PORTUGAL
COUNTRY FICHE

2014 Ageing Working Group pension projection exercise

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Index

1. Overview of the pension system

1.1. Description

The Portuguese public system incorporates two distinct schemes: one that covers private sector workers and public sector employees registered since January 2006 (the general regime of social security subsystem) and CGA (*Caixa Geral de Aposentações* subsystem)[1] that covers civil servants who have started working in the public sector until 2005.

The general regime of Social Security is divided into a General Contributory Regime and a welfare subsystem. The latter includes the Non-contributory Regime and the Agricultural Workers Regime, both being financed by the State Budget. The Agricultural Workers' Regime is closed to new contributors since 1986.

The public social security pension system is basically a defined benefit (DB) system, working on a pay-as-you-go (PAYG) financing basis. Even though the system is run on a PAYG basis, a Social Security Trust Fund (FEFSS) was created to ensure the coverage of foreseeable pension expenditure for a minimum period of two years. In order to meet this objective 2 to 4 percentage points of the employee contributions are consigned to FEFSS, in addition to the annual surplus of the welfare subsystem, revenue from the sale of assets and gains on financial investments. However the transfer related to employee contribution or/and the surplus only occurs when the contributory regime of the Social Security system has a surplus or when the economic situation allows. In the case of CGA, the gap between pension expenditures and contributions is financed by State transfers.

In 2013, the general regime of social security covered about 3.1 million workers and 3.1 million pensions (general regime of social security and non earning related scheme).

The CGA covered 441 thousand contributors and 614 thousand pensions at the end of 2013. As it is a closed system since January 2006, the number of contributors is decreasing continuously (until the 2040's) and the pensions trend is expected to increase by the early 2030's and then will decrease as well.

At the end of 2013, occupational pension schemes implemented through pension funds accounted to near 165 thousand members, 119 thousand beneficiaries and the amount of assets under management represented 8,7% of the Portuguese GDP. This system is composed by three types of pension schemes:

• 1st pillar DB schemes, related to the banking sector collective labour agreement in which the benefits promised are substitutive of the Social Security benefits (these schemes

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[1] CGA subscribers enrolled since September 1993 are subject to the same rules of those of general regime of social security. The pension scheme of these employees has been in a convergence process towards the general regime of social security since 2005.

were closed to new entrants in 2009 and new workers are compulsory inscribed in the Social Security system);

• other DB schemes, that encompass all other DB schemes, which are complementary of the Social Security system;

• DC schemes.

There is no common formula for DB benefits as it depends on the specific provisions of the pension schemes. However, pensions for the DB schemes are commonly final salary pension schemes, in which the benefit depends on the number of years of service and the pensionable salary.

Pension indexation under collective labour agreements is usually mandatory. For the remaining pension schemes, indexation is typically not guaranteed but granted on a discretionary basis.

This exercise covers the public pension and private occupational systems that will be described in the following sections.

A. Public pension systems (Social Security + CGA)

<u>Qualifying conditions</u>

Under the General Contributory Regime, since 2014, the insured person is entitled to an old age pension if he/she has both completed <u>66 years</u> of age and fulfilled the required qualifying period (15 years with earnings registration). As from 2015, the legal age for the entitlement to the old-age pensions shall vary according to the evolution of life expectancy at the age of 65[2].

As far as disability pension is concerned, the required qualifying period is: 5 years in case of relative disability pension and 3 years in case of total disability pension. The disability is deemed relative when due to permanent incapacity, the insured person cannot earn in his/her occupation more than one third of the earnings he/she would get if he/she carried out his/her activity on a regular basis, and therefore it can be presumed that, within the following three years, he/she will not recover the capacity to obtain from his/her activity more than 50% of the corresponding earnings. The incapacity is deemed total when the insured person has neither any remaining work capacities nor it can be presumed that he/she will recover the capacity to obtain any means of subsistence, until the age of 65.

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[2] According to the following calculation formula:

$$m_n = \sum_{i=2015}^{n} (LE_{i-2} - LE_{i-3}) \times 12 \times \frac{2}{3}$$

«m» corresponds to the number of months to be added to the pensionable age in 2014; «n» corresponds to the year of pension entitlement; «LE» corresponds to the average life expectancy at 65.

If the person is not covered by any compulsory social protection scheme or does not have the required qualifying period for the pension he/she is entitled to a pension under the non-contributory regime. Benefits provided by this scheme depend on the fulfilment of a means test, which means that the claimant should prove that his/her income does not exceed the amounts legally prescribed: gross monthly income not higher than €167.69 (40% of the Public Support Index - PSI (Indexante dos apoios Sociais – IAS))[3] - or € 251.53 (60% of PSI) if it is a couple.

Regarding to CGA, the rules have been converging to the ones of social security general regime: to public sector employees hired since September 1993 the same conditions apply; to other public sector employees, which were under a legal retirement age convergence period, since 2014 the legal retirement age and the qualifying period is equal to social security general regime (Law no. 11/2014, March 6), except for those that had all requirements for require a pension when the law was published.

Until April 2012, in the Social Security general regime, the old age pension could be claimed before the legal retirement age if the insured person had both a minimum age of 55 and 30 years of contributory career. In this case of early retirement, it is applied a reduction of 0.5% for each month of anticipation, corresponding the number of anticipation months to the difference between the date when the anticipated pension is claimed and the date when the insured person completes 65 years of age. In order not to penalize longer careers, if at the age of 55 the insured person has more than 30 years with earnings registration, the number of anticipation months is reduced by 12 months for each period of 3 years that exceeds those 30 years[4].

During the Economic and Financial assistance programme period and until the end of 2014, the Government suspended early retirement for employed workers covered by the social security scheme. However during that period there were exceptions in situation of long-term involuntary unemployment and the anticipation schemes for physically demanding activities.

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[3] The PSI value is 419,22 euro and is frozen since 2009.
[4] These rules weren't changed until December 2014.

		2010	2013	2014	2015	2020	2030	2040	2050	2060
CGA scheme										
Men and Women - with 20 contribution years	statutory retirement age	62.5	65	66	66	66.4	67.1	67.7	68.3	68.8
	earliest retirement age	-	-	-	-	-	-	-	-	-
	penalty in case of earliest retirement age	-	-	-	-	-	-	-	-	-
Men and Women - with 40 contribution years	statutory retirement age	62.5	65	66	66	66.4	67.1	67.7	68.3	68.8
	earliest retirement age	30 contribution years when completes 55 years of age	30 contribution years when completes 55 years of age	30 contribution years when completes 55 years of age	30 contribution years when completes 55 years of age	30 contribution years when completes 55 years of age	30 contribution years when completes 55 years of age	30 contribution years when completes 55 years of age	30 contribution years when completes 55 years of age	30 contribution years when completes 55 years of age
	penalty in case of earliest retirement age	-0.5%/month	-0.5%/month	-0.5%/month	-0.5%/month	-0.5%/month	-0.5%/month	-0.5%/month	-0.5%/month	-0.5%/month
Social security scheme										
Men and Women - with 20 contribution years	statutory retirement age	65	65	66	66	66.4	67.1	67.7	68.3	68.8
	earliest retirement age	62	not possible *	not possible *	**	**	**	**	**	**
	penalty in case of earliest retirement age	-0.5%/month	- *	**	**	**	**	**	**	**
Men and Women - with 40 contribution years	statutory retirement age	65	65	66	66	66.4	67.1	67.7	68.3	68.8
	earliest retirement age	55	not possible *	not possible *	**	**	**	**	**	**
	penalty in case of earliest retirement age	-0.5%/month ****	- *	- */***	**	**	**	**	**	**

* Except in special cases as long term unemployment (with 57 years old).

** The law that defines the qualifying conditions (age) and penalties to early retirement is under consideration by the Government.

*** There will be the possibility to claim the old age pension before the legal retirement age if the insured person has both a minimum age of 65 and more than 40 years of contributory period.

**** With a maximum of 42%.

Source: Member States

Pension benefit formula

Old age pensions are calculated according to the following formula:

$$P = RE * GAR * SF$$

Where:

P represents the value of the monthly pension (14 months per year),

RE is the reference earning,

GAR is the pension global accrual rate and

SF is the sustainability factor.

Reference earnings

According to the pension rules, the reference earning equals the total annual earnings (after they have been adjusted by the Consumer Price Index) of the whole insurance career (up to the limit of 40). Whenever the number of calendar years with earnings registration is higher than 40, it is taken into account the best 40 annual earnings, after they have been adjusted. These rules are fully applicable to those who first registered on Social Security system after 2002. For all the others, registered in the Social Security system before 2001, there are transition clauses to the application of the new rules. For those, the pension is calculated as a weighted average between the pensions that result from the new and the old benefit formula (the best 10 out of the last 15 years earnings, in the case of social security general regime, and only the last month earnings[5], in the case of CGA, for the service before 2005).

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[5] The reference earnings, according to recent legislation (Law no. 11/2014, March 6), are 80% of the gross earnings. The reference earnings of CGA contributors that were enrolled before 1993 are calculated adding 80% of the last wage of 2005, adjusted by inflation and divided by the number of career years until 2005, with updated average salary of the remaining contributor years.

Pension global accrual rate

According to the new pension rules, the annual accrual rate varies between 2% and 2.3%. The global accrual rate is set according to the number of years with earnings registration and the amount of reference earnings, as follows:

Number of years with earnings registration		
20 years or less	**21 years or more** (Calculation according to the RE value)	
	Reference Earnings (RE)	**Calculation formula**
P = RE x 2% x N	Equal to or lower than 1,1 PSI	P = RE x 2,3% x N
	Higher than 1,1 PSI and lower than 2 PSI	P = (1,1 PSI x 2,3% x N) + [(RE-1,1 PSI) x 2,25% x N]
	Higher than 2 PSI and equal to or lower than 4 PSI	P = (1,1 PSI x 2,3% x N) + (0,9 PSI x 2,25% x N + [(RE – 2 PSI) x 2,2% x N]
	Higher than 4 PSI and up to 8 PSI	P = (1,1 PSI x 2,3% x N) + (0,9 PSI x 2,25% x N) + (2 PSI x 2,2% x N) + [(RE - 4 PSI) x 2,1% x N]
	Higher than 8 PSI	P = 1,1 PSI x 2,3% x N) + (0,9 PSI x 2,25% x N) + (2 PSI x 2,2% x N) + (4 PSI x 2,1% x N) + [(RE - 8 PSI) x 2% x N]

Where:
        P is the statutory pension amount,
        RE the reference earnings,
        N the number of relevant calendar years (up to the limit of 40) and
        PSI (the Public Support Index).

When the transition clauses are applicable, to the part of the pension that is calculated under the old benefit formula the annual pension accrual rate is equal to 2% for each calendar year with earnings registration and the global accrual rate corresponds to the product of the annual rate and the number of calendar years with earnings registration (lower limit of 30% and upper limit of 80%).

Sustainability factor

The sustainability factor is an adequacy factor of the pensions system to the demographic changes, which results from the relation between the average life expectancy in 2000 (previously it was 2006), and the one that will occur in the year before the pension claim. According to the recent reform it is applied for those individuals for whom the old age pension is attributed before the legal retirement age. Therefore, the pensions exempted from the application of the sustainability factor are: total disability pensions which at the date of the respective conversion into old-age pensions (65 years) have been paid for more than 20 years; and total disability pensions granted to beneficiaries registered in the social security system before June 1, 2007 and who have received that pension for more than

half the period between that date and the date in which they will reach the pensionable age in force.

The sustainability factor is not applied to pensions where the insured person has both a minimum age of 65 and more than 40 years of contributory period and for pensions granted to beneficiaries who have completed the legal age for the entitlement to an old-age pension.

The sustainability factor is calculated as:

$$SF_t = LE_n / LE_{t-1}{}^6$$

Where:

LE is the average life expectancy at the age of 65[7],

t is the year when the pension is required and

n is the initial reference year for the SF and it will be 2000 for early old-age pensions or 2006 for disability pensions paid for less than 20 years that are converted to old- age pensions.

Indexation

Since the beginning of 2007, the annual increase of pensions was defined by law as a reference to a Public Support Index (PSI). The index is annually updated according to a specific formula linked to the Consumer Price Index as a function of the GDP real growth rate and the pension's value, as shown in the following table.

	GDP real variation rate less than 2%	GDP real variation rate from 2% to 3%	GDP real variation rate equal or greater than 3%
Pensions under 1.5 PSI	CPI change rate	CPI change rate + 20% GDP real variation rate (minimum: CPI change rate + 0.5 percentage points)	CPI change rate + 20% GDP real variation rate
Pensions 1.5 to 6 PSI	CPI change rate – 0.5 percentage points	CPI change rate	CPI change rate + 12.5% GDP real variation rate
Pensions 6 to 12 PSI	CPI change rate – 0.75 percentage points	CPI change rate – 0.25 percentage points	CPI change rate

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[6] For 2013 the SF based on 2000 is 0.8827 and SF based on 2006 is 0.9522.
[7] LE is published annually by the National Statistics Institute (INE). For projections purposes, it refers to the weighted average of male and female life expectancy at 65, being the weights the shares of male and female on total population aged 65.

The suspension of the usual automatic updating scheme of pensions and other social benefits granted under the social security system is in force since 2010.

On the other hand, it has also held the nominal freeze of the following benefits: disability and old age pensions granted under the social security general scheme; other pensions, allowances and supplements granted under the social security system, with the exception of minimum pension amounts corresponding to insurance careers with less than 15 years; old age, disability and other pensions granted under the convergent social protection scheme (of public servants admitted before 2006) with an insurance career up to 18 years; pensions granted under the special social security scheme for agricultural activities (RESSAA); and the non-contributory pension scheme and similar schemes, which were updated in line with the inflation[8].

Minimum Pensions

Under the General Contributory Regime, minimum amounts are guaranteed according to the pensioner's insurance career. When the pensions' amount calculated according to the general rules is lower than the guaranteed minimum amount, it will be increased by the so called social supplement whose value is equal to the difference between the guaranteed minimum amount and the statutory or legal pension amount. The social supplement granting is not subject to a means test.

In 2014, the following minimum amounts were guaranteed, according to the pensioner's insurance career and the pension scheme:

GENERAL SCHEME	
Insurance career (number of years)	Pensions Minimum value
Less than 15	259.36
From 15 to 20	274.79
From 21 to 30	303.23
Above 30	379.04

These minimum amounts do not apply to early pensions.

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[8] For 2013, the minimum pensions were update in 1.1% (Administrative Rule no. 432/2012 of 31 December) and for 2014 in 1% (Administrative Rule no. 378-B/2013 of 31 December).

If the person is not covered by the General Contributory Regime or does not have the required qualifying period for the pension he/she is entitled to a pension under the non-contributory regime, the so-called social pension. These pensions grow in line with the Public Support Index.

PSI is updated according to the following rule:

	GDP real variation rate less than 2%	GDP real variation rate from 2% to 3%	GDP real variation rate equal or greater than 3%
PSI updated	CPI change rate	CPI change rate + 20% GDP real variation rate (minimum: CPI change rate + 0.5 percentage points)	CPI change rate + 20% GDP real variation rate

As PSI is frozen since 2009, these pensions have been updated in line with inflation. In 2014, the monthly pension of non-contributory scheme was set at 199.53 euro.

Financing

Social Security:

The overall rate for the systems of social security is divided in 11% of gross earnings paid by the employee's and 23.75% paid by the employer's. The self-employed pay 29.6% on reference income (or 34.75% for those with gross annual income of € 3,593.31 or has management functions). There is no ceiling for contributions.

In periods of sickness, maternity, unemployment, military service, compensation for inherent work risks, and jury service and children care periods are considered contributory periods. Of the total 34.75% of gross earnings paid by the insured person and employer, 20.21% finances old-age benefits, 4.29% finances disability benefits, and 2.44% finances survivor benefit. The insured's contributions also finance sickness and maternity, occupational disease, and unemployment benefits.

Caixa Geral de Aposentação:

The overall rate for the systems of social security is divided in 11% (8% finances old-age pension and 3% survivors' pensions) of gross earnings paid by the employee's and 23.75% paid by the employer's.

The Government covers the gap between revenue and expenditure (the Ministry of Finance ensures the permanent financial balance of the Pension scheme), as CGA is a closed system with no new entrances.

In periods of sickness, maternity, unemployment, military service, compensation for inherent work risks, and jury service and children care periods are considered contributory periods.

<u>Taxation</u>

Old age pension taxation benefits are subject to taxation. The pension income is included in gross total income of the household of the pensioner that comprise wages, pensions and property income. Some automatic deductions are made according the type of income of the taxpayer (dependent worker, retirement pension) and the composition of the household. In what concerns accumulation with income from work: it is possible with limits on early retirement.

The tax rates for pensions up to 22,500, is applied for the annual income starting at €4,104. For pensions above € 22,500, taxation is applied for an annual income starting at €4,104 less 20% between the pension and € 22,500. For pensions above € 43,020, income tax is applied on total pension amount. Pensions are subject to a withholding tax determined according to the value of the pension and the family situation of each pensioner. In 2014 withholding taxes were published in ministerial order no. 706-A/2014, January 15th. Additionally, there is a extraordinary solidarity contribution[9].

Pension incomes are included in gross total income of the household of the pensioner that comprise wages, pensions and property income.

1.2. Recent reforms of the pension system included in the projections

A.   Public pension systems

Concerning pensions, since the last AWG exercise a few changes were introduced in the legal framework of disability and old age pensions of the social security general scheme, which came into force on 1 January 2014. The main changes were:

- the statutory retirement age for the entitlement to an old-age pension increased from 65 to 66 and the limit for the contributor career was kept unchanged at 70. As from 2015, the legal age for the entitlement to the old-age pensions shall vary according to the evolution of life expectancy at the age at 65, during the 2nd and 3rd years before the pension date.
- there were changes in the determination and application of the sustainability factor (SF) to old-age pensions' calculation (or in the conversion of disability pensions

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[9] See section A. Public pension system in 1.2. Recent reforms of the pension system included in the projections.

into old age pensions). Since 2014, the SF is applied only to the early old-age pensions and to the disability pension granted for 20 years or less converted into old-age pensions. In early pension calculation, the initial reference year of the average life expectancy at 65 (LE_{65}) was changed from 2006 to 2000, which has implied an aggravation of the sustainability factor. For the calculation of disability pensions granted for 20 years or less and converted in old-age pension, the initial reference year of the average life expectancy at 65 (LE_{65}) was kept unchanged (in 2006).

- the establishment of the convergence mechanisms of the CGA to the general social security scheme regarding the qualifying conditions and pension calculation, particularly with regard to legal statutory age, the qualifying period and Sustainability Factor application;

- for the new pensions granted to contributors that join CGA before September 1, 1993, the calculation of the pension take in account of 80% of the last wage of 2005 (revaluated) for service until 2005 instead of the last wage of 2005 minus employee contribution[10] (revaluated) and the revaluation is made according inflation.

Other pension-related measures were implemented over the past four years to help reduce the budget deficit which were:

- Freezing public pensions[11];

- Increasing of the employers' contributions to CGA from 20% to 23.75% in 2014.

- Introducing of an extraordinary solidarity contribution.

This contribution was introduced in 2011 and its specifications and contribution base have been changed. In 2013 and 2014 pensioners paid from 3.5 to 40 percent according to the following table:

Monthly pension	Extraordinary solidarity contribution
From 1.000 to 1.800 EUR	30.5% of pension amount
From 1,800.01 to 3,750 EUR	30.5% of pension amount plus 16% of the pension amount from 1,800.1 EUR
From 3,750 EUR	10% of pension amount plus 15% of the pension amount from 4,611.42 to 7,126.74 EUR plus 40% of the pension amount above 7,126.74 EUR

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[10] Employees' contribution to CGA increased from 10% to 11% in 2011.
[11] Additionally, in 2012 was suspended the payment of the 13th and 14th month of pension above EUR 1,100 and in 2013 was suspended 90% of the payment of the 14th month for pensions above EUR 1,100. This measure was ruled unconstitutional by the Constitutional Court.

For 2015, the draft budget lays downs that this contribution will be applied from 15 to 40 percent of pension income on amounts exceeding EUR 4,611.

Additionally, several measures were taken to reduce wages in the public administration. Since 2011 promotions and the related wage increases in the public administration were suspended. Temporary wage cuts through suspensions of the 13th and/or 14th salaries or other reductions were introduced in different forms in the budgets 2011 to 2014. However, these suspensions needed to be revised several times after relevant Constitutional Court rulings. Thus, for 2014 and 2015, as ruled by the Constitutional Court, the cut of public employees' wages were reversed and decreased to an average of 5% and for 2016 onwards the cuts are completely removed[12]. This measure was also taken into account in the public sector wages/contributions dynamics with long term effects on pension expenditure.

The measures of the 2007 Reform of Social Security in Portugal (that have been presented in detail in the previous exercises) are also included in the current projections. On what pension expenditure is concerned, and as a reminder, the most relevant measures of this reform are:

- The introduction of the sustainability factor in the pension benefit formula to new pensions required from the beginning of 2008 onwards;
- The rule for updating pensions as a function of the consumer inflation, the real growth of GDP and the pension amount. This rule is suspended since 2010;
- The earlier transition to the new pension benefit formula which considers the whole contributory career and differentiates the accrual rate according to the reference earnings;
- The introduction of a pension ceiling to the new pensions;
- The promotion of active ageing by the increase of penalty for early retirement (reduction rate of 0.5% for each month of anticipation until the date when the insured person reaches the statutory retirement age).
- The introduction of a monthly bonus for those who retire after the legal retirement age, which varies as follows:

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[12] In 2011, wages above EUR 1,500 were cut between 3.5% and 10% (5% in average of the wage bill). In 2012, the Government decided to suspend the payment of the 13th and 14th salary. In 2013, as ruled by the Constitutional Court, the 13th and 14th salary were paid again. For 2014, the Government decided to cut wages deeply: the wages above EUR 675 would be cut between 2.5% and 12%. However, this 2014 cut were ruled unconstitutional and were reversed by the middle of the year. Therefore, in the five first months of the year wages were cut between 2.5% and 12%; between May and September no cuts were applied; and in the remain year the 2011 cuts are in force.

Situation of the insured person		Monthly rate of pension increase (%)
Age	Insurance periods (years)	
More than 65 years	From 15 to 24	0,33
	From 25 to 34	0,5
	From 35 to 39	0,65
	More than 40	1

All these measures are enacted[13] and it is admitted that they will remain in force during the whole projection horizon (no policy change scenario).

B. Occupational private systems

The most representative changes that have occurred in the last couple of years in the occupational pension system, namely in relation to 1st pillar DB schemes of the banking sector, considered in this exercise are:

- The Decree-Law no. 54/2009, of March 2, which established the enrolment of the banking sector' new employees into the Social Security system, closing these schemes to new entrants;
- The Decree-Law no. 1-A/2011, of January 3, according to which the remaining banking sector employees were inscribed in the Social Security system for the purpose of future service regarding retirement benefit. Current banking sector employees began to pay contributions to the Social Security although maintaining the collective labour agreement benefits. In practice, this means that their pensions will be financed both from the Social Security (for the working period between 2011 and their retirement year) and from the pension fund, since the pension fund will now be responsible for the payment of the complement between the total benefits promised in the collective labour agreement less the Social Security pension (the type of plan changed from being an independent plan to an integrated with the Social Security plan). Nevertheless, banking sector funds are still fully responsible for the liabilities concerning illness, disability, death and survivorship benefits.
- The Decree-Law no. 127/2011, of December 31, which established the enrolment of most banking entities current beneficiaries into the Social Security system (following which the pension funds liabilities related to pensions in payment and the corresponding assets were transferred to the Social Security system). Nevertheless, banking sector funds are still fully responsible for future pension indexation, as well as medical post-retirement expenses and post-retirement benefits.

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[13] The application of the Sustainability Factor was changed.

1.3. Description of the actual "constant policy" assumptions used in the projection

These projections are anchored in the 2013 data and rules, assuming "constant policy" since then, except for the recent change in retirement age, public employees' salaries, income from extraordinary solidarity contribution and the ruled actualization of PSI between 2013 and 2015.

The changes in the forthcoming years resulting from the measures that have been enacted (convergence of CGA to Social Security rules, transition to pension formation taking into account the whole contributory career) were considered as well.

Concerning early retirement, as it was suspended between 2012 and 2014 for contributors of Social Security scheme, the projections assume that after 2015 it is possible to retire after reaching 60 years of age and the number of new early pensions is progressively increasing between 2015 and 2017 to the 2012 level[14].

The indexation of pensions has been suspended between 2011 and 2014 and only minimum pensions were updated. In the pension projections we assume that from 2015 onwards the indexation rule is going to be applied.

This exercise does not consider the transfer of responsibility to the CGA of pensions and other charges of workers of PT Comunicações, SA (PT) that occurred at the end of 2010, as it is not reflected in the 2013 CGA data. However, the future costs for CGA were already offset by the amount transferred from PT Pension Funds to the State, being neutral from an actuarial point of view, and should not make a difference in terms of the long term public finance sustainability analysis[15].

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[14] These pensions will be reduced by the early retirement penalty and also by the Sustainability factor with the initial reference year of 2000.

[15] More precisely, the pensions of former PT workers have always been paid by CGA but on behalf of PT that used to transfer the corresponding funds on a regular basis. However, in this projection exercise, PT pensions' funds were included in the occupational pensions by 2010, while public pensions only include those that are State or Social Security responsibility. The flows of pensions or contributions where CGA acts on behalf of private entities are not considered within the scope of the public pensions (related expenditure and revenue are excluded).

2. Demographic and labour forces projections

2.1. Demographic development

Portugal, like other European countries, has been deeply affected by ageing population and the latest demographic projections are quite worrying when compared with those foreseen in the 2012 projections round. Indeed, the old-age dependency ratio, in 2060, is expected to increase around 6.7 percentage points (p.p.), which have a direct impact in the number of pensioners.

<div style="text-align:center">

Graph 1: Dependency ratio

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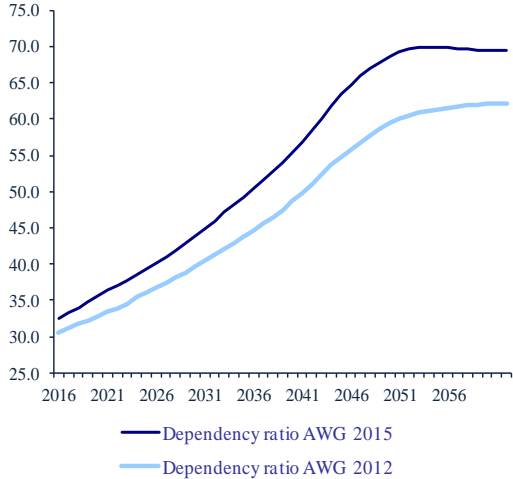
In particular, in the last 30 years, Portugal has been observing a birth rate deterioration and significant gains in life expectancy, which have led to a significant shrink in age cohorts below 30's and an increase in those between 30's and 60's and also in the oldest ones (see age pyramid for 2013 on graph 3). For 2060, if no measures are taken, it is expected an even higher increase in the oldest population cohorts and considerable decrease in the youngest cohorts. These factors combined, as well as migrations flows, will lead to a decrease in total population of 21.6% between 2013 and 2060.

Graph 2: Life expectancy at birth and birth rate
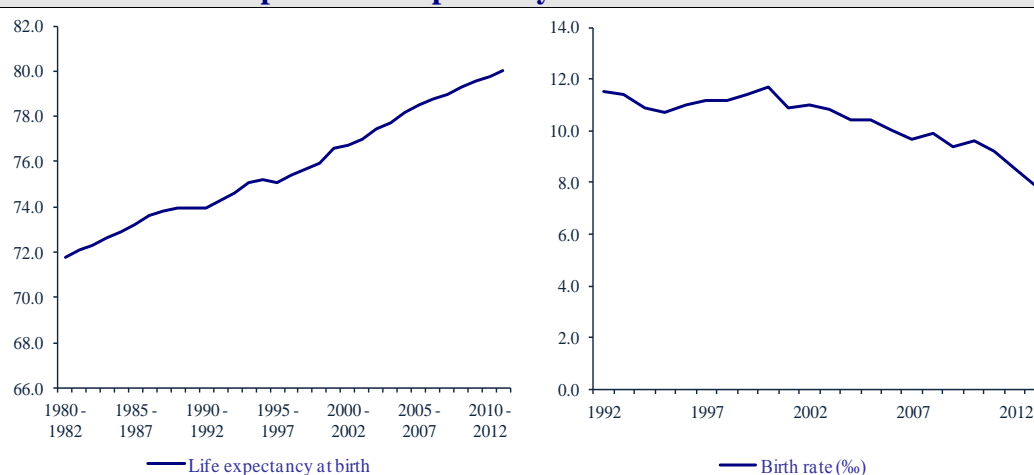
Source: Instituto Nacional de Estatística.

Table 2 – Main demographic variables evolution

	2013	2020	2030	2040	2050	2060	Peak year*
Population (thousand)	10455	10121	9760	9364	8832	8196	2013
Population growth rate	-0.6	-0.4	-0.4	-0.5	-0.7	-0.8	2028
Old-age dependency ratio (pop65/pop15-64)	29.8	34.7	43.6	55.7	64.3	63.9	2051
Ageing of the aged (pop80+/pop65+)	27.7	29.4	30.3	33.2	38.3	46.5	2060
Men - Life expectancy at birth	77.4	78.6	80.2	81.7	83.1	84.5	2060
Men - Life expectancy at 65	17.6	18.3	19.4	20.4	21.3	22.3	2060
Women - Life expectancy at birth	83.5	84.4	85.7	86.9	88.1	89.2	2060
Women - Life expectancy at 65	21.2	21.9	22.9	23.8	24.7	25.6	2060
Men - Survivor rate at 65+	83.7	85.5	87.7	89.5	91.1	92.4	2060
Men - Survivor rate at 80+	54.2	58.1	63.2	67.9	72.1	75.9	2060
Women - Survivor rate at 65+	92.6	93.4	94.3	95.1	95.8	96.3	2060
Women - Survivor rate at 80+	74.4	76.9	80.1	82.9	85.3	87.4	2060
Net migration	-40.3	0.3	9.2	11.9	8.3	7.9	2041
Net migration over population change	0.7	0.0	-0.3	-0.3	-0.1	-0.1	2013

(Explanatory note: *This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2013 to 2060.)

Source: EUROSTAT and Commission Services.

The change in the demographic pyramids yields an increasing old-age dependency ratio, which more than duplicate between 2013 and 2060, while life expectancy at 65 grows around 4.7 years for men and 4.4 years for women in the same period.

Graph 3: Age pyramid comparison: 2013 vs 2060
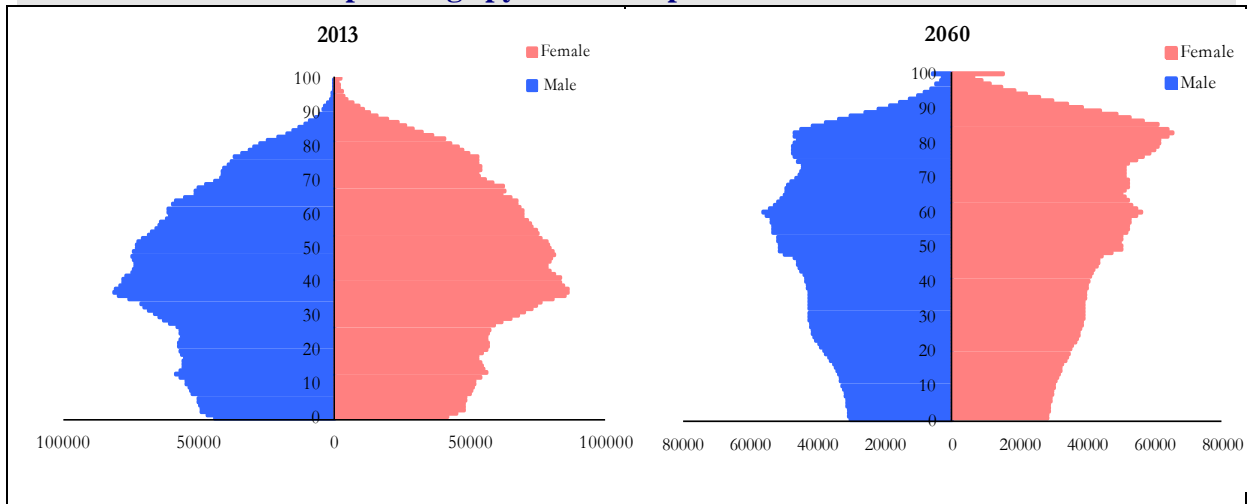
Source: Europop 2010 and Europop 2013.

Migration flows have also had an important role in the demographic structure: Portugal experienced significant net migration flows out of the country in the 50's and 60's followed by net migration inflows after the former colonies independence in the 70's. In the last years, the trend of net inflows was inverted, as in the past 10 to 15 years it was observed an entrance of immigrants mainly from Eastern European countries, Brazil and former Portuguese colonies in Africa. However, the migration trend has reversed again and in the past 3 to 4 years, a substantial outflow of young qualified professionals left the country, in order to find a job abroad, due to the increase in young unemployment rate, as a consequence of the economic and financial crises. Eurostat foresees that this outflow trend will persist until 2020, which also impacts significantly the fertility rates and labour force projections.

Graph 4: Net migration (thousands of persons)
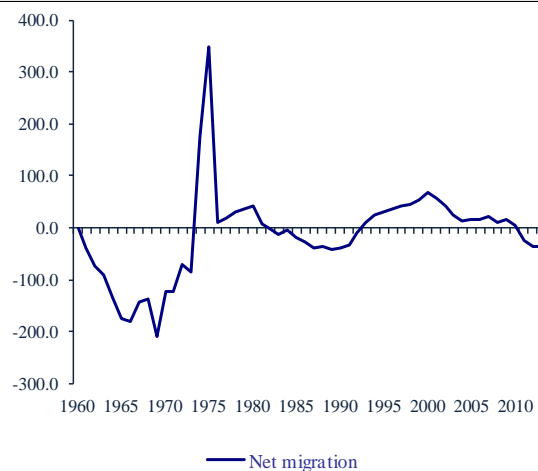
Source: Pordata and Instituto Nacional de Estatística.

2.2. Labour forces

According to the projections given by the European Commission, labour force is expected to decrease around 30%, across the projection period. Labour force with ages between 15 and 44 decrease 52,7%, compared with 27,7% foreseen in the 2012 projections round, for the eldest cohorts, 55 to 64 and 65 to 74, there is an opposite effect and it is expected an increase of 1.5% and 61.4%, respectively (33.3% and 43% in the 2012 projections).

The decrease in the labour force for younger ages can be explained by the low fertility rates, having systematically less young people, and the recent migration trend of young qualified professionals.

Table 3 – Participation rate, employment rate and share of workers for the age groups 55-64 and 65-74

	2013	2020	2030	2040	2050	2060	Peak year
Labour force participation rate 55-64	54.3	61.8	67.6	68.6	68.6	68.6	2056
Employment rate for workers aged 55-64	46.8	55.5	63.1	64.5	64.5	64.5	2056
Share of workers aged 55-64 on the labour force 55-64	86.2	89.8	93.3	94.1	94.0	94.0	2044
Labour force participation rate 65-74	18.4	18.3	25.6	29.6	29.4	31.4	2060
Employment rate for workers aged 65-74	18.1	18.0	25.4	29.3	29.2	31.2	2060
Share of workers aged 65-74 on the labour force 65-74	98.2	98.5	98.9	99.1	99.2	99.1	2052
Median age of the labour force	41.0	43.0	45.0	44.0	44.0	45.0	2029

Source: Commission Services

According to the Cohort Simulation Model, in the base year the average effective exit age for men is almost three years higher than for women. This difference tends to narrow until 2020, as the average effective exit age increases by more than two years for women and decreases 0.3 years for men. From then on both genders show an identical behaviour until 2060 with the average effective exit age increasing one year. Despite this, after 2030 the average effective exit age tends to increase less than the statutory retirement age, which evolves according to life expectancy at 65 years (see table 1).

Although there are small gender differences on the average effective entry and exit ages, the contributory period of men is much higher (by 7 years in 2013 and close to 8 years in the remaining years of the projection). On the other hand, as women live longer, they spent more time of their life at retirement than men (almost 8 years in 2013 and 4 years in the remaining years of the projection).

Table 4a – Labour market entry age, exit age and expected duration of life spent at retirement - MEN

	2013	2020	2030	2040	2050	2060	Peak year
Average effective entry age (CSM) (I)	24.8	22.4	22.4	22.4	22.4	22.4	2013
Average effective exit age (CSM) (II)	65.7	65.3	66.3	66.5	66.6	66.7	2060
Average effective working career (CSM) (II)- (I)	40.9	43.0	43.9	44.1	44.2	44.3	2060
Contributory period	32.1	34.7	36.0	36.8	38.4	39.8	2060
Contributory period/Average working career	78.4	80.8	81.9	83.4	86.8	89.9	2060
Duration of retirement	16.8	18.3	18.6	19.5	19.7	20.6	2060
Duration of retirement/average working career	41.1	42.6	42.3	44.2	44.6	46.5	2060
Percentage of adult life spent at retirement	26.1	27.9	27.8	28.7	28.9	29.7	2060
Early/late exit	1.3	1.3	0.7	0.5	0.4	0.6	2016

Source: Commission Services

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Table 4b – Labour market entry age, exit age and expected duration of life spent at retirement - WOMEN

	2013	2020	2030	2040	2050	2060	Peak year
Average effective entry age (CSM) (I)	23.8	23.0	23.0	23.0	23.0	23.0	2013
Average effective exit age (CSM) (II)	62.9	65.1	65.8	66.0	66.1	66.2	2060
Average effective working career (CSM) (II)- (I)	39.0	42.1	42.8	43.0	43.1	43.2	2060
Contributory period	25.0	26.9	28.5	29.2	30.6	32.1	2060
Contributory period/Average working career	64.1	63.9	66.5	68.1	71.0	74.4	2060
Duration of retirement	22.9	21.9	22.0	22.9	23.8	24.7	2060
Duration of retirement/average working career	58.6	52.0	51.4	53.3	55.2	57.2	2013
Percentage of adult life spent at retirement	33.8	31.7	31.5	32.3	33.1	33.9	2060
Early/late exit	1.3	1.8	0.9	0.7	0.5	0.7	2022

Source: Commission Services

3. Pension projection results

3.1. Extent of the coverage of pension schemes in the projections

The present projections comprise the main Portuguese pension systems: the public system (Social Security and CGA) and the private occupational system.

The scope of these public projections differs from Eurostat figures for public pensions (ESSPROS). One of the factors that explain the differences relates to the exclusion in ESSPROS of the Solidarity supplement for the elderly (Complemento Solidário para Idosos – CSI). Additionally, pensions paid to bank and to BPN employees transferred to the social security scheme are not considered as pension expenditure by the AWG[16].

Table 5 - Eurostat (ESSPROS) vs. Ageing Working Group definition of pension expenditure (% GDP)

	2005	2006	2007	2008	2009	2010	2011	2012
1 Eurostat total pension expenditure	12.3	12.6	12.6	13.2	14.1	14.2	14.8	14.8
2 Eurostat public pension expenditure	10.8	11.1	11.2	11.8	12.8	13.0	13.5	13.9
3 Public pension expenditure (AWG)	10.6	10.9	11.0	11.5	12.4	12.5	13.1	13.1
4 Difference (2) - (3)	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.8
5 Expenditure categories not considered in the AWG definition, please specify:	:	:	:	:	:	:	:	:
5.1 CSI (not considered in ESSPROS)	:	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.2
5.2 The bank employees' pension funds	:	:	:	:	:	:	:	-0.3
5.2 Other CGA benefits	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.3 Residual	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3

Source: Eurostat and Member States

The occupational pension schemes implemented through pension funds can be classified into: 1st pillar DB, other DB and DC schemes. The projection exercise was separately made for each type of pension scheme, as its different characteristics determine that different assumptions should be used in modelling the cash flows for the future.

Private pension schemes also include occupational schemes funded by group insurance policies (the corresponding amount of technical provisions represented 0,2% of the Portuguese GDP by the end of 2013) and personal schemes of a DC nature (non-mandatory private schemes). Personal schemes are mainly composed by individual adhesions to open pension funds and retirement saving schemes, usually known as PPR (Planos de Poupança Reforma) and the respective amount of assets / technical provisions represented 8,4% of the Portuguese GDP by the end of 2013. These schemes have not

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[16] This exercise does not consider the payment of pensions or revenue due to transfers of responsibility to the Social Security scheme of pensions of bank and of BPN employees as they are considered neutral from an actuarial point of view, without impact on the long term public finance sustainability analysis.

been included in the projection exercise due to the lack of data with a level of granularity that would be needed to derive assumptions and model cash flows for the future.

The projections are in line with all the assumptions agreed within the AWG (both macroeconomic and demographic assumptions).

3.2. Overview of projection results

Under the assumptions implicit in the AWG baseline scenario, public pension system expenditure is expected to decrease by 0.7 p.p. of GDP at the end projection period (from 14.3% of GDP in 2013 to 13.6% in 2060 after reaching a peak of 15.5% of GDP in 2033). Survivors and old-age and early pensions decrease by 0.5 p.p. and 0.2 p.p. of GDP, respectively, and disability pensions show an increase of 0.1 p.p. of GDP.

Graph 5: Old-age pension expenditure (% GDP) and population with statutory retirement age

Public old-age earnings and non-earnings related pensions

population with statutory retirement age or more (growth rate - right axis)
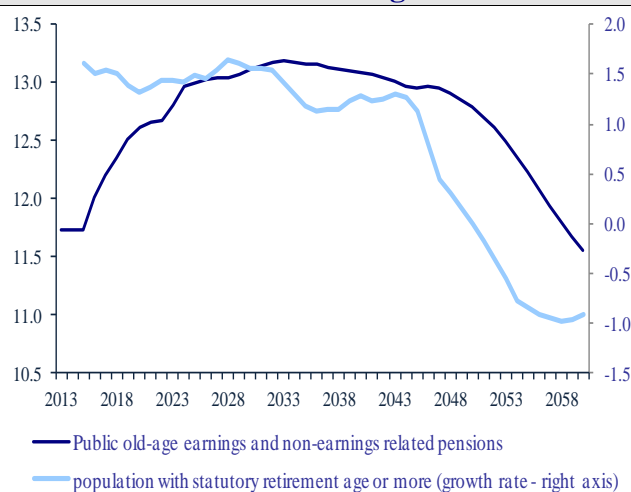
Source: Commission Services and Ministry of Finance.

The evolution of total pension expenditure shows a reduction in the projection period, from 14.6% of GDP in 2013 to 13.8% in 2060, mainly driven by the public pension system as private occupational pension is expected to decrease from 0.3% to 0.2% of GDP between 2013 and 2060.

After increases in the tax rate on pensions in 2007 and 2011, as part of the convergence process of labour income and pension's taxation, the current projection assumes that the

average tax rate (around 7.85%[17]) will be kept unchanged along the projection period. It means that net pension expenditures will have the same behaviour as gross pension expenditures.

Overall contributions are expected to decrease 1.0 p.p. of GDP from 11.2% in 2013 to 10.1% in 2060. Public contributions reached 11.2% of GDP in 2013 and are estimated to decrease to 9.9% in 2060.

Table 6 - Projected gross and net pension spending and contributions (% of GDP)

Expenditure	2013	2020	2030	2040	2050	2060	Peak year
Gross public pension expenditure	14.3	15.0	15.5	15.3	14.9	13.6	2033
Private occupational pensions	0.3	0.3	0.2	0.2	0.2	0.2	2013
Private individual pensions	:	:	:	:	:	:	:
Mandatory private	:	:	:	:	:	:	:
Non-mandatory private	:	:	:	:	:	:	:
Gross total pension expenditure	14.6	15.3	15.7	15.5	15.1	13.8	2032
Net public pension expenditure	13.5	14.1	14.5	14.3	13.9	12.7	2032
Net total pension expenditure	13.7	14.4	14.7	14.5	14.1	12.9	2032
Contributions	2013	2020	2030	2040	2050	2060	Peak year
Public pension contributions	10.9	9.9	9.9	9.9	9.9	9.9	2013
Total pension contributions	11.2	10.2	10.1	10.1	10.1	10.1	2013

Source: Commission Services.

Public contributions start at a lower level, when compared to previous exercises, due to the highest unemployment level. They are also driven, throughout the projection period, by the employment trend, which decreases 22,1% for employees between 15 and 74 years old, and labour productivity evolution, which increases until 2044 and then reverses until 2060. It should be noted that in first years of the projection (2013 to 2016) contributions revenue include the extraordinary solidarity contribution paid by pensioners on pension benefits[18], computed at around 0.7% of GDP over the projection period.

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[17] Average effective tax applied to families which sole income is pensions.
[18] See Section1.2. Recent reforms of the pension system included in the projections.

Graph 6: Public contributions, employment growth and labour productivity

- Public contributions (% of GDP)
- Employment growth (15-74) (right axis)
- Labour productivity (growth rate, per hour) (right axis)
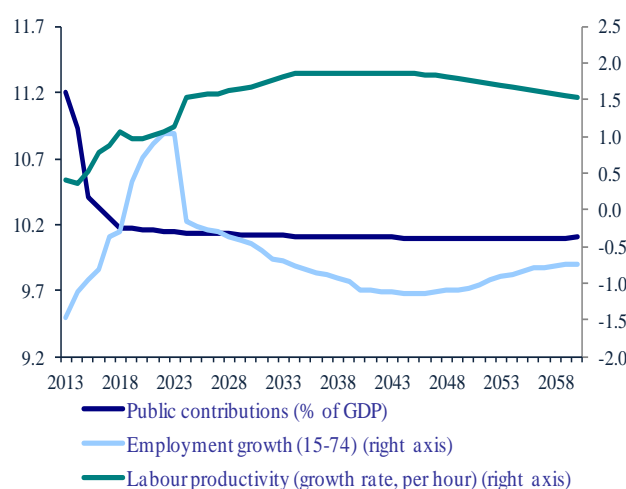
Source: Commission Services and Ministry of Finance.

Occupational pensions spending in terms of GDP is expected to slightly decrease over the projection horizon (from around 0.3% of GDP in 2013 to 0.2% of GDP in 2060). This evolution is mainly explained by a downward trend of pension spending relative to DB schemes due to a gradual reduction of the number of beneficiaries. On the other hand, the share of pension spending with regard to DC schemes (which have a lower average pension than DB schemes) is expected to significantly increase over the years.

The global decrease in public pension expenditure comes entirely from the earning-related pensions, mainly from old-age and early earnings-related pensions (-0.7 p.p. of GDP between 2013 and 2060) (see graph 7). Survivors expenses also decrease (-0.4 p.p.) mainly due to the reduction of number of descendants who comply with age qualifying conditions. Old-age non-earnings related pension expenses increase 0.5 p.p. of GDP during the projection reflecting the evolution of the old-age supplement benefit projections, a non contributory benefit paid to old-age earnings-related pensioners when the statutory old-age pension amount is less than the minimum old-age pension.

Graph 7: Public pensions expenditure by type (% of GDP)
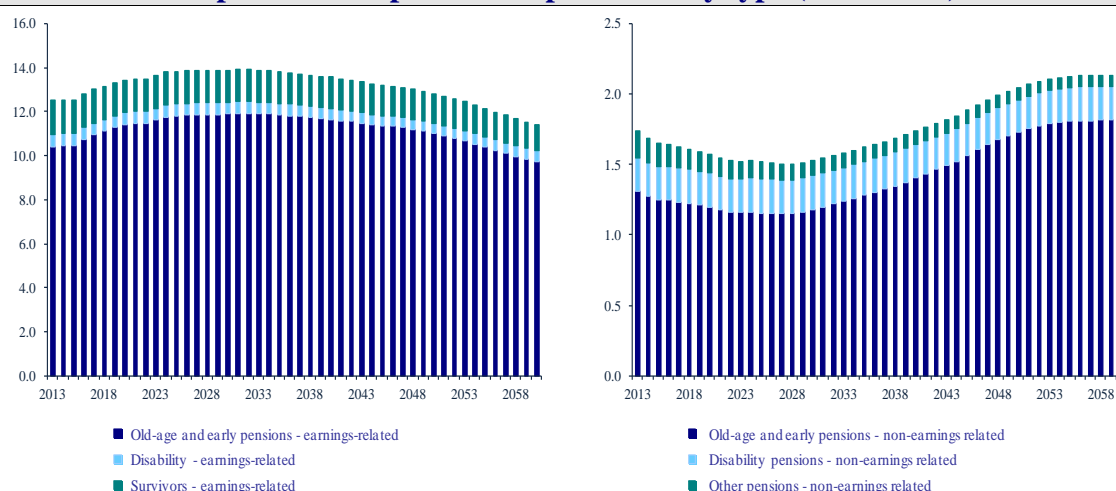
Source: Commission Services and Ministry of Finance.

Table 7 - Projected gross public pension spending by scheme (% of GDP)

Pension scheme	2013	2020	2030	2040	2050	2060	Peak year
Total public pensions	14.3	15.0	15.5	15.3	14.9	13.6	2033
of which earnings related:							
Old age and early pensions	10.4	11.4	11.9	11.7	11.1	9.7	2032
Disability pensions	0.6	0.5	0.5	0.5	0.4	0.5	2013
Survivors' pensions	1.6	1.5	1.5	1.4	1.4	1.2	2013
Other pensions	:	:	:	:	:	:	:
of which non-earnings related (including minimum pension and minimum income guarantee):							
Old age and early pensions	1.31	1.20	1.19	1.41	1.74	1.82	2060
Disability pensions	0.24	0.24	0.24	0.24	0.23	0.24	2060
Other pensions	0.18	0.13	0.11	0.10	0.09	0.07	2013

Source: Commission Services.

On what concerns **Social Security system** pensions' expenditure, simulation results suggest that until 2060 social security pensions are expected to rise 3.9 p.p. of GDP. Old-age and early earnings-related pensions expenditure is expected to increase 3.8 p.p. of GDP, while disability and survivors earnings-related pension expenditures are both expected to decrease 0.1 p.p. of GDP along this period. The decrease in the disability expenditure is mainly due to the decrease in the number of these pensions (in line with the projected decrease of active age population between 15-64 years old). The expected decrease in the survivors expenditure is due, on one hand, to the significant decrease in the number of orphan's pension (in line with the decrease of population between 0-24 years old given by the demographic scenario) and, on the other hand, to the closure of the Agricultural Workers' Regime.

The Agricultural Workers' Regime, which is closed to new contributors since 1986, is expected to be merely residual near 2030. In 2010, the expenses with this regime represent less than 5% of total pension expenditure of the Social Security system.

The expenditure for the Non-contributory Regime is expected to increase from 1.7% of total pension expenditure in 2013 to 2.1% in 2060 which mainly reflects the evolution of the old-age supplement benefit.

Regarding **CGA** pension expenditure, 2013 presents an expenditure of 5.6% of GDP and as it is a closed system, the expenditure is foreseen to decrease along the projection period, until 0.9% of GDP by 2060.

Table 7a - Projected gross public pension spending and contributions by scheme (% of GDP)

Pension scheme	2013	2020	2030	2040	2050	2060	Peak year
Social Security							
Pension expenditure	8.7	9.7	10.8	12.0	12.9	12.7	2052
of which:							
Old age and early earning-related pensions	5.4	6.5	7.8	8.7	9.5	9.1	2052
Disability earning-related pensions	0.6	0.5	0.5	0.5	0.4	0.5	2013
Survivors' earning-related pensions	1.0	1.0	1.0	1.0	1.0	0.9	2013
Other pensions	0.0	0.0	0.0	0.0	0.0	0.0	2013
Non-earning related pensions	1.7	1.6	1.5	1.7	2.1	2.1	2060
Contributions	8.1	8.0	9.1	9.7	9.9	9.9	2050
CGA							
Pension expenditure	5.6	5.4	4.6	3.3	2.0	0.9	2013
of which:							
Old age, disability and early pensions	5.0	4.9	4.2	2.9	1.6	0.6	2032
Survivors' pensions	0.5	0.5	0.4	0.4	0.4	0.3	2013
Contributions	2.8	1.9	0.8	0.2	0.0	0.0	2014

Source: Ministry of Finance and Social Security.

3.3. Description of main driving forces behind the projection results and their implications for main items from a pension questionnaire

The main factor driving the evolution of public pension expenditure is the ageing population. Therefore, the dependency ratio[19] is the only component that generates pension expenditure pressure throughout the projection period. In fact, in line with the demographic projections given by the baseline scenario, the dependency ratio is expected to more than double between 2013 and 2060 (from less than 32 elderly for each 100 persons between 20-64 years old in 2013, to 69 elderly for each 100 persons in that age group in 2060).

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[19] Dependency ratio is the population with 65 years or more over population between 20 and 64 years.

Despite this demographic pressure on pension expenditure, from 2030 onwards this effect is offset by all the other components, in particular, by the benefit ratio[20] and coverage ratio[21] effects.

Legend:
- Dependency ratio effect
- Coverage ratio effect
- Benefit ratio effect
- Labour Market/Labour intensity effect
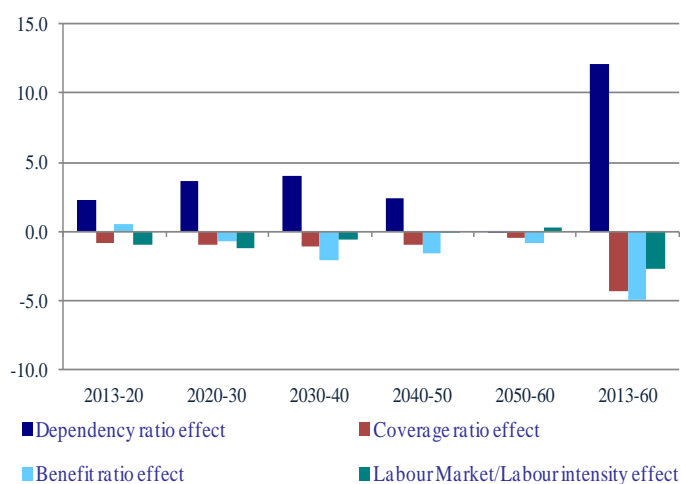
Source: Commission Services and Ministry of Finance.

The analysis by decades reveals a similar picture than the yearly analysis except in 2050-60 when the dependency ratio effect and the labour market/labour intensity effect change signals. In this decade the decrease of public pension expenditures results from the benefit ratio effect by -0.9%, as a consequence of a slight decrease of the average pension and a rise of the average gross wage, and from the coverage ratio effect by -0.5%, as a result of a higher drop of the number of pensioners when compared with the reduction of population with 65 years or more.

The coverage ratio effect can be broken down into three components: the old-age coverage ratio[22], the early-age coverage ratio[23] and a cohort effect[24]. The cohort effect shows the most negative contribution (-8.5% between 2013 and 2060) of the three as population +65 increases more than population in cohort 50-64 decreases. This is followed by the early-age coverage ratio (-7.6%), explained by the decrease of the number of orphans that have survivor pension, and, by the evolution of the old-age coverage ratio (-2,4%), that reflects the rise on the legal statutory retirement age.

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[20] The benefit ratio is given by the average pension over GDP on the total number of hours worked (labour productivity per hour worked).
[21] The coverage ratio is the ratio between the number of pensioners over the population with 65 years or more.
[22] The old-age coverage ratio is given by the number of pensions of pensioners with 65 years or more over the population with 65 years or more.
[23] The early-age coverage ratio is given by the number of pensions of pensioners with less than 65 years over the population in 50-64 cohort.
[24] The cohort effect is given by the population in 50-64 cohort over the population with 65 years or more.

The labour market/labour intensity effect is also subdivided in three effects: the employment ratio effect[25], the labour intensity effect[26] and the career shift effect[27]. The employment rate effect has the higher negative contribution (-1.9%) as population in 20-64 cohort show a higher fall, mainly in the three first decades of the projection. The career shift ratio contribute also for the decrease of the pension expenditure (-0.7%) due to the extension of contributory career, as a consequence of the increase in the statutory retirement age.

Table 8a - Factors behind the change in public pension expenditures between 2013 and 2060 (in percentage points of GDP) - pensions

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60	Average annual change
Public pensions to GDP	0.8	0.4	-0.1	-0.4	-1.3	-0.7	0.010
Dependency ratio effect	2.2	3.6	4.0	2.4	-0.1	12.1	0.249
Coverage ratio effect	-0.9	-1.0	-1.1	-1.0	-0.5	-4.4	-0.098
Coverage ratio old-age*	*-0.2*	*-0.4*	*-0.6*	*-0.6*	*-0.6*	*-2.4*	*-0.051*
Coverage ratio early-age*	*-3.0*	*-2.2*	*0.0*	*-1.8*	*-0.6*	*-7.6*	*-0.167*
Cohort effect*	*-0.9*	*-1.8*	*-4.2*	*-2.7*	*1.1*	*-8.5*	*-0.190*
Benefit ratio effect	0.5	-0.7	-2.1	-1.6	-0.9	-4.9	-0.084
Labour Market/Labour intensity effect	-1.0	-1.2	-0.6	-0.1	0.2	-2.7	-0.054
Employment ratio effect	*-0.9*	*-0.8*	*-0.2*	*-0.1*	*0.1*	*-1.9*	*-0.037*
Labour intensity effect	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-0.002*
Career shift effect	*-0.1*	*-0.4*	*-0.4*	*0.0*	*0.1*	*-0.7*	*-0.015*
Residual	-0.1	-0.3	-0.3	-0.2	0.0	-0.9	-0.004

* Sub components of the coverage ratio effect do not add up necessarily.

Source: Commission Services.

The evolution in pensioners follows closely the behaviour of pensions. The main differences are the benefit ratio effect and the coverage ratio effect which compensate between them as the number of pensions is higher than the number of pensioners.

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[25] The employment ratio effect is given by the population in 20-64 cohort over the working people in the same cohort.

[26] The labour intensity effect is given by the working people in 20-64 cohort over the hours worked by the same cohort.

[27] The career shift effect is given by the number of hours worked by people in 20-64 cohort over the hours worked by people in 20-74 cohort.

Table 8b - Factors behind the change in public pension expenditures between 2010 and 2060 (in percentage points of GDP) - pensioners
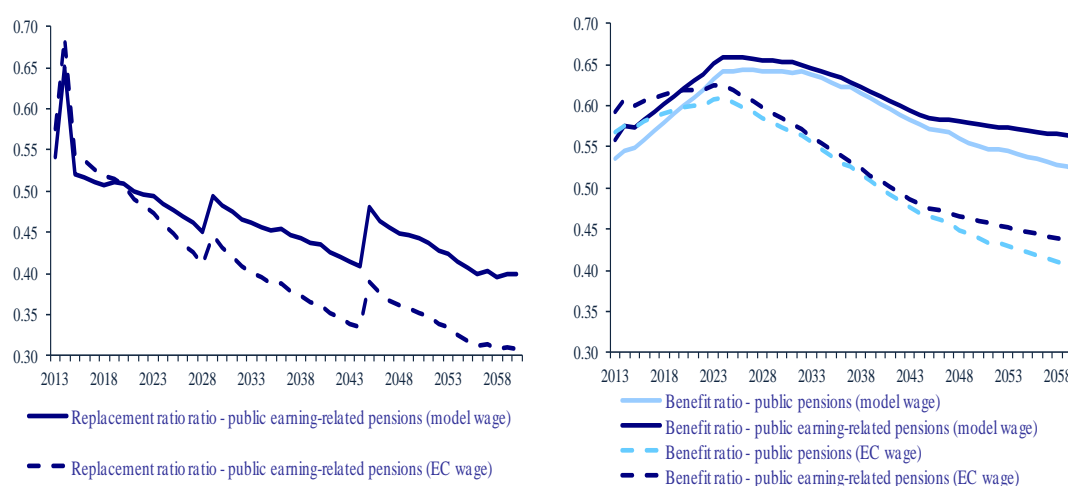
	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60	Average annual change
Public pensions to GDP	0.8	0.4	-0.1	-0.4	-1.3	-0.7	0.010
Dependency ratio effect	2.2	3.6	4.0	2.4	-0.1	12.1	0.249
Coverage ratio effect	-0.9	-1.3	-0.9	-0.3	0.2	-3.2	-0.069
*Coverage ratio old-age**	*0.1*	*-0.6*	*-0.2*	*0.3*	*0.2*	*-0.2*	*-0.004*
*Coverage ratio early-age**	*-2.9*	*-2.3*	*0.1*	*-1.5*	*-0.6*	*-7.2*	*-0.159*
*Cohort effect**	*-0.9*	*-1.8*	*-4.2*	*-2.7*	*1.1*	*-8.5*	*-0.190*
Benefit ratio effect	0.5	-0.4	-2.3	-2.3	-1.6	-6.1	-0.132
Labour Market/Labour intensity effect	-1.0	-1.2	-0.6	-0.1	0.2	-2.7	-0.054
Employment ratio effect	*-0.9*	*-0.8*	*-0.2*	*-0.1*	*0.1*	*-1.9*	*-0.037*
Labour intensity effect	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*-0.002*
Career shift effect	*-0.1*	*-0.4*	*-0.4*	*0.0*	*0.1*	*-0.7*	*-0.015*
Residual	-0.1	-0.3	-0.3	-0.2	0.0	-1.0	-0.004

* Sub components of the coverage ratio effect do not add up necessarily.

Source: Commission Services.

The public replacement rate is expected to decrease throughout the projection period from 57% in 2013 to 31% in 2060. This decrease goes in line with the evolution of the average pension, which decreases, and the increase in the average salary. The average pension is decreasing more deeply in the two first decades mainly because the CGA scheme, which is a closed system, has a higher pension benefit as it had a more generous pension formula and contributors have longer careers.

Graph 9: Replacement rate at retirement and benefit ratio

Replacement ratio ratio - public earning-related pensions (model wage)

Replacement ratio ratio - public earning-related pensions (EC wage)

Benefit ratio - public pensions (model wage)

Benefit ratio - public earning-related pensions (model wage)

Benefit ratio - public pensions (EC wage)

Benefit ratio - public earning-related pensions (EC wage)

Source: Commission Services and Ministry of Finance*.*

The public benefit ratio computed according to the average gross wage used in the models is estimated to decrease 16 p.p. over the whole projection period after reaching a peak in 2023. This evolution is mainly a consequence of pension indexation: as real GDP growth

is below 2% in almost the whole projection period (excluding in 2022 and 2023) pensions are updated in line with inflation (pensions under 1.5 PSI) or less (pensions between 1.5 and 6 times PSI are updated at inflation rate minus 0.5 and pensions above 6 times PSI are updated at inflation rate minus 0.75).

In relation to occupational schemes, both gross average replacement rate at retirement and benefit ratio are expected to decrease over time due to a progressively larger proportion of DC schemes and the fact that the average pension is lower in these cases, in comparison to DB schemes.

Table 9 - Replacement rate at retirement (RR) and coverage by pension scheme (in %)						
	2013	2020	2030	2040	2050	2060
Public scheme (BR)	61.8	64.8	63.3	54.4	46.7	41.7
Public scheme (RR)	:	:	:	:	:	:
Coverage	98.5	99.8	99.6	99.8	100.0	100.1
Public scheme old-age earnings related (BR)	59.3	61.9	58.5	50.8	46.0	43.4
Public scheme old-age earnings related (RR)	57.5	50.7	43.2	36.1	35.2	30.7
Coverage	74.9	79.3	83.3	81.4	75.4	69.0
Private occupational scheme (BR)	27.4	24.8	20.2	16.4	13.7	12.9
Private occupational scheme (RR)	20.2	19.8	18.1	16.7	15.9	18.4
Coverage	4.6	4.6	4.6	4.5	4.5	5.0
Private individual scheme (BR)	:	:	:	:	:	:
Private individual scheme (RR)	:	:	:	:	:	:
Coverage	:	:	:	:	:	:
Total (BR)	62.1	65.8	64.0	55.0	47.3	42.4
Total (RR)	55.8	54.9	47.8	40.8	40.5	36.6

Source: Commission Services.

Although the number of pensioners is growing between 2013 and 2043, employment reduction after 2023 explains mainly the fast rise of the pension system dependency ratio between 2020 and 2050. This evolution boosted by the growing of the old-age dependency rate in 34 p.p. leads to a drop in the system efficiency of 0.7 p.p.

Table 10 - System dependency ratio and old-age Dependency Ratio						
	2013	2020	2030	2040	2050	2060
Number of pensioners (thousand) (I)	2592.2	2654.3	2816.7	2994.1	3031.1	2843.0
Employment (thousand) (II)	4354.3	4441.5	4479.9	4124.2	3690.3	3393.0
Pension System Dependency Ratio (SDR) (I)/(II)	59.5	59.8	62.9	72.6	82.1	83.8
Number of people aged 65+ (thousand) (III)	2050.5	2266.9	2619.8	2956.2	3059.1	2832.7
Working age population 15 - 64 (thousand) (IV)	6872.1	6538.1	6003.3	5308.1	4755.9	4435.3
Old-age Dependency Ratio (ODR) (III)/(IV)	29.8	34.7	43.6	55.7	64.3	63.9
System efficiency (SDR/ODR)	2.0	1.7	1.4	1.3	1.3	1.3

Source: Commission Services.

Before analysing the pensioners to inactive population ratio it should be noted that, as explained, the number of pensioners is not available from the Portuguese statistics on pensions' schemes. For that reason, for purposes of this exercise, that number was estimated from the number of pensions and "duplication" cases (the former also includes disability and survivors' pensioners).

Between 2013 and 2060 the total number of pensioners is expected to increase by around 9.7% and the number of public pensioners is expected to rise 6.2%.

It should be stressed that the base year (2013) is not a typical year due to the freezing of the early pensions.

Table 11a – Pensioners (all schemes) to inactive population ratio by age group (%)						
	2013	2020	2030	2040	2050	2060
Age group -54	7.7	7.2	6.8	6.0	5.9	5.5
Age group 55-59	69.9	57.2	58.0	56.2	52.8	51.0
Age group 60-64	87.8	90.0	93.1	88.7	82.7	80.1
Age group 65-69	100.0	100.0	100.0	100.0	100.0	100.0
Age group 70-74	100.0	100.0	100.0	100.0	100.0	100.0
Age group 75+	100.0	100.0	100.0	100.0	100.0	100.0

Source: Commission Services.

Below 65 years, the number of pensioners is driven by the number of survivors, disable and early pensions, as a direct result of the population decline. Analysing the trend over the projection period, the decline of the number of pensioners on the inactive or total population could be explained by the number of survivors (orphans) and disable pensioners and also by longer working lives as a way to avoid lower pension benefits as a result of penalties and application of the Sustainability Factor when the pension is requested before the statutory retirement age.

The higher female ratios in the first decades show that there are more women than men receiving a survivorship pension. From then onwards the trend goes in line with the increasing participation rate of women in the labour market and with the increase in life-expectancy of men.

Table 11b – Pensioners (all schemes) to population ratio by age group (%)

	2013	2020	2030	2040	2050	2060
Age group -54	3.0	2.8	2.5	2.3	2.3	2.2
Age group 55-59	23.0	16.7	14.6	13.6	13.1	12.7
Age group 60-64	52.0	43.2	37.3	33.4	31.5	30.4
Age group 65-69	79.2	75.2	64.7	59.4	57.6	55.9
Age group 70-74	84.5	89.1	85.4	82.6	82.0	81.7
Age group 75+	98.7	100.0	100.0	100.0	100.0	100.0

Source: Commission Services.

Table 12a - Female pensioners (public schemes) to inactive population ratio by age group (%)

	2013	2020	2030	2040	2050	2060
Age group -54	8.1	7.4	6.8	5.9	5.7	5.3
Age group 55-59	62.7	53.2	57.4	56.1	51.7	48.9
Age group 60-64	79.5	83.0	87.8	79.6	72.0	68.2
Age group 65-69	100.0	100.0	100.0	100.0	100.0	100.0
Age group 70-74	100.0	100.0	100.0	100.0	100.0	100.0
Age group 75+	100.0	100.0	100.0	100.0	100.0	100.0

Source: Commission Services.

**Table 12b - Female pensioners (public schemes) to population ratio by age group (%)**

	2013	2020	2030	2040	2050	2060
Age group -54	3.3	2.9	2.6	2.3	2.3	2.1
Age group 55-59	25.6	18.0	15.0	13.6	13.2	12.5
Age group 60-64	52.7	44.0	37.6	30.9	28.2	26.7
Age group 65-69	85.5	80.1	68.8	62.0	59.7	58.6
Age group 70-74	90.1	92.6	87.4	84.0	83.0	82.7
Age group 75+	99.3	100.0	100.0	100.0	100.0	100.0

Source: Commission Services.

In the public pension scheme, after the freezing on early pensions in 2013 and 2014, the expenditure with the earnings-related old-age pensions of new pensioners (as a percentage of GDP) is expected to sharply increase in 2015 and 2016 as people that want to claim for early pension could do so with a lower cut on the pension benefit, then decreasing until the end of the projection period. This evolution reflects the fact that the CGA is closed as

Social Security shows a stabilization until 2050 and a slight decrease between 2050 and 2060.

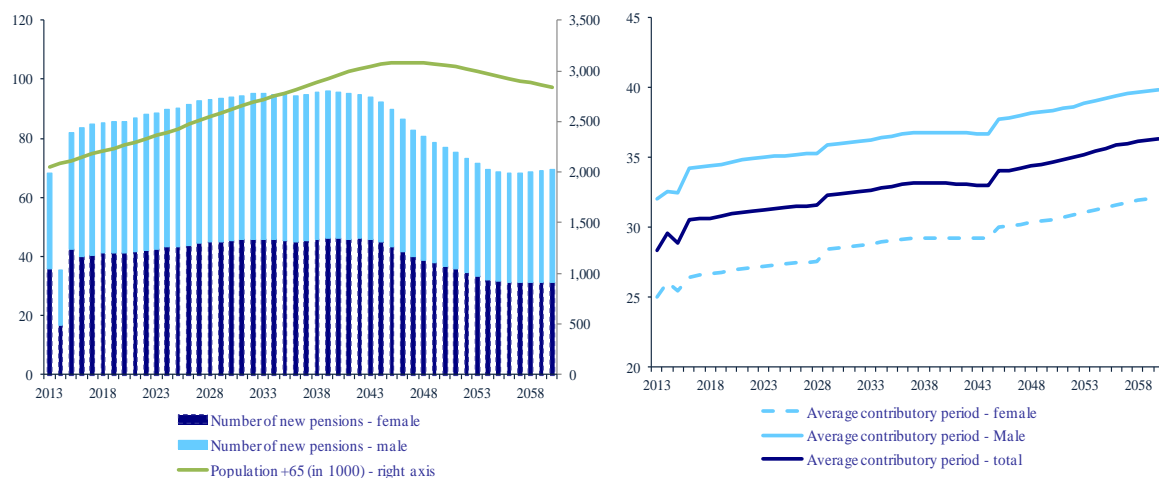**Graph 10: New old-age and early pensions - earnings-related pensions expenditures break by scheme**
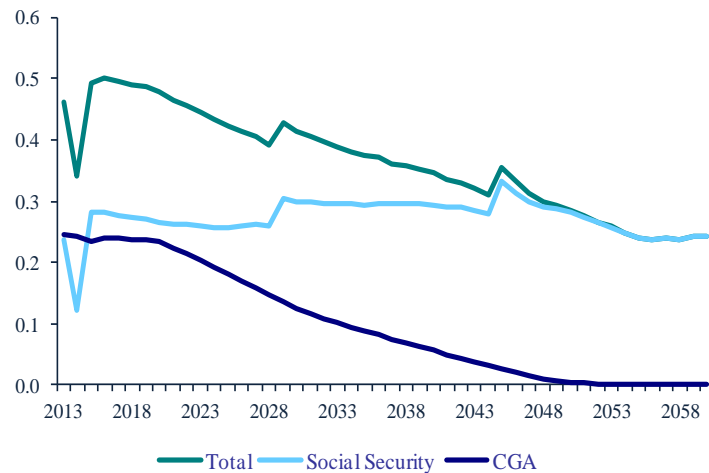
Source: Commission Services and Ministry of Finance*.*

Given that the data of the Public scheme is computed by two different models (CGA and Social Security scheme), the information concerning the new old-age earnings-related pension expenditures is presented individually for each scheme.

Concerning Social Security scheme the evolution of the number of new pensions follows the behavior of the population with 65 years or more, increasing until the forties and then declining. The average contributory period rises (7 years for women and almost 8 years for men) due to the growing of the statutory retirement age.

**Graph 11 Number of new pensions** (in 1000) **and average contributory period** (in years) **in Social Security Scheme**

The assumption made for the early pensions (possibility of retire with 60 years and more and the maintaining the proportion of early retirements at 2012 level) has consequences on the average pensionable earnings as it includes the penalty. Therefore, the average pensionable earnings grow almost in line with the gross average wage (that evolves with productivity). Comparing genders, men have higher pensionable earnings but the difference tends to wane over time.

The total average accrual rate increases faster between 2013 and the mid-30s (from 2.06% in 2013 to 2.2% in 2035), remaining almost unchanged until the end of the projection period. It should to point out that the accrual rate depends on the level of the pensionable earnings (lower pensionable earnings has higher accrual rates). As concerning genders, the average accrual rate increases more for men than for women (0.18p.p. for men and 0.14 for women).

The Sustainability Factor computed for the new pensions follows the Sustainability Factor calculated on the ageing demographic assumptions, but it is weighted by the number of new early retirement pensions as it is applied only for these cases.

Graph 12: Average accrual rates and monthly average pensionable earnings by gender in Social Security Scheme
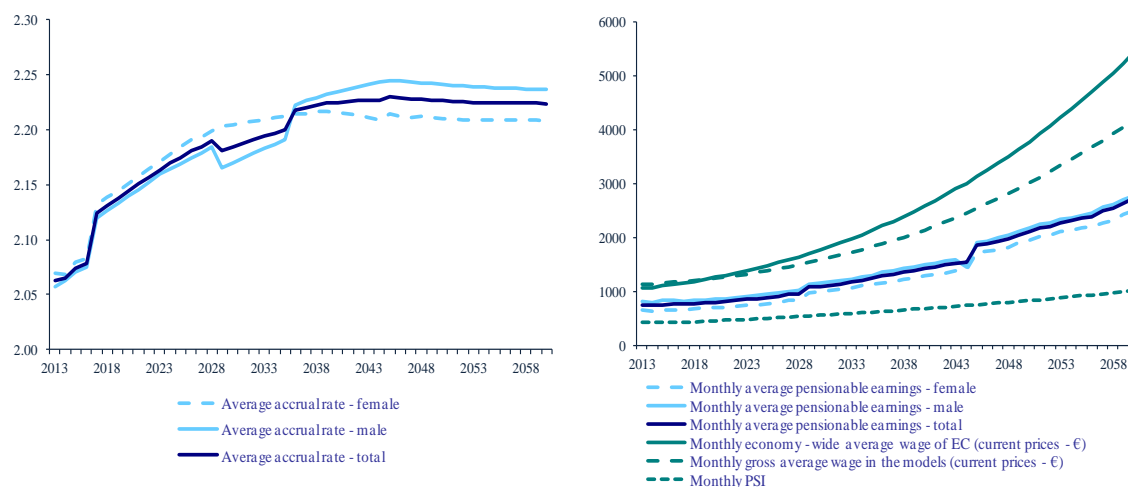
Source: Commission Services and Ministry of Finance.

As presented on table 13, the monthly average pensionable earnings over the economy-wide average wage of CGA is much higher than in Social Security. This fact could be explained by the value of average wage that is in fact higher than for those private employees especially for certain types of jobs. Also the average accrual rate and the average contributory period in CGA are much higher than in Social Security. This difference is explained by the fact that the pensioners who joined CGA before 31 August 1993 benefited from more generous retirement conditions than those that have their pensions computed according to Social Security rules and they are less likely to be out of the labor market because they could not be dismissed. During the projection period, these differences tend to narrow.

Table 13a - Projected and disaggregated new Social Security pension expenditure (old-age and early earnings-related pensions) - TOTAL

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	394.5	534.8	854.7	1127.6	1414.2	1624.4
II. Average contributory period	28.4	31.0	32.4	33.1	34.6	36.4
III. Monthly average pensionable earnings	739.7	803.5	1098.0	1422.0	2111.6	2724.4
IV. Average accrual rates (%)	2.1	2.1	2.2	2.2	2.2	2.2
V. Sustainability/Adjustment factor	1.0	0.8	0.8	0.8	0.8	0.8
VI. Number of new pensioners ('000)	68.4	85.8	93.9	95.6	76.9	69.5
VII Average number of months paid the first year	14.0	14.0	14.0	14.0	14.0	14.0
Monthly average pensionable earnings / Monthly economy-wide average wage	0.7	0.6	0.6	0.6	0.6	0.5

Source: Commission Services.

Table 13b - Projected and disaggregated new Social Security pension expenditure (old-age and early earnings-related pensions) - MALE

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	233.6	332.6	506.6	668.9	833.2	1001.4
II. Average contributory period	32.1	34.7	36.0	36.8	38.4	39.8
III. Monthly average pensionable earnings	820.5	860.3	1149.8	1491.7	2175.7	2775.4
IV. Average accrual rates (%)	2.1	2.1	2.2	2.2	2.2	2.2
V. Sustainability/Adjustment factor	1.0	0.8	0.8	0.8	0.8	0.8
VI. Number of new pensioners ('000)	32.4	44.6	48.7	49.5	40.1	38.2
VII Average number of months paid the first year	14.0	14.0	14.0	14.0	14.0	14.0
Monthly average pensionable earnings / Monthly economy-wide average wage	0.8	0.7	0.6	0.6	0.6	0.5

Source: Commission Services.

Table 13c - Projected and disaggregated new Social Security pension expenditure (old-age and early earnings-related pensions) - WOMEN

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	160.9	202.3	348.1	458.6	581.0	623.0
II. Average contributory period	25.0	26.9	28.5	29.2	30.6	32.1
III. Monthly average pensionable earnings	646.9	702.6	997.8	1289.3	1963.3	2512.4
IV. Average accrual rates (%)	2.1	2.2	2.2	2.2	2.2	2.2
V. Sustainability/Adjustment factor	1.0	0.9	0.9	0.9	0.8	0.8
VI. Number of new pensioners ('000)	36.0	41.2	45.3	46.1	36.8	31.3
VII Average number of months paid the first year	14.0	14.0	14.0	14.0	14.0	14.0
Monthly average pensionable earnings / Monthly economy-wide average wage	0.6	0.6	0.6	0.5	0.5	0.5

Source: Commission Services.

Table 13d - Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) - CGA

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	370.5	430.4	325.2	200.0	0.0	0.0
II. Average contributory period	34.3	33.4	32.9	32.7	0.0	0.0
III. Monthly average pensionable earnings	1654.1	1729.5	1838.0	3176.5	0.0	0.0
IV. Average accrual rates (%)	2.4	2.4	2.4	2.3	0.0	0.0
V. Sustainability/Adjustment factor	1.0	1.0	1.0	1.0	0.0	0.0
VI. Number of new pensioners ('000)	20.3	22.2	16.3	6.1	0.0	0.0
VII Average number of months paid the first year	14.0	14.0	14.0	14.0	0.0	0.0
Monthly average pensionable earnings / Monthly economy-wide average wage	1.54	1.37	1.04	1.23	0.00	0.00

Source: Commission Services.

Table 13e - Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) - CGA - MEN

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	164.4	185.7	152.0	143.3	0.0	0.0
II. Average contributory period	35.4	34.3	33.9	33.0	0.0	0.0
III. Monthly average pensionable earnings	1649.9	1722.3	2126.7	4567.1	0.0	0.0
IV. Average accrual rates (%)	2.4	2.4	2.4	2.3	0.0	0.0
V. Sustainability/Adjustment factor	0.0	0.0	1.0	1.0	0.0	0.0
VI. Number of new pensioners ('000)	8.8	9.3	6.4	3.0	0.0	0.0
VII Average number of months paid the first year	0.0	0.0	0.0	0.0	0.0	0.0
Monthly average pensionable earnings / Monthly economy-wide average wage	1.54	1.37	1.20	1.77	0.00	0.00

Source: Commission Services.

Table 13f - Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) - CGA - WOMEN

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	206.0	244.8	173.2	56.7	0.0	0.0
II. Average contributory period	33.5	32.8	32.3	32.4	0.0	0.0
III. Monthly average pensionable earnings	1657.4	1734.9	1642.4	1795.2	0.0	0.0
IV. Average accrual rates (%)	2.4	2.4	2.4	2.3	0.0	0.0
V. Sustainability/Adjustment factor	1.0	1.0	1.0	1.0	0.0	0.0
VI. Number of new pensioners ('000)	11.6	12.8	9.9	3.1	0.0	0.0
VII Average number of months paid the first year	0.0	0.0	0.0	0.0	0.0	0.0

Source: Commission Services.

3.4. Financing of the pension system

The number of public contributors is projected to evolve in line with the employment and, consequently, is expected to decrease between 2013 and 2018 and, more markedly, between 2023 and 2060. The number of private occupational contributors is estimated to rise 64.5%. This evolution was made on the basis that the fund members will be the double of the total employed population, i.e. the fund members are around 4% of employed population and are assumed to increase to 8% in 2060.

Graph 13: Contributors and contributions
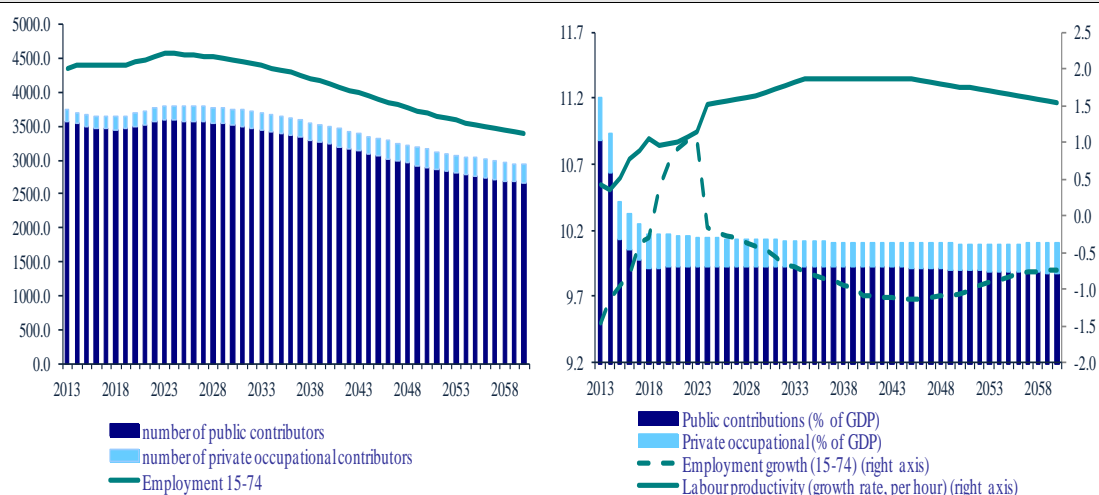
Source: Commission Services and Ministry of Finance.

Total contribution revenue in percentage of GDP stays almost constant until 2060, after a break in the initial years, explained by the extraordinary solidarity contribution.

The private occupational contributions in percentage of GDP rise between 2013 and 2040 and then show a downward trend until the end of the projection. This is explained by the fact that overall contributions to DB schemes is expected to decrease while the overall contribution to DC schemes is expected to increase over time.

Concerning public contributions, it should point out that CGA is a closed scheme and as a consequence the gap between expenditure and contributions should be covered by State transfers.

The projections for public pensions show a gap that increases until 2033 (from 3.4% of GDP in 2013 to 5.6% in 2033), decreasing then on to 3.7% of GDP in 2060.

Considering the contributory regime, the public pension system presents a deficit of 1.7% in 2013 and 1.6% of GDP in 2060, whereas the non contributory regime concurs to the deficit with 1.7% in 2013 and 2.1% of GDP in 2060.

Table 14 – Revenue from contribution (million), number of contributors in the public scheme (in 1000), total employment (in 1000) and related ratios (%)

	2013	2020	2030	2040	2050	2060
Public contribution	18029.9	19957.8	28280.9	38076.3	49830.7	65721.2
Employer contribution	:	:	:	:	:	:
Employee contribution	:	:	:	:	:	:
State contribution	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Number of contributors (I)	3586.2	3497.8	3524.0	3244.2	2902.9	2669.0
Employment (II)	4354.3	4441.5	4479.9	4124.2	3690.3	3393.0
Ratio of (I)/(II)	0.8	0.8	0.8	0.8	0.8	0.8

Source: Commission Services.

3.5. Sensitivity analysis

The results of the sensitivity analysis are coherent with the different scenarios.

The global results computed for different scenarios show that pension expenditure projections is more vulnerable to productivity scenarios, the risk scenario which also implies changes in productivity and the higher life expectancy scenario. This scenario has implied an increase in the population over 65 years from 2020. On the other hand it also leads to a higher statutory retirement age which induces to a higher contributory career. These effects result in higher expenses that is not balanced by a higher GDP,

A lower migration scenario drives to a higher expenditure as a consequence of a higher population with 65 years and more and of a lower nominal GDP.

A higher employment rate of older workers contributes to a decrease of pension expenditure as it postponed the claim of the pension as well the dynamic scenario.

Table 15 - Public and total pension expenditures under different scenarios (deviation from the baseline)

	2013	2020	2030	2040	2050	2060
Public Pension Expenditure						
Baseline	14.3	15.0	15.5	15.3	14.9	13.6
Higher life expectancy (2 extra years)	0.0	0.0	0.3	0.5	0.8	1.1
Higher lab. productivity (+0.25 pp.)	0.0	0.0	-0.3	-0.7	-0.9	-1.0
Lower lab. productivity (-0.25 pp.)	0.0	0.1	0.2	0.6	0.9	1.1
Higher emp. rate (+2 pp.)	0.0	-0.2	-0.2	-0.2	-0.3	-0.3
Higher emp. of older workers (+10 pp.)	0.0	-0.4	-0.3	-0.6	-0.7	-0.7
Lower migration (-20%)	0.0	0.0	0.1	0.1	0.2	0.3
Risk scenario	0.0	0.0	0.1	0.5	1.0	1.2
Policy scenario: linking retirement age to increases in life expectancy	0.0	0.0	0.0	0.0	-0.2	-0.3
Total Pension Expenditure						
Baseline	14.6	15.3	15.7	15.5	15.1	13.8
Higher life expectancy (2 extra years)	0.0	0.0	0.3	0.5	0.8	1.1
Higher lab. productivity (+0.25 pp.)	0.0	0.0	-0.3	-0.7	-0.9	-1.0
Lower lab. productivity (-0.25 pp.)	0.0	0.1	0.2	0.6	1.0	1.1
Higher emp. rate (+2 pp.)	0.0	-0.2	-0.2	-0.3	-0.3	-0.3
Higher emp. of older workers (+10 pp.)	0.0	-0.4	-0.4	-0.7	-0.7	-0.7
Lower migration (-20%)	0.0	0.0	0.1	0.1	0.2	0.3
Risk scenario	0.0	0.0	0.1	0.5	1.0	1.2
Policy scenario: linking retirement age to increases in life expectancy	0.0	0.0	0.0	0.0	-0.2	-0.3

Source: Commission Services.

The total pension expenditure under different scenarios is not significantly affected by the sensibility analysis on occupational schemes due to the low share of the latter in terms of the total pension expenditure over the GDP.

3.6. Description of the changes in comparison with the 2006, 2009 and 2012 projections

In the present exercise, public pension expenditure decreases by 0.7p.p. of GDP between 2013 and 2060, when in the 2012 exercise was planned to increase by 0.2p.p.

Table 16 - Average annual change in public pension expenditure to GDP during the projection period under the 2001, 2006, 2009 and 2012 projection exercises

	Public pensions to GDP	Dependency ratio	Coverage ratio	Employment effect	Benefit ratio	Labour intensity	Residual (incl. Interaction effect)
2006 *	9.27	13.71	-0.86	-0.16	-3.01	:	-0.41
2009 **	2.07	9.80	-1.65	-0.62	-4.54	:	-0.93
2012 ***	0.21	10.37	-2.55	-1.05	-5.51	0.01	-1.07
2015****	-0.70	12.12	-4.39	-1.93	-4.91	-0.01	-1.60

Source: Commission Services.

In the present exercise, there are significant changes both in the demographic scenario and in the macroeconomic scenario.

On one hand, total population suffered a significant revision: under the 2012 projections population was expected to increase 4% between 2013 and 2060 and under the 2015 demographic projections total population is expected to decrease 21,6% in that same period. This change in the demographic projections was mainly due to the change infertility rates and net migration, with consequences in the projections of population aged 15-64. Consequently, the dependency ratio is now relatively higher than in the previous exercise.

On the other hand, the 2012 macroeconomic projections didn't take into account all the measures implemented during the Economic and Financial Adjustment Program and its consequences in the labour market, justifying the behaviour of employment and the labour intensity effects.

The downwards revision in GDP along with the increase in older population implied an increase in pension expenditure as a percentage of GDP both in the base year and in the forthcoming years reaching 1.2% in 2060.

The recent more important changes of the pension system included in the projections, namely the change of statutory retirement age and the change of Sustainability Factor reference year, drives a lower public pension expenditure computed in 0.4% of GDP in 2060.

The analysis by sub-periods shows that either changes in macroeconomic and demographic assumptions or the recent changes of the pension system have a deeper impact between 2020 and 2050 which corresponds to the period with higher elderly population.

Table 17 - Decomposition of the difference between 2012 and the new public pension projection (% of GDP)

	2013	2020	2030	2040	2050	2060
Ageing report 2012	13.4	13.5	13.2	13.2	13.1	12.7
Change in assumptions	0.9	1.74	3.02	3.03	2.35	1.20
Improvement in the coverage or in the modelling	:	:	:	:	:	:
Policy related changes of which:						
Change of statutory retirement age - CGA	0	-0.1	-0.2	-0.2	-0.2	-0.1
Change of Sustainability Factor reference year - CGA	0	0.0	-0.1	-0.1	-0.1	-0.1
Change of statutory retirement age - Social Security	0	-0.2	-0.5	-0.6	-0.3	-0.2
New projection	14.3	15.0	15.5	15.3	14.9	13.6

Source: Commission Services.

4. Description of the pension projection model and its base data

4.1. Institutional context in which those projections are made

The projections now presented were obtained by using three models:

- The model for the general regime of social security
- The public sector employees model – CGA model;
- The occupational pensions' model

The social security pensions' model was developed and is run by the Cabinet for Strategy and Planning of the Portuguese Ministry of Solidarity and Social Security (GEP/MSSS) while the CGA model was developed and is run by the Office for Economic Policy and International Affairs of the Ministry of Finance (GPEARI/MF). In the latter case, the input data is provided by the *Caixa Geral de Aposentações*. The model for occupational pensions was developed by the Portuguese Insurance and Pension Fund Supervisory Authority - *Instituto de Seguros de Portugal* (ISP). GPEARI also coordinates the projection exercise and discusses with the other two institutions (GEP and ISP) the respective results.

The three models will be described separately, as follows.

A. Social Security Pensions Model

4.2. Assumptions and methodologies applied

The model used in the present exercise/calculations as well as the methodology is the same that was used in 2012 Ageing Report. The model has four main modules: the first one projects the number of pensions, the second one pension expenditure, the third one the dynamics of contributors and contributions and the last one estimates the number of pensioners. Modules one, two and four are stratified by age (from 0 to 100+), gender and type of pension (old-age and early-retirement, disability and survivorship).

The social security pensions model takes into account, separately, three different schemes within the social security system: the general regime, the non-contributory regime and the special regime for farmers. The last one mentioned has a non-contributory nature and is a closed regime.

For each year and for all schemes, the total number of pensions is derived by the stock of pensions of the previous year, discounted of mortality and added with new pensions. It is assumed that new pensions are initiated at the beginning of the year, so that every new pensioner receives a full year payment (14 months).

For each type of pension the model takes into account the stock of pensions and the number of new pensions in the base year in percentage of the total population of each stratum. These ratios (by age and gender) are assumed to remain constant over the period of projection.

Under these assumptions and according to the demographic and macroeconomic scenarios defined exogenously, projections are made assuming that the fundamental relations of the social security system will remain constant.

4.3. Data used to run the model

The input data refers to 2013 and is provided by three different bodies within the Portuguese Ministry of Solidarity and Social Security (National Pensions Centre, Informatics Institute and Institute of Financial Management of the Social Security).Furthermore it is also used the data provided by the Commission, concerning demographic and macroeconomic variables/projections,

4.4. Reforms incorporated in the model

The measures of the 2006 Reform of Social Security in Portugal are included in the present projections, as well as, the increased insurance careers average (5 years until the end of the projection).

In accordance with recent legislation (December 2013) it was adjusted the minimum age for retirement to 66 years, as well as, the rule that establishes that the legal age for claim an old-age pensions will vary according to the evolution of life expectancy at the age at 65.

It was also applied the sustainability factor (FS) to the individuals that apply for the old age pension before the legal age pension and to the total invalidity pensions which at the date of the respective conversion into old-age pensions (65 years) have been paid for more than 20 years

For the contributions projections, was taken in account the legislative changes, since 2013. So, in 2013 and in 2014 the extraordinary solidarity contribution structure was equal. However, the contribution of 6% for unemployment benefit and 5% for sickness benefit were extinguished.

4.5. General description of the model

New pensions by age and gender are determined by assuming a constant proportion of the set of new pensions for a combination of sex and age on the overall population in the base year for that same age and gender.

So, the number of new pensions is given by the following relation:

$$NewPens_{t,i,g} = \frac{NewPens_{2010,i,g}}{Pop_{2010,i,g}} \times Pop_{t,i,g}$$

Where,

$NewPens_{t,i,g}$ - New pensions in year t, for age i and gender g

$Pop_{t,i,g}$ - Population in year t, for age i and gender g

Each year, new pensions will be added to the stock of pensions, such that the number of total pensions can be written in the following way:

$$TotalPens_{t,i,g} = NewPens_{t,i,g} + TotalPens_{(t-1),(i-1),g} \times (1 - \mu)$$

Where,

$NewPens_{t,i,g}$ - New pensions in year t, for age i and gender g

$TotalPens_{t,i,g}$ - Total pensions in year t, for age i and gender g

μ - Mortality rate given by the demographic scenario

Average old age and disability pensions for new pensioners are calculated in another module according to age, gender, the average contributory career of the new pensions in the base year (for each age and gender) and a theoretical wage history. This theoretical wage history is derived by applying to the average wage of the economy (in 2013) a retrospective matrix of the average wage growth in the Portuguese economy until 1960. The theoretical wage history is only differentiated by gender (which means that it is equal for every age).

Employment grows at the same rate as the average employment growth rate and wages grow at the same rate as productivity. So, total contributions can easily be derived by the following formula:

$$Contrib_t = Contrib_{t-1} \times (1 + w_t) \times (1 + \theta_t)$$

Where,

$Contrib_t$ - Contributions in year t

w_t - Wage growth rate in year t

θ_t - Employment growth rate in year t

And the number of contributors is given by:

$$\text{Contributors}_t = \text{Contributors}_{t-1} \times (1 + \theta_t)^{[28]}$$

Where,

Contributors_t - Contributors in year t

θ_t - Employment growth rate in year t

For the pension expenditure, the calculation of new pensions and the pension updates are based on a macroeconomic scenario that is set exogenously to the model.

The average pension is determined by:

$$P_{t,i,g} = \frac{S_{t,i,g} \times Ps_{t,i,g} + N_{t,i,g} \times Pn_{t,i,g}}{Pt_{t,i,g}}$$

Where,

P – Average pension;

S – Number of pensions carried over from last year;

Ps – Average of pension carried over from last year;

N – Number of new pensions;

Pn – Average of new pensions;

Pt – Number of pensions;

i –age; g – gender; t –year

The new pensions are calculated according to the rules described in Decree-law no. 187/2007 of 10 May. For each stratum of gender and age is estimated a "statutory" pension which is calculated according to the average length of the insurance career, the respective reference remuneration.

Pension expenditures and contributions projections (that are based upon monthly input data) are then calibrated, according to the Social Security's balance sheet of the base year.

The number of pensioners is derived from the analysis of administrative microdata.

The non earnings-related pensions (disability and old-age supplement benefits) are computed according the formula:

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[28] It was also assumed that contributors enrolled in CGA in 2013 are going to be replaced according macroeconomic assumptions, namely the employment growth rate.

$$CS_{t,i} = \frac{Expend\ s_{\ t,i}\ X\ CS_{\ t-1,i-1}\ + Expend\ n_{\ t,i}\ X\ CS\ n}{Expend\ t_{\ t,i}}$$

Where:

Expend s – pension expenditure carried over from last year

Expend n – new pension expenditure

Expend t – total pension expenditure

CS – percentage of supplements benefit/disability expenditure on total pension expenditure

CS n – new percentage of supplements benefit/disability expenditure on total pension expenditure (average of the last three years)

Old age pensions and disability pensions granted under the special social security scheme for agricultural activities (RESSAA) and the non-contributory pension scheme and similar schemes, were updated in line with the Public Support Index. The non-earning-related survivors pension develop as follows: i) if the pensioner is less than 65 years, then grows according to the salary; ii) if the pensioner is 65 years, then grows according to the 50% salary evolution and 50% of old age pensions variation; iii) if the pensioner is more than 65 years, then grows according like the of old age pensions variation.

4.6. Additional features of the projection model

Careers

For each age and gender, the model considers the average contributory career of new pensions in the base year. Additionally, it was considered a gradual increase in the average career of old-age pensioners (over five years until 2060).

Survivors' pensions

For survivorship, the base year ratios of new pensions are calculated over the number of deaths in the previous year that may originate survivorship pensions for widows or survivorship pensions for dependent children.

For survivorship pensions it is also considered a depreciation rate (constant over the projection period) that expresses the number of pensions that ceased for other motives than the death of the entitled person. These ratios were calculated, by age and gender, based upon administrative data.

Average survivorship pension is indexed to the wage growth and to the average old-age pension growth.

B. CGA model

4.1. Institutional context in which those projections are made

The pension model used for the CGA projections is the same that was used in the 2012 AWG exercise on the Portuguese pension projections. It is an accounting/actuarial model that allows a detailed parameterization of the system, including the simulation of different demography or macroeconomic assumptions and changes in the reform parameters. However, as it is not a general equilibrium model it does not permit endogenous analysis of the changes in supply and demand and in the consumption and investment decisions of economic agents stemming from their adjustment, for example, to the reforms in social security that were enacted.

4.2. Assumptions and methodologies applied

The model has four main modules: the first one relates to input data (including macroeconomic and demography data), the second one comprises the dynamics for contributors and number of pensions, the third one refers to the dynamics of contributions and pensions and the last one provides the outputs. Modules two and three are structured by age and gender strata in order to allow more precise results.

4.3. Data used to run the model

The input data was provided by CGA. The figures used were extracted from the database in March 2014 and were adjusted to those observed in the end of 2013.

4.4. Reforms incorporated in the model

The measures of the 2006 Reform of Social Security in Portugal are included in the present projections, as well as, the increased insurance careers average (5 years until the end of the projection).

In accordance with recent legislation (December 2013) it was adjusted the minimum age for retirement to 66 years, as well as, the rule that establishes that the legal age for claim an old-age pensions will vary according to the evolution of life expectancy at the age at 65.

It was also applied the sustainability factor (FS) to the individuals that apply for the old age pension before the legal age pension and to the total invalidity pensions which at the date of the respective conversion into old-age pensions (65 years) have been paid for more than 20 years

For the contributions projections, was taken in account the legislative changes, including the increase in employers' contributory rate (to 23.75%). For 2013 and in 2014 the extraordinary solidarity contribution structure was equal.

4.5. General description of the model

Module for contributors and pensioners dynamics

Due to the fact of CGA being a closed system, the dynamics of contributors is quite simple: the number of contributors decreases each year due to mortality and to other motives like moving to the private sector or exoneration. The number of CGA contributors at the end of year is given by:

$$C_{t,a,g} = C_{t-1,a-1,g} \times \left(1 - \mu_{t,a,g} - \pi_{t,a,g}\right) - np_{t,a,g}$$

where,

$C_{t,a,g}$ - Number of CGA contributors in year t, for age a and gender g

$\mu_{t,a,g}$ - Mortality rate in year t, for age a (for those who would complete age a during year t) and gender g

$\pi_{t,a,g}$ - Contributors rate of exoneration in year t, for age a and gender g

$np_{t,a,g}$ - Number of new pensioners (includes old-age pensioners and disability pensioners) in year t, for age a and gender g.

The dynamics of number of pensions is done for old age and disability pensions together and for survivors separately. The stock of pensioners' increases with new pensioners and decreases according to pensioners' mortality. In this model, survivor pensioners also depend on a "depreciation rate" that applies mainly to descendants when conclude their studies.

Old age and disability pensioners
New pensioners (and pensions) are computed according to the legal regime that applies to each type of contributors: regime of Estatuto de Aposentação (that applies to public employees registered in the CGA until August 1993) and social security regime that applies to public employees registered in CGA between September 1993 and December

2005. For each legal regime, new pensioners are projected with a breakdown by motive: disability, old age (including early retirement) or age limit (at 70 years old).

New pensioners are computed by using "retirement probabilities". The later are defined as the base year ratios of new pensioners over contributors, for those who are aged less than 70. This means that new pensions are not determined only as a function of the legal criteria.

Number of new old-age pensioners:

$$op_{t,a,g} = op_{t-1,g,a-1} \times \frac{C_{t-1,g,a-1}}{C_{t-2,g,a-1}}$$

where,

$op_{g,a}(t)$ - Number of new old-age pensioners during year t for age a and gender g

In the case of old age, including early pensioners, the above mentioned ratios move along legal retirement age (LRA). It should be recalled that the LRA for CGA contributors is increasing from 60 years old in 2005 to 65 years old in 2015, at a pace of 6 months per year, in order to achieve convergence to the private sector regime.

It was assumed that the retirement probabilities for disabled do not change with the above mentioned increase in the LRA.

The number of CGA new disability pensioners is given by:

$$dp_{t,a,g} = dp_{t-1,a,g} \times \frac{C_{t-1,a-1,g}}{C_{t-2,a-1,g}}$$

where,

$dp_{t,a,g}$ - Number of new disability pensioners in year t, for age a and gender g

The dynamics for the number of old-age and disability pensioners at the end of year t is given by:

$$Op_{t,a,g} = Op_{t-1,a-1,g} \times (1 - \mu_{t,a,g}) + op_{t,a,g} + dp_{t,a,g}$$

where,

$Op_{t,a,g}$ - Number of old-age and disability pensioners at the end of year t for age a and gender g

Survivor pensioners

New pensioners are a function of old age and disability pensioner's mortality. In the past, on average, 80 per cent of pensioners who die had a survivor entitled to a pension, but this percentage is expected to decrease (to near 60%), as spouses beneficiaries tend to have their own wage/ pension and would not be eligible to a survivor pension and the number of children tend to decrease as well. Having the estimate for total new survivors' pensioners, the age and gender distribution is the same of base year.

It is also considered that the stock of survivor pensioners depend on a "depreciation rate" that applies mainly to descendants when conclude their studies. So it is necessary to divide the age strata into the following:

- 18<a<27

$$Sp_{t,a,g} = Sp_{t-1,a-1,g} \times (1 - \mu_{t,a,g} - \chi_{t,a,g}) + sp_{t,a,g}$$

- Other a

$$Sp_{t,a,g} = Sp_{t-1,a-1,g} \times (1 - \mu_{t,a,g}) + sp_{t,a,g}$$

where,

$Sp_{t,a,g}$ - Number of survivor pensioners in year t, for age a and gender g

$sp_{t,a,g}$ - Number of new survivor pensioners in year t, for age a and gender g

$\chi_{t,a,g}$ - Depreciation rate of the survivor pensioners stock, unrelated to the death of the beneficiary in year t, for age a and gender g

The number of pensioners is not available in the current databases and in this exercise it was estimated taking into account the number of pensions by age/gender and additional

administrative data on the "duplication" cases (eg. pensioners receiving both old-age and disability pensions, CGA and Social security pensions,…)..

Module for contributions and pensions dynamics

Contributions to CGA are a fixed percentage of employees remuneration (10% supported by employees and 28.4% by the employer. Therefore, the contributions dynamics depends on the remunerations evolution. The data available for 2010 contained average values for remunerations of the subscribers by age and gender strata. The actualized and adjusted average remuneration is:

$$W_{t,a,g} = \max\left(W_{t-1,a,g} \times (1+\gamma_t), W_{t-1,a-1,g} \times (1+\gamma_t)\right)$$

where, γ_t is the annual update rate for public sector wage scale.

Contributions in each year are given by:

$$Cont_{t,a,g} = \tau_t \times W_{t,a,g} \times C_{t,a,g}$$

where, τ_t is the CGA's contributory rate

The average old-age pension is determined by:

$$Pens_{t,a,g} = \frac{\left[(Op_{t,a,g} - op_{t,a,g}) \times Pens_{t-1,a-1,g} \times (1+\alpha_t) + op_{t,a,g} \times npens_{t,a,g}\right]}{Op_{t,a,g}}$$

where,

α_t represents annual pension update and n pens tag is the new old-age pension in year t, for age a and gender g.

Total old-age and disability pensions' expenditure is given by:

$$TE_{t,a,g} = pens_{t,a,g} \times \left(Op_{t,a,g}\right)$$

The dynamics of survivor's pensions follows the old-age pension's one:

$$SurvPens_{t,a,g} = \frac{\left[(Sp_{t,a,g} - sp_{t,a,g}) \times SurvPens_{t-1,a-1,g} \times (1+\alpha_t) + sp_{t,a,g} \times nsurvpens_{t,a,g}\right]}{Sp_{t,a,g}}$$

where

αt represents annual pension update (the same of old age pensions) and nsurvpenstag is the new survivors pension in year t, for age a and gender g.

Each new survivor's pension, according to the law, is equivalent to 50% of the old age pension that originate it. In the model, it was assumed the average new survivors pensions to be around 40% of the average old age pensions.

C. Occupational pensions' model

4.2.   Assumptions and methodologies applied

The model for the occupational pension system was based on current market statistics, relationships between fundamental economic and demographic variables and on assumptions that were made on the future behaviour of those variables. In brief, the projection exercise can be described as follows:

- The pension fund members were modelled taking into account the current population, the normal decrements (disability, survival, retirement and other exists) and an assumption regarding the coverage ratio of the pension population out of the total employed population. This coverage ratio allows projecting the total number of members for each year.
- The beneficiaries population was modelled by taking the current population, applying the mortality rates defined in the Ageing Working Group assumptions for Portugal to determine the exiting population and adding the new beneficiaries for each year.
- Taking the current market statistics and trends from the last couple of years, the per capita financial values were computed in order to project the financial cash flows. Main financial variables determined and projected were

pensionable salary, benefit ratio, average pension and contribution rate, from which the cash flows benefits paid and contributions were determined.

The projections of the financial variables were made upon assumptions of how these variables are expected to behave in the future. Some of these relevant assumptions, for example benefit ratios in the future, were based on past experience and knowledge of the market. In other words, some of the assumptions are based on expectations and are not determined from any scientific formula. It is important to emphasize that some of the assumptions on the variables' behaviour and modelling formulas have indeed a substantial effect on the final results. Therefore, sensitivity analysis plays an important role on the projection exercise.

Despite presenting only the aggregated figures for occupational pensions, the entire projection exercise was made separately for three pension schemes: 1st pillar DB schemes, other DB schemes and DC schemes.

4.3.   Data used to run the model

To run the model, the ISP used the data provided by pension fund management entities in the regular reporting of quantitative information.

4.4.   Reforms incorporated in the model

4.5.   General description of the model(s)

- The type and the structure of the model.
- The coverage of the model (if different schemes are modelled separately please describe scheme by scheme).
- Main equations.
- Additional assumptions: expert's judgments needed for modelling the pensioners' behaviour and pension accrual (maturation, indexation…).

Pension fund population modelling:

- The current pension fund population coverage ratio (number of pension fund members over total employed population) was determined and an assumption was made on how this coverage ratio would evolve until 2060.

- Having the total employed population projections enabled the projection of the total members population:

$$total\ members_t = total\ employed\ population_t \times$$
$$\times\ pension\ fund\ coverage\ ratio_t$$

- For each year, the number of members for the DB schemes was determined considering the population in the year before and the variation occurred in that year (i.e., plus new entrants and minus the exiting population).
- Due to the enrolment of the banking sector' new employees into the Social Security system (Decree-Law n.º 54/2009, of March 2), which closed these schemes to new entrants, for 1st pillar DB schemes the projected number of new entrants is equal to zero.
- It was established that the number of new entrants for other DB schemes was equal to a percentage of the number of participants in the year before. The idea underneath this assumption is that the number of new DB schemes will be very small and one only expects some population refreshment for the existent schemes, therefore assuming a fixed low percentage of new entrants for the DB scheme.
- For DC schemes, the number of new entrants was determined as a difference between the population in that year minus the population in the year before and plus exits in that year.
- For all types of pension schemes, a distribution of new entrants by age was created to allocate the number of new entrants to each age. This distribution was determined based fully on an expectation basis.
- The vectors of population decrements for each type of scheme were determined with the help of some statistics for the ages 15 - 75 and assumptions based on coherent expectation.
- For each year and age, the number of members was determined in the following way:

$$members_{t,i} = members_{t-1,i-1} - members\ exits_{t,i} + new\ members_{t,i}$$

- In a similar way, the number of beneficiaries for each year and age was calculated as:

$$beneficiaries_{t,i} = beneficiaries_{t-1,i-1} - beneficiaries\ exits_{t,i} + new\ beneficiaries_{t,i}$$

Financial variables modelling:

- The pensionable salary was projected taking into account the statistics available and assumptions about future salary growth.
- Per capita pensionable salary:

$$pensionable\ salary_t = pensionable\ salary_{t-1} \times (1 + average\ salary\ growth_t)$$

- The benefit ratios for the DB schemes were calculated from statistical analysis, namely the average pension benefit amount received by the beneficiaries over the average salary of the members. Assumptions were made on what these benefit ratios are expected to be in the future.
- For 1st pillar DB schemes, in order to reflect the change introduced by the Decree-Law n.º 1-A/2011, of January 3, according to which the remaining banking sector employees were inscribed in the Social Security system for the purpose of retirement benefit and began to pay contributions to it (as referred before, the enrolment of the banking sector' new employees into the Social Security system was already established in 2009), a progressive decrease of the benefit ratio over time was considered.
- Due to legal reasons, the payment of benefits in the DC schemes has to be made through a life insurance annuity, at least 2/3 of the accumulated amount. As the pension decumulation phase is transferred to the insurance market (by buying the life annuities), available pension fund statistics only capture the total outflows from the DC funds, instead of regular pension payments. In order to maintain the same modelling approach as for the DB schemes, the total accumulated amounts were converted into annual payments by using an annuity conversion factor.
- Although the replacement rate is a required output for this pension projection exercise, the available information only allowed determining the benefit ratio, which could be used as an indicator of what the replacement rate might be.
- Benefit ratio:

$$benefit\ ratio_t = (benefit\ ratio_{t-1}) \times (1 + benefit\ ratio\ growth_t)$$

- For all schemes, the average benefit paid each year was divided into two segments, the first one being the average benefit for the new entrants and the second one the average benefit for the remaining beneficiaries. The reasoning for this was the fact that the benefits for the new entrants will be different (according to the behaviour of the benefit ratio defined as an assumption) from the remaining beneficiaries, for which the average pension will increase with a pre-determined assumption. The average pension for the new entrants is determined from the corresponding average pensionable salary and the benefit ratio. For the current beneficiaries, the average pension is determined by weighting (using population numbers) the average pension of current beneficiaries with the average pension of the new entrants.

- Per capita average pension:

    Current beneficiaries

    New entrants

$$average \ pension_t = pensionable \ salary_t \times benefit \ ratio_t$$

    Current beneficiaries

$$average \ pension_t = \frac{\begin{pmatrix} current \ beneficiaries \ average \ pension_{t-1} \times \\ \times (total \ beneficiaries_{t-1} - new \ beneficiaries_{t-1}) + \\ + new \ entrants \ average \ pension_{t-1} \times new \ beneficiaries_{t-1} \end{pmatrix}}{total \ beneficiaries_{t-1}} \times$$
$$\times (1 + pension \ growth \ rate_t)$$

- The benefits paid are just the beneficiaries' population (both current beneficiaries and new entrants) times the corresponding average pension for each year:

    New entrants

$$benefits \ payed_t = new \ entrants \ average \ pension_t \times new \ beneficiaries_t$$

    Current beneficiaries

$$benefits \ payed_t = current \ beneficiaries \ average \ pension_t \times$$
$$\times (total \ beneficiaries_t - new \ beneficiaries_t)$$

- The current contribution rate was determined from the statistics available, dividing current contributions by the gross salaries. An assumption was made on how this variable would evolve in the future considering its relation to the benefit ratio:

$$contribution\ rate_t = \left(contribution\ rate_{t-1}\right) \times \left(1 + contribution\ rate\ growth_t\right)$$

- Contributions cash flows were determined by multiplying the average per capita pensionable salary by the contribution rate times the members' population for each type of scheme:

$$contributions_t = contribution\ rate_t \times pensionable\ salary_t \times total\ members_t$$

ANNEX

Table A1 - Factors behind the change in public pension expenditures between 2013 and 2060 using pension data (in percentage points of GDP) - pensions

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60
Public pensions to GDP	0.8	0.4	-0.1	-0.4	-1.3	-0.7
Dependency ratio effect	2.3	4.1	5.7	4.3	-0.3	16.2
Coverage ratio effect	-0.9	-0.8	-0.9	-0.7	-0.4	-3.7
*Coverage ratio old-age**	*-0.2*	*-0.4*	*-0.5*	*-0.5*	*-0.5*	*-2.1*
*Coverage ratio early-age**	*-2.9*	*-1.6*	*0.0*	*-1.1*	*-0.4*	*-5.9*
*Cohort effect**	*-0.8*	*-1.5*	*-3.1*	*-1.5*	*0.5*	*-6.4*
Benefit ratio effect	0.5	-0.7	-1.9	-1.3	-0.7	-4.0
Labour Market/Labour intensity effect	-0.9	-1.1	-0.5	-0.1	0.2	-2.4
Employment ratio effect	*-0.9*	*-0.7*	*-0.2*	*-0.1*	*0.1*	*-1.8*
Labour intensity effect	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Career shift effect	*-0.1*	*-0.4*	*-0.3*	*0.0*	*0.1*	*-0.7*
Residual	-0.2	-1.1	-2.6	-2.7	-0.2	-6.9

Source: Commission Services.

Table A2 - Factors behind the change in public pension expenditures between 2013 and 2060 using pensioners data (in percentage points of GDP) - pensioners

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60
Public pensions to GDP	0.8	0.4	-0.1	-0.4	-1.3	-0.7
Dependency ratio effect	2.3	4.1	5.7	4.3	-0.3	16.2
Coverage ratio effect	-0.9	-1.1	-0.7	-0.2	0.2	-2.8
*Coverage ratio old-age**	*0.1*	*-0.5*	*-0.2*	*0.3*	*0.2*	*-0.1*
*Coverage ratio early-age**	*-2.8*	*-1.7*	*0.1*	*-0.9*	*-0.4*	*-5.7*
*Cohort effect**	*-0.8*	*-1.5*	*-3.1*	*-1.5*	*0.5*	*-6.4*
Benefit ratio effect	0.5	-0.4	-2.1	-1.8	-1.1	-4.8
Labour Market/Labour intensity effect	-0.9	-1.1	-0.5	-0.1	0.2	-2.4
Employment ratio effect	*-0.9*	*-0.7*	*-0.2*	*-0.1*	*0.1*	*-1.8*
Labour intensity effect	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Career shift effect	*-0.1*	*-0.4*	*-0.3*	*0.0*	*0.1*	*-0.7*
Residual	-0.2	-1.2	-2.6	-2.7	-0.3	-7.0

Source: Commission Services.