Economic Impact Assessment
White Paper "Pensions - Adequate and Sustainable"

Pensions Working Group

Economic Policy Division
Ministry of Finance
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Note

The workings in this document are based on simulations developed by the World Bank generated by the PROST Model. The data in the files were not subject to validation in the context of the preparation of this report. One should also keep in mind the degree of uncertainty inherent in medium to long term forecasts. This document was sub-tasked to the Economic Policy Division by the Management Efficiency Unit (MEU).

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Acronyms

WPS	White Paper Scenario
SGS	Slow Growth Scenario
MGS	Medium Growth Scenario
ALS	Alternative Labour Force Participation Scenario
AIS	Alternative Income Distribution Scenario
RWP	Reform White Paper Scenario
RSG	Reform Slow Growth Scenario
RMG	Reform Medium Growth Scenario
RAL	Reform Alternative Labour Force Participation Scenario
RAI	Reform Alternative Income Distribution Scenario
SSC	Social Security Contributions

Executive Summary

It is a well-known fact that industrialised countries around the world, including Malta are undergoing a major demographic transition. Population is growing at a slower pace than in the past, owing to the decline in the fertility rates. As a result of the gains in life expectancy, the share of young in the population is falling whilst that of older persons is rising. These phenomena are expected to have a negative effect on economic growth as the stock of working age population declines thus leading to a lower direct productive input. The expected decline in the support ratio is also likely to impact negatively on public finances due to increased pressure associated with expenditure on pensions and health care and the concomitant erosion in the tax base. Additionally, since the benefit under the current Pay-As-You-Go (PAYG) system is strongly influenced by the ceiling on contributions and benefits, inflationary developments are likely to erode the value of future average pensions relative to the average wage.

Population ageing is expected to have a significant impact on the performance of the Maltese economy as the smaller working age population is expected to limit the labour supply and thus affect negatively output growth over the medium to long term. The demographic changes are associated with a smaller number of persons in their prime working years who generally have a higher propensity to save than the rest of the population, thus the transition is likely to result in a smaller savings ratio. In view of the reduced savings pool, there would be fewer resources available to finance investment activity, and in the absence of capital flows, lower savings are likely to lead to a lower share of investment in output in Malta. Population ageing is also likely to result in deterioration in public finances due to increased pressure associated with expenditure on pensions and health care. Additionally, the fall in the savings ratio is expected to result in a worsening of the current account balance.

The decline in the support ratio under the status quo would clearly impinge on the number of contributors and beneficiaries in the system and consequently affect negatively the PAYG deficit to GDP ratio. After reaching a peak in 2030, the demographic developments over the long run lead to marginal improvement in the PAYG deficit to GDP ratio. Under the current regime, the average replacement rates for two-thirds pension beneficiaries are expected to fall significantly and in addition a decline in real average per capita benefits over the years is also envisaged. The crux of this result is robust to alternative macroeconomic, income distribution and labour force participation rates scenarios hence highlighting the importance in addressing the current status quo in order to ensure that future generations of retirees will have a decent standard of living in future.

The package of parametric and system reforms proposed in the White Paper may have negative short-term repercussions but are expected to have a favourable effect on economic growth in Malta over the medium to long term, relative to the no-reform scenario. By averting the implicit increase in the social security contribution that would be required to restore balance to the unreformed PAYG system, the reforms are also expected to have a beneficial effect on the consumption of both working age population

and the elderly. The reforms are also expected to have a beneficial effect on public finances.

The reform as proposed in the White Paper is effective in raising the support ratio relative to the no-reform scenario. The change in the number of contributors and beneficiaries under the system leads to a significant improvement in the PAYG deficit to GDP ratio over the forecast horizon. The reform is expected to have an unfavourable effect on the replacement rate for the non-switchers group who are unable to top up their income under the Second Pillar scheme. In contrast, while the average replacement rate for the switchers group from the reformed PAYG is comparable to the one applicable under the no-reform scenario, the total average replacement rate (First plus Second pillar) will be significantly higher when compared to the no-reform scenario, but still below the rates enjoyed by a person retiring in 2002 under the current system. Simulations demonstrate that the average replacement rate for the funded Second Pillar pension is sensitive to the assumed rate of return from the fund.

When compared to the no-reform scenario, the average replacement rates for the First Pillar pension following the implementation of the reforms results in a real average per capita benefits that is not falling over time. This is important in highlighting the effectiveness of the reform in sustaining future standard of living of retirees. The analysis of the reform under different macro economic assumptions shows that the reform is still generally effective in reducing the PAYG deficit as a ratio of GDP and in increasing the average replacement rate.

Defining fiscal sustainability as the tax rate that ensures that the ratio of debt to GDP remains at the initial level, calculations show that under the no-reform scenario, an imbalance of around 3 per cent of GDP was identified. The magnitude of this imbalance is sensitive to the assumptions on the ensuing rate of GDP growth. Delays in the necessary fiscal adjustment increase the sustainability gap significantly. The proposed pension reform is effective in reducing the gap to 0.6 per cent of GDP under the White Paper scenario. Yet this result is dependent on the success of structural reforms in raising output growth and excludes the effects of ageing on health expenditure on public finances.

The report identifies a class of policy measures, specifically those proposed by the White Paper, to address the current pension system. The multiplier effect on the economy of various measures is also illustrated. This class of policy measures includes changes to the social security contribution rates and reduction in government expenditure. Simulation results suggest that policy measures affecting both the demand side and the supply side of the economy have a negative and persistent impact on the economy. The negative effect can be virtually eliminated if such policies are imposed gradually and the supply side of the economy is not affected by the policy measure. The simulations also indicate that the higher the success rate of the voluntary Second Pillar scheme, the lower will be the magnitude of the negative effects of the mandatory scheme upon its introduction. Simulations also indicate that policies which focus on the expenditure side (including those contained in the White Paper) tend to have a less permanent negative effect on

output. The forecasted impact of the reform could however be affected through exogenous supply side shocks.

In conclusion, it is worth emphasising that the expected gains in economic growth associated with pension reform are primarily attributable to labour market reforms and changes to the effective retirement age, as international experience suggests that the growth effects of the switch to a funded pension system are likely to be limited. Thus the success of the pension reform in contributing positively to economic growth hinges significantly on the extent that labour market reform is successful in raising the participation rates as well as the implementation of structural initiatives aimed at improving the functioning of the product and capital markets.

1. Introduction

Malta is facing a major demographic shift over the next fifty years. The decline in the fertility rates that followed the baby boom in the post-war period and the increasing life expectancy are expected to lead to an ageing and declining population stock. These phenomena are expected to have a negative effect on economic growth as the stock of working age population declines thus leading to a lower direct productive input. The expected decline in the support ratio (number of employees per retiree) is also likely to impact negatively on public finances due to increased pressure associated with expenditure on pensions and health care and the concomitant erosion of the tax base. Additionally, since the benefit under the current Pay-As-You-Go (PAYG) system is strongly influenced by the ceiling on contributions and benefits, inflationary developments are likely to erode the value of future average pensions relative to the average wage.

The aim of this document is to provide an assessment of the White Paper 'Pensions – Adequate and Sustainable'. In accordance to the Terms of Reference set at the outset, the document will address:

- the economic impact if no changes are carried out to the pensions system;
- the economic impact of the proposed reforms to the pensions system and how the proposed reforms compare to the no-reforms scenario;
- the intertemporal and generational impact of the proposed reform on retired persons retiring over the short, medium and long term;
- the impact on the cost of production and labour as well as the multiplier effect due to the potential decrease in disposable income arising from the introduction of the Second Pillar pensions scheme on a
    i. voluntary
    ii. mandatory basis.

This document will proceed by reviewing international studies into the economic impact of population ageing (the no-reform scenario) and apply these results to the Maltese context in Section 2. Section 3 and Section 4 will provide an analysis of the economic environment assumed to prevail in the White Paper and subsequently assess the implications of population ageing for pension sustainability and individual benefits under alternative macroeconomic and labour market scenarios using PROST. Section 5 will illustrate the likely economic impact of pension reform in Malta. Section 6 will assess the impact of reform on the sustainability of the First Pillar pension and individual benefits under alternative macroeconomic and labour market scenarios, whilst granting special attention to the intertemporal and generational aspects of pension reform. Section 7 will consider the impact of ageing and pension reform on the sustainability of public finances in Malta, using a quantitative indicator of fiscal sustainability. Section 8 will report the simulation result of the impact of selected policy options specified in the White Paper on the economy using the Structural Annualised Econometric Model for Malta (SAMM). Section 9 will summarise the main findings.

2. The Economic Implications of Population Ageing

It is a well-known fact that industrialised countries around the world, including Malta are undergoing a major demographic transition. Population is growing at a slower pace than in the past, owing to the decline in the fertility rates. As a result of the gains in life expectancy, the share of young in the population is falling whilst that of older persons is rising. The ageing process has been going on for some time in some countries and has coincided with a period of increased economic prosperity, as older people lead healthier lives than in the past and thus continue to contribute to society even beyond the statutory retirement age. However a less optimistic view associates population ageing with the possibility of slower economic growth, less innovation, financial market instability and unsustainable public pension systems.[1] This Section will report the results emanating from international studies into the economic impact of population ageing and discuss the relevance of these results for Malta. These studies can be mainly split into two categories: econometric results and calibrated economic models.

2.1 Econometric Analysis

The IMF, in the World Economic Outlook for September 2004, published the results of an econometric study into the relationship between demographic variables and a set of macroeconomic variables which include per capita GDP, saving, investment, the current account and fiscal balance. The study was based on a panel data-set of 115 countries representing all major geographic regions, over the period 1960-2000. Although Malta was not among the countries incorporated in the study, the results are broadly generalisable to the Maltese context since the study covers a cross-section of countries of different levels of development and spans over a long period of time.[2]

The main results reported in the paper are reproduced in Table 2.1. Although the authors of the study caution against interpreting correlations as causal relationships, it is notable that the results of the regression analysis are broadly consistent with economic theory. In particular, per capita output growth is positively correlated with changes in the growth rate of the working-age population thus reflecting the direct productive impact of a larger workforce whilst economic growth is negatively correlated with changes in the share of the elderly in total population.

The study is also insightful in its findings on the relationship between demographics and saving. According to the life-cycle hypothesis, individuals attempt to 'smoothen' their consumption over their lifetime. Consumption and saving behaviour over the lifecycle depend on the size of current income in relation to lifetime income. Thus young people tend to be net-borrowers, older people at the peak of their earnings profile tend to be high savers while the elderly tend to dissave or save at a lower rate.[3] Consistent with this theory, the study reports that the savings ratio is positively correlated with the share of

[1] IMF (2004) pg. 137
[2] More details about the methodology of the study can be found in Appendix 3.1 of IMF (2004)
[3] IMF (2004) pg. 146

working age population and negatively correlated with the share of elderly in total population. Changes in the saving behaviour also affects the pool of resources available to finance future investment. Thus, another related result reported in the study is the positive correlation between the share of the working-age population and investment.

The study also suggests that the current account balances increase with the relative size of the working age population, and decrease when the elderly dependency ratio rises, a result that is in line with recent empirical findings.[4] Importantly, demographic factors also affect the budget balance as the share of elderly population is negatively correlated with budget balance. This reflects the adverse effect of population ageing on the budget balance due to higher spending on pensions, health care as well as a shrinking tax base.

Another important effect of demographic changes on the economy reflects the pressure of population ageing on real equity prices in industrialised countries. In particular, the empirical literature finds a robust relationship between the proportion of high net-savers in the population and asset prices, suggesting that the ageing of the baby-boomers generation could cause real stock prices to decline.[5]

On the basis of the econometric results, the study concludes that the projected demographic changes could have a substantial impact on growth in advanced countries. In particular, demographic changes could reduce annual real GDP per capita by around half a percentage point in Europe.[6]

2.2 The INGENUE Model

The INGENUE model is a multi-region world model where the structure of each regional economy is based on an applied Overlapping-Generations model. Overlapping-Generations models are a class of economic models in which economic agents live for a finite length of time, which is long enough in order to live for at least one period of time along with the next generation of agents. This modelling structure makes them useful in illustrating the economic impact of population ageing and pension reform.

In the INGENUE model, the world is divided into six regions where regions are ranked

Table 2.1 Macroeconomic Impact of Demographic Changes

	Growth in Real Spending per capita	Saving/GDP	Investment/GDP	Current Account/GDP	Budget Balance/GDP
Impact of:					
Share of working-age population	**0.08**	**0.72**	**0.31**	**0.05**	0.06
Share of elderly population	**-0.04**	**-0.35**	-0.14	**-0.25**	**-0.46**

Source: World Economic Outlook, September 2004

Bold-faced values are statistically significant at the 10 per cent level.

[4] see Luhrmann (2003)
[5] IMF (2004) pg. 150
[6] ibid pg. 148

according to their stage in demographic transition. There are three main categories of economic agents: households, firms and the public sector. The equilibrium is obtained by equating in each region, the optimal labour demand to the exogenous labour supply, and the regional sum of savings to the regional demand for investment. The calibration involves setting the fertility rates and households' life expectancy according to demographic projections. Other important parameters, including the coefficients governing households' and firms' behaviour, technological convergence and replacement rates for the pension system, are based on historical data.[7]

Results from the model suggest that demographic changes over the next fifty years are expected to lower GDP growth, although the effect on per capita growth will not be as large due to slowing population growth. The effect of ageing on output growth is accentuated amongst rapidly ageing countries, a category that includes the European Union countries. Saving rates in Europe are expected to decline sharply as the working-age population falls and the share of elderly in the population rises. This result reflects the dynamics of the pension systems as the contribution rates need to rise in order to finance the additional expenditure that results from the increase in retirees. This represents a transfer of resources from the high-saving working-age population to the elderly who have a lower or negative propensity to save.[8]

The decline in the working age population results in an increase in the marginal product of labour and consequently an increase in the capital/labour ratio, whilst the marginal product of capital is expected to decline. Thus, as a result of the decline in the savings ratio and in the marginal product of capital, the share of investment in GDP declines, with the most pronounced declines recorded in the fastest-ageing countries.

The results reported here are subject to a degree of uncertainty especially as regards the behaviour of household saving. In particular, the rising life expectancy could induce elderly persons to maintain their wealth rather than dissaving in retirement. Additionally, since individuals are assumed to be forward-looking, they are likely to expect that incomes in the future would be lower due to demographic changes. This in itself could induce economic agents to save in the near-term in excess of what is predicted by the INGENUE model.[9]

2.3 Application to Malta

In the view of the terms of reference of this document, the conclusions of the studies described in this section provide a valuable insight into the likely effects of population ageing on the Maltese economy. As it was already emphasised, the results from the econometric analysis conducted by the IMF are relevant to the domestic policy context as the study covers a cross-section of countries at different levels of development whilst spanning a long period of time. Additionally, in absence of an Overlapping-Generations model calibrated with the Maltese data, the results reported above based on simulations

[7] IMF (2004) pg. 173
[8] ibid pg. 154
[9] ibid pg. 154

using the INGENUE model are pertinent in illustrating the likely dynamic effects of demographic changes on households' consumption and savings behaviour, industrial production, internal and external balances.

Thus, on the basis of the results described above, population ageing is expected to have significant economic costs on the Maltese economy. The reduction in the working age population is expected to constrain the supply of labour and thus it is likely to have a negative effect on output growth in Malta in the medium to long run. Additionally, the lifecycle hypothesis predicts that persons in their prime working years tend to be high savers, in contrast with the young or the elderly who generally have a low or negative propensity to save. Demographic transition in Malta is expected to reduce the size of the working age population (including the number of persons at their prime working years) whilst increasing the number of elderly. This is likely to result in a reduction in the savings ratio. Further reduction in the savings ratio is highly undesirable given that the savings rate for January-September 2004 stood at 2.4 per cent.[10] Consequently, since lower savings restricts the pool of resources accessible to finance investment activity, in the absence of capital flows (including foreign direct investment), lower savings is likely to lead to a lower share of investment in output in Malta.

Population ageing is also expected to have significant implications for Government finance, especially in terms of the sustainability of the current pension and health system. The relevance of population ageing for fiscal sustainability will be discussed in Section 7.

The current account balance is also negatively associated with the share of the elderly in the population. The fall in the savings ratio implies an increase in absorption relative to income. This implies an increase in the current account deficit and a consequent need to finance the excess absorption from capital inflows. Given that the current account in Malta is in deficit, any further deterioration in the current account balance would exacerbate the external imbalance.

Having identified the likely macroeconomic impact of population ageing (in the absence of pension reform), this document will proceed by analysing the economic environment assumed in the White Paper and subsequently testing the sensitivity of the implications of population ageing for pension sustainability under alternative scenarios using the PROST model. Particular emphasis is also assigned to the impact of no reform for the affluence of retirees.

[10] Ministry of Finance (2004) pg. 41

3. An Assessment of the Macroeconomic Assumptions in the White Paper

The simulations carried out using PROST in the White Paper are based on two sets of assumptions:

i) Macro Economic Variables and
ii) Pension Specific Assumptions.

The following section will assess the macroeconomic assumptions in the White Paper in the light of current macroeconomic data and forecasts for the Maltese economy. The forecast assumptions are evaluated in line with the current projections as published in the Update of the Convergence Programme presented by the Maltese authorities to the European Commission in accordance to Council Regulation (EC) No 1446/97 in November 2004.

The macroeconomic assumptions in the White Paper assume that Gross Domestic Product (GDP) in real terms will grow by 4 per cent per annum until 2020 and this rate will converge to 2.5 per cent for the future years up to the end of the forecast horizon (2072). This leads to an average growth rate of GDP of around 3.0 per cent over the forecast period. The inflation rate is assumed at 2.5 per cent over the modelling period. Furthermore, the White Paper assumes an increasing labour force participation rate for women, reaching 55 per cent by 2020, further increasing to 62 per cent from 2021 onwards. In rendering the economy more competitive a number of structural changes will need to be undertaken over the next few years. The Report assumes that in the light of these structural changes the unemployment rate will reach 7 per cent during the years of restructuring and once this period is over, mainly after 2015, the economy will perform at a better rate and thus unemployment will level out at 6 per cent.

One could immediately point out a divergence in the assumed growth rates for GDP in the White Paper and in the Convergence Report, clearly the assumptions in the White Paper are for a more robust growth of the Maltese economy over the forecast period. The White Paper assumes that the increase in the supply of labour (through the increased women participation rate) is being met by an increase in demand for labour, which demand will be boosted through improvements expected to materialise over the years in the economy. This increase in demand will accommodate the extra supply of labour, and thus the expected increase in unemployment is reduced in the long run. The White Paper, thus assumes a ‘best’ case scenario, where the additional supply of labour is fully accommodated by the increase in the demand for labour, and by the success of structural reforms which ensure an improvement in productivity. The White Paper assumes that this should lead to an improvement in GDP and hence the assumed rate of growth of 4 per cent per annum from 2005 to until 2020.

It should be pointed out at the outset that the simulations carried out in this report are based on two particular scenarios which were indicated as the ‘base case’ in the White Paper (file called I_Maltabasec) and as the ‘reform’ scenario (file called I_Malta

model2cp6750). It is pertinent to note that for analysis purposes, the contribution of the State with respect to persons (currently 1/10) is excluded from the revenue component, given that according to the World Bank, the yardstick to determine a pensions deficit should exclude the State's contribution. Furthermore, one should highlight that health expenditure is excluded from the calculations, even though a proportion of expenditure on health by Government is financed through the Social Security contributions.

4. An Analysis of the Baseline Case under Alternative Assumptions

This section starts with an evaluation of the baseline scenario, which for analysis purposes will be called the 'White Paper Scenario' (WPS). In line with the Terms of Reference, this section deals with the economic impact if no changes are carried out to the pension system. Various important indicators will be evaluated to assess the impact of no change in the current pensions system on individuals and on Government's public finances. For analysis purposes a number of other scenarios have been undertaken, using PROST, in order to assess the sensitivity of the result to a range of different assumptions.

Scenario 1 will describe the likely impact on the individual and on public finances of the current pension system if a worst case scenario in terms of macroeconomic assumptions is assessed. This scenario will be referred to as a 'Slow Growth Scenario' (SGS). The SGS will assume that GDP will grow at a significantly lower rate in the forecast years when compared to the WPS. GDP is assumed to grow at an average of 1.7 per cent over the forecast years. Inflation is assumed at an average rate of 1.5 per cent whilst productivity is assumed to grow at an average rate of 1.6 per cent over the forecast period.

Scenario 2 will describe the likely impact on the individual and on public finances of the current pension system if a 'medium' case scenario in terms of macroeconomic assumptions is assessed. This scenario will be referred to as a 'Medium Growth Scenario' (MGS) and in this scenario GDP is assumed to grow at a moderate rate over the forecast period, averaging 2.4 per cent over the forecast horizon. Inflation is assumed at an average rate of 2.2 per cent whilst productivity is assumed to grow at an average rate of 2.3 per cent over the forecast period.

Scenario 3 will discuss the affect on the individual and on public finances of changes in the assumption for the growth rate in the labour force participation rate for women. Whilst the macroeconomic assumptions are kept as in the WPS, this scenario assumes that the labour force participation rate of women grows at a slower rate when compared to the rate assumed in the WPS. In this report this scenario will be referred to as the 'Alternative Labour force participation rate Scenario' (ALS).

Various documents show that the growth rate of the labour force participation rate for women assumed in the WPS is on the high side and thus the need for such a scenario. According to figures published in the Labour Force Survey, the labour force participation rate for women in 2002 stood at 37.6, as against the 43 per cent imputed in the WPS. The National Action Plan for Employment (NAP) also includes a set of targets for the growth rate in the labour force participation rate for women. The NAP specifically states (Table 1 page 15) that the target is to increase the labour force participation rate for women to 40.7 per cent by 2010. In the WPS the labour force participation rate for women is assumed to increase to 55 per cent by 2020 and 62 per cent from 2021 onwards. The ALS assumes that the labour force participation rate for women in 2002 stood at around 37 per cent, in 2020 it will increase to 50.7 per cent, rising gradually to 57 per cent by 2072.

From our analysis it was also deemed necessary to evaluate the likely sensitivity of the current pension system to the assumptions taken for income distribution of households by gender. This fourth scenario will be referred to as the 'Alternative Income Scenario' (AIS) in this report. The current projections in the White Paper assume an average annual wage in 2002 of around Lm 4,000. A scenario was undertaken whereby use was made of information taken from the Distribution of reference persons by individual disposable income group from the Household Budgetary Survey 2000. This alternative distribution of income was assumed in the baseline scenario to evaluate the workings under the current pension system. Internal calculations show that the average wage for 2002 stood at around Lm4,900.

The following sub-sections will discuss in further detail the results for each of the scenarios described above. The development of the pensions system over time is analysed in this section by various indicators, related to the demographic trends of the system, to the contributors and beneficiaries of the system, to the financial implications of the system and to the individual benefits to the individual accruing from the system over the years.

4.1 Baseline Scenario: White Paper Scenario (WPS)

The following section will discuss the main results of projections carried out using PROST if the current pension system is maintained and if the assumptions taken in the White Paper provide a base for future projections. As already explained, the scenario in the White Paper is assumed to be a 'best' case scenario, with GDP growth of 4 per cent in the forthcoming years, an inflation rate of 2.5 per cent and real wage growth of 3 per cent. A number of assumptions are also made with regards to demographic patterns, where the participation rate for males is expected to fall gradually from 85 per cent assumed for 2002 to 78 per cent in 2072, whilst the participation rate for females is expected to increase significantly over the forthcoming years to reach 62 per cent by 2021. The baseline also assumes an annual increase of 500 immigrants and 150 returned migrants, whilst specific assumptions are imposed on fertility rates and the probability of dying.

As shown in Table 4.1, a considerable number of demographic factors can be singled out for the forecast years. In particular, the share of the population above retirement age is expected to increase from around 17 per cent in 2002 to around 29 per cent in 2030 and around 34 per cent in 2072. This implies that whereas each person of retirement age is currently supported by around 4 persons of working age, by 2072 this will drop to less than 2 persons. This is in part explained by the changes in the average life expectancy at birth and at retirement and by demographic developments over time.

Table 4.1 Demographic Trends (White Paper Scenario)

	2002	2005	2010	2015	2020	2030	2040	2050	2060	2070	2072
Total Population (thousands)	397	399	404	408	410	410	398	388	381	369	366
Male	197	198	200	202	204	203	198	194	191	184	183
Female	200	201	204	205	207	206	200	194	191	184	183
Share (% of population)											
0 - 14	19.0	17.0	15.0	14.0	14.0	14.0	14.0	14.0	15.0	16.0	16.0
15 - Ret. Age	65.0	65.0	64.0	62.0	59.0	57.0	54.0	50.0	48.0	50.0	51.0
Ret. Age +	17.0	18.0	21.0	24.0	27.0	29.0	32.0	35.0	37.0	34.0	34.0
Support Ratio:											
Age 15-Ret. Age / Ret. Age +	3.9	3.6	3	2.6	2.2	1.9	1.7	1.4	1.3	1.5	1.5
Male Life Expectancy:											
At Birth	75.7	75.9	76.4	76.8	77.3	78.3	79.5	80.7	81.3	82.0	82.1
At Retirement	17.9	18.1	18.4	18.8	19.2	19.9	20.7	21.6	22.0	22.6	22.7
Female Life Expectancy:											
At Birth	80.0	80.3	80.8	81.3	81.9	82.6	83.3	84.1	84.8	85.5	85.6
At Retirement	22.2	22.4	22.8	23.2	23.7	24.2	24.8	25.4	25.9	26.5	26.6

The demographics of the Maltese population also impact on the number of total contributors and beneficiaries of the system. As shown in Table 4.2 the 2/3 beneficiaries are expected to rise significantly over the forecast period, from around 25 thousand to around 91 thousand by 2072. The other pension beneficiary categories are not expected to register significant increases, while top-ups (as defined in PROST) are expected to die out over the years.

The increase in the number of beneficiaries is attributable to a number of factors, in particular, the increase in population ageing and the increase in the participation rate of females. As a per cent of the total population, the number of two-thirds beneficiaries is expected to reach 25 per cent in 2072 from the 7 per cent for 2002. The total number of effective contributors is expected to register marginal increases over the medium term, from around 152 thousand in 2002 to 155 thousand in 2015, falling to 122 thousand by 2072. This primarily results from demographic developments expected over the forecast period, which exceed the expected increases in contributors arising from the increase in women labour force participation rates. As a percentage of total population, effective contributors in 2072 fall to around 33 per cent from the 38 per cent registered in 2002.

The trajectory of the pension system for the forthcoming years significantly impacts on the state of public finances and in particular on the financial sustainability of the current pension system. As explained above, for modelling purposes, it is assumed that in the baseline the State contribution is not included in the income collected by Government, given that according to the World Bank, the yardstick to determine a pensions deficit should exclude the State's contribution.[11] Table 4.3 includes the impact of the current pension system on public finances if both the state contribution is included or excluded.

[11] The Pensions Working Group (2004) pg. 44

Without State contribution, the deficit on the social security system stood at around Lm10 million, if state contribution is included a surplus of around Lm50 million is registered. As shown in the table, this accounts for a deficit of around 0.6 per cent of GDP if the state contribution is excluded and to a surplus of 2.9 per cent of GDP if the state contribution is included. Over the forecast period, the deficit on the Social Security System (without State contribution) account is expected to peak at around 5.4 per cent in 2030 and fall to around 3.9 per cent in 2072. It is notable that despite the high female participation rate assumed throughout the forecast, demographic developments still lead to a deterioration in the PAYG balance to GDP when compared to the current ratio. With state contribution the deficit will peak at around 4.5 per cent in 2050 but fall marginally to 3.5 per cent by 2072. If converted to net present value terms, the deficit on the social security system in 2030 is expected to widen by a maximum of approximately Lm60 million (excluding State contributions). Projections of the PROST model also provide the required employers and employee contribution rate necessary to balance the budget. In 2002, a rate of 20.2 per cent is needed whilst the highest rate required to ensure a balance in 2020 is around 30.0 per cent.

Given the expected demographic developments one would have expected a significantly higher increase in the ratio of social security deficit to GDP over the forecast years. However, one has to recall that given the current nominal ceilings on benefit and contribution rates, then this progressive increase is much lower than expected. Thus, in spite of the capping system, the deficit in Net Present Value terms expands significantly due to the demographic developments.

Table 4.2 Contributors and Beneficiaries (White Paper Scenario)

	2002	2005	2010	2015	2020	2030	2040	2050	2060	2070	2072
Effective Contributors (thousands)	152.0	151.5	154.6	155.3	153.1	144.3	135.2	126.5	119.5	121.4	122.2
Male	102.5	101.1	101.2	100.4	98.0	91.7	83.4	75.1	69.1	68.3	68.4
Female	49.5	50.4	53.4	54.9	55.1	52.6	51.8	51.4	50.4	53.1	53.9
Total Beneficiaries (thousands)											
2/3 retirement pension	25.6	27.1	36.0	44.5	53.2	64.9	77.0	91.9	100.3	93.0	91.1
invalids	5.6	6.5	6.8	7.2	7.4	8.1	8.5	8.0	7.1	6.7	6.7
survivors	12.5	13.0	14.4	15.8	17.4	19.9	19.8	19.0	19.1	17.3	16.7
top-ups	13.6	13.5	13.6	13.1	11.9	8.3	3.0	..	..	..	..
Total Beneficiaries (% of population)											
2/3 retirement pension	6.5	6.8	8.9	10.9	13.0	15.8	19.3	23.7	26.3	25.2	24.9
invalids	1.4	1.6	1.7	1.8	1.8	2.0	2.1	2.1	1.9	1.8	1.8
survivors	3.1	3.3	3.6	3.9	4.2	4.9	5.0	4.9	5.0	4.7	4.6
top-ups	3.4	3.4	3.4	3.2	2.9	2.0	0.8	0.0	0.0	0.0	0.0
Effective Contributors (% of population)	38.3	38.0	38.2	38.1	37.3	35.2	34.0	32.6	31.4	32.9	33.4

Table 4.3 Fiscal Sustainability (White Paper Scenario)

Lm (million)

	2002	2005	2010	2015	2020	2030	2040	2050	2060	2070	2072
Without state contribution											
Employer and Employee Contributions	120.0	116.0	150.0	191.0	230.0	286.0	331.0	381.0	442.0	549.0	575.0
PAYG Total Expenditure	130.0	147.0	223.0	324.0	454.0	755.0	1,094.0	1,613.0	2,408.0	3,122.0	3,256.0
Pension Payments	121.0	137.0	210.0	307.0	433.0	729.0	1,067.0	1,587.0	2,382.0	3,100.0	3,236.0
Other Payments	6.0	6.0	9.0	11.0	14.0	18.0	17.0	14.0	13.0	5.0	3.0
Adminstrative Costs	4.0	3.0	4.0	6.0	7.0	9.0	10.0	11.0	13.0	16.0	17.0
PAYG Current Balance	-10.0	-31.0	-73.0	-134.0	-223.0	-469.0	-763.0	-1,231.0	-1,967.0	-2,574.0	-2,681.0
As % of GDP											
PAYG Total Revenue	7.1	6.1	5.7	5.3	4.7	3.3	2.3	1.6	1.2	0.9	0.8
PAYG Total Expenditure	7.8	7.7	8.5	9.0	9.2	8.7	7.7	6.9	6.3	5.0	4.7
PAYG Current Balance	-0.6	-1.6	-2.8	-3.7	-4.5	-5.4	-5.4	-5.3	-5.2	-4.1	-3.9
Net Present Value											
PAYG Total Revenue	119.9	96.2	86.2	75.9	63.6	37.9	21.0	11.6	6.4	3.8	3.5
PAYG Total Expenditure	130.3	121.9	128.3	129.1	125.2	99.9	69.4	49.1	35.2	21.9	19.7
PAYG Current Balance	-10.5	-25.7	-42.1	-53.2	-61.6	-62.0	-48.4	-37.5	-28.7	-18.0	-16.2
With state contribution											
PAYG Total Revenue	180.0	174.0	225.0	286.0	346.0	429.0	497.0	572.0	662.0	823.0	863.0
Employer and Employee Contributions	120.0	116.0	150.0	191.0	230.0	286.0	331.0	381.0	442.0	549.0	575.0
PAYG Total Expenditure	130.0	147.0	223.0	324.0	454.0	755.0	1,094.0	1,613.0	2,408.0	3,122.0	3,256.0
Pension Payments	121.0	137.0	210.0	307.0	433.0	729.0	1,067.0	1,587.0	2,382.0	3,100.0	3,236.0
Other Payments	6.0	6.0	9.0	11.0	14.0	18.0	17.0	14.0	13.0	5.0	3.0
Adminstrative Costs	4.0	3.0	4.0	6.0	7.0	9.0	10.0	11.0	13.0	16.0	17.0
PAYG Current Balance	49.0	27.0	2.0	-38.0	-108.0	-326.0	-597.0	-1,040.0	-1,746.0	-2,299.0	-2,394.0
As % of GDP											
PAYG Total Revenue	10.7	9.1	8.6	8.0	7.0	5.0	3.5	2.5	1.7	1.3	1.3
PAYG Total Expenditure	7.8	7.7	8.5	9.0	9.2	8.7	7.7	6.9	6.3	5.0	4.7
PAYG Current Balance	2.9	1.4	0.1	-1.1	-2.2	-3.8	-4.2	-4.5	-4.6	-3.7	-3.5
Net Present Value											
PAYG Total Revenue	179.6	144.2	129.2	113.9	95.4	56.8	31.5	17.4	9.7	5.8	5.2
PAYG Total Expenditure	130.3	121.9	128.3	129.1	125.2	99.9	69.4	49.1	35.2	21.9	19.7
PAYG Current Balance	49.3	22.3	0.9	-15.3	-29.8	-43.1	-37.9	-31.7	-25.5	-16.1	-14.5

Table 4.4 illustrates the impact of the current pension system, with the underlying assumptions as in the White Paper, on the development of benefits received by the individual beneficiary. The basic entry benefit replacement rates, which is the proportion of the first benefit received by the retiree to the wage earned while in employment, is less than the statutory 2/3 ratio, primarily due to the averaging mechanism used to calculate the entry benefit. For the two-thirds beneficiaries, the replacement rate falls from around 57 per cent in 2002 to around 8 per cent in 2072. Primarily this is a result of the existence of the maximum cap on benefits that are receivable, which render starting benefits even smaller in comparison to the increasing wages earned by retirees. Calculations show that after 2030, the average two-thirds retirement benefit declines in terms of purchasing power, implying a lower standard of living for beneficiaries. This indicates an important element of potential unsustainability of the current pension system, namely that

individual benefits would decline with respect to the wages earned in the economy and also in terms of their overall purchasing power – which implies a lower overall standard of living. One should note that given that this statistic is an average, it tends to fluctuate significantly in reflection of changes in the underlying distribution of the number of beneficiaries.

From the above analysis two very important conclusions can be derived:

1) The cost of the current pension system is expected to increase in the coming years, thus increasing the pressure on Government's finances. However, PAYG current balance as a share of GDP, improves slightly after 2050;
2) The actual benefits to pension earners over the years will fall thus implying a lower standard of living. This is of critical relevance in appreciating the urgency and importance of addressing the current status quo.

The following section will describe the main variations to the conclusions derived under the WPS as a result of a number of changes in the underlying assumptions. Each scenario is discussed in detail below. A comparison of the main variables under the different scenarios with the White Paper scenario is illustrated in Table 4.5.

4.2 Scenario 1: The Slow Growth Scenario (SGS)

This scenario assumes that GDP growth over the medium term is significantly weaker than the WPS scenario and over the full horizon the overall rate of GDP growth is assumed at 1.7 per cent. A lower rate of inflation (1.5 per cent) is also assumed in this scenario, while productivity is assumed to grow on average by 1.6 per cent.

Table 4.4 Individual Benefits (White Paper Scenario)

	2002	2005	2010	2015	2020	2030	2040	2050	2060	2070	2072
Avg Repl Rate for All Existing Beneficiaries	52.3	52.3	51.3	49.2	45.8	36.1	26.7	20.3	16.8	14.5	14.1
Avg Repl Rate for Existing 2/3 retirement pension	56.9	57.8	55.6	51.8	46.2	32.5	21.5	15.2	11.2	8.7	8.3
Total Payments to 2/3 retirement pension	58.8	68.5	115.4	178.1	258.2	420.4	611.9	918.3	1264.5	1471.5	1506.4
Total Benefit Payments	121.0	137.2	209.9	307.3	432.8	728.8	1067.3	1586.9	2382.5	3100.4	3235.7
Average per capita retirement benefit											
2/3 pensioners (nominal)	2294	2522	3206	4006	4856	6475	7942	9998	12612	15826	16540
Growth Rate (%)		2.9	4.9	4.4	3.6	1.9	2.2	2.4	2.4	2.2	2.2
2/3 pensioners (real)	2294	2391	2686	2966	3178	3311	3172	3120	3074	3014	2998
Growth Rate (%)		0.4	2.3	1.8	1.1	-0.6	-0.3	-0.1	-0.1	-0.2	-0.3

Table 4.5 Comparison of Different Scenarios with White Paper Scenario (Main Indicators)

	2002	2005	2010	2015	2020	2030	2040	2050	2060	2070	2072
Total Effective Contributors (thousands)											
White Paper Scenario (WPS)	152.0	151.5	154.6	155.3	153.1	144.3	135.2	126.5	119.5	121.4	122.2
Slow Growth Scenario (SGS)	152.0	151.5	154.6	155.3	153.1	144.3	135.2	126.5	119.5	121.4	122.2
Medium Growth Scenario (MGS)	152.0	151.5	154.6	155.3	153.1	144.3	135.2	126.5	119.5	121.4	122.2
Alternative female Labour force participation Scenario (ALS)	151.4	145.0	148.2	149.3	147.5	139.5	130.6	122.3	115.4	117.2	118.0
Alternative Income Scenario (AIS)	152.0	151.5	154.6	155.3	153.1	144.3	135.2	126.5	119.5	121.4	122.2
Total Beneficiaries (thousands)											
White Paper Scenario (WPS)	57.3	60.1	70.8	80.6	89.9	101.2	108.3	118.9	126.5	117.0	114.5
Slow Growth Scenario (SGS)	57.3	60.1	70.8	80.6	89.9	101.2	108.3	118.9	126.5	117.0	114.5
Medium Growth Scenario (MGS)	57.3	60.1	70.8	80.6	89.9	101.2	108.3	118.9	126.5	117.0	114.5
Alternative female Labour force participation Scenario (ALS)	57.3	60.1	70.7	80.2	89.2	99.9	106.0	115.4	122.3	113.0	110.5
Alternative Income Scenario (AIS)	57.3	60.1	70.8	80.6	89.9	101.2	108.3	118.9	126.5	117.0	114.5
PAYG Current Balance (as % of GDP)											
White Paper Scenario (WPS)	-0.6	-1.6	-2.8	-3.7	-4.5	-5.4	-5.4	-5.3	-5.2	-4.1	-3.9
Slow Growth Scenario (SGS)	-0.6	-1.7	-3.2	-4.5	-5.7	-7.0	-7.2	-7.4	-6.9	-5.3	-5.0
Medium Growth Scenario (MGS)	-0.6	-1.7	-3.1	-4.1	-5.0	-5.9	-5.9	-5.6	-5.4	-4.3	-4.1
Alternative female Labour force participation Scenario (ALS)	-0.6	-1.9	-3.0	-3.9	-4.6	-5.4	-5.3	-5.2	-5.1	-4.1	-3.8
Alternative Income Scenario (AIS)	-0.2	-1.6	-3.3	-4.6	-5.5	-6.4	-6.3	-6.1	-5.8	-4.6	-4.3
Avg Repl Rate for Existing 2/3 retirement pension (%)											
White Paper Scenario (WPS)	56.9	57.8	55.6	51.8	46.2	32.5	21.5	15.2	11.2	8.7	8.3
Slow Growth Scenario (SGS)	56.9	57.4	57.0	55.5	53.2	47.3	41.6	35.7	28.8	23.6	22.7
Medium Growth Scenario (MGS)	56.9	57.4	58.3	56.5	53.2	44.1	35.1	25.7	19.1	14.3	13.5
Alternative female Labour force participation Scenario (ALS)	56.8	57.7	55.5	51.7	46.3	32.6	21.6	15.2	11.2	8.7	8.3
Alternative Income Scenario (AIS)	47.2	50.3	51.3	47.9	42.0	29.1	20.0	14.2	10.4	7.9	7.5

The changes in the above assumptions primarily impact on the macroeconomic side of the system. No changes are registered in the demographic forecasts for population, the share of the population above retirement age, the support ratio and life expectancy at birth and at retirement. Furthermore, no changes are registered for the number of contributors and the number of beneficiaries in the system.

As expected this scenario clearly illustrates the responsiveness of the projections to changes in the main macroeconomic assumptions. Under the SGS significant variations are recorded in the deficit to GDP ratio over the forecasted horizon. In particular, the deficit to GDP ratio is expected to peak at around the 7.5 per cent mark in 2050, compared to 5.3 per cent of GDP in the WPS. By 2072, the deficit will fall marginally to 5.0 per cent compared to 3.9 per cent in the WPS. The increase in the PAYG deficit is primarily the result of lower employer and employee contributions which more than offset the lower PAYG expenditure.

Under this scenario, the basic entry benefit replacement rates for 2/3 pensioners fall from 56.9 per cent in 2002 to 22.7 per cent in 2072. This is still considered to be a significant fall in the basic entry benefit but it is of a lower magnitude when compared to the base. This is the result of a lower rate of growth in the economy which results into a weaker increase in wages, (due to an assumed lower productivity increase) and thus a lower proportion of persons reaching the maximum ceiling on benefits. The nominal per capita retirement benefit is projected to grow at a much slower rate when compared to the base.

One should note that the real average benefit for the individual is very sensitive to the assumption for the inflation rate used to deflate nominal average benefits.

4.3 Scenario 2: Medium Growth Scenario (MGS)

This scenario analyses the developments in the pension system if a different set of macroeconomic assumptions are adopted for the forecast years. In particular, it is assumed that GDP growth over the medium term is significantly less robust when compared to the White Paper scenario but is of a higher magnitude when compared to the SGS. Over the full horizon of the forecast the overall rate of GDP growth is assumed at 2.4 per cent and an inflation rate of 2.0 per cent is also assumed over the long run. Productivity is assumed to grow by 2.3 per cent on average.

As in Scenario 1, no changes are registered in the demographic forecasts for population, the share of the population above retirement age, the support ratio and life expectancy at birth and at retirement. Furthermore, no changes are registered for the number of contributors and the number of beneficiaries. However, the different macroeconomic assumptions used in this scenario lead to a deficit to GDP ratio of 4.1 per cent in 2072, a go-between situation when compared to the SGS and the WPS. The deficit to GDP ratio is expected to peak in 2030 and reach 5.9 per cent.

Under this scenario, the basic entry benefit replacement rates for 2/3 pensioners fall from 56.9 per cent in 2002 to 13.5 per cent in 2072. This is still considered to be a significant fall in the basic entry benefit but it is of a slightly lower magnitude when compared to the WPS and of a higher magnitude when compared to the SGS. Compared to the WPS, the slower productivity growth is leading to a slower increase in wage growth and thus to a higher replacement rate for 2/3 pensioners over the forecast horizon. The slower increase in GDP also leads to a lower average per capita benefit in this scenario when compared to WPS scenario, but results are very sensitive to the rate of inflation assumed for the forecast period.

4.4 Scenario 3: Alternative Labour Force Participation Rate Scenario (ALS)

This scenario assumes that the labour force participation rate for women increases from around 37 per cent in 2002, to 50.7 per cent in 2020, rising gradually to 57 per cent by 2072. This trajectory for growth in the labour force participation rate for women is around 5 percentage points lower when compared to that in the WPS. The macroeconomic assumptions of GDP growth, inflation and productivity are kept as in the WPS.

The changes carried out in this scenario do not impact on the main demographic factors underpinning Maltese society. No changes are recorded in the total population, the share of the population of retirement age, the support ratio and life expectancy at birth and at retirement.

On the other hand, the change in the participation rate of women impacts on the number of contributors and beneficiaries of the social security system. As expected a fall is

projected in both the number of contributors and the number of beneficiaries to the system. In particular, the number of female effective contributors is expected to reach 50 thousand in 2020 when compared to 55 thousand in the WPS. By 2072 the number of females participating in the workforce will reach almost 50 thousand when compared to the projected 54 thousand in the WPS. A similar decline is also expected in the number of female beneficiaries to the system. It is projected that the number of female beneficiaries under this scenario will reach 36 thousand by 2072 as compared to the 40 thousand in the WPS. As a percent of the population this results into an overall drop for those receiving the 2/3 retirement pension from 24.9 per cent to 23.8 per cent

The drop in the number of contributors and beneficiaries impacts marginally on the amount of funds collected under the system from employee and employer contributions and the amount of funds given out as beneficiaries. Overall the impact on the ratio of the PAYG deficit to GDP is marginal and not forecasted to vary from the WPS. As expected no major changes are recorded in the entry benefit replacement rates and in the average per capita retirement benefit.

Nevertheless, a lower increase in the labour force participation rate for women could lead to a slower rate of economic growth, compared to that assumed in the WPS. Consequently, this could have a negative effect on social security contributions and the PAYG deficit ratio to GDP. However for the sake of this scenario, the economy is still expected to grow at the same rate and the possible effect on the economy of a lower female participation rate is not taken into account.

4.5 Scenario 4: Alternative Income Scenario (AIS)

The WPS assumes an income distribution which results in an average wage of around Lm4,000 for 2002. Based on data obtained from the Household Budgetary Survey 2000, an alternative scenario was undertaken, assuming an average wage for 2002 at around Lm4,900. *A priori* one would expect that this scenario will have a significant impact on wages earned by employed persons and thus on their contributors and expected benefits. This change is also expected to impact on the entry benefit of individuals.

Given the nature of this scenario no changes are recorded in the main demographic indicators and in the number of contributors and beneficiaries analysed for the social security system. The main impact of the higher wages arises on the employer and employee contributions collected by Government. By 2005 contributions increase in the scenario by Lm17 million when compared to the base, and by Lm14 million by 2010. The difference in employer and employee contributions under the two scenarios falls to just Lm4 million by 2072, primarily due to the maximum ceiling upon contributions. More people would reach the maximum cap and thus would reach the maximum amount of contributions, which they are required to make.

Expenditure by Government on pension payments also increases in the short term given that higher wages now serve as a base for the calculation of pension benefits. In the very short run the overall effect of the higher wages leads to a lower deficit to GDP ratio given

the increase in the contributions received by Government, but after 2005, the deficit to GDP ratio is higher to that obtained in the WPS. The main driving force behind this result is the current capping system on employer and employee contributions. As a per cent of GDP under the AIS the deficit will peak at 6.4 per cent in 2030 and fall to 4.3 per cent of GDP by 2072.

As expected under the AIS the replacement rate is lower given the increase in the wages of the employed. In 2002 a replacement rate of 47.2 per cent is recorded as compared to the 56.9 per cent registered in the WPS scenario. Over time the replacement rate is expected to fall to 7.5 per cent as compared to 8.3 per cent in the WPS scenario. When compared to the WPS the individual benefits decline in terms of their own purchasing power at a higher rate, implying an even lower standard of living. It is pertinent to note that the results in this section are based on the macroeconomic assumptions of the White Paper Scenario. One would expect a worsening of the average replacement under a less optimistic economic scenario.

4.6 Conclusion

Under the no reform scenario, the demographic developments expected in the Maltese society, would clearly lead to a significant reduction in the support ratio (number of workers per retiree), clearly impinging on the number of contributors and beneficiaries in the system and thus on the social security deficit to GDP ratio (excluding State contribution). Over the forecast years the deficit to GDP ratio is expected to peak in 2030 at 5.4 per cent, but then fall marginally to around 3.9 per cent in 2072, primarily due to the demographic factors and the capping on benefits within the current system. Under the current pension system the replacement rates for two-thirds beneficiaries fall significantly from around 57 per cent in 2002 to around 8 per cent in 2072. In per capita terms, real average benefits decline over the years implying a lower standard of living for future beneficiaries. Thus the cost of the current pension system is expected to increase over the coming years, increasing the pressure on government finances, although there seems to be a minimal reversal in trend after reaching a peak in 2030. Actual average benefits to pension earners over the years will fall thus implying a lower standard of living. This is of significant importance in highlighting the need to address the current pension system at the earliest.

The analysis of a number of scenarios under different macroeconomic assumptions indicate the relevance of the above conclusions under different scenario options. The main impact on the current system of changes in the main macroeconomic assumptions arises in the PAYG deficit to GDP ratio and the replacement rates, which tend to be sensitive to the assumptions imposed. The deficit to GDP ratio under a slow growing macroeconomic framework serves to increase this ratio in all years of the forecast. In particular, the current situation would be in a worse state when compared to that assumed in the White Paper. However, the trajectory of the deficit to GDP ratio is still one of reaching a peak (even though at a later stage) and then registering a fall thereafter. Results show that the deficit to GDP ratio is quite sensitive to changes in the distribution of income. In fact, larger deficit to GDP ratios are registered, given the higher income earned by individuals. The analysis also shows that average replacement rates over the

forecast horizon are sensitive to changes in macroeconomic variables. In particular the main divergences arise under a scenario of slow growth, primarily due to the low increase in wages, thus leading to less persons reaching the maximum ceiling on benefits. Under the alternative income distribution scenario replacement rates throughout the forecast scenario are lower relative to the WPS.

This analysis has clearly demonstrated that even under alternative macroeconomic, income distribution and labour force participation rates assumptions, the current pension system would be unable to provide an adequate pension for future beneficiaries and the sustainability of the system would be at a risk if no reform is undertaken.

5. The Economic Impact of Pension Reform

In view of the significant implications of the demographic changes on the economy and particularly, the effect of ageing on the sustainability of public pensions, the debate on pension reform has been on the public policy agenda in several countries around the world, including Malta. This section will proceed by illustrating the likely economic impact of pension reform by referring to empirical results obtained from a study based on simulations using DG ECFIN's QUEST model by Mc Morrow and Roeger (2002). The QUEST model can be described as a neo-classical model over the medium to long run, with short run properties dictated by Keynesian features. For the purpose of the exercise the private household sector of QUEST was modified in order to capture intergenerational issues in such a way that it could be interpreted as a generalisation of the Overlapping-Generations model.[12]

5.1 Baseline Scenario

The baseline scenario of the QUEST model is based on the assumptions that participation rates stay at their 2000 level until 2050, no further reductions in the effective retirement age from the current level and unchanged generosity of the pension system. As shown in Table 5.1, population ageing results in a fall of GDP in the European Union over the period of 19 per cent or an average of 0.2 per cent per annum. As regards the fiscal impact, the social security contributions (SSC) as a percentage of wages are expected to rise to 26.9 per cent relative to baseline while public expenditure as a percentage of GDP is expected to rise significantly. The increase in the SSC is necessary in order to meet the pension expenditure obligations under the PAYG. Consumption of both the working age population and pensions is expected to decline by around 19.6 per cent.

Table 5.1 Baseline Scenario (QUEST Mode)l: Effect of Population Ageing

	Growth	Budgetary Impact		Income Distribution	
	GDP per capita	SSC as % of wages	Public Pension Expenditure as % of GDP	Working Age Population Consumption	Pensioners Consumption
2000	0.0	16.1	10.5	0.0	0.0
2030	-12.0	22.9	15.0	-11.9	-15.5
2050	-19.0	26.9	17.6	-19.6	-19.5

Source: Mc Morrow and Roeger (2002)

Figures are relative to scenario with no ageing assumed.

[12] For details see Annex I in Mc Morrow and Roeger (2002)

5.2 Parametric Reforms

The results presented in this sub-section assess the adequacy of parametric reforms aimed at bringing back the PAYG system in equilibrium. One main parametric change that is frequently considered in the pension reform debate is a reduction in the generosity of the current system. In Mc Morrow and Roeger (2002) this is achieved by changing the pension indexation system from one based on wages to a system based on price developments. However, there are several methods that can be used in order to reduce the generosity of the pension system, some of which are contemplated in the White Paper on pension reform in Malta. Particularly in the White Paper, a reduction in generosity is achieved by shifting to price indexation, changing the eligibility criteria for a full pension entitlement and directly via changes to the benefit formula.

When the net replacement rate is simulated to decline from 74 per cent in 2000 to 58 per cent in 2050 by shifting to a hybrid form of indexation, the SSC are required to rise by less than in baseline scenario in order to balance the system. Additionally, the movement to a hybrid indexation regime would have insignificant impact in terms of growth. In terms of income distribution, the reform is expected to improve the consumption of working age population as the rise in SSC is lower, but would have significant negative implications for pensioners' consumption.[13]

An alternative parametric reform involves raising the effective retirement age from the current level of 60 in the EU to the statutory retirement age of 65. The effect of this reform lightens the burden on workers by precluding the implicit increase in the SSC that would be required to balance the system in the baseline scenario whilst leading to a reduction in public expenditure on pensions. Mc Morrow and Roeger propose a rough rule of thumb that the public expenditure impact of an increase in the effective retirement age is to the order of one-to-one i.e. an additionally year of work prior to retirement, the implied increase in public expenditure on pensions would be reduced by 0.84. The increase in the retirement age has a significant effect on the level of GDP compared to baseline to the extent of offsetting a significant part of the loss in GDP associated with ageing. Thus raising the retirement age has significant positive supply-side effects according to the model. This reform option has also positive effects on the consumption of both working age population and pensioners relative to baseline.[14]

Mc Morrow and Roeger also present a broad reform package consisting of a reduction in the generosity of the system, an increase in the effective retirement age and labour market reforms aimed at stabilising the PAYG system by requiring an unchanged SSC over time. The labour reforms include raising the participation rates and reducing structural unemployment. Such package more than offsets the negative growth effect of ageing whilst ensuring fiscal sustainability. In terms of income distribution, working age population will still do better than pensioners due to decline in generosity of the system. Yet both groups witness improvements relative to baseline with the gains enjoyed by the working age population being of a larger magnitude.

[13] Mc Morrow and Roeger (2002) pg. 36
[14] ibid pg. 38

5.3 Systemic Reforms

In considering the transition from the PAYG pension system to a full or partially funded pension system one main issue deserving attention is the internal rate of return of both the PAYG and funded system. In the baseline scenario, funded systems enjoy a rate of return differential over the PAYG system that is likely to persist over the simulation period. This is in line with *a priori* expectations that the return on capital should be higher than the return on labour (the internal rate of return of PAYG) otherwise there would be no incentive to undertake the risks associated with investment.[15] The rates of return from the PAYG have been on a steep downward trend over time and there exists the possibility the returns to future contributors could turn negative.[16] It is apparent that the cost of the funded system for a worker that wants to assure a specific generosity level is very sensitive to the rates of return assumed. Thus the lower the prevailing rate of return earned on the funded pension, the less generous the pension received will be.

One pertinent reform scenario put forward by Mc Morrow and Roeger is the case where a mixed pension system (75% PAYG and 25% funded pension) and stabilisation of the PAYG system is implemented. The authors consider the move to a 100% funded system in the EU as unrealistic in view of the large transition burden that would be placed on the workforce if the transition were considered over a single generation.

Similar to the parametric reform scenarios explored above, the PAYG is brought into equilibrium, (by equilibrium implying, stabilising the PAYG SSC at the 2000 level) by implementing labour market reforms, reducing pension generosity and raising the effective retirement age to the statutory level. As a consequence of the pension reform, the EU economy is expected to make a large gain in terms of growth, more than wiping out the negative growth effects of population ageing. Yet one has to emphasise that a great proportion of the growth gains are attributable to the labour market and retirement age reforms with only a small proportion associated with the partial shift to funding. The final growth impact of the shift to funding is determined by the effect on the reform on savings behaviour.[17] In this regard the empirical literature provides no conclusive evidence of the effect of funded pensions on savings.[18]

The fiscal impact of the reform is positive with reductions in the required rise in SSC and government pension expenditure relative to the baseline. Additionally the consumption of both working age population and pensioners are expected to rise significantly when compared to the baseline, however the gains enjoyed by the working age population are of a greater magnitude.

Mc Morrow and Roeger emphasise that while a shift to funding would alleviate the negative growth effects associated with ageing, it is important to emphasise that the shift

[15] The internal rate of return on the PAYG is defined as the rate earned on contributions in terms of pension benefits.
[16] Mc Morrow and Roeger (2002) pg. 50
[17] ibid pg. 67
[18] see Barr (2000)

is accompanied by significant labour market reforms. The labour supply and savings gains that are crucial for future economic growth in any economy can only be achieved if pension reform is accompanied by a package of reforms aimed at raising labour force participation, reducing structural unemployment and raising the effective retirement age.

5.4 Application to Malta

This section has illustrated the impact of pension reform on economic activity in the European Union based on simulations using the QUEST model. In the absence of an Overlapping-Generations Model (or an equivalent alternative) calibrated with Maltese data, an important insight into the likely effects of pension reform on the Maltese economy can be gained by reference to international studies. Although the magnitudes reported in the paper are fairly sensitive to country specificities, the dynamic interlinkages described in the paper are broadly generalisable to the domestic policy context.

The reform proposed in the White Paper envisages a combination of parametric reforms and systemic reforms. The main parametric reforms include changing the pension indexation method, changes to the contribution period, changes to the accumulation period and changes to the retirement age. The first three reforms are likely to reduce the generosity of the pension system. Furthermore the introduction of a mandatory second pillar contribution represents a systemic development.

On the basis of the simulation results reported by Mc Morrow and Roeger, one expects the package of reforms to have a positive effect on economic growth in Malta over the medium to long term, relative to the no-reform scenario. The reforms are expected to have a beneficial effect on the consumption of both working age population and the elderly by precluding the implicit increase in the social security contribution that would be required to restore balance to the unreformed PAYG system. The pension reform is also likely to have beneficial effect on the Government Finances. However this aspect will be more closely dealt with in Section 7. In the context of a liberalised capital account in the balance of payments, the proposed reform, particularly the introduction of a funded scheme, may also have an effect on capital flows in the balance of payments.

It is important to emphasise that the projected gains in economic growth reported in the paper are mainly attributable to labour market reforms and changes in the effective retirement age as the growth effects of the shift to funded are limited. This point is very important in the local policy scenario where in the White Paper, it is assumed that measures aimed to raise the labour force participation rate especially amongst females will be implemented. Additionally, the success of the welfare reform in contributing positively to economic growth hinges on the success of structural reforms in the domestic market. In particular, Mc Morrow and Roeger recommend the implementation of initiatives aimed at improving the functioning of the product, labour and capital markets.

After illustrating the likely macroeconomic impact of pension reform on the Maltese economy, this report will proceed by analysing the impact of pension reform in Malta by referring to the effects on public finances and individual benefits. These results are

subsequently tested to alternative macroeconomic assumptions using PROST. The economic impact of pension reform will be further studied by considering the impact of the reform on fiscal sustainability and by tracing the likely multiplier effects on the economy.

6. An Analysis of the Proposed Reform: Various Scenarios

In line with the Terms of Reference the following is an analysis of the pension reform proposal as presented in the White Paper and the sensitivity of the policy reform scenario to the various assumptions inherent in the projections. This Section deals with the macroeconomic impact of welfare reform as proposed in the White Paper and evaluates the sensitivity of the conclusions contained in the White Paper to the inherent assumptions relating to:

1. different macroeconomic scenarios;
2. the female labour participation rate;
3. the income level and distribution.

The results for the reform scenario are based on projections from the PROST model. Reform is assumed in PROST to come into effect in 2005. The main features of the reform proposals include:

- changes to the retirement age;
- changes to the pension valorisation method from one based on wages to one based on prices;
- changes to the accumulation period of the Two-Thirds First Pillar Pension;
- the minimum pension guarantee is valorised by the rate of inflation;
- the switching pattern of persons;
- two per cent of the social security contribution paid by an employee is channelled to a health fund;
- the ceiling of the First Pillar's maximum pensionable income is based on the current pensionable income adjusted yearly to reflect inflation;
- the second pillar pensions scheme is introduced initially on a voluntary basis in 2006 and becomes compulsory in 2010;
- Second Pillar pension is introduced on a mandatory basis for persons aged 45 years and younger at a contribution of 2 per cent from employees and employers, with the rate rising to 5 per cent from 2025 onwards;
- The rate of return on private fund investments is assumed to be 5 per cent in real terms.

The results derived using PROST for the proposed reform will be analysed in the following section by specific reference to important variables that have been affected by the reform proposal. Emphasis will be made on the impact of reform and changes to the underlying assumptions of reform on:

- the demographic characteristics of the Maltese society;
- the number of contributors and beneficiaries to the system;
- public finances in terms of expected expenditure and revenue for Government, and;
- the individual benefits to be gained at retirement.

The reform scenario as in the White Paper will be referred to in this document as 'Reform White Paper' (RWP). Figures for the Reform White Paper Scenario are included in Table 6.2 and Table 6.3.

6.1 Impact of Reform on Demographic Characteristics

When comparing to the WPS, the main demographic impact of the reform, is on the support ratio. This is the ratio of individuals aged 15 to the retirement age, to pensioners. The ratio gives an indication of how many contributors are financing each pensioner under a PAYG system. Given the increase in the retirement age to 65 years, and thus the fact that people are taking longer to retire, then the support ratio over the forecast horizon in the RWP is higher when compared to the WPS. PROST calculations show that the support ratio in 2072 would stand at 1.9 per cent, compared to the ratio of 1.5 recorded in the WPS.

6.2 Impact of Reform on the number of Contributors and Beneficiaries

In the proposed reform the number of contributors to the system will increase given the increasing number of years which each individual would be required to work. Thus, by 2020 the number of contributors under the WPS will reach 153 thousand, whereas in the reform scenario this will increase to 157 thousand. By 2050, the number of contributors under the reform scenario will increase to 129 thousand from the 127 thousand in the WPS. One should note that the number of contributors to the system would start to fall after 2020 given the underlying demographics of the Maltese population.

The projections from the PROST model relating to the reform scenario indicate that as a per cent of total population, the number of 2/3 beneficiaries to the system will be of around 19 per cent, as compared to the 25 per cent in the WPS. The reform proposal also effects the beneficiaries to the system. Given the increase in the retirement age, the number of beneficiaries to the system will fall in the RWP when compared to the WPS. In other words, the retirement of a number of persons is postponed to a latter date.

6.3 Impact of Reform on Public Finances

As expected the main impact of the reform is on employee and employer contributions and on the expenditure required by Government to finance the social security commitments. The employer and employee contributions collected by Government fall in the first years of the horizon. This is primarily the result of a shift of 2 per cent of the contributions paid by employees to a special health fund. One though has to take into account the expected increase in employee contributions and the number of contributors as a result of the increase in the retirement age.

A significant impact of the reform is on the total expenditure by Government on benefits. The main contributor behind the fall in Government expenditure during the first years of the horizon, is the increase in the retirement age. This will allow Government to postpone payment of some of its pension liabilities. Over time, the proposed change in the method

of calculating benefits to an average of 40-year contributions serves to further decrease the generosity of the pension outlays.

Initially, under the reform scenario, the PAYG deficit as a per cent of GDP deteriorates. In 2005, a deficit of 1.6 per cent of GDP is recorded in the absence of reform implementation. This goes up to 2.1 per cent of GDP under the reform scenario primarily due to the new administrative costs related to the setting up of the second pillar and the shift of 2 per cent of contributions paid by employees to a special health fund. By 2010, however, the reform would start to impact positively on the deficit ratio. By 2050 the deficit reaches 2.1 per cent of GDP, compared to 5.3 per cent in the absence of reform implementation. Under the RWP the deficit to GDP ratio peaks at around 2015, then reaching 1.4 per cent of GDP by 2072. It is clearly evident from this scenario that the reform proposal serves to contain the costs of the social security system to levels comparable to current social security deficit to GDP rates. The reform as proposed in the White Paper would be successful in controlling the significant increase in the deficit ratio that would otherwise result under the no reform scenario.

One should nevertheless note that, even though employees under the reform would be contributing 2 per cent less towards the Social Security System, this amount is actually being shifted to a special health fund. As a result, the contribution rates paid by employees are expected to remain unchanged at 10 per cent of their wage under the PAYG until 2010. Thus, it does not represent an increase in household disposable income. This would also imply that no extra funds would be available to increase consumption and thus no impact on GDP growth would be expected. In addition, under the proposed reform, no changes to employers' contributions under the PAYG are envisaged until 2010 and thus no major changes are to be expected in terms of production costs.

In 2010, the Second Pillar is introduced on a mandatory basis at a contribution rate of 2 per cent. In 2025 contributions are envisaged to be increased by a further 3 percentage points to a rate of 5 per cent for both employers and employees. These are expected to have a significant impact on the economic scenario. In particular, an increase in employers and employees' contributions exert a negative impact on both the supply and the demand side of the economy. Further details on the likely impacts on the economy of such measures are analysed in more detail in Section 8.

6.4 Impact of Reform on Individual Benefits

The reform proposals also impact significantly on the replacement rate of future retirees. It is important to distinguish between two particular groups of individuals; those who are currently (2005) under 48 years of age and thus will be covered entirely by the new system (identified as switchers) and those over 48 years of age who will either remain under the present system or will have only minor modifications depending on their current age (referred to as non-switchers).

It is important to note that the White Paper reform proposal specifically states that the Second Pillar Pension Scheme will only be introduced on a mandatory basis for persons

who are 45 years old or younger in 2010, thus ensuring that enough contributions are paid to the fund for an expected reasonable return. Difference between these two different age groups also arise as a result of a different method used to calculate the contribution period for the accumulation of the Two-Thirds pension under the First pillar. Moreover, persons of different ages will be treated differently in their calculation of the pension benefit at retirement. The different treatment of these persons, mainly due to age at point of the introduction of the reform, would lead to differences in the pension benefits received from the Social Security System. Further details on how different groups will be affected, is presented in sub-section 6.7 of this section.

In the light of the proposed changes, particularly with regard to changes in the method of calculation for the entry benefit from the best consecutive three years to the average of the best 5 or 10 years depending on age, then the average replacement rate for 2/3 pensions for those individuals who do not switch to the new system (non-switchers) is expected to fall when compared to the replacement rates in the WPS. The projections generated by PROST indicate that this group will be worst off. They will be carrying some of the burden from the reform proposals through lower pension entitlement. The replacement rate for those individuals who will switch to the new system would still decline compared to its level today. Nevertheless, the replacement rate of this group will generally be higher than the replacement rate of the non-switchers. This will primarily depend on the second pillar and thus subject to the rate of return on investment assumed in the White Paper reform scenario. Moreover, the non-switchers will be excluded from the mandatory contribution towards the Second Pillar Fund.

The switchers group (the under 45's) will have very similar low entry benefit replacement rates (from the first pillar), when compared to the WPS. Nevertheless, this group will also enjoy the return from the Second Pillar, which will supplement the entry benefit to a more acceptable level.

However one has to highlight that the average replacement rate is sensitive to the assumed rate of return on the Second Pillar Fund. Section 6.9 of this report analyses the sensitivity of gains made under the Second Pillar to the rate of return on the financial markets. In addition it is also important to highlight that by 2040 the average replacement rate for existing 2/3 pension rates will be higher under the reform scenario than under the no-reform scenario. By 2072, the reform is expected to increase the average replacement rate to 31.7 per cent compared to 8.3 per cent from the PAYG in the absence of reform.

One should note that although the return from the PAYG is very similar to that under the WPS scenario, the retirees will benefit from the additional savings made during their working life. This would ensure a more reasonable pension upon retirement, though still well below the entry benefit enjoyed today. It is notable that the second pillar will contribute to most of the increase in the replacement rate. In fact, the average replacement rate from the second pillar, if all balance is annuitized, is equivalent to 21.5 per cent in 2072. This suggests that whereas today pensions are totally dependent on the PAYG system, by 2060 the relative importance of the Second Pillar will actually surpass that of the PAYG system. It is important to highlight that the return on the Second Pillar Fund is dependent on the rate of return obtained by the fund.

When compared to the no-reform scenario, Table 6.1 and Chart 6.1, show that the PAYG average per capita benefits for the two-thirds pension in real terms following the implementation of the reforms do not decline over time. One should note that given that this statistic is an average it tends to fluctuate significantly, in reflection of changes in the underlying distribution of the number of beneficiaries. In particular, trends in the average per capita benefits are sensitive to measures affecting the number of beneficiaries and the pension payments by Government. It is important to note that contributors under the age of 45 at the time of the reform will supplement their PAYG benefit with the proceeds from the Second Pillar. Furthermore, Section 6.7 of this report gives a detailed analyses of different specific average replacement rates accruing to different persons, depending on their age in 2007.

One should also highlight the economic impact of the proposed changes in the current pension system. As shown in Section 8 of this report, different classes of policy measures may have different impacts on the economy. The increase in the employers and employees' contribution rate proposed to finance the second pillar is expected to have a negative impact on the economy, particularly on the costs of production.

Chart 6.1 Average per capita Benefit in real terms
First Pillar Pension

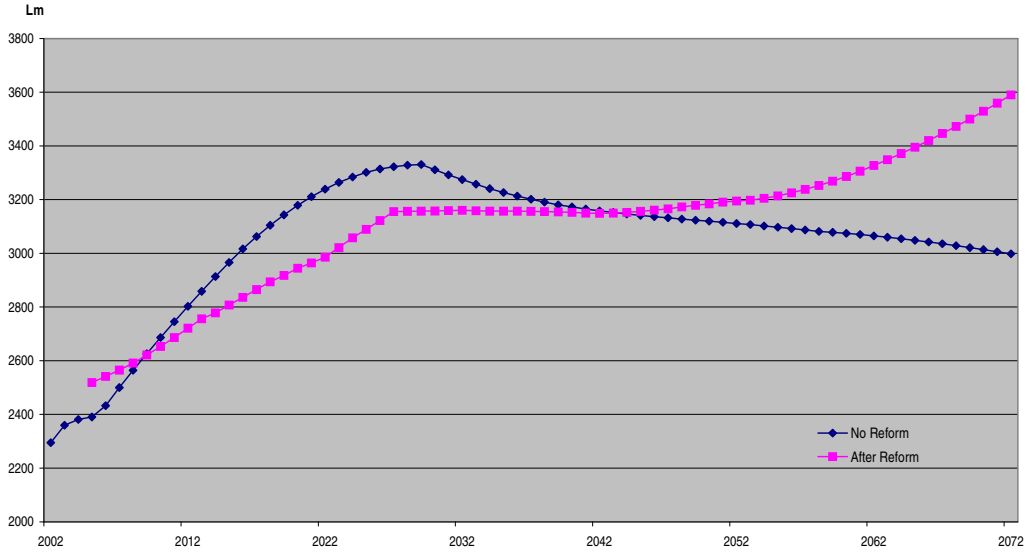

Table 6.1 Average per capita retirement benefit

	2005	2010	2015	2020	2030	2040	2050	2060	2070	2072
Average per capita retirement benefit										
2/3 pensioners (nominal)	2,519	3,002	3,593	4,264	5,854	7,481	9,673	12,780	17,567	18,777
Growth Rate (%)	0.0	3.7	3.5	3.4	2.5	2.4	2.7	3.1	3.3	3.4
2/3 pensioners (real)	2,519	2,653	2,807	2,944	3,158	3,152	3,184	3,286	3,529	3,590
Growth Rate (%)	0.0	1.2	1.0	0.9	0.0	-0.1	0.2	0.5	0.8	0.9

6.5 Impact of Reform on Support Ratios

According to a study carried out by the OECD[19], the dependency ratio (which is defined as the ratio of those aged 55 and over[20] to those aged 20 to 54) is the major contributor to the increase in total old-age pension spending as a ratio to GDP. The concept of dependency ratio is in line with the support ratio used in this analysis. According to the OECD study the average impact of ageing taken alone is around 5 percentage points of GDP, exceeding by far the impact of other variables influencing pension spending including the eligibility ratio, the generosity of the system, and the participation rate.

In the absence of reform, the support ratio is projected to decline from the current ratio of 3.9 to a ratio of 1.5 in 2072. Thus, whereas in 2002 around four individuals of working age are supporting every pensioner, through the PAYG system, by 2072 every pensioner will be supported by less than two individuals of working age. With the reform, the support ratio increases. By 2072, around two individuals of working age will be supporting every pensioner in the PAYG system. Thus it may be safely concluded that the reform, under its various assumptions, will be effective in increasing the support ratio, one of the prime determinants of the increase in pension spending.

6.6 Testing the Assumptions of the Welfare Reform Proposal and Projections

Following the analysis of the pension reform under the White Paper assumptions, it is important to determine the sensitivity of the results presented above to alternative economic scenarios. In line with the framework adopted in Section 4 for the base case analysis, different macroeconomic assumptions underlying the welfare reform proposal will be tested. In particular the projections will be tested against different economic growth scenarios, labour force participation rates and different income levels and distributions. The effectiveness of the proposed pension reform under each alternative scenario will be assessed in relation to the comparable no-reform scenarios that were introduced earlier.

[19] "Fiscal Implications of Ageing: Projections of Age-Related Spending"; T.T. Dang et al; 2001
[20] The age of 55 is taken because early-retirement schemes have a downward effect on the average pensionable age

A comparison of the sensitivity of the main indicators to the different reform scenarios presented in this document is presented in Table 6.2. Meanwhile, Table 6.3 highlights the effects of different reform scenarios on average replacement rates and support ratios. These are also compared to the respective indicators in the event that reform is not undertaken.

The slow growth scenario (RSG) simulates the effect of the reform under the assumption that GDP grows at an average rate of 1.7 per cent, an inflation rate of 1.5 per cent whilst productivity is assumed to grow at an average rate of 1.6 per cent over the forecast period.

The medium growth scenario (RMG) models the state where pension reform is undertaken under the assumption that GDP grows at an average rate of 2.4 per cent per annum over the forecast period. The inflation rate is assumed at an average rate of 2.2 per cent and productivity is assumed to grow at an average rate of 2.3 per cent over the period.

An alternative simulation concerns the reform under an alternative labour force participation rate of women (RAL). Under the RAL scenario, pension reform occurs under the assumption that the female labour force participation rate is lower than assumed in RWP i.e. around 37 per cent in 2002, 50.7 per cent in 2020 and 57.0 per cent by 2072. These assumptions are similar to those in ALS scenario.

In the alternative income scenario (RAI), the pension reform was simulated based on an alternative income distribution than that in the RWP. The alternative income distribution was based on the Household Budgetary Survey 2000. These were the same assumptions used in the AIS scenario.

Table 6.2 Comparison of Different Scenarios with Reform White Paper Scenario (Main Indicators)

	2002	2005	2010	2015	2020	2030	2040	2050	2060	2070	2072
Total Effective Contributors (thousands)											
Reform White Paper Scenario (RWP)	152	151	153	155	157	148	140	129	119	117	118
Reform Slow Growth Scenario (RSG)	152	151	153	155	157	148	140	129	119	117	118
Reform Medium Growth Scenario (RMG)	152	151	153	155	157	148	140	129	119	117	118
Reform Alternative Labour force participation Scenario (RAL)	151	145	149	152	155	148	141	131	122	121	121
Reform Alternative Income Scenario (RAI)	152	151	153	155	157	148	140	129	119	117	118
Total Beneficiaries (thousands)											
Reform White Paper Scenario (RWP)	57	60	70	78	82	93	97	106	113	105	103
Reform Slow Growth Scenario (RSG)	57	60	70	78	82	93	97	106	113	105	103
Reform Medium Growth Scenario (RMG)	57	60	70	78	82	93	97	106	113	105	103
Reform Alternative Labour force participation Scenario (RAL)	57	60	70	78	82	93	97	105	112	104	102
Reform Alternative Income Scenario (RAI)	57	60	70	78	82	93	97	106	113	105	103
PAYG Current Balance (as % of GDP)											
Reform White Paper Scenario (RWP)	..	-2.1	-2.6	-2.6	-2.3	-2.3	-2.1	-2.1	-2.0	-1.5	-1.4
Reform Slow Growth Scenario (RSG)	..	-1.9	-2.6	-2.9	-2.6	-2.3	-1.5	-1.4	-1.4	-0.9	-0.8
Reform Medium Growth Scenario (RMG)	..	-1.9	-2.7	-2.9	-2.3	-1.7	-0.9	-0.9	-1.1	-0.9	-0.9
Reform Alternative Labour force participation Scenario (RAL)	..	-2.3	-2.7	-2.7	-2.3	-2.4	-2.1	-2.1	-2.0	-1.5	-1.3
Reform Alternative Income Scenario (RAI)	..	-2.1	-3.2	-3.7	-3.4	-3.4	-2.9	-2.6	-2.2	-1.6	-1.4

Table 6.3 Replacement Rates and Support Ratios: Comparison of Different Reform Scenarios with (No-reform) White Paper Scenario

	2002	2005	2010	2015	2020	2025	2030	2035	2040	2050	2060	2070	2072
N0-Reform Scenarios													
Avg Repl Rate for Existing 2/3 retirement pension (%)													
White Paper Scenario (WPS)	***56.9***	***57.8***	***55.6***	***51.8***	***46.2***	***39.6***	***32.5***	***26.1***	***21.5***	***15.2***	***11.2***	***8.7***	***8.3***
Slow Growth Scenario (SGS)	***56.9***	***57.4***	***57.0***	***55.5***	***53.2***	***50.4***	***47.3***	***44.5***	***41.6***	***35.7***	***28.8***	***23.6***	***22.7***
Medium Growth Scenario (MGS)	***56.9***	***57.4***	***58.3***	***56.5***	***53.2***	***48.9***	***44.1***	***39.5***	***35.1***	***25.7***	***19.1***	***14.3***	***13.5***
Alternative Labour force participation Scenario (ALS)	***56.8***	***57.7***	***55.5***	***51.7***	***46.3***	***39.7***	***32.6***	***26.2***	***21.6***	***15.2***	***11.2***	***8.7***	***8.3***
Alternative Income Scenario (AIS)	***47.2***	***50.3***	***51.3***	***47.9***	***42.0***	***35.4***	***29.1***	***24.0***	***20.0***	***14.2***	***10.4***	***7.9***	***7.5***
Reform White Paper Scenario (RWP)													
Avg Repl.Rate for Existing 2/3 retirement pension	..	57.7	51.9	46.5	42.0	37.0	30.9	25.8	21.9	16.1	12.5	10.4	10.2
Male Switchers	..	0.0	0.0	0.0	0.0	40.8	32.0	26.2	22.3	16.7	12.1	9.6	9.3
Male Non-switchers	..	61.4	53.7	47.4	42.4	36.8	30.5	26.0	22.6	0.0	0.0	0.0	0.0
Female Switchers	..	0.0	0.0	0.0	0.0	39.0	30.1	24.3	20.5	15.3	11.0	8.6	8.2
Female Non-switchers	..	49.1	48.1	44.8	41.3	36.7	31.0	26.6	23.3	0.0	0.0	0.0	0.0
Avg Repl.Rate if All Balance is Annuitized	..	0.0	0.0	0.0	0.0	3.1	3.5	4.5	6.1	10.1	15.2	20.3	21.5
Total Average Replacement Rate (PAYG + 2nd Pillar)	..	***57.7***	***51.9***	***46.5***	***42.0***	***40.1***	***34.4***	***30.3***	***28.0***	***26.3***	***27.6***	***30.7***	***31.7***
Reform Slow Growth Scenario (RSG)													
Avg Repl.Rate for Existing 2/3 retirement pension	..	57.7	53.7	51.1	49.5	47.0	42.7	39.0	35.5	28.7	24.2	21.4	21.1
Male Switchers	..	0.0	0.0	0.0	0.0	48.7	42.5	38.6	35.6	29.8	23.7	20.1	19.6
Male Non-switchers	..	61.4	55.5	51.9	49.9	46.9	43.0	40.6	38.7	0.0	0.0	0.0	0.0
Female Switchers	..	0.0	0.0	0.0	0.0	46.1	39.5	35.4	32.4	27.2	21.1	17.2	16.6
Female Non-switchers	..	49.1	49.7	49.2	48.7	46.9	43.9	41.8	40.0	0.0	0.0	0.0	0.0
Avg Repl.Rate if All Balance is Annuitized	..	0.0	0.0	0.0	0.0	3.6	4.5	6.2	8.8	15.8	24.7	32.8	34.4
Total Average Replacement Rate (PAYG + 2nd Pillar)		***57.7***	***53.7***	***51.1***	***49.5***	***50.6***	***47.2***	***45.2***	***44.2***	***44.6***	***48.9***	***54.2***	***55.5***
Reform Medium Growth Scenario (RMG)													
Avg Repl.Rate for Existing 2/3 retirement pension	..	57.7	56.5	53.4	49.9	45.2	39.3	34.5	30.2	22.8	17.9	14.9	14.5
Male Switchers	..	0.0	0.0	0.0	0.0	47.0	39.4	34.5	30.5	23.7	17.6	14.1	13.6
Male Non-switchers	..	61.3	58.4	54.3	50.4	45.1	39.5	35.6	32.2	0.0	0.0	0.0	0.0
Female Switchers	..	0.0	0.0	0.0	0.0	44.2	36.6	31.6	27.8	21.6	15.5	11.9	11.4
Female Non-switchers	..	49.1	52.3	51.4	49.1	45.1	40.3	36.6	33.2	0.0	0.0	0.0	0.0
Avg Repl.Rate if All Balance is Annuitized	..	0.0	0.0	0.0	0.0	3.4	4.0	5.5	7.5	12.7	18.4	22.8	23.6
Total Average Replacement Rate (PAYG + 2nd Pillar)	..	***57.7***	***56.5***	***53.4***	***49.9***	***48.6***	***43.4***	***40.0***	***37.7***	***35.5***	***36.3***	***37.7***	***38.2***
Reform Alternative Labour force participation Scenario (RAL)													
Avg Repl.Rate for Existing 2/3 retirement pension	..	57.7	51.9	46.5	42.1	37.2	31.2	26.1	22.2	16.3	12.5	10.3	10.1
Male Switchers	..	0.0	0.0	0.0	0.0	40.9	31.9	26.1	22.2	16.6	12.0	9.5	9.2
Male Non-switchers	..	61.3	53.7	47.4	42.4	36.8	30.5	25.9	22.5	0.0	0.0	0.0	0.0
Female Switchers	..	0.0	0.0	0.0	0.0	42.5	32.5	26.0	21.8	16.0	11.2	8.6	8.2
Female Non-switchers	..	49.1	48.1	44.8	41.4	36.9	31.1	26.7	23.4	0.0	0.0	0.0	0.0
Avg Repl.Rate if All Balance is Annuitized	..	0.0	0.0	0.0	0.0	3.1	3.5	4.5	6.1	10.2	15.3	20.6	21.9
Total Average Replacement Rate (PAYG + 2nd Pillar)	..	***57.7***	***51.9***	***46.5***	***42.1***	***40.2***	***34.7***	***30.7***	***28.3***	***26.5***	***27.8***	***30.9***	***31.9***
Reform Alternative Income Scenario (RAI)													
Avg Repl.Rate for Existing 2/3 retirement pension	..	50.3	49.2	46.1	42.0	36.9	30.6	25.4	21.3	15.0	10.9	8.9	8.6
Male Switchers	..	0.0	0.0	0.0	0.0	43.0	33.4	27.1	22.7	16.0	10.7	8.2	7.8
Male Non-switchers	..	54.4	53.6	50.4	46.0	40.2	33.4	28.4	24.5	0.0	0.0	0.0	0.0
Female Switchers	..	0.0	0.0	0.0	0.0	34.5	26.7	21.6	18.2	13.5	9.5	7.3	7.0
Female Non-switchers	..	40.8	39.6	36.6	33.8	30.1	25.3	21.7	19.1	0.0	0.0	0.0	0.0
Avg Repl.Rate if All Balance is Annuitized	..	0.0	0.0	0.0	0.0	3.3	3.6	4.7	6.4	10.5	15.4	20.2	21.3
Total Average Replacement Rate (PAYG + 2nd Pillar)	..	***50.3***	***49.2***	***46.1***	***42.0***	***40.2***	***34.3***	***30.1***	***27.6***	***25.4***	***26.3***	***29.1***	***29.9***
Support Ratio No Reform: Age 15-Ret. Age / Ret. Age +	***3.9***	***3.6***	***3.0***	***2.6***	***2.2***	***2.0***	***1.9***	***1.8***	***1.7***	***1.4***	***1.3***	***1.5***	***1.5***
Support Ratio With Reform: Age 15-Ret. Age / Ret. Age +	***3.9***	***3.6***	***3.1***	***2.9***	***3.0***	***2.8***	***2.6***	***2.6***	***2.4***	***2.0***	***1.8***	***1.9***	***1.9***

6.6.1 Pension Reform under Slow Growth (RSG)

As expected, when compared to the RWP scenario, the change in the macroeconomic assumptions analysed under the RSG had no impact on the demographic developments, the support ratio, life expectancy at birth and at retirement and the number of contributors and beneficiaries. Thus the analysis of these issues presented above for the RWP scenario applies also for the RSG scenario.

Under the RSG scenario, the reformed PAYG current balance is projected at a deficit of 1.9 per cent of GDP in 2005, it peaks at 3.0 per cent in 2013 and then it declines to 0.8 per cent by 2072. This is mainly due to an increasing trend in employer and employee contributions as well as a declining trend in total expenditure in the reform scenario relative to the comparable slow-growth no-reform scenario (SGS). Thus, during the first years after the implementation of the reform, there is a worsening in the deficit to GDP ratio. However, over the years, the pension reform represents an improvement in terms of the PAYG current balance as under the SGS scenario the PAYG current balance worsens significantly and reaches 5.0 per cent of GDP by 2072.

In general, the reform is still effective in reducing the PAYG deficit as a ratio of GDP even in the event of a slow growth scenario. However, the positive impact of reform on the deficit is initially of a lower magnitude. For instance, the deficit in 2020 under the RWP scenario is projected at 2.3 per cent of GDP whereas in the event of a slower growth rate, the deficit is projected at 2.6 per cent of GDP. This ratio is however still lower than the ratio of 5.7 per cent in the event that reform is not undertaken. In addition, after 2030, the deficit to GDP ratio is actually lower in the RSG scenario, compared to the RWP scenario. This is due to a lower government expenditure on pensions as a result of lower wages throughout the forecast period.

Pension reform under the slow-growth scenario has limited effect on the total average replacement rate during the early years. In fact when the reform scenario is compared to the no-reform scenario under slow growth, there exists a negative gap in total average replacement rate of 3.3 percentage points in 2010 that initially increases to 4.4 percentage points in 2015 but then narrows to 0.1 percentage points by 2030.[21]

In subsequent years, the reform is actually effective in raising the total average replacement rate compared to its no-reform counterpart. This conclusion still holds under the slow growth scenario. In fact, in 2035 the average replacement rate is 0.7 percentage points higher if reform is undertaken under a slow growth scenario. By 2072, the average replacement rate with reform is projected to reach 55.5 per cent, compared to 22.7 per cent in the absence of reform. This partly results from the assumed lower rate of growth in the economy which results into a weaker increase in wages, and thus a lower

[21] Under the RSG scenario and the other pension reform scenarios, the total average replacement rate is the sum of the replacement rate for existing 2/3 pensions from the PAYG and the average replacement rate if all balance is annuitized.

proportion of persons reaching the maximum ceiling on benefits. However, compared to the RWP scenario, this positive effect of reform will take longer to materialise[22].

6.6.2 Pension Reform under Medium Growth (RMG)

As already noted in the case of pension reform under slow economic growth (RSG), the changes in the macroeconomic assumptions had no effect on demographic variables, number of contributors and beneficiaries apart from those mentioned in the analysis for the pension reform under the White Paper scenario (RWP).

Under the RMG scenario, the PAYG deficit is projected at 1.9 per cent of GDP in 2005, it is expected to peak during the first half of the following decade at around 3 per cent, whilst it is expected to follow a declining trend during the following years, reaching 0.9 per cent of GDP in 2072. During the first years the proposed reform under the medium growth scenario will worsen the deficit to GDP ratio, however, when compared to the no-reform, medium growth scenario, the implementation of the pension reform represents a significant improvement mainly due to an increasing trend in the employer and employee contributions and a decreasing trend in total expenditure. The developments reflect mainly the effects of the parametric reforms envisaged in the reform. In general, the reform is still effective in reducing the PAYG deficit as a ratio of GDP even in the event of a medium growth scenario.

When the reform scenario is compared to the no-reform scenario under medium growth, the total average replacement rate following the reform is lower than average replacement rate prevailing under the no-reform scenario during the first two decades. In fact the gap in the average replacement rate between the two scenarios stood at 1.8 percentage points and 3.3 percentage points during 2010 and 2020 respectively. From 2035 onwards the total average replacement rate under the reform scenario is higher than that prevailing under the no-reform scenario. In 2072 the average replacement rate is 38.2 per cent, compared to 13.5 per cent under the no-reform scenario. This increase is again related primarily to the benefits received from the second pillar.

6.6.3 Pension Reform under Alternative Labour Force Participation Rate (RAL)

As expected there are no differences in the demographics of the Maltese Population as a result of lowering the female participation rate from the projections obtained under the reform scenario as in the White Paper (RWP) and in this scenario. However, given the change in this important assumption one records a number of changes in the number of contributors and beneficiaries to the system. With the lower women participation rate in both the ALS and in the RAL the number of contributors under the reform would increase. In 2020 the number of effective contributors under the ALS will be of 147.5 thousand whilst under the RAL this will stand at 155.2 thousand. This is primarily attributed to an increase in the retirement age. This implies that the reform is effective in

[22] According to Table 6.3, by 2025, the average replacement rate of the RWP exceeds that in the WPS. In 2030, the average replacement rate in the RSG scenario is still lower than that of the SGS.

increasing 7.7 thousand contributors even in the event of a lower female participation rate in the economy.

As to the number of beneficiaries, a comparison of the reform under a scenario of a lower women labour force participation rate with the ALS shows that for 2020 the number of beneficiaries would decrease by around 7 thousand (for 2050 difference of 10 thousand). If one had to compare this to the effect of the reform under the assumption of a higher participation rate for women (as in the WPS and AWP), then the fall in number of beneficiaries would also be of around 8 thousand (for 2050 decrease of 13 thousand). This suggests that the negative effect of reform on the number of beneficiaries is not very sensitive to the female participation rate assumed.

The interpretation of changes in the PAYG deficit to GDP ratio and the average replacement rates under the RAL scenario should be interpreted with caution as a change in the participation rate could have an effect on the supply side of the economy which is not captured by this scenario. According to the results from the PROST model, the lower labour force participation rate does not have a significant effect on the sensitivity of the PAYG current balance to the reform proposals. In other words, the reform is as effective in reducing the future PAYG deficits under the assumption of a lower female participation rate as it is in the case of a higher female participation rate.

In general, the effects of the reform proposal on the replacement rate remain practically unchanged under the two different assumptions for female participation rates. Thus with a lower female participation rate, the replacement rate is initially lower as a result of the reform. But by 2025 the replacement rate under the reform scenario (40.2 per cent) exceeds the replacement rate without reform (39.7 per cent). The impact of a lower female participation on the effectiveness of welfare reform is at best marginally positive and at worst insignificant. For instance, in the White Paper, the replacement rate in 2072 after reform implementation is projected at 31.7 per cent. If the female participation rate were lower, this would rise marginally to 31.9 per cent. The difference is just 0.2 percentage points.

6.6.4 Pension Reform under Alternative Income scenario (RAI)

As in the other scenarios, there are no differences in the demographics of the Maltese population and in the number of contributors and beneficiaries as a result of the implementation of a change in the income distribution if the proposed reform is undertaken, when compared to results obtained if the same reform is undertaken under the assumed income distribution in the White Paper.

The RAI scenario assumes that the wages in the economy are higher relative to the RWP. As a result the employer and employee contributions together with the expenditure on pension benefits would be influenced by this change in assumption. In 2010, under the RAI scenario the contributions collected compared to the AIS scenario would be lower. However, they would be higher when compared to the RWP scenario due to higher average wages.

By 2020, the reform under the assumption of a higher average wage reduces contributions by around Lm4 million less compared to a lower income scenario as assumed in the White Paper. By 2072, most people would have reached the cap and thus the employers and employees contribution under the two reform scenarios, RAI and RWP will be the same.

Given the higher wages, then pension payments would reflect the increase in wages. By 2020, the total expenditure on PAYG under the RAI will increase to Lm379.9 million, when compared to the Lm322.0 million under the RWP scenario. However, one should note that the expenditure under the RAI scenario is still significantly below the AIS scenario. This is related to the fact that pension payments are being delayed due to the increase in the retirement age and due to the change in the method of calculating the pension payments. Thus reform is still effective in reducing expenditure on pensions in the PAYG system. However, it is less effective and expenditure is reduced by less.

This is confirmed by the projected deficit in the PAYG system. The deficit as a per cent of GDP under the RAI scenario is an improvement over the deficit as a per cent of GDP under the AIS scenario after 2010. In particular for 2010, the deficit to GDP ratio under the AIS scenario would stand at 3.3 per cent of GDP while under the RAI scenario it would go down to 3.2 per cent of GDP. By 2030, when the deficit to GDP ratio reaches its peak in the AIS scenario (6.4 per cent), the deficit to GDP ratio under the RAI scenario would be of 3.4 per cent. By 2072, the ratio falls from 4.3 per cent in the AIS scenario to 1.4 per cent in the RAI scenario.

When compared to the RWP scenario the deficit to GDP ratio at 2072 would converge to practically the same rate in both scenarios. But over the forecast years, the deficit to GDP ratio under the RAI scenario is higher than that under the RWP. This primarily reflects the higher expenditure by Government over these years as pension payments increase significantly reflecting the higher wages earned by individuals during their working life.

Throughout the forecast period, the higher expenditure on PAYG resulting from higher incomes more than offsets the higher contributions, leading to a deterioration in the current PAYG balance. Despite this, the reform is still effective in reducing the deficit ratio compared to the AIS.

When the reform scenario is compared to the no-reform scenario under the higher wage assumption, the total average replacement rate following the reform is lower than average replacement rate prevailing under the no-reform scenario for 2010. In fact the gap in the average replacement rate between the two scenarios stood at 2.1 percentage points during 2010. However, after 2020 the total average replacement rate under the reform scenario is higher than that prevailing under the no-reform scenario. In 2025, the average replacement rate under the RAI scenario is equivalent to 40.2 per cent, compared to 35.4 per cent in the AIS scenario. By 2072, the positive gap increases and the replacement rate is projected at 29.9 per cent, compared to 7.5 per cent in the absence of reform.

However, the higher income throughout the forecast period implies that the average replacement rate is generally lower compared to the RWP scenario. Indeed, from 2010 onwards, the average replacement rate is on average 1.0 percentage points lower. By 2072, the reform as proposed in the White Paper leads to a projected average replacement rate of 31.7 per cent. Under the alternative income distribution assumption, this replacement is projected at 29.9 per cent, 1.8 percentage points lower. This suggests that the reform proposals are relatively sensitive to the assumption of income levels. However, the effectiveness of reform remains and the results should not change significantly.

6.7 Intertemporal Aspects of Pension Reform

The aim of this sub-section is to illustrate the impact of pension reform on the standard of living of retired persons over time. This exercise is carried out by analysing the changes in the total average replacement rate of retired persons at different points in time.

6.7.1 Effect of Pension Reform on Replacement Rate in 2010

Starting by focusing on the persons in retirement in 2010, this category includes the group of persons who are nearing retirement in January 2007, but who are not affected from the parametric reforms contemplated in the White Paper, except from the changes contemplated in the pension indexation mechanism. The average replacement rate for existing 2/3 retirement pensions under the no-reform scenario is 55.6 per cent. Following the implementation of the reform, the total average replacement rate declines by 3.7 percentage points to 51.9 per cent. Under the alternative macroeconomic scenarios, the total average replacement rate is expected to decline by 1.8 percentage points and 3.3 percentage points under the medium growth and slow growth scenarios respectively. When compared to the average replacement rate of 56.9 per cent under the no-reform scenario for 2002, the total average replacement rate for persons in retirement in 2010 is 5.0 percentage points lower.

6.7.2 Effect of Pension Reform on Replacement Rate in 2015

By the year 2015, the retirees would include the group of persons aged 50-54 in 2007 whose first pillar pension would be based on the average of the best 5 years whereas their retirement age would also be rising to 62 or 63, as applicable. Under the no-reform scenario, the average replacement rate for persons in retirement in 2015 is 51.8 per cent. The total average replacement rate for existing 2/3 pensions following the implementation of the reform is expected at 46.5 per cent, a decrease of 5.3 percentage points. Under alternative macroeconomic scenarios, the total average replacement rate will decline by 3.1 percentage points and 4.4 percentage points under the medium growth scenario and slow growth scenario respectively. Additionally, the average replacement rate for the persons in retirement in 2015 is 10.4 percentage points lower than the average replacement rate for retirees in 2002.

6.7.3 Effect of Pension Reform on Replacement Rate in 2025

In the year 2025 the retirees will include also the 45-49 age cohort whose two-thirds pension is based on the average of the last ten years and will retire at an age of 65. Some of these retirees may also be receiving a second pillar pension that is assumed to be established in 2006 on a voluntary basis. Under the no-reform scenario, the average replacement rate for persons in retirement in 2025 is 39.6 per cent. Following the implementation of the reform, the total average replacement rate for existing 2/3 pensioners rises to 40.1 per cent, a marginal increase of 0.5 percentage points. Under the medium term scenario, total average replacement declines marginally by 0.3 percentage points while under the slow growth scenario the total average replacement rate increased by 0.2 percentage points. The total average replacement rate for persons retiring in 2025 is 16.8 percentage points lower than the average replacement rate for persons retired in 2002.

6.7.4 Effect of Pension Reform on Replacement Rate in 2030

Amongst the persons in retirement in 2030, there are persons aged between 40 – 44 in 2007, for whom the retirement age is 65 years, following an accumulation period of 35 years. Additionally, some persons in retirement in 2030 will start receiving the second pillar pension following the establishment of mandatory contribution. Under the no-reform scenario the average replacement rate for persons in retirement in 2030 is 32.5 per cent. As a result of the implementation of the pension reform, the total average replacement rate will be 34.4 per cent, an increase of 1.9 percentage points. This is mainly due to the establishment of the second pillar that offsets the decline in PAYG pension following the implementation of the parametric reforms. Under the medium growth scenario, the total average replacement rate declines by 0.7 percentage points whilst under the slow growth scenario the total average replacement rate decreases marginally by 0.1 percentage points. When compared to average replacement rate for 2002 under the no-reform regime, the total average replacement rate for persons retiring in 2030 following the implementation of the reform is 22.5 percentage points lower.

6.7.5 Effect of Pension Reform on Replacement Rate in 2035

By the year 2035 the retirees would include some of the persons aged 36-39 years in 2007, who would retire at 65 years, after forty years of contribution and for whom the pension is based on the two-thirds of the average wage over a forty-year period. An increasing number of retirees would also be receiving a second pillar pension following the introduction of mandatory contributions. Under the no-reform scenario, the average replacement rate for the persons in retirement in 2035 is 26.1 per cent. Following the implementation of the pension reform, the total average replacement rate rises by 4.2 percentage points to 30.3 per cent. Allowing for alternative macroeconomic assumptions, the gain in the total average replacement rate ranges from 0.5 percentage points under the medium growth scenario to 0.7 percentage points under the slow growth scenario. The total average replacement rate for a retired person in 2030 following the implementation of the reform thus is 26.6 percentage points lower than that prevailing in 2002 under the unreformed regime.

6.7.6 Effect of Pension Reform on Replacement Rate in 2050

The persons in retirement in 2050 are all switchers and some of these persons have contributed for a part of their whole working life at a rate of 5 per cent for the second pillar pension. Under the no-reform scenario, the average replacement rate for retired persons in 2050 is 15.2 per cent. As a result of the implementation of the reforms, the total average replacement rate rises by 11.1 percentage points to 26.3 per cent, mainly as a result of the accumulation of funds under the Second Pillar. Taking alternative macroeconomic assumptions into account, the gain in the total average replacement rate varies from 9.8 percentage points under the medium growth scenario to 8.9 per cent under the slow growth scenario. When compared to the average replacement rate for retire persons in 2002 (no-reform scenario), the total average replacement rate is 30.6 percentage points lower.

6.7.7 Effect of Pension Reform on Replacement Rate in 2072

Finally, amongst the retirees in 2072, there are a group of persons who contributed for their whole working life at the rate of 5 per cent. Under the no-reform scenario, the average replacement rate for persons in retirement in 2072 is 8.3 per cent, thus rising by 23.4 percentage points to 31.7 per cent following the implementation of the reform. Under alternative macroeconomic assumptions, the gain in the total average replacement rate ranges from 24.7 percentage points under the medium growth scenario to 32.8 percentage points under the slow growth scenario. Despite the sharp increase in the total average replacement rate as a result of the introduction of the reform, the total average replacement rate for retired persons in 2072 is significantly lower than the average replacement rate for retirees in 2002 of 56.9 per cent.

6.7.8 Assessment

Summarising, the analysis of the developments in the average replacement rate over time illustrates some general aspects of the impact of the pension reform in Malta. In comparing the welfare of retirees over time one has to balance the developments in the average replacement rate against the reduced lifetime income of future retirees following the introduction of the mandatory funded pillar. One also has to caution that the analysis contained in this section was based on the changes in the average replacement rate over time, hence omitting the differences among income groups within the same generation and within different generations of retirees. Generally speaking, one expects that low income groups will be affected more negatively than the average for the population. Nevertheless the changes to the average replacement rate are strongly indicative of the changes in welfare level of different generations.

During the initial years of the reform, for both switchers and non-switchers, the average replacement rate following the reform is lower than the rate that would have prevailed under the no-reform scenario. The gap for females is larger than that for males relative to the average replacement rates in the no-reform scenarios. However, by 2025, the total average replacement rate under the reform scenario is higher than the average replacement under the no-reform scenario. This reflects the accumulation of funds under

the second pillar and especially the increase in the mandatory contribution rate to 5 per cent as from 2025.

Chart 6.2 Total Average Replacement Rate for New Pensioners

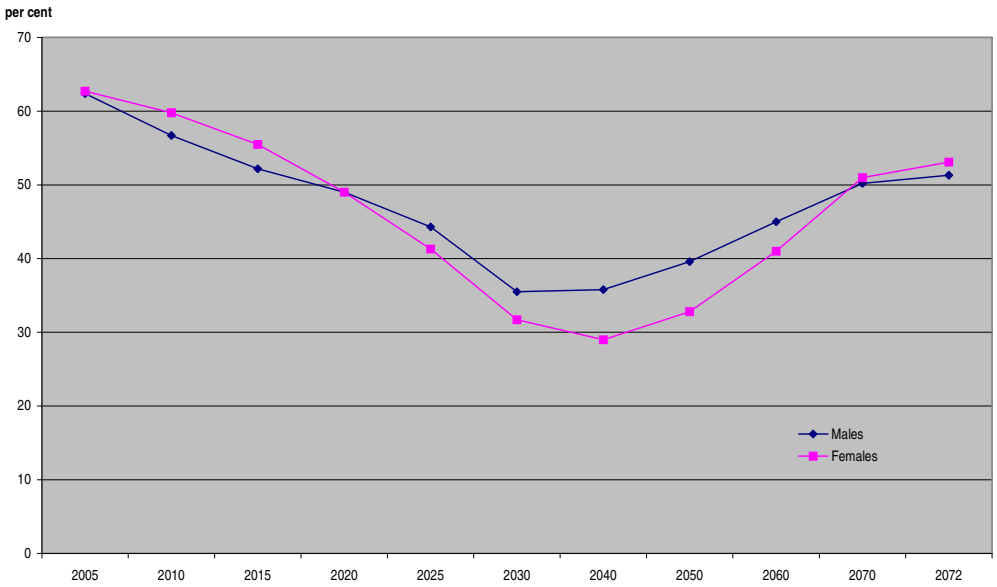

Table 6.4 Total Average Replacement Rate For New Pensioners (including Hypothetical Annuity)

	2005	2010	2015	2020	2025	2030	2040	2050	2060	2070	2072
Reform White Paper Scenario											
Male Switchers											
Average Replacement Rate (PAYG)	-	-	-	-	40.8	30.2	22.5	17.2	13.5	11.8	11.6
Average Replacement Rate from Hypothetical Annuity	-	-	-	-	3.5	5.3	13.3	22.4	31.5	38.4	39.7
Total Average Replacement Rate	-	-	-	-	44.3	35.5	35.8	39.6	45	50.2	51.3
Female Switchers											
Average Replacement Rate (PAYG)	-	-	-	-	39	27.9	20.5	16.2	13.3	11.7	11.5
Average Replacement Rate from Hypothetical Annuity	-	-	-	-	2.3	3.8	8.5	16.6	27.7	39.3	41.6
Total Average Replacement Rate	-	-	-	-	41.3	31.7	29	32.8	41	51	53.1
Male Non-switchers											
Average Replacement Rate (PAYG)	62.4	56.7	52.2	49	-	-	-	-	-	-	-
Female Non-switchers											
Average Replacement Rate (PAYG)	62.7	59.8	55.5	49	-	-	-	-	-	-	-

6.8 The Generational Aspect of the Reform

This sub-section will assess the impact of pension reform on different generations of retirees under the White Paper Scenario. Chart 6.2 and Table 6.4 above depict the trends in the total average replacement rate for males and females following the implementation of the reform over the period 2005-2072.

The total average replacement rate for new male pensioners is 62.4 per cent in 2005 and it then follows a declining trend until 2030. In 2030, the average replacement rate for new male pensioners is 35.5 per cent and it then follows a rising trend over the following years. In 2072, the total average replacement rate for new males is 51.3 per cent.

As regards the total average replacement rate for new female pensioners, the trend mirrors closely the developments for males described above. The average replacement rate for new female retirees in 2005 is 62.7 per cent. In the following years it follows a declining trend and in 2040 the total average replacement rate for new female pensioners is 29.0 per cent. In the following years the rate for females rises at a faster rate than the rate for males, thus reaching 53.1 per cent in 2072.

The trends described above reflect the timing of the changes introduced in the White Paper. The parametric changes to the PAYG system are reflected in the downward trend in the total average replacement rate until around 2030 for males and 2040 in the case of females. In the following years, as more funds accumulate under the second pillar (more so following the increase in the contribution rate to 5 per cent in 2025), the growth in second pillar pension more than compensates for the declining trend in PAYG pension.

6.9 Sensitivity to Changes in the Rate of Return on Private Fund Investments

As already emphasised in other sections, the outcome of the pension reform is very sensitive to the assumed rate of return on private fund investments. In the PROST sheet used for simulating the reform, the rate of return was assumed to be 5.0 per cent in real terms. This assumption is considered to be quite realistic as the average rate of return on funded pension schemes over the last forty years has been around 5.25 per cent per annum.[23] Nevertheless, there exists a significant degree of uncertainty over the rate of return that will prevail in the future. In particular, it was stated that the ageing of the baby-boomers generation could lead at some point in the future to a decline in stock prices as they would be selling off their stock portfolios to a smaller new generation of buyers.[24] For these reasons, it was deemed appropriate to determine the sensitivity of the pension reform scenario to changes in the rates of return. In particular, two alternative rates of return were simulated: 3 per cent and 7 per cent per annum in real terms.

In terms of the First Pillar Pension, the changes in the rates of return have no effect on the average replacement rate. This result is consistent with a priori expectations as the changes in the rate of return affects only the second pillar pensions. Nevertheless assuming that the individuals are rational and forward-looking, they would be conscious that the rate of return to their funded pension may be lower or higher than the expected rate of return and they would adjust their consumption and savings over the lifecycle accordingly. However these effects are not detected by the PROST model.

[23] Mc Morrow and Roeger (2002) pg.48
[24] IMF (2004) pg.150

The impact of the change in the rate of return on the second pillar can be assessed by analysing its effect on average replacement rate if all balances are annuitised or converted as scheduled payments when compared to the scenario where the rate of return stands at 5.0 per cent.

Table 6.5 Sensitivity of the Replacement Rate to Changes in Rate of Return

change in percentage points

	2025	2030	2040	2050	2060	2070	2072
Interest Rate at 3 per cent							
Average Replacement Rate if all Balance is Annuitised	-0.9	-1.1	-2.1	-3.9	-6.6	-9.5	-10.1
Male	-1.0	-1.2	-2.5	-4.6	-7.3	-10.1	-10.7
Female	-0.7	-0.8	-1.5	-3.1	-5.7	-8.8	-9.5
Average Replacement Rate if all Balance is Converted to Scheduled Payments	-1.0	-1.1	-2.1	-3.9	-6.3	-8.6	-9.1
Male	-1.1	-1.3	-2.5	-4.5	-7.0	-9.2	-9.6
Female	-0.7	-0.8	-1.4	-3.0	-5.3	-7.8	-8.4
Interest Rate at 7 per cent							
Average Replacement Rate if all Balance is Annuitised	1.2	1.5	3.1	6.6	12.0	18.3	19.9
Male	1.4	1.8	3.6	7.4	12.9	18.8	20.3
Female	0.9	1.1	2.3	5.3	10.7	17.6	19.4
Average Replacement Rate if all Balance is Converted to Scheduled Payments	1.3	1.6	3.1	6.4	11.5	16.6	17.9
Male	1.5	1.8	3.6	7.3	12.4	17.2	18.3
Female	0.9	1.1	2.2	5.1	10.2	16.0	17.4

Source: Figures are relative to scenario where a 5% rate of return is assumed

In the case of a decrease in the interest rate to 3.0 per cent, the average replacement rate if all balances are annuitized would decrease by 0.9 percentage points in 2025 with the effect on males stronger than on females. The extent of this decline gathers pace over time and by the end of the projection period 2072, the average replacement rate would decline by 10.1 percentage points. In the case where the balance is converted as scheduled payments, the effect is of a similar magnitude to that where all the balances are annuitised and by 2072 the average replacement rate would decline by 9.1 percentage points.

In the case where an interest rate of 7.0 per cent is assumed, the average replacement rate is positively affected. In fact, where all balances are annuitised, the average replacement rate would increase by 1.2 percentage points in 2005 with the impact for males being stronger than for females. By the end of the projection period in 2072, the average replacement rate would rise by 19.9 percentage points relative to the scenario where the interest rate stood at 5.0 per cent. When the balances are converted as scheduled

payments, the changes recorded in the average replacement rate are similar in magnitude to the case where all balances are annuitised, however the impact by 2072 would be relatively weaker at an increase of 17.9 percentage points.
As can be seen from Table 6.5, the impact of changes in the interest rate has a different impact across genders and among different groups of retirees. In fact the impact is of an accumulative nature over time. In the case where the interest rate is 3 per cent, males tend to be worse affected than females thus reflecting the differences in the length of the working life and life expectancy among genders. Moreover, earlier retirees (e.g. the persons in retirement in 2025) are less negatively affected than persons who retire at a later stage.

In the case where the interest rate is 7 per cent, the rise in the replacement rate is stronger for males than for females throughout the projection period. Additionally, later retirees (e.g. the persons in retirement in 2070) experience a stronger rise in the replacement rate than persons retiring at an earlier stage. On the basis of these results one can conclude than the effect of a change in the interest rate on the average replacement rate in the funded pillar is highly significant.

Another interesting aspect of the reform is the sensitivity of the average replacement rate for new pensioners to changes in the interest rate. Table 6.6 shows the developments in the average replacement rate for new pensioners following changes in the interest rate relative to the scenario where interest rate is constant at 5 per cent per annum.

In the case where the interest rate is 3 per cent, the average replacement rate for males from a hypothetical annuity declines by 1.0 percentage points in 2025. This decline gathers momentum over the projection period and reaches 19.1 per cent by 2072. In the case of females, the decline is 0.7 percentage points for 2025, going down by 21.9 percentage points by 2072. Thus over time, the impact of a decline in interest rate results in a lower replacement rate for all generations, with the impact being worse for later retirees. The impact on females is relatively more severe than the impact on males.

Under the scenario where the interest rate is 7 per cent, the average replacement rate increases by 1.4 percentage points for new male retirees in 2005 and reaches 37.9 percentage points for the retirees of 2072. As regards females, the average replacement

Table 6.6 Sensitivity of the Average Replacement Rate for New Pensioners

	change in percentage points						
	2025	2030	2040	2050	2060	2070	2072
Interest Rate at 3 per cent							
Average Replacement Rate from Hypothetical Annuity							
Male	-1.0	-1.7	-4.8	-9.3	-14.3	-18.4	-19.1
Female	-0.7	-1.2	-3.1	-7.4	-13.7	-20.5	-21.9
Interest Rate at 7 per cent							
Average Replacement Rate from Hypothetical Annuity							
Male	1.4	2.5	7.4	16.0	27.0	36.1	37.9
Female	0.9	1.7	4.9	13.5	27.7	44.0	47.6

Source: Figures are relative to scenario where a 5% rate of return is assumed

rate for the new retirees of 2025 increases by 0.9 percentage points, rising by 47.6 percentage points for the retirees of 2072. Therefore, an increase in the interest rate results in an increase in the average replacement rate for future generations of retirees, with the impact on females being relatively stronger than the impact on males.

6.10 Conclusion

The aim of the reform as proposed in the White Paper is to address the deficiency arising from the trajectory development of the current pension system through a number of recommendations. A primary impact of the reform is on demographic characteristics. The reform ensures that the support ratio does not reach levels as low as those that would be reached if no reform is undertaken. A significant change is also registered in the number of contributors and beneficiaries under the system, given the new parameters, thus leading to significant improvements in the PAYG deficit to GDP ratio over the forecast horizon. It is pertinent to note, that in the first years of the reform the PAYG deficit to GDP ratio deteriorates, but by 2010 the reform would start to impact positively on the deficit ratio. By the end of the forecast horizon, the reform will reduce the deficit to 1.4 per cent of GDP, a comparable level to current PAYG deficits to GDP.

The impact of the reform, given the introduction on the Second Pillar Scheme impacts individuals differently, depending on whether an individual shifts to the new system (switcher) or stays under the current system (non-switcher). Average replacement rates for existing 2/3 retirement pension fall during the first few years of the reform when compared to the returns if no reform is undertaken. The category of individuals mostly hit during this period, the non-switchers, would thus receive a lower average replacement rate from the first pillar and are unable to top up their income from the Second Pillar scheme, because they make no contributions under the reform proposals. On the other hand, the switchers group, mostly those under 45 at the time of the reform, although receiving practically the same average replacement rate from the PAYG under the reform, they would have a supplementary pension coming from the Second Pillar Scheme to which they contributed during their working life. The total average replacement rate for 2/3 retirement pension (First plus Second pillar) will thus be significantly higher when compared to the returns projected in the current system, but still below the rates enjoyed today by persons retiring over the forthcoming years who gain only from the PAYG. It is important to highlight, that returns from the Second Pillar are significantly dependent on the assumed return from the fund.

When compared to the no-reform scenario, calculations show that the real PAYG average per capita benefits for the two-thirds retirement pension following the implementation of the reforms do not decline over time. One should note that given that this statistic is an average it tends to fluctuate significantly, in reflection of changes in the underlying distribution of the number of beneficiaries. In particular, trends in the average per capita benefits are sensitive to measures affecting the number of beneficiaries and the pension payments by Government

The analysis of the reform under different macro economic assumptions shows that the reform is still generally effective in reducing the PAYG deficit as a ratio of GDP and in

increasing the average replacement rate. The main differences arise in a scenario of higher income earned by individuals on average, in which case, the reform will not be as effective in reducing the PAYG deficit to GDP ratio in the medium term, although over the longer term horizon the PAYG deficit to GDP ratio falls to the same levels as in the scenario in the White Paper. The replacement rates under the RAI scenario are lower than those prevailing under other scenarios. Yet the reform is effective in increasing the replacement rates in the future years by a significant proportion.

7. The Impact of Population Ageing on Fiscal Sustainability in Malta

Like other countries in Europe and elsewhere, Malta is facing a significant demographic shift over the next fifty years. The combination of declining fertility rates and increasing longevity is expected to result in ageing and declining population stock. These demographic projections represent a distributional challenge, as the number of contributors to the welfare system will fall relative to the number of welfare recipients. The increasing number of elderly will lead to higher old-age related expenditure on pensions and health care at a time when the working age population is declining. This in turn is expected to erode the tax base and in absence of changes to the current welfare system such trends would widen the fiscal deficit.

The demographic developments described above have important implications for the sustainability of public finances in Malta. In line with the Terms of Reference, this section partly addresses the expected macroeconomic impact if no changes are carried out to the pension system, as well as in the case where the reform is implemented. In other words, it evaluates partly the effects of population ageing and subsequently the effect of pension reform on the sustainability of public finances in Malta. The analysis excludes the effects of a declining fertility rate, and consequently a declining labour force, on the economy in general and on public finances in particular. This is analysed in Section 2.

The methodology used to evaluate fiscal sustainability follows Blanchard et al, (1990). The methodology used is described in further detail in Appendix A. In general, the idea is to calculate the tax rate as a percentage of GDP (t^*) required in order to ensure that public finances are sustainable in the long term. Then the indicator of sustainability is obtained as the gap between the sustainable tax rate (t^*) and current tax rate (t). The sustainable tax rate is equivalent to the annuity value of future expected spending and transfers, plus the difference between the real interest rate and the average GDP growth rate, times the ratio of debt to GDP. Thus if the sustainable tax rate (t^*) is higher than the current tax rate (t), then sooner or later Government would have to either raise taxes or decrease expenditure, or both. Then the gap between the sustainable tax rate (t^*) and current tax rate (t) represents the size of the adjustment required to return public finances to a sustainable path[25].

The interpretation of a positive value ($t^* - t$) depends on the initial level of the tax rate, thus a positive gap is more worrying in the case where the initial level of the tax rate is high. One must emphasise that a positive value of the gap ($t^* - t$) does not imply that taxes should necessarily be raised. Indeed the method is agnostic on whether the adjustment to a sustainable fiscal path should be done from the revenue or the expenditure side of the budget[26].

[25] Blanchard *et al* (1990) pg.13
[26] ibid.

7.1 Long-term Sustainability of Government Finances

In line with the analysis presented by Blanchard *et al*, the long-term is defined as a forty-year period. The current tax ratio taken as a benchmark is equal to 43.7 per cent of GDP. This is equivalent to the ratio of estimated total government revenue, excluding extraordinary revenue, to estimated GDP in 2004[27]. Only the long-term gap is estimated, based on projections of spending and transfers for the period 2003-2043. The projected increase in expenditure on pensions was taken from projections of the PROST model of expenditure on pensions. Other expenditure items were assumed to maintain a constant ratio to GDP projections. The methodology follows closely Blanchard et al, 1990.

7.1.1 No-Reform Scenarios

Table 7.1 gives the implied long-term gap, over the projected period, under different scenarios in the event that welfare reform, as proposed in the White Paper, is not undertaken. The base case scenario is equivalent to the base case scenario assumed in the White Paper, hereinafter referred to as the 'White Paper Scenario', where GDP is assumed to grow at an average of 3.0 per cent per annum and a discount rate of 5 per cent. In this case, the adjustment required to bring public finances back on a sustainable path is equivalent to 2.7 per cent of GDP. This implies that the current tax rate should be increased or expenditure should be reduced by this amount, or a combination of both[28]. If adjustment is not undertaken immediately and delayed by 2 years, the gap would increase to 4.0 per cent of GDP. If adjustment is delayed by 5 years, the cost of adjustment would rise to a significant 7.8 per cent of GDP.

Alternative scenarios were also carried out in order to test the sensitivity of fiscal sustainability to the various assumptions. In particular, the assumption of an increasing participation rate of women in the labour force was tested and the effect on fiscal sustainability of a lower participation rate was estimated. The sustainability indicators did not change significantly. An alternative scenario with a different distribution of income, and a higher average wage was also carried out. This had a significant impact with the long-term gap increasing by 1 percentage point to 3.7 per cent of GDP.

The degree of adjustment required increases in the Medium Case Scenario. Assuming an average GDP growth rate of 2.4 per cent and a real discount rate of 5.5 per cent, the adjustment required increases to 5.7 per cent of GDP. In the worst-case scenario, where real GDP grows by an average of 1.7 per cent per annum and assuming a discount rate of 6.0 per cent, the required adjustment reaches 6.5 per cent of GDP.

[27] Extraordinary revenue was removed from the current tax ratio on the basis that such revenue may not necessarily repeat itself in the future.
[28] Thereafter keeping the tax and/or expenditure ratio at this sustainable level throughout the forecast period.

Table 7.1 Sustainability of Fiscal Policy in the Long Term

Long-term gaps based on projected growth of general spending on pensions
(no-Reform scenarios)

	Long term Gap	Long Term Gap 2 year delay	Long Term Gap 5 year delay
	(% of GDP)	(% of GDP)	(% of GDP)
Gap based on growth in pension outlays			
White Paper Scenario	2.7	4.0	7.8
Alternative Female Participation Rate Scenario	2.7	3.9	7.7
Alternative Income Distribution Scenario	3.7	5.4	10.7
Medium Growth Scenario	5.7	8.7	17.5
Slow Growth Scenario	6.5	10.1	20.3

This clearly indicates that the sustainability of public finances is very sensitive to economic performance. The long-term costs to society under the slow growth scenario may be as high as 3.8 per cent of GDP when compared to the White Paper Scenario. Furthermore, the costs will increase significantly if action is not taken immediately.

The above calculations exclude the effects of ageing on the public health sector. However, as the proportion of the elderly population increases, health expenditure is also expected to increase accordingly.

7.1.2 Reform Scenarios

The above scenarios exclude the positive effects welfare reform could have on the sustainability of public finances, if this is successfully undertaken. Welfare reform, as presented in the document, is expected to reduce government's outlays on pensions in the long term. This is expected to contribute positively to fiscal sustainability. The impact of pension reform on the sustainability of public finances is shown in Table 7.2.

Under the White Paper Scenario, the reform is expected to improve the fiscal sustainability of public finances by as much as 2.1 percentage points. The long-term gap is thus expected to fall from 2.7 per cent of GDP to 0.6 per cent of GDP. This clearly indicates that the welfare reform initiatives as presented in the White Paper, are expected to reduce the fiscal sustainability gap significantly.

It is important to note, at this stage, that welfare reform as contemplated in the document will also have a positive effect on government revenue, primarily as a result of the increase in retirement age, which is expected to increase the number of contributors. It was not possible to quantify exactly the extent of this effect such that the resulting long-term gap may be slightly overestimated.

Table 7.2 Sustainability of Fiscal Policy in the Long Term

Long-term gaps based on projected growth of general spending on pensions
(Reform scenarios)

	Long term Gap (% of GDP)	Long Term Gap 2 year delay (% of GDP)	Long Term Gap 5 year delay (% of GDP)
Gap based on growth in pension outlays			
White Paper Scenario	0.6	0.9	1.7
Alternative Female Participation Rate Scenario	0.6	0.9	1.7
Alternative Income Distribution Scenario	1.6	2.4	4.6
Medium Growth Scenario	3.1	4.7	9.3
Slow Growth Scenario	4.3	6.5	13.0

In the event that welfare reform is undertaken immediately under the slow growth scenario the extent of fiscal consolidation required will be equal to around 4.3 per cent. Thus, the long-term costs to society, under a slow growth scenario, after allowing for the positive effects of the envisaged welfare reform, when compared to the White Paper no-reform scenario, may be as high as 1.6 per cent of GDP. This cost increases significantly if corrective action is not undertaken immediately.

In addition, our estimates are based on the assumption that debt should converge to its initial value in the long term. However, Government may be committed to a reduction in the debt ratio to GDP. Assuming a reduction in the ratio to 60 per cent of GDP would entail further measures to bring the ratio to this level. Calculations indicate that a further adjustment of around 0.2 per cent of GDP is required to bring down the debt to GDP ratio to the 60 per cent target.

7.2 Conclusion

This section has primarily quantified the imbalance inherent in public finances in terms of long-term sustainability. In line with the analysis presented by Blanchard et al, sustainability is defined as the level of taxation which ensures that the ratio of debt to GDP remains constant at its initial level (i.e. excludes an increase in the debt level). In the absence of welfare reform implementation as proposed in the White Paper, an imbalance of 2.7 per cent of GDP has been identified. However this imbalance is sensitive to:

1) the assumptions on GDP growth - for instance if the economy grows at a slower rate, the gap could increase by as much as 3.8 percentage points, reaching 6.5 per cent of GDP;

2) the possible delays in the necessary fiscal adjustment – this could increase the sustainability gap significantly;

3) the effect of ageing on health expenditure.

The reform as proposed in the White Paper is effective in reducing part of the gap. In the best case scenario, only a gap of 0.6 per cent of GDP remains. This gap could increase to 4.3 per cent under the slow growth scenario. This may increase significantly if adjustment is not undertaken immediately.

8. The Economic Impact of Policy Reform Scenarios

The projected demographic situation in the context of the current PAYG system is expected to affect the economy through two main channels:

1. the direct effects of ageing and lower fertility on economic growth, consumption and savings patterns, investment, the current account and fiscal policy;
2. the indirect effects on the economy of the policy response to the effects of ageing on government finances;

The first issue has already been dealt with in Section 2 of this report. This section deals primarily with the effects pension policy reform options could have on economic activity. This section sheds light on the likely economic impact of the various fiscal policy measures suggested in the White Paper, in fulfilment of the Terms of Reference.

One must be careful when interpreting results, particularly the magnitudes of the economic effects. Although the scenarios undertaken may be similar in nature to the White Paper proposals, they need not necessarily correspond exactly. In addition, no account has been taken of distributional aspects. Thus whilst the results are generally applicable, the impact on different sectors of society is not necessarily equal.

The Structural Annualised Econometric Model for Malta (SAMM) was used to evaluate the likely impact of policy response scenarios. SAMM is primarily a demand-driven model and might partly underestimate second-round supply-side effects such as the effects of higher participation rates and disincentive effects on the decision to work. Projections for the impact of policy over an 8-year period were generated. This represents a medium term impact. The policy scenarios, particularly the magnitudes of the initial policy shock are purely illustrative. A number of policy options were analysed. The idea of carrying out these scenarios is to demonstrate how different classes of policy responses can affect the economy differently. The policy scenarios include:

> Policy Scenario 1: an immediate increase of 2 percentage points in social security contribution rate paid by employers and employees;
>
> Policy Scenario 2: a gradual increase in employer and employee social security contributions by 2 percentage points, over an 8-year period;
>
> Policy Scenario 3: a gradual increase in employee social security contributions of 2 percentage points over an 8-year period.
>
> Policy Scenario 4: an assumed reduction of Lm25 million per annum in government expenditure;

The first policy scenario involves a policy measure that has an effect on both household disposable income and on the costs of production. Thus it affects directly both demand and supply conditions in the economy. This scenario is also useful to evaluate the

possible effects of the introduction of a mandatory two-tier pension scheme, financed by an increase of 2 percentage points in the social security contribution rates, as proposed in the White Paper. It is important to note that the White Paper also proposes an eventual increase in the social security contribution rate by a further 3 percentage points. Although, this is not explicitly modelled, its effects will be similar in scope but different in magnitudes.

Scenario 2 models the effects of a gradual increase in social security contributions paid by employers and employees. The latter scenario should be similar to the effects of introducing a voluntary scheme such as the second-pillar of the proposed pension reform.

On the other hand, Scenario 3 models the effects of a gradual increase in social security contributions paid by employees only. Although the latter policy scenario does not form part of the reform proposals contained in the White Paper, particularly those related to the Second Pillar, it is useful in illustrating how a policy which refrains from affecting directly the supply side of the economy implies a less persistent negative effect on the economy. In particular, unlike policies that affect the supply side (Scenario 1 and Scenario 2), policies that primarily affect the demand side have no significant effect on unit labour costs and the competitiveness of the Maltese economy.

Scenario 4 is intended to model the impact which one class of policy measure, related to a reduction in government expenditure (which could include the suggestion of the White Paper to index pensions to the price level and changes in the eligibility criteria for a full pension) is expected to have on the economy. It is thus useful in highlighting the possible economic impact of the pension reform proposals related to the expenditure side rather than the revenue side. Again, the magnitudes of the simulated policy shock are not necessarily those contained in the White Paper proposals and the Lm25 million is purely hypothetical. The policy scenario does not include the effects of a reduction in capital expenditure that could have negative effects on potential output in the long-term. Scenario 4 can be characterised as a class of policy action that affects the demand side of the economy, with direct effects on household disposable income but not unit labour costs.

8.1 Policy Scenario 1

The scenario presented here is similar in scope to the introduction of a mandatory Second Pillar pension scheme as proposed in the White Paper. An increase in the social security contribution rates paid by employers and employees affects both supply and demand conditions. Whilst demand shocks tend to have temporary effects on output, supply shocks have a more permanent effect. The demand shock in this scenario works through the fall in household disposable income. The growth rate of real household disposable income is reduced by 2.1 percentage points. As expected, this is a temporary effect and dies down completely in the second year. The supply shock works through an increase in compensation of employees, which includes the social security contributions paid by employers on behalf of their employees and a fall in real labour productivity. As expected, this has a more permanent effect. In fact, unit labour costs continue to increase for three successive years. However, the major impact is in the initial year, and is

equivalent to an increase of 2.3 percentage points. In the second and third year, the impact does not exceed 0.2 percentage points. Further details are provided in Table 8.1.

The higher costs of production also reduce profits, thus exerting a negative influence on output and investment activity. The growth rate of gross fixed capital formation is reduced by 0.3 percentage points in the first year. The negative effect on investment persists for up to four years. Value added growth also declines by 0.4 per cent in the first year and the negative impact takes three years to die down. The decline in value added is a reflection of the fall in output. Because the fall in output in this scenario is also coming from the supply side, exports are also affected negatively. The growth in exports of goods and services is reduced by 0.7 percentage points in the first year, and an average of around 0.4 percentage points in subsequent years.

The increase in the cost of labour has a marginal negative effect on employment growth and a marginal but persistent effect on the unemployment rate which is around 0.1 to 0.3 percentage points higher. Inflation is also marginally higher.

The projected scenario also affects the demand side through a fall in household disposable income. This has an immediate negative effect on the growth rate of private consumption of 1.7 percentage points. The negative effect on private consumption persists in the second year, partly reflecting further declines in income growth as a result of a slower output growth and partly reflecting a marginally higher price level. The fall in private consumption and output is in turn reflected in a fall in the growth rate of imports of around 1 percentage point initially and an average of around 0.2 percentage points in subsequent years. The effect on imports is persistent reflecting the persistent fall in output and exports, as the need for imports of industrial supplies falls.

Table 8.1 Impact of an increase in Social Security Contribution Rate of Employers and Employees by 2 percentage points

		YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8
GDP (at constant market prices)	pp	-0.6	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2
Private Consumption	pp	-1.7	-0.5	0.0	0.2	0.2	0.1	0.0	0.0
Gross Fixed Capital Formation	pp	-0.3	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.0
Government Consumption	pp	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exports of Goods and Services (volumes)	pp	-0.7	0.0	-0.5	-0.4	-0.3	-0.3	-0.3	-0.3
Imports of Goods and Services (volumes)	pp	-1.0	-0.3	-0.3	-0.2	-0.1	-0.1	-0.2	-0.2
Value Added	pp	-0.4	-0.2	-0.1	0.0	0.1	0.0	0.0	0.0
Real Household Disposable Income	pp	-2.1	-0.1	0.0	0.1	0.1	0.1	0.0	0.0
Inflation	pp	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Unemployment rate	pp	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1
Employment	pp	-0.2	-0.1	-0.1	0.0	0.1	0.1	0.0	0.0
Real Labour Productivity	pp	-0.4	0.0	-0.2	0.1	0.0	0.1	0.1	0.1
Compensation per head	pp	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unit Labour Cost	pp	2.3	0.1	0.2	-0.1	0.0	-0.1	-0.1	-0.1

Government consumption increases primarily as a result of the increased outlays on social security contributions it pays on behalf of public sector employees. In addition, higher costs of goods and services produced locally seem to add up the costs of providing public services.

The negative effect on real GDP growth is initially equal to 0.6 percentage points. Subsequently economic growth remains at 0.2 percentage points lower for the duration of the forecast period. This clearly indicates that the negative effects of this reform proposal may be persistent.

8.2 Policy Scenario 2

Policy scenario 2 evaluates the economic impact of a gradual increase in social security contributions paid by both employers and employees. The above policy scenario reproduces, in part, the effects of introducing the second pillar of the pension system on a voluntary basis for a number of years. Because not all households will adopt the second pillar, the impact on household disposable income does not materialise immediately but gradually, over a period of time.

It is important to highlight that the simulation, though similar, is not necessarily fully in line with the proposed policy. In particular, this would depend on the number of employers and employees who volunteer to contribute to the second pillar. The simulation is purely illustrative. It is primarily aimed to approximate the general direction of the effects of such a voluntary scheme on the economy. These would generally hold true even though the magnitudes of the effects may not necessarily be accurate.

Table 8.2 Impact of a Gradual Increase in Social Security Contribution Rate of Employers and Employees by 2 percentage points

		YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8
GDP (at constant market prices)	pp	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Private Consumption	pp	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Gross Fixed Capital Formation	pp	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Government Consumption	pp	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Exports of Goods and Services (volumes)	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports of Goods and Services (volumes)	pp	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Value Added	pp	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Real Household Disposable Income	pp	-0.2	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2
Inflation	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unemployment rate	pp	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
Employment	pp	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0
Real Labour Productivity	pp	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Compensation per head	pp	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2
Unit Labour Cost	pp	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1

Apart from the extent of the impact, a major issue of concern in the simulation is the persistence of the effect on the economy. In particular, since the policy, though voluntary, will be subscribed by both employers and employees, it will affect both the supply side of

the economy as well as the demand side. Table 8.2 illustrates the main impact on the economy of such a scenario.

Compared to Scenario 1 where the policy is implemented at one go, a gradual implementation ensures that the impact on GDP is only marginal. GDP is reduced by 0.1 percentage point each year along its implementation. The persistence of the effect is partly due to the gradual implementation of the policy. Nevertheless, it is clear that the policy will have a negative effect on the supply side of the economy. Indeed, unit labour costs are projected to increase by 0.3 percentage points for the first three years and 0.1 percentage points for the subsequent years. The policy also has a persistent negative effect on investment activity.

Due to its effects on the supply side, such a policy should have a persistent effect on output compared to a similar policy that affects only the demand side. Indeed, by way of comparison, Scenario 3 illustrates the effect of an increase in employee contributions, thus affecting primarily the demand side.

The effect of a gradual increase in employers and employees' contribution rate on demand is similar to that of Scenario 1. It mainly works through a fall in household disposable income that is reduced by around 0.2 percentage points each year. Because the policy is undertaken gradually, however, the effects on demand are significantly lower in the first year. In subsequent years, the effect is only marginally higher. This indicates that as long as the proposed second-pillar remains on a voluntary basis, the effects on the economy, excluding possible second-round effects from an increase in the savings ratio (see Section 5) should be marginal.

8.3 Policy Scenario 3

The third policy scenario is similar to Scenario 2. However, the policy is carried out gradually by increasing the employee's contribution rate over a period of eight years. Thus, the employers' contribution rate remains unchanged. This scenario models the effect of a fall in aggregate demand, particularly private consumption expenditure, as a result of a fall in household disposable income. However, given that the policy is implemented gradually, there is no significant effect on output. Indeed, GDP growth is virtually unaffected. More importantly, because the policy action does not have a direct impact on the supply-side, its effects are not persistent. Indeed, no significant effect on productivity and unit labour costs are registered. No change in inflation and employment growth are registered either. Further details are provided in Table 8.3.

Table 8.3 Impact of a Gradual Increase in Social Security Contribution Rate of Employees by 2 percentage points

		YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8
GDP (at constant market prices)	pp	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.1
Private Consumption	pp	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Gross Fixed Capital Formation	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Government Consumption	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exports of Goods and Services (volumes)	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports of Goods and Services (volumes)	pp	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Value Added	pp	0.0	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1
Real Household Disposable Income	pp	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Inflation	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unemployment rate	pp	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Employment	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real Labour Productivity	pp	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1
Compensation per head	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unit Labour Cost	pp	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1

Such a policy scenario is not contained in the proposed reform. The main aim of this scenario is to demonstrate that effects of policy actions which do not impact the supply-side of the economy

8.4 Policy Scenario 4

The fourth scenario shows the likely effects of a hypothetical reduction in government expenditure of Lm25 million per annum. This scenario could approximate the suggestions in the White Paper of changing the system of indexation of pensions to the price level rather than wages and changes in the eligibility criteria for full pension entitlement or a reduction in bureaucracy, rationalisation of public entities and a number of other measures. The magnitude of the policy reform is also purely hypothetical and does not necessarily reflect the extent of the proposed reforms mentioned above. As shown in Table 8.4, this policy scenario is expected to have a significant but temporary negative effect on household disposable income. The growth rate of household disposable income declines significantly by 2.7 percentage points. However, this effect dies down immediately.

The fall in household disposable income affects private consumption expenditure negatively. The impact on private consumption expenditure growth is initially equal to 2.2 percentage points. This is partly compensated by a fall in imports of 1 percentage point. The net effect of a fall in aggregate demand is to reduce output growth by 0.6 percentage points in the first year.

Table 8.4 Impact of a fall in Government expenditure by Lm25 million per annum

		YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8
GDP (at constant market prices)	pp	-0.6	-0.2	0.0	0.1	0.0	0.0	0.0	0.0
Private Consumption	pp	-2.2	-0.6	0.1	0.3	0.2	0.2	0.1	0.1
Gross Fixed Capital Formation	pp	-0.2	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.0
Government Consumption	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exports of Goods and Services (volumes)	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports of Goods and Services (volumes)	pp	-1.0	-0.3	0.1	0.2	0.1	0.1	0.0	0.0
Value Added	pp	-0.7	-0.1	0.0	0.1	0.1	0.1	0.0	0.0
Real Household Disposable Income	pp	-2.7	-0.1	0.1	0.2	0.2	0.2	0.1	0.1
Inflation	pp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unemployment rate	pp	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.1
Employment	pp	-0.2	-0.2	-0.1	0.0	0.1	0.1	0.0	0.0
Real Labour Productivity	pp	-0.4	0.0	0.1	-0.1	-0.1	-0.1	-0.1	0.0
Compensation per head	pp	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unit Labour Cost	pp	0.5	0.0	-0.1	0.1	0.1	0.1	0.1	0.0

The fall in output growth is estimated to exceed the fall in employment, leading to a one-off decline in real labour productivity growth of around 0.4 percentage points. Unit labour costs increase temporarily by 0.5 percentage points.

The initial fall in output leads to a subsequent fall in income. As a result, the negative effect on the growth in private consumption expenditure persists in the second year as well. In addition, the fall in output also exerts a negative and relatively persistent effect on investment activity. The effects are however marginal.

In general, the effect on economic activity is significant in the first year of implementation and equivalent to Scenario 1. However, because it mainly affects demand, the negative effects are not as persistent and by the second year of implementation no effect on output is observed.

8.5 Conclusion

This section has identified 4 different classes of possible policy measures. These are:

1. measures which have an impact on both the demand and the supply side of the economy such as an increase in employers and employee contribution rate;
2. measures imposed gradually which primarily affect the demand side and supply side of the economy such as a gradual increase in the employee and employer social security contribution rate;
3. measures imposed gradually which primarily affect the demand side of the economy such as a gradual increase in the employee social security contribution rate;

4. measures aimed at reducing government expenditure with a direct effect on aggregate demand ;

Class 1, 2 and 4 are similar in scope to the measures contained in the White Paper whilst Class 3 is purely illustrative of a class of policy actions which refrain as much as possible to influence directly the supply-side.

In general:

- Policy measures that affect both the supply and demand conditions, such as an increase in employers and employee contribution rate, have negative effects on the economy, which are significant and persistent;

- The negative impact of policy measures that affect the demand side but do not have a direct impact on the supply side are generally less persistent;

- The negative effect can be reduced significantly if such policies are imposed gradually;

From this section one can also draw a number of conclusions on some of the policy measures proposed in the White Paper.

- The negative effects on the economy of a reformed pension system (as proposed in the White Paper) are expected to be temporary because such policies mainly affect demand conditions. Negative income distribution effects may however be expected.

- Financing the proposed Second Pillar through higher employer and employee social security contributions as proposed in the White Paper has a significant and persistent negative impact on the economy because it affects directly both demand and supply conditions;

- The initial voluntary scheme, the Second Pillar, should exert persistent but marginal negative effects on the economy in the short run as long as it remains voluntary and thus adopted gradually;

This may suggest that the introduction of the voluntary second pillar pension scheme prior to the mandatory scheme should reduce the magnitude of the impact on the economy of the mandatory scheme considerably. If the voluntary scheme is gradually subscribed by a significant proportion of the population, the change in regime from a voluntary to a mandatory system will be significantly less damaging on the economy. Thus, the success of the voluntary scheme will be very important in ensuring that any negative impact from the mandatory second pillar is contained.

9. Conclusion

Population ageing is expected to have a significant impact on the performance of the Maltese economy. In particular the smaller working age population is expected to limit the labour supply and thus affect negatively output growth over the medium to long term.

The economic impact of status quo

The demographic changes are associated with a smaller number of persons in their prime working years who generally have a higher propensity to save than the rest of population, thus the transition is likely to result in a smaller savings ratio. In view of the reduced savings pool, there would be fewer resources available to finance investment activity, and in the absence of capital flows, lower savings are likely to lead to a lower share of investment in output in Malta. Population ageing is also likely to result in deterioration in public finances due to increased pressure associated with expenditure on pensions and health care. Additionally, the fall in the savings ratio is expected to result in a worsening of the current account balance.

Under the no reform scenario, the projected demographic developments, would lead to a significant reduction in the support ratio, thus clearly impinging on the number of contributors and beneficiaries in the system and consequently affecting negatively the PAYG deficit to GDP ratio. After reaching a peak in 2030, demographic developments over the long run lead to a marginal improvement in the PAYG deficit to GDP ratio. Under the current regime, the average replacement rates for two-thirds beneficiaries are expected to fall significantly and in addition a decline in real average per capita benefits over the years is also envisaged. This is critical in highlighting the need of addressing the current status quo. Although the simulations carried out under alternative macroeconomic, income distribution and labour force participation rates illustrate the degree of sensitivity of the PAYG balance and pension benefits adequacy to the White Paper Scenario, these do not change the basic conclusion that under the current system, pension benefits are unlikely to be sufficient to have a decent standard of living in future.

The economic impact of pension reform

Based on the findings of Section 8, reform may lead to negative short-run effects on the economy. However, the reform as proposed in the White Paper is effective in raising the support ratio relative to the no-reform scenario. Additionally the change in the number of contributors and beneficiaries under the system, leads to a significant improvement in the PAYG deficit to GDP ratio over the forecast horizon. The average replacement rates for the existing 2/3 retirement pension falls during the first few years of the reform when compared to the returns if no reform is undertaken. Non-switchers are the category mostly hit during this period, as their average replacement rate from the First Pillar is low relative to the no-reform scenario and are unable to top up their income under the Second Pillar scheme.

As regards the switchers group, their average replacement rate from the reformed PAYG is practically the same as under the no-reform, however they would augment their income

with the Second Pillar pension. The total average replacement rate (First plus Second Pillar) will thus be significantly higher when compared to the returns projected under the no-reform scenario, but still below the rates enjoyed by a person retiring in 2002. Simulations demonstrate that the average replacement rate for the funded Second Pillar pension is sensitive to the assumed rate of return from the fund.

When compared to the no-reform scenario, calculations show that the real PAYG average per capita benefits for the two-thirds retirement pension following the implementation of the reforms do not fall over time. This is important in highlighting the efficacy of the reform in sustaining future standard of living of retirees. Additionally, the analysis of the reform under different macroeconomic assumptions shows that the reform is still generally effective in reducing the PAYG deficit as a ratio of GDP and in increasing the average replacement rate.

Long-Term Sustainability of Public Finances

Defining fiscal sustainability as the tax rate that ensures that the ratio of debt to GDP remains at the initial level, calculations show that under the no-reform scenario, an imbalance of around 3 per cent of GDP was identified. The magnitude of this imbalance is sensitive to the assumptions on the ensuing rate of GDP growth. Delays in the necessary fiscal adjustment increase the sustainability gap significantly. The proposed Pension Reform is effective in reducing the gap to 0.6 per cent of GDP under the White Paper Scenario. Yet this result is dependent on the success of structural reforms in raising output growth and excludes the effects of ageing on health expenditure on public finances.

The report identified a class of policy measures, specifically those proposed by the White Paper, to address the current pension system. The multiplier effect on the economy of various measures is also illustrated. This class of policy measures includes changes to the social security contribution rates and reduction in government expenditure. Simulation results suggest that policy measures affecting both the demand side and the supply side of the economy have a negative and persistent impact on the economy. The negative effect can be virtually eliminated if such policies are imposed gradually and the supply side of the economy is not affected by the policy measure. The simulations also indicate that the higher the success rate of the voluntary Second Pillar scheme, the lower will be the magnitude of the negative effects of the mandatory scheme upon its introduction. Simulations also indicate that policies which focus on the expenditure side tend to have a less permanent negative effect on output. The forecasted impact of the reform could however be affected through exogenous supply side shocks.

In general……

It is worth emphasising that the expected gains in economic growth associated with pension reform are primarily attributable to labour market reforms and changes to the effective retirement age, as international experience suggests that the growth effects of the switch to a funded pension system are likely to be limited. Thus the success of the pension reform in contributing positively to economic growth hinges significantly on the

extent that labour market reform is successful in raising the participation rate as well as the implementation of structural initiatives aimed at improving the functioning of the product and capital markets.

Appendix A: Calculating the Fiscal Sustainability Gap in terms of Taxation

Methodology

Fiscal sustainability can be defined as the time-path of fiscal policy such that the ratio of debt to GDP eventually converges to its initial level b_0. This standard definition of sustainability implies that in the limit, as *'n'* (the number of years) tends to infinity, the discounted value of debt goes to zero:

$$\lim_{n\to\infty} b_n \exp-(r-\theta)n = 0 \qquad (1)$$

The indicator reported in this paper follows Blanchard *et al* (1990) and defines sustainability as the constant (or sustainable) tax rate (t^*) such that the present discounted value of the ratio of primary deficits to GDP is equal to the negative of the initial level of the debt to GDP ratio. The sustainable tax rate is computed as follows:

$$t_n^* = \left(\frac{r-\theta}{1+r-\theta}\right)\left[\left[1-\left(\frac{1}{1+r-\theta}\right)^n\right]^{-1}\left[\sum_{s=1}^{n}\left(\frac{1}{1+r-\theta}\right)^{s-1}(g_s+h_s)\right]+b_0\right] \qquad (2)$$

where t^* is the sustainable tax rate, expressed as a percentage of GDP
r is the real discount rate
ϑ is the average real rate of GDP growth
n is the number of years
g is the ratio of spending to GDP
h is the ratio of transfers to GDP
b_0 is the ratio of initial debt to GDP

Then the indicator of sustainability is obtained as the gap between the sustainable tax rate (t^*) and current tax rate ($\underline{t}$):

$$t_n^* - t \qquad (3)$$

Thus the sustainable tax rate is equivalent to the annuity value of future expected spending and transfers, plus the difference between the real interest rate and the average GDP growth rate, times the ratio of debt to GDP. Thus if the sustainable tax rate (t^*) is higher than the current tax rate (t), then sooner or later Government would have to either raise taxes or decrease expenditure, or both. Then the gap between the sustainable tax rate (t^*) and current tax rate (t) represents the size of the adjustment to return public finances to a sustainable path[29]. The interpretation of a positive value (t^* - t) depends on the initial level of the tax rate, thus a positive gap is more worrying in the case where the initial

[29] Blanchard *et al* (1990) pg.13

level of the tax rate is high. One must emphasise that a positive value of the gap (t^* - t) does not imply that taxes should necessarily be raised. Indeed the method is agnostic on whether the adjustment to a sustainable fiscal path should be done from the revenue or the expenditure side of the budget[30].

[30] ibid.

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