2011

Military Superannuation and Benefits Scheme

Defence Force Retirement and Death Benefits Scheme and Defence Forces Retirement Benefits Scheme

(MSBS, DFRDB AND DFRB)

A report on long term costs prepared by the Australian Government Actuary using data to 30 June 2011

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Summary

This report sets out estimates as at 30 June 2011 of the long term costs of superannuation benefits payable in respect of the members of the three superannuation schemes covering the vast majority of Australian Defence Force (ADF) personnel. The previous report was prepared using data as at 30 June 2008.

The schemes covered in this report are:

- the Military Superannuation and Benefits Scheme (MSBS) which commenced on 1 October 1991;
- the Defence Force Retirement and Death Benefits Scheme (DFRDB) which commenced on 1 October 1972 and which has been closed to new members since the commencement of the MSBS; and
- the Defence Forces Retirement Benefits Scheme (DFRB) which commenced on 1 July 1948 and only covers those who were in receipt of a pension at the time DFRDB commenced, or their reversionary dependants.

Notional employer contribution rates

The notional employer contribution rate is the contribution rate that would be required to fund the defined benefits accruing to serving members over the next three years on the basis that superannuation benefits are accrued uniformly over the period until a member exits from the scheme or reaches his or her maximum benefit limit, whichever occurs first. The following table shows the contribution rates for the MSBS and the DFRDB as calculated for this report and the previous report as at 30 June 2008. There is no contribution rate for the DFRB as it comprises only pensioner members. These rates include the 3 per cent productivity contributions but do not include the additional employer contributions paid as a result of the application of the Ordinary Time Earnings (OTE) earnings base in calculating Superannuation Guarantee obligations from 1 July 2008. The additional OTE contributions amount to around 1 per cent of

superannuation salary across the membership of both schemes and are paid to the ancillary section of the MSBS Fund.

Notional employer contribution rate as a percentage of superannuation salary

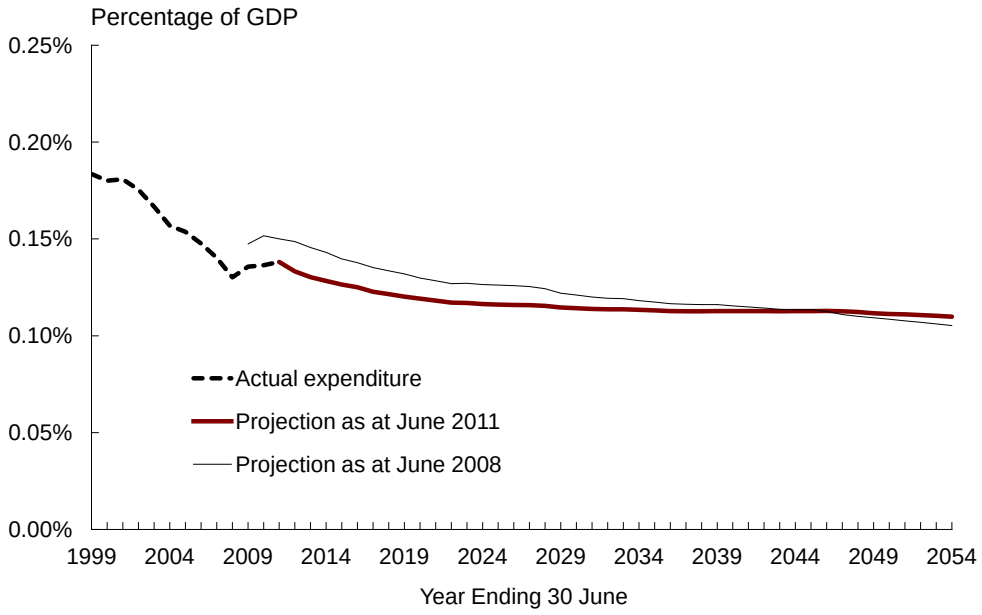
Report as at	MSBS[1] (%)	DFRDB (%)	Combined[2] (%)
2008 Report	27.0	33.4	27.6
2008 Addendum[3]	29.1	33.4	29.5
Current Report	30.4	29.7	30.4

1. The MSBS rates exclude the cost of the retention benefit.
2. The 2008 and 2011 combined rates are weighted average rates based on salaries of the members of the two schemes projected over the three years following the review date.
3. The 2008 Addendum was provided following the Government's decision to ratify the increases to MSBS death and invalidity benefits resulting from the increase in Compulsory Retirement Ages.

Projection of employer cash costs

Direct Commonwealth outlays that will be required under the current method of funding benefits have been projected for the next 44 years and expressed as a percentage of Gross Domestic Product (GDP) so that the relativities of annual Government superannuation cash outlays can be matched against a relevant base. The following chart shows actual cash costs since 1999 and projected costs for the next 44 years, together with the cash costs that were projected in the Long Term Cost Report as at 30 June 2008 (the '2008 Report').

Actual and projected Commonwealth outlays as a percentage of GDP



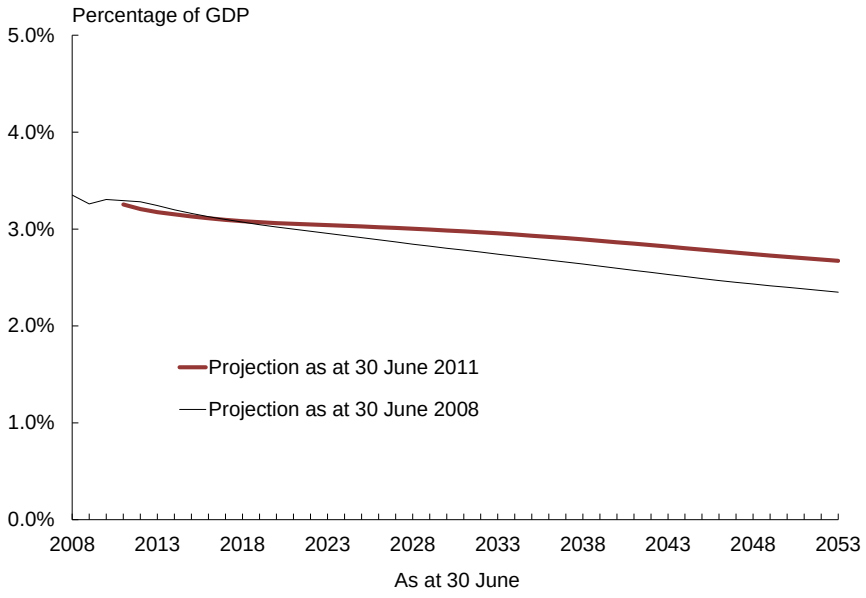
Annual cash costs represent approximately 0.13 per cent of GDP at present, falling to around 0.11 per cent of GDP in the long term. In the short to medium term, the current projections are lower than the projections on the 2008 Report. In the long term, the current projections are slightly higher than the previous projections. The factors leading to this result are discussed in Chapter 6.

Present value of unfunded liabilities

The unfunded liability in respect of benefits that have already accrued for current employees, former employees and pensioners has been estimated as $45.2 billion as at 30 June 2011 of which $0.5 billion relates to the DFRB, $25.3 billion to the DFRDB and $19.3 billion to the MSBS. This is 3.3 per cent of GDP. This compares with the figures appearing in the 2008 Report of $37.9 billion or 3.4 per cent of GDP as at 30 June 2008.

The following chart illustrates the projected fall off in the total unfunded liabilities as a percentage of GDP. The trend is favourable with this measure of liabilities falling by around 20 per cent over the 44 year projection period. The chart also gives the projection from the 2008 Report. Overall, the projected liabilities as a percentage of GDP are higher than those from the 2008 Report. The factors leading to this result are discussed in Chapter 7.

Projected unfunded liabilities as a percentage of GDP



Scheme membership

Over the three years to 30 June 2011, total contributory membership continued to increase, reaching almost 59,500 members, around 5,100 more than the membership in 2008. The total number of pensioner members across all schemes has slightly increased, with almost 65,000 pensioners being valued for the current review. The number of MSBS members with a preserved benefit increased by approximately 13,000 over the three years from 2008 to 2011, to over 84,000. More details on the scheme membership are provided in Chapter 3.

Changes to military superannuation since the previous report

There have been two major changes to military superannuation arrangements since the last report. The first flowed from the change in the method of determining Superannuation Guarantee obligations. This change took effect from 1 July 2008 and the anticipated financial impact was included in the previous Report. The second was the Government's decision to ratify the increase in death and invalidity benefits in the MSBS resulting from the increase in Compulsory Retirement Ages. A full discussion of the changes to scheme arrangements is provided in Chapter 2.

Changes in assumptions since the previous report

The assumptions adopted and changes since the previous report are discussed in Chapter 4. The most significant change from a cost perspective was to assume increased take up rates of the pension option in MSBS. There have been a number of other minor changes to assumptions which have had a much smaller impact on reported scheme costs.

Chapter 1 Introduction

1.1 This report has been prepared by the Australian Government Actuary, Mr Peter Martin, FIAA, and members of his office at the request of the Department of Defence. It sets out estimates of the long term superannuation costs of the Military Superannuation and Benefits Scheme (MSBS) the Defence Force Retirement and Death Benefits Scheme (DFRDB) and the Defence Forces Retirement Benefits Scheme (DFRB) that will be charged to the Consolidated Revenue Fund (CRF). The estimates are based on scheme data supplied by ComSuper (the schemes' administrator) as at 30 June 2011.

1.2 Estimates of the long term costs of military superannuation have been provided by the Australian Government Actuary in a series of reports since the commencement of the DFRDB on 1 October 1972. The most recent estimate of the long term costs of the DFRDB and MSBS was carried out using data as at 30 June 2008 and was presented in my report dated June 2009.

1.3 At the time of preparing the previous Long Term Cost Report, there was some uncertainty about the MSBS benefits to be valued following the increase in Compulsory Retirement Ages for most ADF personnel in July 2007. The increase in Compulsory Retirement Ages had an unintended flow-on effect of increasing MSBS death and invalidity benefits. At the time of preparing the previous report, it seemed likely that the flow-on effect would be reversed and the report was prepared on this basis. The Government decided not to reverse the flow-on effect and an Addendum to the Long Term Cost Report was provided in March 2010 giving revised figures based on the increased MSBS benefits.

1.4 For the first time, at the request of the Department of Defence, DFRB outlays and liabilities have been reported on separately from DFRDB. Previously, costs associated with DFRB members have been included in the results for DFRDB.

1.5 This report has been completed in accordance with the principles recommended in the separate actuarial paper 'The Financing and Costing of Government Superannuation Schemes'. That paper provides a full explanation of the methods used and the reasons for their adoption.

1.6 Three measures of long term costs are provided:

- Notional employer contribution rate

  This is the employer contribution rate that would be required to fund the defined benefits accruing over the next three years, on the basis that superannuation benefits are accrued uniformly over the period until a member exits from the scheme or reaches his or her maximum benefit limit, whichever occurs first. It represents the employment cost that arises from the superannuation schemes, and has been expressed as a percentage of the defined benefit superannuation salaries.

- Projection of actual employer cash costs

  This is a projection of the actual cash outlays payable annually by the Commonwealth in respect of superannuation benefits for ADF personnel. The items included are set out in paragraph 2.21. The cost has been projected over the next 44 years and expressed as a percentage of gross domestic product.

- Net present value of unfunded liabilities

  This is the excess of the accrued Commonwealth liability for superannuation benefits in respect of service up to 30 June 2011 over the value of assets held by the schemes.

1.7 The measures of costs above represent the Commonwealth's direct costs for superannuation. If these costs are incurred by the Commonwealth, there should be some consequential reduction in the Commonwealth's Age Pension outlays and increase in taxation receipts. I have not provided an estimate of these potential benefits in this Report since they are highly uncertain, involving assumptions about future Age Pension and taxation parameters as well as the private savings and spending behaviour of scheme members.

1.8 The purpose of the triennial reviews is to assess the financial position of the schemes over the long term. Estimates of the net present value of the unfunded liabilities have also been produced on an annual basis for inclusion in the Department of Defence Financial Statements. These annual estimates are calculated in accordance with Australian Accounting Standard AASB 119 and are not directly comparable to the estimates provided here

Increase in the Superannuation Guarantee Contribution Rate

1.9 The Government announced its intention to increase the minimum level of employer support under the Superannuation Guarantee (SG) arrangements from 9 per cent of Ordinary Time Earnings to 12 per cent of Ordinary Time Earnings. Subsequent to 30 June 2011, the legislation needed to give effect to this increase was passed. The current report has not factored in any potential changes to MSBS and DFRDB benefits that may occur as a result of this increase.

Future Fund

1.10 In 2006, the Government established a Future Fund to meet unfunded superannuation liabilities, contribute to national savings and increase net worth. The assets of the Future Fund are intended to reduce calls on the budget to meet the liabilities of the Commonwealth's superannuation schemes when spending pressures associated with an ageing population are projected to emerge. However, since the assets of the Future Fund are not held by the schemes, the unfunded liabilities projected in this report have not been reduced to take account of the assets which may be held by the Future Fund. Similarly, the projected outlays have not been reduced to take account of any drawdowns from the Future Fund.

Compliance with professional standards

1.11 The report has had regard to the Institute of Actuaries of Australia Professional Standard 400 (Investigations of Defined Benefit Superannuation Funds) and complies with the Standard insofar as it deals with unfunded superannuation schemes. Professional Standard 400 is designed to primarily apply in the context of funded private sector defined benefit superannuation funds. The schemes under review in this report operate on an unfunded or substantially unfunded basis with an implicit Government guarantee.

Chapter 2 The Military Superannuation Schemes

2.1 Current and former Australian Defence Force personnel (other than Reservists who are not rendering continuous full-time service) are covered under one of three superannuation schemes: the Defence Forces Retirement Benefits Scheme (DFRB); the Defence Force Retirement and Death Benefits Scheme (DFRDB) and the Military Superannuation and Benefits Scheme (MSBS). It is possible for members to have benefits in both the DFRDB and the MSBS.

The DFRB

2.2 The DFRB was established under the *Defence Forces Retirement Benefits Act 1948*. It was closed on 1 October 1972 when the DFRDB was introduced. At that time, all contributory members were transferred to the DFRDB. Existing pensioners and their reversionary beneficiaries continue to receive pensions payable under the DFRB legislation. This scheme represents a very small proportion of the total liability.

2.3 The DFRB is a defined benefit scheme. It is unfunded and does not hold any assets. The Scheme has no external insurance arrangements. Benefits are financed from Consolidated Revenue as they become due for payment. The Scheme is untaxed and no tax is levied on employer contributions. The Scheme is an exempt public sector superannuation scheme under the *Superannuation Industry (Supervision) Act 1993.*

The DFRDB

2.4 Under the *Defence Force Retirement and Death Benefits Act* 1973, the DFRDB was deemed to have come into existence on 1 October 1972. The documents setting out the provisions of the DFRDB are the Act itself, as amended, together with the associated Regulations and the Defence Force (Superannuation) (Productivity Benefit) Determinations made under the *Defence Act 1903*. The DFRDB was closed to new members on 30 September 1991. Contributory members at that time were given the option of transferring to the MSBS under the transitional arrangements associated with the introduction of the new scheme.

2.5 The DFRDB is a defined benefit scheme. It is unfunded and does not hold any assets. The Scheme has no external insurance arrangements. Benefits are financed from Consolidated Revenue as they become due for payment. The Scheme is untaxed and no tax is levied on employer contributions. The Scheme is an exempt public sector superannuation scheme under the *Superannuation Industry (Supervision) Act 1993*.

The MSBS

2.6 The Military Superannuation and Benefits Scheme was introduced on 1 October 1991. The documents setting out the provisions of the MSBS are the *Military Superannuation and Benefits Act 1991* and the Trust Deed and Rules of the Scheme. Membership is compulsory for those joining the ADF as permanent employees. MSBS members now make up over 90 per cent of serving personnel and it will be expected to overtake the DFRDB as the scheme accounting for the largest unfunded liability within the next few years although it is likely to be around 15 years before cash outlays for MSBS exceed those of DFRDB.

2.7 The MSBS is a defined benefit scheme. It is a partially funded arrangement. The Scheme has no external insurance arrangements. The Scheme is a complying superannuation fund under the *Superannuation Industry (Supervision) Act 1993*.

2.8 Ancillary benefits in MSBS are fully funded. Generally, member financed accounts in MSBS are fully funded. The employer financed component of benefits is largely unfunded, apart from the 3 per cent Productivity Benefit component which is funded. Benefits that are not paid from MSBS Fund assets are financed from Consolidated Revenue as they become due for payment.

2.9 Summaries of the benefits payable under the MSBS and the DFRDB are set out in Appendices A and B respectively. They can be described briefly as follows:

MSBS A member financed benefit equal to member contributions accumulated with fund earnings plus an employer financed lump sum benefit based on a multiple of final average salary and total service. On age retirement, the employer financed lump sum may be wholly or partially converted to an indexed pension.

DFRDB An indexed pension benefit based on a multiple of final salary and total service. Part commutation of the pension to a lump sum is permitted on age retirement.

Changes to military superannuation over the review period

Superannuation Guarantee — Ordinary Time Earnings

2.10 The most significant change to superannuation over the review period, from a financial perspective, flowed from the change in the method of determining employer's Superannuation Guarantee obligations. Since 1 July 2008, defined benefit schemes have been required to assess their obligations against ordinary time earnings (OTE). Previously such schemes had been assessed against what were known as protected earnings bases. In the case of the DFRDB and the MSBS, the protected earnings bases were essentially the superannuation salaries defined in the schemes' governing documents.

2.11 OTE for ADF personnel includes allowances which are not included in the schemes' definitions of superannuation salary. In order to ensure compliance with Superannuation Guarantee obligations, employer superannuation contributions of up to 9 per cent of certain allowances which do not form part of superannuation salary have been paid into the ancillary section of the MSBS. In determining the amount of employer superannuation contributions for an individual, the maximum earnings base for Superannuation Guarantee purposes is taken into account. The additional employer contributions apply for both DFRDB and MSBS members and amounted to approximately $44 million in 2010-11.

2.12 The anticipated additional cash expenditure involved was included in the projected cash outlays in the previous Long Term Cost Report. There is no impact on the projected unfunded liability as the additional employer contributions are paid into a fully funded accumulation arrangement.

MSBS Compulsory Retirement Ages

2.13 In 2007, the Compulsory Retirement Ages for most ADF personnel were increased with the intention of providing greater employment flexibility. The change had a flow-on effect on the calculation of death and invalidity benefits paid under the MSBS which was not appreciated when the amendment was made. At the time of writing the 2008 Long Term Cost Report, no death or invalidity benefits had been paid using the higher retirement ages and steps were being taken to clarify in the MSBS Rules that the change in Compulsory Retirement Ages did not flow through to the calculation of these benefits. Accordingly, I assumed that death and invalidity benefits would not be impacted by the change in Compulsory Retirement Ages.

2.14 The Government subsequently made a decision that the flow-on effect on the calculation of death and invalidity benefits paid under the MSBS would stand. The figures in this report are based on the higher death and invalidity benefits and thus are, therefore, not directly comparable with the formal estimates in the 2008 Long Term Cost Report. Figures based on the higher death and invalidity benefits were included in the Addendum to the 2008 Long Term Cost Report dated 21 March 2010. Where relevant, I have included the figures from the Addendum, in addition to the results from the 2008 Report, for the purposes of comparison with the findings of the current report.

Same Sex Reversionary Pensions

2.15 From 1 January 2009, the Government extended the provision of reversionary pensions, following death to same sex partners, in Commonwealth superannuation schemes including the military schemes. The cost of this change was minor in the overall context of the military schemes with an estimated increase in the unfunded liability of around $30 million.

Funding and payment of benefits

2.16 Member contributions and after-tax productivity superannuation contributions are accumulated with interest at the actual investment earnings rates of the MSBS Fund[1]. When benefits commence to be paid to a member, the accumulated productivity contributions are transferred to the CRF and the employer benefit is financed from the CRF on an unfunded basis. In any given year, the unfunded benefits paid from CRF will be the total amount of benefits paid less the transfers from the MSBS Fund relating to members who have exited in that year.

2.17 The unfunded component of employer financed benefits from the MSBS is untaxed and no tax is levied on employer contributions for this component of benefits. Employer contributions for the 3 per cent Productivity Benefit are taxed at 15 per cent when received by the MSBS Fund.

2.18 Member contributions to the DFRDB are paid direct to the CRF and not accumulated in a fund. All benefits from the DFRDB (and DFRB pensions) are provided from the CRF on an unfunded basis.

2.19 The OTE obligations discussed in paragraph 2.11 are funded through contributions to the ancillary benefits section of the MSBS Fund. Employer OTE contributions are taxed at 15 per cent when received by the MSBS Fund.

2.20 Other contributions to the MSBS ancillary benefits section are payable in addition to the above contributions. Government co-contributions for all superannuation schemes are made via the Australian Taxation Office (ATO) and accounted for via that program. Accordingly, no allowance has been made in the projections for the Commonwealth cash expenditure associated with government co-contributions (for reference, these co-contributions amounted to $13 million in 2010-11). Transfer amounts, personal, spouse and salary sacrifice contributions paid to the ancillary benefits section are

1 Prior to the valuation date, contributions to the MSBS were invested by the Military Superannuation and Benefits Board of Trustees No 1 (the trustees). From 1 July 2011, the Military Superannuation and Benefits Board of Trustees No 1 was replaced by the Commonwealth Superannuation Corporation.

made at an individual's discretion, rather than determined under scheme rules. They have not been included in the projections. Any employer contributions for ancillary benefits are taxed at 15 per cent when received by the MSBS Fund.

2.21 The estimates in Chapter 6 of this report relate to the actual employer cash cost payable by the Commonwealth, with the cost in each year being calculated as follows:

(i) **MSBS**

Funded productivity superannuation contributions paid to the MSBS Fund

plus

Unfunded benefits paid from the CRF

(ii) **DFRDB**

Benefits (entirely unfunded) paid from the CRF

less

Member contributions paid to the CRF

(iii) **DFRB**

Pensions paid from CRF

(iv) **Superannuation Guarantee Contributions**

Funded contributions paid to the ancillary section of the MSBS Fund.

Retention benefit

2.22 The *Military Superannuation and Benefits Act 1991* also provides for a retention benefit which is payable to eligible personnel who, on completion of 15 years' service, undertake to complete a further five years' service. The benefit is a lump sum of one year's salary which is paid directly to the individual at the time he or she commits to the additional service and is taxed as assessable income in the hands of the individual. As the retention benefit is not a superannuation benefit (being payable prior to exit from service), the benefit outgo and associated employer costs have not been included in this report.

2.23 Access to the retention benefit ceased for new members entering the ADF on 5 October 2005. Retention benefit provisions have been retained for those who were members of the MSBS prior to that date. The last retention benefit payments can therefore be expected to occur in 2020.

2.24 Since 2005, there have been a number of retention initiatives introduced, including more targeted completion bonus payments. As with the MSBS retention benefit, these payments are not superannuation benefits, nor do they form part of superannuation salary for the purposes of the defined benefits payable under the MSBS or the DFRDB. They do, however, form part of OTE and, as such, give rise to Superannuation Guarantee contributions which have been included in the cashflows reported in Chapter 6.

Chapter 3 Membership, data and assets

Data

3.1 This report has been based on data supplied by ComSuper who carry out the administration of the schemes. ComSuper put a considerable effort into supplying data in a form suitable for actuarial analysis. A number of checks were carried out to ensure that the data was sufficiently accurate for the purpose of the report.

3.2 Details of the main data checks are included below. These checks indicate that the data is substantially complete and hence I am satisfied that the data is sufficiently accurate for the purposes of this report.

3.3 Checks were also done on the internal consistency of individual records and, where necessary, queries were followed up with ComSuper. Where it could be established that the information on the data supplied was inaccurate, records were amended to enable a more accurate valuation.

Membership

3.4 A summary of the contributory membership valued is set out below.

Contributors (as at 30 June 2011)

	MSBS		DFRDB	
	Number	Salaries ($m)	Number	Salaries ($m)
Male officers	9,083	913	1,314	167
Female officers	2,085	194	45	6
Male other ranks	37,350	2,420	2,288	199
Female other ranks	5,693	358	81	7
Cadets	1,558	68	-	-
Total	**55,769**	**3,952**	**3,728**	**378**

Note that components may not add up to totals due to rounding.

3.5 The number of MSBS contributors valued is 55,769. Data on MSBS contributors provided by the Department of Defence showed 55,176 contributors as at the last payday of 2010-11 plus 306 non effective members and 349 members not contributing. Superannuation salary related checks did not reveal any cause for concern. In my opinion, the MSBS contributor data valued was effectively complete.

3.6 The number of DFRDB contributors valued is 3,728. The DFRDB Annual Report has 3,743 contributors as at 30 June 2011. In my opinion, the DFRDB contributor data valued was effectively complete.

3.7 A summary of the pensioners valued is set out below. There are also a number of children's pensions payable.

Pensioners (as at 30 June 2011)

	Number	Pensions[1] ($m pa)
DFRB		
Age pensioners	871	14
Invalid pensioners	662	12
Reversionary pensioners[2]	2,215	34
Associate pensioners[3]	1	0
Total DFRB	**3,749**	**60**
DFRDB		
Age pensioners	44,189	1,095
Invalid pensioners	1,990	69
Reversionary pensioners[2]	6,353	128
Associate pensioners[3]	438	5
Total DFRDB	**52,970**	**1,297**
MSBS		
Age pensioners	3,449	73
Invalid pensioners	4,436	122
Reversionary pensioners[2]	256	5
Associate pensioners[3]	36	0
Total MSBS	**8,177**	**201**
Total All Schemes	**64,896**	**1,558**

Note that components may not add up to totals due to rounding.

1. The pension amounts include the July 2011 pension increase.
2. Reversionary pensions are pensions that are payable to the surviving spouse and any dependent children following the death of a pensioner or contributory member. The figures in the above table do not, as far as possible, include the pensions payable in respect of children.
3. Associate pensioners are pensioners who receive a pension as a result of a superannuation split following a Family Law settlement in respect of a pensioner in the MSBS or the DFRDB.

3.8 The equivalent figures for pensioners as at 30 June 2008 were 6,760 MSBS pensioners with total annual pension of $133 million, 52,647 DFRDB pensioners with total annual pension of $1,173 million and 4,396 DFRB pensioners with total annual pension of $67 million.

3.9 The 2011 MSBS Annual Report has the number of pensioners as 8,166 compared to the 8,177 valued. The corresponding figures for the DFRDB (excluding children's pensions) are 52,970 and 52,982 respectively and for DFRB (excluding children's pensions) are 3,749 and 3,762.

3.10 Checks were also done for the DFRB, the DFRDB and the MSBS by comparing the pensions valued with the ComSuper pension payroll figures. The payroll figures showed payments being made to 3,748 DFRB pensioners, 53,267 DFRDB pensioners and 8,291 MSBS pensioners on the first pension payday of the 2011-12 financial year. The equivalent annual pension amounts paid were $60 million for the DFRB, $1,299 million for the DFRDB and $207 million for the MSBS. These numbers include children's and orphan's pensions. This suggests that the pension data was essentially complete.

3.11 Preserved benefits from the MSBS are payable on attaining age 55, although in certain limited circumstances they may be payable earlier. There were 84,186 preserved beneficiaries valued, with total nominal preserved benefits of $6,001 million. At 30 June 2008, there were 71,054 preserved beneficiaries with total nominal preserved benefits of $4,795 million.

3.12 There are a small number of deferred pensioners in the DFRDB. These individuals are entitled to receive a deferred pension payable from the day that they would have been eligible to receive a pension on exit from the DFRDB had they continued as a serving member. This is normally 20 years after joining the DFRDB. To continue to be eligible for a deferred pension, deferred pensioners must be in public employment. At 30 June 2011, there were 8 deferred pensioners in the DFRDB. They have been ignored for valuation purposes.

3.13 At 30 June 2011, there were 1,224 non-pensioner associate beneficiaries in the MSBS with total associate benefit amounts, both funded and unfunded, of $164 million. Associate benefit accounts are set up in the MSBS as a result of superannuation splits following Family Law settlements. Non-pensioner associate benefits are accumulation style lump sum benefits.

Assets

3.14 The assets of the MSBS are invested in a wide range of investments including the short term money market, Australian and overseas fixed interest, Australian and overseas equities, property trusts, private equity, infrastructure and hedge funds. Based on the Financial Statements as at 30 June 2011, the net assets of the MSBS amounted to $3,737,538,000. The equivalent figure as at 30 June 2008 was $2,934,747,000.

3.15 The MSBS assets are unitised. Members have a number of investment options from which to choose. The investment strategy for the MSBS assets is structured to be consistent with the investment options chosen by members. As such, the investment policies of the MSBS Fund appear suitable.

3.16 For the MSBS, the total of the funded components from all individual records valued, plus the amount of ancillary benefits, was compared to the MSBS Fund as recorded in the Financial Statements. This check again suggested that the data was suitable for valuation purposes. It also suggests that the MSBS Fund approach for allocating investment earnings to accounts is suitable.

3.17 The DFRDB and DFRB are totally unfunded and thus do not hold any assets.

Chapter 4 Assumptions

4.1 Estimates of superannuation costs over the future are, by necessity, based on assumptions about the future. These assumptions can be divided into two categories:

- those which are not directly related to the scheme membership (termed General Assumptions); and
- those which are based on the experience of the membership of the scheme (termed Experience Assumptions).

4.2 This Chapter sets out a broad outline of the main assumptions adopted for this report and comments on the changes made from the assumptions used in preparing the 2008 Report.

4.3 Appendix D to this report provides a sensitivity analysis of the results to changes in assumptions, mainly relating to changes in economic assumptions.

General assumptions

Future size of the schemes

4.4 The following table shows the contributory membership of the schemes as valued since the 1993 review.

Contributory membership at last seven reviews

Valuation year	MSBS	DFRDB	Total
1993	36,933	26,595	63,528
1996	38,610	20,271	58,881
1999	37,041	14,511	51,552
2002	42,113	9,571	51,684
2005	44,491	7,072	51,563
2008	49,307	5,076	54,383
2011	55,769	3,728	59,497

4.5 The experience over the eighteen years falls into three distinct six year periods. The first of these periods saw a significant fall in the combined MSBS and DFRDB membership. This was followed by six years of relatively stable membership. Since 2005, there has been strong growth in contributory membership, particularly over the last three years. This is consistent with the increase in total military personnel foreshadowed by the previous Government. Actual numbers are now slightly in excess of the target established in those projections and little or no further growth is expected in the short term. As would be expected, DFRDB membership has fallen significantly over the last eighteen years. However, it is anticipated to be around another 15 years before DFRDB contributory membership is close to zero.

4.6 The cost projections for this report require an assumption regarding future growth in the membership of the relevant schemes over the long term. Given the expectation of short term stability and uncertainty about long term movements in ADF numbers, I have assumed that the total contributory membership of the MSBS and the DFRDB will remain constant at the level existing at the valuation date.

4.7 Since the DFRDB is closed to new members, its contributory membership will decline. To compensate for this, the MSBS contributory membership is assumed to increase at the rate required to replace the members leaving the DFRDB. The projected decline in DFRDB contributory membership is based on the exit assumptions adopted for the DFRDB, as discussed below.

Economic assumptions

4.8 The significant financial assumptions made in assessing the long term cost of the Commonwealth's military superannuation commitments are:

- the rate of future increases in those pensions and benefits which are linked to increases in the consumer price index (CPI);

- the level of future general increases in salaries (that is, increases other than those relating to promotion or length of service etc). This is measured as the excess of nominal wage growth over the increase in the CPI; and

- the rate of interest to be used to discount future cashflows to a present value. Again, this is measured as the excess over the increase in the CPI.

4.9 The relationship between these rates is one of the most significant factors affecting the long term cost estimates. It is important to note that changes of equal magnitude in the absolute levels of each of the rates can have a major effect on nominal cashflows but will have only a minor effect on the unfunded liability and notional employer contribution rate. On the other hand, changes in the relationship between the rates can have quite substantial effects on the unfunded liability and long term cost estimates. Care is therefore needed when setting the economic assumptions.

4.10 For the purposes of this report, I have decided to adopt the following assumptions:

CPI increases	2.5 per cent per annum (base)
General salary increases	1.5 per cent per annum (in excess of CPI)
Interest rate	3.5 per cent per annum (in excess of CPI)

4.11 The financial assumptions for an investigation into long term costs must be realistic. At the same time, stability over time must be considered. Since cost estimates are sensitive to even small changes in the financial assumptions, it is important not to introduce unnecessary volatility which might mask genuine effects. Inevitably, judgement is required in setting the financial assumptions.

4.12 At the current time, the interest rates on Commonwealth bonds relative to expected price inflation and general salary increases appear to be abnormally low by historic standards. This phenomenon is not restricted to Australia, and many developed economies, including, for example, the US and UK, are also seeing very low interest rates on sovereign debt. There is considerable uncertainty around how the current turmoil in the global economy will be resolved and whether real interest rates will return to the levels observed over the past thirty years. Given the sensitivity of the results to the real interest rate assumption and the absence of any consensus view on the likely trajectory of future interest rates, I have decided to retain the financial assumptions which were adopted in the 2008 Report for this current investigation.

4.13 Assumptions regarding the rate of increase in GDP are also required. Based on the above assumptions for inflation and wage growth, Treasury have produced a projection of annual GDP growth rates (included in Appendix C). This projection has been generated specifically for the purpose of this report. It should not be regarded as an official Commonwealth Treasury projection. The GDP growth rates incorporate the long term effects of demographic and labour force change. The change to the GDP growth assumption has no effect on nominal dollar outlays. However, the variation in growth rates does affect the outlays and liabilities reported as a percentage of GDP.

Experience assumptions

4.14 Experience assumptions are set having regard to the assumptions adopted in the previous report, the experience over the intervening period and the likely impact of any factors expected to affect future experience but not yet apparent in the data.

4.15 In some areas, there are noticeable differences in the experience of the two major schemes. These differences reflect in part the behavioural incentives created by the design features of the two schemes. For instance, in the DFRDB, there is a big increase in the value of benefits when a member qualifies for a pension (normally after 20 years' service). Thus, few members leave the DFRDB in the years just before qualifying for a pension and many left shortly after qualifying for a pension. In the MSBS, there are some incentives to serve 20 years but they are less pronounced than in the DFRDB and hence the resignation experience of the MSBS is different. Assumptions are made to reflect expected experience. Thus, assumptions may differ according to scheme, gender, and whether officer, officer cadet or other rank. Details of assumptions are given in Appendix C.

Mortality of contributors

4.16 The assumed contributor mortality rates are unchanged from those used for the 2008 Report. The assumed rates are higher than those experienced over the three years. This allows for a margin to cover the possibility of serious accidents which result in multiple deaths.

Invalidity

4.17 Invalidity retirements can impose a significant cost on the schemes, particularly when they affect young members. As a result, considerable care needs to be taken in setting invalidity assumptions. At the same time, invalidity experience over the past decade for the MSBS has been difficult to interpret and predict with rates falling between the 2002 and 2005 Reports and increasing markedly between 2005 and 2008.

4.18 The analysis for the current report suggests that invalidity A rates for officers and cadets have largely stabilised and these rates have therefore been left unchanged. For other ranks, DFRDB rates were quite a bit higher than expected and the assumed rates have been increased at all ages, with the largest increases at younger ages. For other ranks in the MSBS, invalidity A exits were only slightly below the assumptions adopted in 2008 and the rates have been left unchanged.

4.19 Invalidity B rates for officers and cadets in the MSBS showed a large spike at the youngest ages and somewhat lower than expected rates at older ages. Fairly minor modifications have been made to the assumptions to allow for this change in experience.

4.20 For other ranks, there were considerably fewer exits than expected. This was not a surprising result for the DFRDB when the design of the scheme is taken into account; the invalidity B benefit for members who have served for 23 or more years (the bulk of the remaining DFRDB contributors), is less than the retirement benefit. Given that the DFRDB closed in 1991, it has been assumed that there will be no invalidity B exits in future. For the MSBS, actual exits were around half the number expected and the rates, have been reduced while retaining a margin above the observed experience.

4.21 Invalidity C benefits are similar to the benefits payable on resignation and for the DFRDB, the two modes of exit have been combined in a single withdrawal rate. A separate invalidity C exit rate is included for the MSBS but is immaterial in a valuation context.

4.22 Historically, the invalidity rates for the MSBS have been higher than the comparable DFRDB rates and, apart from the invalidity A rates for other ranks aged 42 or less, this remains the case for the current valuation. This

feature may be partly attributable to differences in scheme design. For example, invalidity benefits in the DFRDB must be taken wholly in pension form, while those who take a normal retirement benefit may elect to convert part of the benefit to a lump sum. As a result, those in DFRDB who wish to access a lump sum benefit may well consider taking a normal retirement benefit rather than the invalidity benefit.

Resignation

4.23 Resignation assumptions have been made by duration of service.

4.24 DFRDB resignation rates in the past have been strongly influenced by the scheme design which sees a minimal benefit paid on resignation prior to completion of 20 years' service and a lifetime pension paid once that threshold is achieved. With the closure of the DFRDB in 1991, virtually all contributory DFRDB members now have the 20 years of service needed to qualify for a pension benefit on resignation.

4.25 In the 2008 Report, I commented on the abnormally low resignation rates observed in 2007-08 relative to the experience of the previous years. Since that time, resignation rates in both schemes have remained low and the rates adopted for the current review are lower than the 2008 Report assumptions at most durations. In most cases, the differences between male and female experience were not found to be significant enough to justify setting separate assumptions and rates have been adopted which apply to both genders. The exception was MSBS other ranks where separate assumptions have been made.

4.26 The lower exit rates when combined with the changes in the retirement assumptions (see discussion below) have resulted in a small reduction in the unfunded liability for DFRDB as well as a reduction in the notional employer contribution rate. As current DFRDB contributors are assumed to remain in service longer and accrue more benefits, projected longer term cash flows and unfunded liabilities increase. In the MSBS, lower exit rates have slightly increased the unfunded liability and the notional employer contribution rate.

4.27 It is impossible to know how long the lower resignation rates will persist. There is anecdotal evidence that the availability of overseas deployments reduces exit rates and the range of retention measures implemented over recent years, which have provided financial incentives to defer resignation, could be expected to be a contributing factor. Opportunities for employment outside the ADF are also likely to play a part. Changes in any one of these three elements might see a sudden shift in experience. However, with four years of low exits, I have chosen to more closely follow the recent experience.

4.28 I noted in the 2008 report that resignation rates for long serving MSBS members appeared to be lower than had been previously assumed in the absence of any direct MSBS data. Accordingly, the MSBS resignation rates were reduced to reflect this emerging experience, but not all the way to the observed rates. The current analysis has reinforced the view that the initial assumptions were too high and supported a further reduction in these rates.

4.29 The compulsory retirement age for most ADF personnel was effectively increased from age 55 to age 60 from 1 July 2007. There are now a growing group of members aged 55 or more and our previous assumptions that all ADF personnel will exit at age 55 (if they have not exited beforehand) is no longer tenable. I have allowed for these post-55 exits through a retirement decrement as discussed below.

Retirement

4.30 Prior to the change to the compulsory retirement ages, only a very small group of ADF personnel served beyond age 55. I was therefore comfortable assuming that any members still serving at this age would exit on their 55th birthday. There are now 371 DFRDB and 510 MSBS contributors aged 55 or more. In these circumstances, the assumption of immediate exit is unrealistic and leads to a distortion in the projected cashflows and liabilities.

4.31 At the same time, however, there is no credible experience on which to base any assumption about exit rates. Accordingly, I have adopted the somewhat arbitrary assumption that exits of those still in service at age 55 will be evenly spread over the subsequent five years. This issue will need to be looked at more closely once a body of data is available on this group.

Retrenchment and redundancy

4.32 No allowance has been made for the effect of retrenchments and redundancies as their occurrence is unpredictable and impossible to model with any confidence. Generally, the effect of retrenchments and redundancies is to advance outlays rather than increase them overall.

New entrants

4.33 The data on new entrants showed a big increase in the number of cadets and other ranks joining at age 17 and the age distribution of these categories of members were adjusted to reflect this experience. Over 50 per cent of cadets and other ranks join between the ages of 17 and 19. For officers, the data was consistent with the distributions adopted for the last two valuations and I have retained these assumptions for the current valuation. The peak ages at which officers join the ADF are from 23 to 25 but this accounts for only around 20 per cent of the officer intake.

4.34 I have assumed that the gender balance in the new entrant population is such that the mix of the contributory membership is maintained. This assumption does not have a material impact on reported costs, which are not particularly sensitive to the gender balance.

4.35 The various changes made to salaries over the last few years have increased new entrant salaries. This is particularly so for cadets. This has been incorporated into the assumptions.

Promotional increases in salaries

4.36 For other ranks in both schemes, promotional increases appear to be related to period of service. For MSBS cadets and officers, promotional increases appear to be related to both period of service and the age at joining. A similar approach has previously been taken with DFRDB officers but the small number of remaining members and the sparseness of available experience no longer justified this degree of sophistication and a simple service duration based promotional scale has been used for this group. The changes in new entrant salaries meant that corresponding changes were needed to the

MSBS promotional salary scales and this has reduced promotional increases in the earliest years after appointment.

4.37 The lower exit rates have also affected the observed promotional salary growth with the larger numbers of people at longer durations being associated with lower average promotional salary growth for the MSBS in particular.

Mortality of pensioners

4.38 The numbers of deaths of age and reversionary pensioners (that is, pensioners other than invalid pensioners) were close to what was expected based on the assumptions adopted for the 2008 Report after allowing for mortality improvement at the assumed rates over the intervening period. For males, the rates appeared somewhat high between ages 70 and 80 and an additional reduction was made. Overall, the rates adopted for males are around the same or a little less than the mortality rates for the general population. For females, the observed rates are a little higher than the population averages between around 50 and 80. This may reflect the fact that the vast bulk of female pensioners are reversionary beneficiaries and there is evidence that the mortality of widows is higher than that of their never married or married counterparts. The same assumptions are used for all three schemes.

4.39 It is conceivable that MSBS pensioners will have lower mortality rates than DFRB or DFRDB pensioners of the same age. This is because most MSBS members have a choice between pension and lump sum on retirement whereas members of the two closed schemes do not. The ability to choose the form of benefit means that those with poorer life expectancies might be expected to opt for the lump sum and, conversely, those who consider themselves healthier are more likely to choose the pension option. It is not possible to gauge the impact of this selection effect as the number of MSBS pensioners from age retirement is insufficient to allow a proper analysis. Thus, for the time being, the same assumptions are used across all schemes.

4.40 Analysis of invalid pensioner mortality experience suggested that mortality rates at older ages were somewhat less than the assumptions used for the 2008 Report and the rates were adjusted downwards at ages

between 60 and 80. As would be expected, the rates of mortality are significantly higher than for the age pensioners.

4.41 Allowances for future improvements in mortality rates of age and reversionary pensioners were made in accordance with the trend in improvements shown in the series of Australian Life Tables published over a period of 40 years. No allowance was made for improvement in the mortality of invalid pensioners.

Proportions married and age differences

4.42 There was no evidence to suggest that the assumptions on age differences between spouses should be altered from those adopted in the 2008 Report. The assumptions that married male members are four years older than their wives on death and female members three years younger than their husbands were therefore retained. The data on proportions married was also consistent with the previous assumptions, which were accordingly also retained.

Pension option in the MSBS

4.43 Members retiring from the MSBS (other than on the grounds of invalidity) have the option to convert all or part of their employer financed lump sum to a pension. This assumption has a significant impact on the reported costs of the MSBS. In the 2005 Report, the assumption regarding the proportion of benefits which will be taken in pension form was increased substantially for both officers and other ranks. This reflected a growing trend towards pension take-up that had been evident in both the military schemes and other Government superannuation schemes offering similar options. At the 2008 review, these assumptions were considered to be consistent with the more recent experience. The current analysis, however, has revealed a further shift towards pension benefits. I have therefore increased the proportion of employer financed lump sum benefits which are assumed to be converted to pension. I am now assuming that 75 per cent of the lump sum will be converted to a pension for other ranks and 85 per cent will be converted for officers.

Commutation option in the DFRDB

4.44 Members retiring from the DFRDB (other than on the grounds of invalidity A or B) have the option to convert part of their pension to a lump sum. Experience over the last two decades suggests that members choose to take the maximum allowable lump sum. As the conversion factors provide for a lump sum which is greater than actuarial value of the forgone pension at virtually all ages, this is not a surprising outcome. Accordingly, it has been assumed that all retiring members take advantage of this option to the maximum extent permissible.

Taxation

4.45 The DFRDB and DFRB are entirely unfunded. They are untaxed schemes and hence no tax is levied on the schemes. At the time of the 2008 valuation, the notional interest rate used to determine the productivity superannuation benefit was based on the long term Commonwealth Bond rate with an allowance for a notional 15 per cent tax to replicate the investment tax payable under a funded arrangement. This policy was subsequently changed to remove the adjustment for tax and the current valuation assumes that the full Commonwealth Bond rate will be credited to the notional productivity benefit.

4.46 In calculating the accumulation of productivity contributions, allowance has been made for the 15 per cent contributions tax payable on employer contributions made to the MSBS Fund. Investment earnings of the Fund are also taxable at 15 per cent. For the purposes of the valuation, the after tax return on Fund assets is assumed to be the same as the valuation interest rate, that is, 3.5 per cent per annum in excess of the CPI assumption.

Superannuation surcharge

4.47 The superannuation surcharge was a tax on notional employer superannuation contributions in respect of those with high incomes. The tax was assessed on a year-by-year basis but for unfunded schemes, such as the DFRDB and the MSBS, is not paid to the Australian Taxation Office (ATO) until a benefit is payable. The tax was abolished from 1 July 2005 but those individuals who incurred a surcharge liability and have not yet taken

their benefit will, for the most part, still have a surcharge debt account. When the benefit becomes payable, the actual benefit paid to the individual is reduced to take account of the superannuation surcharge amount payable to the ATO by the scheme. I have assumed that the schemes' liability to pay the superannuation surcharge to the ATO will be offset by the value of the benefit reductions resulting from the payment to the ATO. No specific allowances have thus been made in this report for the effects of the superannuation surcharge.

Early release of preserved benefits in the MSBS

4.48 Early release of preserved benefits in the MSBS is permitted on the basis of disablement or hardship. No allowance has been made for early release of preserved benefits.

Splitting of superannuation under the Family Law Act

4.49 Under the Family Law Act, superannuation benefits may be split as part of a Family Law agreement or order. At present, the data received in relation to affected contributory and preserved members does not include the details of the adjustment that will eventually be made to their benefits and thus overvalues the members' interests. At the same time, the value of benefits which have been allocated to non-member spouses is also not included. These two amounts could be expected to largely balance, with any discrepancy relating to differences in the timing of the adjustment of the member's benefit and the payment of the non-member spouse's entitlement. I have made no allowance for the impact of splits of superannuation on the grounds that, at this stage, it is not material.

Conflict situations

4.50 A number of ADF personnel are currently serving in various conflict situations (including peace-keeping duties). At any one point in time, the bulk of personnel are not on deployment, but a significant number are likely to spend some time overseas involved in a conflict situation. The long term costings reported here implicitly assume that the levels of ADF deployment will remain stable. If levels of deployment in a war or warlike situations were to significantly increase, the assumptions adopted here are unlikely to hold. In particular, death and invalidity rates would be expected to be higher, as would ADF personnel numbers.

Chapter 5 Notional contribution rates

5.1 A notional employer contribution rate has been calculated to illustrate the effective cost of the defined benefits being provided by the Commonwealth as a percentage of the superannuation salaries of scheme members. It represents the estimated contribution rate that would be required to fund the defined benefits accruing to serving members over the next three years on the basis that benefits are attributed to periods of service under the AASB 119 accrual methodology. In other words, if the scheme was exactly fully funded in respect of AASB 119 methodology accrued benefits at the beginning of the three years and contributions were made at the calculated rate, then the scheme would be expected to be exactly fully funded at the end of the period. The AASB 119 accrual methodology effectively assumes that benefits are accrued either on a pro rata basis over service to exit or attaining the Maximum Benefit Limit, if earlier.

5.2 The table below shows the notional employer contribution rates for the two schemes separately and also a combined rate for the MSBS and DFRDB. These rates include the 3 per cent productivity contributions, but do not include the additional employer contributions paid as a result of the application of the OTE earnings base in calculating Superannuation Guarantee obligations from 1 July 2008. The additional OTE contributions amount to around 1 per cent of superannuation salary across the membership of both schemes and are paid to the ancillary section of the MSBS Fund. The DFRB scheme has no serving ADF personnel members and hence has no notional employer contribution rate. For comparison, the rates from the 2008 Report and the Addendum to that Report are also shown.

Notional employer contribution rates as a percentage of superannuation salary

	MSBS[1] (%)	DFRDB (%)	Combined[2] (%)
2008 Report	27.0	33.4	27.6
2008 Addendum[3]	29.1	33.4	29.5
Current Report	30.4	29.7	30.4

1. The MSBS rates exclude the cost of the retention benefit.
2. The 2008 and 2011 combined rates are weighted average rates based on salaries of the members of the two schemes projected over the three years following the review date.
3. The 2008 Addendum was provided following the Government's decision to ratify the increases to MSBS death and invalidity benefits resulting from the increase in Compulsory Retirement Ages.

5.3 The majority of the increase in the MSBS notional employer contribution rate from that in the 2008 Report is due to the government decision to ratify the improvement to death and invalidity benefits following the changes to Compulsory Retirement Ages. Changes to valuation assumptions also increased the notional employer contribution rate. The principal assumption change affecting the contribution rate was the increased assumed rate of pension take up. Other changes in assumptions had a minor impact on the notional employer contribution rate.

5.4 The DFRDB is now closed to new entrants. The changes in assumptions, principally the lower exit rates and allowing for post age 55 service, have resulted in a reduction in the notional employer contribution rate.

5.5 The increase in the combined rate from 27.6 per cent of salaries in 2008 to 30.4 per cent of salaries in 2011 is primarily due to the increase in the MSBS notional employer contribution rate. At 30 June 2011, DFRDB contributory members represented less than 10 per cent of the total contributory membership and changes in the MSBS rate will tend to dominate the combined rate.

5.6 The actuarial method used for calculating the notional employer contribution rate in both this report and the previous report is known as the Projected Unit Credit (PUC) method as set out in AASB 119.

5.7 As noted in Chapter 2, additional funded employer contributions are now also being made under the approach adopted to ensure compliance with Superannuation Guarantee requirements. These contributions amounted to around $44 million in 2010-11 or slightly less than 9 per cent of the allowances on which the contributions are paid. Using the same salary base as the notional employer contribution rates, the additional contributions represent close to 1 per cent of superannuation salaries.

Chapter 6 Projection of outlays

6.1 A projection of annual Commonwealth cash outlays has been carried out to show the impact of the schemes in the long term. The Table below shows the actual outlays for 1991-92, 1992-93, every third year thereafter and for each of the years since 2007-08 for the DFRB, DFRDB, the MSBS, and the three schemes combined. Prior to 2008-09, DFRB outlays are included in DFRDB outlays. It also shows projected outlays for the next four years and then every fifth year from 2014-15.

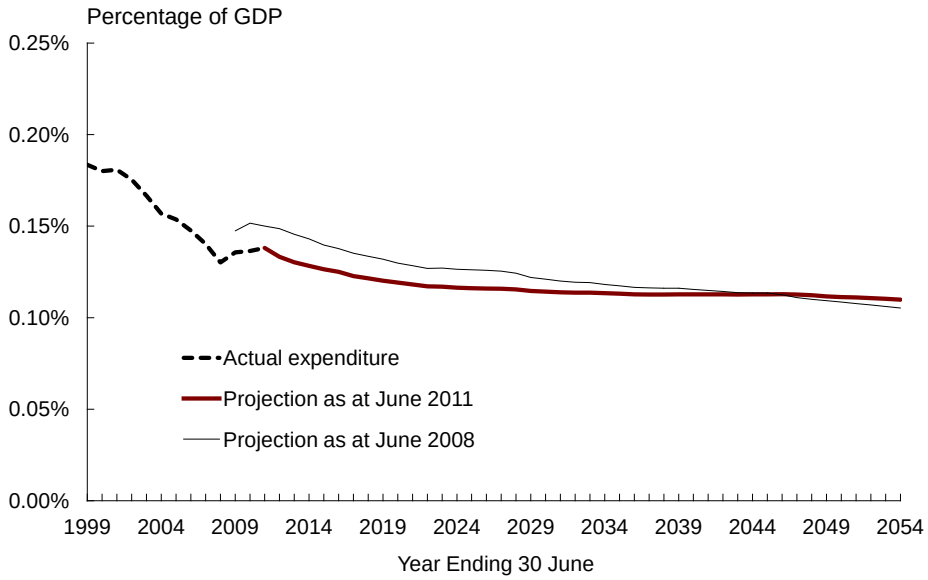
Actual and projected Commonwealth outlays[1]

Year	DFRB[2] ($m)	DFRDB ($m)	MSBS ($m)	SG contributions[3] ($m)	Total ($m)	As a percentage of GDP
Actual[4]						
1991-92		600	32	—	632	0.16
1992-93		703	139	—	842	0.21
1995-96		801	153	—	954	0.20
1998-99		986	158	—	1,144	0.19
2001-02		1,160	171	—	1,331	0.18
2004-05		1,222	202	—	1,424	0.16
2005-06		1,269	209	—	1,478	0.15
2006-07		1,307	224	—	1,531	0.15
2007-08		1,295	249	—	1,543	0.14
2008-09	66	1,325	281	31	1,703	0.13
2009-10	64	1,321	313	55	1,753	0.13
2010-11[5]	65	1,423	386	44	1,918	0.13
Projected						
2011-12	59	1,454	404	47	1,964	0.13
2012-13	57	1,483	444	49	2,033	0.13
2013-14	54	1,515	492	51	2,112	0.13
2014-15	52	1,545	545	53	2,195	0.13
2019-20	40	1,674	900	64	2,678	0.12
2024-25	30	1,736	1,500	78	3,344	0.12
2029-30	21	1,743	2,356	95	4,215	0.11
2034-35	14	1,704	3,515	116	5,349	0.11
2039-40	9	1,613	5,061	141	6,824	0.11
2044-45	6	1,452	7,073	171	8,702	0.11
2049-50	3	1,221	9,441	209	10,874	0.11
2054-55	1	999	11,684	254	12,938	0.11

1. These figures have **not** been adjusted to 2011 dollars.
2. Prior to 2008-09, DFRB outlays were included in the DFRDB figures.
3. The SG contributions paid in 2008-09 only covered three quarterly payments whereas 2009-10 covered five quarterly payments. Subsequent years include four quarterly payments.
4. The figures up to 2010-11 reflect the actual expenditure in those years.
5. 2010-11 was a 27 pension pay day year and hence had higher expenditure than normal.

6.2 The chart below shows total projected outlays as a percentage of GDP over the next 44 years. For comparison purposes, actual outlays since 1999 and the projection of the equivalent figures taken from the 2008 Report are also shown.

Actual and projected Commonwealth outlays as a percentage of GDP



6.3 Outlays as a percentage of GDP gradually decline over the projection period. The main reason for this reduction is that the number of ADF personnel is assumed to remain constant at the 30 June 2011 level, and so to fall as a percentage of the total population.

6.4 The projection as at June 2011 is initially lower than the projection as at June 2008. This is primarily because of the lower exit rates being assumed for DFRDB which defers some lump sum payments due to commutation of pensions and payment of the 3 per cent productivity benefit. In the longer term the projection as at June 2011 has higher outlays. This is partly because the number of assumed serving ADF personnel is higher for the June 2008 projection, reflecting the increase in contributory members noted in paragraph 4.4. The higher pension take up rates assumed for MSBS also increase overall scheme costs and lead to higher overall benefits in the long term.

6.5 Actual expenditure, both in dollar terms and GDP terms, in 2008-09 and 2009-10 was noticeably lower than the projections made in the 2008 Report. This can be largely attributed to the low exit rates from DFRDB which significantly reduced lump sum payments arising from commutation of pensions and the 3 per cent productivity benefit. This would also have been the case in 2010-11 except that 2010-11 was a 27 pension pay day year which has an extra fortnightly pension payment compared to a normal 26 pension pay day year. This brought the actual dollar cash outlays close to those projected. The exit experience and changes to assumptions have been previously discussed. The 2008 Report assumed a return to the turnover rates applying before 2007-08. Given the persistence of these lower exit rates over the intervaluation period, DFRDB exit rates are now assumed to remain at the lower level observed over recent years.

6.6 Over the three years to 2011, GDP was higher than that projected in 2008 with the impact of the Global Financial Crisis on the Australian economy being less than expected.

6.7 Overall, the projected outlays for the next 44 years are higher in dollar terms than the projections from the 2008 Report, particularly in the long term where they are around 20 per cent higher. There are a number of factors contributing to this result. The most important was the increase in military personnel numbers. The assumption of increased take up of the pension option in MSBS increases the long term cash outlays as does the ratification of the higher death and invalidity benefits payable as a result of the increase in Compulsory Retirement Ages.

6.8 When expressed as a percentage of GDP, the projected outlays are generally lower than in the 2008 Report.

6.9 Given the projected decline in costs as a percentage of GDP, the establishment of the Future Fund and the implicit Commonwealth guarantee to pay benefits, I believe that the current method of funding benefits is adequate from the perspective of the continuing financial viability of the schemes.

Chapter 7 Unfunded liabilities

7.1 The unfunded liabilities are the liabilities for superannuation entitlements in respect of service already rendered to the ADF for which no assets are held. For this purpose, as discussed in paragraph 1.10, assets held in the Future Fund are not considered to be held against the scheme liabilities. These liabilities do not fall due until the rules of the schemes provide for benefits to be payable, which is generally when members retire, and so they are spread over many years into the future. They have been calculated as the present value of all of the liabilities accrued in respect of past service less the value of the assets held in the MSBS Fund.

7.2 The net present value of unfunded liabilities was calculated to be $45.2 billion as at 30 June 2011. This is 3.3 per cent of GDP. The net present value of unfunded liabilities reported as at 30 June 2008 was $37.9 billion or 3.4 per cent of GDP.

7.3 The 2008 Report projected that unfunded liabilities would be $42.5 billion as at 30 June 2011, or 3.3 per cent of GDP for 2011. Liabilities are therefore higher than were projected at the last report in dollar terms, but similar to those projected in GDP terms. The change in the contributory membership base, both in terms of increased numbers of personnel and higher salaries has contributed to this outcome. The ratification of the higher death and invalidity benefits resulting from the increase in Compulsory Retirement Ages is also a factor. The trend in the MSBS towards increased pension take up with the associated change in actuarial assumptions has added to the MSBS unfunded liabilities. The higher than expected GDP negated the impact of these changes when the figure is expressed as a percentage of GDP. Had the previous assumptions used for the 2008 Report been retained for this Report, the unfunded liabilities would have been approximately $44.5 billion.

7.4 The unfunded liability for the DFRB is $0.5 billion, for the DFRDB is $25.3 billion and the equivalent figure for the MSBS is $19.3 billion. These figures are lower than the estimates used for the Financial Statements for the Department of Defence as at 30 June 2011 of $0.6 billion for the DFRB, of $28.0 billion for the DFRDB and $21.5 billion for MSBS. The major contributor to this result is the discount rate which is required to be used under the relevant accounting standard, AASB 119, to value the liabilities for Financial Statement purposes. The discount rate used for AASB 119

reporting was 5.3 per cent compared with the 6 per cent used for this report. The lower the discount rate used, the higher the unfunded liability. The issues associated with reporting under AASB 119 are discussed further, later in this chapter.

7.5 A breakdown of the unfunded liabilities between contributors, pensioners and preserved members by scheme is shown in the following table.

Estimate of unfunded liabilities as at 30 June 2011

Category of members	DFRB ($b)	DFRDB ($b)	MSBS ($b)
Contributors	—	3.7	10.1
Pensioners	0.5	21.6	4.0
Preserved members	—	0.0	5.2
Total	**0.5**	**25.3**	**19.3**

Note that components may not add up to totals due to rounding.

7.6 The table below shows the projected unfunded liability for the DFRB, DFRDB, the MSBS and for the three schemes combined. The projections are in nominal dollars and have **not** been adjusted to 2011 dollars. To enable a proper comparison of the projected liabilities with the position in 2011, projections of the combined unfunded liability as a percentage of GDP are also shown. Note that the projections assume that the MSBS remains open to new ADF personnel.

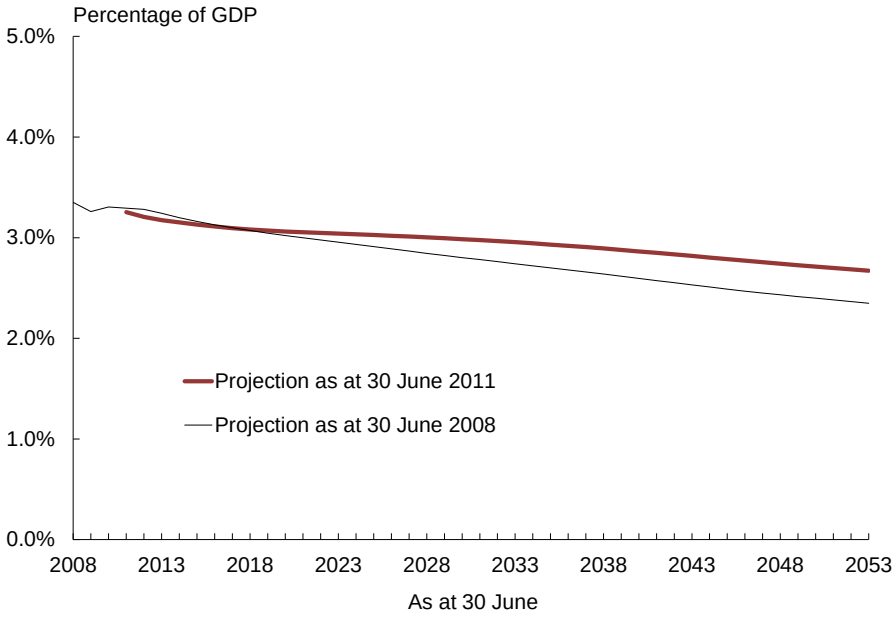
Projected Unfunded Liabilities

Year ending 30 June	DFRB ($b)	DFRDB ($b)	MSBS ($b)	Total ($b)	As a % of GDP
2011	0.5	25.3	19.3	45.2	3.3
2012	0.5	25.4	21.4	47.3	3.2
2013	0.5	25.5	23.5	49.5	3.2
2014	0.4	25.6	25.8	51.9	3.2
2015	0.4	25.6	28.3	54.4	3.1
2020	0.3	25.1	43.4	68.8	3.1
2025	0.2	23.8	63.2	87.2	3.0
2030	0.1	21.7	88.3	110.2	3.0
2035	0.1	19.1	119.5	138.6	2.9
2040	0.0	15.9	157.5	173.4	2.9
2045	0.0	12.4	202.7	215.1	2.8
2050	0.0	8.9	256.3	265.2	2.7
2055	0.0	7.0	293.3	300.3	2.7

Note: Totals may differ from the sum of DFRB, DFRDB and MSBS due to rounding.

7.7 The chart below shows the projected unfunded liabilities as a percentage of GDP together with the equivalent projection from the 2008 Report.

Projected unfunded liabilities as a percentage of GDP



7.8 Over the longer term, the main feature of the projection is the steady fall in unfunded liabilities relative to GDP. There are two main reasons for this:

- it is assumed that the total number of ADF personnel will stay at the same level as at 30 June 2011, that is, that the number of ADF personnel as a percentage of the population will fall; and
- the MSBS is partially funded whereas the DFRDB is wholly unfunded.

7.9 The general trend is favourable with liabilities at the end of the period being around 80 per cent of their current level relative to GDP.

7.10 Relative to the 2008 Report, projected unfunded liabilities as a proportion of GDP are initially slightly lower but, from 2018, the current projections are higher with the margin increasing gradually to over 0.3 percentage points by the end of the projection period. There a number of factors contributing to this result, most notably:

- the higher assumed numbers of serving ADF personnel;

- the higher death and invalidity benefits in MSBS as a result of the increase in Compulsory Retirement Ages; and

- the assumed higher take up of the pension option in MSBS which both increases the cost of MSBS and defers cash outlays. Deferral of cash outlays increases the retained unfunded liability.

7.11 While GDP is also assumed to be higher than that projected in the 2008 Report, it is insufficient to offset the increases arising from the factors mentioned above.

AASB 119

7.12 Since the 2005-06 financial year, the Department of Defence has been required to comply with Australian Accounting Standard AASB 119 — Employee Benefits in reporting on superannuation obligations in its financial statements. The discount rate assumption required under AASB 119 differs from the assumption used in this report. The requirement for the AASB 119 discount rate to be based on the Government bond rate at the reporting date is likely to result in changes in economic assumptions from year to year. All else being equal, movements in interest rates will lead to volatility in reported liabilities under AASB 119. While to date the interest rates used in calculating the unfunded liabilities for financial statements under this Standard have, to date, been within one percentage point of the interest rate used for this report, it cannot be expected that this will continue to be the case.

7.13 The current report is focussed on the financial implications of the military superannuation arrangements over the long term. As noted earlier, it is important in a long term cost report not to introduce unnecessary volatility which might mask genuine effects. Accordingly, in my view, this is a more appropriate document for considering liabilities in a long term context than the Department of Defence Financial Statements.

Peter Martin FIAA
Australian Government Actuary
21 June 2012

APPENDIX A

Summary of membership, contribution and benefit provisions of the Military Superannuation and Benefits Scheme (MSBS)

The MSBS is governed by a Trust Deed and Rules established under the *Military Superannuation and Benefits Act 1991*. The Act, Trust Deed and Rules set out the full membership, contribution and benefit provisions of the MSBS. The provisions of the Scheme are complex and a summary of the principal provisions of the Scheme is set out below. It should not be used to calculate benefits for individuals.

Membership

Membership is compulsory for all members of the Permanent Force and Reservists rendering continuous full time service.

Definitions

Salary	Salary is actual salary including higher duties allowance, service allowance, and some qualifications and skills allowances.
Final average salary	Average annual salary received over the last three years prior to termination of service.
Accrual rates	The accrual rate is variable and calculated on a daily basis. The rate is 18 per cent for each of years of service 0 to 7, 23 per cent for each of years 8 to 20 and 28 per cent for year 21 and each year thereafter.
Total accrued multiple	The sum of the accrual rates for the total period of service.

Member contributions

Contributions rates are variable. There is a set base rate of 5 per cent of salary with an option to contribute additional amounts of up to 5 per cent in increments of 1 per cent (maximum contributions are thus 10 per cent of salary).

Scheme structure

Member component	This consists of the member contributions paid into the MSBS together with accumulated earnings on the contributions.
Employer component	This consists of a defined benefit equal to: Total accrued multiple x Final average salary.
3 per cent benefit	This consists of employer contributions of 3 per cent of salary less 15 per cent employer contribution tax together with accumulated earnings. The 3 per cent benefit forms part of the employer component.

Retirement benefits (on or after age 55)

On retirement the member would be entitled to a lump sum of:

- Member component + Employer component

The member has an option to convert between 50 per cent and 100 per cent of the employer component to a pension. The terms of conversion are determined by the member's age at the date of conversion. At age 55, $12 of lump sum is converted to $1 per annum of pension. At age 60, $11 of lump sum is converted to $1 per annum of pension.

Resignation benefit (before age 55)

On resignation, the member would be entitled to:

- an immediate lump sum of the Member component; and
- a Preserved Employer Benefit of the Employer component

The Preserved Employer Benefit is paid at age 55, or earlier in certain circumstances. The funded portion of the Preserved Employer Benefit (the 3 per cent benefit) is accumulated with Fund Earnings between the date of exit and the date of payment. The unfunded portion of the Preserved Employer Benefit (the portion in excess of the 3 per cent benefit) is increased in line with movements in the CPI between the date of exit and the date of payment.

When the Preserved Employer Benefit is paid the member has the same pension option as applies to retirement benefits.

Retrenchment or redundancy

The benefit is calculated in the same way as the resignation benefit. The member may elect one of two options with the employer financed part of the benefit:

- take a Preserved Employer Benefit; or
- convert all of the Preserved Employer Benefit into an immediate pension. The conversion factor is dependent on the member's age.

Invalidity benefits

Invalidity and death benefits depend on retirement age. For virtually all members, retirement age is 60 and the conversion factor at age 60 is 11. The relevant references to retirement age in the following formulae have been marked with an asterisk (*).

The invalidity benefit payable depends on the level of invalidity suffered by the member.

Invalidity classification	Degree of incapacity
A	60% — 100%
B	30% — 59%
C	Less than 30%

Invalidity A benefit

A benefit equal to:

- an immediate lump sum of the member component; plus
- a pension calculated as follows:

$$\frac{\text{Total Accrued Multiple at Retirement Age*} \times \text{Final Average Salary}}{\text{Conversion Factor at Retirement Age*}}$$

Invalidity B benefit

A benefit equal to:

- an immediate lump sum of the member component; plus
- a pension equal to the better of:

(i) $50\% \times \frac{\text{Total Accrued Multiple at Retirement Age*} \times \text{Final Average Salary}}{\text{Conversion Factor at Retirement Age*}}$; and

(ii) $\frac{\text{Total Accrued Multiple (to date of exit)} \times \text{Final Average Salary}}{\text{Conversion Factor at Age at Exit}}$

Invalidity C benefit

The invalidity C benefit is the same as the resignation benefit.

Death benefits for contributory members

The death benefit for a contributory member is:

- an immediate lump sum of the member component; plus
- an employer financed lump sum equal to:

Total Accrued Multiple at Retirement Age* x Final average salary.

The surviving spouse of the member may convert between 50 per cent and 100 per cent of the employer financed lump sum into a pension. The amount of the pension is calculated as:

$$67\% \times \frac{\text{Employer Financed Lump Sum} \times \text{Proportion Converted}}{\text{Conversion Factor at Retirement Age*}}$$

If the pension option is taken and there are dependent children, additional pension is paid.

Pensions

Pensions are payable for the life of the pensioner and are increased twice each year in line with the movement in the Consumer Price Index (CPI). On the death of the pensioner, a pension of 67 per cent of the member's pension is paid to the surviving spouse (if any). An additional pension is payable in respect of children under age 16 (or age 25 if still in full time education). If there is no surviving spouse then in some circumstances orphan's pensions or a lump sum may be payable.

Ancillary benefits

The ancillary section of the MSBS provides fully funded accumulation benefits. Ancillary benefits can arise in various ways including superannuation guarantee employer contributions, additional voluntary member contributions, salary sacrifice employer contributions, Government co-contributions, spouse contributions and transfers into the MSBS.

Superannuation guarantee

With effect from 1 July 2008, additional employer contributions have been payable to the ancillary section of the MSBS on a quarterly basis to ensure compliance with Superannuation guarantee requirements. The contributions are paid in respect of both DFRDB and MSBS members at the rate of 9 per cent of eligible allowances that are not included in superannuation salary. The additional contributions are subject to a maximum of 9 per cent of the maximum quarterly earnings base for Superannuation guarantee less 9 per cent of superannuation salary for the quarter.

APPENDIX B

Summary of membership, contribution and benefit provisions of the Defence Force Retirement and Death Benefits Scheme (DFRDB)

The DFRDB is established under the *Defence Force Retirement and Death Benefits Act 1973*. The Act and associated Regulations, and the Defence Force (Superannuation) (Productivity Benefit) Determination under the *Defence Act 1903* set out the full membership, contribution and benefit provisions of the DFRDB. The provisions of the Scheme are complex and a summary of the principal provisions of the Scheme is set out below. It should not be used to calculate benefits for individuals.

Membership

Membership of the Scheme is closed to new entrants and consists of members of the Scheme as at 30 September 1991 who did not transfer to the MSBS.

Definitions

Salary	Salary is the highest incremental salary for substantive rank plus Service Allowance and some Qualifications and Skills allowances.
Final salary	Salary at the date of termination of service.
Statutory retirement age	Varies between age 47 and 60 depending on rank for officers, age 55 for other ranks.

Member contributions

Member contributions are 5.5 per cent of salary.

Appendix B

Retirement pay (pension)

Members who separate from the ADF on other than invalidity grounds are entitled to retirement pay on separation after completion of a minimum of 20 years' service or, if they have reached statutory retiring age for their rank, on completion of 15 years' service.

Retirement pay

Years of service	Per cent of final salary	Years of service	Per cent of final salary
15	30.00	28	47.50
16	31.00	29	49.25
17	32.00	30	51.25
18	33.00	31	53.25
19	34.00	32	55.50
20	35.00	33	57.75
21	36.50	34	60.25
22	38.00	35	62.75
23	39.50	36	65.25
24	41.00	37	67.75
25	42.50	38	70.50
26	44.00	39	73.50
27	45.75	40	76.50

Officers who voluntarily retire or are discharged on disciplinary grounds before reaching notional retiring age (generally five years below the statutory retiring age) have a penalty applied to the calculation of their retirement pay. The penalty is a 3 per cent reduction in retirement pay for each year that their age on retirement is less than their notional retiring age.

Commutation

A portion of retirement pay may be commuted to a lump sum. The maximum sum is currently five times the annual retirement pay. The residual pension after commutation is calculated by use of an expectation of life factor ranging from 40.18 at age 31 to 15.60 at age 60 for males, and from 45.53 to 19.51 respectively for females.

Resignation benefit (no entitlement to retirement pay)

On resignation prior to being entitled to retirement pay, a benefit of a refund of the member contributions is paid.

Retrenchment or redundancy benefit

There is no special retrenchment or redundancy benefit and the benefit is either the retirement pay or resignation benefit as appropriate.

Invalidity benefits

The invalidity benefit payable depends on the level of invalidity suffered by the member.

Invalidity classification	Degree of incapacity
A	60% — 100%
B	30% — 59%
C	Less than 30%

Invalidity A benefit

A pension of 76.5 per cent of final salary.

Invalidity B benefit

A pension of 38.25 per cent of final salary.

Invalidity C benefit

A lump sum of 1.5 times member contributions.

Death benefits for contributory members

If the member is survived by a spouse, the spouse receives a pension of 62.5 per cent of the pension that would have been paid to the member on being classified Invalid A. An additional pension may be paid in respect of dependent children. The surviving spouse has an option to convert part of the pension to a lump sum. The maximum lump sum is twice the member's final salary at death.

If the member is not survived by a spouse but is survived by dependent children under age 25, orphan's pensions may be payable.

If the member is not survived by a spouse or dependent children, a lump sum of 1.5 times member contributions is paid.

Pensions

Pensions are payable for the life of the pensioner and are increased twice each year in line with the movement in the Consumer Price Index (CPI).

On the death of the pensioner, a pension of 62.5 per cent of the member's pension prior to commutation is paid to the surviving spouse (if any). An additional pension is payable in respect of children under age 16 (or age 25 if still in full time education).

If there is no surviving spouse then in some circumstances orphans' pensions may be payable.

Productivity (3 per cent) superannuation benefit

A productivity superannuation benefit of 3 per cent of salary accumulated with interest at a rate based on the long term Commonwealth Bond rate is paid in addition to the benefits set out above.

Superannuation Guarantee top up

A top up benefit may be payable in addition to the benefits payable above in order to ensure that the benefits payable from the Scheme are at a level which meets Superannuation Guarantee requirements in respect of DFRDB superannuation salary. Note that with effect from 1 July 2008, additional employer contributions in respect of eligible allowances have been paid to the MSBS ancillary section to ensure compliance with the Superannuation Guarantee requirements following the removal of the protected earnings base for the DFRDB.

APPENDIX C

Demographic assumptions

Set out below is a summary of the demographic assumptions for the MSBS and the DFRDB.

Contributor exits by death and invalidity

The tables below set out the rates adopted for death and invalidity per 1,000 contributors at each age shown. The rates for males and females are assumed to be the same.

MSBS death and invalidity rates (per 1,000 contributors)

		Invalidity 'A'		Invalidity 'B'		Invalidity 'C'	
Age	Death	Officers and cadets	Other ranks	Officers and cadets	Other ranks	Officers and cadets	Other ranks
20	0.49	0.18	0.65	4.50	3.00	1.45	1.50
25	0.54	0.73	2.97	0.85	5.57	2.24	1.50
30	0.56	1.19	3.67	1.26	5.71	1.26	1.50
35	0.58	1.48	4.14	1.85	5.71	0.96	1.50
40	0.59	1.72	4.49	2.35	5.71	0.78	1.50
45	0.61	1.82	4.70	2.85	5.71	0.75	1.50
50	0.76	1.80	4.70	3.35	5.71	0.75	1.50
55	1.30	1.80	4.70	3.75	5.71	0.75	1.50
59	1.92	1.80	4.70	3.75	5.71	0.75	1.50

DFRDB death and invalidity rates (per 1,000 contributors)

		Invalidity 'A'		Invalidity 'B'	
Age	Death	Officers and cadets	Other ranks	Officers and cadets	Other ranks
40	0.59	1.60	7.01	0.00	0.00
45	0.61	1.60	3.81	0.00	0.00
50	0.76	1.60	3.57	0.00	0.00
55	1.30	1.60	3.39	0.00	0.00
59	1.92	1.60	3.26	0.00	0.00

Note the service durations of DFRDB contributors are such that, for a large and increasing majority of members, the invalidity B benefit provides a lower pension than the pension which would be paid on retirement. Accordingly, it is assumed that there will be no future invalidity B exits from the DFRDB.
Invalidity 'C' exits from the DFRDB are included in the resignation assumptions.

Appendix C

Contributor exits by retirement and resignation

The tables below set out the rates adopted for resignation below age 55. The figures represent the numbers leaving per 1,000 contributors at each duration shown. Retirement rates for those age 55 or more are a separate assumption.

MSBS resignation rates (per 1,000 contributors)

Years of service	Officers & Cadets	Other ranks	
	Male & Female	Male	Female
0	150	135	230
1	75	70	140
2	55	35	90
3	38	35	90
4	40	103	200
5	43	60	120
6	53	140	145
7	53	100	115
8	53	70	85
9	40	40	55
10	80	100	105
11	75	84	95
12	70	75	87
13	65	68	80
14	60	63	74
15	83	55	70
16	63	50	68
17	50	44	67
18	40	42	67
19	30	40	69
20	43	69	73
21	41	58	58
22	39	54	54
23	37	50	50
24	35	47	47
25	33	45	45
26	33	44	44
27	33	43	43
28	33	43	43
29	37	44	44
30	47	46	46

DFRDB service duration resignation rates (per 1,000 contributors)

Years of service	Officers Male & Female	Other Ranks Male & Female
20	250	200
21	200	200
22	170	169
23	155	156
24	135	144
25	115	135
26	105	128
27	98	123
28	95	121
29	93	121
30	93	124
31	95	130
32	105	148
33	105	148
34	110	160
35	120	173
36	130	196
37	142	221
38	156	259
39	200	300
40	250	360

Note: The DFRDB has been closed to new entrants since 1991.
DFRDB resignation rates include exits under the Invalidity 'C' provisions.

Retirement

The change to compulsory retirement age has means that retirements can now occur over the five years between 55 and 60. The following retirement rates have been assumed for all contributory members in both the MSBS and DFRDB. Any member attaining age 60 is assumed to retire then.

Retirement rates (per 1,000 contributors)

Age	Rate
55	167
56	200
57	250
58	333
59	500

Appendix C

Retrenchment and redundancy

No allowance has been made for the effects of retrenchments and redundancies as the retrenchment and redundancy decision is unpredictable and impossible to model with any confidence.

New entrants (MSBS)

The following table shows figures for the assumed age distribution and average salaries of male new entrants.

New entrants

	Officers			Other ranks			Cadets		
Age	Males %	Females %	Average salary ($)	Males %	Females %	Average salary ($)	Males %	Females %	Average salary ($)
17	—	—	—	14.0	15.0	43,707	20.7	20.7	35,190
18	0.5	—	49,980	21.5	22.5	44,064	33.6	33.6	35,700
19	1.0	—	52,020	14.5	14.0	44,421	12.9	12.9	37,740
20	1.5	1.0	54,060	10.0	9.0	44,778	7.0	7.0	39,780
21	2.0	4.1	56,100	7.3	6.8	45,135	5.2	5.2	41,820
22	3.4	6.0	58,140	5.9	5.5	45,492	4.6	4.6	43,860
23	5.5	8.2	60,180	4.9	4.5	45,849	4.0	4.0	44,625
24	5.5	8.2	62,220	4.0	3.5	46,206	3.4	3.4	45,390
25	5.5	7.2	64,260	3.3	3.0	46,563	2.9	2.9	45,900
26	5.5	6.1	66,300	2.7	2.5	46,920	2.3	2.3	46,410
27	5.0	5.3	68,340	2.2	2.3	47,277	1.7	1.7	46,665
28	4.5	4.4	70,380	1.8	1.9	47,634	1.1	1.1	46,920
29	4.1	3.8	72,420	1.5	1.6	47,991	0.6	0.6	47,175
30	3.7	3.4	74,460	1.2	1.4	48,348	—	—	—
31	3.4	3.0	76,500	1.0	1.2	48,705	—	—	—
32	3.2	2.8	78,540	0.8	1.0	49,062	—	—	—
33	3.0	2.5	80,580	0.7	0.9	50,132	—	—	—
34	2.8	2.4	82,620	0.5	0.7	51,018	—	—	—
35	2.7	2.3	84,660	0.4	0.6	51,940	—	—	—
36	2.5	2.2	86,700	0.4	0.5	52,891	—	—	—
37	2.4	2.2	88,740	0.3	0.4	53,864	—	—	—
38	2.4	2.2	90,780	0.2	0.4	54,853	—	—	—
39	2.4	2.2	92,820	0.2	0.3	55,851	—	—	—
40	2.4	2.2	94,758	0.2	0.3	56,850	—	—	—
41	2.4	2.2	96,599	0.1	0.2	57,843	—	—	—

New entrants (continued)

	Officers			Other ranks			Cadets		
Age	Males %	Females %	Average salary ($)	Males %	Females %	Average salary ($)	Males %	Females %	Average salary ($)
42	2.4	2.2	98,348	0.1	—	58,825	—	—	—
43	2.4	2.2	99,999	0.1	—	59,787	—	—	—
44	2.4	2.2	99,999	0.1	—	60,724	—	—	—
45	2.4	2.2	99,999	0.1	—	61,627	—	—	—
46	2.4	2.2	99,999	—	—	—	—	—	—
47	2.4	2.2	99,999	—	—	—	—	—	—
48	2.1	2.2	99,999	—	—	—	—	—	—
49	1.8	1.2	99,999	—	—	—	—	—	—
50	1.5	—	99,999	—	—	—	—	—	—
51	1.2	—	99,999	—	—	—	—	—	—
52	0.9	—	99,999	—	—	—	—	—	—
53	0.6	—	99,999	—	—	—	—	—	—

Promotional salary increases

MSBS officer and cadet promotional salaries are related to both period of service and entry age. DFRDB officer salaries and other rank salaries for both schemes salaries are only related to period of service. Since the officer and cadet promotional salary scales are two-dimensional, they cannot all be tabulated below. A cross-section of the salary scales is presented below for a selection of entry ages.

Salary progression — male and female MSBS officers

	MSBS Officers			MSBS Cadets				
Duration	Entry Age 20	Entry Age 23	Entry Age 27	Entry Age 18	Entry Age 21	Entry Age 25	DFRDB Officers	Other Ranks
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	1.074	1.075	1.063	1.150	1.075	1.050	1.065	1.190
2	1.145	1.147	1.123	1.275	1.167	1.095	1.130	1.235
3	1.213	1.216	1.181	1.440	1.314	1.296	1.194	1.278
4	1.279	1.283	1.237	1.564	1.462	1.477	1.259	1.320
5	1.342	1.347	1.290	1.684	1.588	1.618	1.309	1.361
6	1.403	1.408	1.342	1.792	1.695	1.725	1.337	1.400
7	1.461	1.466	1.390	1.899	1.798	1.827	1.365	1.438
8	1.517	1.522	1.437	2.001	1.897	1.923	1.392	1.475
9	1.570	1.575	1.481	2.102	1.994	2.016	1.420	1.511
10	1.621	1.625	1.523	2.198	2.086	2.104	1.447	1.546
11	1.669	1.672	1.563	2.289	2.171	2.185	1.474	1.579

Salary progression — male and female MSBS officers (continued)

	MSBS Officers			MSBS Cadets				
Duration	Entry Age 20	Entry Age 23	Entry Age 27	Entry Age 18	Entry Age 21	Entry Age 25	DFRDB Officers	Other Ranks
12	1.714	1.717	1.600	2.375	2.253	2.263	1.502	1.611
13	1.757	1.759	1.636	2.458	2.331	2.336	1.529	1.641
14	1.798	1.798	1.668	2.536	2.405	2.406	1.557	1.670
15	1.836	1.834	1.699	2.611	2.475	2.471	1.585	1.699
16	1.871	1.868	1.727	2.681	2.542	2.533	1.612	1.725
17	1.904	1.898	1.753	2.748	2.604	2.591	1.639	1.751
18	1.934	1.926	1.777	2.810	2.663	2.645	1.667	1.775
19	1.961	1.952	1.798	2.869	2.717	2.696	1.696	1.798
20	1.987	1.974	1.817	2.923	2.768	2.742	1.752	1.820
21	2.009	1.994	1.834	2.974	2.815	2.785	1.804	1.840
22	2.029	2.011	1.848	3.021	2.858	2.823	1.853	1.859
23	2.046	2.025	1.861	3.063	2.897	2.858	1.897	1.877
24	2.061	2.036	1.871	3.102	2.932	2.889	1.937	1.894
25	2.074	2.047	1.880	3.136	2.964	2.917	1.972	1.909
26	2.084	2.057	1.889	3.167	2.991	2.940	2.004	1.923
27	2.094	2.067	1.899	3.194	3.015	2.960	2.031	1.936
28	2.105	2.078	1.908	3.216	3.035	2.977	2.054	1.947
29	2.115	2.088	1.918	3.236	3.053	2.993	2.073	1.957
30	2.126	2.098	1.927	3.253	3.069	3.008	2.088	1.966
31	2.137	2.109	1.937	3.270	3.085	3.024	2.098	1.970
32	2.147	2.119	1.947	3.287	3.101	3.039	2.104	1.974
33	2.158	2.130	1.956	3.304	3.117	3.054	2.108	1.978
34	2.169	2.141	1.966	3.320	3.132	3.069	2.113	1.982
35	2.180	2.151	1.976	3.337	3.148	3.085	2.117	1.986
36	2.190	2.162	1.986	3.354	3.164	3.100	2.121	1.990
37	2.201	2.173	1.996	3.370	3.179	3.116	2.125	1.994
38	2.212	2.184	2.006	3.387	3.195	3.131	2.130	1.998
39	2.224	2.195	2.016	3.404	3.211	3.147	2.134	2.002

As an example, consider an MSBS cadet who joined at age 21. The salary of such a person at age 31 would, in the absence of inflation, be assumed to be 2.086 times the commencing salary at age 21.

Pensioner mortality

The table below shows the mortality rates assumed for pensioners in the 2010-2011 year.

Pensioner mortality (per 1,000 pensioners)

	Males		Females	
Age	**Age retired**	**Invalid retired**	**Age retired**	**Invalid retired**
20	—	6.50	—	6.50
30	0.23	6.50	0.24	6.50
40	0.70	6.50	0.71	6.50
50	1.70	11.01	2.00	11.01
55	3.12	12.10	3.29	12.10
60	5.65	14.39	5.04	14.39
65	10.06	17.36	7.92	17.36
70	17.63	28.09	13.21	28.09
75	30.36	46.83	22.18	46.83
80	53.88	81.18	37,86	81.18
90	143.08	188.66	111.61	188.66
100	275.78	322.49	253.32	322.49

Widows are assumed to have the same mortality rates as female age retirements. Likewise widowers are assumed to have the same mortality rates as male age retirements.

Improvements in pensioner mortality

The following table summarises the assumed rates of improvement in future mortality of age retirements. No allowance has been made for future improvements in mortality for invalid retirements.

Assumed rates of mortality reduction (per cent per annum)

Age	Male	Female
60	2.4	1.9
70	2.0	2.0
80	1.5	1.9
90	1.1	1.3
100	1.3	1.1

Appendix C

Proportions married and age differences

The assumed proportions married at each age are shown below:

Proportions married

Age	Males (per cent)	Females (per cent)
20	2	7
30	49	55
40	71	55
50	73	55
60	73	50
70	69	37
80	60	16

Married male members are assumed to be married to females four years their junior on death.

Married female members are assumed to be married to males three years their senior on death.

GDP increases adjusted for inflation

GDP growth rates are based on Commonwealth Treasury projections of nominal GDP values adjusted for consistency with the inflation and wage growth assumption adopted for this valuation. Given this adjustment, they should not be regarded as official Commonwealth Treasury projections.

GDP growth rates (adjusted for inflation)

Year	Per cent per annum
2011-12	3.6
2012-13	3.2
2013-14	2.9
2014-15	2.9
2015-16	2.9
2016-17	2.8
2017-18	2.7
2018-19	2.7
2019-20	2.6
2020-21	2.6

GDP growth rates (adjusted for inflation) (continued)

Year	Per cent per annum
2021-22	2.5
2022-23	2.5
2023-24	2.5
2024-25	2.5
2025-26	2.5
2026-27	2.5
2027-28	2.5
2028-29	2.5
2029-30	2.5
2030-31	2.5
2031-32	2.5
2032-33	2.5
2033-34	2.5
2034-35	2.5
2035-36	2.5
2036-37	2.5
2037-38	2.5
2038-39	2.5
2039-40	2.5
2040-41	2.5
2041-42	2.4
2042-43	2.4
2043-44	2.4
2044-45	2.4
2045-46	2.3
2046-47	2.3
2047-48	2.3
2048-49	2.3
2049-50 onwards	2.2

APPENDIX D

Sensitivity Analysis

1. Some sensitivity analyses has been undertaken on a variety of factors to show their impact on the unfunded liabilities for all schemes and the notional employer contribution rates (NECR) for the DFRDB and MSBS.

2. The key sensitivities around the costs of the schemes relate to the economic parameters. Accordingly, six scenarios which illustrate the impacts of changes to the economic assumptions have been modelled, specifically:

   - a decrease of 1 percentage point in the annual interest rate used (to 5 per cent per annum);
   - an increase of 1 percentage point in the annual interest rate used (to 7 per cent per annum);
   - a decrease of 1 percentage point in the assumed annual rate of general salary inflation (to 3 per cent per annum);
   - an increase of 1 percentage point in the assumed annual rate of general salary inflation (to 5 per cent per annum);
   - a decrease of 1 percentage point in the assumed annual rate of CPI inflation (to 1.5 per cent per annum); and.
   - an increase of 1 percentage point in the assumed annual rate of CPI inflation (to 3.5 per cent per annum).

3. In each case, it is assumed that the other economic assumptions are unchanged. The base assumptions for this purpose are those adopted for the Long Term Cost Report, namely:

Interest rate	6.0 per cent per annum
General salary inflation	4.0 per cent per annum
CPI increases	2.5 per cent per annum

4. One significant change in assumptions made for the 2011 long term cost report, was an increase in the take-up of the pension option in the MSBS. The actuarial value of the pension is markedly higher than the alternative lump sum and this change therefore leads to an increase in both the unfunded liabilities and the notional employer contribution rate. When the first actuarial valuation of the MSBS was undertaken in 1993, it was assumed that one third of the employer financed lump sum benefit would be converted to a pension. There was some very limited experience data available for the 1996 valuation and this prompted an increase in this proportion to 70 per cent for officers and 40 per cent for other ranks. Over subsequent years, experience has suggested an increasing preference for pension benefits. The experience of other government schemes also suggests and increasing preference for pension benefits. For the current valuation, the assumption for officers was that 85 per cent of the lump sum benefit would be converted to a pension, while for other ranks three quarters of the benefit would be taken as a pension.

5. It is highly unlikely that a situation will ever be reached where 100 per cent of employer financed benefits are converted to a pension. However, this scenario represents an upper bound on the costs and is therefore included to provide a measure of how much further costs might rise.

6. The results of the analyses are as follows:

	DFRB + DFRDB			MSBS	
	DFRB Unfunded Liability	DFRDB Unfunded Liability	NECR	MSBS Unfunded Liability	NECR
	$m	**$m**	**%**	**$m**	**%**
2011 Long Term Cost Report	534	25,306	29.7	19,349	30.4
Interest rate (5% pa)	577	28,979	38.8	25,459	42.9
Interest rate (7% pa)	496	22,374	28.1	15,125	22.5
Salary increases (3% pa)	534	25,149	31.3	18,519	28.1
Salary increases (5% pa)	534	25,474	34.3	20,306	33.1
Inflation (1.5% pa)	497	22,517	29.4	16,147	25.6
Inflation (3.5% pa)	575	28,739	37.0	23,580	36.9
100% pension take up	534	25,306	29.7	20,759	32.6

7. The first six analyses highlight the sensitivity of the estimates of the unfunded liability and the notional employer contribution rates to changes in economic assumptions. Changes in the assumed rates of salary increases have a lesser impact compared to changes in the inflation assumption. For the DFRDB, this is because there are relatively few contributors remaining and pensions are inflation linked. For the MSBS, the majority of preserved benefits as well as pensions are inflation linked, and most contributors will end up with a preserved benefit. As a result, MSBS costs are also very sensitive to the inflation assumption.

8. The final scenario affects only the MSBS and involves a lower cost than the higher wage growth or inflation assumptions. As has been noted earlier, there has been an increase in the actual and assumed take up of the pension option in MSBS since the scheme commenced. This provides a theoretical upper bound on the cost impact from this process. In practice, a more realistic upper bound is probably around half the increase in costs reported here as there are likely to still be some individuals who prefer the lump sum over the alternative pension.