2008

Military Superannuation and Benefits Scheme

and

Defence Force Retirement and Death Benefits Scheme

(MSBS and DFRDB)

A report on long term costs prepared by
the Australian Government Actuary
using data to 30 June 2008

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Summary

This report sets out estimates as at 30 June 2008 of the long term costs of superannuation benefits payable in respect of the members of the major superannuation schemes covering the vast majority of Australian Defence Force (ADF) personnel. The previous report was prepared using data as at 30 June 2005.

The schemes covered in this report are:

- the Military Superannuation and Benefits Scheme (MSBS) which commenced on 1 October 1991; and
- the Defence Force Retirement and Death Benefits Scheme (DFRDB) which has been closed to new members since the commencement of the MSBS.

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 each scheme as calculated for this report and the previous report as at 30 June 2005.

Notional employer contribution rate as a percentage of superannuation salary

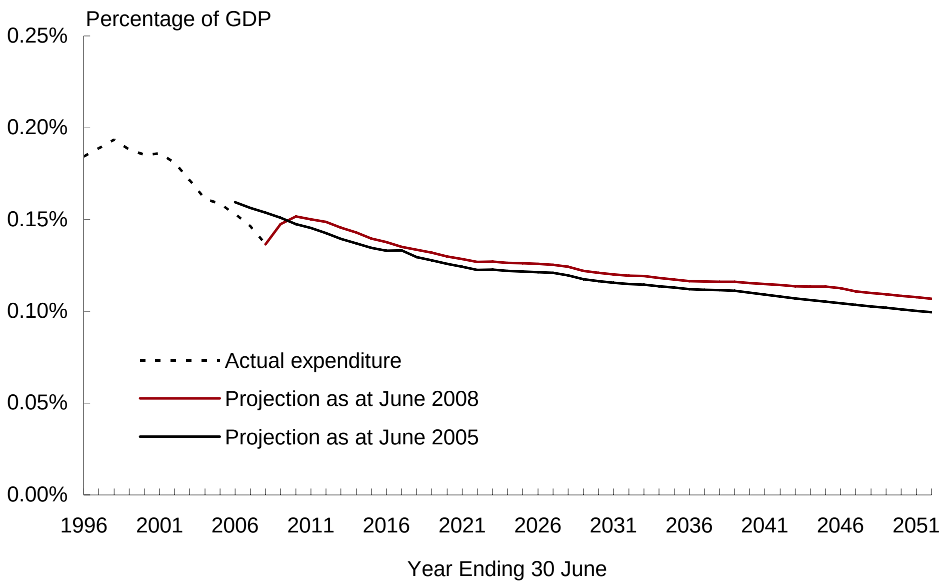
Report as at	MSBS (%)	DFRDB (%)	Combined (%)
30 June 2005	24.7	33.5	26.0
30 June 2008	27.0	33.4	27.6

1. The MSBS rates exclude the cost of the retention benefit.
2. The 2005 and 2008 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. Attention is drawn to the changes in assumptions between 2005 and 2008. Details are given in Chapter 4.
4. These rates include the 3 per cent productivity contributions.
5. The rates 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. Contributions in respect of members of both schemes are paid to the ancillary section of the MSBS Fund. These contributions amount to around 1 per cent of superannuation salary.
6. The 2005 Report figures are based on the pro rata accrual approach. The 2008 Report figures are based on the AASB 119 accrual approach.

Projection of employer 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 costs since 1996 and projected costs for the next 44 years, together with the costs that were projected in the 2005 Report.

Actual and projected employer costs as a percentage of GDP



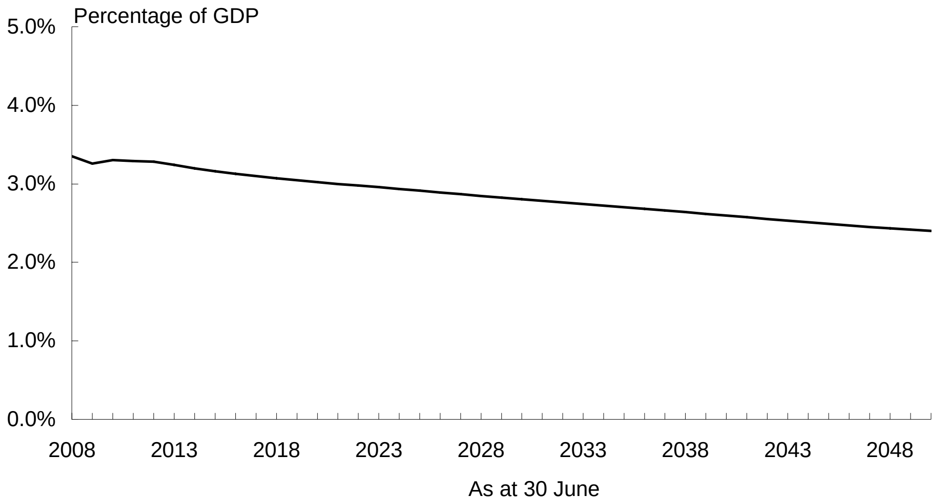
Annual costs represent approximately 0.15 per cent of GDP at present, falling to around 0.11 per cent of GDP in the long term. The current projections are slightly higher than the projections in the 2005 Report.

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 $37.9 billion as at 30 June 2008 of which $25.1 billion relates to the DFRDB and $12.8 billion to the MSBS. This is 3.4 per cent of GDP. This compares with the figures appearing in the last report of $32.1 billion or 3.6 per cent of GDP as at 30 June 2005.

The following graph illustrates the projected fall off in the total unfunded liabilities as a percentage of GDP. The trend is clearly favourable with this measure of liabilities falling by around 25 percent over the 44 year projection period.

Projected unfunded liabilities as a percentage of GDP



Scheme membership

Over the three years to 30 June 2008, total contributory membership increased to around 54,500, following a period of several years where membership had been stable at around 51,000. The number of pensioner members in both schemes has continued to increase with almost 64,000 pensioners in total 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 2005 to 2008, to over 70,000.

ADF Operational environment

The relatively high operational tempo of the ADF over recent years has been associated with a significant increase in the number of invalidity exits from the MSBS. This has increased the on-going costs for contributory members of the MSBS by the order of 10 per cent. There has also been an increase in the number of ADF personnel leading to a higher total salary base for superannuation purposes and hence higher dollar costs. There are a number of other indirect impacts on superannuation costs flowing from the operational environment which are discussed in Chapter 1.

Changes to military superannuation since the previous report

There have been a number of relatively minor changes to military superannuation arrangements since the last report. The most significant, from a financial perspective, flowed from the change in the method of determining Superannuation Guarantee obligations. This change took effect from 1 July 2008 but the financial impact has been included in the cashflows reported here. 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 has been to allow for an increase in invalidity exits which has significantly increased costs. There have been a number of other changes to assumptions which have had a much smaller impact on scheme costs.

Reviews of military superannuation arrangements

A Review of Military Superannuation headed by Mr Andrew Podger was announced in February 2007. The final report of the Review Team, submitted in July 2007, recommended the closure of the MSBS to new members and the establishment of a new accumulation scheme. There was also a review of the pension indexation arrangements for Australian Government superannuation schemes, which include the military superannuation schemes, carried out in the second half of 2008.

At the time of preparing this report, no decisions had been announced on any possible changes to military superannuation or pension indexation arrangements. We have therefore prepared this report assuming that the MSBS will continue to be open to new members and pension indexation arrangements will be unchanged.

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) and the Defence Force Retirement and Death Benefits Scheme (DFRDB) 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 2008.

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 2005 and was presented in my report dated June 2006.

1.3 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.

1.4 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 costs

  This is a projection of the actual cash outlays payable annually by the Commonwealth in respect of superannuation benefits for ADF personnel. The cost, which is explained in paragraph 2.14, has been projected over the next 44 years and expressed as a percentage of gross domestic product.

- Net present value of unfunded liabilities

  This indicates the total level of the accrued Commonwealth liability for superannuation benefits in respect of service up to 30 June 2008 less the value of assets held by the schemes.

1.5 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.

ADF operational environment

1.6 The recent high operational tempo of the ADF has resulted in changes which affect superannuation costs. Most notably, it is likely to have led to the significant increase in the number of invalidity exits from the MSBS. Allowing for this effect in the valuation assumptions has increased the on-going costs for contributory members of the MSBS by the order of 10 per cent. There has also been an increase in the number of ADF personnel which results in a higher total salary base for superannuation purposes and hence higher dollar costs.

1.7 Remuneration reform has led to higher than expected increases in pay rates for ADF personnel and a number of retention pay initiatives have been introduced. Increases in pay rates translate into higher dollar superannuation costs. Retention pay initiatives are not included in the defined benefit superannuation salary, but do affect resignation rates, at least in the short term. They also affect the additional contributions required under the approach adopted to ensure compliance with the Superannuation Guarantee arrangements. These arrangements are discussed further in Chapter 2.

Same sex partners

1.8 The Government announced its intention to provide reversionary pensions, following the death of same sex partners, in Commonwealth superannuation schemes including the military schemes. Changes to the schemes had not been made as at 30 June 2008. The cost of this change is minor in the overall context of the schemes with an estimated increase in the unfunded liability of around $30 million. In these circumstances, no explicit allowance has been made for this change in the estimates in this report.

Reviews of military superannuation arrangements

1.9 A review of military superannuation headed by Mr Andrew Podger was announced in February 2007. In its final report, the Review Team recommended the closure of the MSBS to new members and the establishment of a new accumulation scheme. The Review Team also recommended serving ADF personnel in the DFRDB and the MSBS and preserved members in the MSBS be offered the opportunity to transfer to the new accumulation arrangement and receive a transfer value in respect of their accrued benefits. A lower priority recommendation was to index DFRDB (including DFRB) pensions in a similar manner to age pensions.

1.10 Separately from the Review of Military Superannuation, a review of the pension indexation arrangements for Australian Government superannuation schemes, which include the military superannuation schemes, was carried out by Mr Trevor Matthews in the second half of 2008.

1.11 At the time of preparing this report, no decisions had been made on any possible changes to military superannuation arrangements. We have therefore prepared this report on the basis that there are no changes to military superannuation arrangements and the MSBS continues to be open to new members.

Future Fund

1.12 In 2006, the Government established a Future Fund to meet unfunded superannuation liabilities, contribute to national savings and increase net worth. It is intended that the unfunded liabilities of all Commonwealth superannuation schemes, including the military superannuation schemes, would eventually be covered by the assets of the Future Fund. 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

1.13 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. Given the different context, there are substantial sections of Professional Standard 400 that are not relevant to this report.

Chapter 2: The MSBS and the DFRDB

The MSBS

2.1 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.

The DFRDB (and the DFRB)

2.2 The Defence Force Retirement and Death Benefits Scheme came into existence on 1 October 1972 when it replaced the Defence Forces Retirement Benefits Scheme (DFRB). All contributory members of the DFRB transferred to the DFRDB at that time. While DFRB pensioners continue to receive pensions payable under the DFRB legislation, their costs are shown under the DFRDB. The DFRDB was itself closed to new entrants from 1 October 1991. The documents setting out the provisions of the DFRDB are the *Defence Force Retirement and Death Benefits Act 1973* as amended, together with the associated Regulations and the Defence Force (Superannuation) (Productivity Benefit) Determination made under the *Defence Act 1903*. The DFRDB covers all members of the DFRDB as at 30 September 1991, with the exception of those contributory members who transferred to the MSBS under the transitional arrangements associated with the introduction of the new scheme.

Benefits

2.3 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

2.4 There have been a number of relatively minor changes to military superannuation arrangements since the last report. The most significant, 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.

2.5 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 will be 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 will apply for both DFRDB and MSBS members and are expected to amount to approximately $45 million in 2008-09.

2.6 The anticipated additional cash expenditure involved has been included in the projected cash outlays in this report. There is no impact on the projected unfunded liability as the additional employer contributions are paid into a fully funded accumulation arrangement. The notional employer contribution rates for the MSBS and the DFRDB do not include any allowance for these additional contributions. However, the approximate total cash cost has been reported as a percentage of superannuation salary to allow comparison with the cost of the defined benefit schemes.

2.7 Other minor amendments have been made to remove the loss of spouse benefit entitlements on remarriage; incorporate the Qualification and Skills (Q & S) component of certain allowances into superannuation salary; and correct an unintended anomaly in the provisions relating to adjustment of DFRDB benefits to take account of Family Law settlements. There were also a number of technical changes to the MSBS as a result of the 'Better Super' taxation changes that came into effect from 1 July 2007.

2.8 A more significant change, but one which does not impact on employer costs or the unfunded liabilities of the scheme, is the introduction of a new class of benefits under the MSBS; ancillary benefits provide a vehicle for DFRDB and MSBS members to accumulate spouse contributions, Government co-contributions, voluntary salary sacrifice or personal contributions and amounts transferred from other schemes. Ancillary benefits are fully funded accumulation benefits. The cost of ancillary benefits is not included in this report.

2.9 In 2007, the compulsory retirement ages for most ADF personnel were increased with the intention of providing greater employment flexibility. The change had an unintended flow-on effect on the calculation of death and invalidity benefits paid under the MSBS. At the time of writing this report, no death or invalidity benefits had been paid using the higher retirement age and steps were being taken to clarify in the MSBS Rules that the change in compulsory retirement age did not flow through to the calculation of these benefits. We have assumed that death and invalidity benefits will not be impacted by the change in compulsory retirement age. Should this assumption turn out to be wrong, the results presented in this report may need to be revised.

Funding and payment of benefits

2.10 Member contributions and productivity superannuation contributions to the MSBS are invested by the Military Superannuation and Benefits Board of Trustees No 1 (the trustees). Contributions are accumulated with interest at the actual investment earnings rates of the MSBS Fund. 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.

2.11 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.

2.12 The OTE contributions discussed above are funded as they accrue through contributions to the ancillary benefits section of the MSBS Fund.

2.13 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 $33 million in 2007-08). Transfer amounts, personal, spouse and salary sacrifice contributions paid to the ancillary benefits section are made at an individual's discretion, rather than determined under scheme rules. They have not been included in the projections.

2.14 The estimates in Chapter 6 of this report relate to the actual employer 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

2.15 For simplicity, DFRB is treated as being part of DFRDB in this report.

Retention benefit

2.16 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 times 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.

2.17 Access to the retention benefit ceased on 5 October 2005; the last payments will be 15 years after this date. Since 2005, there have been a number of retention initiatives introduced, including more targeted completion bonus payments. As with the retention benefit, these payments do not form part of superannuation salary for the purposes of the defined benefits payable under the MSBS or the

DFRDB and are not superannuation benefits. 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. We also carried out a number of checks 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 we are satisfied that the data is sufficiently accurate for the purposes of this report. A significant proportion of female new entrants in recent years had been recorded as males. As the results are not particularly sensitive to gender, we have carried out the valuation relying on the data as provided in this respect and we are satisfied that the results are sound. While this issue does not materially impact on the valuation results, it should be addressed before the next triennial review.

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 2008)

	MSBS		DFRDB	
	Number	**Salaries ($m)**	**Number**	**Salaries ($m)**
Officers	10,780	946	1,761	199
Other ranks	36,830	2,022	3,315	245
Cadets	1,697	50	-	-
Total	**49,307**	**3,018**	**5,076**	**444**

3.5 The number of MSBS contributors valued is 49,307. The MSBS Annual Report has 49,355 contributors as at 30 June 2008 which is consistent with the membership valued. Data on MSBS contributors provided by the Department of Defence in the context of calculating Superannuation Guarantee contributions showed 49,555 contributors as at the first payday of 2008-09. Checks against the valuation data showed that 418 of these members were being valued as preserved members, suggesting the data used for the valuation was substantially complete. Total superannuation salaries for the members valued were within 0.3 per cent of the Defence payroll for final payday for 2007-08. In my opinion, the MSBS contributor data valued was effectively complete.

3.6 The number of DFRDB contributors valued is 5,076. The DFRDB Annual Report has 5,600 contributors as at 30 June 2008. The data provided for Superannuation Guarantee purposes showed 5,254 contributors as at the first payday of 2008-09. Of these, 243 were found on the pension files and valued as pensioners. Total superannuation salaries for the members valued were within 0.3 per cent of the Defence payroll figures for the final pay of the 2007-08 financial year. 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 2008)

	MSBS		DFRDB	
	Number	**Pensions ($m pa)**	**Number**	**Pensions ($m pa)**
Age pensioners	3,028	54	45,799	1,018
Invalid pensioners	3,531	76	2,734	75
Reversionary pensioners	183	3	8,230	144
Associate pensioners	18	0	280	3
Total	**6,760**	**133**	**57,043**	**1,240**

1. The pension amounts include the July 2008 pension increase.
2. DFRDB figures include DFRB pensioners.
3. Reversionary pensions are pensions that are payable to the surviving spouse following the death of a pensioner or contributory member.
4. 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 2005 were 5,509 MSBS pensioners with total annual pension of $93 million and 56,185 DFRDB pensioners with total annual pension of $1,107 million.

3.9 The 2008 MSBS Annual Report has the number of pensioners as 6,710 compared to the 6,760 valued. The corresponding figures for the DFRDB (excluding children's pensions) are 56,873 and 57,043 respectively.

3.10 Checks were also done for both the DFRDB and the MSBS by comparing the pensions valued with the ComSuper pension payroll figures. The payroll figures showed payments being made to 6,794 MSBS pensioners and 57,183 DFRDB pensioners on the first pension payday of the 2008-09 financial year. The amounts paid were $133 million for the MSBS and $1,235 million for the DFRDB. 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 71,054 preserved beneficiaries valued, with total nominal preserved benefits of $4,795 million. The 2008 MSBS Annual Report has 72,812 preserved beneficiaries. At 30 June 2005, there were 57,631 preserved beneficiaries with total nominal preserved benefits of $2,893 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 2008, there were 15 deferred pensioners in the DFRDB. They have been ignored for valuation purposes.

3.13 At 30 June 2008, there were 797 associate beneficiaries in the MSBS with total associate benefit amounts, both funded and unfunded, of $89 million. Associate benefit accounts are set up in the MSBS as a result of superannuation splits following Family Law settlements. 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 2008, the net assets of the MSBS amounted to $2,934,747,000.

3.15 The MSBS assets are unitised and 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.

3.16 Since 30 June 2008, there has been considerable volatility in equity, property and currency markets with significant falls in asset values. Movements in market values have only a small impact on the Commonwealth cash flows and unfunded liabilities disclosed in this report. This is because most of the MSBS

Fund relates to members' accounts and ancillary benefits which are paid as accumulation benefits.

3.17 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.

3.18 The DFRDB is totally unfunded and thus does 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 Long Term Cost Report as at 30 June 2005 (the '2005 Report').

General assumptions

Future size of the schemes

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

Contributory membership at last six 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

4.4 There was a significant fall in the combined MSBS and DFRDB membership over the six years to 1999. This was followed by a period of relatively stable membership. The last three years have seen a growth in contributory membership, which is probably, in part, related to the operational environment. As would be expected, DFRDB membership has fallen significantly over the last fifteen years. However, it is anticipated to be around another 20 years before DFRDB contributory membership is close to zero.

4.5 The long term cost projections require an assumption regarding future growth in the membership of the relevant schemes. The previous Government had foreshadowed an increase in total military personnel and this has been achieved to some extent over the three years. This has, however, been in the context of a gradual decline in numbers over the longer term. Given the length of the projection period and uncertainty about long term movements in ADF numbers, we have continued to use the assumption that the total contributory membership of the MSBS and the DFRDB will remain constant at the level existing at the valuation date.

4.6 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

4.7 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.

4.8 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 liability and long term cost estimates. Care is therefore needed when setting the economic assumptions.

4.9 The financial assumptions for an investigation into long term costs must be realistic. At the same time, stability over time must be considered. Thus, 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.

Taking all of this into account, we have decided that it is appropriate to retain the assumptions in relation to price and salary inflation and interest rates which were adopted in the 2005 Report for this current investigation.

4.10 For the purposes of this report, we 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 As well as these financial assumptions, assumptions regarding the rate of increase in GDP are required. A series of rates based for the first four projection years on Treasury forecasts for the 2008 Mid-Year Economic and Fiscal Outlook, increasing to a maximum of 2.8 per cent (adjusted for forecast inflation) for the 2012-13 financial year and then falling gradually over the following 35 years to 2.1 per cent per annum from 2047-48 onwards has been adopted.

4.12 The GDP growth rates have been produced by the Commonwealth Treasury specifically for the purpose of this report. They should not be regarded as official Commonwealth Treasury projections. The rates of GDP increase assumed are set out in Appendix C. 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, particularly the effectively zero growth in GDP projected for 2009-10, can and does affect the outlays and liabilities reported as a percentage of GDP.

Experience assumptions

4.13 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.

4.14 There are noticeable differences in the experience of the two 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 leave 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

4.15 The assumed contributor mortality rates are unchanged from those used for the 2005 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

4.16 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.

4.17 In the late 1990's, the ADF introduced a new individual combat readiness regime which required serving members to have a high level of fitness. The 1999 Report anticipated that the introduction of this new regime would also lead to a one off effect with 1998-99 and 1999-2000 likely to be peak years for invalidity B and C exits. As it turned out, invalidity rates for 1999-2000 were higher than those for 1998-99 and stayed at similar levels for the following few years. Consequently, invalidity B and C rates were increased significantly for the 2002 Report.

4.18 In the following three years, observed rates were lower than the peak years and small reductions were made to the rates for both invalidity A and B for the 2005 Report.

4.19 The experience has deteriorated markedly since 2005. The observed invalidity A exits for both the DFRDB and the MSBS were noticeably higher than expected based on the assumptions adopted for the 2005 Report. This is likely to be associated with the operational tempo. This poses particular problems for setting rates which are to apply over the long term and under a range of operational conditions.

4.20 We have decided to increase the invalidity A rates to reflect the change in experience. In previous years, the invalidity rates have included a margin to allow for major incidents which result in multiple invalidity claims. In a situation where it is not clear whether the high invalidity rates observed over the two year analysis period will persist, the inclusion of this margin over and above the upwards adjustment of the rates could be regarded as unduly conservative. We have therefore decided to set the rates without the inclusion of this margin.

4.21 There is, however, a risk that invalidity rates could continue to increase. This is an area which will need to be closely examined in the next review.

4.22 There were smaller deviations in invalidity B experience from what was expected and the rates adopted are slightly lower overall than those from the 2005 Report.

4.23 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.

4.24 The invalidity experience for the MSBS has been consistently worse than for the DFRDB and accordingly the MSBS assumptions include significantly higher rates of invalidity. The explanation for this feature is not known, although it may be partly attributable to differences in scheme design. For example, a DFRDB member who has already qualified for a pension may elect to take a normal exit benefit instead of an invalidity benefit so as to be able to take part of the benefit as a lump sum. Pensions payable as a result of invalidity A or B must be taken wholly in pension form.

Resignation

4.25 Resignation assumptions have been made by duration of service.

4.26 As would be expected, given the benefit design, there are relatively few resignations from the DFRDB before 20 years service has been completed. A large number of resignations occur at the 20 year mark when entitlement to the pension benefit is attained. Lower rates of resignation apply thereafter. Experience over the three years was somewhat confusing with resignation rates being higher in the first two years and sharply lower in the third year.

4.27 Our judgement was that the experience for 2007-08 was abnormally low. We note that Defence introduced a number of retention pay initiatives in this period which may have created significant financial incentives to defer resignation. However, it is unclear exactly how this will flow through to resignation rates in the longer term. It is possible that the incentives will only result in a short term deferral of exits rather than increase retention rates in the long term. Accordingly, we have set the assumptions primarily having regard to the experience in the first two years. Again, this is an area that will warrant close examination in the next review.

4.28 Analysis of MSBS resignation experience has been complicated by the fact that most members joined the scheme after 1991 and assumptions about resignation at longer durations have therefore necessarily involved a greater degree of judgement. With the availability of more experience, it appears that resignation rates for long serving members may be lower than previously assumed and the MSBS resignation rates were reduced to reflect this emerging experience. The observed resignation rates at short durations were affected by the issues around gender noted in paragraph 3.2. The assumptions were adjusted, but not all the way to the observed rates.

4.29 The compulsory retirement age for most ADF personnel was effectively increased from age 55 to age 60 from 1 July 2007. As there is very little experience as to how this will affect exit behaviour for those over age 55, we have continued to assume (for valuation calculation purposes only) that all ADF personnel will exit at age 55, if they have not exited beforehand. This is an area to be reviewed in the context of the next Long Term Cost Report when there will be more experience data available on those aged 55 or more.

Retrenchment and redundancy

4.30 No allowance has been made for the effect of retrenchments and redundancies as the 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

4.31 The data for the two year period to 30 June 2007 confirmed the reasonableness of age distributions for new entrants adopted for the 2005 Report and we have retained these assumptions for the current valuation. The majority of ADF personnel join at young ages, normally between 18 and 22.

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

Promotional increases in salaries

4.33 For other ranks, promotional increases appear to be related to period of service. For officers, promotional increases appear to be related to both period of service and the age at joining. Since the last review, there have been a range of reforms affecting remuneration, including the incorporation of a number of allowances which were previously non-superannuable into superannuation salary and a major pay restructure for officers and some other ranks. This made it impossible to carry out any sensible analysis of the experience. Accordingly, we have retained the previous assumptions on promotional salary growth.

Mortality of pensioners

4.34 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 2005 Report. As a result, the only change made was to include an allowance in the base rates for mortality improvement since the last review. Overall, the rates adopted are less than the mortality rates for the general population as reflected in the Australian Life Tables 2000-02. The same assumptions are used for both the DFRDB and the MSBS.

4.35 It is conceivable that MSBS pensioners will have lower mortality rates than DFRDB pensioners of the same age. This is because most MSBS members have a choice between pension and lump sum on retirement whereas DFRDB members 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 for both schemes.

4.36 Analysis of invalid pensioner mortality experience suggested that mortality rates at older ages were somewhat less than the assumptions used for the 2005 Report and the rates were adjusted downwards at ages above 60. As would be expected, the rates of mortality are significantly higher than for the age pensioners.

4.37 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 the last 40 years. No allowance was made for improvement in the mortality of invalid pensioners.

Proportions married and age differences

4.38 There was no evidence to suggest that the assumptions on age differences between spouses should be altered from those adopted in the 2005 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. There are few married female members and the sparse data was consistent with the previous assumptions on proportions married, which were accordingly also retained. Based on the more recent experience, the proportions married for males were reduced over most ages but increased for ages over 70 relative to the assumptions adopted in 2005.

Pension option in the MSBS

4.39 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, we substantially increased the proportion of benefits which are assumed to be taken in pension form 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. The experience since the last review did not suggest that further adjustment was required at this stage. We have, therefore, retained the assumption that 60 per cent of the employer financed lump sum will be converted to a pension for other ranks and 75 per cent will be converted for officers.

Commutation option in the DFRDB

4.40 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. As the conversion factors provide for a lump sum which is greater than actuarial value of the forgone pension, it has been assumed that all retiring members take advantage of this option to the maximum extent permissible. The assumption is borne out by the experience since the last review.

Taxation

4.41 The DFRDB is entirely unfunded and hence no tax is levied on the scheme. At the time of the 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 and the results in this report reflect this arrangement. The policy was subsequently changed to remove the adjustment for tax. The impact of allowing for this change on the valuation results would be immaterial.

4.42 In calculating the accumulation of productivity contributions, allowance has been made for the 15 per cent contributions tax payable on 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

4.43 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. We 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

4.44 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

4.45 Under the Family Law Act, superannuation benefits may be split as part of a Family Law agreement or order. At present, the data we receive in relation to affected contributory 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, we do not include the value of benefits which have been allocated to non-member spouses. 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. We have made no allowance for the impact of splits of superannuation on the grounds that, at this stage, it is not material.

Conflict situations

4.46 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. As discussed in this report, there appears to be a positive correlation between increased involvement in overseas operations and invalidity rates. 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 accrued benefits at the beginning of the three years and contributions were made at calculated rate, then the scheme would be expected to be exactly fully funded at the end of the period. Previous Long Term Cost Reports have attributed benefits to service on a pro rata basis. The notional contribution rate outcomes for the two accrual approaches are similar in the context of the military schemes and the resulting rates for the current report are the same when rounded to the nearest 0.1 per cent.

5.2 The table below shows the notional employer contribution rates for the two schemes separately and also a combined rate for both schemes. For comparison, the rates from the 2005 Report are also shown.

Notional employer contribution rates as a percentage of superannuation salary

	MSBS (%)	DFRDB (%)	Combined (%)
2005 Report	24.7	33.5	26.0
Current Report	27.0	33.4	27.6

1. The MSBS rates exclude the cost of the retention benefit.
2. The 2005 and 2008 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. Attention is drawn to the changes in assumptions between 2005 and 2008. Details are given in Chapter 4.
4. These rates include the 3 per cent productivity contributions.
5. The rates 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. Contributions in respect of members of both schemes are paid to the ancillary section of the MSBS Fund. These contributions amount to around 1 per cent of superannuation salary.
6. The 2005 Report figures are based on the pro rata accrual approach. The 2008 Report figures are based on the AASB 119 accrual approach.

5.3 The majority of the increase in the MSBS notional employer contribution rate is due to changes in valuation assumptions. The most important change to the assumptions is the increase in the assumed number of invalidity A retirements. This has had a significant impact on reported costs for male other rank members, who account for over 60 per cent of the costs for the scheme. Other changes in assumptions had a relatively minor impact on the notional employer contribution rate.

5.4 The DFRDB is now closed to new entrants. The changes in assumptions and membership structure have resulted in a minimal reduction in the notional employer contribution rate.

5.5 The increase in the combined rate from 26.0 per cent of salaries in 2005 to 27.6 per cent of salaries in 2008 is due to the increase in the MSBS notional employer contribution rate. At 30 June 2008, DFRDB contributory members represented just under 10 per cent of total contributory members and changes in the MSBS rate will tend to dominate the combined rate. The decrease in the proportion of DFRDB members since 2005 has moderated the impact of the increase in the MSBS rate on 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 are likely to amount to around $45 million in 2008-09 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 around 1 per cent of superannuation salaries.

Chapter 6: Projection of outlays

6.1 A projection of annual Commonwealth 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 2004-05 for the DFRDB, the MSBS, and the two schemes combined. It also shows projected outlays for the next four years and then every fifth year from 2014-15. Note that the projections assume that the MSBS remains open to new ADF personnel.

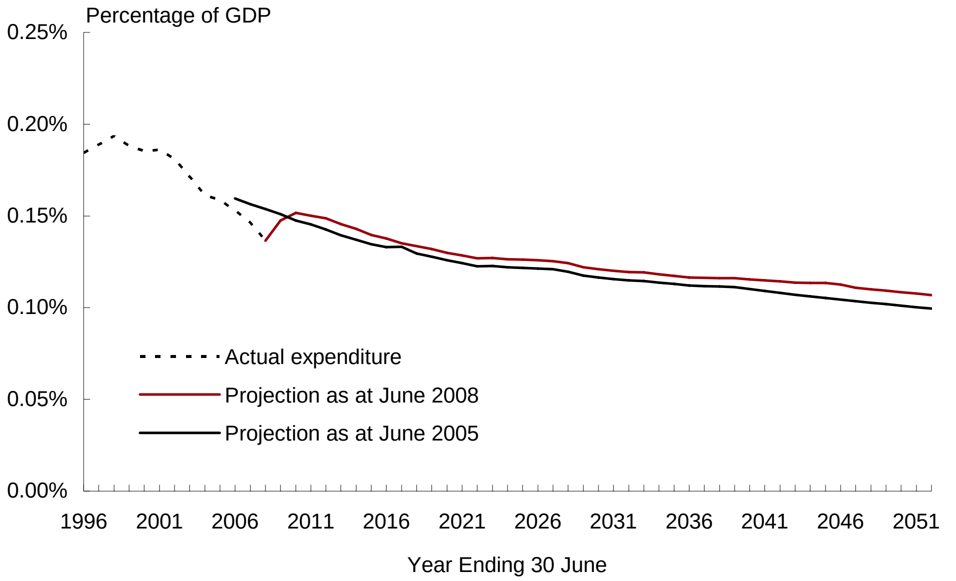
Actual and projected Commonwealth outlays

Year	DFRDB ($m)	MSBS ($m)	SG contributions ($m)	Total ($m)	As a percentage of GDP
Actual					
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
Projected					
2008-09	1,444	291	45	1,780	0.15
2009-10	1,498	330	47	1,875	0.15
2010-11	1,516	370	49	1,935	0.15
2011-12	1,537	410	51	1,998	0.15
2014-15	1,591	544	57	2,192	0.14
2019-20	1,657	880	69	2,606	0.13
2024-25	1,689	1,447	84	3,220	0.13
2029-30	1,687	2,132	103	3,922	0.12
2034-35	1,651	3,052	125	4,828	0.12
2039-40	1,556	4,315	152	6,023	0.12
2044-45	1,394	5,904	185	7,483	0.11
2049-50	1,168	7,612	225	9,005	0.11

1. These figures have **not** been adjusted to 2008 dollars.
2. The figures up to 2007-08 reflect the actual expenditure in those years.
3. An allowance for payments to the MSBS ancillary section to meet Superannuation Guarantee obligations following the move to an Ordinary Time Earnings (OTE) base from 1 July 2008 has been included. The amount included is $45 million, indexed in line with the general wage growth assumption.
4. The Australian Bureau of Statistics (ABS) retrospectively increased historic GDP figures. The figures as a percentage of GDP up to 2004-05 have not been adjusted for this and are as recorded in previous Long Term Cost Reports.

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 1996 and the projection of the equivalent figures taken from the 2005 Report are also shown.

Actual and projected Commonwealth outlays as a percentage of GDP



6.3 The initial increase in outlays as a percentage of GDP reflects both the lower GDP growth projected for 2008-09 and 2009-10 and an anticipated return to more normal exit rates following the very low rates of withdrawal which depressed cashflows in 2007-08. Following this initial increase, outlays as a percentage of GDP gradually decline over the projection period. There are two main reasons for this reduction:

- the number of ADF personnel is assumed to remain constant at the 30 June 2008 level, and so to fall as a percentage of the total population; and
- there is a cost saving arising from the fact that the MSBS is expected to be cheaper in the long term than the DFRDB.

6.4 Actual expenditure in 2005-06 and 2006-07 was close to the projections made in the 2005 Report. In 2007-08, expenditure was around $40 million lower than expected, due to a fall in the benefits paid under the DFRDB. The lump sum benefits, which reflect turnover rates in the DFRDB, fell by around $50 million from their level in the previous year. Anecdotal evidence suggested that this was partly a short term effect associated with the introduction of various retention initiatives and that the low turnover rates would not persist. Our valuation assumes a return to the turnover rates applying before 2007-08.

6.5 Over the three years to 2008, GDP was considerably higher than projected and this has also contributed to the significant drop in outlays when expressed as a percentage of GDP.

6.6 Overall, the projected outlays for the next 44 years are higher in dollar terms than the projections from the 2005 Report, particularly in the long term where they are around 20 per cent higher. There are a number of factors contributing to this result, most importantly, the increase in military personnel numbers and the increased prevalence of invalidity retirements. The larger than anticipated increases in superannuation salary over 2007-08 due to remuneration reform also flow through as higher benefit payments in the future. The incorporation of an allowance of $45 million (indexed) to cover the Superannuation Guarantee obligations also has a small impact on cashflows.

6.7 These increases in nominal outlays are largely matched by higher projected GDP and, as a result, the projected outlays as a percentage of GDP over the next 44 years are only a little higher than the estimates made in 2005.

6.8 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, we 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. 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 $37.9 billion as at 30 June 2008. This is 3.4 per cent of GDP. The net present value of unfunded liabilities reported as at 30 June 2005 was $32.1 billion or 3.6 per cent of GDP.

7.3 Note that in previous reviews, the accrual methodology has differed slightly from that required under AASB 119. For the current review, the accrual methodology has been aligned with the AASB 119 approach. This has increased the MSBS unfunded liability by around $150 million relative to what it would otherwise have been.

7.4 The 2005 Report projected that unfunded liabilities would be $35.7 billion as at 30 June 2008, or 3.4 per cent of GDP for 2008. Liabilities are therefore somewhat higher than was projected at the last report in dollar terms, but as projected in GDP terms. The main reason for the increase in dollar terms is the change in the contributory membership base, both in terms of increased numbers of personnel and higher salaries. A number of other factors also acted to increase the unfunded liability. These include the adverse scheme experience over the three years in terms of higher than expected numbers of invalidity retirements and the consequent change in the actuarial assumptions regarding invalidity rates. 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 and accrual methodology used for the 2005 Report been retained for this Report the unfunded liabilities would have been approximately $37.4 billion.

7.5 The unfunded liability for the DFRDB is $25.1 billion and the equivalent figure for the MSBS is $12.8 billion. These figures are higher than the estimates used for the Financial Statements for the Department of Defence as at 30 June 2008 of $22.9 billion for the DFRDB and $10.7 billion for MSBS. The major contributor to this result is the discount rate which is required to be used under the relevant AASB 119 to value the liabilities for Financial Statement purposes. The discount rate used for AASB 119 reporting was 6.6 per cent compared with the 6 per cent used for this report. The higher the discount rate used, the lower the unfunded liability. The issues associated with reporting under AASB 119 are discussed further, later in this chapter.

7.6 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 2008

Category of members	DFRDB ($b)	MSBS ($b)
Contributors	4.3	6.4
Pensioners	20.8	2.7
Preserved members	0.0	3.7
Total	**25.1**	**12.8**

7.7 The table below shows the projected unfunded liability for the DFRDB, the MSBS and for the two schemes combined. The projections are in nominal dollars and have **not** been adjusted to 2008 dollars. To enable a proper comparison of the projected liabilities with the position in 2008, 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.

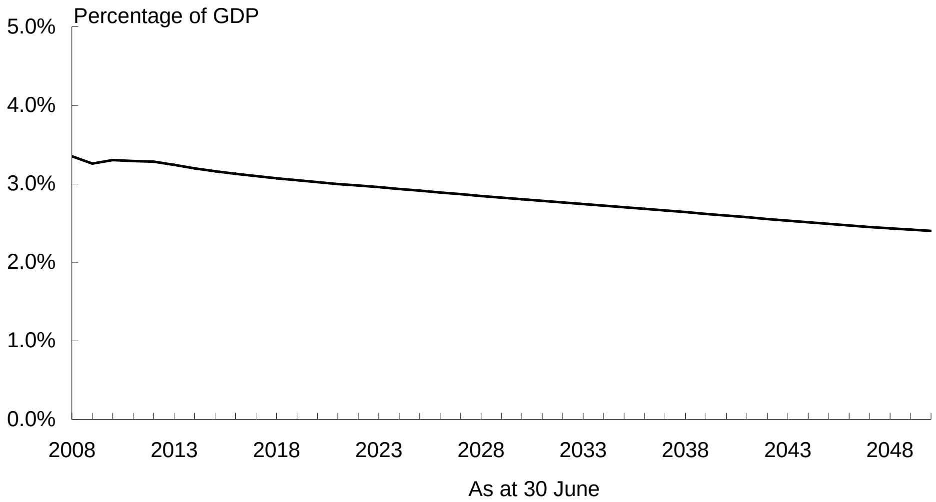
Projected Unfunded Liabilities

Year ending 30 June	DFRDB ($b)	MSBS ($b)	Total ($b)	As a percentage of GDP
2008	25.1	12.8	37.9	3.4
2009	25.2	14.2	39.3	3.3
2010	25.3	15.6	40.8	3.3
2015	25.2	24.4	49.6	3.3
2020	24.4	36.3	60.7	3.2
2025	22.9	51.4	74.3	3.0
2030	20.9	69.9	90.8	2.9
2035	18.2	92.8	111.1	2.8
2040	15.1	120.3	135.4	2.7
2045	11.7	152.5	164.2	2.6
2050	8.3	190.8	199.1	2.5

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

7.8 The graph below shows the projected unfunded liabilities as a percentage of GDP.

Projected unfunded liabilities as a percentage of GDP



7.9 The initial kink in the series is attributable to the short term volatility in the projected GDP series. Over the longer term, the main feature of the projection is the steady fall in unfunded liabilities relative to GDP. There are three main reasons for this:

- it is assumed that the total number of ADF personnel will stay at the same level as at 30 June 2008, that is, that the number of ADF personnel as a percentage of the population will fall;
- the MSBS is a less expensive scheme than the DFRDB; and
- the MSBS is partially funded whereas the DFRDB is wholly unfunded.

7.10 The general trend is clearly favourable with liabilities at the end of the period being around 75 per cent of their current level relative to GDP.

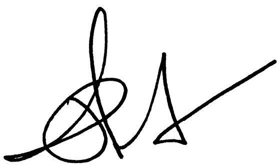
AASB 119

7.11 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 assumptions 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. Over the period for which unfunded liabilities have been calculated for financial statements under this Standard, the interest rates used in the calculations have all been within one percentage point of the interest rate used for this report.

7.12 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.

Future Fund

7.13 In 2006, the Government established a Future Fund to meet unfunded superannuation liabilities, contribute to national savings and increase net worth. It is intended that the unfunded liabilities of all Commonwealth superannuation schemes, including the military superannuation schemes, would eventually be covered by the assets of the Future Fund. 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.



Peter Martin FIAA
Australian Government Actuary
24 June 2009

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.

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. At the time of preparing this report, steps were being taken to clarify that retirement age for the purposes of calculating invalidity benefits was 55 for most members. 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) $$50\% \times \frac{\text{Total Accrued Multiple at Retirement Age*} \times \text{Final Average Salary}}{\text{Conversion Factor at Retirement Age*}}\text{; and}$$

(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 additional voluntary member contributions, salary sacrifice employer contributions, Government co-contributions, spouse contributions and transfers into the MSBS.

Superannuation guarantee

Additional employer contributions are payable with effect from 1 July 2008 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.

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. At the time of carrying out the valuation, the interest rate included an adjustment for a notional 15 per cent tax.

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. Note that with effect from 1 July 2008, additional employer contributions in respect of eligible allowances are 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)

Age	Death	Invalidity 'A'		Invalidity 'B'		Invalidity 'C'	
		Officers and cadets	Other ranks	Officers and cadets	Other ranks	Officers and cadets	Other ranks
20	0.49	0.18	0.65	0.51	3.78	1.04	3.35
25	0.54	0.73	2.97	1.08	7.55	2.24	8.01
30	0.56	1.19	3.67	1.65	8.86	1.79	3.66
35	0.58	1.48	4.14	2.23	9.78	1.67	1.90
40	0.59	1.72	4.49	2.80	10.35	1.57	1.10
45	0.61	1.82	4.70	3.37	10.37	1.51	0.87
50	0.76	1.80	4.70	3.60	10.37	1.51	0.89
54	1.17	1.80	4.70	3.60	10.37	1.51	0.89

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

Age	Death	Invalidity 'A'		Invalidity 'B'	
		Officers and cadets	Other ranks	Officers and cadets	Other ranks
30	0.56	1.60	3.47	0.40	2.05
35	0.58	1.60	3.02	0.40	1.25
40	0.59	1.60	2.58	0.40	0.68
45	0.61	1.60	2.14	0.40	0.30
50	0.76	1.60	1.70	0.40	0.09
54	1.17	1.60	1.70	0.40	0.00

Note that Invalidity 'C' exits from the DFRDB are included in the resignation assumptions.

Contributor exits by retirement and resignation

All contributors who attain age 55 are assumed to retire at age 55. The tables below set out the rates adopted for resignation below this age. The figures represent the numbers leaving per 1,000 contributors at each duration shown.

MSBS resignation rates (per 1,000 contributors)

Years of	Officers		Other ranks		Cadets
service	Male	Female	Male	Female	Male & Female
0	180	250	120	330	109
1	44	170	38	180	77
2	40	110	38	140	53
3	35	71	38	130	37
4	34	59	120	123	34
5	33	56	90	123	37
6	43	60	135	150	43
7	54	65	115	126	54
8	51	70	105	102	51
9	45	75	60	78	45
10	89	125	120	200	89
11	73	82	105	127	84
12	81	91	93	124	78
13	86	97	85	121	73
14	83	101	78	118	67
15	79	80	69	98	61
16	69	67	62	78	56
17	59	61	55	80	50
18	49	60	52	80	70
19	39	68	50	80	89
20	81	121	116	249	109
21	73	120	106	238	93
22	67	120	98	227	88
23	63	120	91	216	85
24	62	120	86	205	80
25	62	120	82	194	76
26	64	120	80	183	73
27	68	120	79	172	75
28	74	120	79	172	81
29	82	120	81	172	91
30	92	130	84	172	103

DFRDB resignation rates (per 1,000 contributors)

Years of service	Officers Male	Officers Female	Other ranks Male	Other ranks Female
14	20	15	20	20
15	20	15	15	20
16	20	15	10	10
17	20	15	10	10
18	20	15	10	10
19	20	15	15	10
20	180	135	337	450
21	122	133	233	250
22	115	134	199	250
23	115	138	186	250
24	115	145	176	250
25	116	154	168	250
26	118	166	163	250
27	120	181	159	250
28	126	199	159	250
29	135	220	163	250
30	149	240	170	250
31	164	240	182	250
32	179	240	197	250
33	196	240	217	250
34	218	240	240	250
35	248	240	268	250

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

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

Age	Officers			Other ranks			Cadets		
	Males %	Females %	Average salary ($)	Males %	Females %	Average salary ($)	Males %	Females %	Average salary ($)
17	-	-	-	0.1	-	35,115	0.1	0.1	22,411
18	0.6	-	42,799	12.0	14.0	35,663	22.0	22.0	23,281
19	1.1	-	44,966	20.0	12.7	36,210	24.0	24.0	25,537
20	1.5	1.0	47,132	16.0	9.0	36,757	15.0	15.0	28,475
21	2.0	4.1	49,298	10.0	5.9	37,305	8.7	8.7	31,058
22	3.4	6.0	51,464	7.0	5.6	37,852	7.6	7.6	32,582
23	5.5	8.2	53,630	5.6	5.3	38,399	6.5	6.5	33,415
24	5.5	8.2	55,796	4.7	5.0	38,947	5.4	5.4	34,095
25	5.5	7.2	57,962	3.9	4.7	39,494	4.3	4.3	34,377
26	5.5	6.1	60,128	3.3	4.4	40,041	3.2	3.2	34,575
27	5.0	5.3	62,294	2.9	4.2	40,589	2.1	2.1	34,685
28	4.5	4.4	64,460	2.4	3.9	41,136	1.0	1.0	34,776
29	4.1	3.8	66,627	1.9	3.6	41,684	0.1	0.1	34,866
30	3.7	3.4	68,793	1.4	3.3	42,231	-	-	-
31	3.4	3.0	70,959	1.2	3.1	42,778	-	-	-
32	3.2	2.8	73,125	0.9	2.8	43,326	-	-	-
33	3.0	2.5	75,286	0.8	2.5	43,873	-	-	-
34	2.8	2.4	77,006	0.7	2.2	44,420	-	-	-
35	2.7	2.3	78,725	0.6	1.9	44,968	-	-	-
36	2.5	2.2	80,444	0.5	1.7	45,515	-	-	-
37	2.4	2.2	82,163	0.4	1.4	46,062	-	-	-
38	2.4	2.2	83,882	0.3	1.1	46,610	-	-	-
39	2.4	2.2	85,602	0.3	0.8	47,157	-	-	-
40	2.4	2.2	87,321	0.3	0.6	47,704	-	-	-
41	2.4	2.2	89,040	0.3	0.3	48,252	-	-	-
42	2.4	2.2	89,040	0.3	-	48,799	-	-	-
43	2.4	2.2	89,040	0.3	-	49,346	-	-	-
44	2.4	2.2	89,040	0.3	-	49,894	-	-	-
45	2.4	2.1	89,040	0.3	-	50,441	-	-	-
46	2.4	2.1	89,040	0.3	-	50,989	-	-	-
47	2.4	2.1	89,040	0.3	-	51,536	-	-	-
48	2.1	2.1	89,040	0.3	-	51,536	-	-	-
49	1.8	1.1	89,040	0.2	-	51,536	-	-	-
50	1.5		89,040	0.1		51,536	-		-
51	1.2		89,040	0.1		51,536	-		-
52	0.9		89,040	-		-	-		-
53	0.6		89,040	-		-	-		-

Promotional salary increases

An extract from the assumed scale of salary progression (excluding general salary increases due to inflation) is set out below. Officer and cadet promotional salaries are related to both period of service and entry age. Other rank 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 for a selection of entry ages.

Salary progression — male and female MSBS officers

Entry age	Duration					
	0	1	5	10	20	30
20	1.000	1.044	1.219	1.432	1.760	2.081
23	1.000	1.068	1.314	1.503	1.798	2.202
27	1.000	1.034	1.155	1.279	1.506	1.852

Salary progression — male DFRDB officers

Entry age	Duration					
	0	1	5	10	20	30
20	1.000	1.039	1.193	1.377	1.654	1.948
23	1.000	1.065	1.309	1.447	1.723	2.055
27	1.000	1.040	1.128	1.237	1.457	1.769

Salary progression — female DFRDB officers

Entry age	Duration					
	0	1	5	10	20	30
20	1.000	1.039	1.193	1.377	1.654	1.827
23	1.000	1.065	1.309	1.447	1.689	1.866
27	1.000	1.040	1.128	1.237	1.396	1.542

Salary progression — cadets

Entry age	Duration					
	0	1	5	10	20	30
18	1.000	1.074	2.654	3.330	4.047	4.767
21	1.000	1.022	1.993	2.436	2.918	3.484
25	1.000	1.000	1.802	2.525	2.998	3.722

Salary progression — all other ranks

Duration					
0	1	5	10	20	30
1.000	1.280	1.529	1.678	1.945	2.102

As an example, consider an MSBS female officer who joined at age 23. The salary of such a person at age 33 would, in the absence of inflation, be assumed to be 1.503 times the commencing salary at age 23.

Pensioner mortality

The table below shows the mortality rates assumed for pensioners in the 2008-2009 year.

Pensioner mortality (per 1,000 pensioners)

	Males		Females	
Age	**Age retired**	**Invalid retired**	**Age retired**	**Invalid retired**
20	-	6.50	-	6.50
30	0.24	6.50	0.24	6.50
40	0.72	6.50	0.71	6.50
50	2.13	11.01	2.00	11.01
55	3.69	12.41	3.29	12.41
60	6.39	15.15	5.04	15.15
65	11.09	21.70	7.92	21.70
70	19.26	36.24	13.21	36.24
75	33.47	58.54	22.18	58.54
80	58.12	87.77	37.86	87.77
90	146.27	188.66	111.61	188.66
100	283.07	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

Proportions married and age differences

The assumed proportions married at each age is shown below:

Proportions married

Age	Males (%)	Females (%)
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
2008-09	4.2
2009-10	-0.1
2010-11	1.7
2011-12	1.7
2012-13	2.6
2013-14	2.8
2014-15	2.7
2015-16	2.6
2016-17	2.5
2017-18	2.5
2018-19	2.4
2019-20	2.4
2020-21	2.4
2021-22	2.4
2022-23	2.3
2023-24	2.3
2024-25	2.3
2025-26	2.3
2026-27	2.3
2027-28	2.3
2028-29	2.3
2029-30	2.3
2030-31	2.3
2031-32	2.3
2032-33	2.3
2033-34	2.3
2034-35	2.3
2035-36	2.3
2036-37	2.3
2037-38	2.3
2038-39	2.3
2039-40	2.3
2040-41	2.3
2041-42	2.3
2042-43 to 2046-47	2.2
2047-48 onwards	2.1