explicitly opt for sending half of their personal contributions to a savings account. Until now, most workers in this situation made this option and are currently contributing to both pillars by halves. Affiliates with higher wages are obliged to make personal contributions to both pillars. Employers' contributions go exclusively to the public-PAYG pillar. Accordingly, low-wage workers who did not opt for the savings accounts receive their full pension from the BPS, while other workers' pensions are financed by both the BPS and the funds accumulated in their savings accounts. According to estimations made in the BPS (Camacho, 1997), the public pillar will still be paying roughly three quarters of the pensions of this mixed program when the reformed system reaches maturity.

The public-PAYG pillar was reformed in several important aspects. As a general rule, the accessibility conditions were tightened, both on paper and in practice. The required minimum age for women to receive a contributory pension was raised from 55 to 60 years, and the minimum number of years of effective contributions required to receive the pension was raised from 30 to 35 for both women and men. The administration of the system was significantly improved, implying, among other things, that the accessibility conditions are currently better controlled for. In turn, the formulae used to compute the pension were changed. Minimum and maximum pensions paid by the public pillar were raised. The replacement rate was made more sensitive to the retirement age and the years of contributions, i.e. it was reduced for workers retiring with the minimum required age and years of contributions and raised for workers who decide to retire later. Finally, the number of years of contributions considered to compute the initial pension was raised. Before the reform, the so-called "basic pension wage" (the figure that multiplies the replacement rate to produce the initial pension) was the average of the wages on which the last three years of contributions were done. After the reform, the formula takes into account the last ten years of contributions and the twenty years of highest contributions. With this change, the reformers aimed at reducing the incentives to underreport earnings during most of the working life and to over report earnings during the last three years prior to retirement.

3.1 Methodology

We simulated the public pillar of the Uruguayan pension system using the MISS program (Modelo Informático de la Seguridad Social, Forteza, 2002). MISS is an overlapping generations model programmed in GAMS. It is a variant of the Auerbach-Kotlikoff multigenerations model (Auerbach and Kotlikoff, 1987) adapted and calibrated to the Uruguayan conditions. These models are mainly used to perform sensitivity analysis, i.e. to study the impact of exogenous shocks and policy changes on the endogenous variables. Like most users of these tools, we do not aim at forecasting.

We present the simulated budget of the BPS between 1995 and 2050. The initial year is the moment in which the reform that introduced a mixed system was passed and the final year was chosen to capture the maturity of the reformed system (the new steady state). Even though the series are computed on an annual basis, the current version of the model is not designed to represent short-run or cyclical fluctuations. It is rather meant to represent the medium to long run trends.

In order to reproduce some basic Uruguayan figures, we calibrated several key parameters. Some of these parameters were kept invariant through all the simulations. In this group, life expectancies and the rate of growth of the population are among the most important. We calibrated these demographic variables to reproduce the existing forecasts for the Uruguayan population, introducing in the model gender and generational specific life expectancies and rates of growth of the population.

Other parameters and exogenous variables were initially set at a certain level, based mostly on historical performance, to define a base scenario, and later modified to study the impact on the path of the endogenous variables.[6] These parameters and exogenous variables include the real interest rate, the rate of growth of real wages (labour productivity), the actual and the declared individual labour histories, the minimum age for retirement, the replacement rates and the benefits actually granted to permanent evaders.[7]

The analysed scenarios are summarized in table 6. The base scenario is described first (scenario 1) and the following ones are variants designed to study the impact of changes in the exogenous variables and parameters. The differences between the base and the following scenarios are highlighted in bold.

[6] This study was not designed to analyse the impact of the reform on the pension system, but rather to analyse the impact of several variables and parameters on the working of the reformed system. In order to assess the impact of the reform, a counterfactual should be provided, i.e. the path of the endogenous variables in a non-reformed system should be evaluated. The assessment would be based on a comparison of the simulated paths with and without reform. For an analysis on those lines, see Forteza 1999; Caristo and Forteza, 2003; among others. In the present paper, the base scenario plays the role of a benchmark case against which other scenarios are compared.

[7] The MISS model distinguishes between actual and declared labour histories to represent evasion. It also considers the possibility that the BPS does not abide by the law and grant contributory pensions to individuals who do not fulfil the legally required conditions.

The scenarios 2 and 3 differ from the base scenario only in the interest rate. The scenarios 4 and 5 differ from the base scenario in the assumed rate of growth of the real wage. In these four scenarios, we considered values for the interest rate and the rate of growth of wages above and below those in the base scenario.

The following two scenarios were designed to analyse the impact of changes in the behaviour of individuals in terms of actual and reported labour histories. In the scenarios 6 and 7, individuals raise their actual and reported working time in one and two years, respectively, compared to the base scenario. Accordingly, the age at which they receive the pension for the first time rises by one and two years, respectively, compared to the base values, which were computed from data reported before the reform.[8] We did not consider a scenario in which individuals work less and the age of retirement is reduced with respect to the base scenario, because this event does not look likely. In fact, as we have already mentioned, there is some evidence that the mean age of retirement could be increasing (table 1). Besides, this is not surprising in the light of the incentives introduced in the law of reform for later retirement. The most direct measure oriented to raising retirement ages was the increase in the required minimum age for women to receive a contributory old-age pension. However, minimum retirement ages were scheduled to rise gradually following a timetable that only finished in 2003, and hence it does not seem to explain much of the recent rise in the *mean* age of retirement. Other policy measures that are most likely impacting on the mean ages for retirement are the change of the formula to compute the replacement rate, the increase in the minimum number of years of contributions required to receive a pension and the improved monitoring of the conditions that candidates must fulfil to get the pension (see box 1).

Scenarios 8 and 9 consider an increase in the minimum retirement age, from the current 60 years to 63 and 65, respectively. Other assumptions are those of the base scenario. We estimated first the impact that these changes in the minimum retirement age could have on average ages of retirement, and then simulated the model with the new average retirement ages. For the first step, we considered the number of new pensioners of different ages in 1994.[9] We assumed that the increased minimum age would induce those who were retiring younger to do it at the new minimum age, and that other workers would not change their retirement behaviour. Proceeding in this way, we tried to isolate the effect of the change in the required age for retirement from other innovations of the pension policy, but it should be clear that the change of this parameter interacts with other aspects of the reform. Among other things, the reformulation of the replacement rates and the increase of the minimum number of years of contributions required for a pension are likely to induce later retirement, independently of the increased minimum age. If this is so, the impact of a given increase in the minimum age for retirement might be smaller than what our computations, that disregard these interactions, suggest. For this reason, we consider this estimation in particular as an upper bound to the real impact of this policy change.

[8] The decisions to work and to declare the activity to the BPS and the resulting age for retirement should ideally be treated as endogenous variables. However, and even though the MISS allows to endogenize these variables, we do not feel confident with the calibration of the model in this respect in the current version. Therefore, we prefered to keep them exogenous.

[9] This is the same information used to compute average retirement ages before the reform (BPS, 1995). Unfortunately, there is no such information for recent years.

Scenarios 10 and 11 are designed to analyze the impact of reducing the rates of replacement. We assumed that these rates are reduced by 2 and 4 percentage points, respectively, from 2005 onwards. In these simulations, the workers' decisions to work, retire and evade were kept constant. In the real world, reductions in the rates of replacement would probably induce workers to modify these decisions. However, it is not easy to tell by how much would workers raise evasion or even whether they would retire earlier or later and work more or less, if the rates of replacement decreased. We decided then to adopt the neutral assumption that these variables remain constant.

Finally, scenario 12 was designed to study the impact of changes in evasion. The focus is on a group of individuals who managed to get a contributory pension without having contributed.[10] In the base scenario, the assumption is that from 1995 onwards the BPS does not grant this benefit to new applicants who do not fulfil the required conditions. Individuals in this group are assumed to stay out of the contributory system: they keep on evading, but they no longer receive the contributory pension. They get instead a non-contributory-old-age pension when they are 70 years old. The rationale for this assumption is that, as all observers have pointed out, the controls have been tightened up during the nineties and there is today almost no room for getting a contributory pension without having contributed. Nevertheless, in scenario 12 we assumed that these practices continue in place in order to assess the contribution of the tightening of controls on the budget of the BPS.

The variables used to analyse the budget of the BPS reproduce the current accounting conventions. In order to interpret the numbers that follow, it is crucial to notice that the central government provides financial assistance to feel the gap between the own resources and the expenditure of the BPS. This financial assistance generates no debt and so the BPS does not pay interests. The central government financial assistance could be interpreted as the deficit of the BPS, but this would be just a primary deficit.

3.2 Results

In the base scenario, the central government financial assistance paid to the BPS rises in about 0.6 percentage points of GDP during the first years of the reform (table 7). This "transition deficit" is the result of the different speed with which contributions and benefits in the public pay-as-you-go (PAYG) pillar shrink during the transition. The BPS already starts losing contributions at the inception of the reform, while its obligations do not significantly reduce until generations that receive part of their pension from the private fully-funded pillar start retiring. Approximately ten years after the beginning of the reform, the deficit of the BPS falls below the 1995 level, and from then on it continues falling. In the long run, the deficit of the BPS falls from 3.1 per cent of GDP in 1995 to 0.6 per cent of GDP in 2050.[11]

[10] On this, see Camacho, 1997, Bertranou, 2001, Forteza, 2003, among others.

[11] It is worth mentioning once more that the model does not reproduce short-run economic fluctuations, and hence we did not aim at calibrating it to simulate the recent economic cycle. The figures in table 7 should be read as the outcomes of the system in highly standardized conditions, and become meaningful in the context

We did not find significant effects of the interest rate on the budget of the BPS (table 8, scenarios 2 and 3). It is key for this result the practice of not recording any debt of the institution. Obviously, the impact that the financial assistance of the government to the BPS has on public debt does crucially depend on the interest rate.[12]

The rate of growth of real wages did not have significant impact on the simulated budget of the BPS as percentage of GDP (table 8, scenarios 4 and 5). The fact that we measure these variables in per cent of GDP is crucial to interpret this result. What is actually occurring in this simulation is that the three involved variables (the estimated contributions, expenditure of the BPS, and GDP) rise almost in the same proportion with an increase of the rate of growth of wages.[13] Hence, the ratios do not change. The rate of growth of real wages is positively correlated with GDP growth in the model, because both are ultimately determined by the rate of growth of productivity. Contributions naturally depend on real wages, since these are payroll taxes. Part of the own resources of the BPS come from the value added tax, which is directly correlated to GDP. Finally, benefits paid are fully indexed to wages in Uruguay. In sum, the revenues and the expenditure of the BPS, as well as GDP, are scaled up and down according to the rate of growth of productivity and real wages.

As it could be expected, the budget of the BPS depends on the retirement ages (table 8, scenarios 6 and 7). On average, each year of delay of the retirement decision reduces the financial assistance in about 0.2 percentage points of GDP (average in the whole period of estimation 1996-2050). If the decisions to postpone retirement were taken at the inception of the reform and from then onwards, the maximum reduction in the assistance would take place in the second decade of this century, reaching in that moment approximately 0.3 percentage points of GDP (per year of delayed retirement).

Later retirement reduces the financial assistance required by the BPS basically because it reduces the institution's expenditure. When workers retire later, they receive larger pensions, but during less years. Obviously, the former raises and the latter reduces the expenditure of the BPS. According to our simulations, in the aggregate the former outweighs the latter, at least for one or two years of postponement of retirement. The balance could of course be different for individual cases. There is also some effect going through revenues, but this is of a smaller order of magnitude.

As we have already mentioned, we can only get very imprecise estimations of the impact of raising the minimum retirement age because of both the likely interactions with other policies and the lack of updated information on the retirement behaviour of the population

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of the sensitivity analysis that follows. Nevertheless, we provide a rough comparison between what happened in recent years and the results of the simulations in the appendix.

[12] Furthermore, if the interest rate is larger than the rate of growth of GDP (which is the normal case), the public debt dynamics is unstable, unless the government has explicit fiscal rules designed to stabilize it. There is nothing like that in Uruguay nor in most countries.

[13] To save space, we only included in the tables the financial assistance to the BPS. Other series are available upon request (including contributions, general taxes affected to the BPS, contributory and non-contributory pensions, benefits paid to active workers and administrative expenditure).

attended by the BPS. With these qualifications, we found that setting the minimum age for retirement in 63 years would induce average retirement ages of 65 for males and 64 for females. If the minimum were raised further to 65, the averages would be 66 for males and 65 for females (table 6, scenarios 8 and 9). In other words, raising the minimum in three (five) years would cause an increase in the average retirement age of about one (two) year for males and four (five) years for females. The financial assistance required by the BPS could be reduced by almost 0.25 percentage points of GDP if the minimum retirement age were risen to 63, and by approximately 0.50 if it were risen to 65 (both figures are averages of the period 1996-2050). The main channel is through reduced expenditure.

The simulated financial assistance to the BPS declined in the scenarios with reduced rates of replacement more than in the base scenario (table 8, scenarios 10 and 11). The BPS could reduce its average deficit over the period 2005-2050 by 0.17 and 0.34 percentage points of GDP, if the replacement rates were reduced by 2 and 4 percentage points, respectively. In the long run, the savings to the BPS would be in the order of 0.20 and 0.40 points of GDP, respectively.

The results in scenario 12 highlight the importance of the controls of the BPS over who receive the contributory pensions. According to these simulations, the financial assistance required by the BPS would continue growing, reaching figures as large as 5 percentage points of GDP in some years, if the old *flexibility* for granting pensions continued unchanged despite of the reform initiated in 1995. This is not to say that this is a likely scenario, but just to show that the expected improvement on the budget of the BPS in our simulations hinges on the assumed tightening of the procedures to grant the pensions. We have already raised this point in previous studies (Forteza, 1999, Caristo and Forteza, 2003). Forteza (1999) also shows that the improvement in the budget of the BPS projected by Camacho (1997) is mostly due to this same assumption.

4 Options to reform the non-contributory-old-age pensions program

As we have already discussed, the Uruguayan pension system has broad coverage and the incidence of poverty is low among the aged population in Uruguay today, but several analysts fear that these conditions might deteriorate in the future. The conditions that workers must fulfil to be entitled to a contributory pension have been tightened in recent years, both *de jure* and *de facto*. As to the formal norms, the minimum number of years of contributions required to receive a pension in the main ordinary program was raised from 30 to 35, and the minimum retirement age for women was raised from 55 to 60 (Law 16.713 of reform of the main pension program passed through in 1995). As to the implementation or *de facto* policy, several observers have claimed that during the nineties the Banco de Previsión Social (BPS, main pension institution in the country) adopted more demanding and close-to-the-norms procedures to grant the contributory pensions,

abandoning the former highly flexible practices (Saldain, 1995; Forteza, 2003; Murro, 2003, personal communication; among others).[14]

If these fears are well founded, poverty and social exclusion among the elderly could become an issue in Uruguay in the next years, and the government might feel the necessity to reform the non-contributory programs to address these problems. One of the first questions that arise then is whether the government would be able to afford such a reform or, put differently, which are the contingent fiscal liabilities associated to the risk of increasing social exclusion among the elderly? The aim of this section of the paper is to provide some estimations of the fiscal cost of reforming the non-contributory pension programs to face these new challenges.

After this introduction, we briefly describe first the non-contributory-old-age program of the BPS. Then, we discuss some options for reform and some contingent claims on the non-contributory program that could stem from the failure of the contributory program to provide effective coverage to all the legally covered population. Some words of warning are in order though, before we proceed. The computations we provide are meant to convey a sense of the order of magnitude of the contingent fiscal liabilities involved. We cannot expect to compute any precise cost of a program that has not yet been designed, and to face a social problem that has not yet arisen. The aim is rather to provide some estimations that should help to assess fiscal sustainability in the medium to long run, taking into account the often mentioned contingent liabilities that are associated to the risk of declining coverage of the pension programs among the elderly.

4.1 The non-contributory-old-age pension program of the BPS

The old-age pension program of the Banco de Previsión Social is a means-tested-non-contributory benefit. The target population is composed of persons aged 70 and above whose personal earnings do not reach a certain threshold or target pension and do not have close relatives who could support them. The benefit is the difference between the target pension and the current earnings of the candidate.[15] Box 2 summarizes the main characteristics of the program.

[14] Murro and Saldain are former members of the board of the Banco de Previsión Social, the former in representation of the workers and the latter being the president of the institution when the reform began and one of the writters of the reform law.

[15] Many assistance programs in the world provide supplementary earnings, rather than a flat amount. This is the case, for instance, of the Supplemental Security Income program, in the United States, the old-person´s pension within the State Earnings - Related Pension Scheme in the United Kingdom or the old-age allowances in France.

Box 2. The non-contributory-old-age pensions program of the Banco de Previsión Social	
Target population	• The elderly.
Eligibility conditions	• Being 70 years old or more. • Having individual earnings lower than the target pension. • Not having direct relatives with economic capacity to support them with a "pensión alimenticia" (alimony). Members of the applicant's family who live with him/her must provide a "pensión alimenticia", if they earn 2 or more minimum salaries and are single, or earn 3 or more minimum salaries per capita and are married. Members of the applicant's family who do not live with him/her must provide a "pensión alimenticia", if their individual earnings are equal to or larger than 5 minimum salaries. • Living in Uruguay.
Benefit	• The individual pension is the difference between the target pension and other earnings of the pensioner. The target pension amounts to approximately 73 dollars per month today (March, 2004), and is periodically adjusted with the average wage index.[16]
Source: Adapted from Ferreira-Coimbra and Forteza, 2004.	

This is a small program, both in terms of the number of recipients and in terms of the budget of the BPS, but individual benefits are comparatively generous (tables 9 and 10). Expenditure in this program is in the order of 0.2 per cent of GDP.[17] In recent years (1995 to 2002), the target pension has represented about 31 per cent of per capita GDP, which is basically equal to the poverty line that the Instituto Nacional de Estadística computes. Hence the benefit is enough to get recipients out of poverty. Bertranou, Solorio and Van Ginneken (2002) compare non-contributory pensions in Argentina, Brazil, Chile, Costa Rica and Uruguay, and conclude that Uruguay's pension is the most generous one.

Our computations from the household survey show that there is a significant number of people aged 70 or more who do not receive the pension, even though their declared total earnings are below the old-age target pension. For 2002, we estimate this figure to be somewhere in between 21.1 and 22.4 thousands, while the number of recipients of the old-age pensions program was 18.1 thousands in the same year (table A5). Some of them might not be entitled to the pension because they have relatives who support them, but others might not be receiving the benefit because of a failure of the program to reach all the target population. According to the norms, persons whose earnings are large enough are obliged

[16] Due to the abailability of information, most of the computations in this paper are based on data from 2002. It should be noticed that several figures can change drastically in this period when measured in dollar terms, because of the devaluation of the domestic currency that took place that year. The target pension in January 2002 was 135 dollars.

[17] The total expenditure in non-contributory old-age and disability pensions amounts to approximately 0.6 per cent of GDP.

to give their old-age-poor relatives an alimony called *pensión alimenticia*, and the elderly receiving this transfer are not eligible for the non-contributory-old-age pension (see box 2). The survey asks whether the person is receiving transfers from his/her family or other households. The proportion of affirmative answers to this question among old people earning less than the old-age pension is extremely low (around 3 per cent, table A5), suggesting that most of them are not receiving the benefit even though they have the right to receive it. However, on the other hand, no less than 86 per cent of the people aged 70 or more whose own earnings are below the old-age pension live in households with per capita income high enough to make the family transfer mandatory, rendering them not eligible for the pension. These contradictory observations could respond to the fact that most of these families do support their old members without providing them a formal *pensión alimenticia*, and hence the corresponding question in the survey fails to capture these in-kind transfers. If this conclusion were correct, there would not be a significant number of potential recipients who are not receiving the pension in this moment. No significant contingent claims to the government could arise from this source, at least not if the managers of the program could prove that these potential applicants have relatives who can support them (we will come back to this delicate issue below).

4.2 Methodology

We simulated the coverage and cost of several options to reform the current non-contributory pension program for the elderly. To do this, we combined data provided by the BPS on the aggregates of the current program, and micro data on individual incomes from the Uruguayan Household Survey (ECH) carried out by the Instituto Nacional de Estadística of Uruguay (INE). In order to provide an "anchor" to our simulations, we began by replicating the aggregates the BPS reports for the current program with the micro data in the household survey. A basic assumption in this replication is that the income reported to the household survey and to the BPS are the same, save for an unbiased error. This is a strong assumption, given that the incentives to underreport income are much higher in the case of the BPS. Unfortunately, lacking micro data from the BPS, this is the best we can do today.

The information in the ECH does not allow to directly identify the recipients of the non-contributory-old-age program of the BPS, because these benefits are merged in the survey with survival pensions and some pensions from other sources. Nevertheless, knowing the conditions that the recipients should fulfil to be eligible for the assistance pension of the BPS plus the earnings they should have once they receive this benefit, we split these two different pensions for each individual (see the methodological appendix for the details). We could thus identify in the ECH the group of individuals that, according to this source of information, are currently beneficiaries of the old-age assistance program. This analysis allowed us to determine the average supplementary pension these individuals should currently be receiving and compare it with the data from the BPS. In addition to this, we calculated the number of people who are currently kept out from the Uruguayan old–age pension scheme, despite of having very low earnings, and outlined their most salient features in an attempt to understand the reasons for their exclusion.

Then we proceeded to estimate the impact of several reforms, keeping the assumption on unbiased reports. In these estimations, we also assumed that individuals do not actively respond to the reforms changing their actual or declared behaviour. More specifically, we assumed that the individual reports of both non-pension earnings and composition of families do not change with the simulated reforms. In this sense, our estimations should be considered as just accounting computations; there is no economics in them. This assumption could be considered as optimistic from the fiscal point of view, since all the evaluated reforms provide more generous accessibility conditions and/or benefits, raising the incentives for misreporting or actual change in behaviour (working less, changing the composition of the family, etc.). Because of this type of problems, we finish this section of the paper simulating a flat universal pension scheme. By their very nature, the coverage and cost of this type of programs do not depend on individual reports and are thus basically free of the above-mentioned problems.

We considered several reform options concerning accession requirements and pension values and determined their effects on the cost of the program, the number of beneficiaries and the amount of the average pension. We appraised first the impact of reducing from 70 to 65 the minimum age to be eligible for the non-contributory-old-age pension. We considered two scenarios for this estimation. In the first one, the only change with respect to the current situation is the reduction in the minimum age for eligibility. In the second scenario, we assumed that the number of workers covered by the contributory programs is significantly reduced due to the recent tightening in the accessibility conditions for eligibility. The new excluded are assumed to be poor and eligible for the assistance program. In order to give a regional perspective, we also compared the current Uruguayan non-contributory-old-age program with similar assistance programs in Chile and Costa Rica, and estimated the number of recipients and total cost of implementing those programs in Uruguay. The program Uruguay has today and the options for reform considered above are all means-tested. Given the difficulties in implementing this type of programs, we also simulated a universal flat program, with two values for the benefit.

4.3 Results

4.3.1 Extending the scope of the non-contributory-old-age pensions program

The central trade union PIT-CNT has recently proposed a reform of the old-age pensions program. In this proposal, the benefit is maintained in its current terms, but the eligibility conditions are modified. On one hand, the minimum age is reduced from 70 to 65 years old. On the other hand, the minimum earnings which make individuals legally responsible to support their elder direct relatives, providing alimony, is raised to 24 *unidades reajustables* (unit of account indexed to the average salary). This amount represents about 2.3 times the

existing threshold (for the case of single relatives).[18] Hence, this reform should basically expand the coverage of the current program, providing the same benefit per capita.

We estimated the impact of a reform on these lines, focusing on the reduction in the age for eligibility.[19] We also estimated the effects of a significant drop in the rate of coverage of the contributory pension programs among the population aged 65 and above, assuming that the workers who lose the right to receive a contributory pension are poor and eligible for the non-contributory pension (table 12).

The expenditure of the BPS in the non-contributory-old-age program must be increased by 47 per cent with respect to the current levels to meet the needs of a program covering poor people aged 65 and above. The number of recipients would rise 56 per cent. If, on top of that, the number of workers that fulfil the requirements for a contributory pension dropped by 10 per cent due to the above mentioned recent tightening of the conditions to access to the benefit, and the newly excluded were poor and eligible for the non-contributory program, the expenditure of the BPS in this program would rise by 121 per cent. The number of recipients would rise by 115 per cent.

A rise of any program by 121 per cent is a very significant increase, indeed. But the fiscal impact of this change is not that big, considering the size of the initial program. The expenditure in the program would rise in this scenario in the order of 25 million dollars, were this numbers computed for 2002. This is an increase of about 0.2 per cent of GDP or 0.7 per cent of total public expenditure. By themselves, these numbers are not likely to risk the sustainability of the government budget. Furthermore, a scenario with a 10 per cent drop in the total number of contributory pensioners, all of them among the poorest workers, is very pessimistic and not very likely. Therefore, the provision the government should make to face these contingent fiscal liabilities do not seem to reach an order of magnitude that could destabilize the budget, even in a very pessimistic scenario. Some words of caution are in order, though. We assumed that this program is efficiently managed, in the specific sense that the underreporting of earnings in the program will not be substantially larger than in the household survey. The cost of the program could be much larger if this assumption proved false. We will come back to this issue below.

4.3.2 Implementing in Uruguay the programs of Chile and Costa Rica

Chile, Costa Rica and Uruguay have means-tested non-contributory-old-age programs. The Uruguayan norms differ from the other two in that the individual pension is computed as the difference between the target pension and current declared earnings. Chile and Costa Rica in turn grant a flat pension to all elected candidates. The Uruguayan non-contributory-old-age program has a higher target pension than similar programs in Chile (PASIS) and Costa Rica (RNC). Both in terms of current dollars and as a percentage of per capita GDP,

[18] The PIT-CNT estimates in 2.5 members the average size of the households in which individuals aged 65 and above live. The proposed threshold results from multiplying this family size by the poverty line.

[19] We could not assess the impact of changing the conditions refered to family earnings, because of limitations of the available data. In any case, it is not clear that the BPS can actually impose such conditions.

the Uruguayan pension is substantially larger than its counterparts (table 10). The access conditions also differ. The Uruguayan program is more restrictive in terms of the minimum age (70 years in Uruguay and 65 in the other two countries), and less restrictive in terms of the maximum earnings of eligible candidates (91 dollars in Uruguay, 58 dollars in Chile and 51 dollars in Costa Rica; 2002 figures). Other access conditions are more difficult to assess and compare. Unlike in Uruguay, there is no explicit mandate or general rule for families of poor elderly to support them in Chile and Costa Rica, but both countries perform individual socio-economic studies, which presumably determine whether the candidates have close relatives able to support them. Finally, governments in Chile and Costa Rica settle the maximum amount they are willing to spend on these programs, and give pensions to the better ranked candidates until this amount is reached (Bertranou, Solorio and Van Ginneken, 2002). There is nothing similar in Uruguay.

According to our estimations, the Uruguayan government would save money if it substituted either a Chilean like or a Costa Rican like program for the current Uruguayan non-contributory-old-age pension program (table 11). The pension in these new schemes would be lower than in the current Uruguayan program. The covered population would decrease in the Chilean like program, reinforcing the savings from the lower pension, and rise in the Costa Rican one, but not enough to compensate for the reduction in the per capita benefit. Implementing the Chilean program in Uruguay would drastically reduce government expenditure, despite of the lower minimum age, basically because of the low income per capita of the household above which the person is non-eligible for a pension. This condition would leave most of the current recipients of the Uruguayan old-age pension program out of it. The implementation of a Costa Rican like program in Uruguay would increase the number of recipients substantially, but the Costa Rican pension is so low compared to the Uruguayan one that total expenditure would even decrease.

It should be mentioned that in this exercise of mimicking the Chilean and Costa Rican non-contributory programs in Uruguay, we assumed the pension is granted to all candidates fulfilling the conditions. This means that we did not reproduce those programs in setting a maximum total expenditure and granting benefits only to the better-ranked candidates. In this sense, our estimation must be considered as an upper bound to the size of these types of non-contributory programs in Uruguay. It must be emphasized, though, that we assumed for these computations that all the norms of the programs are actually enforced and, in particular, that the administrator of the program is able to exclude applicants whose household income is above the threshold. This was a key condition in determining the very small size that a hypothetical Chilean like program would have in Uruguay. In practice, it is doubtful that the Uruguayan bureaucracy can actually do that.

4.3.3 A lump-sum universal pension

The options for reform of the non-contributory-old-age pension program we have analysed so far condition eligibility to earnings, and as such assume there is some means testing. This type of conditionality is prevalent among real world programs that are primarily aimed at alleviating poverty, but it is also possible to alleviate poverty giving a flat universal transfer, and there are some programs in the world that do this (for an example, see box 1 in

World Bank, 2003). The rationale for conditionality and means testing is quite obvious: reduce costs and give the benefit to those who really need it. But the difficulties that are associated to this type of programs are also significant: large administrative costs, corruption, distortions of incentives to save, and social stigma (see World Bank, 2003; Willmore, 2001 a and b). Once these real world problems are taken into account, the relative virtues of means-tested vis-à-vis universal assistance programs become more balanced.

Assessing the Uruguayan non-contributory-old-age program is beyond the scope of this paper, but given the universal problems with this type of programs and some local evidence, we should not give for granted that the BPS will be able to manage a highly selective and considerably expanded program for poverty alleviation, like the ones we simulated before, with reasonable degrees of efficiency. Uruguay does not have a significant income tax, so that the tax office has not developed the specific capabilities that are involved in the report of earnings. The BPS does have some experience with means testing and related conditionality. However, casual observation and some aggregate figures of the system suggest that the institution might be experiencing difficulties in getting truthful reports of earnings. In recent years, the average pension actually paid has been more than 90 per cent of the target pension, which looks pretty high for a program that pays only the gap between the target and current income. We computed the average pension the BPS should pay, assuming the earnings reported to the household survey are correct, and got only 50 per cent of the target pension. Therefore, the assumption implicit in our previous estimations that the BPS pays exactly the difference between the target pension and the actual current earnings of recipients seems too optimistic.[20] We estimated then the cost of a universal program.

The Achilles' heel of a universal flat pension is its fiscal cost. The World Bank (2003) estimated the fiscal cost of giving a universal flat pension equivalent to the minimum wage to all individuals aged 65 and above in several Latin American countries. For the case of Uruguay, the cost of this program would represent now about two per cent of GDP, reaching almost four per cent of GDP by 2050. It could be argued that the minimum wage is very low in Uruguay, so we estimated the fiscal cost of giving the current non-contributory-old-age pension as a universal benefit to all individuals aged 65 and above.[21] This program would cost today almost four per cent of GDP, which represents roughly twenty times the size of the program that the BPS currently has in place. The number of recipients would rise by more than twenty times (see table 12).

[20] The data suggests that many potential candidates abstain from applying to the assistance pension when their families can support them, despite of the limited capacity of the BPS to effectively control that this condition is actually fulfilled (see section 4.3.3 on this). Self-control seems to be relatively effective to produce reliable reports in this respect. But many of those who apply to the benefit significantly under report their actual earnings. A similar pattern seems to be present in the family allowances program (Bucheli, personal communication). It would be useful to further explore this hypothesis, conducting surveys among both the target population and the staff of the BPS engaged in these programs.

[21] As we already noticed, this amount has been almost equal to the INE's poverty line in recent years, which adds another reason to consider it.

5 Conclusions

According to the simulations presented in this paper and in almost all the scenarios analysed, the financial assistance required by the BPS should currently be on a decreasing trend. Only when we assumed that the institution continues granting pensions to people who do not fulfil the conditions legally required we got a diverging path, but this scenario looks unlikely. This is not enough to say that the government budget is sustainable, since the BPS is only part of the government, but it does show that one of the most challenging and menacing components of the government budget in the first half of the nineties should now be under control.

However, the results of these simulations contrast sharply with the financial performance of the BPS in recent years. Between 1998 and 2002 (which is the last year for which we have data now), the financial assistance as a percentage of GDP grew significantly more than expected according to our simulations (table A1). The main discrepancy is on the expenditure side. The total expenditure of the BPS as a percentage of GDP *grew* 0.8 points between 1998 and 2002, while according to our simulations in the base scenario it should have *decreased* 0.8 points. The deep depression the Uruguayan economy passed through explains this discrepancy (table A2). The expenditure-GDP ratio grew despite of the reduction of the number of pensioners and of the real expenditure per pensioner, because total real GDP fell 17.5 per cent between 1998 and 2002. In the base scenario, total GDP was assumed to grow about 7 per cent in the same period in which actual GDP fell 17.5 per cent. Our simulations are not meant to reproduce the short run economic cycles and, in particular, we did not simulate the depression. What the simulations with MISS should provide is a better understanding of the trends. Unfortunately, having fluctuations of the size Uruguay has had in recent years makes it difficult to identify in which trend the system really is.[22]

The sensitivity analysis did not show significant effects of the interest rates or the rate of growth of wages on the budget of the BPS in per cent of GDP. The interest rate had no impact on the budget of the BPS simply because the BPS does not pay interests, but it does impact on the budget of the government that assists the BPS. The rate of growth of wages did not significantly impact on the simulated budget of the BPS as a percentage of the GDP, because the expenditure and the resources of the institution and the GDP are scaled up and down with real wages. In order to assess this result, it is important to remind that these are long run simulations in which the real wage is assumed to evolve according to productivity. The impact of short run deviations of the real wages with respect to the productivity trend could be different.

The ages of retirement do matter for the financial result of the BPS, according to our simulations. On average, each year of delay of retirement reduces the financial assistance required by the BPS in about 0.2 percentage points of GDP (average in the whole period of estimation 1996-2050). Raising the minimum age for retirement would have a smaller

[22] See the appendix for a more detailed comparison between actual and simulated performance in this period.

impact, because this requirement is not currently binding for many workers. These workers are not likely to modify their current retirement behaviour, unless the rise of minimum retirement ages is really large.[23] The financial assistance required by the BPS could be reduced in almost 0.25 percentage points of GDP if the minimum retirement age were risen to 63 years (the current minimum is 60), and in approximately 0.50 if it were risen to 65 (both figures are averages of the period 1996-2050).

Following previous analysts, we assumed in all save one scenarios that, by the mid nineties, the BPS substantially improved its ability and/or willingness to monitor that applicants for contributory pensions did actually fulfil the required conditions. This assumption proved crucial for the results. To assess the point, we simulated a scenario in which the institution continues granting new pensions to individuals who did not contribute; other assumptions are those of the base scenario. With this only change with respect to the base scenario, we got a completely different path for the BPS financial assistance. Rather than a decreasing trend, we got an increase in the required assistance, reaching in the pick more than 5 percentage points of GDP. It is worth emphasizing that we only have indirect estimations of the size of this phenomenon on which, according to our simulations, much of the fate of the reformed system hinges.

The stricter conditions to apply for contributory pensions, both in the norms and in practice, could also have some worrisome social consequences in the future. Some of the elderly that under the previous rules would have received a contributory pension might end up with no pension under the new conditions. Being the elderly usually a vulnerable group in terms of the risk of poverty, this consideration is worth being taken into account. Besides, from a fiscal point of view, there are contingent liabilities associated to it, since this group of the population will have to be attended one way or another.

The incidence of poverty among the elderly is low today in Uruguay. Even if the situation deteriorated in the future as several observers fear, the amount of resources the government would need to attend the new demands could be moderate to low, according to our estimations, **provided the government managed it efficiently**. Expanding the Uruguayan non-contributory-old-age pension program to cover individuals aged 65 years or more and adding a substantial number of applicants derived from an assumed drastic 10 per cent drop in the number of recipients of the contributory pension program (because of more restrictive access conditions) would cost about 0.4 points of GDP.[24]

We adopted pretty conservative assumptions, so that our estimation of the fiscal impact of the program can basically be taken as an upper bound. A reduction in the stock of retirees

[23] We have already warned in the body of this paper that the information we have to do these computations is partial and old, though.

24 Neither this estimation of the cost of an increased program nor the expenditure reported by the BPS in the current one (table 9) include the costs of the administration of the program. Even though these programs are usually administratively expensive, it does not mean that the estimated fiscal cost should change in terms of orders of magnitude. Of course, these costs should be computed in any specific project to reform the non-contributory-old-age program, but this study is not such a project. It is rather meant to be a preliminary exploration of the available options.

as large as 10 per cent is highly unlikely. It seems realistic to assume that workers who could become non-eligible for contributory pensions are poor, but we took this assumption to the extreme: we picked the poorest to conform the set of quitters, so that the number of new applicants for the non-contributory program was maximized. We were also very conservative in doing the estimation based on the household survey of 2002. This was one of the worst years of Uruguay in a long period. GDP dropped by almost 11 per cent that year, unemployment rose to almost 17 per cent, and, above all, the rate of poverty reached the maximum value of the decade (more than 8 percentage points over the minimum of the decade). In normal years, the estimated number of eligible candidates and the amount of pensions to pay should be lower.

There is however one aspect in which the previous estimation is not conservative: we assumed that the public administration is able to determine current income of candidates accurately or, alternatively, that candidates report their earnings truthfully. Both assumptions are pretty optimistic. There are of course significant incentives to lie in this type of programs and it is not clear how well can the administration avoid being cheated. For this and related reasons mentioned above, we estimated the fiscal cost of a universal flat pension. Giving the current non-contributory-old-age pension to all individuals aged 65 and above would cost about four per cent of GDP, which means approximately twenty times the expenditure of the current program.

The estimated large cost of a universal flat pension, on one hand, and the technical and political challenges involved in the implementation of an expanded means-tested pension, on the other, face the government with a policy dilemma. One option is to try with a universal program, but with benefits significantly smaller than the current non-contributory-old age pension. Another option is to insist with means testing, but rather than just expanding the current program, it seems wiser to consider first whether it is possible to strengthen the program to reduce the existing gap between what the legal norms say and what the administration seems to be able to do. Our study was too macro to provide the details, but it suggests that the following points could at least be analysed. First, the eligibility conditions should probably be simplified. The current ones look too complicated to implement and monitor, particularly in what refer to the earnings of direct relatives of the potential recipients. Second, the ability of the administrator of the program to control earnings should be carefully and realistically assessed, detecting the weak points and trying to improve on them. The evidence analysed in this paper suggests that the current capabilities of the BPS are not matching the very high administrative standards required to accurately implement the existing norms. Finally, in the fashion of the Chilean PASIS or the Costa Rican RNC, the assistance program could have an explicit ceiling on total expenditure and give the benefits to those applicants with better ratings until the available resources are spent or the number of eligible candidates becomes zero. Our computations show that, if the resources were efficiently managed, a pretty small program should be sufficient to get all the elderly needy out of poverty. This information could help to hold managers accountable: the number of eligible candidates in the waiting queue would be a simple measure of the efficiency and efficacy of the program. This would probably put significant pressure on the managers of the program.

6 Appendix

6.1 Simulated and observed budget of the BPS between 1995 and 2002

As it should be expected, there are significant discrepancies between the simulated and the observed paths of the budget of the BPS in recent years, mostly due to the economic cycle. In tables A1 and A2 we provide some information to compare the results of simulating the base scenario with the model MISS and the official statistics from the BPS and the BCU.

In the aftermath of the reform, the resources collected by the BPS in per cent of GDP decreased less than expected according to the simulation. At the pick of the recent economic cycle, the own resources of the BPS according to the official statistics surpassed the results of the simulation in one percentage point of GDP. By the end of this period, both series almost overlapped. In the years of the boom, the rise of real wages pushed contributions up and the rise of GDP fostered the revenues from the value added tax, part of which is computed as own resources of the BPS.

On the expenditure side, and according to the official statistics, the BPS has continued raising its spending as a percentage of GDP, at least until 2001. This ratio should have declined according to the model MISS, at least in the base scenario. In order to explain the sources of the discrepancy, we decomposed the BPS expenditure-GDP ratio (*G/GDP*) in three components, i.e. the number of pensioners (*N*), the real expenditure per pensioner (*g*) and the real product (*gdp*): [25] $G/GDP = N * g/gdp$.

As table A2 shows, there are differences between simulated and observed paths in the three components. The number of pensioners informed by the BPS continued growing at the inception of the reform, particularly until 1998, contradicting the simulated path. In the following years, the number of pensioners began to fall, and it did so at a greater pace than the simulated series. Nevertheless, in 2002 the number of pensioners registered in the BPS was approximately 4 per cent larger than the simulated figure in the base scenario. One possible explanation of this observed path is that the initial uncertainty with the reform induced some workers to retire earlier (table 1). Unfortunately, we do not have more detailed information to test this hypothesis formally.

The expenditure per pensioner is smaller in the observed than in the simulated series in 2002, but the situation was the opposite in the previous years. Between 1995 and 2000, the real expenditure per pensioner grew 16 per cent, just to lose it in the following two years. This path resembles that of real wages, but it is even more pronounced. The simulated

[25] Notice that *g* results from dividing nominal per capita expenditure of the BPS by the implicit deflator of GDP (and not by CPI). This is just one of many possible decompositions of the expenditure-GDP ratio and it is a highly stylised one. It does not reflect the complexity of the institution, but we think it does provide some useful clues to understand the discrepancies between the simulations and the actual performance during the recent economic cycle. A more detailed analysis of this point is well beyond the scope of this paper.

series is more paused, presenting an annual rate of growth of 0.9 per cent in this period. It is basically driven by the assumed rate of growth of productivity and wages, and the gradual substitution of pensioners of the old regime by pensioners ruled by the new norms.

The third and last component in our decomposition of the expenditure-GDP ratio is the GDP itself. According to the BCU, the Uruguayan GDP was 4 per cent smaller in 2002 than in 1995. The simulated series grew 17 per cent in the same period, mostly due to the assumed growth in the labour force and in productivity. During the first years of this period, however, the observed GDP grew significantly faster than the simulated GDP.

We conclude that the discrepancies between the simulated and the observed expenditure-GDP ratios during the first seven years of the reformed system were mostly determined by a pronounced macroeconomic cycle that the MISS model is not meant to capture. The ratio did not fall in the actual series as it did in the simulated one mostly because of the economic recession that reduced the denominator. During the first years, the unexpected and still not fully understood rose in the number of pensioners and the significant growth in real pensions played an important role as well. The strong expansion that the economic activity seems to have been experiencing in recent months and the forecast of a fast recovery during 2004 should drive the simulated and measured BPS expenditure-GDP ratios closer. Nevertheless, the unexpected path of the number of pensioners should be further scrutinized.

6.2 Reforms of the non-contributory pensions

6.2.1 Replicating the current old-age-non-contributory pension program

The information provided by INE aggregates old-age-non-contributory and survival pensions. Therefore, in order to obtain a primary assessment of the expenditure involved by the old-age-non-contributory pension scheme, we resorted to the following methodology.

The old-age-non-contributory pension is a supplementary income paid to people aged 70 or more whose individual incomes are below a certain threshold $\overline{pv}$ and do not receive an alimony from their relatives (see box 2 for the details). For this estimation, we focused only on the individual earnings of the elderly, because we did not have reliable information on the alimonies. The implicit assumption is that all candidates in the age group with income below the threshold are in fact eligible. Individual incomes comprise both pension incomes and "other" incomes: $y_i = p_i + o_i$. In addition to this, pension incomes reported in the ECH (p) may include both survival (ps) and non contributory (pv) pensions: $p_i = ps_i + pv_i$. Hence, we can divide the population aged 70 or more into three groups based on their individual incomes:

1. People whose incomes are higher than $\overline{pv}$. These people are not entitled to non-contributory pensions. Therefore, pensions received by them should comprise only contributory pensions: $p = ps$ and $pv = 0$.
2. People whose incomes are equal to $\overline{pv}$. These people may be receiving contributory as well as non-contributory pensions. The only thing we know about old-age non-contributory pension in this case is that $0 \leq pv \leq p$.
3. People whose incomes are less than $\overline{pv}$. These people are not currently receiving old-age assistance pension; otherwise, their income would be equal to $\overline{pv}$. Thus, $p = ps$ and $pv = 0$.

Hence, the group of individuals receiving the non-contributory-old-age pension must satisfy the following criterion: $I = \{i | age_i \geq 70, y_i = \overline{pv}\}$. In practice, the set of individuals in the survey aged 70 or more and earning *exactly* $\overline{pv}$ is almost empty, because of measurement errors. If the survey measured earnings with no error, the number of individuals earning exactly $\overline{pv}$ could not be lower than the number of receivers of the non-contributory-old-age pension according to the BPS (keeping the assumption that reports are correct). But because of measurement errors, the set *I* must be defined with an interval of earnings. Let y'_i be the observed earnings according to the ECH. The measurement error for total earnings is $\varepsilon_i = y'_i - y_i$. Assuming errors are normally distributed with zero mean, we can build confidence intervals of wide 2μ, and redefine the set of eligible candidates as: $I = \{i | age_i \geq 70, \ \overline{pv} - \mu \leq y_i \leq \overline{pv} + \mu\}$.

If $p_i = pv_i$ for all the individuals in *I*, then the sum of these individual pensions should be equal to total expenditure of the BPS in non-contributory-old-age pensions. But we cannot be sure of that. Let $a_i \in [0,1]$ be the ratio between the non-contributory pension and the total pension received by individual *i*: $a_i = pv_i / p_i$. As discussed above, $a_i = 0$ for people belonging to the first and the third group. However, we do not know the value of a_i for people belonging to group 2. We made then the following two assumptions:

Assumption 1: the mean relative error of the values of contributory and non-contributory pensions reported in the ECH is the same. Formally: $pv_i = \tilde{pv}_i + \varepsilon v_i$, $ps_i = \tilde{ps}_i + \varepsilon s_i$, where variables with tilde refer to measurements obtained by the ECH and variables without tilde refer to "true" values. This assumption implies that: $\varepsilon\% = \sum_i \varepsilon v_i / \sum_i pv_i = \sum_i \varepsilon s_i / \sum_i ps_i$.

We have aggregated information provided by the BPS about total expenditure in old-age non-contributory pensions (pvBPS), in disablement pensions and in contributory old-age pensions (psBPS). Based on this information, we can write:

$$\frac{pvBPS}{psBPS} = \frac{\sum pv_i^{'}}{\sum ps_i^{'}} = \frac{\sum (pv_i - \varepsilon v_i)}{\sum (ps_i - \varepsilon s_i)}$$

Under the assumptions made:

$$\frac{\sum (pv_i - \varepsilon v_i)}{\sum (ps_i - \varepsilon s_i)} = \frac{\sum pv_i (1 - \varepsilon\%)}{\sum ps_i (1 - \varepsilon\%)} = \frac{\sum pv_i}{\sum ps_i} = \frac{\sum a_i * p_i}{\sum (1 - a_i) * p_i}$$

implying that the chosen values of a_i should satisfy that:

$$\frac{pvBPS}{psBPS} = \frac{\sum a_i * p_i}{\sum (1 - a_i) * p_i}$$

There is no information about expenditures of BPS in non-contributory pensions to allow us to separate those beneficiaries aged 70 or older from the rest of the population. Due to that, we considered for the right hand side of the former equation the whole population, bearing in mind that $a_i = 0$ for all individuals who are aged less than 70.

Assumption 2*:* $a_i = a$ is the same for all *i* belonging to the second group, and $a_i = 0$ for all those who do not belong to that group.

According to this:

$$\frac{pvBPS}{psBPS} = \frac{\sum a_i * p_i}{\sum (1 - a_i) * p_i} = \frac{\sum_{i \in I} a_i * p_i + \sum_{i \notin I} a_i * p_i}{\sum_{i \in I} (1 - a_i) * p_i + \sum_{i \notin I} (1 - a_i) * p_i}$$

$$= \frac{a \sum_{i \in I} p_i}{(1 - a) \sum_{i \in I} p_i + \sum_{i \notin I} p_i}$$

The next step was to estimate the value of *a*. For this purpose, we considered three alternative values for the amplitude of the interval of confidence: $\mu = 500$ (estimation 1), $\mu = 425$ (estimation 2) and $\mu = 350$ (estimation 3). The old-age assistance pension ($\overline{pv}$) for the year 2002 amounts to $1.947. The ratio between the expenditure of the BPS in non-contributory-old-age and survival pensions is about 0.07 $((pvBPS / psBPS) \cong 0{,}07)$. The results are summarized in the following table:

Table A3: The estimation of the auxiliary coefficient *a*

	Estimation 1	Estimation 2	Estimation 3
Earnings range ($ per month)	1447 to 2447	1522 to 2372	1597 to 2297
$\sum_{i\in I} p_i$ (Millions of $ per month)	35	33	31
$\sum_{i\notin I} p_i$ (Millions of $ per month)	464	466	468
Coefficient *a*	0.93	0.97	1.00

When we consider $a = 1$ (estimation 3), we are assuming that people aged 70 or older whose incomes are higher than $1597 and less than $2297 do not receive any other pension than old-age assistance pension, so the value they declare in the ECH questionnaire corresponds exactly to the assistance program. In that sense, $a=1$ determines the minimum range of income given BPS information. If we extend the range of income variation considered admissible to perceive old-age assistance pensions, then the proportion of such pension in the total pension income decreases, though not significantly (if we move from $\mu = 350$ to $\mu = 500$, "*a*" goes from 1.00 to 0.93).

Once achieved the previous results, we proceed to calculate the assistance program expenditure for each one of the estimations proposed. The procedure involves applying the *a* values to the second group (people aged 70 or older whose incomes are around the actual value of old-age pension) and extract, by this means, the amount of old-age pension they should receive. We estimated in each case the number of recipients and total expenditure of the BPS in the program. The results attained are detailed in table A4.

Table A4: Beneficiaries and expenditure in assistance pensions computed from the ECH.

	Estimation 1	Estimation 2	Estimation 3
Number of beneficiaries	18917	17892	16748
Annual expenditure (millions of dollars)	18.4	18.3	18.0

The overall estimated expenditure of about 18 million dollars is lower than the BPS's estimation (U$S 22 million). Nevertheless, our figure represents an important part of BPS's estimation, and is in accordance with the ratio between old age (non contributory) pensions and survival (contributory) pensions reported by BPS. Hence, the set *I* seems to be a reasonable sample of the population receiving old-age pension payments nowadays. Finally, it should be noted that the results attained in each estimation do not differ substantially, both regarding the expenditure under the program and the number of beneficiaries. In other words, the results are rather insensitive to the arbitrary assumptions concerning the range of values (μ) considered to select the population of beneficiaries.

6.2.2 Characteristics of people currently excluded from old – age non contributory scheme

In addition to estimating the number of beneficiaries and total expenditure under the current old – age non-contributory pension scheme, we calculated the number of people who are

being kept out of the program despite the fact that they are aged 70 or older and their individual incomes are less than the value of the pension.

Table A5: Characteristics of individuals aged 70 and above who do not receive the assistance pension despite of earning less than the target pension

	Estimation 1	Estimation 2	Estimation 3
Number of people	21089	22274	22422
% of people receiving financial support from other members of the household	2.9	3.3	3.5
% of people whose household's per capita income is less than $ 2.000	13.9	13.3	13.5
% of people whose household's per capita income is less than $ 2.500	22.3	22.4	22.7
% of people who receive no income at all	60.4	57.2	52.8
% of men	10.2	11.2	11.3
% of women	89.8	88.8	88.7
% of people between 70 and 75 years old	69.2	68.2	68.2

This information suggests that most of these people are not currently receiving old-age-non-contributory pensions because they live in households with relatively high incomes and are therefore not legally eligible for this program. What is more, if we take into account those relatives who do not share the same house with the elderly person but can nonetheless afford to pay him/her alimony, this figure would probably rise. Unfortunately, as it was already mentioned, it is not possible to do so based on the information provided by the Uruguayan Household Survey.

6.2.3 Implementing in Uruguay the programs of Chile and Costa Rica

We simulated the effects of the implementation in Uruguay of old – age non-contributory programmes resembling the ones existing in Chile and Costa Rica.

Table A6: Same data from assistance programs in Chile, Costa Rica and Uruguay

	Uruguay	**Chile**	**Costa Rica**
GDP (millions of U$S, 2002)	12300	66425	15155
Population (millions, 2002)	3.4	15.6	4.2
Monthly per capita GDP (US$, 2002)	303	355	300
Non contributory pension (US$, 2002)	91	53	38
Non contributory pension (in % of per capita GDP)	30	15	13
Minimum age (years)	70	65	65
Minimum contributory pension (US$, 2002)	122	117	102
Minimum contributory pension (in % of per capita GDP)	40	32	34

In order to estimate total expenditure under both programmes, we computed the amount of individual benefits and afterwards multiply it by the number of beneficiaries. Individual benefits were calculated multiplying the ratio between assistance pension and per capita GDP in Chile and Costa Rica to per capita GDP in Uruguay.

On the other hand, the number of potential beneficiaries was estimated in accordance with the accession requirements imposed by each of these programmes. In Chile, potential beneficiaries of non contributory old – age pensions are those people aged 65 or older who are currently earning less than 50% of the minimum contributory pension, are not entitled to any other pension or allowance (or else they should choose between them[26]) and whose household's per capita income lies below that threshold. In Costa Rica, potential beneficiaries are those people aged 65 or older who are currently earning less than 50% of the minimum contributory pension and receive no contributory pensions.

We used data from the 2002 Uruguayan Household Survey to simulate the effects of the implementation of the Chilean and Costa Rican programme in Uruguay. As already mentioned, we assumed that all candidates fulfilling the prerequisites were granted assistance benefits, not only the better ranked ones.

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[26] We are assuming rationality on behalf of the agents. Thus, if they fulfil the other requirements but are receiving a contributory pension that is lower than the assistance pension, they will choose the latter.

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Table 1: Percentage of population covered by the social protection system by age groups [a]

Year	55 to 59 years old			60 to 64 years old			65 or more years old		
	Beneficiaries	Contributors	Population covered	Beneficiaries	Contributors	Population covered	Beneficiaries	Contributors	Population covered
1991	32.1	33.4	65.5	58.0	17.5	75.5	88.3	2.8	91.1
1992	31.7	32.7	64.4	57.1	18.2	75.3	88.5	3.0	91.5
1993	31.5	33.6	65.1	58.0	16.6	74.6	88.5	2.5	91.0
1994	29.2	33.5	62.7	58.4	16.2	74.6	88.3	2.6	90.9
1995	29.5	34.5	64.0	56.8	18.1	74.9	87.7	3.2	90.9
1996	31.0	33.5	64.5	57.5	16.7	74.2	87.8	3.0	90.8
1997	30.6	32.7	63.3	56.8	15.8	72.6	88.1	2.8	90.9
1998	29.8	35.8	65.6	55.1	16.2	71.3	87.6	2.7	90.3
1999	28.9	35.6	64.5	54.3	17.0	71.3	87.4	2.8	90.2
2000	27.9	35.8	63.7	55.1	19.1	74.2	86.9	3.1	90.0
2001	25.7	38.4	64.1	52.6	18.7	71.3	85.9	3.2	89.1
2002	23.3	38.7	62.0	50.7	20.3	71.0	87.1	3.3	90.4

[a] It includes all those who are covered by the contributory system and those who receive an assistential pension by the concept of disablement or old age.

Note: The percentage of contributors is a proxy variable because the household survey does not allow for a direct estimation of it for most of the period. The methodology for building the proxy was taken from Bucheli (2003).

Source: own computation based on ECH (INE).

Table 2: Percentage of poor people by age groups.

Year	Poor People	Younger than 6 years old	From 6 to 12 years old	From 13 to 17 years old	From 18 to 64 years old	Older than 64 years old
1986	46.2	68.3	69.4	63.7	47.0	40.6
1987	35.6	57.1	56.6	50.5	33.7	26.5
1988	26.6	na [a]	na [a]	na [a]	na [a]	na [a]
1989	26.6	49.0	49.0	43.7	26.9	19.0
1990	29.7	57.8	54.1	49.4	31.8	24.3
1991	23.4	46.5	45.1	39.0	24.3	15.4
1992	19.9	41.7	39.4	34.1	21.6	12.7
1993	17.1	36.0	34.4	30.5	16.0	7.1
1994	15.3	32.8	31.2	25.7	13.5	5.4
1995	17.4	36.5	34.8	27.8	15.6	6.1
1996	17.2	37.4	33.5	27.1	14.8	5.4
1997	17.2	37.4	31.8	26.8	14.8	5.1
1998	16.7	34.7	29.2	26.7	13.1	4.1
1999	15.3	32.5	28.3	22.7	12.1	3.4
2000	17.8	37.4	32.2	25.8	14.5	3.9
2001	18.8	38.3	35.4	27.7	15.3	3.9
2002	23.7	46.6	41.9	34.6	20.3	5.4

na = not available

Note: The ECH has two methodological changes during this period: the first was in 1991, and the following in 2001.

Source: own computation based on ECH (INE).

Table 3: Purchasing power of pensions and wages, inflation and GDP growth.

Year	Pensions [a]	Wages [b]	Inflation [c]	GDP growth [d]
1990	100.0	100.0	104.1	0.20
1991	114.1	103.8	102.0	3.61
1992	129.1	106.1	68.5	7.96
1993	131.5	111.2	54.1	2.62
1994	136.7	112.2	44.7	7.30
1995	134.8	109.0	42.2	-1.45
1996	136.7	109.7	28.3	5.58
1997	137.3	109.9	19.8	5.04
1998	140.7	111.9	10.8	4.55
1999	145.5	113.7	5.7	-2.85
2000	143.3	112.2	4.8	-1.44
2001	141.3	111.9	4.4	-3.39
2002	133.0	99.9	14.0	-10.76

[a] Elaborated on the basis of BPS data. It refers to the evolution of the amount of contributory pensions paid annually.
[b] Based on the real mean salary index elaborated by INE.
[c] Mean annual inflation.
[d] Real GDP growth rate.

Sources: Statistical Bulletin of BPS 2003, INE (web) and BCU (web).

Table 4: **Social expenditure in pensions by institution (in percentage of GDP)**

Year	BPS a/	Army retirement service	Police retirement service	Total
1990	9.2	0.8	0.5	10.4
1991	10.2	0.7	0.4	11.3
1992	11.0	0.8	0.4	12.2
1993	11.9	1.2	0.6	13.7
1994	11.7	1.0	0.6	13.3
1995	12.2	1.1	0.6	14.0
1996	12.2	1.1	0.6	13.9
1997	12.0	1.1	0.6	13.8
1998	12.1	1.2	0.6	13.8
1999	13.1	1.2	0.6	15.0
2000	13.3	1.2	0.7	15.2
2001	13.4	1.3	0.7	15.3
2002	12.7	1.2	0.6	14.5

a/ Expenditure due to health insurance (DISSE) and medical services due to domestic assignment are not included. Both are considered health expenditure.

Source: based on information from BCU and OPP.

Table 5: The budget of the BPS by source (in percentage of the GDP)

Year	Financial assistance	Expenditure	Own resources
1990	0.8	10.0	9.2
1991	1.4	11.6	10.2
1992	1.5	12.5	11.0
1993	2.2	12.9	10.7
1994	2.6	13.5	10.9
1995	3.1	13.8	10.6
1996	3.4	13.8	10.3
1997	3.6	13.7	10.2
1998	3.5	13.8	10.3
1999	4.2	15.0	10.8
2000	4.5	15.0	10.5
2001	4.6	15.0	10.5
2002	4.8	14.7	9.9

Source: own computations with data from BPS and BCU.

Table 6: Description of the Simulated Scenarios

	1	2	3	4	5	6	7	8	9	10	11	12
Real interest rate (annual)	3.8	**2.8**	**4.8**	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Real wage (annual rate of growth)	1.1	1.1	1.1	**0.4**	**1.8**	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Minimum age for retirement	60	60	60	60	60	60	60	**63**	**65**	60	60	60
Rates of replacement	a/	a/	a/	a/	a/	a/	a/	a/	a/	**b/**	**c/**	a/
Labor history of males												
Actual working ages	24 to 65	24 to 65	24 to 65	24 to 65	24 to 65	**24 to 66**	**24 to 67**	**24 to 66**	**24 to 67**	24 to 65	24 to 65	24 to 65
Declared working ages	29 to 63	29 to 63	29 to 63	29 to 63	29 to 63	**29 to 64**	**29 to 65**	**29 to 64**	**29 to 65**	29 to 63	29 to 63	29 to 63
Age when the pension is granted	64	64	64	64	64	**65**	**66**	**65**	**66**	64	64	64
Labor history of females												
Actual working ages	24 to 59	24 to 59	24 to 59	24 to 59	24 to 59	**24 to 60**	**24 to 61**	**24 to 63**	**24 to 64**	24 to 59	24 to 59	24 to 59
Declared working ages	24 to 58	24 to 58	24 to 58	24 to 58	24 to 58	**24 to 59**	**24 to 60**	**24 to 62**	**24 to 63**	24 to 58	24 to 58	24 to 58
Age when the pension is granted	60	60	60	60	60	**61**	**62**	**64**	**65**	60	60	60
Benefits recieved by non-contributors												
Assistance old-age pension	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**No**
Contributory pension	No	No	No	No	No	No	No	No	No	No	No	**Yes**

a/ Rates of replacement according to law 16.713. The minimum is 50 and the maximum is 82.5 percent. In the middle, the rate of replacement is an increasing function of the age of retirement and the years of effective contributions.
b/ In this scenario, the rates of replacement are two percentage points lower than in the base scenario.
c/ In this scenario, the rates of replacement are four percentage points lower than in the base scenario.

Source: own computations.

Table 7: The budget of the BPS by source in the base scenario (as a percentage of GDP).

Year	Assistance	Expenditure	Own resources
1995	3.13	13.78	10.65
1996	3.77	13.79	10.03
1997	3.70	13.67	9.96
1998	3.64	13.54	9.90
1999	3.58	13.41	9.84
2000	3.52	13.29	9.77
2001	3.09	12.96	9.87
2002	2.96	12.76	9.81
2003	3.29	13.05	9.76
2004	3.16	12.86	9.69
2005	3.03	12.67	9.63
2006	2.91	12.48	9.57
2007	2.79	12.31	9.52
2008	2.68	12.14	9.46
2009	2.56	11.98	9.42
2010	2.59	11.96	9.38
2011	2.43	11.76	9.33
2012	2.28	11.57	9.29
2013	2.14	11.38	9.24
2014	2.08	11.30	9.22
2015	2.02	11.21	9.19
2016	1.95	11.13	9.17
2017	1.88	11.04	9.16
2018	1.81	10.95	9.14
2019	1.72	10.85	9.13
2020	1.63	10.74	9.11
2021	1.50	10.61	9.11
2022	1.36	10.47	9.11
2023	1.28	10.40	9.11
2024	1.20	10.31	9.11
2025	1.10	10.22	9.11

Table 7: The budget of the BPS by source in base scenario (as a percentage of GDP). (Continuation)

Year	Assistance	Expenditure	Own resources
2026	1.01	10.12	9.11
2027	0.94	10.06	9.12
2028	0.87	9.99	9.12
2029	0.80	9.91	9.12
2030	0.72	9.84	9.12
2031	0.64	9.76	9.12
2032	0.90	10.03	9.13
2033	0.82	9.95	9.13
2034	0.75	9.88	9.13
2035	0.69	9.83	9.13
2036	0.64	9.78	9.13
2037	0.60	9.73	9.13
2038	0.55	9.69	9.13
2039	0.52	9.65	9.13
2040	0.49	9.62	9.13
2041	0.47	9.60	9.13
2042	0.45	9.58	9.13
2043	0.44	9.57	9.13
2044	0.43	9.57	9.14
2045	0.43	9.57	9.14
2046	0.43	9.57	9.14
2047	0.44	9.57	9.14
2048	0.56	9.71	9.15
2049	0.57	9.71	9.15
2050	0.57	9.72	9.15

Note: The figures in this table were computed with the MISS simulation model and do not reproduce the economic cycle.
Source: Own computations

Table 8: Government financial assistance to the BPS in different scenarios (as a percentage of GDP)

Year	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	Scenario 12 [a]
1995	3.13	3.13	3.13	3.13	3.13	3.11	3.10	3.11	3.10	3.13	3.13	3.13
1996	3.77	3.78	3.76	3.76	3.78	3.71	3.64	3.63	3.57	3.77	3.77	3.78
1997	3.70	3.72	3.69	3.70	3.71	3.60	3.49	3.50	3.40	3.70	3.70	3.89
1998	3.64	3.65	3.63	3.64	3.65	3.50	3.35	3.37	3.23	3.64	3.64	4.01
1999	3.58	3.59	3.57	3.57	3.59	3.41	3.21	3.25	3.07	3.58	3.58	4.11
2000	3.52	3.53	3.51	3.51	3.53	3.31	3.08	3.13	2.91	3.52	3.52	4.22
2001	3.09	3.11	3.07	3.08	3.10	3.05	2.76	2.82	2.56	3.09	3.09	3.96
2002	2.96	2.97	2.94	2.95	2.97	2.89	2.63	2.69	2.40	2.96	2.96	4.00
2003	3.29	3.31	3.28	3.28	3.31	3.21	2.96	3.03	2.74	3.29	3.29	4.51
2004	3.16	3.18	3.15	3.15	3.18	3.05	2.78	2.90	2.58	3.16	3.16	4.54
2005	3.03	3.05	3.02	3.02	3.05	2.90	2.61	2.74	2.43	3.03	3.03	4.58
2006	2.91	2.93	2.89	2.89	2.93	2.74	2.43	2.58	2.25	2.89	2.88	4.62
2007	2.79	2.81	2.78	2.78	2.81	2.61	2.29	2.44	2.10	2.76	2.73	4.68
2008	2.68	2.70	2.66	2.66	2.70	2.47	2.11	2.30	1.92	2.63	2.59	4.73
2009	2.56	2.58	2.54	2.54	2.58	2.31	1.94	2.13	1.75	2.50	2.44	4.78
2010	2.59	2.61	2.57	2.57	2.61	2.32	1.97	2.16	1.78	2.51	2.44	4.97
2011	2.43	2.45	2.41	2.41	2.45	2.15	1.79	2.00	1.61	2.34	2.26	4.97
2012	2.28	2.30	2.27	2.26	2.31	1.99	1.63	1.86	1.46	2.18	2.08	4.99
2013	2.14	2.16	2.12	2.11	2.16	1.83	1.46	1.71	1.32	2.01	1.90	5.01
2014	2.08	2.10	2.06	2.06	2.10	1.83	1.46	1.72	1.31	1.94	1.82	4.99
2015	2.02	2.05	2.00	2.00	2.05	1.77	1.46	1.66	1.30	1.87	1.73	4.98
2016	1.95	1.97	1.93	1.93	1.98	1.71	1.41	1.59	1.24	1.79	1.63	4.95
2017	1.88	1.91	1.87	1.86	1.91	1.64	1.34	1.52	1.18	1.70	1.53	4.93
2018	1.81	1.83	1.79	1.79	1.84	1.55	1.26	1.45	1.11	1.62	1.45	4.90
2019	1.72	1.74	1.70	1.70	1.75	1.46	1.17	1.38	1.04	1.53	1.34	4.84
2020	1.63	1.65	1.61	1.60	1.65	1.37	1.09	1.30	0.97	1.43	1.24	4.79
2021	1.50	1.52	1.48	1.47	1.52	1.27	0.99	1.21	0.90	1.29	1.10	4.72
2022	1.36	1.39	1.34	1.34	1.39	1.13	0.90	1.09	0.81	1.15	0.96	4.62
2023	1.28	1.31	1.26	1.26	1.31	1.06	0.84	1.03	0.76	1.07	0.87	4.54
2024	1.20	1.22	1.18	1.17	1.22	0.98	0.77	0.96	0.71	0.98	0.77	4.47
2025	1.10	1.13	1.09	1.08	1.13	0.90	0.70	0.89	0.64	0.89	0.67	4.38

Table 8: Government financial assistance to the BPS in different scenarios (as a percentage of GDP) (continuation)

Year	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 12 [a]
2026	1.01	1.03	0.99	0.98	1.03	0.81	0.61	0.80	0.57	4.28
2027	0.94	0.96	0.92	0.91	0.97	0.75	0.56	0.75	0.52	4.23
2028	0.87	0.89	0.85	0.84	0.90	0.68	0.50	0.69	0.47	4.17
2029	0.80	0.82	0.78	0.77	0.83	0.61	0.43	0.63	0.41	4.09
2030	0.72	0.74	0.70	0.69	0.75	0.54	0.36	0.56	0.35	4.02
2031	0.64	0.67	0.62	0.61	0.67	0.46	0.29	0.49	0.28	3.96
2032	0.90	0.92	0.88	0.86	0.93	0.73	0.57	0.76	0.56	4.33
2033	0.82	0.85	0.80	0.79	0.86	0.66	0.49	0.68	0.48	4.26
2034	0.75	0.77	0.73	0.72	0.78	0.58	0.42	0.61	0.41	4.20
2035	0.69	0.72	0.68	0.66	0.73	0.53	0.36	0.55	0.35	4.14
2036	0.64	0.67	0.62	0.61	0.68	0.48	0.31	0.50	0.30	4.10
2037	0.60	0.62	0.58	0.56	0.63	0.43	0.26	0.45	0.25	4.06
2038	0.55	0.58	0.54	0.52	0.59	0.39	0.22	0.41	0.20	4.02
2039	0.52	0.54	0.50	0.48	0.55	0.35	0.18	0.37	0.16	3.99
2040	0.49	0.51	0.47	0.45	0.52	0.32	0.15	0.34	0.13	3.97
2041	0.47	0.49	0.45	0.43	0.50	0.30	0.13	0.31	0.11	3.96
2042	0.45	0.47	0.43	0.41	0.48	0.28	0.11	0.29	0.09	3.95
2043	0.44	0.46	0.42	0.40	0.47	0.27	0.10	0.28	0.08	3.94
2044	0.43	0.45	0.41	0.40	0.47	0.27	0.09	0.28	0.07	3.94
2045	0.43	0.45	0.41	0.39	0.47	0.27	0.09	0.28	0.07	3.95
2046	0.43	0.46	0.41	0.40	0.47	0.27	0.09	0.28	0.07	3.95
2047	0.44	0.46	0.42	0.40	0.47	0.27	0.10	0.28	0.07	3.96
2048	0.56	0.58	0.54	0.52	0.60	0.40	0.23	0.43	0.23	4.13
2049	0.57	0.59	0.55	0.52	0.60	0.40	0.23	0.43	0.23	4.14
2050	0.57	0.59	0.55	0.53	0.61	0.41	0.24	0.44	0.24	4.15

Notes: See table 6 for a description of the scenarios. The figures in this table were computed with the MISS simulation model and do not reproduce the economic cycle.
a/ These computations were taken from Caristo and Forteza (2003).
Source: own computations.

Table 9: The non-contributory-old-age pension program of BPS.

	1990	1995	2000	2001	2002
Number of old-age pensioners	29293 [a]	21172	20443	18777	18126
Pensions (in % of per capita GDP)					
Target	23.9	29.4	31.7	31.8	30.2
Average	21.6	27.5	29.2	29.7	29.2
Poverty line of INE (in % of per capita GDP)	38.3	31.0	28.6	29.2	34.6
Expenditure of BPS in non-contributory-old-age pensions					
In per cent of total BPS expenditure	1.99	1.39	1.29	1.20	1.15
In per cent of GDP	0.20	0.19	0.19	0.18	0.17

Value in December of 1990. For the rest of the series, values are annual means.

Sources: based on data from INE, BPS and BCU.

Table 10: Non-contributory pension programs in Chile, Costa Rica and Uruguay (2002)

	Uruguay	Chile	Costa Rica
Pension			
Formula to compute the individual pension	Target pension minus current reported earnings	Equal to the target pension	Equal to the target pension
Target pension (in US dollars per month)	91.4	53	38
Target pension (in per cent of per capita GDP)	30.2	14.9	12.6
Eligibility conditions			
Minimum age (in years)	70	65	65
Maximum individual income (in US dollars)	91.4	57.5	51
Maximum household per cápita income (in US dollars)	It does not apply	57.5	No restriction
Minimum income for direct relatives to be legally mandated to provide an alimony (in US dollars)	104 to 156	It does not apply	It does not apply
Other requirements	No	To qualify in CAS questionaire	Study of socioeconomic conditions

Source: own computations, based on information from the Uruguayan household survey 2002, BPS, PASIS and Costa Rica Social Security Funds.

Table 11: Amount of pension, number of beneficiaries and total cost of implementing in Uruguay the non-contributory pension programs of Chile and Costa Rica.

	Uruguayan old-age program	A Chilean-like program in Uruguay	A Costa Rica-like program in Uruguay
Pension (in per cent of per capita GDP)	30.20	14.90	12.60
Number of beneficiaries	18126	2174	33397
Total cost of the program (in per cent of GDP)	0.17	0.01	0.14

Sorce: own computations based on information from BPS, BCU, MIDEPLAN and Costa Rica Social Security Funds.

Table 12: Number of receipients and total cost of several alternatives to reform the assistance old-age program.

	Number of beneficiaries	Total cost of the program (in per cent of GDP) b/
Current program	18126	0.17
Proposals to reform a/		
1. Reducing from 70 to 65 the minimun age		
1.1. Assuming no reduction in coverage of the contributory programs	28186	0.25
1.2. Assuming receipients of contributory pensions drop by 10% and all of them apply and are eligible for non-contributory pensions.	39043	0.37
2. Lump sum universal pension		
2.1. Pension equal to minimum salary	439251	2.30
2.2. Maintaining current old-age pension	439251	3.90

Notes:
a/ The details of each option are explained in the text.
b/ Based on 2002 figures.

Source: own computations based on data from BPS and INE.

Table A1: The budget of the BPS in per cent of GDP. Official statistics and series simulated with MISS.

Año	Financial assistance		Expenditure		Own resources	
	BPS-BCU	MISS	BPS-BCU	MISS	BPS-BCU	MISS
1995	3.1	3.1	13.8	13.8	10.6	10.7
1996	3.4	3.8	13.8	13.8	10.3	10.0
1997	3.6	3.7	13.7	13.7	10.2	10.0
1998	3.5	3.6	13.8	13.5	10.3	9.9
1999	4.2	3.6	15.0	13.4	10.8	9.8
2000	4.5	3.5	15.0	13.3	10.5	9.8
2001	4.6	3.1	15.0	13.0	10.5	9.9
2002	4.8	3.0	14.7	12.8	9.9	9.8

Notes: The simulated figures are for the base scenario (scenario 1 in table 1).

Sources: Computed with data from BCU and BPS.

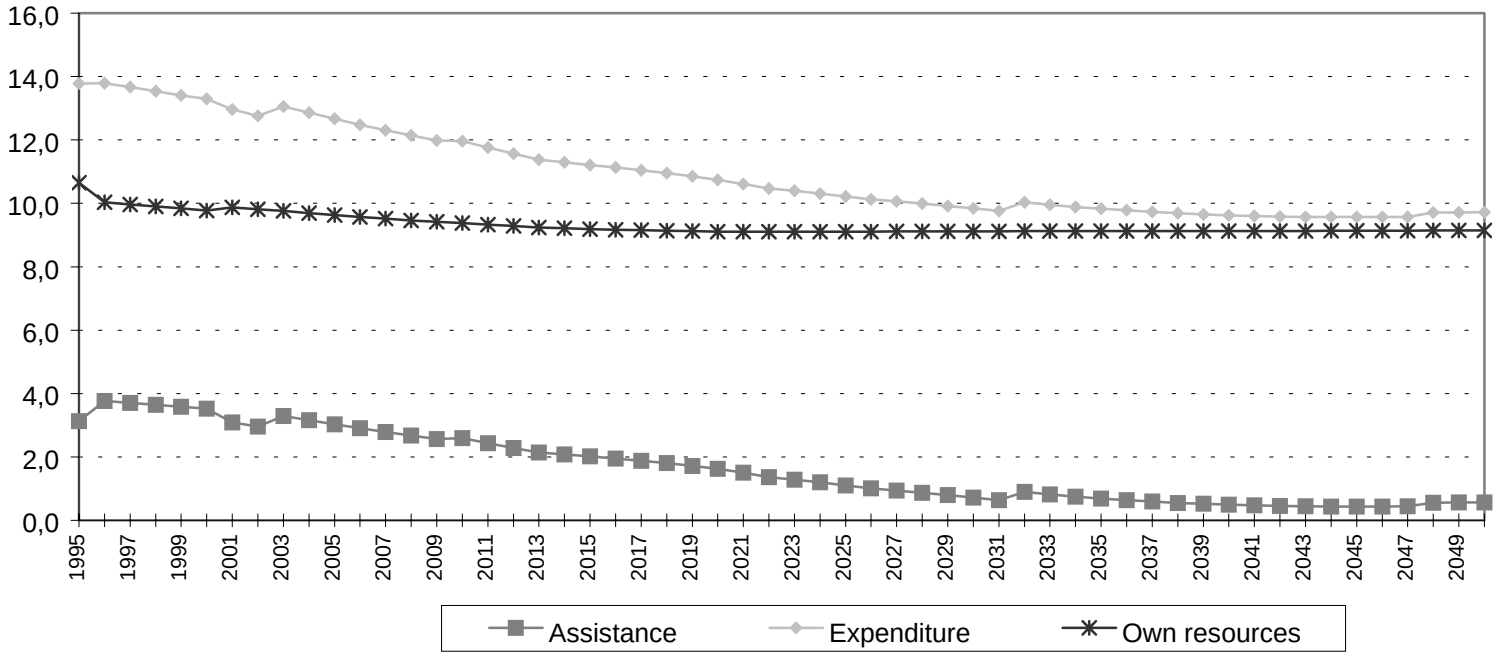
Table A2: Expenditure of the BPS, number of pensioners and GDP. Official statistics and series simulated with MISS.

Año	Expenditure of the BPS (per cent of GDP)		Number of pensioners (thousands)		Real expen. per pensioner (thousands of pesos 1995)		Real GDP (thousands of millions of pesos 1995)	
	BPS-BCU	MISS	BPS	MISS	BPS	MISS	BCU	MISS
1995	13.8	13.8	352	352	48	48	123	123
1996	13.8	13.8	356	353	50	49	129	125
1997	13.7	13.7	367	353	51	49	136	127
1998	13.8	13.5	373	354	53	49	142	129
1999	15.0	13.4	371	354	56	50	138	131
2000	15.0	13.3	367	354	56	50	136	134
2001	15.0	13.0	363	345	54	51	131	136
2002	14.7	12.8	360	346	48	51	117	138
Annual rate of growth 1995-2002 (in %)			0.3	-0.3	0.0	0.9	-0.6	1.7

Notes: The simulated figures are for the base scenario (scenario 1 in table 6).

Sources: Computed with data from BCU and BPS.

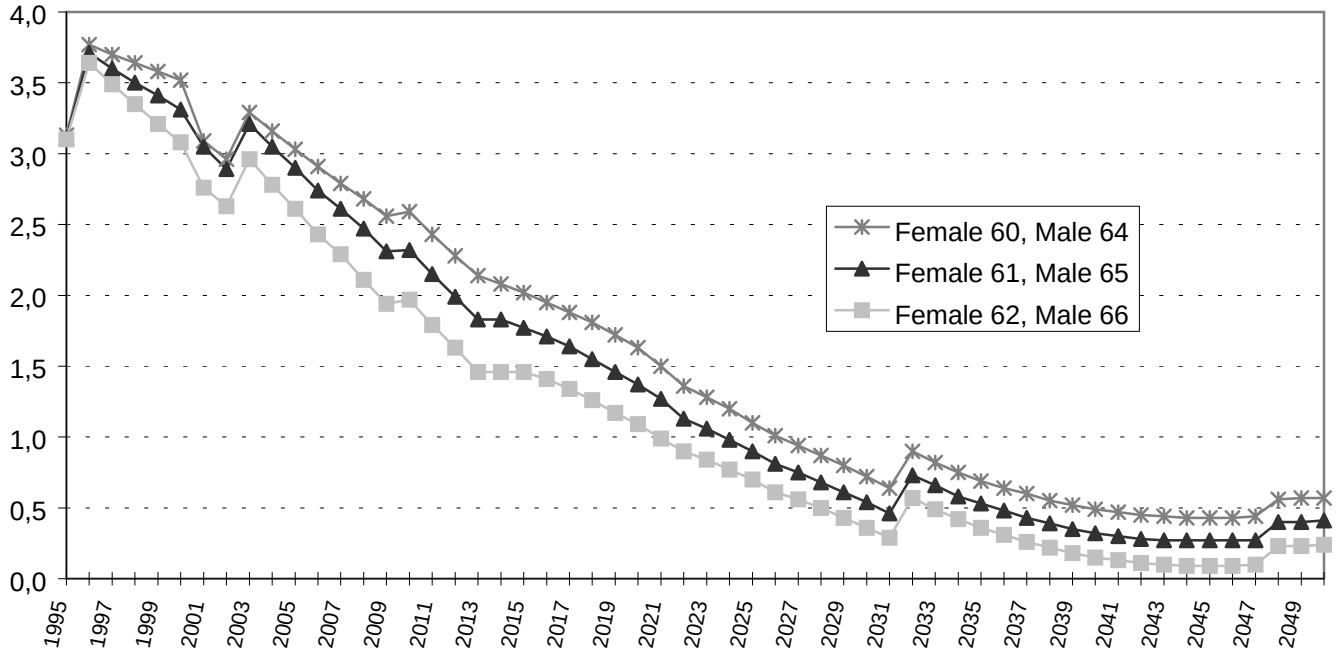
Figure 1: The budget of the BPS. Base Scenario.
(in per cent of GDP)



Assumptions:
Real interest rate = 3.8%
Rate of growth of real wages = 1.1%
Average age for retirement: female 60, male 64.

Source: Own computations.

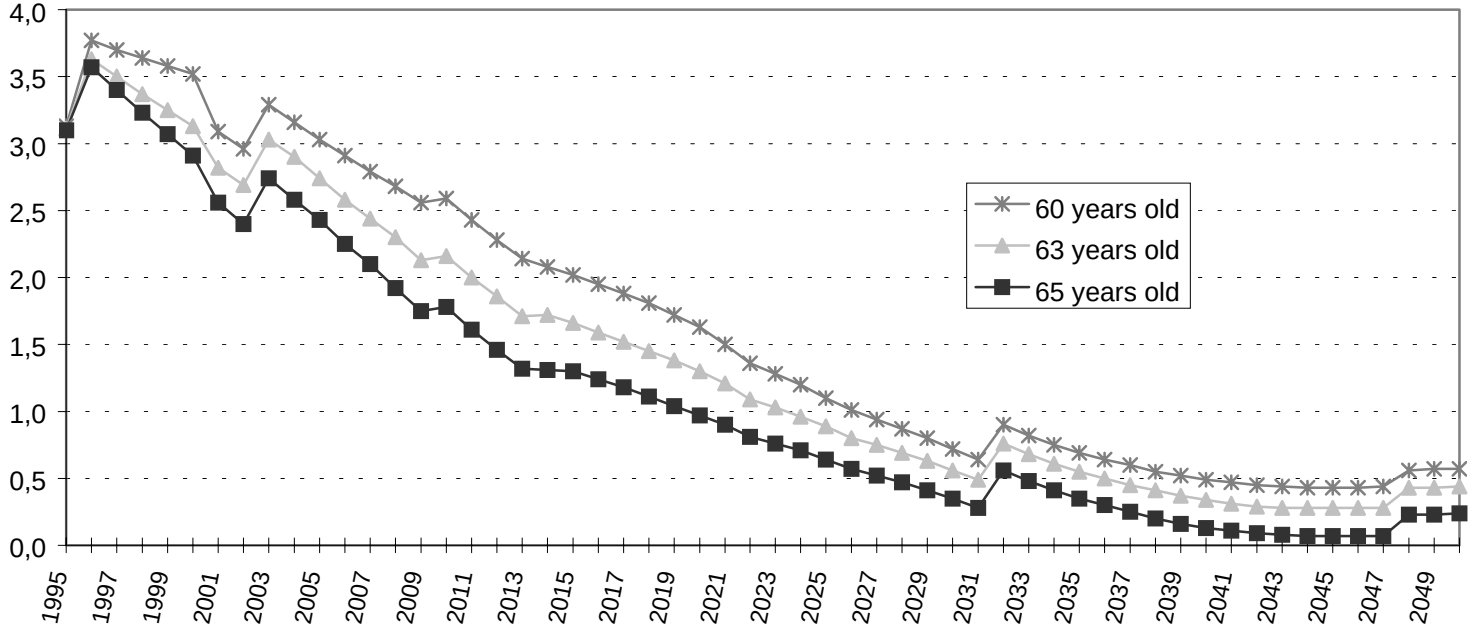
Figure 2: Deficit of the BPS with several average retirement ages (in per cent of GDP)



Assumptions:
Real interest rate = 3.8%
Rate of growth of real wages = 1.1%

Source: Own computations.

Figure 3: Deficit of the BPS with several minimum retirement ages (in per cent of GDP)



Assumptions:
Real interest rate = 3.8%
Rate of growth of real wages = 1.1%

Source: Own computations.