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Social Security in Portugal: An Update of Long-Term Projections

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Abstract. *At the request of the Laeken European Council, Portugal has prepared a National Strategy Report on its pension system, in view of objectives like adequacy, financial sustainability, and modernisation. This paper documents the official long-term projections of social security revenues and expenditures therein, using PROST, an actuarial model developed by the World Bank. Taking on board the pension reform effective Jan-1-2002 (Law 17/2000), simulation results suggest that, in light of the expected ageing of the population from 2000 to 2075, overall social security expenditure as a percentage of GDP is projected to grow by 3.2 pp, from 12.9 to 16.1%. Public pensions paid to former private-sector workers increase by 1.7 pp, while those paid to former civil servants rise by 1.4 pp, a larger relative increase given the latter's reduced size. As a result, the reserve fund is expected to go dry in 2029, three years earlier than if no pension reform had taken place. The 2002 pension reform entails changes to the benefit formula with offsetting financial effects: the reference wage is lowered by eventually being calculated using the whole contribution history, and the accrual rate is, in effect, increased.*

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*__Comments welcome at__ prodrigues@dgep.pt. While the paper documents official Portuguese projections, the author claims full responsibility for the analysis and for any remaining errors. Thanks are due to José Luis Albuquerque, Teresa Bomba, Aniruddha Bonnerjee, Fernando Chau, Miguel Gouveia, Pedro Marques, Edmundo Martinho, Luis Sarmento, and Pedro Silva for insightful comments and occasional words of encouragement. Serafim Amorim, José Barrias, Teresa Costa, Margarida Carvalho, Daniel Mota, and Nuno Santos provided valuable assistance with the data, without which this work would not have been possible.

"Population ageing, in the absence of appropriate reforms, risks undermining the European social model as well as economic growth and stability in the European Union."

in *Commission of the European Communities (2000)*

1. INTRODUCTION

Ensuring the long-term sustainability of public pensions has long been a concern both of the European Union and of its Member States. Recently, though, pension reform has become a priority of the policy agenda (see Economic Policy Committee of the European Union, 2002, for the EPC's updated opinion on pension reform in the EU). In 2001, the Stockholm and Göteborg European Councils emphasized the urgency of addressing the impending demographic challenge by raising employment rates, reducing public debt, and adapting social protection systems. Furthermore, it was agreed that Member States' strategies should be presented in conjunction with stability and convergence programmes and be examined in the context of multilateral surveillance.

In this light, three broad principles for securing the long-term sustainability of public pension systems were endorsed: (i) *adequacy* – the capacity to provide safe and adequate income to retirees, thus preventing poverty and social exclusion amongst the elderly; (ii) *financial sustainability* – so that the future impact of population ageing does not lead to an unfair sharing of resources between generations; and (iii) *modernisation* – thereby contributing to enhanced labour market flexibility and equal opportunities for men and women (see Commission of the European Communities, 2001, for procedural details). At the Laeken and Barcelona European Councils, national strategy reports were requested from Member States. These reports, due to be presented in September 2002, should contain a strategic statement and focus on reforms undertaken, or

envisaged, to meet the commonly agreed objectives. After a comprehensive assessment with a clear identification of good practices, a Joint Commission and Council Report on Pensions will be drawn up and presented to the Spring 2003 European Council.

The objective of this paper is to document the official projections[1] of long-term social security revenues and expenditures that are at the centre of the analysis of financial sustainability contained in the Portuguese strategy report (see Ministério da Segurança Social e do Trabalho, 2002). This National Strategy Report was the result of a significant interministerial effort and the Portuguese Ministry of Finance would like to take this opportunity to express its deep appreciation for the ongoing collaboration between various institutions. The names of the representatives at and collaborators of the working group that was set up for this purpose are included in the annex.

Two scenarios are presented. The first scenario examines the effects of the new Framework Law for Social Security, approved by Parliament in August 2000 (Law 17/2000) and parameterised through secondary legislation in December 2001 (Law 35/2002). To evaluate the recent reform measures, the second scenario considers the situation that prevailed until 2002. At present, the Portuguese Government is considering changes to this Framework Law and, whenever feasible, alternative scenarios will be provided, as these changes have first to be submitted to Parliament.

The plan of the paper is as follows. In Section 2 we provide a brief account of the projection model and of the main assumptions used. Then, in Sections 3 and 4 we

[1] These projections replace those in Pereira and Rodrigues (2001) that did not take into account the effects of the New Framework Law for Social Security, the full details of which were only recently determined. This previous set of official projections was developed at the request of the Ageing Working Group, a sub-group of the European Union's Economic Policy Committee, that was mandated to determine the budgetary and economic effects of an ageing population (see Economic Policy Committee of the European Union, 2001, for the final report). Using technical assumptions that were agreed upon amongst all fifteen Member States, the projection exercise was carried out with the participation of representatives of the European Commission, the ECB, and the OECD (see OECD, 2001, for a complementary account).

present the expenditure and revenue projections *per se*, contrasting the 2002 Reform with the previous setting. In Section 5 we present similar long-term projections for the CGA, the civil servants' public pension scheme that were carried out by Gouveia and Sarmento (2002). We are grateful to them for the permission to reproduce these projections here. Finally, Section 6 concludes with some important caveats and a summary of the main points.

2. THE MODEL AND ITS PARAMETERIZATION

The long-term projections of Social Security revenues and expenditures that this paper centres upon were obtained with the help of PROST, the *Pension Reform Options Simulation Toolkit*, developed by the World Bank. This is a policy-oriented simulation model of an actuarial nature with a successful track record of over forty countries. Using data from a number of different sources, it has been carefully parameterised to match the most relevant characteristics of the Portuguese Social Security system. In particular, it is worth stressing that, for the very first time, anonymously-sampled individual administrative records were used to complete age- and gender-specific profiles for a number of variables.

Population projections are calculated within the model from assumptions for fertility and mortality rates provided by the Eurostat's central demographic variant. **Table 1** shows an almost doubling of the old age dependency ratio by 2050 and an increase of around 3½ years in the life expectancy at the age of retirement. According to these projections, by 2050 the elderly will represent 26% of the Portuguese population, up from 15.3% in 2000. The corresponding numbers for the European Union as a whole are 29.4% and 17.2%. As such, in 2050, Portugal is expected to be the fifth youngest Member State of the current fifteen.

Table 1. Demographic projections

	1999	2000	2001	2005	2010	2020	2030	2040	2050	2075
Old age dependency ratio	22.4%	22.5%	22.9%	24.2%	25.1%	28.1%	32.4%	39.8%	44.5%	40.2%
Life expectancy at the age of 65										
Males	14.7	14.7	14.8	15.2	15.7	16.6	17.4	17.9	18.1	18.1
Females	18.3	18.4	18.5	18.9	19.4	20.3	21.1	21.6	21.7	21.7

Source: Ministry of Finance calculations using PROST and based on Eurostat assumptions.

The following assumptions were adopted in the scenarios. The number of contributors equals those that are employed. These are computed by applying labour force participation and unemployment rates to specific cohorts. In **Table 2**, male participation rates are held constant, while female labour force participation rates converge, cohort-by-cohort, at the average rate of increase from 1999 to 2001. Unemployment rates (not shown) are also age- and gender-specific, and the aggregate unemployment rate is held fixed at 4%. **Table 3** shows that employment is expected to grow steadily until 2020 and then decline.

Table 2. Assumptions on labour force participation rates

	2000	2005	2010	2020	2030	2040	2050	2075
				Males				
16-24	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%
25-54	80.9%	80.9%	80.9%	80.9%	80.9%	80.9%	80.9%	80.9%
55-64	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%	59.7%
65+	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%
				Females				
16-24	43.1%	44.8%	45.7%	47.0%	47.0%	47.0%	47.0%	47.0%
25-54	77.1%	81.3%	82.6%	83.3%	83.3%	83.3%	83.3%	83.3%
55-64	46.0%	50.5%	55.4%	58.9%	58.9%	58.9%	58.9%	58.9%
65+	18.0%	19.8%	21.7%	24.2%	25.2%	25.6%	25.6%	25.6%

Source: Ministry of Finance calculations based on the INE Employment Survey.

Table 3. Projections of employment in the private sector

(Thousands)	1999	2000	2001	2005	2010	2020	2030	2040	2050	2075
Total	**4,346.9**	**4,412.9**	**4,463.9**	**4,631.9**	**4,735.5**	**4,793.9**	**4,781.0**	**4,621.3**	**4,437.1**	**4,303.7**
Males	2,323.9	2,286.4	2,301.8	2,344.6	2,377.1	2,406.7	2,418.9	2,351.5	2,267.7	2,199.9
Females	2,022.9	2,126.5	2,162.1	2,287.3	2,358.3	2,387.2	2,362.1	2,269.8	2,169.4	2,103.8

Source: Ministry of Finance calculations using PROST.

A cumulative distribution of wages, broken down for men and women summarizes the dispersion of wages *vis-à-vis* the minimum wage. Real wage growth is assumed to follow labour productivity growth and reflects mainly gains in the accumulation of human capital. **Table 4** presents the projections generated by PROST. From 2020 onwards, as the labour market becomes tighter, wages are expected to grow faster.

Table 4. Real wage projections

	1999	2000	2001	2005	2010	2020	2030	2040	2050	2075
Overall	**1.7%**	**4.1%**	**2.9%**	**1.6%**	**1.9%**	**3.1%**	**2.4%**	**4.5%**	**1.8%**	**2.9%**
Males	1.7%	4.9%	3.2%	2.0%	2.1%	3.1%	2.1%	4.4%	1.6%	2.9%
Females	1.7%	4.6%	2.7%	1.1%	1.7%	3.1%	2.8%	4.7%	2.0%	2.9%

Source: Ministry of Finance calculations based on Mincer regressions using *Quadros de Pessoal* .

Beneficiaries of old age, disability, and survivors' pensions are specified as a fraction of the total population. The number of new pensioners is determined endogenously once the pool of employment is defined and is naturally affected by the retirement policy. The outflow of pensioners in each year depends on mortality rates. **Table 5** presents the expected evolution of the number of pensioners.

RESSAA is a closed regime for agricultural workers, and RNCE is a non-contributory scheme, where pension increases are discretionary. In both regimes, the number of pensioners is expected to fall substantially in the future, as there will be no

new pensioners. As a guiding principle in determining how the number of pensioners will evolve, because the Portuguese social security system is universal, we keep overall coverage more or less constant for old age pensioners. The same applies for disability pensioners. For survivors, however, the assumption is that coverage will increase.

Table 5. Projections of the number of pensioners

(Thousands)	1999	2000	2001	2005	2010	2020	2030	2040	2050	2075
Old age pensioners	**1,462.8**	**1,511.7**	**1,492.6**	**1,589.5**	**1,667.3**	**1,912.7**	**2,168.2**	**2,533.3**	**2,721.6**	**2,376.1**
RG normal and new min.	473.2	500.7	499.0	547.4	625.4	901.3	1,344.5	1,921.2	2,388.9	2,374.1
RG minimum	589.1	622.8	620.2	720.4	834.2	940.0	804.6	599.6	324.6	0.0
RESSAA	339.3	332.4	318.7	274.6	169.5	20.2	1.3	-	-	-
RNCE	61.1	55.8	54.8	47.2	38.2	25.9	17.8	12.5	8.1	2.0
Coverage as a % Pop. 65+	96%	99%	96%	97%	97%	97%	97%	96%	96%	96%
Disability pensioners	**392.9**	**370.1**	**357.3**	**336.1**	**325.9**	**322.5**	**323.1**	**316.0**	**284.2**	**246.6**
RG normal and new min.	126.5	122.4	118.5	132.3	161.1	211.3	245.5	261.6	245.9	230.3
RG minimum	184.5	178.5	172.8	151.6	128.7	92.8	66.9	48.2	34.8	15.4
RESSAA	36.2	22.2	19.3	14.1	6.3	0.4	-	-	-	-
RNCE	45.8	47.0	46.8	38.1	29.8	18.0	10.8	6.1	3.5	1.0
Coverage as a % Pop. 15-64	6%	5%	5%	5%	5%	5%	5%	5%	4%	4%
Survivors	**585.1**	**599.0**	**614.9**	**651.0**	**696.6**	**787.0**	**884.1**	**988.4**	**1,078.6**	**1,310.1**
RG normal and new min.	108.1	111.2	114.5	117.4	122.7	135.0	150.7	160.6	159.3	142.6
RG minimum	382.2	393.0	404.7	445.6	494.4	602.1	720.9	824.9	916.5	1,165.1
RESSAA	91.1	91.5	92.3	84.7	76.2	46.7	9.3	-	-	-
RNCE	3.7	3.3	3.3	3.3	3.3	3.2	3.1	3.0	2.8	2.3
Coverage as a % Pop.	6%	6%	6%	6%	7%	7%	8%	9%	10%	13%

Source: Ministry of Finance calculations using PROST and data from CNP, the National Centre for Pensions.

In PROST, new old age pensions are computed with the aid of a benefit formula that takes into account the average length of service at retirement (see **Table 6**), the accrual rate, and the number of years that are relevant in the calculation of the reference wage. In addition to the so-called normal pensions, a minimum pension is ensured. To better calibrate the parameters of the benefit formula, minimum pensions paid to existing pensioners were modelled outside PROST. Of course, new pensions that accrue within PROST and that fall short are guaranteed the minimum. Once again

a cumulative distribution of pensions, specified for the base year, describes the dispersion of pensions *vis-à-vis* the minimum pension.

Table 6. Length of service at retirement for normal pensioners of different age groups

(Years of contributions)	55-59	60-64	65-69	70-74
Males	37.1	38.6	36.0	28.5
Females	36.3	36.4	32.6	21.5

Source: Based on data from the CNP.

For existing pensioners, indexation schemes differentiate minimum pensions from regular pensions. **Table 7** spells out the assumptions made. An often-used benchmark for minimum pensions is the minimum wage; that's why we include it here.

Table 7. Assumptions for pension increases

	Percentage points above expected inflation
Normal pensions	0.4
Minimum pensions (*)	2.0
Minimum wages	2.0

(*) After reaching €200 in 2003.

The macroeconomic scenario is very simple. Inflation is assumed to be constant at 2% throughout the projection period. Real GDP growth is projected as the sum of employment growth and of real wage growth. **Table 8** presents the numbers.

Table 8. Projections of real GDP growth

	2005	2010	2020	2030	2040	2050	2075
Real GDP growth	2.8%	2.0%	3.3%	2.3%	4.2%	1.5%	2.7%

Source: Ministry of Finance calculations in PROST.

At the end of 1998, Portugal had a reserve fund worth 1 681 million euros, 414 million of which were held in the form of non-government assets. In the scenarios presented in this paper, government assets such as Treasuries have been left out. The reserve fund is assumed to accumulate if there is a surplus, and to decumulate *only* in case of a deficit. The social security system is said to be financially sustainable for as long as the reserve fund remains positive, without further budget transfers.

Some social security expenditures are clearly welfare benefits and, as such, should be financed by general taxes. In the projections, the assumption is that the budget transfer covers the following expenditures: pensions of the agricultural workers' regime (RESSAA), pensions of the non-contributory regime (RNCE), social action funds, the special regime for train workers (REF), and the social insertion income (RSI). Family benefits, social unemployment benefits, and subsidies for the handicapped have a mixed nature and, as such, from 2005 onwards the Budget will bear 50% of the cost.

This implies that social security contributions from employers and from employees, along with social VAT revenues have to finance the general regime (RG) including both normal and minimum pensions, and a range of contemporaneous benefits such as for sickness, maternity, occupational hazards, tuberculosis, unemployment, death, and one half of family benefits, social unemployment benefits, and subsidies for the handicapped. The assumption adopted is that welfare benefits grow with GDP and contemporaneous benefits grow with nominal wages. **Table 9** presents projections for all social security expenditures *with the exception of* pensions paid under the general regime. The reform initiatives we consider next do not change these expenditure items - that is why this table belongs here. As one can see, most expenditures remain more or less constant as a share of GDP, however the agricultural regime (RESSAA) and the non-contributory regimes (RNCE) are expected to taper off in the 2020s and 2050s,

respectively. The first regime was closed to new entrants in 1986, and the second is an instrument of poverty relief, aimed at pensioners with short contribution histories.

A more detailed description of the data, parameters, and assumptions made is out of the scope of this document, but will be the focus of a forthcoming paper.

Table 9 - Other social security expenditures

(As a percentage of GDP)	1999	2000	2001	2005	2010	2020	2030	2040	2050	2075
... Financed from SS funds	**1.5%**	**1.5%**	**1.5%**	**1.3%**	**1.3%**	**1.2%**	**1.2%**	**1.3%**	**1.3%**	**1.3%**
Sickness	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Maternity	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Occupational hazards	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Death benefits	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Unemployment	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%	0.5%	0.5%	0.5%
Family benefits (*)	0.4%	0.4%	0.4%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Social unemployment benefits (*)				0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Subsidies for the handicapped (*)				0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
... Financed from the Budget	**2.6%**	**2.7%**	**2.8%**	**2.7%**	**2.4%**	**1.9%**	**1.7%**	**1.6%**	**1.6%**	**1.5%**
Social Action	0.8%	0.8%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
Special regime for train workers	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Social insertion income	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Family benefits (*)				0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Social unemployment benefits (*)	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Subsidies for the handicapped (*)	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
RESSAA	***0.7%***	***0.7%***	***0.8%***	***0.7%***	***0.5%***	***0.1%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***
Old age	0.5%	0.5%	0.6%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Disability	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Survivors	0.1%	0.2%	0.2%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
RNCE	***0.5%***	***0.6%***	***0.6%***	***0.5%***	***0.4%***	***0.2%***	***0.2%***	***0.1%***	***0.1%***	***0.0%***
Old age	0.3%	0.3%	0.3%	0.3%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%
Disability	0.2%	0.3%	0.3%	0.2%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%
Survivors	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: Ministry of Finance calculations based on data provided by the Ministry of Social Security and Labour.
(*) - Financing split 50-50 between the Budget and the Social Security Budget as from 2005.

3. PROJECTIONS UNDER THE NEW FRAMEWORK LAW

From a public finance perspective, the main change that the New Framework Law for Social Security brought about affects the benefit formula that applies to normal old age, disability, and survivors' pensions under the general regime.

First, the number of years over which wages are averaged to compute the reference salary will gradually increase from the former best 10 of the last 15 years of contributions, to eventually the whole contribution history, capped at 40 years.[2] On account of the fact that, at present, many beneficiaries still have relatively short contribution histories, two grandfather clauses were introduced. The specifics of these transitional phases are rather difficult to model so a stylised approach was taken. As such, the assumption is that until 2016 there are no changes. We also know that in 2036 the whole contribution history will be used. In between, we use a linear approximation such that each year an extra 1.5 years are used to compute the reference salary.

The second change to the benefit formula involves the move from a flat accrual rate of 2% to a progressive schedule ranging from 2 to 2.3% that is conditional on having more than 20 years of registered contributions. Reference salaries that are 'lower' relative to multiples of the statutory minimum wage receive the highest accrual rates. Beneficiaries with less than 20 years of contributions still get a flat accrual rate of 2%. To simplify matters, we determine what the accrual rate would be for the average wage, if this progressive schedule were used. This was calculated at 2.2%. Until 2016, a triple guarantee ensures pensioners that pensions will never be lower because of the new formula. We model this guarantee with an accrual rate of 2.05% until 2016.

While progressively using the whole contribution history to compute the reference wage should contribute towards strengthening the long-term financial sustainability of the social security system, increasing the average accrual rate clearly worsens it. The New Framework Law for Social Security also mentions the introduction of contribution ceilings, but the specifics have yet to be decided upon.

[2] While it is hoped that contribution patterns over the life-cycle will change as a result, in keeping with fiscal prudence, we assume no such behavioural changes. When interpreting the projections one should keep this in mind.

Table 10 - Projections of the social security account under the new framework law

(As a percentage of GDP)	1999	2000	2001	2005	2010	2020	2030	2040	2050	2075
Old age pensions (*)	**3.8%**	**4.0%**	**4.1%**	**4.6%**	**4.7%**	**4.9%**	**5.2%**	**5.4%**	**5.5%**	**5.8%**
RG normal and new minima	2.0%	2.1%	2.1%	2.5%	2.8%	3.2%	3.9%	4.5%	5.1%	5.8%
RG minimum	1.0%	1.1%	1.1%	1.3%	1.5%	1.5%	1.2%	0.8%	0.4%	0.0%
Disability pensions (*)	**1.1%**	**1.1%**	**1.2%**	**1.2%**	**1.3%**	**1.3%**	**1.3%**	**1.1%**	**1.0%**	**0.8%**
RG normal and new minima	0.5%	0.5%	0.5%	0.7%	0.8%	1.0%	1.1%	1.0%	0.9%	0.7%
RG minimum	0.4%	0.3%	0.4%	0.3%	0.3%	0.2%	0.1%	0.1%	0.1%	0.0%
Survivors' pensions (*)	**0.9%**	**0.9%**	**1.0%**	**1.0%**	**1.0%**	**1.1%**	**1.1%**	**1.2%**	**1.2%**	**1.3%**
RG normal and new minima	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%
RG minimum	0.4%	0.4%	0.4%	0.4%	0.5%	0.6%	0.6%	0.7%	0.7%	0.8%
Total pension expenditure	5.9%	6.1%	6.3%	6.8%	7.1%	7.3%	7.5%	7.7%	7.7%	7.8%
Other social security expenditure (**)	2.8%	2.9%	3.0%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
Administrative costs	0.3%	0.3%	0.3%	0.3%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%
Total social security expenditure	**9.0%**	**9.3%**	**9.6%**	**10.0%**	**10.3%**	**10.5%**	**10.7%**	**10.9%**	**10.9%**	**11.1%**
Total social security revenues	**10.5%**	**10.9%**	**11.3%**	**11.2%**	**10.8%**	**10.2%**	**9.6%**	**9.5%**	**9.4%**	**9.4%**
Social security revenues	7.3%	7.5%	7.6%	7.7%	7.6%	7.6%	7.5%	7.4%	7.4%	7.4%
Budget transfer incl. social VAT	3.0%	3.2%	3.3%	3.0%	2.7%	2.2%	2.0%	2.0%	1.9%	1.9%
Other revenues	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Investment returns	0.0%	0.1%	0.2%	0.3%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%
Current account balance	1.5%	1.6%	1.7%	1.1%	0.5%	-0.3%	-1.1%	-1.4%	-1.5%	-1.7%
Reserve fund balance	1.9%	3.4%	4.9%	9.0%	11.0%	7.1%	0.0%	0.0%	0.0%	0.0%

(*) Includes the corresponding RESSAA and RNCE pensions; (**) Excluding the RESSAA and RNCE pensions.

Source: Ministry of Finance calculations using PROST.

Table 10 presents projections of social security expenditures and revenues under the New Framework Law. It should be noted that, as a result of the recent reform, only normal pensions paid under the general regime (RG) are affected.

Overall social security expenditure expressed as a percentage of GDP is expected to increase by 1.8 pp from 9.3% in 2000 to 11.1% in 2075. Within the same period, total social security revenues are expected to fall by 1.5 pp, mostly because of a lower

budget transfer, on account of the gradual disappearance of the agricultural (RESSAA) and the non-contributory (RNCE) regimes.

Table 11. Projections of the social security account under the old framework law

(As a percentage of GDP)	1999	2000	2001	2005	2010	2020	2030	2040	2050	2075
Old age pensions (*)	**3.8%**	**4.0%**	**4.1%**	**4.5%**	**4.7%**	**4.8%**	**5.0%**	**5.4%**	**5.7%**	**5.7%**
RG normal and new minima	2.0%	2.1%	2.1%	2.5%	2.7%	3.1%	3.7%	4.5%	5.2%	5.7%
RG minimum	1.0%	1.1%	1.1%	1.3%	1.5%	1.5%	1.2%	0.8%	0.4%	0.0%
Disability pensions (*)	**1.1%**	**1.1%**	**1.2%**	**1.2%**	**1.3%**	**1.3%**	**1.3%**	**1.1%**	**1.0%**	**0.8%**
RG normal and new minima	0.5%	0.5%	0.5%	0.7%	0.8%	1.0%	1.1%	1.0%	0.9%	0.7%
RG minimum	0.4%	0.3%	0.4%	0.3%	0.3%	0.2%	0.1%	0.1%	0.1%	0.0%
Survivors' pensions (*)	**0.9%**	**0.9%**	**1.0%**	**1.0%**	**1.0%**	**1.1%**	**1.1%**	**1.2%**	**1.2%**	**1.3%**
RG normal and new minima	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%
RG minimum	0.4%	0.4%	0.4%	0.4%	0.5%	0.6%	0.6%	0.7%	0.7%	0.8%
Total pension expenditure	5.9%	6.1%	6.3%	6.8%	7.0%	7.2%	7.4%	7.7%	7.8%	7.7%
Other social security expenditure (**)	2.8%	2.9%	3.0%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
Administrative costs	0.3%	0.3%	0.3%	0.3%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%
Total social security expenditure	**9.0%**	**9.3%**	**9.6%**	**10.0%**	**10.3%**	**10.3%**	**10.6%**	**10.9%**	**11.1%**	**11.0%**
Total social security revenues	**10.5%**	**10.9%**	**11.3%**	**11.2%**	**10.8%**	**10.3%**	**9.7%**	**9.5%**	**9.4%**	**9.4%**
Social security contributions	7.3%	7.5%	7.6%	7.7%	7.6%	7.6%	7.5%	7.4%	7.4%	7.4%
Budget transfer incl. social VAT	3.0%	3.2%	3.3%	3.0%	2.6%	2.2%	2.0%	1.9%	1.9%	1.8%
Other revenues	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Investment returns	0.0%	0.1%	0.2%	0.3%	0.5%	0.4%	0.1%	0.0%	0.0%	0.0%
Current account balance	1.5%	1.6%	1.7%	1.2%	0.5%	-0.1%	-0.8%	-1.4%	-1.7%	-1.6%
Reserve fund balance	1.9%	3.4%	4.9%	9.1%	11.2%	8.2%	1.4%	0.0%	0.0%	0.0%

(*) Includes the corresponding RESSAA and RNCE pensions; (**) Excluding the RESSAA and RNCE pensions.
Source: Ministry of Finance using PROST.

As a result, the current account balance goes from a surplus of 1.6% of GDP to a deficit of 1.7% of GDP. The first year with an deficit is 2016. Conversely, by 2029 the reserve fund should have a zero balance.

4. PROJECTIONS UNDER THE OLD FRAMEWORK LAW

To better evaluate the effects of the New Framework Law, a similar table to Table 10 is presented that describes what the future would likely be in the absence of such a policy change (see **Table 11**).

Overall social security expenditure expressed as a percentage of GDP would be expected to increase by 1.7 pp from 9.3% in 2000 to 11.0% in 2075. Total social security revenues are unchanged by the reform. As a result, the current account balance would be expected to go from a surplus of 1.6% of GDP to a deficit of 1.6% of GDP. The first year expected to have a deficit would be 2018. Conversely, by 2032 the reserve fund would presumably register a zero balance.

5. PROJECTIONS FOR THE CIVIL SERVANTS' PUBLIC PENSION SCHEME

This section presents long-term expenditure and revenue projections for the CGA, an occupational scheme for public-sector workers.[3] It should be noted that the scenario chosen corresponds to the 4:1 human resource policy, whereby for each four civil servants that retire only one new worker is hired. **Table 12** details how the number of contributors and the number of pensioners are expected to change over the next 75 years. It should be noted that the CGA does not distinguish between old age and disability pensioners – both are termed *aposentados*.

[3] The CGA projections described here were taken from Gouveia and Sarmento (2002), who also used PROST. The author wishes to thank Miguel Gouveia and Luis Morais Sarmento for the permission to use these projections for the purpose of the National Strategy Report.

Table 12. Projections of contributors and pensioners of the CGA

(Thousands)	1999	2000	2005	2010	2020	2030	2040	2050	2075
Contributors	710.0	747.0	723.0	710.0	709.0	710.0	711.0	711.0	711.0
Total number of pensioners	418.0	428.0	464.0	511.0	621.0	699.0	712.0	693.5	694.0
Old age and disability	302.0	309.0	346.0	393.0	499.0	577.0	595.0	583.0	587.0
Survivors	116.0	119.0	122.0	124.0	127.0	129.0	126.0	120.5	117.0

Source: Gouveia and Sarmento (2002), Table A.2 using PROST.

As a percentage of GDP, pension expenditure paid under the CGA is expected to increase by 1.4 pp from 3.6% in 2000 to 5% in 2075. With contributions and other revenues more or less constant at around 1.5% of GDP, the compensating budget transfer is expected to rise from 2% of GDP in 2000 to 3.4% of GDP in 2075. Taking the current budget transfer as a baseline in which the Government's contributions as an employer are around 2% of GDP, this implies that a deficit of 1.4% of GDP is expected to materialize in 2075.

Table 13. Projections of the CGA account

(As a percentage of GDP)	1999	2000	2001	2005	2010	2020	2030	2040	2050	2075
Pension expenditure	3.5%	3.6%	3.7%	4.1%	4.4%	5.0%	5.0%	4.6%	4.4%	5.0%
Contributions and other revenues	1.5%	1.6%	1.6%	1.5%	1.5%	1.5%	1.5%	1.5%	1.6%	1.6%
Current account balance	-2.0%	-2.0%	-2.1%	-2.6%	-2.9%	-3.5%	-3.5%	-3.1%	-2.8%	-3.4%

Source: Gouveia and Sarmento (2002), Table A.9 using PROST.

6. CAVEATS AND CONCLUSIONS

Countries where pay-as-you-go financing is predominant are expected to come under serious pressure as population ageing develops. Given that under this arrangement

current workers finance current pensioners, an increase in the ratio of elderly persons to employed individuals will inevitably create an imbalance between revenues and outlays. Persistent social security imbalances carry implications both for macroeconomic stability and for economic growth, as public funds have to be diverted from education and public investment, and or taxes have to be increased.

This paper has focused on the long-term financial sustainability of the whole social security system in Portugal. Both the public pension scheme for private-sector workers and the corresponding scheme for civil servants were considered. Furthermore, in a comprehensive analysis of the Social Security account, all social security expenditures were included.

Results of the scenarios suggest that the recent reform measures aimed only at the private sector workers' public pension scheme and that are to be adopted under the New Framework Law for Social Security **do not** guarantee the long-term sustainability of the system. Under the assumptions of the first scenario considered, the Reserve Fund is expected to go dry in 2029. This means that the system is financially sustainable for less than half of the projection horizon considered, i.e., until 2075.

In fact, it seems that the recent reform measures have actually worsened the fiscal stance of the system: the first deficit would otherwise be expected to appear in 2018 (rather than in 2016), and the Reserve Fund would presumably be extinguished in 2032 (rather than in 2029). Our interpretation of the results is that the expenditure saving effect that results from using the whole contribution history when calculating the reference salary is dominated by the expenditure augmenting effect that results from higher-on-average accrual rates. It seems that the transition period is just too long for there to be any significant gain in terms of strengthening financial sustainability.

Over a period of 75 years, overall social security expenditure is expected to rise by 3.2 pp of GDP. Although the private sector workers' scheme accounts for 1.8 pp and

the civil servants' scheme accounts for the remaining 1.4 pp, the CGA is *by far* the least sustainable system from a financial point of view, insomuch as, by 2075 the general scheme is expected to cover almost 4 million pensioners versus around 700 thousand pensioners under the civil servants' scheme.

Although the conclusions of this paper seem clear-cut, there are a few important shortcomings that need to be mentioned. Before doing so, there are also some positive points that deserve to be highlighted. Compared to the standard analysis carried out in Pereira and Rodrigues (2001) that uses composition and adjustment effects of pension increases, this paper has a few significant improvements that were not done earlier mainly out of data insufficiencies. In addition to considering the 2002 pension reform, which has made the previous research largely obsolete, anonymously sampled administrative micro data were now intensively used. This wealth of new information allows us to ask more sophisticated questions like: What do age and gender profiles look like? Our exploration of these new databases has, however, just begun.

As for the caveats of the analysis, we have to consider two lines of criticism: one pertaining to the characteristics of the model used, and another to the assumptions made.

PROST is an actuarial model. This means that it lacks the micro foundations of a dynamic general equilibrium framework, where feedbacks from and to all markets are present and many crucial variables are endogenous. While these more economic models are, as many would say, the only sensible way forward, it's also true that they represent a rather ambitious undertaking – adapting an academic model to the specificities of a pension system, even as simple as the Portuguese one, is not a trivial exercise. See Pereira and Rodrigues (2002) for an attempt at this. Notwithstanding, PROST is a (relatively) simple model that has the main advantage of being transparent. This makes it an important complement to other more sophisticated analyses. For a

discussion of the issues surrounding the development of alternative models for social security policy analysis see Toder *et al* (2000).

Finally, moving on to the never-ending critiques regarding the assumptions made, most of them can be obviated through comprehensive sensitivity analysis, albeit at a cost. As gloomy as the projections might seem to be, there are strong reasons to believe that they could in fact turn out to be too optimistic. If fertility and mortality rates have been overstated, if increased labour force participation does not materialise, if early retirement trends are not reversed, if wages and productivity sag, if GDP growth is not as vibrant as expected, if capital markets misbehave, or if politicians continue to misbehave (by not containing annual real pension increases, by not carrying out pension reforms, or in general by promising what they know cannot be delivered), then the future will turn out differently, for the worst that is.

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- ANNEX -

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