



**Australian Government**

**Australian Government Actuary**

# **MILITARY SUPERANNUATION SCHEMES REVIEW OF LONG-TERM COSTS**

**AS AT 30 JUNE 2014**



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ISBN 978-1-925220-62-9

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## SUMMARY

This report sets out estimates as at 30 June 2014 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 2011.

The schemes covered in this report are:

- the Military Superannuation and Benefits Scheme (MSBS) which commenced on 1 October 1991 and which is planned to be closed to new ADF personnel from 1 July 2016;
- 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.

### Changes to military superannuation since the previous report

There has been one major change to military superannuation arrangements since the previous report. This was the Government's decision to improve indexation arrangements for DFRB and DFRDB pensioners aged 55 or more from 1 July 2014. This change has led to an increase in cash outlays and unfunded liabilities.

The Government has also announced its intention to close the MSBS to new ADF personnel from 1 July 2016 and replace it with an accumulation superannuation scheme to be known as ADF Super. This change will have the effect of reducing cash outlays and unfunded liabilities for MSBS from 1 July 2016 when compared with the projections under the assumption of an open MSBS scheme. In this report, I have presented projections for MSBS under two scenarios – one based on the MSBS remaining open and the second based on the MSBS being closed to new entrants from 1 July 2016. The projections for the MSBS closure scenario relate to the MSBS only. They do not include cash outlays for employer superannuation contributions to the proposed new ADF Super or the cash outlays for benefits from the associated ADF Cover which would provide death and invalidity insurance cover. Finally, they do not include the unfunded liabilities of ADF Cover.

These changes to scheme arrangements are discussed in Chapter 2.

## Notional employer contribution rates

The notional employer contribution rate is the estimated employer contribution rate that would be required to fund the defined benefits accruing to serving ADF members over the next three years, expressed as a percentage of superannuation salary. The contribution rate is sensitive to the economic assumptions adopted. For the purposes of this calculation, superannuation benefits are assumed to accrue 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 notional employer contribution rates for the MSBS and the DFRDB as calculated for this report and the previous report as at 30 June 2011. 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 an employer's Superannuation Guarantee (SG) obligations from 1 July 2008. The additional employer SG contributions currently amount to around 0.6 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 <sup>1</sup> (%)	DFRDB (%)	Combined <sup>2</sup> (%)
2011 Report	30.4	29.7	30.4
Current Report (MSBS open)	33.2	35.9	33.3
Current Report (MSBS closed) <sup>3</sup>	33.2	35.9	33.3

1. The MSBS rates exclude the cost of the retention benefit.
2. The 2011 and 2014 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. Based on no new entrants to the MSBS from 1 July 2016 and no transfers from the MSBS to ADF Super.

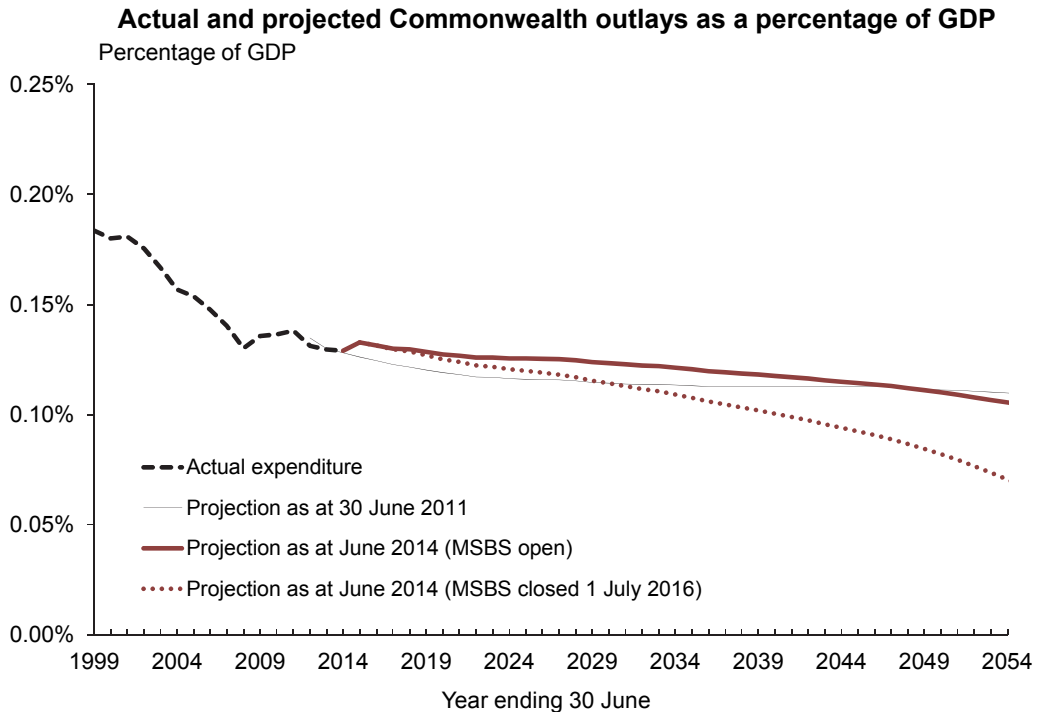
The increase in the notional employer contribution rate for DFRDB is due to the additional cost associated with the improved pension indexation arrangements for those pensioners aged 55 or more.

The increase in the notional employer contribution rate for MSBS is due to assuming higher rates of invalidity A and B retirement. The last three years have seen a dramatic increase in the numbers of new invalidity pensions. Further details regarding this are given in Chapter 4.



## 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 41 years and expressed as a percentage of gross domestic product (GDP) so that the amounts of the cash outlays can be matched against a relevant base. The following chart shows actual cash costs since 1999 and projected costs for the next 41 years, together with the cash costs that were projected in the Long-Term Cost Report as at 30 June 2011 (the '2011 Report').



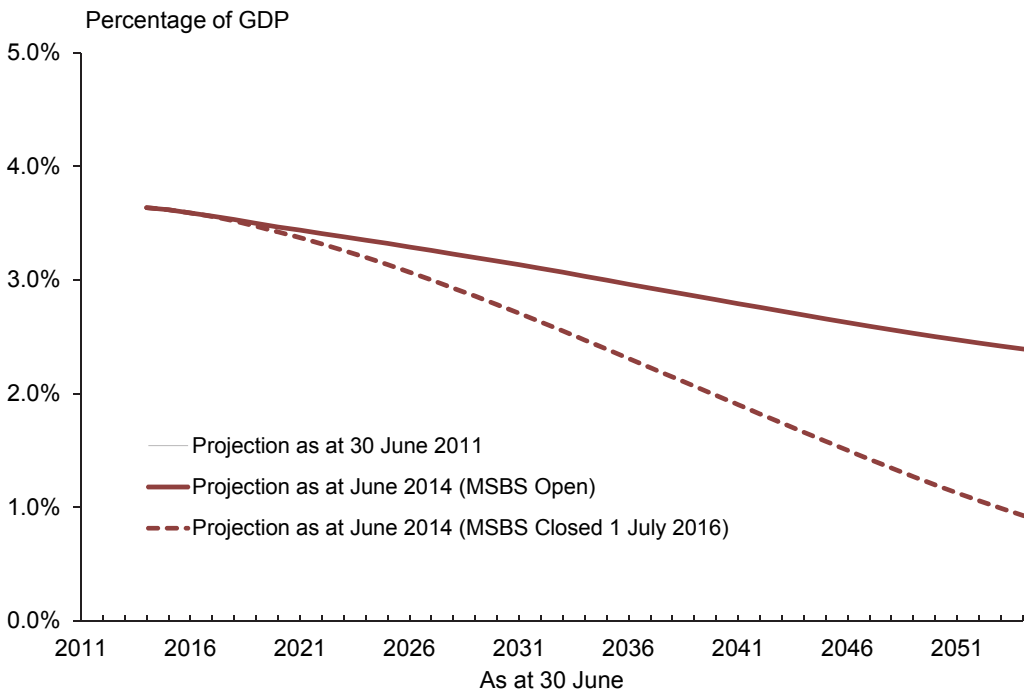
Annual cash costs represent approximately 0.13 per cent of GDP at present, falling to around 0.10 per cent of GDP in the long term (and around 0.07 per cent with a closed MSBS). The current projections are higher than the projections in the 2011 Report. In the medium term, this is primarily due to the improved pension indexation arrangements for DFRB and DFRDB. In the long term, the current projections are slightly lower 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 \$57.5 billion as at 30 June 2014 of which \$0.5 billion relates to the DFRB, \$30.3 billion to the DFRDB and \$26.7 billion to the MSBS. This is 3.6 per cent of GDP. This compares with the figure appearing in the 2011 Report of \$45.2 billion or 3.3 per cent of GDP as at 30 June 2011.

The following chart illustrates the projected fall off in the total unfunded liabilities as a percentage of GDP if MSBS were to remain open to new members. The trend is clearly favourable with this measure of liabilities falling by around 35 per cent over the 41 year projection period. The chart also gives the projection from the 2011 Report. Under the open MSBS scenario, the short to medium term projected liabilities as a percentage of GDP are higher than those from the 2011 Report, while in the long term, the current projections are slightly lower than the previous projections. Under a closed MSBS from 1 July 2016, projections of unfunded liabilities as a percentage of GDP are expected to decrease more rapidly from 3.6 per cent to 0.9 per cent. The primary reason for the increase in unfunded liability in 2014 compared to the 2011 projections is the cost associated with the improved indexation arrangements for DFRB and DFRDB. The factors leading to these results are discussed further in Chapter 7.

**Projected unfunded liabilities as a percentage of GDP**

























- 2.18 In respect of the standard member account (non-ancillary account) in MSBS, member contributions are accumulated with interest at the actual investment earnings rates of the MSBS Fund. When a benefit from the member account is paid, the payment is made directly to the individual, or the individual's nominated fund in the case of a roll over payment. Where an MSBS member has an unfunded component of his or her member account as a result of earlier membership of DFRDB, payment of that component of the benefit is made from CRF.
- 2.19 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.
- 2.20 Since 1 July 2008, employers with personnel in defined benefit schemes have been required to assess their Superannuation Guarantee (SG) obligations against ordinary time earnings (OTE). OTE for ADF personnel includes allowances which are not included in the schemes' definitions of superannuation salary.
- 2.21 In order to ensure compliance with SG obligations, employer contributions of up to 9.5 per cent of certain allowances which do not form part of superannuation salary are currently being paid into the ancillary section of the MSBS. In determining the amount of employer superannuation contributions for an individual, the maximum earnings base for SG purposes is taken into account. The additional employer contributions apply for both DFRDB and MSBS members and amounted to approximately \$28 million in 2013-14 based on the then applicable SG rate of 9.25 per cent. Total SG top up contributions due to the OTE assessment requirement have declined in recent years as the number of ADF personnel on overseas deployment has reduced. The figure for 2012-13 was \$40 million based on the applicable SG rate of 9 per cent.
- 2.22 For the purposes of the projections in this report, it has been assumed that the OTE base for SG employer contributions will represent a steady proportion of ADF salaries. A starting point of \$30 million for 2014-15 has been used for projections of SG contributions going forward. The projections allow for the scheduled increases in the SG contribution rate from its current level to an eventual 12 per cent over the period from 1 July 2021 from 1 July 2025.
- 2.23 Employer SG contributions in respect of certain allowances which do not form part of superannuation salary are taxed at 15 per cent when received by the MSBS Fund.

- 2.24 There are a number of other contributions made to the MSBS ancillary benefits section. 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 \$3.4 million in 2013-14). 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. Any employer contributions to the ancillary benefits section are taxed at 15 per cent when received by the MSBS Fund.
- 2.25 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 (after netting off transfers from the MSBS Fund)
  - (ii) **DFRDB**
    - Benefits (entirely unfunded) paid from the CRF
    - less*
    - Member contributions paid to the CRF
  - (iii) **DFRB**
    - Pensions paid from the CRF
  - (iv) **Superannuation Guarantee Contributions (OTE assessment)**
    - Funded contributions paid to the ancillary section of the MSBS Fund.

## Retention benefit

- 2.26 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.
- 2.27 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.
- 2.28 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 which administers 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 2014)

	MSBS		DFRDB	
	Number	Salaries (\$m)	Number	Salaries (\$m)
Male officers	9,693	1,089	1,040	145
Female officers	2,322	243	50	7
Male other ranks	35,565	2,555	1,540	149
Female other ranks	5,909	407	56	5
Cadets	1,485	70	-	-
<b>Total</b>	<b>54,974</b>	<b>4,364</b>	<b>2,686</b>	<b>306</b>

Note: Contributors include MBL members who have ceased paying contributions.

- 3.5 The number of MSBS contributors valued is 54,974, a decrease of around 800 compared to the equivalent figure of 55,769 for the 2011 Report. Data on MSBS contributors provided by the Department of Defence showed 53,993 contributors as at the last payday of 2013-14 plus 407 non-effective members and 476 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 2,686, a decrease of around 1,000 compared to the equivalent figure of 3,728 for the 2011 Report. Data on DFRDB contributors provided by the Department of Defence showed 2,634 contributors as at the last payday of 2013-14 plus 24 non-effective members and 135 members not contributing. The majority of members not contributing relate to re-entered recipients who have returned to service for less than 12 months and receive a small Superannuation Guarantee lump sum. Superannuation salary related checks did not reveal any cause for concern. 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 2014)**

	Number	Pensions <sup>1</sup> (\$m pa)
<b>DFRB</b>		
Age pensioners	614	10
Invalid pensioners	589	12
Reversionary pensioners <sup>2</sup>	1,915	30
Associate pensioners <sup>3</sup>	0	0
<b>Total DFRB</b>	<b>3,118</b>	<b>52</b>
<b>DFRDB</b>		
Age pensioners	43,220	1,165
Invalid pensioners	1,982	76
Reversionary pensioners <sup>2</sup>	7,059	149
Associate pensioners <sup>3</sup>	570	7
<b>Total DFRDB</b>	<b>52,831</b>	<b>1,396</b>
<b>MSBS</b>		
Age pensioners	4,298	111
Invalid pensioners	6,141	207
Reversionary pensioners <sup>2</sup>	340	8
Associate pensioners <sup>3</sup>	58	1
<b>Total MSBS</b>	<b>10,837</b>	<b>326</b>
<b>Total All Schemes</b>	<b>66,786</b>	<b>1,774</b>

Note: Pension amounts may not add up to totals due to rounding.

1. The pension amounts include the July 2014 pension increase.
2. Reversionary pensions are pensions that are payable to the surviving spouse and any eligible 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, the DFRB or the DFRDB.

- 3.8 The equivalent figures for pensioners as at 30 June 2011 were 8,177 MSBS pensioners with total annual pensions of \$201 million, 52,970 DFRDB pensioners with total annual pensions of \$1,297 million and 3,749 DFRB pensioners with total annual pensions of \$60 million.
- 3.9 The 2013-2014 CSC Annual Report has the number of MSBS pensioners as 10,975 compared to the 10,837 valued. The corresponding figures for the DFRDB are 53,057 (including children's pensions) and 52,831 (excluding children's pensions) respectively and for DFRB are 3,129 (including children's pensions) and 3,118 (excluding children's pensions).
- 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 3,120 DFRB pensioners, 53,052 DFRDB pensioners and 11,006 MSBS pensioners on the first pension payday of the 2014-15 financial year. The equivalent annual pension amounts paid were \$52 million for the DFRB, \$1,398 million for the DFRDB and \$340 million for the MSBS. These numbers include children's and orphan's pensions. For DFRB and DFRDB, this suggests that the pension data was essentially complete.
- 3.11 The checks on the pension payroll for MSBS indicated the possibility of missing MSBS pension records in the data supplied. Further enquiries were made of ComSuper to see if there was a logical explanation as to why the pension payroll was noticeably higher than would be expected from the data valued. ComSuper pointed out that the difference was almost certainly due to back payments of pension for new invalidity A and B pensions. Assessment procedures for invalidity exits can take some time to complete and hence there would be some back payments made on commencement. Rough checks based on the current high commencement rates of invalidity pensions confirmed that ComSuper's explanation was reasonable and I am thus satisfied that the pension data supplied was essentially complete.

- 3.12 ComSuper's explanation raises the issue of how to value MSBS contributor exits who may be part way through the invalidity assessment procedures at 30 June 2014 and who subsequently become invalidity pensioners with an effective pension commencement date prior to 1 July 2014. While this is not a new issue, in the past it has not been material. There has been a substantial increase in the number of new invalidity pensions commencing in recent years. Accordingly, I have decided to include an approximate adjustment to the valuation results to allow for those who were part way through the invalidity assessment procedures at 30 June 2014 and are ultimately found to have an invalidity pension entitlement pre-dating the valuation date. Details of this are set out in Chapter 4.
- 3.13 Preserved benefits from the MSBS are payable on attaining age 55, although in certain limited circumstances they may be payable earlier. There were 97,139 preserved beneficiaries valued, with total nominal preserved benefits of \$8,062 million. At 30 June 2011, there were 84,186 preserved beneficiaries with total nominal preserved benefits of \$6,001 million.
- 3.14 There have historically been 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 2014, there was 1 deferred pensioner in the DFRDB. This pensioner has been ignored for valuation purposes.
- 3.15 At 30 June 2014, there were 1,677 non-pensioner associate beneficiaries in the MSBS with total associate benefit amounts, both funded and unfunded, of \$246 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

- 3.16 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 2014, the net assets of the MSBS amounted to \$5,765.203 million. Of this, \$658 million relates to ancillary accounts. The equivalent figure as at 30 June 2011 was \$3,737.538 million.
- 3.17 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.
- 3.18 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.
- 3.19 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 2011 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 eight 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
2014	54,974	2,686	57,660

- 4.5 The experience over the twenty-one years falls into several distinct periods. The first of these periods saw a significant fall in the combined MSBS and DFRDB membership from 1993 to 1999. This was followed by six years of relatively stable membership. From 2005 to 2011, there was strong growth in contributory membership, particularly from 2008 to 2011. From 2011 until 2014 membership has been relatively stable and little or no further growth is expected in the short term. As would be expected, DFRDB membership has fallen significantly over the last 21 years. However, it is anticipated to be around another 15 to 20 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 size existing at the valuation date. It should be noted this implies that the number of serving ADF personnel in the schemes will represent a declining proportion of the Australian population.
- 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.

### **Closure of the MSBS to new ADF personnel from 1 July 2016**

- 4.8 As noted in 2.15, I have assumed there will be no transfers from MSBS to ADF Super upon inception of the new scheme. However, it is possible that there may be scope for MSBS members to transfer ADF Super depending on the final arrangements of the new scheme.

### **Economic assumptions**

- 4.9 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 shown below as the excess of nominal wage growth over the increase in the CPI;



- the level of future pension increases for DFRB and DFRDB pensioners aged 55 or more. The methodology used to determine increases is such that, over the long term, pensions would be expected to increase in line with Male Full Time Average Weekly Earnings (MTAWE). MTAWE increases would be expected to be similar to future general increases in salaries. This is also shown below 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 shown below as the excess over the increase in the CPI.

4.10 The relationships between these rates are significant factors affecting the long-term cost estimates. 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 relationships between the rates can have quite substantial effects on the unfunded liability and notional employer contribution rate estimates. Care is therefore needed when setting the economic assumptions.

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

<b>CPI increases</b>	2.5 per cent per annum (base)
<b>General salary increases and MTAWE increases</b>	1.5 per cent per annum (in excess of CPI) (4.0 per cent nominal)
<b>Interest rate</b>	3.5 per cent per annum (in excess of CPI) (6.0 per cent nominal)

4.12 These are the same assumptions as were adopted for my 2011 Report and, in terms of relativities, are effectively the same assumptions as have been adopted since the 1996 Report.

- 4.13 The financial assumptions for an investigation into long-term costs should be realistic. At the same time, stability of assumptions over time is desirable since cost estimates can be sensitive to even small changes in the financial assumptions. It is important not to introduce unnecessary volatility in to the assumptions, and hence the resulting estimates, which might mask genuine features and effects. Inevitably, judgement is required in setting the financial assumptions.
- 4.14 At the current time, the relationships between price inflation, interest rates and general salary increases are abnormal by historical standards. Interest rates are close to the rate of price inflation while salary increases have been marginally higher than price inflation. The short-term outlook for military personnel is for salary increases to be comparable with the rate of price inflation. This situation is not unique to Australia, and developed economies such as the US, UK, Europe and Japan, are also experiencing very low interest rates and depressed wage growth. This abnormal situation was noted in our 2011 Report and, if anything, the situation has become even more anomalous since then.
- 4.15 There is some uncertainty as to whether the relationships between price inflation, general salary increases and interest rates will return to close to the averages observed over the past forty years and, if so, over what time frame. There have been periods in the past where these relationships have deviated substantially from long-term averages. For example, in the early to mid-1970s price inflation was well in excess of both interest rates and salary increases. Historically, these abnormal relationships have eventually tended to revert to what might be considered the norm. As this report has estimates covering the next 40 years, I have decided to retain the assumptions based on historical long-term relationships. While my decision on the economic assumptions was derived independently of Treasury projections, I note that Treasury projections implicitly assume that there will be a return to normal relationships between price inflation, general salary increases and interest rates over the next decade.
- 4.16 While it has had no direct bearing on the economic assumptions I have adopted, I note that the Future Fund now has a substantial body of assets. These assets are hypothecated against the unfunded liabilities of the Commonwealth superannuation schemes which include DFRD, DFRDB and MSBS. The investment mandate of the Future Fund is to target a long-term average investment return of at least 4.5 to 5.5 per cent per annum in excess of the CPI.

- 4.17 Appendix D provides a sensitivity analysis of the results to changes in economic assumptions. This enables the impact of alternative scenarios around the future trajectory of the key macroeconomic parameters to be assessed.
- 4.18 Assumptions regarding the rate of increase in GDP are also required. Based on the above assumptions for inflation and wage growth, Treasury has produced a projection of annual GDP growth rates (included in Appendix C). This projection has been generated specifically for the purpose of this report and so it is not to 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**

- 4.19 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. For the experience analysis, detailed data was not readily available for 2013-14 and hence the analysis was largely based on the three year period from 2010-11 to 2012-13.
- 4.20 Analysis of the data over the long term indicates that experience may differ according to scheme, gender, and whether officer, officer cadet or other rank. Assumptions have been set accordingly. Details of assumptions are given in Appendix C.

### **Mortality of contributors**

- 4.21 The assumed contributor mortality rates are unchanged from those used for the 2011 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

4.22 Invalidation 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 very volatile, with rates falling between the 2002 and 2005 Reports and increasing markedly between 2005 and 2008. This makes it difficult to set assumptions about future experience.

4.23 In the 2011 Report, we observed that invalidity rates had appeared to stabilise and we set the invalidity rate assumptions accordingly. However, in the last three years, we have observed a significant increase in invalidity exit rates amongst MSBS contributors. The table below shows the number of new invalidity pensions commencing in each of the last 5 years.

Year	Invalidity A	Invalidity B	Total
2009-10	147	152	299
2010-11	182	142	324
2011-12	289	236	525
2012-13	364	224	588
2013-14	325	390	715

4.24 Anecdotal evidence suggests that this experience is likely to be correlated with the ending of overseas deployments. If this is so, then it might be that the annual numbers of new invalidity pensions commencing in the next few years may well reduce to something closer to historical levels. However, preliminary invalidity exit data for the current year to date indicates that it is likely that 2014-15 will see another increase in the number of new invalidity pensions commencing.

4.25 For the MSBS, the number of actual new invalidity A pensions commencing in the three years to 2012-13 was almost double the number expected. As a result, we have increased the invalidity A exit rates for all MSBS contributors to a level that is approximately half way between the previous rates and the observed rates. These new rates aim to provide a balance between reflecting the previous long-term expectations of invalidity A exit experience and the observed recent experience.

4.26 Invalidation B exit rates appear to have stabilised for MSBS officers and cadets, but have increased over the last three years for other ranks. Despite this increase in invalidity B exit rates, the observed rates are still somewhat below our 2011 invalidity B exit rate assumptions and these rates have been left unchanged.

- 4.27 Using the assumptions adopted for this long-term cost report would effectively result in assuming the level of new MSBS invalidity pensions commencing would be about 450 per year. There continues to be considerable uncertainty around the future trajectory for invalidity exit rates in the MSBS. Given this uncertainty, I have included a scenario in the sensitivity analysis in Appendix D which allows for invalidity exits to continue into the future at the current high rates. This sensitivity analysis effectively assumes that there would be around 600 new invalidity pensions commencing each year.
- 4.28 As with the 2011 Report, we have assumed that all future DFRDB invalidity exits will be invalidity A exits. The design of the DFRDB scheme means that 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. Actual DFRDB invalidity exits, primarily invalidity A exits, for other ranks were somewhat higher than those expected, but due to the inherent uncertainty around invalidity rates and the small numbers of exits, the rates were left unchanged. Actual DFRDB invalidity exits for officers were close to those expected and the rates were also left unchanged.
- 4.29 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.
- 4.30 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.
- 4.31 An increasing number of MSBS invalidity classifications are retrospective in nature. For example, in 2013-14, our analysis indicates that almost one-quarter of new invalidity pensioners were classified as a result of a discharge which occurred in the previous financial year (or earlier). Some of these are due to normal delays from assessment procedures but a number go back some years.

4.32 As noted earlier in the report, there is a significant number of retrospective invalidity classifications. In the past, this was not material in a valuation context because of the lower incidence of commencements of new invalidity pensions. However, with the higher levels of commencements of new invalidity pensions seen in recent years, I have decided to incorporate an approximate adjustment to the MSBS unfunded liability of \$150 million for the current long-term cost report. This is to cover the financial strain imposed by future retrospective invalidity pensions that will be backdated to a commencement date before 1 July 2014. I have also approximately increased future MSBS benefit payments to be consistent with the assumed increase in the unfunded liability for MSBS.

### Resignation

4.33 Resignation assumptions have been made by scheme and duration of service.

4.34 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.

4.35 Continuing the trend observed in the 2011 Report, resignation rates in both schemes remained at low levels over the analysis period.

4.36 Overall, minor reductions were made to the unisex DFRDB resignation rates for both officers and ranks to reflect this recent experience.

4.37 Slightly more significant reductions were made to MSBS resignation rates in light of the recent experience. Exit rates for MSBS other ranks were lower than anticipated, particularly for female members. The differences between male and female experience were not found to be significant enough to justify setting separate assumptions and exit rates for MSBS other ranks have been adopted which apply to both genders. Exit rates for MSBS officers were lower than expected for both males and females. The observed exit rates for males were somewhat lower than those for females, and separate male and female rates have been adopted.

4.38 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.

## **Retirement**

4.39 The compulsory retirement age for most ADF personnel was effectively increased from age 55 to age 60 from 1 July 2007. Prior to the change to the compulsory retirement ages, only a very small group of ADF personnel served beyond age 55 and it was assumed that any members still serving at this age would exit on their 55<sup>th</sup> birthday. This assumption was retained for the 2008 Report.

4.40 In the 2011 Report, I noted that there was a growing group of contributors aged 55 or more and that the assumption of universal exit at age 55 was no longer tenable. At the same time, there was minimal experience on actual exit rates for this group and I therefore adopted the somewhat arbitrary assumption that the exits of those still in service at age 55 would be evenly spread over the subsequent five years.

4.41 There are now 450 DFRDB and 786 MSBS contributors aged 55 or more. The experience for this group remains relatively sparse but it does not appear to be grossly inconsistent with the assumption adopted for the 2011 Report. Accordingly, I have continued to assume that the exits of those still in service at age 55 would be evenly spread over the subsequent five years. This issue will be looked at more closely in the next long-term cost report when there should be a sufficient volume of experience on which to base assumptions.

## **Retrenchment and redundancy**

4.42 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.

## **New entrants**

- 4.43 The data on new entrants over the period 2010-11 to 2013-14 was roughly consistent with the distributions adopted for the 2011 Report. Minor modifications have been made to reflect the most recent new entrant experience. Over 50 per cent of cadets and other ranks join between the ages of 17 and 20. The peak ages at which officers join the ADF are from 23 to 26 but these ages only account for around 20 per cent of the officer intake.
- 4.44 I have assumed that the gender balance in the new entrant population is such that the current gender 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.
- 4.45 The various changes made to salaries and salary structures 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**

- 4.46 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.
- 4.47 The changes in salaries and salary structures for new members meant that corresponding changes were needed to the MSBS promotional salary scales. The higher starting salaries for new members have reduced promotional increases in the earliest years after commencement.
- 4.48 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. This is particularly the case for the MSBS.



## Mortality of pensioners

- 4.49 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 2011 Report after allowing for mortality improvement at the assumed rates over the intervening period.
- 4.50 For males, the rates were consistent with the 2011 assumptions (after allowing for mortality improvement) and the 2011 rates, adjusted for assumed mortality improvement over the three years have been retained for this long-term cost report. Overall, the rates adopted for males are around the same or a little less than the mortality rates for the general population.
- 4.51 For females, the rates were also consistent with the 2011 assumptions (after allowing for mortality improvement) except at higher ages. For ages up to age 84, the 2011 assumptions adjusted for the assumed mortality improvement over the three years were retained. For those aged 85 and over, the rates were slightly increased relative to the 2011 assumptions adjusted for mortality improvement. 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.
- 4.52 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 three schemes. In this context, it is relevant to note that, to date, a high proportion of MSBS retirees have chosen to take at least part of their benefit as a pension. This suggests that the impact on future MSBS pensioner mortality rates due to MSBS retirees selecting a full lump sum because of their poorer life expectancies is likely to be small.

- 4.53 Analysis of invalid pensioner mortality experience suggested that mortality rates at younger ages were less than the assumptions used for the 2011 Report and the rates were noticeably adjusted downwards at ages less than 60. Observed mortality rates were higher than those assumed between ages 60 and 80, and were increased slightly. As would be expected, the rates of mortality are significantly higher than for the age pensioners.
- 4.54 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 to 2000-02. No allowance was made for improvement in the mortality of invalid pensioners.

### Proportions married and age differences

- 4.55 There was no evidence to suggest that the assumptions on age differences between spouses should be altered from those adopted in the 2011 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

- 4.56 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 2011 analysis, revealed a further shift towards pension benefits. Based on this, for the 2011 Report I assumed that 75 per cent of the lump sum would be converted to a pension for other ranks and 85 per cent would be converted for officers. An analysis of recent data suggests that these pension take up rates are still appropriate and the assumptions made for the 2011 Report have been retained.

## Commutation option in the DFRDB

4.57 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 the actuarial value of the forgone pension at most 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

4.58 The DFRDB and DFRB are entirely unfunded. They are untaxed schemes and hence no tax is levied on the schemes. The current valuation assumes that the full Commonwealth Bond rate (without any reduction for notional investment tax) will be credited to the notional productivity benefit payable in accordance with the Determination made under the *Defence Act 1903*.

4.59 In calculating the accumulation of productivity contributions for MSBS, 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

4.60 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, does not need to be paid to the Australian Taxation Office (ATO) until a benefit is payable. The tax commenced in 1996 and 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.

## **Division 293 tax**

- 4.61 The Division 293 tax was introduced from 1 July 2012. The Division 293 tax applies to individuals whose income for Division 293 purposes is greater than \$300,000 and imposes an additional 15 per cent tax on the individual's superannuation contributions.
- 4.62 In a similar manner to the superannuation surcharge, members of defined benefit superannuation funds are eligible to defer their Division 293 tax liabilities until benefits become payable.
- 4.63 As with the superannuation surcharge, I have assumed that the Schemes' liability to pay the Division 293 tax liabilities to the ATO on behalf of the individual tax payer 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 Division 293 tax.

## **Early release of preserved benefits in the MSBS**

- 4.64 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**

- 4.65 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**

4.66 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 number are likely to spend some time overseas involved in a conflict situation. The long-term costs reported here implicitly assume that average future levels of ADF deployment will not be unusually high. If levels of deployment in a war or warlike situations were to significantly increase, the assumptions adopted here may not hold. In particular, death and invalidity rates could be higher, as could ADF personnel numbers.



## CHAPTER 5: NOTIONAL EMPLOYER 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, on the assumptions made, 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 MBL, 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 0.6 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 2011 Report are also shown.

### Notional employer contribution rates as a percentage of superannuation salary

	MSBS <sup>1</sup> (%)	DFRDB (%)	Combined <sup>2</sup> (%)
2011 Report	30.4	29.7	30.4
Current Report (MSBS open)	33.2	35.9	33.3
Current Report (MSBS closed) <sup>3</sup>	33.2	35.9	33.3

1. The MSBS rates exclude the cost of the retention benefit.
2. The 2011 and 2014 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. Based on no new entrants to the MSBS from 1 July 2016 and no transfers from the MSBS to ADF Super.

- 5.3 The majority of the increase in the MSBS notional employer contribution rate from that disclosed in the 2011 Report is due to the changes to valuation assumptions. The principal assumption change affecting the contribution rate was the increased invalidity exit rates for MSBS contributors. 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 majority of the increase in the DFRDB notional employer contribution rate is due to the Government's decision to improve indexation arrangements for DFRDB pensioners aged 55 or more from 1 July 2014. Changes in valuation assumptions have had a relatively minor effect on the notional employer contribution rate.
- 5.5 The increase in the combined rate from 30.4 per cent of salaries in 2011 to 33.3 per cent of salaries in 2014 is primarily due to the increase in the MSBS notional employer contribution rate. At 30 June 2014, DFRDB contributory members represented only around 5 per cent of the total contributory membership and changes in the MSBS rate dominate changes in 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 \$28 million in 2013-14. Using the same salary base as the notional employer contribution rates, the additional contributions represent close to 0.6 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 cash impact to the Commonwealth from 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 six years and then every fifth year from 2019-20. Note that the projections are presented separately under two scenarios: the MSBS remaining open to new members; and the MSBS closing to new members from 1 July 2016.

### Actual and projected Commonwealth outlays (MSBS remains open)<sup>1</sup>

Year	DFRB <sup>2</sup> (\$m)	DFRDB (\$m)	MSBS (\$m)	SG contributions <sup>4</sup> (\$m)	Total (\$m)	As a percentage of GDP
<b>Actual<sup>5</sup></b>						
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
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 <sup>6</sup>	65	1,423	386	44	1,918	0.13
2011-12	59	1,445	405	41	1,950	0.13
2012-13	55	1,434	446	40	1,975	0.13
2013-14	53	1,455	505	28	2,041	0.13
<b>Projected</b>						
2014-15	50	1,541	594	30	2,216	0.13
2015-16	49	1,587	649	31	2,316	0.13
2016-17	47	1,633	710	33	2,423	0.13
2017-18	45	1,684	791	34	2,555	0.13
2018-19	43	1,733	867	35	2,679	0.13
2019-20	41	1,777	951	36	2,806	0.13
2024-25	33	1,967	1,567	53	3,621	0.13
2029-30	25	2,114	2,436	68	4,643	0.12
2034-35	18	2,209	3,603	83	5,913	0.12
2039-40	13	2,236	5,141	100	7,490	0.12
2044-45	8	2,148	7,133	122	9,410	0.11
2049-50	4	1,925	9,565	148	11,644	0.11
2054-55	2	1,577	12,334	181	14,094	0.10

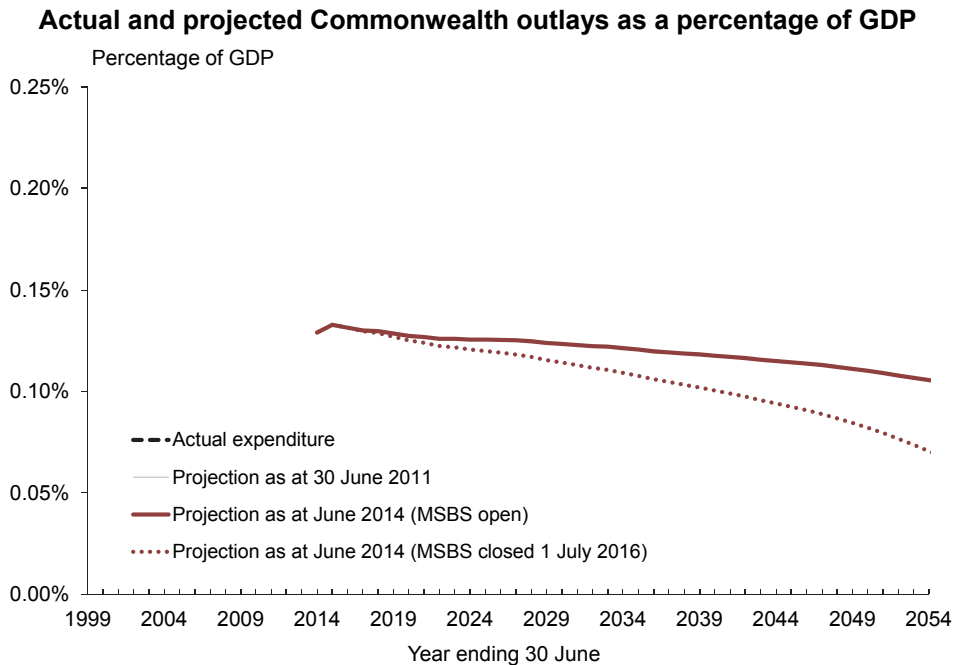
**Actual and projected Commonwealth outlays  
(MSBS closed from 1 July 2016)<sup>1</sup>**

Year	DFRB <sup>2</sup> (\$m)	DFRDB (\$m)	MSBS <sup>3</sup> (\$m)	SG contributions <sup>4</sup> (\$m)	Total (\$m)	As a percentage of GDP
<b>Actual<sup>5</sup></b>						
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
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 <sup>6</sup>	65	1,423	386	44	1,918	0.13
2011-12	59	1,445	405	41	1,950	0.13
2012-13	55	1,434	446	40	1,975	0.13
2013-14	53	1,455	505	28	2,041	0.13
<b>Projected</b>						
2014-15	50	1,541	594	30	2,216	0.13
2015-16	49	1,587	649	31	2,316	0.13
2016-17	47	1,633	705	32	2,417	0.13
2017-18	45	1,684	776	31	2,536	0.13
2018-19	43	1,733	840	30	2,646	0.13
2019-20	41	1,777	910	29	2,758	0.13
2024-25	33	1,967	1,429	30	3,458	0.12
2029-30	25	2,114	2,134	26	4,298	0.11
2034-35	18	2,209	3,031	20	5,277	0.11
2039-40	13	2,236	4,136	14	6,399	0.10
2044-45	8	2,148	5,443	6	7,606	0.09
2049-50	4	1,925	6,747	-	8,677	0.08
2054-55	2	1,577	7,495	-	9,074	0.07

Note: The components may not add exactly to the total due to rounding.

1. These figures have **not** been adjusted to 2014 dollars and do not include cash outlays relating to the proposed new accumulation superannuation scheme ADF Super or the associated scheme for death and invalidity cover, ADF Cover.
2. Prior to 2008-09, DFRB outlays were included in the DFRDB figures.
3. These figures assume the MSBS is closed to new members from 1 July 2016 with no transfers from MSBS to ADF Super.
4. 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.
5. The figures up to 2013-14 reflect the actual expenditure in those years.
6. 2010-11 was a 27 pension pay day year and hence had higher expenditure than normal. No allowance is made for future 27 payday years in the projections

- 6.2 The chart below shows total projected outlays as a percentage of GDP over the next 41 years. For comparison purposes, actual outlays since 1999 and the projection of the equivalent figures taken from the 2011 Report are also shown.



- 6.3 Outlays as a percentage of GDP gradually decline over the projection period under the scenario where the MSBS remains open to new ADF personnel. The main reason for this reduction is that the number of ADF personnel is assumed to remain constant at the 30 June 2014 level, and so to fall as a percentage of the total population.
- 6.4 In GDP terms, the projection as at June 2014 is higher than the projection as at June 2011 except for the later years of the projection period. In the medium term, this increase in outlays is mostly due to the changed indexation arrangements for DFRB and DFRDB pensioners and, to a lesser degree, due to the increased invalidity exit rates for MSBS contributors. In the very long term, the impact of the improved pension indexation arrangements for DFRB and DFRDB diminishes as pensioner numbers decline due to death and the effect of assuming higher GDP growth rates for the current long-term cost report relative to the 2011 Report results in a slight reduction in projected cash outlays expressed as a percentage of GDP.

- 6.5 A further factor behind the increase in short term cash outlays expressed as a percentage of GDP was that over the three years to 2014, GDP was lower than that projected in 2011.
- 6.6 Actual expenditure, both in GDP terms and dollar terms, in 2012-13 and 2013-14 was slightly lower than the projections made in the 2011 Report. This can be largely attributed to the lower than expected exit rates from DFRDB (discussed in Chapter 4) which has the effect of reducing lump sum payments arising from commutation of pensions and the 3 per cent productivity benefit.
- 6.7 Overall, the projected outlays in nominal dollar terms for the next 41 years, assuming the MSBS remains open, are higher than the projections from the 2011 Report, reaching around 10 per cent higher in 15 to 25 years. The same two main factors behind the outcome in GDP terms, namely improved pension indexation arrangements for DFRB and DFRDB, and increased invalidity exit rates for MSBS contributors, apply here as well.
- 6.8 Were the MSBS to be closed to new members in 2016, there would be a reduction in cash outlays for the MSBS. However, it does take some time for the reduction to become significant. This is because in the short to medium term most of the cash outlays are locked in as they reside with the current MSBS membership. The projected Commonwealth outlays shown in paragraph 6.1 with the MSBS closed to new members from 2016 do not include any Commonwealth outlays for the new ADF Super and ADF Cover.
- 6.9 Given the projected decline in costs as a percentage of GDP, the existence 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 1.9, 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. The assets attributable to the fully funded ancillary section of MSBS and the associated accumulation benefit liabilities are excluded from this calculation.
- 7.2 The net present value of unfunded liabilities was calculated to be \$57.5 billion as at 30 June 2014. This is 3.6 per cent of GDP. The net present value of unfunded liabilities reported as at 30 June 2011 was \$45.2 billion or 3.3 per cent of GDP.
- 7.3 The 2011 Report projected that unfunded liabilities would be \$51.9 billion as at 30 June 2014, or 3.2 per cent of GDP for 2014. Liabilities are therefore higher than was projected at the last report in dollar and GDP terms. The change in the DFRB and DFRDB pension indexation arrangements has been the key driver of this outcome. This has added around \$5 billion to the unfunded liability which is equivalent to 0.3 per cent of GDP. The increased invalidity exit rates assumed for MSBS contributors are a lesser, but still significant, contributory factor. Had the assumptions used for the 2011 Report been retained for this report, the unfunded liabilities would have been \$56.9 billion.
- 7.4 The unfunded liability for the DFRB is \$0.5 billion, for the DFRDB is \$30.3 billion and the equivalent figure for the MSBS is \$26.7 billion. These figures are lower than the estimates used for the Financial Statements for the Department of Defence as at 30 June 2014 of \$0.6 billion for the DFRB, of \$40.7 billion for the DFRDB and \$41.6 billion for MSBS. The major reason for this 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 nominal discount rate used for AASB 119 reporting was 4.1 per cent per annum compared with the nominal 6 per cent per annum 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 2014**

Category of members	DFRB (\$b)	DFRDB (\$b)	MSBS (\$b)
Contributors	-	3.8	13.1
Pensioners	0.5	26.5	6.8
Preserved members	-	0.0	6.9
<b>Total</b>	<b>0.5</b>	<b>30.3</b>	<b>26.7</b>

Note: Components may not add up to totals due to rounding.

7.6 The table below shows the projected unfunded liability for the DFRB, the DFRDB, the MSBS and for the three schemes combined. The projections are in nominal dollars and have **not** been adjusted to 2014 dollars. To enable a proper comparison of the projected liabilities with the position in 2014, projections of the combined unfunded liability as a percentage of GDP are also shown. The projections are presented separately under the two scenarios of the MSBS remaining open to new members and the MSBS closing to new members from 1 July 2016.

**Projected Unfunded Liabilities (MSBS remains open)<sup>1</sup>**

Year ending 30 June	DFRB (\$b)	DFRDB (\$b)	MSBS (\$b)	Total (\$b)	As a percentage of GDP
2014	0.5	30.3	26.7	57.5	3.6
2015	0.5	30.6	29.3	60.4	3.6
2016	0.4	30.9	31.9	63.3	3.6
2017	0.4	31.2	34.8	66.4	3.6
2018	0.4	31.4	37.8	69.6	3.5
2019	0.4	31.6	41.0	72.9	3.5
2020	0.3	31.7	44.4	76.4	3.5
2025	0.3	31.6	64.0	95.8	3.3
2030	0.2	30.4	88.5	119.1	3.2
2035	0.1	28.1	118.8	147.0	3.0
2040	0.1	24.6	155.4	180.0	2.8
2045	0.0	20.2	198.6	218.8	2.7
2050	0.0	15.2	249.3	264.5	2.5
2055	0.0	10.3	309.4	319.7	2.4

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

1. These figures have not been adjusted to 2014 dollars.

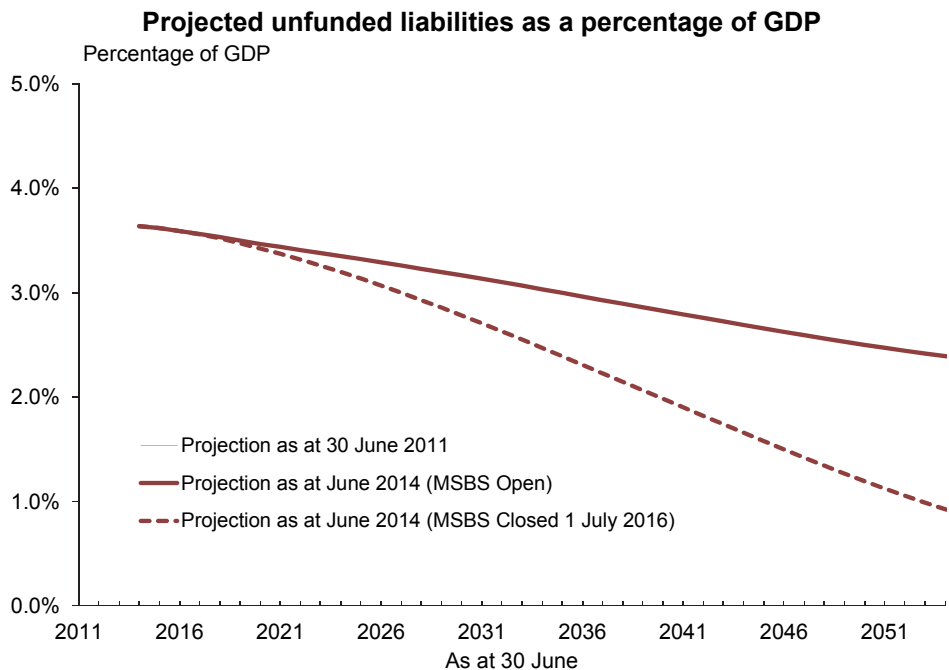
**Projected Unfunded Liabilities (MSBS closed from 1 July 2016)<sup>1</sup>**

Year ending 30 June	DFRB (\$b)	DFRDB (\$b)	MSBS (\$b)	Total (\$b)	As a percentage of GDP
2014	0.5	30.3	26.7	57.5	3.6
2015	0.5	30.6	29.3	60.4	3.6
2016	0.4	30.9	31.9	63.3	3.6
2017	0.4	31.2	34.7	66.3	3.6
2018	0.4	31.4	37.6	69.4	3.5
2019	0.4	31.6	40.5	72.4	3.5
2020	0.3	31.7	43.4	75.4	3.4
2025	0.3	31.6	58.6	90.5	3.1
2030	0.2	30.4	74.1	104.7	2.8
2035	0.1	28.1	89.0	117.2	2.4
2040	0.1	24.6	101.7	126.3	2.0
2045	0.0	20.2	109.8	130.0	1.6
2050	0.0	15.2	111.3	126.5	1.2
2055	0.0	10.3	106.9	117.1	0.9

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

1. These figures have not been adjusted to 2014 dollars and do not include liabilities relating to the proposed new accumulation superannuation scheme ADF Super or the associated scheme for death and invalidity cover, ADF Cover.

7.7 The chart below shows the projected unfunded liabilities as a percentage of GDP together with the equivalent projection from the 2011 Report.



- 7.8 Over the longer term, the main feature of the projection assuming that the MSBS remains open 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 2014, 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 clearly favourable with liabilities at the end of the period being around 65 per cent of their current level relative to GDP.
- 7.10 Relative to the 2011 Report and assuming that the MSBS remains open, projected unfunded liabilities as a proportion of GDP are higher for about 25 years. From 2038, the current projections are lower than the previous projections, with the margin increasing gradually to about 0.3 percentage points of GDP by the end of the projection period. The initially higher projections for the current report are mostly due to the improved indexation arrangements for DFRB and DFRDB pensions which have increased the unfunded liability by around 10 per cent. The estimates for the later projection years are lower. This is due to the lower assumed numbers of serving ADF personnel reducing future accruals of unfunded liabilities and the higher GDP growth rates assumed eventually outweighing the impact of the improved pension indexation arrangements for the closed DFRB and DFRDB.
- 7.11 As would be expected, were the MSBS to be closed to new ADF personnel in 2016, there would be a substantial reduction in the unfunded liabilities for the later projection years.



## 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. Up until the 2011 Report, the interest rates used in calculating the unfunded liabilities for financial statements under this Standard had been within one percentage point of the interest rate used for this report. In recent years, the interest rates used for AASB 119 have been significantly lower than that used for this report. This has had the effect of significantly increasing the reported liabilities under AASB 119.
- 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

18 June 2015



# APPENDIX A

## Summary of membership, contribution and benefit provisions of the MSBS

The Military Superannuation and Benefits Scheme (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

<b>Salary</b>	Salary is actual salary including higher duties allowance, service allowance, and some qualifications and skills allowances.
<b>Final average salary</b>	Average annual salary received over the last three years prior to termination of service.
<b>Accrual rates</b>	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.
<b>Total accrued multiple</b>	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:
  - (v)  $50\% \times \frac{\text{Total Accrued Multiple at Retirement Age}^* \times \text{Final Average Salary}}{\text{Conversion Factor at Retirement Age}^*}$ ; and
  - (vi)  $\frac{\text{Total Accrued Multiple (to date of exit)} \times \text{Final Average Salary}}{\text{Conversion Factor at Age at Exit}}$

### **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 (SG) requirements. The contributions are paid in respect of eligible allowances that are not included in superannuation salary for both DFRDB and MSBS members at the applicable SG rate (currently 9.5 per cent). The additional contributions are subject to a maximum of the applicable SG rate multiplied by the maximum quarterly earnings base for Superannuation Guarantee less the applicable SG rate multiplied by the superannuation salary for the quarter.





# APPENDIX B

## Summary of membership, contribution and benefit provisions of the DFRDB

The Defence Force Retirement and Death Benefits Scheme (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

<b>Salary</b>	Salary is the highest incremental salary for substantive rank plus service allowance and some qualifications and skills allowances.
<b>Final salary</b>	Salary at the date of termination of service.
<b>Statutory retirement age</b>	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 according to the age of the pensioner. For pensioners less than age 55, the pension is indexed in line with the movement in the Consumer Price Index (CPI). For pensioners aged 55 or more, the pension is indexed using the same methodology as currently applies for indexation of Age and Service pensions. At the present time, Age and Service pensions are increased by the greater of the CPI and the Pensioner and Beneficiary Living Cost Index (PBLCI), and benchmarked against a percentage of Male Total Average Weekly Earnings (MTAWE) (currently at 27.7 per cent of MTAWE for a single person).

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, orphans' pensions may be payable in some circumstances.

### **Productivity (3 per cent) superannuation benefit**

A productivity superannuation benefit of 3 per cent of superannuation 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)

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	0.24	0.84	4.50	3.00	1.45	1.50
25	0.54	1.09	4.46	0.85	5.57	2.24	1.50
30	0.56	1.85	5.69	1.35	5.71	1.26	1.50
35	0.58	2.37	6.62	1.85	5.71	0.96	1.50
40	0.59	2.83	7.18	2.35	5.71	0.78	1.50
45	0.61	3.05	7.52	2.85	5.71	0.75	1.50
50	0.76	3.03	7.52	3.35	5.71	0.75	1.50
55	1.30	3.03	7.52	3.75	5.71	0.75	1.50
59	1.92	3.03	7.52	3.75	5.71	0.75	1.50

#### 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
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.

## 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	175	175	110
1	75	75	70
2	45	60	35
3	30	50	35
4	31	40	103
5	32	40	80
6	37	40	100
7	39	40	100
8	40	40	70
9	41	45	40
10	45	80	90
11	50	55	70
12	60	45	63
13	55	40	60
14	45	40	53
15	43	40	50
16	40	40	48
17	40	40	45
18	40	40	40
19	40	43	38
20	40	45	45
21	40	41	75
22	39	39	55
23	37	37	45
24	35	35	40
25	33	33	40
26	33	33	40
27	33	33	40
28	33	33	43
29	37	37	44
30	47	47	46

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

Years of service	Officers	Other Ranks
	Male & Female	Male & Female
20	100	180
21	125	170
22	130	157
23	135	144
24	135	133
25	130	125
26	120	116
27	98	108
28	95	103
29	93	100
30	93	103
31	95	107
32	100	114
33	105	122
34	110	132
35	120	143
36	130	162
37	143	182
38	158	220
39	200	263
40	250	321

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

Note: Preserved benefits are assumed to be taken at age 55.

## 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	-	-	-	9.0	10.0	48,700	20.7	20.7	39,564
18	0.5	-	54,782	18.9	20.0	49,100	31.5	31.5	40,289
19	1.0	-	56,862	16.0	15.0	49,500	13.1	13.1	42,619
20	1.5	-	58,942	10.6	10.0	49,800	8.6	8.6	44,969
21	2.0	1.0	61,022	8.2	8.0	50,100	5.6	5.6	47,340
22	3.4	4.1	63,102	6.8	6.5	50,400	5.0	5.0	49,612
23	6.0	6.0	65,182	5.6	5.5	50,700	4.3	4.3	50,543
24	6.3	10.0	67,262	4.4	4.5	51,000	3.7	3.7	51,305
25	5.5	8.2	69,342	3.5	3.6	51,300	3.1	3.1	51,745
26	5.2	7.2	71,422	2.9	2.9	51,500	2.5	2.5	52,184
27	5.1	6.1	73,502	2.4	2.5	51,700	1.9	1.9	52,352
28	4.5	5.3	75,582	1.9	2.0	51,900	1.2	1.2	52,620
29	4.1	4.5	77,662	1.6	1.6	52,100	0.6	0.6	52,889
30	3.5	3.9	79,742	1.3	1.4	52,300	-	-	-
31	3.3	3.4	81,822	1.1	1.2	52,500	-	-	-
32	3.0	3.0	83,902	1.0	1.0	52,700	-	-	-
33	2.9	2.8	85,982	0.8	0.9	52,900	-	-	-
34	2.7	2.5	88,062	0.7	0.7	53,319	-	-	-
35	2.5	2.4	90,142	0.6	0.6	54,282	-	-	-
36	2.5	2.3	92,222	0.5	0.5	55,276	-	-	-
37	2.4	2.2	94,302	0.4	0.4	56,293	-	-	-
38	2.4	2.2	96,382	0.4	0.4	57,327	-	-	-
39	2.4	2.2	98,462	0.3	0.3	58,369	-	-	-
40	2.4	2.2	99,999	0.3	0.3	59,414	-	-	-
41	2.4	2.2	99,999	0.2	0.2	60,452	-	-	-
42	2.4	2.2	99,999	-	-	-	-	-	-
43	2.4	2.2	99,999	-	-	-	-	-	-
44	2.4	2.2	99,999	-	-	-	-	-	-



**New entrants (continued)**

Age	Officers			Other ranks			Cadets		
	Males %	Females %	Average salary (\$)	Males %	Females %	Average salary (\$)	Males %	Females %	Average salary (\$)
45	2.4	2.2	99,999	-	-	-	-	-	-
46	2.4	2.2	99,999	-	-	-	-	-	-
47	2.4	2.2	99,999	-	-	-	-	-	-
48	2.1	2.2	99,999	-	-	-	-	-	-
49	1.8	2.2	99,999	-	-	-	-	-	-
50	1.5	1.2	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**

Duration	MSBS Officers			MSBS Cadets			DFRDB Officers	Other Ranks
	Entry Age 20	Entry Age 20	Entry Age 27	Entry Age 18	Entry Age 21	Entry Age 25		
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	1.082	1.071	1.048	1.125	1.060	1.040	1.065	1.100
2	1.161	1.139	1.094	1.246	1.119	1.082	1.130	1.194
3	1.236	1.205	1.140	1.403	1.262	1.245	1.194	1.242
4	1.308	1.268	1.184	1.521	1.404	1.406	1.259	1.284
5	1.376	1.328	1.227	1.642	1.526	1.526	1.309	1.321
6	1.441	1.386	1.269	1.755	1.632	1.616	1.337	1.357
7	1.502	1.441	1.310	1.867	1.735	1.702	1.365	1.390
8	1.560	1.494	1.350	1.974	1.832	1.782	1.392	1.421
9	1.614	1.544	1.389	2.077	1.927	1.861	1.420	1.451
10	1.665	1.591	1.426	2.176	2.017	1.935	1.447	1.480
11	1.712	1.636	1.462	2.267	2.100	2.004	1.474	1.507
12	1.756	1.678	1.498	2.354	2.178	2.071	1.502	1.533
13	1.796	1.718	1.532	2.435	2.252	2.135	1.529	1.559
14	1.833	1.755	1.565	2.510	2.322	2.196	1.557	1.583

**Salary progression — male and female MSBS officers (continued)**

Duration	MSBS Officers			MSBS Cadets			DFRDB Officers	Other Ranks
	Entry Age 20	Entry Age 20	Entry Age 27	Entry Age 18	Entry Age 21	Entry Age 25		
15	1.867	1.789	1.596	2.581	2.387	2.254	1.622	1.607
16	1.897	1.821	1.627	2.646	2.448	2.310	1.689	1.629
17	1.923	1.851	1.656	2.707	2.504	2.363	1.755	1.651
18	1.946	1.877	1.685	2.762	2.555	2.413	1.820	1.672
19	1.966	1.901	1.712	2.811	2.603	2.461	1.883	1.693
20	1.982	1.923	1.738	2.856	2.645	2.506	1.946	1.712
21	1.995	1.942	1.763	2.895	2.683	2.548	2.004	1.731
22	2.005	1.958	1.787	2.929	2.717	2.588	2.058	1.749
23	2.015	1.972	1.809	2.958	2.746	2.625	2.108	1.767
24	2.025	1.983	1.831	2.981	2.771	2.660	2.154	1.784
25	2.035	1.993	1.851	3.000	2.792	2.691	2.197	1.800
26	2.045	2.003	1.870	3.017	2.810	2.720	2.237	1.816
27	2.055	2.013	1.889	3.033	2.826	2.747	2.273	1.831
28	2.066	2.023	1.905	3.049	2.842	2.771	2.305	1.845
29	2.076	2.033	1.921	3.065	2.856	2.794	2.334	1.859
30	2.086	2.043	1.931	3.080	2.871	2.815	2.359	1.873
31	2.097	2.053	1.941	3.095	2.885	2.836	2.381	1.886
32	2.107	2.064	1.950	3.111	2.900	2.856	2.401	1.898
33	2.118	2.074	1.960	3.126	2.914	2.873	2.420	1.909
34	2.128	2.084	1.970	3.142	2.929	2.888	2.437	1.921
35	2.139	2.095	1.980	3.158	2.944	2.903	2.452	1.931
36	2.150	2.105	1.990	3.174	2.958	2.918	2.466	1.941
37	2.160	2.116	1.999	3.189	2.973	2.933	2.478	1.951
38	2.171	2.126	2.009	3.205	2.988	2.947	2.491	1.960
39	2.182	2.137	2.020	3.221	3.003	2.962	2.502	1.969

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 2.017 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)**

Age	Males		Females	
	Age retired	Invalid retired	Age retired	Invalid retired
20	-	3.18	-	3.18
30	0.23	3.18	0.23	3.18
40	0.67	4.04	0.68	4.04
50	1.62	7.08	1.91	7.08
55	2.97	10.09	3.17	10.09
60	5.39	14.91	4.86	14.91
65	9.62	22.57	7.61	22.57
70	16.93	34.69	12.68	34.69
75	29.32	53.53	21.30	53.53
80	52.88	82.09	36.46	82.09
90	139.95	181.72	117.46	181.72
100	268.67	346.11	263.74	346.11

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 are 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.

## Gross Domestic Product 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 CPI inflation)

Year	Per cent per annum
2014-15	2.9
2015-16	3.1
2016-17	3.1
2017-18	3.1
2018-19	3.2
2019-20	3.1
2020-21	3.0
2021-22	3.0
2022-23	2.9
2023-24	2.9

**GDP growth rates (adjusted for CPI inflation) (continued)**

<b>Year</b>	<b>Per cent per annum</b>
2024-25	2.9
2025-26	2.9
2026-27	2.9
2027-28	2.9
2028-29	2.8
2029-30	2.9
2030-31	2.8
2031-32	2.9
2032-33	2.8
2033-34	2.9
2034-35	2.8
2035-36	2.9
2036-37	2.8
2037-38	2.8
2038-39	2.8
2039-40	2.8
2040-41	2.7
2041-42	2.7
2042-43	2.7
2043-44	2.7
2044-45	2.7
2045-46	2.6
2046-47	2.6
2047-48	2.6
2048-49	2.5
2049-50	2.5
2050-51	2.5
2051-52	2.5
2052-53	2.4
2053-54	2.4
2054-55	2.4



# APPENDIX D

## Sensitivity analysis

1. Some sensitivity analyses have been undertaken on a variety of factors to show their impact on the unfunded liabilities for all schemes and the notional employer contribution rates 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% pa);
  - an increase of 1 percentage point in the annual interest rate used (to 7% pa);
  - a decrease of 1 percentage point in the assumed annual rate of general salary (and MTAW) inflation (to 3% pa);
  - an increase of 1 percentage point in the assumed annual rate of general salary (and MTAW) inflation (to 5% pa);
  - a decrease of 1 percentage point in the assumed annual rate of CPI inflation (to 1.5% pa); and.
  - an increase of 1 percentage point in the assumed annual rate of CPI inflation (to 3.5% pa).
3. In each case, it is assumed that the other economic assumptions are unchanged. The nominal base assumptions for this purpose are those adopted for the Long-Term Cost Report, namely:

<b>Interest rate</b>	6.0% pa
<b>General salary inflation</b>	4.0% pa
<b>CPI increases</b>	2.5% pa
4. In addition, the impacts of a 100% pension take-up rate for MSBS and increased MSBS invalidity rates on the unfunded liabilities of all schemes have been modelled.

5. It is highly unlikely that a situation will ever be reached where 100 per cent of employer financed benefits for MSBS 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 from this source.
6. As noted earlier in the report, MSBS invalidity rates have significantly increased in recent years. In this sensitivity analysis, it is assumed that invalidity exit experience remains at its currently high observed levels into the future, with around 600 new invalidity pensions commencing each year. A summary of the invalidity A and B exit assumptions for MSBS underlying this analysis are set out at the end of this Appendix.
7. The results of the analyses are as follows:

	DFRB & DFRDB			MSBS	
	DFRB Unfunded Liability \$m	DFRDB Unfunded Liability \$m	Notional Employer Contribution Rate %	MSBS Unfunded Liability \$m	Notional Employer Contribution Rate %
2014 Long-Term Cost Report	479	30,314	35.9	26,746	33.2
Interest rate (5% pa)	519	35,059	43.8	33,950	43.9
Interest rate (7% pa)	444	26,557	29.9	21,514	25.9
Salary increases (3% pa)	445	26,841	30.2	25,695	30.7
Salary increases (5% pa)	517	34,584	43.1	27,949	36.1
Inflation (1.5% pa)	479	30,014	35.4	22,431	28.1
Inflation (3.5% pa)	479	30,632	36.4	32,376	40.0
100% pension take up	479	30,314	35.9	28,561	35.4
Higher invalidity rates	479	30,314	35.9	27,226	35.3

Note: These sensitivity analysis scenarios do not represent upper or lower bounds of the unfunded liabilities or notional employer contribution rates, with the exception of the 100% pension take-up rate scenario for MSBS.



8. 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. As DFRB and DFRDB pensions are now linked to salary (MTAWE) inflation for most of the period while in payment, these schemes are much more sensitive to the salary (MTAWE) increase assumption than the CPI increase assumption which only applies to pension indexation for those under age 55. For the MSBS, the large unfunded components of the preserved benefits as well as pensions are CPI inflation linked. Most contributors will end up with a preserved benefit on exit from the ADF and are likely to take a pension on eventual retirement. As a result, MSBS costs are much more sensitive to the CPI inflation assumption than the salary increase assumption.
9. The pension take up scenario affects only the MSBS and involves a lower cost than the higher salary growth or CPI inflation assumptions. 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 always be some individuals who will prefer the lump sum over the alternative pension.
10. The increased invalidity exit rates (for MSBS contributors) scenario involves a cost approximately equal to the 100% pension take up rate assumption.
11. Both of the latter two scenarios involve a proportionately higher impact on the notional employer contribution rate going forward than on the unfunded liability.
12. A summary of the invalidity A and B exits rates used for the higher invalidity rates scenario are set out in the table below:

**MSBS invalidity rates (per 1,000 contributors)**

Age	Invalidity 'A'		Invalidity 'B'	
	Officers and cadets	Other ranks	Officers and cadets	Other ranks
20	0.31	1.10	5.85	3.90
25	1.42	5.80	1.11	7.24
30	2.41	7.40	1.76	7.42
35	3.09	8.60	2.41	7.42
40	3.68	9.33	3.06	7.42
45	3.97	9.78	3.71	7.42
50	3.94	9.78	4.36	7.42
55	3.99	9.78	4.94	7.42
59	4.20	9.78	5.20	7.42