

Malta: Country Fiche on Pension Projections

January 2015

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Ministry for Finance

Introduction

This pension fiche summarises the pension projections for Malta for the period 2013-2060 on the basis of the assumptions of the Ageing Working Group. The pension projections incorporate the latest changes to the Social Security System, in particular the reform law enacted during December 2006. The fiche is organised as follows: Part 1 provides an overview of the pension system in Malta, Part 2 provides an overview of the demographic and labour force projection results; Part 3 presents the pension projection results; while Part 4 describes the pension projection model.¹ Annex I provides the methodological annex, and Annex II provides a description of the contributory and non-contributory benefits in Malta.

¹ The assistance of the World Bank and the Ministry for Family and Social Solidarity is acknowledged.

Part 1: Overview of the Pension System in Malta

1.0 Description of the Social Security Scheme

The current pension scheme in Malta is based on the Social Security Act, Chapter 318 of the Laws of Malta. The Act provides for two basic schemes, the Contributory Scheme, and the Non Contributory Scheme. In the Contributory Scheme, the basic requirement for entitlement is that specific contribution conditions are satisfied. In the Non Contributory Scheme, the basic requirement is that the conditions of the means test are satisfied.

The Non Contributory Scheme has made possible the allocation of more than one benefit at the same time, thus providing simultaneous coverage in those cases where more than one contingency is present. Through the process of targeting, this scheme has succeeded in the provision of additional assistance to certain specific categories such as, in the case of persons with a disability, in the case of single parents, as well as in the case of the family as a single unit.

The Contributory Scheme is universal since it practically covers all strata of the Maltese society. Within this scheme, employees, self-occupied and self-employed persons acquire social insurance rights through the payment of a weekly contribution as laid down by the Social Security Act. A description of the contributory and non-contributory benefits can be found in Annex 1.

Contributions are payable by all gainfully occupied persons between the age of 16 and their pension age.² The scheme allows for different types of contributions in order to extend coverage to all types of persons in employment. Employed persons pay Class One contributions, while the self-occupied pay Class Two contributions. Class One contributions imply that any person employed under a contract of service in Malta is considered to be in insurable employment and subject to the payment of these contributions. For each person, a tripartite contribution is payable: the employed person, the employer and the State each pay 10 per cent of the basic salary of the employee; with the contribution capped to the Maximum Pensionable Income that stood at €20,964 in 2013. The rate of Class Two contributions is equally shared by the State and self-occupied persons, whereby the self-occupied pays 15 per cent and the State pays 7.5 per cent of their annual income that is subject to the same ceiling that applies for employees.³

The following categories of persons are statutorily exempt from the payment of a Class Two contribution:

- a) Persons in receipt of full-time education or training.

² Contributions are also payable by pensioners in gainful employment that retired after 5 of January 2008. Pensioners who retired earlier than this date are allowed to work without prejudicing their pension rights in the ages of 61 years to 65 years without paying social security contributions, subject to a ceiling on earnings equivalent to the national minimum wage. For this group, ceiling on earnings is removed at age of 65 years and no further contributions are due.

³ A self-occupied person is defined by the Social Security Act as “a self-employed person who is engaged in any activity through which earnings exceeding €910 *per annum* are being derived”

- b) Non-gainfully occupied married persons.
- c) Persons in receipt of a pension in respect of widowhood, invalidity or retirement or persons in receipt of a Parent's Pension.
- d) Persons in receipt of non-contributory Social Assistance or a non-contributory pension.

Crediting of contributions is allowed during certain contingencies, mainly:

- i. A widow, where such widow is not gainfully occupied for any period during which she does not remarry.
- ii. An ex-member of the Malta Police Force or the Armed Forces of Malta who retires on a service pension on completion of the full service prior to reaching pension age, for any period during which he or she is not gainfully occupied and has not yet reached pension age.
- iii. A person who goes abroad as a volunteer worker on projects in the areas of human welfare and development and environmental protection for any period he or she is performing such volunteer work and has not yet reached pension age subject to statutory defined criteria.
- iv. A person who is entitled to sickness, injury, or unemployment benefits or to an Invalidity Pension.
- v. Following the implementation of the pension reform, which is explained in detail below, the categories of persons to whom credit of contributions is allowed has been extended to include persons born on or after the 1 January 1962, who have the legal care and custody of a child who is less than six years old, or ten years old in the case of a child suffering from a serious disability.

1.1 Overview of Key Pension Parameters

What follows is an outline of the main pension parameters of the contributory old-age pension also known as the two-thirds pension scheme. During December 2006 the House of Representatives formally adopted a series of parametric reforms (Act No. XIX of 2006) that provided for changes in the definition of pension age, retirement before pension age, the full rate of two-thirds pension, calculation formula, the maximum pensionable income and the crediting of contributions. By virtue of Legal Notice 336 of 2006 published in the Malta Government Gazette of the 29 December 2006, Government announced the dates when provisions of the Social Security (Amendment) (No. 2) Act, 2006 will enter into force. It was announced that some of these measures entered into force as from 2007 while others came into force as from the 1st of January 2011.

The Definition of Pension Age

One of the main parametric changes announced in the reform concerns changes to the statutory pension age. Prior to the reform, pension age stood at sixty years for females and sixty-one years for males. Following the implementation of the reform, pension age was raised to sixty-five years, however, a number of provisos apply: in the case of a person born on or before the 31 December 1951, pension age shall be sixty-one years while for females pension age shall be sixty years; in the case of a person born during the calendar years 1952 to 1955, pension age shall be sixty-two years; for persons born during the period 1956 to 1958, pension age shall be sixty-three years; for persons born in

the period 1959 to 1961, pension age shall be sixty-four years. Table 1 shows the statutory retirement age, earliest retirement age and penalties for early retirement in Malta.

Table 1 – Statutory retirement age, earliest retirement age and penalties for early retirement

		2013	2020	2030	2040	2050	2060
Men - with 20 contribution years	statutory retirement age	62	63	65	65	65	65
	earliest retirement age	62	63	65	65	65	65
	penalty in case of earliest retirement age	:	:	:	:	:	:
Men - with 40 contribution years	statutory retirement age	62	63	65	65	65	65
	earliest retirement age	61	61	61	61	61	61
	penalty in case of earliest retirement age	:	:	:	:	:	:
Women - with 20 contribution years	statutory retirement age	62	63	65	65	65	65
	earliest retirement age	62	63	65	65	65	65
	penalty in case of earliest retirement age	:	:	:	:	:	:
Women - with 40 contribution years	statutory retirement age	62	63	65	65	65	65
	earliest retirement age	61	61	61	61	61	61
	penalty in case of earliest retirement age	:	:	:	:	:	:

Retirement before the Pension Age

Prior to the enactment of the reform, the full weight of a pension was payable to a person who has paid or has been credited with a yearly average of 50 contributions over a 30 year contributions period upon reaching pension age. Fewer years of contribution resulted in linearly reduced pensions, with the minimum years of contributions paid required to collect a pension currently set at ten years. Following the reform, a person who has attained the age of sixty-one years but has not yet attained pension age, can after attaining sixty-one years of age claim a pension in respect of retirement if such person is no longer gainfully occupied. It is necessary that since reaching his eighteenth birthday, the claimant has had a total of:

- 2,080 (or 40 years) paid or credited contributions in the case of a person born on or after the 1st January 1962, or
- 1,820 (or 35 years) paid or credited contributions in the case of a person born during calendar years 1952 to 1961.

Pensionable Income

Prior to the enactment of the pension reform law, the pension was determined on the basis of the yearly average of the basic wage during the best three years of the last ten years in the case of employees while the best ten years were taken into consideration for

self-occupied persons.⁴ Under the reform law, in the case of a person born on or after the 1 January 1962, the pension shall be determined by taking the yearly average of the basic wage/salary/net income/net earnings as the case may be, during the best ten calendar years within the last forty years immediately preceding his retirement or invalidity. In determining pensionable income, past wages and incomes are updated with the cost of living adjustment (COLA) granted with respect to those years.⁵

Pension Formula

Prior to the reform, the pension formula for the two thirds pension was as follows:

$$\text{Contribution_Average} * \left(\frac{2}{3}\right) * \text{Pensionable_Income} - \text{Service_Pension}$$

Where the Contribution Average was determined as the average of two averages with the first average being the average weekly contribution over the last ten years prior to retirement (Avg_Cont₁₀) and second being the average weekly contribution paid during a maximum of twenty years falling prior the last ten years before the retirement of an insured person (Avg_Cont₂₀):

$$\text{Contribution_Average} = \frac{(\text{Avg_Cont}_{10} + \text{Avg_Cont}_{20}) / 2}{50}$$

The Social Security Act defines the ‘service pension’ as a pension or any allowance awarded to a person at any time before and after 1st of April 1978 that is payable by or on behalf of his employer with respect to past services in Malta or abroad. Over the years there were a number of changes made to the definition of service pension, however the principle introduced in 1978 remained in place as in the case where a person is in receipt of a service pension that exceeds two-thirds of his or her pensionable income then he or she is entitled to a flat-rate Retirement Pension (classified under ‘top-ups’). On the other hand, if the person’s service pension is less than two-thirds of pensionable income then the person is awarded an Increased Retirement Pension (classified under ‘2/3 retirement pension’) that is equivalent to the difference between the two-thirds of pensionable income and the service pension.

Therefore, prior to the enactment of the reform, the full rate of the Two-Thirds Pension was equal to 2/3 of pensionable income for a claimant who has paid or been credited with a yearly average of 50 contributions over a period of thirty-years. Under the reform law, the period of contribution was changed as follows:

- (i) thirty years in the case of a person born on or before the 31 December 1951;
- (ii) thirty-five years for a person born during calendar years 1952 to 1961; and

⁴ The basic wage refers to the gross wage or salary that is payable to an employed person by or on behalf of his employer excluding any remuneration for overtime, any form of bonus, any extra allowances, any remuneration in kind and commissions.

⁵ COLA is a flat rate increase in wages and pensions (the latter granted in full as from Budget for 2008) that reflects the indexation of the basic wage to the average Retail Price Index inflation of the last 12 months to September of that year.

(iii) forty years in the case of a person born on or after the 1 January 1962.

For a person born on or after the 1 January 1962, the yearly average of contributions required for the purposes of awarding a Two-Thirds Pension shall be assessed on any period of 40 years between the first day of his contribution year in which he reaches the age of eighteen and the last day of his last complete contribution year before the beginning of his benefit year.

The Maximum Pensionable Income

Prior to the reform, the maximum pensionable income was fixed by law and was revised in recent years in line with the cost of living adjustment (COLA). Following the reform, in the case of a person born on or before the 31 December 1961, whose retirement occurs on or after the 1 January 2007, the basic wage/salary/net income/net earnings and the resultant pensionable income, shall not exceed €16,207.78 increased by such sum as the Government may award as a cost of living increase. The following provisions stand: (i) for a person born on or before the 31 December 1951, the resultant pensionable income including any such cost of living increase shall not exceed the sum of €17,470.30; (ii) in the case of a person born during calendar years 1952 to 1961, the resultant pensionable income including any such cost of living increase shall not exceed the sum of €20,964.36.

In the case of a person born on or after the 1 January 1962 whose retirement occurs on or after the 1 January 2007, the resultant pensionable income shall not exceed: (i) €16,207.78 increased by such sum that the Government awards for the cost of living, in respect of the years 2007 to 2010; (ii) €16,207.78 increased on the 1 January of each year between 2011 and 2013 by one third of the difference between the sum referred to above and €20,964.36; (iii) €20,964.36 increased annually by 70 per cent of the percentage increase in the national average wage for the previous calendar year, plus 30 per cent of the inflation rate for that same year. This applies as from the 1 January 2014.

The Guaranteed National Minimum Pension

Changes were enacted to the National Minimum Pension, which stood at 4/5ths of the National Minimum Wage for a couple and 2/3rds of the National Minimum Wage for any other person. Following the enactment of the reform law, a person born on or after the 1 January 1962 who is not entitled to a Service Pension shall be entitled to a Guaranteed National Minimum Pension (GNMP) which shall be payable at a rate that is not less than 60 per cent of the National Median Income. This represents a higher rate than that awarded to pensioners at present. The exact rate shall be determined by the Minister in charge of the Department of Social Security with the concurrence of the Minister responsible for Finance. In any case, the rate of GNMP cannot be less than that declared for the preceding year.

Crediting of contributions

The categories of persons to whom credit of contributions is allowed has been extended to include persons born on or after the 1 January 1962, who have the legal care and custody of a child who is less than six years old, or ten years old in the case of a child suffering from a serious disability. Crediting of contributions may be claimed for a

maximum period of two years in the case of a parent who has stopped working to take care of his/her child, extended to four years in the case of a child suffering from a serious disability. An adoptive parent is also able to claim such credits. Credits may be claimed for every child, with no distinction between employed and self-employed persons. The claimant is bound to have worked a minimum number of years equal to the duration of the crediting period. In the case of a parent's death, the latter proviso ceases to apply.

Pension Indexation

Persons born before the 1 of January 1962 (including present retirees) have their pension updated on the basis of the COLA as well as any increases in wages presently awarded through collective bargaining to the occupation or salary scale previously occupied by the person in retirement. Following the pension reform, persons born after the 1 of January 1962 will have their pension updated annually by such a sum that corresponds to 70 per cent of the increase in the national average wage and 30 per cent of the inflation rate as published by National Statistics Office.

Ministerial Powers and Responsibilities

The Minister in charge of the Department of Social Security will, within intervals not exceeding five years, prepare a report reviewing the workings regarding the Retirement Pensions together with recommendations for achieving further adequacy, sustainability and social solidarity. This first report was submitted in 2010. The Minister, in concurrence with the Minister of Finance has the power to make and vary any regulations requiring persons who have not reached pension age and their employers as the case may be, to make contributions into Mandatory Second Pension Funds. Such regulations may provide for the rate of contribution payable, method and frequency of payment. Second Pension funds shall be governed by the Special Funds (Regulation) Act (Cap. 450). The Minister may in conjunction with the Minister for Finance provide exemptions from income tax in respect of contributions made by any person to Third Pension funds. These funds will be governed by the Special Funds (Regulation) Act (Cap. 403) as applicable.

1.2 Other reforms

Apart from the pension reform described in Section 1.1, the Maltese Government also introduced changes to regime regulating the award of the invalidity pensions and the review procedure. The new regime was implemented over the course of 2007 after the necessary legislative and organisational changes were instituted.

These measures introduced a new medical review process for this benefit and amongst the measures involved one finds:

- (i) Change the application format – to include more medical data and further responsibility on the part of the claimant to prove his case. No invalidity pension is issued for life and each case is subject to regular reviews. All cases are reviewed every three to four years – where updated medical evidence is requested from the beneficiary.
- (ii) Change the current medical panel system – under the new system, the Department of Social Security will be recruiting medical practitioners through an Expression of Interest to act as a Medical Review Team. The Team's main function is to advise the Director (Social Security) on the medical aspects of Invalidity claims.

(iii) Establish specific medical criteria for the award of benefits – this has been achieved by establishing “Impairment Tables” that provide the basic guidelines under which that Medical Review Team would decide on work-related impairment for Invalidity pension.

(iv) Establish an independent systems audit – Establish a medical audit for benefit claims awarded and rejected on medical grounds, in order to establish whether such benefits have been awarded correctly.

Changes were also made to minimum period of sickness prior to payment of invalidity pension benefit which is now set at three months. However this waiting period does not apply in the case of sudden severe or terminally-ill persons.

Further Developments in the Pension Reform

In 2013, the Minister for the Family and Social Solidarity has set up a Pensions Strategy Group primarily made up of representatives of the Ministry for the Family and Social Solidarity and the Ministry for Finance. The Pensions Strategy Group will assess and recommend how reforms can be introduced in the pension system in order to (i) render it as a policy instrument directed to support pro-natal growth at the one hand and to seek to attract the member of the family who exited to take up child rearing responsibilities to re-enter into the labour market on the other; (ii) incentivise persons to continue to remain active in the labour market beyond the statutory retirement age by resulting in higher pension income for additional years worked as against increasing the statutory retirement age; and (iii) adopting a targeted immigration and residency policy directed to target persons who have the appropriate skills levels that the local economy is not in a position to provide in order to engender continued economic growth. The Pensions Strategy Group has delivered its report to the Minister for the Family and Social Solidarity and a presentation with the proposals is expected to be delivered to the Cabinet in February 2015. .

In addition, in November 2014, following the establishment of a regulatory framework for private pensions by the MFSA, the Minister for Finance launched the Third Pillar pension scheme, referred to as the Personal Retirement Scheme, and which is being supplemented by another scheme, the Individual Savings Account (ISA). Both schemes are optional and are intended to encourage low-income earners to save more for their retirement and safeguard their future quality of life.

1.3 Reforms of the pension system included in the projections

The modelling work reflects as strictly as possible the pension rules, both current as well as those applying in future following the reform act.

Part 2: Demographic and Labour Force Projections

In projecting pensions, the demographic assumptions reflect EUROPOP2013 projections by Eurostat, while the macroeconomic assumptions reflect the commonly agreed methodology in the Economic Policy Committee.

2.1 Demographic developments

Population projections (EUROPOP2013) indicate that total population in Malta is projected to rise from around 423,000 in 2013 to around 457,000 in 2030, and to reach around 476,000 by 2060. As shown in Graph 1, the age structure is projected to change significantly. While the share of the very young people (aged 0-14 years) in the total population is projected to hover around the 15 per cent share, the share of the people aged 65+ is projected to increase from 17.5 per cent to 28.5 per cent.

As indicated in Table 2, life expectancy at birth for men is assumed to rise by 6.4 years over 2013 to reach 85.1 years in 2060, whilst in the case of women it is expected to reach 89.1 years, an increase of 6.3 years over 2013. This implies that despite some convergence, female life expectancy in 2060 is projected to remain 4 years higher than that of males. Meanwhile, life expectancy at 65 years for males is projected to increase by 4.3 years between 2013 and 2060, while for women it is projected to increase by 4.4 years during this period. The survivor rate for men aged over 65 years is projected to increase from 87.5 years in 2013 to 93.9 years in 2060, while that for women is projected to increase from 91.6 years in 2013 to 96.2 years in 2060. Following a similar upward trend, the survivor rate for men aged over 80 years, is projected to increase from 58.5 years in 2013 to 77.8 years in 2060, and that for women, is projected to increase from 72.5 years in 2013 to 86.9 years in 2060.

Another important variable in the evolution of the demography is net migration. As shown in Table 2, net migration inflows are projected to decline from 1,600 in 2013 to 1,146 in 2060. As a share of total population, net migration inflows to Malta is projected to decline from 0.4 per cent in 2013 to 0.2 per cent in 2060. Net migration shall represent an important factor in determining developments in total population during the projection period as indicated by the ratio of net migration over population change, which is projected to increase from 0.5 per cent in 2013 to 3.6 per cent in 2040 and to decline to 1.7 per cent in 2060.

From an economic perspective, the most significant change in demography concerns the working-age population (aged 15-64 years), which reflects the share of the population that will bear the financial 'burden' of the elderly. From a share of 68.0 per cent in 2013, this ratio is projected to subsequently fall to 60.2 per cent by 2030 and reach 56.1 per cent in 2060. By contrast, the share of the elderly population (aged 65+ years) in total population is projected to increase steeply from 17.5 per cent in 2013 to 28.5 per cent by 2060.

Graph 1: Age Pyramid Comparison: 2013 vs 2060

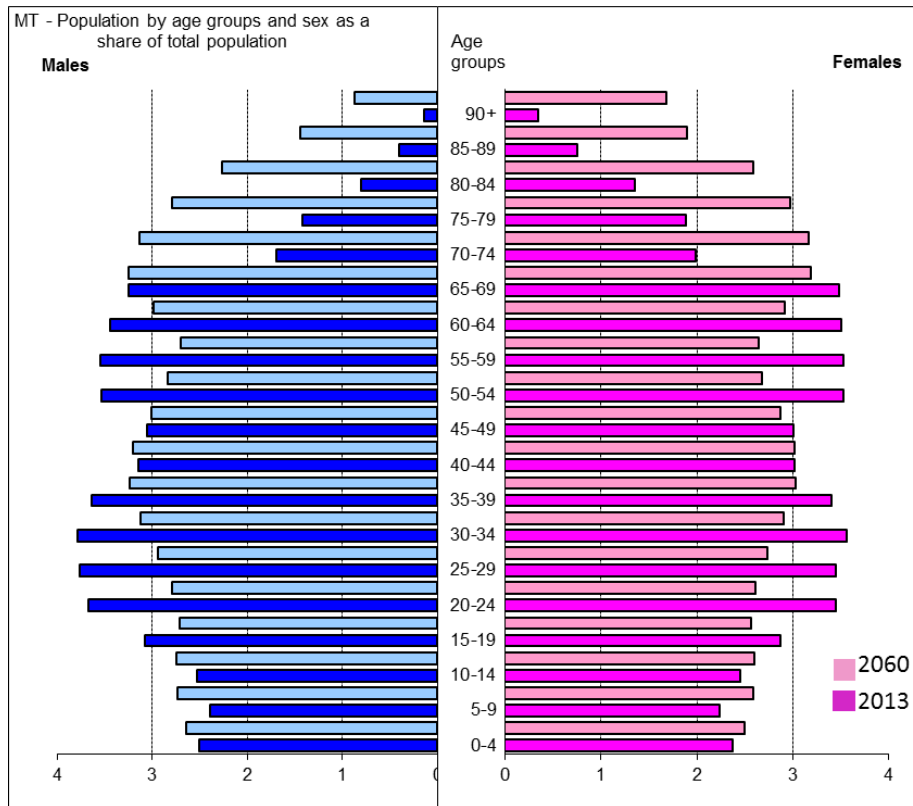


Table 2 – Main demographic variables evolution

	2013	2020	2030	2040	2050	2060	Peak year*
Population (thousand)	423	439	457	463	468	476	2060
Population growth rate	0.7	0.5	0.3	0.1	0.2	0.1	2013
Old-age dependency ratio (pop65/pop15-64)	25.8	33.2	40.5	40.8	45.0	50.9	2060
Ageing of the aged (pop80+/pop65+)	21.7	23.1	31.8	38.9	35.6	36.7	2042
Men - Life expectancy at birth	78.7	79.8	81.3	82.6	83.9	85.1	2060
Men - Life expectancy at 65	18.1	18.8	19.7	20.7	21.6	22.4	2059
Women - Life expectancy at birth	82.8	84.0	85.4	86.8	88.0	89.1	2060
Women - Life expectancy at 65	21.3	22.0	23.0	24.0	24.9	25.7	2060
Men - Survivor rate at 65+	87.5	88.8	90.4	91.8	92.9	93.9	2060
Men - Survivor rate at 80+	58.5	62.1	66.7	70.8	74.5	77.8	2060
Women - Survivor rate at 65+	91.6	92.5	93.7	94.7	95.5	96.2	2060
Women - Survivor rate at 80+	72.5	75.3	78.9	82.0	84.6	86.9	2060
Net migration (thousand)	1.6	1.6	1.5	1.4	1.3	1.1	2013
Net migration over population change	0.5	0.7	1.3	3.6	1.8	1.7	2040

The dynamics of the ageing process could be better appreciated by analysing the developments in the relative share of the elderly to the working-age population. These dependency ratios relate the number of individuals that are likely to be “dependent” on the support of others for their daily living – youths and the elderly – to the number of those individuals who are capable of providing such support. Key indicators of age dependency presented in Table 2 are the old-age-dependency ratio (for persons aged 65 years and more) calculated relative to the number of individuals aged 15-64 years and the ageing of the aged ratio. The old-age dependency ratio (65+ year bracket as a percentage of the 15-64 year bracket) is projected to increase consistently from 25.8 per cent in 2013 to 50.9 per cent in 2060, an increase of 25.1 percentage points. Meanwhile, the ageing of the aged ratio, is projected to increase from 21.7 per cent in 2013 to 38.9 per cent in 2040, decline to 35.6 per cent by 2050 and increase to 36.7 per cent by 2060.

2.2 Labour force projections

Table 3 presents indicators related to the labour force projections for the age groups of 55-64 years and the 65-74 years. Labour force participation rate for the 55-64 age bracket is projected to reach a peak in 2048 at 66.0 per cent and decline thereafter to 64.8 per cent in 2060, while the employment rate for the 55-64 years age category is projected to increase from 36.5 years to 60.8 years, reaching a peak at 61.9 per cent in 2048. Accordingly, the share of workers aged 55-64 years on the labour force of the 55-64 years age bracket is projected to fluctuate around the 94 per cent.

Meanwhile, labour force participation rate for the 65-74 years age bracket is projected to reach a peak in 2015, decline to 3.9 per cent by 2030, increase to 5.4 per cent in 2040 and decline to 5.2 per cent by 2060. Employment rate for this age category follows the same pattern as the labour force participation rate variable, with the result that the share of workers aged 65-74 years on the labour force of this age category is projected to fluctuate around the 99 per cent ratio.

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	38.7	43.3	61.1	65.2	65.7	64.8	2048
Employment rate for workers aged 55-64	36.5	40.7	57.4	61.3	61.7	60.8	2048
Share of workers aged 55-64 on the labour force 55-64	94.2	94.0	93.9	94.0	93.9	93.8	2013
Labour force participation rate 65-74	6.1	5.0	3.9	5.4	5.3	5.2	2015
Employment rate for workers aged 65-74	6.1	4.9	3.9	5.3	5.3	5.2	2015
Share of workers aged 65-74 on the labour force 65-74	99.4	99.2	98.9	98.9	99.1	99.1	2019
Median age of the labour force	36.0	37.0	40.0	41.0	40.0	39.0	2033

Table 4a and Table 4b present indicators on the labour market entry age, exit age and expected duration of life spent at retirement by gender. The average effective entry age for men is assumed to increase from 19.8 years in 2014 to 20.0 years in 2060, while that for women is assumed to increase from 21.1 years in 2014 to 21.4 years in 2060. The average effective exit age for men is projected to increase to 64 years in 2060 while that for women is projected to increase to 62.6 in 2060. The average effective working career for men is projected to increase by 1.8 years to reach 44 years in 2060, while that for women is projected to increase by 1.2 years to reach 41.2 years in 2060. Men are projected to spend 23.3 years of retirement by 2060 as compared to 20.7 years in 2014, while women are projected to spend 27.6 years in retirement in 2060 from 24.9 years in 2013. Men are projected to record an increase of 3.9 years in the average working career by 2060, while women are projected to record an increase of 4.6 years in their average working career by 2060. Both for men and for women, the percentage of adult life spent at retirement is projected to increase by 1.6 per cent over 2060-2014, to reach 33.6 years for men and 38.2 years for women.

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)	19.6	20.0	20.0	20.0	20.0	20.0	2016
Average effective exit age (CSM) (II)	62.8	63.1	64.0	64.0	64.0	64.0	2033
Average effective working career (CSM) (II)- (I)	43.2	43.2	44.0	44.0	44.0	44.0	2033
Contributory period	:	40.4	41.4	41.4	41.4	41.5	2027
Contributory period/Average working career	:	93.5	94.2	94.1	94.1	94.2	2013
Duration of retirement	19.7	20.4	20.6	21.5	22.5	23.3	2060
Duration of retirement/average working career	45.6	47.3	46.8	48.9	51.1	53.0	2060
Percentage of adult life spent at retirement	30.6	31.1	30.9	31.9	32.9	33.6	2060
Early/late exit	2.7	1.5	0.8	0.9	0.8	0.7	2013

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)	20.9	21.4	21.4	21.4	21.4	21.4	2019
Average effective exit age (CSM) (II)	72.0	62.0	62.6	62.6	62.6	62.6	2013
Average effective working career (CSM) (II)- (I)	51.1	40.6	41.2	41.2	41.2	41.2	2013
Contributory period	:	28.2	30.5	31.7	33.0	34.3	2060
Contributory period/Average working career	:	69.4	73.9	76.9	80.0	83.2	2060
Duration of retirement	15.4	24.7	24.8	25.8	26.7	27.6	2060
Duration of retirement/average working career	30.1	60.9	60.1	62.6	64.7	66.9	2060
Percentage of adult life spent at retirement	22.2	36.0	35.7	36.6	37.4	38.2	2060
Early/late exit	0.9	2.3	1.9	1.9	1.7	1.5	2015

Part 3: Pension Projections Results

The pension projection exercise covers contributory and non-contributory old-age pension paid under the social security scheme. The coverage of pension schemes includes also the expenditure on non-contributory old-age pension together with the share paid on the contributory and non-contributory bonus payment. At present private pensions play a rather minor role as regards pension provision for old-aged persons.

The European System of National Accounts (ESA) 2010 was introduced from September 2014. As decided by the AWG, Member States do not need to update their pension country fiches to reflect the new national accounts. The Commission services will incorporate the ESA2010 revision by updating the GDP series for the base year (2013), and by applying the previous growth rates of both GDP and the pension projections from 2013 onwards throughout the projection horizon.

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

Table 5 shows the difference in the definition of pension expenditure available in Eurostat versus the pension schemes taken into consideration under the AWG.

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

	2005	2006	2007	2008	2009	2010	2011	2012
1 Eurostat total pension expenditure	8.9	9.0	8.9	8.9	9.5	9.6	9.3	9.6
2 Eurostat public pension expenditure	8.9	9.0	8.9	8.9	9.5	9.6	9.3	9.6
3 Public pension expenditure (AWG)	9.3	9.3	9.2	9.3	9.9	10.2	9.8	10.2
4 Difference (2) - (3)	-0.4	-0.3	-0.3	-0.4	-0.4	-0.5	-0.5	-0.6
5 Expenditure categories not considered in the AWG definition, please specify:	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5.1 Disability Pensions/Allowance	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5.2 Orphans Allowance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.3 Pensions under the MDDWMSLMSY Voluntary Early Retirement Schemes	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0
5.4 Injury Pension	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

When compared to ESSPROS, the AWG definition excludes the means tested disability pensions (including the disability child allowance, the disability pension and the severely disability pension), orphans allowance, early retirement schemes and injury pensions, which in the social security system are minor schemes and amount to around 0.3 per cent of GDP in 2012. The AWG definition is covering the contributory and the non-contributory bonus with the end result that expenditure under the AWG definition is higher than under ESSPROS. ESSPROS figures do not include statutory bonuses, since bonuses are classified under a separate item.

3.2 Overview of Projection Results

Table 6 shows the projected gross pension spending and contributions as a percentage of GDP. Over the projection period, pension expenditure is projected to increase from 10.0 per cent of GDP in 2013 to 13.4 per cent of GDP by 2060. Pension expenditure is composed as follows:

- Old age pensions – earnings related
 - 2/3 retirement pension (TTP)
 - National Minimum Pension (NMP)
 - Increased National Minimum Pension (INMP)
 - Decreased National Minimum Pension (DNMP)
 - share of contributory bonus payment
- Disability – earnings related
 - Decreased National Invalidity Pension (DNIP)
 - National Minimum Invalidity Pension (NMIP)
 - share of contributory bonus payment
- Survivors – earnings related
 - Early Survivors Pension (ESRP)
 - National Minimum Widows' Pension (NMWP)
 - Survivors Pension (SRP)
 - share of contributory bonus payment
- Non-earning-related pensions
 - Non-Contributory Age Pension (AP)
 - share of non-contributory bonus payment
- Other pensions – earnings related
 - Invalidity Pension (IP)
 - Increased Invalidity Pension (IIP)
 - Increased Retirement pension (IRP)
 - Retirement Pension (RP)
 - Widows Pension (WP)
 - Treasury Pensions
 - share of contributory bonus payment

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	10.0	10.3	10.1	10.2	11.5	13.4	2060
Private occupational pensions	:	:	:	:	:	:	:
Private individual pensions	:	:	:	:	:	:	:
<i>Mandatory private</i>	:	:	:	:	:	:	:
<i>Non-mandatory private</i>	:	:	:	:	:	:	:
Gross total pension expenditure	10.0	10.3	10.1	10.2	11.5	13.4	2060
Net public pension expenditure	:	:	:	:	:	:	:
Net total pension expenditure	:	:	:	:	:	:	:
Contributions	2013	2020	2030	2040	2050	2060	Peak year*
Public pension contributions	9.0	7.9	8.1	8.0	7.9	7.7	2013
Total pension contributions	9.0	7.9	8.1	8.0	7.9	7.7	2013

Revenue from contributions is expected to increase from 9.0 per cent as a percentage of GDP in 2013 to 8.1 per cent in 2030 and, thereby decreasing to 7.7 per cent in 2060.

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

Pension scheme	2013	2020	2030	2040	2050	2060	Peak year *
Total public pensions	10.0	10.3	10.1	10.2	11.5	13.4	2060
<i>of which earnings related:</i>							
<i>Old age and early pensions</i>	5.5	6.1	6.4	7.0	8.7	10.8	2060
<i>Disability pensions</i>	0.4	0.3	0.3	0.3	0.3	0.3	2013
<i>Survivors' pensions</i>	1.6	1.7	1.8	1.7	1.6	1.4	2031
<i>Other pensions</i>	2.1	1.8	1.3	0.8	0.5	0.5	2013
<i>of which non-earnings related (including minimum pension and minimum income guarantee):</i>	0.3	0.3	0.4	0.4	0.4	0.4	2060

The increase in pension expenditure is primarily attributable to an increase in expenditure on old age pensions that increases from 5.5 per cent of GDP in 2013 to 10.8 per cent in 2060, an increase of 5.3 percentage points. Conversely, expenditure on Disability Pensions is projected to decrease marginally from 0.4 per cent of GDP to 0.3 per cent of GDP while expenditure on survivors' pensions is projected to decrease from 1.6 per cent of GDP to 1.4 per cent of GDP. Similarly, expenditure on Other Pensions is projected to decrease from 2.1 per cent of GDP to 0.5 per cent of GDP. The increase in old-age pension expenditure is driven by the ageing process, in reflection of projected demographic developments. At the same time, one notes that the parametric changes introduced in the pension reform also contribute to raise expenditure. The increase in the pension age, the increase in the contribution period for full pension eligibility and the

changes to the benefit formula contribute to lower the projected increase in pension expenditure. However, at the same time the more dynamic indexation of the ceiling on pensionable income, the statutory changes to indexation for old-age pensions and the introduction of the guaranteed national minimum pension for persons retiring from 2027 onwards contribute to increase expenditure pressure.

The decreasing contributions of Disability Pensions, Survivors' Pensions and Other Pensions (includes top-ups and treasury pensions) reflect a combination of factors. The invalidity pension contributes negatively to the rise in expenditure in reflection of the demographic developments as well as the indexation to COLA. On the other hand, the survivors' pension contributes positively to overall increase in expenditure as result of the ageing process as well as its indexation that is similar to old-age pensions. The 'top-up' pension covers benefits currently payable to persons in receipt of service pensions which includes former servicemen in receipt of overseas pensions. This expenditure category is projected to decrease in importance over time in line with the life expectancy of the recipients of this pension. Similarly, the Treasury Pension is projected to decrease in importance over time given that it has been closed to new Government employees since 1979. Those who qualify for a Treasury Pension are:

- All Government employees who started service with the Government before the 15th of January 1979,
- Police, AFM personnel and Correctional Facilities officials,
- Widows of Public service officials in a pensionable post who were contributors in the widows pension scheme,
- Members of Parliament.

Public officers qualify only if they were employed with public service before the 15th of January 1979 and the service rendered was continuous. The pension is awarded as a result of dedicated and loyal service. In cases where service is deemed to be inferior, the pension awarded may be granted at a reduced rate.

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

A deeper insight into the drivers of these results may be obtained by looking at the results of the decomposition of pension expenditure between 2013 and 2060 into the dependency ratio, coverage ratio, the benefit ratio, employment rate and labour intensity. Table 8a shows the developments in these factors behind the change in public pension expenditures during the projection period using pension data

Table 8a – Factors behind the change in public pension expenditures between 2010 and 2060 using pension data (in p.p. of GDP) - pensions

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60	Average annual change
Public pensions to GDP	0.3	-0.2	0.1	1.3	1.8	3.4	0.066
Dependency ratio effect	2.5	2.3	0.1	1.0	1.6	7.6	0.164
Coverage ratio effect	-1.0	-1.1	0.1	0.0	0.1	-2.0	-0.039
<i>Coverage ratio old-age*</i>	-0.1	-0.3	0.0	0.1	0.3	0.0	0.000
<i>Coverage ratio early-age*</i>	-1.4	-4.1	-0.2	0.2	0.7	-4.7	-0.105
<i>Cohort effect*</i>	-2.9	-1.8	1.1	-1.0	-2.7	-7.4	-0.179
Benefit ratio effect	-0.5	-0.5	-0.1	0.4	0.2	-0.4	-0.021
Labour Market/Labour intensity effect	-0.6	-0.7	-0.1	0.0	-0.1	-1.4	-0.036
<i>Employment ratio effect</i>	-0.6	-0.8	-0.1	0.0	-0.1	-1.5	-0.038
<i>Labour intensity effect</i>	0.0	0.0	0.0	0.0	0.0	0.1	0.003
<i>Career shift effect</i>	0.0	0.0	0.0	0.0	0.0	0.0	-0.001
Residual	-0.2	-0.2	0.0	0.0	0.0	-0.4	-0.002

As shown in Table 8a, over the period 2013-2060, pension expenditure as a percentage of GDP increases by 3.4 percentage points. Taking into consideration the entire projection horizon, this increase is entirely driven by the developments in the dependency ratio. The other factors play a mitigating effect with the contribution of the career shift effect, coverage ratio of the old-age, labour intensity effect and the benefit ratio effect being almost neutral. Over the period 2013-2020 public expenditure declines marginally by 0.2 p.p. while in the subsequent periods public expenditure increases continuously. Over the period 2030-2040 pension expenditure rises marginally by 0.1 p.p. while in 2040-2050, pension expenditure increases by 1.3 p.p. the rise in expenditure is driven by the dependency ratio and the benefit ratio, in reflection of the entrance into effect of some expenditure-increasing reforms described above. Meanwhile, in 2050-2060 the increase in expenditure is driven by the dependency ratio effect, the coverage ratio effect and the benefit ratio effect.

When assessing the factors behind the change in public pension expenditure by using pensioners' data, over the period 2013-2060, the benefit ratio and the coverage ratio have a different impact on the expenditure. The coverage ratio has a lower effect on the pension expenditure, while the benefit ratio has a more pronounced impact of a negative 1.5 p.p. on the pension expenditure.

Table 8b – Factors behind the change in public pension expenditures between 2010 and 2060 using pensioners data (in p.p. of GDP) - pensioners

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60	Average annual change
Public pensions to GDP	0.3	-0.2	0.1	1.3	1.8	3.4	0.066
Dependency ratio effect	2.5	2.3	0.1	1.0	1.6	7.6	0.164
Coverage ratio effect	-0.8	-0.8	0.4	0.1	0.1	-1.0	-0.021
<i>Coverage ratio old-age*</i>	<i>0.1</i>	<i>0.2</i>	<i>0.3</i>	<i>0.2</i>	<i>0.3</i>	<i>1.1</i>	<i>0.024</i>
<i>Coverage ratio early-age*</i>	<i>-0.7</i>	<i>-4.1</i>	<i>-0.1</i>	<i>0.2</i>	<i>0.6</i>	<i>-4.2</i>	<i>-0.094</i>
<i>Cohort effect*</i>	<i>-2.9</i>	<i>-1.8</i>	<i>1.1</i>	<i>-1.0</i>	<i>-2.7</i>	<i>-7.4</i>	<i>-0.179</i>
Benefit ratio effect	-0.7	-0.8	-0.3	0.2	0.2	-1.5	-0.032
Labour Market/Labour intensity effect	-0.6	-0.7	-0.1	0.0	-0.1	-1.4	-0.036
<i>Employment ratio effect</i>	<i>-0.6</i>	<i>-0.8</i>	<i>-0.1</i>	<i>0.0</i>	<i>-0.1</i>	<i>-1.5</i>	<i>-0.038</i>
<i>Labour intensity effect</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>0.003</i>
<i>Career shift effect</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>-0.001</i>
Residual	-0.2	-0.2	0.0	0.0	0.0	-0.3	0.141

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

Table 9 shows the replacement rate at retirement, the benefit ratio and the coverage of the public pension scheme in Malta. The public scheme replacement rate at retirement is expected to reach 48.0 per cent by 2020 and decrease thereafter to 45.6 per cent at the end of the projection horizon. Similarly, the benefit ratio is expected to decline by 3.1 percentage points between 2020 and 2060, to reach 44.1 per cent by 2060. The replacement rate for the new old-age pensioners under the contributory scheme is expected to increase to 51.5 per cent by 2030 and decline thereafter to 47.4 per cent in 2060. Meanwhile, the total coverage is projected to increase from 88.0 per cent in 2013 to 97.5 per cent in 2060, while the coverage ratio for the old-age pension scheme is projected to increase from 50.7 per cent in 2013 to 76.2 per cent in 2060.

Table 9 – Replacement rate at retirement (RR), benefit ratio (BR) and coverage by pension scheme (in %)

	2013	2020	2030	2040	2050	2060
Public scheme (BR)	48.3	47.2	43.7	42.5	43.4	44.1
Public scheme (RR)	NA	48.0	46.3	44.4	44.9	45.6
Coverage	88.0	90.1	93.4	95.8	97.1	97.5
Public scheme old-age earnings related (BR)	46.5	46.2	44.0	43.5	44.8	45.5
Public scheme old-age earnings related (RR)	NA	50.8	51.5	49.5	48.1	47.4
Coverage	50.7	54.4	59.0	64.1	70.9	76.2
Private occupational scheme (BR)	:	:	:	:	:	:
Private occupational scheme (RR)	:	:	:	:	:	:
Coverage	:	:	:	:	:	:
Private individual scheme (BR)	:	:	:	:	:	:
Private individual scheme (RR)	:	:	:	:	:	:
Coverage	:	:	:	:	:	:
Total (BR)	48.3	47.2	43.7	42.5	43.4	44.1
Total (RR)	NA	48.0	46.3	44.4	44.9	45.6

Table 10 provides an insight into the impact of demographic factors on the financial sustainability of public pension schemes. The number of pensioners is projected to rise by around 66 per cent over the projection period, in reflection of increases in the number of old-age pensioners (number of people aged 65+), which is expected to increase by around 84 per cent between 2013 and 2060. The number of persons in employment is projected to rise from around 178,000 in 2013 to around 199,600 in 2040. Subsequently it decreases in line with the ageing process of the Maltese population as the number of new entrants in the labour market is not enough to compensate for the number of persons entering into retirement. As a result, the system efficiency ratio (defined as the ratio of pension system dependency ratio/the old-age dependency ratio) is projected to decrease from 2.2 persons to 1.6 per sons in 2060.

Table 10 – System dependency ratio and old-age dependency ratio

	2013	2020	2030	2040	2050	2060
Number of pensioners (thousand) (I)	88.9	103.4	114.4	122.1	133.0	147.4
Employment (thousand) (II)	178.0	186.9	194.7	199.6	196.4	190.9
Pension System Dependency Ratio (SDR) (I)/(II)	49.9	55.3	58.8	61.2	67.7	77.2
Number of people aged 65+ (thousand) (III)	74.1	93.2	111.5	114.7	123.7	135.9
Working age population 15 - 64 (thousand) (IV)	287.3	280.8	275.1	280.8	274.9	267.1
Old-age Dependency Ratio (ODR) (III)/(IV)	25.8	33.2	40.5	40.8	45.0	50.9
System efficiency (SDR/ODR)	2.2	1.9	1.6	1.6	1.5	1.6

Table 11a shows the ratio of the pensioners to the inactive population, while Table 11b shows the ratio of the pensioners to total population by age category. This ratio is the highest for the 75+ age group which increases from 101.6 per cent in 2013 to 103.6 per cent in 2060. The 60-64 pensioners age group to the inactive population is expected to fluctuate from 70.0 per cent in 2013 to 48.9 per cent in 2030 and to increase to 58.3 per cent by 2060. By contrast, as presented in Table 11b, the ratio of the pensioners aged 60-64 years in the respective age-group is projected to decline from 55.3 per cent in 2013 to 27.6 per cent in 2060.

Table 12a shows the ratio of female pensioners to inactive population while Table 12b shows the ratio of the female pensioners to population by age group. The ratio of female pensioners to inactive population is projected to record increases in all the age brackets from 55 years upwards with the major increase being in the 65-69 age bracket, where the ratio of female pensioners to the inactive population increases from 55.7 per cent in 2013 to 102.8 per cent in 2060. With regards to the ratio of female pensioners to total population, increases are projected in the age brackets from 65 years upwards.

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

	2013	2020	2030	2040	2050	2060
Age group -54	2.3	2.3	2.3	2.2	1.9	1.7
Age group 55-59	24.7	27.2	42.5	45.1	42.4	45.9
Age group 60-64	70.0	61.8	48.9	55.0	56.4	58.3
Age group 65-69	84.8	86.5	86.2	93.2	98.6	104.0
Age group 70-74	91.4	86.3	84.2	86.5	90.6	95.0
Age group 75+	101.6	102.6	101.0	101.5	102.9	103.6

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

	2013	2020	2030	2040	2050	2060
Age group -54	1.0	0.9	0.9	0.9	0.8	0.7
Age group 55-59	10.9	10.6	10.9	10.2	9.2	10.0
Age group 60-64	55.3	45.4	26.4	26.2	26.4	27.6
Age group 65-69	78.7	80.3	80.5	85.2	90.1	95.2
Age group 70-74	87.6	83.9	83.1	85.0	88.9	93.2
Age group 75+	101.6	102.6	101.0	101.5	102.9	103.6

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

	2013	2020	2030	2040	2050	2060
Age group -54	1.8	1.8	1.9	1.8	1.5	1.3
Age group 55-59	12.4	14.2	19.8	22.1	21.8	22.0
Age group 60-64	40.2	40.2	31.9	37.9	40.0	41.8
Age group 65-69	55.7	62.6	71.7	82.7	92.8	102.8
Age group 70-74	67.4	65.2	72.5	78.8	85.9	93.4
Age group 75+	91.8	94.4	96.1	102.9	108.2	110.5

Table 12b – Female pensioners (public scheme) to total population ratio by age group (%)

	2013	2020	2030	2040	2050	2060
Age group -54	1.0	0.9	0.9	0.8	0.7	0.6
Age group 55-59	8.7	8.2	7.9	7.5	6.9	7.0
Age group 60-64	36.8	35.0	22.0	22.2	22.7	23.9
Age group 65-69	54.5	61.1	69.4	78.6	88.1	97.5
Age group 70-74	66.6	65.2	72.5	78.7	85.7	93.3
Age group 75+	91.8	94.4	96.1	102.9	108.2	110.5

Tables 13a-13c focus on new public pension expenditure data. The number of new pensioners, as presented in Table 13a is projected to increase from around 3,800 in 2020 to around 5,000 in 2060. Male new pensioners are projected to fluctuate from around 2,400 to around 2,500 during the projection period, while female new pensioners are projected to increase from around 1,400 in 2020 to around 2,500 in 2060. The total average contributory period is expected increase from 36.0 years in 2020 to 37.9 years in 2060. The average contributory period for males and females is expected to increase by 1.1 years and 6.1 years to reach 41.5 and 34.3 at the end of the projection horizon, respectively.

Furthermore, it is pertinent to underline that in the case of Malta the new pension expenditure for new pensioners does not depend on the average wage at retirement but on the pensionable income – discussed in detail in Section 1.⁶ The total new pension expenditure in 2014, as calculated on the basis of the drivers of the decomposition, is estimated to be slightly higher than the actual new pension expenditure being produced by the Model. This divergence is attributed to the fact that the critical variable to be used in calculating new pensions is pensionable income and not average pensionable wage at retirement.

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

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	:	36.9	48.0	84.9	139.6	197.5
II. Average contributory period	:	36.0	37.0	37.2	37.5	37.9
III. Monthly average pensionable earnings	:	1.2	1.9	2.7	3.8	5.3
IV. Average accrual rates (%)	:	1.9	1.7	1.7	1.7	1.7
V. Sustainability/Adjustment factor	:	:	:	:	:	:
VI. Number of new pensioners ('000)	:	3.8	3.4	4.3	5.0	5.0
VII Average number of months paid the first year	:	12.0	12.0	12.0	12.0	12.0
Monthly average pensionable earnings / Monthly economy-wide average wage	:	0.7	0.8	0.8	0.8	0.8

Table 13b – Disaggregated new public pension expenditure (old-age and early earnings-related pensions) - MEN

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	:	27.9	31.7	54.3	84.1	111.2
II. Average contributory period	:	40.4	41.4	41.4	41.4	41.5
III. Monthly average pensionable earnings	:	1.3	2.0	2.8	4.0	5.6
IV. Average accrual rates (%)	:	1.9	1.7	1.7	1.7	1.7
V. Sustainability/Adjustment factor	:	:	:	:	:	:
VI. Number of new pensioners ('000)	:	2.4	2.0	2.4	2.7	2.5
VII Average number of months paid the first year	:	12.0	12.0	12.0	12.0	12.0
Monthly average pensionable earnings / Monthly economy-wide average wage	:	0.7	0.8	0.8	0.8	0.8

⁶ In determining pensionable income, past wages and incomes are valorised with the COLA granted with respect to those years.

Table 13c – Disaggregated new public 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)	:	11.0	15.9	31.5	58.1	90.3
II. Average contributory period	:	28.2	30.5	31.7	33.0	34.3
III. Monthly average pensionable earnings	:	1.2	1.8	2.5	3.6	5.0
IV. Average accrual rates (%)	:	1.9	1.7	1.7	1.7	1.7
V. Sustainability/Adjustment factor	:	:	:	:	:	:
VI. Number of new pensioners ('000)	:	1.4	1.4	1.9	2.3	2.5
VII Average number of months paid the first year	:	12.0	12.0	12.0	12.0	12.0
Monthly average pensionable earnings / Monthly economy-wide average wage	:	0.7	0.8	0.8	0.8	0.8

3.4 Financing of the Pension System

Table 14 presents the revenue from contribution, the number of contributors in the public scheme, total employment and related ratios. In Malta, contributions are payable by all gainfully occupied persons between the age of 16 and their pension age. The scheme allows for different types of contributions in order to extend coverage to all types of persons in employment. Employed persons pay Class One contributions, while the self-occupied pay Class Two contributions, (more detail about this provided in the Annex). For each person, a tripartite contribution is payable: the employed person, the employer and the State each pay 10 per cent of the basic salary of the employee; with the contribution capped to the Maximum Pensionable Income. The rate of Class Two contributions is equally shared by the State and self-occupied persons, whereby the self-occupied pays 15 per cent and the State pays 7.5 per cent of their annual income that is subject to the same ceiling that applies for employees. Revenue from contributions is projected to increase from €645.3 million in 2013 to €3,172.7 million in 2060. The number of contributors is projected to increase from around 176,900 in 2013 to around 206,600 in 2040 and decline to 198,800 in 2060. The number of people in employment is projected to increase from around 178,000 in 2014 to 199,600 in 2040 and decline to around 190,900 in 2060.

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

	2013	2020	2030	2040	2050	2060
Public contribution	645.3	756.2	1142.2	1663.2	2334.7	3172.7
<i>Employer contribution</i>	215.1	252.1	380.7	554.4	778.2	1057.6
<i>Employee contribution</i>	215.1	252.1	380.7	554.4	778.2	1057.6
<i>State contribution</i>	215.1	252.1	380.7	554.4	778.2	1057.6
Number of contributors (I)	176.9	187.6	199.6	206.6	204.5	198.8
Employment (II)	178.0	186.9	194.7	199.6	196.4	190.9
Ratio of (I)/(II)	1.0	1.0	1.0	1.0	1.0	1.0

3.5 Sensitivity Analysis

Table 15 shows the impact of different shocks on public pension expenditure as a percentage of GDP.

Population related sensitivity tests:

- **High life expectancy** – : this scenario models an increase in life expectancy at birth. As a result, expenditure in 2060 is 0.7 p.p. higher than in the baseline. This increase reflects that the fact that longevity results in a higher outlay on public pensions in line with a priori expectations.
- **Lower migration** – in this scenario expenditure on public pensions in 2060 is projected to increase by 0.6 p.p. of GDP over the baseline. This increase reflects the outcome of less contributors - that results in a lower expenditure outlay – which is outweighed by the decrease in the rate of GDP growth owing a lower labour input relative to baseline.

Labour force related

- **Higher total employment rate and Older workers employment rate:** the scenarios modelling ‘higher employment rate’ (+2p.p.) and ‘higher employment rate of older workers’ (+10p.p.) result in a decrease in pension expenditure in 2060 of 0.1 p.p. and 0.4 p.p. respectively. This result is the net effect of higher pension expenditure in line with the increase in the number of contributors and higher GDP, with the increase in the latter resulting in a marginal decline in pension expenditure relative to the baseline case.

Productivity related

- **Higher/lower labour productivity** - in the scenario for higher labour productivity public expenditure on pensions in 2060 is projected to be 0.3 p.p. lower than in the baseline case. This result reflects the fact that higher labour productivity results in a higher outlay on pensions in reflection of indexation of benefit formula parameters to wages but also higher GDP with the latter effect outweighing the former. In the scenario for a lower labour productivity, public expenditure on pensions in 2060 as a

result of the lower labour productivity is projected to record an increase of 0.3 p.p. over the baseline case.

- **Lower TFP (risk scenario)** – in this scenario TFP growth would converge to 0.8%, with convergence to the target rate in 2035 from the latest outturn year, i.e. 2013, and the period of fast convergence limited to 5 years, i.e. until 2040. As a result of this scenario, pension expenditure in 2060 is projected to be 0.4 p.p. higher than under the baseline scenario.

Policy scenario: linking retirement age to increases in life expectancy: with this sensitivity test pension expenditure in 2060 is projected to be 1.2 p.p. lower than under the baseline case.

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

	2013	2020	2030	2040	2050	2060
Public Pension Expenditure						
Baseline	10.0	10.3	10.1	10.2	11.5	13.4
Higher life expectancy (2 extra years)	0.0	0.0	0.1	0.3	0.4	0.7
Higher lab. productivity (+0.25 pp.)	0.0	0.0	-0.2	-0.2	-0.3	-0.3
Lower lab. productivity (-0.25 pp.)	0.0	0.0	0.2	0.2	0.3	0.3
Higher emp. rate (+2 pp.)	0.0	-0.1	-0.2	-0.2	-0.1	-0.1
Higher emp. of older workers (+10 pp.)	0.0	-0.3	-0.4	-0.4	-0.4	-0.4
Lower migration (-20%)	0.0	0.1	0.1	0.3	0.5	0.6
Risk scenario	0.0	0.0	0.1	0.2	0.3	0.4
Policy scenario: linking retirement age to increases in life expectancy	0.0	0.0	0.0	-0.3	-0.8	-1.2
Total Pension Expenditure						
Baseline	10.0	10.3	10.1	10.2	11.5	13.4
Higher life expectancy (2 extra years)	0.0	0.0	0.1	0.3	0.4	0.7
Higher lab. productivity (+0.25 pp.)	0.0	0.0	-0.2	-0.2	-0.3	-0.3
Lower lab. productivity (-0.25 pp.)	0.0	0.0	0.2	0.2	0.3	0.3
Higher emp. rate (+2 pp.)	0.0	-0.1	-0.2	-0.2	-0.1	-0.1
Higher emp. of older workers (+10 pp.)	0.0	-0.3	-0.4	-0.4	-0.4	-0.4
Lower migration (-20%)	0.0	0.1	0.1	0.3	0.5	0.6
Risk scenario	0.0	0.0	0.1	0.2	0.3	0.4
Policy scenario: linking retirement age to increases in life expectancy	0.0	0.0	0.0	-0.3	-0.8	-1.2

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

Table 16 compares the decomposition of the main drivers in the pension expenditure ratio over the period 2013-2060 with the 2006, 2009, 2012 and 2015 projections.

Table 16 – Overall change in public pension expenditure to GDP during the projection period under the 2006, 2009, 2012 and 2015 projection exercises

	Public pensions to GDP	Dependency ratio	Coverage ratio	Employment effect	Benefit ratio	Labour intensity	Residual (incl. Interaction effect)
2006 *	-0.48	7.29	-1.01	-1.19	-4.97	:	-0.60
2009 **	6.18	11.32	-3.15	-0.66	-0.54	:	-0.78
2012 ***	5.51	11.35	-2.57	-1.52	-1.05	0.07	-0.78
2015****	3.35	7.57	-1.99	-1.51	-0.45	0.09	-0.36

* 2004-2050; ** 2007-2060; *** 2010-2060; **** 2013-2060

- The benefit ratio had a strong negative effect on expenditure in the 2006 projection, where this effect has remained negative but it has declined in its impact particularly in 2009 and 2015. This development reflects the impact of the expenditure-increasing aspect of the reform.
- The dependency ratio has a lower impact on pension expenditure in the 2015 exercise in comparison to the 2009 and 2012 exercise, which may be attributable to the difference in demographic and macroeconomic assumptions.
- The employment effect has an impact similar to that of the 2012 exercise and higher than under the 2009 exercise and rather stable in comparison with the 2009 exercise.
- The contribution of the coverage ratio is less stronger in 2015 relative to the 2012 and 2009 scenarios but stronger relative to 2006, a development that is likely to reflect the impact of the pensions reform that is expected to lower the number of pensioners particularly as a result of the increase in pension age as well as the demographic assumptions adopted.
- Labour intensity had a low positive impact of around 0.09 p.p. in public pension expenditure to GDP which is slightly higher than under the 2012 scenario.

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	10.3	10.6	10.4	11.4	13.4	15.9
<i>Change in assumptions</i>	-0.1	-0.5	-0.5	-0.9	-1.9	-3.2
<i>Improvement in the coverage or in the modelling</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Change in the interpretation of constant policy</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Policy related changes</i>	0.0	0.0	0.0	0.0	0.0	0.0
New projection	10.0	10.3	10.1	10.2	11.5	13.4

Table 17 shows the decomposition of the difference between 2012 and the new public pension projection as a percentage of GDP. As indicated in this table the change in assumptions is the only factor that is explaining the difference between 2012 and the new public pension projections.

Part 4: Description of the pension projection model and its base data

4.1 Institutional context

The model used in projecting pension expenditure was the World Bank's Pension Reform Options Simulation Toolkit (PROST 15), being the same model used in the projection- of pension expenditure for the previous AWG budgetary projections exercise. Staff from the Economic Policy Department within the Ministry for Finance (MFIN) were licensed to use PROST 15 in order to model the development of the current pension system and analyse various options for the pension reform.

The pension projections baseline was prepared by the World Bank with the assistance of expertise from the MFIN and the Ministry for the Family and Social Solidarity (MFSS). The results obtained were subject to a process of internal review by pension experts within Government.

4.2 Assumptions and methodologies applied

The PROST input files were updated in order to incorporate the Ageing Working Group assumptions. The following is a list of the main assumptions that have been taken on board in our PROST calculations.

Demographic Assumptions:

- Population (EUROPOP 2013)
- Fertility Rate by age (EUROPOP 2013)
- Mortality Rate by age and gender (EUROPOP 2013)
- Net Migration by age and gender (EUROPOP 2013)

Macroeconomic Assumptions:

- Real GDP (growth rate)
- Labour Productivity (growth rate per hour)
- Inflation rate
- Participation rate by age and gender
- Unemployment rate by age and gender

4.3 Data used to run the model

Modelling in PROST is based on the main input sheet which includes general assumptions pertaining to the economy and various parameters of the pension system. Inputs are further subdivided into sheets related to Population, the Labour market, and Pensions. For this exercise data was collected from national sources, including the National Statistics Office, the Inland Revenue Department, and the Social Security Department within the MFSS.

The base year used in the model is 2013. While some input variables require assumptions for the projection interval others are generated in the various output sheets of PROST. The main inputs variables set in the *General* sheet include:

- GDP in Nominal terms in the base year
- The contribution ceiling (for employee and government contributions)
- Wage and pension cumulative income distributions for base year
- Demographic trends – sex ratio at birth, mortality rate multiplier for disabled and for old age pensioners
- Macroeconomic growth trends for real GDP, the inflation rate, the real interest rate, Government bond rate and the discount rate
- The retirement age by sex
- Revenue sources mainly from contributions of employees, employers and Government
- Pension indexation assumptions, minimum and maximum pension indexation, minimum wage indexation and contribution ceiling indexation
- Benefit formula parameters: required years of service for basic replacement rate, the maximum replacement rate, etc.

The *Population* worksheet in PROST includes inputs for the following main variables:

- Maltese population by age and by sex for the base year;
- The age specific fertility rate for the base year and any projections or theories about the way fertility rates are most likely to behave over the simulation horizon (as per EUROPOP 2013);
- Probability of dying (males and females): age specific probability of dying for males/females in the base year as well as over the projection period in line with EUROPOP 2013 assumptions regarding life-expectancy;
- Net migration (males and females): age specific net immigration in each age group. Data in the base year as well as for the projection period in line with EUROPOP 2013.

The *Labour* worksheet in PROST includes inputs for the following main variables:

- Labour force participation (males and females): data are entered for the base year and for the projection period in line with AWG assumptions;
- Unemployment rate (males and females): data for each age group by gender are entered for the base year and for the projection period in line with AWG assumptions;
- Earnings profile for males and females in terms of minimum wage: this reflects the average gross wage of individuals relative to the minimum wage.
- Pension profile in terms of the minimum pension: this represents the initial distribution of pensions across pensioners of different ages.

The *Pensions* worksheet in PROST includes inputs for the following main variables

- Contributors (males and females): data is entered for each age cohort for the base year.
- Specific pensions category: data is entered for the number of pensioners receiving 2/3 pensions, number of invalids and survivors for the base year.
- Assumptions for the length of service at retirement;

- The evolution of the number of pensioners as a stock of population over the projection period.

4.4 Reforms incorporated in the model

The modelling work reflected as far as possible to the rules spelled out by the legislation thus covering the reforms enacted in December 2006.

4.5 General description of the model

4.5.1 Overview

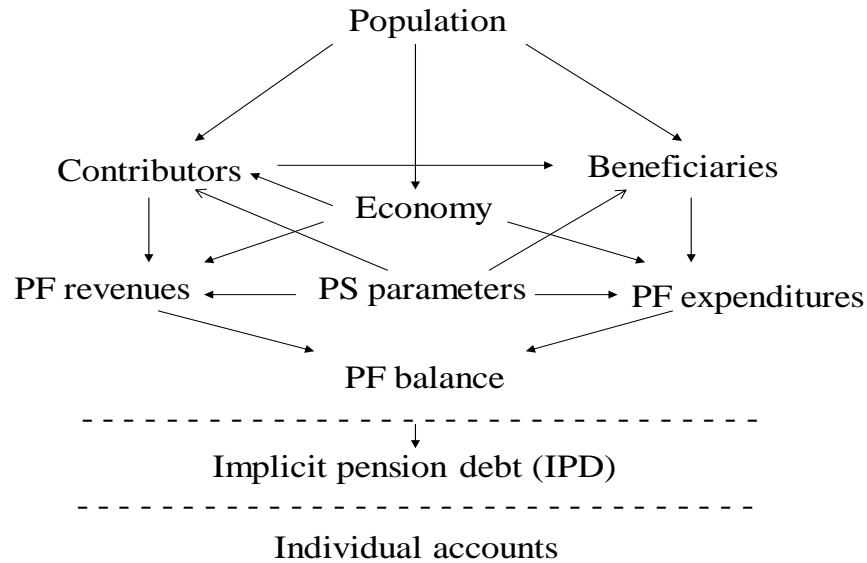
PROST projects pension contributions, entitlements, system revenues, and system expenditure over the long term. It is designed to promote informed policymaking, bridging the gap between quantitative and qualitative analysis of pension regimes. It is a flexible, computer-based toolkit, easily adapted to a wide range of countries' circumstances.

PROST is designed to answer the following kinds of question:

- How much will the pension system cost in the future? Is it viable and sustainable?
- What kind of benefits can people expect to receive in the future?
- Is the pension system equitable? Does it provide a decent retirement income to different categories of people?
- How large are the government's implicit pension liabilities?
- How would broadening coverage, changing eligibility, changing benefits, or adjusting contribution rates affect the system? How will costs, expenditures and liabilities change under various reforms?

The model takes country specific data provided by the user. It generates population projections, which, combined with economic assumptions, are used to forecast future numbers of contributors and beneficiaries. These in turn generate flows of revenues and expenditures. The model then projects fiscal balances, taking account of any partial pre-funding of liabilities.

In the most simplified way the general calculation scheme can be summarized on the below Figure.



PROST follows single age/gender cohorts over time and generates population projections, which, combined with labour market assumptions, are used to forecast future numbers of contributors and beneficiaries. These in turn generate flows of revenues and expenditure. The model then projects fiscal balances and calculates the implicit pension debt. The required contribution rates and affordable replacement rates for zero pension fund balance in each year of the simulation period are also calculated. Finally, PROST produces outputs related to individuals – what an individual would contribute to the system and what he/she obtain under PAYG DB and multipillar schemes. This allows both intra- and intergenerational analysis.

The PROST program produces five output modules:

1. *Population projections*: including life tables, population pyramids, population dependency ratios *etc.*
2. *Demographic structure*: labour force and employment, numbers of contributors and beneficiaries, demographic structure of the pension system, and system dependency ratio.
3. *Finances of Monopillar PAYG*: macroeconomic trends, projections of wages, pension benefits for the existing and new pensioners, pension scheme balance and the implicit pension debt. The financial flows module also calculates the adjustments—to benefit levels or contribution rates—that would ‘balance’ the system, *i.e.* bring revenues and expenditures into line.
4. *Finances of Multipillar System*: this module looks at the effect of a shift to a ‘multipillar’ regime, incorporating both a pay-as-you-go, notional pay-as-you-go, and a funded, defined contribution scheme or exclusively one or the other. Again, it measures the impact both on the public finances and on individual’s pension entitlements, including measurements of transition costs. The total pension benefit and the value of each of the pillars are provided separately. It also compares benefit projections and financial standing under the monopillar pay-as-you-go and multipillar scenarios.

5. *Individual accounts*: the model works out contributions and benefits for six different example individuals, specified by age, sex, age of labour market entry, retirement age, earnings profile, mortality etc.

4.5.2 Main equations

When using PROST, the user needs to specify a time- and age-frame. The simulation horizon is defined by two time points: the base year (2013) and the end year (2060). PROST processes data in terms of single-year age cohorts. The starting age is 0 (infants younger than 1 year old) and the maximum age is usually set in the interval between 75 and 100 years. This time and age frame can be changed to accommodate the data availability.

4.6. Additional features of the projection model

This section presents an outline of some of the main relationships in PROST15. This material was extracted from an unpublished PROST manual named ‘Calculus for PROST15’, property of the World Bank.

- *Number of different persons modelled per generation*

PROST groups the population into three age-related categories: young (YP), working (WP), and old (OP). To show how it is modelled on PROST, let a_r be the retirement age. Then

$$YP(t, g) = \sum_{a=0}^{14} P(a, t, g), \quad WP(t, g) = \sum_{a=15}^{a_r} P(a, t, g), \quad OP(t, g) = \sum_{a=a_r}^{a_{\max}} P(a, t, g)$$

The total population and the ratio of males to females in the total population will respectively be

$$TP(t, g) = YP(t, g) + WP(t, g) + OP(t, g), \quad MF\%(t) = \frac{TP(t,1)}{TP(t,2)}$$

For each category, PROST calculates their annual growth rates,

$$YG\%(t) = \left(\frac{YP(t,3)}{YP(t-1,3)} - 1 \right), \quad WG\%(t) = \left(\frac{WP(t,3)}{WP(t-1,3)} - 1 \right)$$

$$OG\%(t) = \left(\frac{OP(t,3)}{OP(t-1,3)} - 1 \right), \quad TG\%(t) = \left(\frac{TP(t,3)}{TP(t-1,3)} - 1 \right)$$

as well as their share in the total population

$$YS\%(t) = \frac{YP(t,3)}{TP(t,3)}, \quad WS\%(t) = \frac{WP(t,3)}{TP(t,3)}, \quad OS\%(t) = \frac{OP(t,3)}{TP(t,3)}$$

Here, OS%(t) is often used as an indicator of population aging for the whole society. In PROST, the young and old population dependency rates, defined as how many young and old individuals every 100 people of working age need to support, are calculated as

$$SY(t) = 100 \cdot \frac{YP(t,3)}{WP(t,3)}, \quad SO(t) = 100 \cdot \frac{OP(t,3)}{WP(t,3)}, \quad ST(t) = SY(t) + SO(t)$$

where ST(t) is the total population dependency rate. The old-age support ratio, defined as on how many working age persons a 100 old-age person depends, is calculated as

$$OD(t) = \frac{WP(t,3)}{OP(t,3)}$$

- *Replacement Rate of New Retirees*

The replacement rate for income groups other than the minimum wage worker (REPL%(a,t,g,1) is calculated as follows:

$$REPL\%(a, t > 1, g, i) = (WAGE_GR_C(a, t, g, i) - WAGE_GR_C(a, t, g, 1)) \cdot \frac{REPL\%(a, t, g, i = aver) - REPL\%(a, t, g, 1)}{WAGE_C(a, t, g) - WAGE_GR_C(a, t, g, 1)} + REPL\%(a, t, g, 1)$$

where

WAGE_GR_C(a,t,g,i) is the average insured wage for contributor groups

WAGE_C is the average insured wage for contributor groups.

- *Average length of service*

In PROST the ‘Pension’ worksheet in the Input module, contains data specific to the pension system. In particular, this worksheet contains age-specific distributions on old age pensioners, disability pensioners and contributors for the base year along with some assumptions about how these are expected to behave over time. One of the projection parameters in this sheet is the ‘average length of service’ for the new retiree for each age and gender cohort. Individuals who retire at older ages often have the same or fewer years of service than those who retire younger due to factors such as extended periods out of the labour force and later entry to the labour force.

Accordingly, in the ‘Demographic’ worksheet of the Output module, deriving the ‘average accrued length of service’ matrix involves several intermediate steps. The first step is to figure out the number of covered individuals who will eventually retire or are retired, i.e. the eventual retirees. These are derived backwards, starting with the oldest cohort. Next, PROST calculates what per cent of these eventual retirees have already retired at each point in time. This ratio is equal to 100% for the oldest cohort. Then a retirement pattern is derived, that describes what per cent of eventual retirees retire at each age. Finally, the average accrual of length of service per year can be derived from the retirement pattern and length of service at retirement. It is assumed for simplicity that covered individuals accrue their length of service linearly throughout their career, starting from the youngest working age and ending a year before retirement. The derivation is again done backwards, starting with the oldest cohort. The result of this derivation is the

matrix of average accrued length of service, which implies that the total length of service accrued by cohort has to equal the total length of service claimed by the cohort at the time of the retirement.

$$LOS_{AV}(a,t,g) = LOS_{R}(a,t,g) * (a - a_{work} + 1)$$

where

$LOS_{AV}(a,t,g)$ is the average accrued length of service,

$LOS_{R}(a,t,g)$ is the length of service at retirement, and

- *The calculation of survivorship pension*

Benefits for survivors are calculated in a different way. Total pension payments for survivors in different age groups $TP_{SUR}(a, t, g)$ are determined in PROST by weighting the indexed pension payments for the survivors in the previous year and a percentage of the pension payment for new old age pensioners. The weight of new average pension is calculated as the inverse of the average duration of survivorship benefit. This method is used to take account of both the stock as a percentage of old age pensions and flow of the survivor pensions from the previous year. Thereafter, the average replacement rate is calculated.

$$wt = (1 / D_s)$$

$$TP_{SUR}(t) = (rsuold\%(t) * R_{OLD}(t) * AW_{EC}_{U}(t) * wt * TSU(t)) + (TP_{SUR}(t-1) * INDEX_{P}(t) * (1 - wt))$$

$$R_{SUR}\%(t) = TP_{SUR}(t) / (TSU(t) * AW_{EC}_{U}(t))$$

The calculation of total payments to disabled $PAYM_{D}(t,g)$ is identical to that of old age pensions. Total payments for survivors and orphans are derived from average replacement rates for these categories $R_{SUR}\%(t)$ and $r_{orp}\%(t)$. This also allows to calculate total pension payments $PAYM_{T}(t)$:

$$PAYM_{S}(t, g) = AW_{EC}_{U}(t,3) \cdot R_{SUR}\%(t) \cdot TSU(t, g)$$

$$PAYM_{OR}(t) = AW_{EC}_{U}(t,3) \cdot r_{orp}\%(t) \cdot TOR(t,3)$$

$$PAYM_{T}(t) = PAYM_{O}(t,3) + PAYM_{D}(t,3) +$$

$$PAYM_{S}(t,3) + PAYM_{OR}(t,3)$$

- *The modelling of the retirement age and its evolution over the projection period*

Retirement age increase is one of the pension reforms modelled in PROST15 in line with Malta's pension reform. Changes in the retirement age have an impact on other parameters modelled in PROST15, including: the number of new old age pensioners (NP), new disabled (ND), employed population (EM), contributors (NC), existing pensioners (EP), existing disabled (ED), average years of service at retirement (los_{rt}) and others.

PROST15 deals with this modelling by primarily calculating how many people of those who would have retired under the initial retirement age law will now be denied that possibility and what their average length of service is:

$$\left[\begin{array}{l} DENIED(a,t,g) = NP_{old}(a,t,g) + DENIED(a-1,t-1,g) \cdot [1 - m\%(a-1,t-1,g)] \\ \\ LOS_D(a,t,g) = \frac{\left(\begin{array}{l} los_rt(a,t,g) \cdot NP_{old}(a,t,g) + \\ [LOS_D(a-1,t-1,g) + 1] \cdot shift_contr\% \cdot \\ DENIED(a-1,t-1,g) \cdot [1 - m\%(a-1,t-1,g)] \end{array} \right)}{DENIED(a,t,g)} \\ \\ \text{if } ret_age(t_{base_year},g) \leq a < ret_age(t,g) \end{array} \right],$$

$$DENIED(a,t,g) = 0, \quad \text{if } a = ret_age(t,g)$$

Subsequently, PROST15 will figure out what will those who were denied retirement be doing that year: become employed, will continue contributing to the pension system, will claim temporary disability or retire early (probably taking a reduced pension). Relevant matrixes will be adjusted by PROST to reflect these possibilities, using parameters specified by the user.

$$\begin{aligned} EM_{new}(a,t,g) &= EM_{old}(a,t,g) + DENIED(a,t,g) \cdot shift_empl\% \\ NC_{new}(a,t,g) &= NC_{old}(a,t,g) + DENIED(a,t,g) \cdot shift_contr\% \\ GC_{new}(a,t,g) &= NC_{new}(a-1,t-1,g) \cdot m\%(a-1,t-1,g) \\ EP_{new}(a,t,g) &= EP_{old}(a,t,g) - DENIED(a,t,g) \cdot [1 - shift_ret\%] \\ NP_{new}(a,t,g) &= \left(\frac{EP_{new}(a,t,g) - EP_{new}(a-1,t-1,g) \cdot [1 - m\%(a-1,t-1,g)]}{m_m_o\%(t-1,g)} \right) \\ DP_{new}(a,t,g) &= EP_{new}(a-1,t-1,g) \cdot m\%(a-1,t-1,g) \cdot m_m_o\%(t-1,g) \\ ED_{new}(a,t,g) &= ED_{old}(a,t,g) + DENIED(a,t,g) \cdot shift_dis\% \\ ND_{new}(a,t,g) &= \left(\frac{ED_{new}(a,t,g) - ED_{new}(a-1,t-1,g) \cdot [1 - m\%(a-1,t-1,g)]}{m_m_d\%(t-1,g)} \right) \end{aligned}$$

As a final step, PROST adjusts the average length of service at retirement:

$$los_rt(a,t,g) = \frac{\left(\begin{array}{l} los_rt(a,t,g) \cdot NP_{old}(a,t,g) + LOS_D(a-1,t-1,g) \cdot \\ shift_contr\% \cdot DENIED(a-1,t-1,g) \cdot [1 - m\%(a-1,t-1,g)] \end{array} \right)}{NP_{new}(a,t,g)},$$

if $a = ret_age(t,g)$

where:

$Ret_age(t,g)$	Statutory retirement age
$Shift_empl\%$	Shift to employment when ret. age is increased
$shift_contr\%$	Shift to contributors when ret. age is increased
$shift_ret\%$	Shift to early retirement when ret. age is increased
$shift_dis\%$	Shift to disability when ret. age is increased
$Los_rt(a, t, g)$	Length of service at retirement
$EM(a,t,g)$	Employed
$NC(a,t,g)$	Nominal contributors
$CD(a,t,g)$	Contributors that died
$EP(a,t,g)$	Existing pensioners
$NP(a,t,g)$	New pensioners
$OD(a,t,g)$	Dead pensioners
$ED(a,t,g)$	Existing disabled
$ND(a,t,g)$	Newly disabled

- *Projecting the number of Contributors*

The projection of contributors in PROST takes into consideration information by single year of age and gender regarding the income distribution, initial wage in terms of the minimum wage and aggregate information regarding participation rates, labour market position and productivity in terms of the minimum wage worker, amongst other variables. In our case, contributors are modeled as a percentage of the stock of employment, therefore trends in employment are directly reflected in the number of contributors.

PROST has only two restrictions on the contributor data. First, numbers of contributors cannot exceed population numbers for each of the cohorts. Secondly, it is assumed that every contributor eventually retires or dies. Since the oldest person that can retire is aged a_{max} , there can be no contributors older than age $a_{max}-1$. Therefore, the contributor numbers are simply set to be 0 for the oldest cohort. Nominal contributors account for all those to whom pension rights are accruing that particular year. Not all of those people actually do contribute to the system. Some may be exempt and thus, to get the number of effective contributors PROST uses the following formula:

$$EC(a,t,g) = NC(a,t,g) * [1 - ee\%(a,t,g)]$$

where EC is the effective contributors

NC is the nominal contributors in the base year

ee% is the exemption rate

a is an index for age

t is an index for year

g is an index for gender

- *Pension payments for existing old age pensioner*

In order to derive the finances of the pension system, the demographic structure of the pension system is combined with financial assumptions from the input sheets 'General' and 'Pension'. Primarily, PROST constructs a likely current picture of wage distribution

of existing contributors given the marginal distributions and respective profile from the PROST input files. It is assumed that the per cent of age and gender specific contributor population in each income group remains stable with time. However, the income brackets applied to each of these contributor groups will be allowed to change independently.

The income distribution of old age pensioners is created in a similar way to the income distribution of contributors. PROST starts by creating 3-dimensional income distribution matrix of existing old age pensioners $DISTR_P\%(a,1,g)$. Accordingly, after removing all possible data inconsistencies, minimum pension $MIN_PEN(t)$ and maximum pension $MAX_PEN(t)$ are calculated to be:

$$MIN_PEN(1) = bracket_p(1)$$

$$MAX_PEN(1) = bracket_p(i_{max})$$

$$MIN_PEN(t>1) = (Min_PEN(t-1) * [1+infl\%(t-1) * p_min_i\%(t)] * [1+WG_N\%(t-1) * p_min_w\%(t)])$$

$$MAX_PEN(t>1) = (MAX_PEN(t-1) * [1+infl\%(t-1) * p_max_i\%(t)] * [1+WG_N\%(t-1) * p_max_w\%(t)])$$

where,

$bracket_p(i)$ are the pension brackets from pension income distribution ;

$p_min_i\%(t)$ is the indexation of minimum pension to inflation

$p_min_w\%(t)$ is the indexation of minimum pension to nominal wage growth

$p_max_i\%(t)$ is the indexation of maximum pension to inflation

$p_max_w\%(t)$ is the indexation of maximum pension to nominal wage growth

$WG_N\%(t)$ is the nominal insured wage growth of effective contributors

i is the index for the wage/pension income level

Then, the average old age pension paid to existing old age pensioners in the base year is:

$$STREAM_O(a,t = 1, g, i = aver,1) = \left(\begin{aligned} & bracket_p(1) \cdot DISTR_P\%(a,1, g) + \\ & \sum_{i>1} \left(\frac{bracket_p(i) + bracket_p(i-1)}{2} \cdot DISTR_P\%(a, ig,) \right) \end{aligned} \right)$$

where $DISTR_P\%(a,1,g)$ is the pension distribution by income group.

- *Replacement Rate for Survivors*

Total pension payments for survivors is obtained by weighting the indexed pension payments made to survivors in the previous year and a percentage of the pension payments made to new old age pensioners. The weight of the new average pensions (wt) is the inverse of the average duration of survivorship benefit (D_s).

$$TP_SUR(t) = (r_surold\%(t) * R_OLD(t) * AW_EC_U(t) * wt * TSU(t)) \\ + (TP_SUR(t-1) * INDEX_P(t) * (1 - wt))$$

where

$r_surold\%(t)$ is the replacement rate of survivors as a percentage of the replacement rate of old age pensioners

$R_OLD(t)$ is replacement rate of old age pensioners in terms of the economy wide unconstrained wage

$AW_EC_U(t)$ is unconstrained average wage

$TSU(t)$ is the total number of survivors

$INDEX_P(t)$ is the pension indexation coefficient.

Then the average replacement rate for survivors is:

$$R_SUR(t) = TP_SUR(t) / (TSU(t) * AW_EC_U(t))$$

Annex 1: Methodological Annex

The model used in projecting pension expenditure was the World Bank’s Pension Reform Options Simulation Toolkit (PROST 15), being the same model used in the projection- of pension expenditure for the previous AWG budgetary projections exercise.

Assumptions and methodologies applied

The PROST input files were updated in order to incorporate the Ageing Working Group assumptions. The following is a list of the main assumptions that have been taken on board in our PROST calculations.

Demographic Assumptions:

- Population (EUROPOP 2013)
- Fertility Rate by age (EUROPOP 2013)
- Mortality Rate by age and gender (EUROPOP 2013)
- Net Migration by age and gender (EUROPOP 2013)

Macroeconomic Assumptions:

- Real GDP (growth rate)
- Labour Productivity (growth rate per hour)
- Inflation rate
- Participation rate by age and gender
- Unemployment rate by age and gender

Economy- wide average wage at retirement

Table A1 shows the economy wide average wage at retirement evolution.

Table A1 – Economy wide average wage at retirement evolution

	2010	2013	2020	2030	2040	2050	2060
Gross wage (current prices - billions €)	2.61	2.96	3.90	5.76	8.52	12.13	16.85
Economy - wide average wage (current prices - 1000 €)	15.79	16.73	19.99	28.29	40.80	59.02	84.35

Source: Commission Services

It is to be noted that in the baseline questionnaire figures for 2013-2060 reflect the Average Wage of Contributors as projected by the model, in line with productivity assumptions.

Number of Pensioners

The total number of pensioners presented for the pension projection exercise is the aggregation of five categories of pensioners - old age, survivors, invalids, top-ups, treasury pensions and the non-contributory old-age pension. The model used in the projection – World Bank’s PROST - reserves a different modeling treatment for these different categories of pensions, detail about which is provided in Part 4 of the Fiche. For aggregation purposes, we use the prevalence criteria. Hence the pensioner is attributed to the scheme from which the beneficiary is receiving the highest pension.

Pension taxation

No data is provided for pension taxation.

Disability pension

In the projections for the baseline scenario, the invalidity pension contributes negatively to the rise in expenditure in reflection of the demographic developments as well as the indexation to COLA. This negative contribution may also be attributable to the fact that the Maltese Government introduced changes to regime regulating the award of the invalidity pensions and the review procedure. The new regime was implemented over the course of 2007 after the necessary legislative and organisational changes were instituted.

These measures introduced a new medical review process for this benefit and amongst the measures involved one finds:

- (i) Change the application format – to include more medical data and further responsibility on the part of the claimant to prove his case. No invalidity pension is issued for life and each case is subject to regular reviews. All cases are reviewed every three to four years – where updated medical evidence is requested from the beneficiary.
- (ii) Change the current medical panel system – under the new system, the Department of Social Security will be recruiting medical practitioners through an Expression of Interest to act as a Medical Review Team. The Team’s main function is to advise the Director (Social Security) on the medical aspects of Invalidity claims.
- (iii) Establish specific medical criteria for the award of benefits – this has been achieved by establishing “Impairment Tables” that provide the basic guidelines under which that Medical Review Team would decide on work-related impairment for Invalidity pension.
- (iv) Establish an independent systems audit – Establish a medical audit for benefit claims awarded and rejected on medical grounds, in order to establish whether such benefits have been awarded correctly.

Changes were also made to minimum period of sickness prior to payment of invalidity pension benefit which is now set at three months. However this waiting period does not apply in the case of sudden severe or terminally-ill persons.

Table A2 shows the disability rates by age groups, where no data is provided by age groups for 2010. In 2010, total disability beneficiaries as a share of the total population amounted to 1.3 per cent.

Table A2: Disability Rates by Age Group (%)

	2013	2020	2030	2040	2050	2060
aged -54	0.5%	0.4%	0.5%	0.5%	0.5%	0.4%
aged 55-59	5.7%	5.9%	5.7%	5.8%	5.9%	5.8%
aged 60-64	3.8%	3.9%	4.0%	4.0%	4.1%	3.8%
aged 65-69	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
aged 70-74	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
aged 75+	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%

Survivor pensions

- In the pension expenditure projections for the baseline scenario, survivors' pension contributes positively to overall increase in expenditure as result of the ageing process as well as its indexation that is similar to old-age pensions.
- The number of male survivors is negligible.
- Benefits for survivors are calculated in a different way. Total pension payments for survivors in different age groups $TP_SUR(a, t, g)$ are determined in PROST by weighting the indexed pension payments for the survivors in the previous year and a percentage of the pension payment for new old age pensioners. The weight of new average pension is calculated as the inverse of the average duration of survivorship benefit. This method is used to take account of both the stock as a percentage of old age pensions and flow of the survivor pensions from the previous year. Thereafter, the average replacement rate is calculated. More details on the calculation of survivorship pension explained in Part 4 of the Fiche.

Alternative pension spending decomposition

Table A3 and Table A4 present the factors behind the change in public pension expenditures between 2013 and 2060 for pensions and pensioners.

Table A3: Factors behind the change in public pension expenditures between 2013 and 2060 using pension data for pensioners.

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60
Public pensions to GDP	0.3	-0.2	0.1	1.3	1.8	3.4
Dependency ratio effect	2.7	3.0	0.2	1.5	2.4	9.8
Coverage ratio effect	-1.0	-1.0	0.1	0.0	0.0	-1.8
<i>Coverage ratio old-age*</i>	-0.1	-0.3	0.0	0.1	0.2	-0.1
<i>Coverage ratio early-age*</i>	-1.3	-3.1	-0.1	0.1	0.3	-4.1
<i>Cohort effect*</i>	-2.7	-1.3	0.7	-0.6	-1.3	-5.2
Benefit ratio effect	-0.5	-0.4	-0.1	0.3	0.2	-0.5
Labour Market/Labour intensity effect	-0.6	-0.6	-0.1	0.0	-0.1	-1.3
<i>Employment ratio effect</i>	-0.6	-0.7	-0.1	0.0	0.0	-1.4
<i>Labour intensity effect</i>	0.0	0.0	0.0	0.0	0.0	0.1
<i>Career shift effect</i>	0.0	0.0	0.0	0.0	0.0	0.0
Residual	-0.4	-1.1	-0.1	-0.5	-0.7	-2.8

As shown in Table 8a, over the period 2013-2060 pension expenditure as a percentage of GDP increases by 3.4 percentage points. Taking into consideration the entire projection horizon, this increase is entirely driven by the developments in the dependency ratio. The other factors play a mitigating effect with the contribution of the career shift effect, coverage ratio of the old-age, labour intensity effect and the benefit ratio effect being almost neutral. Over the period 2020-2030 public expenditure declines marginally by 0.2 p.p. while in the subsequent periods public expenditure is projected to increase. Over the period 2030-2040 pension expenditure rises marginally by 0.1 p.p. while in 2040-2050, pension expenditure increases by 1.3 p.p. the rise in expenditure is driven by the dependency ratio and the benefit ratio, in reflection of the entrance into effect of some expenditure-increasing reforms described above. Meanwhile, in 2050-2060 the increase in expenditure is driven by the dependency ratio effect, the coverage ratio effect and the benefit ratio effect.

Table A4: Factors behind the change in public pension expenditures between 2013 and 2060 using pensioners' data

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60
Public pensions to GDP	0.3	-0.2	0.1	1.3	1.8	3.4
Dependency ratio effect	2.7	3.0	0.2	1.5	2.4	9.8
Coverage ratio effect	-0.8	-0.7	0.3	0.1	0.1	-1.0
<i>Coverage ratio old-age*</i>	<i>0.1</i>	<i>0.2</i>	<i>0.3</i>	<i>0.2</i>	<i>0.3</i>	<i>1.1</i>
<i>Coverage ratio early-age*</i>	<i>-0.7</i>	<i>-3.4</i>	<i>-0.1</i>	<i>0.1</i>	<i>0.3</i>	<i>-3.8</i>
<i>Cohort effect*</i>	<i>-2.7</i>	<i>-1.3</i>	<i>0.7</i>	<i>-0.6</i>	<i>-1.3</i>	<i>-5.2</i>
Benefit ratio effect	-0.7	-0.7	-0.3	0.2	0.1	-1.4
Labour Market/Labour intensity effect	-0.6	-0.6	-0.1	0.0	-0.1	-1.3
<i>Employment ratio effect</i>	<i>-0.6</i>	<i>-0.7</i>	<i>-0.1</i>	<i>0.0</i>	<i>0.0</i>	<i>-1.4</i>
<i>Labour intensity effect</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>
<i>Career shift effect</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>
Residual	-0.4	-1.1	-0.1	-0.5	-0.7	-2.8

When assessing the factors behind the change in public pension expenditure by using pensioners' data as presented in Table A4, over the period 2013-2060, the benefit ratio and the coverage ratio have a different impact on the expenditure. The coverage ratio has a lower effect on the pension expenditure, while the benefit ratio has a more pronounced impact of a negative 1.4 p.p. on the pension expenditure.

Annex II: Description of contributory and non-contributory benefits

Contributory Schemes

1. Short-term Benefits:	
Unemployment benefit	i. Maximum entitlement for 156 days
Special unemployment benefit	ii. As in (i) but at a higher rate. Applicable to persons who would qualify for non-contributory Social Assistance.
Sickness benefit	iii. Entitlement 156 days but may in certain cases be extended to 312 days.
Injury benefit	iv. Payable for injury at work or contraction of industrial disease. Entitlement up to 12 months.
2. Long-term Benefits:	
Disablement Pension	v. Payable if injury or disease caused or contracted whilst at work is considered to cause a loss of physical or mental faculty calculated between 20% and 89%. Rates awarded according to degree of Disability. Where the degree of disablement is assessed at 90% and over, the person concerned is automatically awarded an Invalidity Pension at the full rate.
Invalidity Pension	vi. Payable to persons deemed permanently incapable for suitable full-time or regular part-time employment. Various rates according to different conditions.
Retirement Pension	vii. Payable to persons on reaching pension age (61 in the case of males and 60 for females). There are various rates and types of categories according to various statutory conditions. Rates vary according to different conditions.
Two-Thirds' Pension	viii. Earnings-related pension payable to persons who have retired after January 1979. This scheme basically provides for a pension equivalent to two-thirds of the insured person's pensionable income. There are applicable maximum and minimum rates. The two-thirds proportion may vary where the insured's contribution average is less than 50.
Widows Pension	ix. Payable to widows, irrespective of age, who are not gainfully occupied or who are carrying out gainful activities but have the care and custody of children under 16 years of age. Rates may vary according to conditions outlined in the Social Security Act.

Survivors' Pension	x. Earnings-related pension payable to a widow whose husband was entitled to a Two-Thirds' pension or whose husband would have been entitled to a pension had he reached retiring age at the time of his death.
Widowers' Pension	xi. Payable to Widowers' on the same conditions as that applicable to a female widow for a Widows pension. Rates equivalent to those of Widows' Pension.
Orphans' Allowance	xii. Weekly allowance paid to a guardian of a child or children who are under 16 years of age.
Orphans' Supplementary	xiii. Weekly pension paid to a guardian of a child or children whose age lies between 16 and 21 years and who are unemployed or employed but earning less than the Maltese National Minimum Wage.
Parents' Pension	xiv. Payable to a parent of an employed or self-occupation person, who died as a result of industrial disease or accident at work and whom, prior to death of son or daughter, depended solely on their financial resources for livelihood.
3. Lump-sum Payments:	
Marriage Grant	xv. One-time payment payable upon marriage to persons normally resident in Malta.
Re-Marriage Grant	xvi. Payable to a widow who remarries and hence forfeits her right to a widows' pension payment equivalent to one year's pension.
Disablement Gratuity	xvii. Payable to a person following injury at work and where the degree of disability is estimated as being between 1% and 19%.

Non-Contributory Schemes

1. Pensions	
Age Pension	xviii. Payable to citizens of Malta over 60 years of age.
Pension for the Visually Impaired	xix. Payable to a citizen of Malta over 14 years of age whose visual activity has been certified by an ophthalmologist to be so low so as to render such persons unable to perform any work for which eyesight is essential.
Pension for Persons with a Disability	xx. Payable to citizens of Malta over 16 years of age. Various types of disability are listed under the Social Security Act.
Carers' Pension	xxi. Payable to single or widowed citizens of Malta who are taking care on a full-time basis of a bed-ridden or wheel-chair bound near relative.
Social Assistance	xxii. Payable to heads of households and who are either unemployed or seeking employment and where the relative financial means falls below that established by the Social Security Act. Payable also to single persons who lack financial resources and who are caring for an elderly or physically/mentally handicapped relative on a full-time basis.
Emergency Assistance	xxiii. Granted to a female who is or has been rendered destitute by the head of household to the extent that she becomes an inmate of any institute for the care and welfare of such persons. This benefit is payable by the Department of Welfare.
Sickness Assistance	xxiv. Payable to persons suffering from a chronic disease or condition that requires a special diet.
Tuberculosis Assistance	xxv. Payable to head of household or any member of the household suffering from or has, within the last 5 years, suffered from Tuberculosis. This assistance is not subject to a means test.
Leprosy Assistance	xxvi. Payable to head of household or any member of the household who is receiving treatment for leprosy. It is not means tested.
Milk Grant	xvii. Payable to head of household receiving Social Assistance when he or any member of the household has the care or custody of a child under 40 weeks of

	<p>age requiring to:</p> <ul style="list-style-type: none"> • either be weaned or, • is losing weight in spite of being breast fed or, • is a member of a household receiving Tuberculosis Assistance.
Free Medical Aid	<p>xxviii. Payable to a person who on account of disablement, sickness, or disease (and who is not hospitalised), is in need of medical, surgical or pharmaceutical aid. Means-tested except in cases where the person is suffering from tuberculosis, leprosy, poliomyelitis or diabetes mellitus or other chronic diseases outlined in the Social Security Act.</p>

**Family Allowances & Maternity Benefits
(Also 'Non-Contributory' Benefits)**

Children's Allowance	<p>xxix. The children's allowance is partly flat-rate applicable universally. However there is over and above a means tested component which increases the basic flat rate according to an incomes test.</p>
Special Allowance	<p>xxx. Payable to locally residing female citizens of Malta who have the care of a child who is 16 years of age or over and who is either still at school or registering for employment. This is also means-tested.</p>
Disabled Child Allowance	<p>xxxi. Payable to locally residing citizens of Malta who have the effective custody of a child suffering from cerebral palsy or severe mental subnormality or is severely handicapped or have a child under 14 years of age who is blind.</p>
Foster Care Allowance	<p>xxii. Payable to recognised institutes for the care of children and to foster parents. The children are to be resident at a recognised institute and young persons or living with foster parents.</p>
Maternity Benefit	<p>xxiii. Payable to local residing pregnant citizens of Malta in respect of the last 8 weeks of pregnancy and the first 6 weeks after childbirth (for a total of 14 weeks benefits). Only payable if the female is not entitled to maternity leave from her employer, if employed. Not means tested.</p>
Bonus(1)	<p>xxiv. Payable to all persons receiving a pension, orphans' allowance, Social Assistance and Leprosy Assistance under the Social Security Act.</p>
Bonus(2)	<p>xxv. Payable to persons receiving a pension for services rendered in Malta, or ex-British Service pensioners, or persons over 75 years of age who receive a service pension.</p>

Additional Bonus	xxvi. Payable to all persons who receive bonus.
Supplementary Allowance	xxvii. Payable to households where the total income of the members falls below the limits outlined by the Social Security Act from time to time.