Australian Government

Australian Government Actuary

MILITARY SUPERANNUATION SCHEMES REVIEW OF LONG-TERM COSTS AS AT 30 JUNE 2020

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SUMMARY

This report sets out estimates as at 30 June 2020 of the long-term costs of superannuation benefits payable in respect of the members of the four defined benefit superannuation schemes covering the majority of Australian Defence Force (ADF) personnel. The previous report was prepared using data as at 30 June 2017.

The schemes covered in this report are:

- the ADF Cover scheme which provides insurance type benefits to those ADF personnel under the new ADF Super accumulation arrangements which cover new ADF personnel with effect from 1 July 2016;
- the Military Superannuation and Benefits Scheme (MSBS) which commenced on 1 October 1991 and which 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 in assumptions since the previous report

The assumptions adopted and changes since the previous report are discussed in Chapter 4.

The most significant assumption change is the increase in invalidity exit rates adopted for MSBS contributors and ADF Cover. Recent years have seen a dramatic increase in the numbers of new invalidity pensions commencing amongst both MSBS and ADF Cover membership. Consequently, the assumptions have been changed to reflect this experience. This growth has specifically been found among other ranks, and almost exclusively in invalidity A pensions. These pensions are payable for life and the benefit formula includes prospective service to age 60. As these pensions are generally paid to younger members with relatively short periods of service, these are expensive benefits relative to the period of service of these individuals and hence have a high cost. Consequently, substantial increases in the numbers of invalidity exits have a significant impact on the underlying costs. There is considerable uncertainty relating to future rates of invalidity exits given the recent experience in this area.

Recent years of experience have also shown a significant increase in the number of retrospective MSBS invalidity pensioners. These are individuals who were MSBS preserved members but who, at some stage after exiting from the ADF, had their mode of exit retrospectively changed to invalidity and commenced an invalidity pension that was backdated to their date of exit from the ADF. These members often receive a large payment soon after their pension becomes payable. The assumptions have also been updated to reflect this experience. These pensions now constitute around 5 per cent of the MSBS unfunded liability.

Reflecting recent growth in the number of scheme members, I have introduced an allowance for future growth in the number of ADF personnel covered by the schemes of 1 per cent per annum, broadly reflecting long term population growth.

There have been a number of other minor changes to assumptions which have had a much smaller impact on reported scheme costs.

Notional employer contribution rates

For MSBS and DFRDB, 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 2017. These rates include the employer 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 an employer's Superannuation Guarantee (SG) obligations from 1 July 2008. The additional employer SG contributions currently amount to around 0.8 per cent of superannuation salary across the membership of both schemes and are paid to the ancillary section of the MSBS Fund. There is no contribution rate for the DFRB as it comprises only pensioner members.

A different approach has been taken for ADF Cover. ADF Cover only provides insurance type benefits. The notional employer contribution rate for ADF Cover has also been calculated 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 pay a notional premium for the insurance cover provided to those members in the current year.

NOTIONAL EMPLOYER CONTRIBUTION RATE AS A PERCENTAGE OF SUPERANNUATION SALARY

Report as at	MSBS[1] (%)	DFRDB (%)	ADF Cover (%)
2017 Report	52.0	43.0	21.6
Current Report	53.7	41.8	54.6

1. The MSBS rates exclude the cost of the retention benefit.

The increase in the notional employer contribution rate for ADF Cover is primarily attributable to the increase in the assumed rate of invalidity exits since the 2017 Report. While not covered by this report, under the ADF Super arrangements, employer contributions at the rate of 16.4% of ordinary time earnings are also paid to the superannuation fund of the individual's choice.

The MSBS notional employer contribution rate is similar to that which was disclosed in the 2017 Report. Underlying this result is the increased costs associated with the higher rate of invalidity benefits offset by a reduction in the cost of those invalidity benefits associated with the ageing population in this closed scheme and other minor changes in demographic assumptions.

The reduction in the DFRDB notional employer contribution rate is almost entirely attributable to minor changes in the demographic assumptions and the ageing of the population in this closed scheme.

Projection of employer cash costs

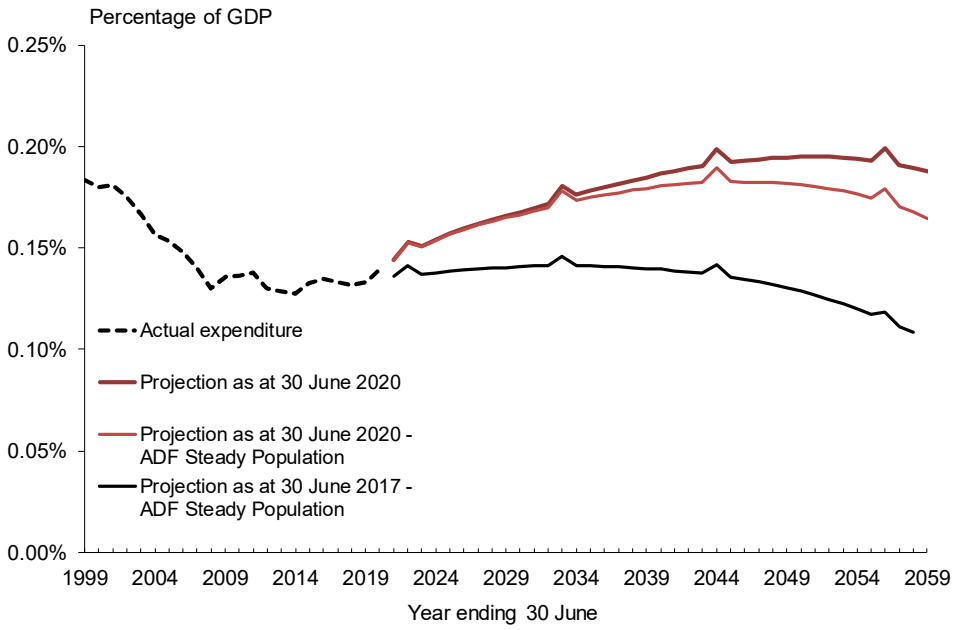
Direct Commonwealth outlays that will be required under the current method of funding benefits have been projected for the next 40 years and expressed as a percentage of Gross Domestic Product (GDP) so that the amounts of the cash outlays can be matched against a relevant base.

The following chart shows actual cash costs since 1999 and projected costs for the next 40 years, together with the cash costs that were projected in the Long-Term Cost Report as at 30 June 2017. Note that the outlays do not include employer contributions under the ADF Super arrangements.

Annual cash costs currently represent approximately 0.14 per cent of GDP. They are expected to increase to around 0.20 per cent of GDP in the medium term before falling to around 0.18 per cent of GDP in the long term.

The current projections are higher than the projections in the 2017 Report. This is partly due to the introduction of a growth rate in the total ADF population. However, even after allowing for this, there has been a significant increase in projected outlays. On current assumptions, employer cash costs as a percentage of GDP are now expected to increase to some of the highest levels seen since the early 1990s.

ACTUAL AND PROJECTED COMMONWEALTH OUTLAYS AS A PERCENTAGE OF GDP



This is primarily a consequence of the increases in the rates of assumed invalidity exits for both MSBS and ADF Cover. The factors leading to this result are further discussed in Chapter 6. The projections also factor in the impact of the occasional years where there are 27 pension pay days instead of the usual 26 pension pay days which lead to extra expenditure in those years. This occurs around every 11 years.

Present value of unfunded liabilities

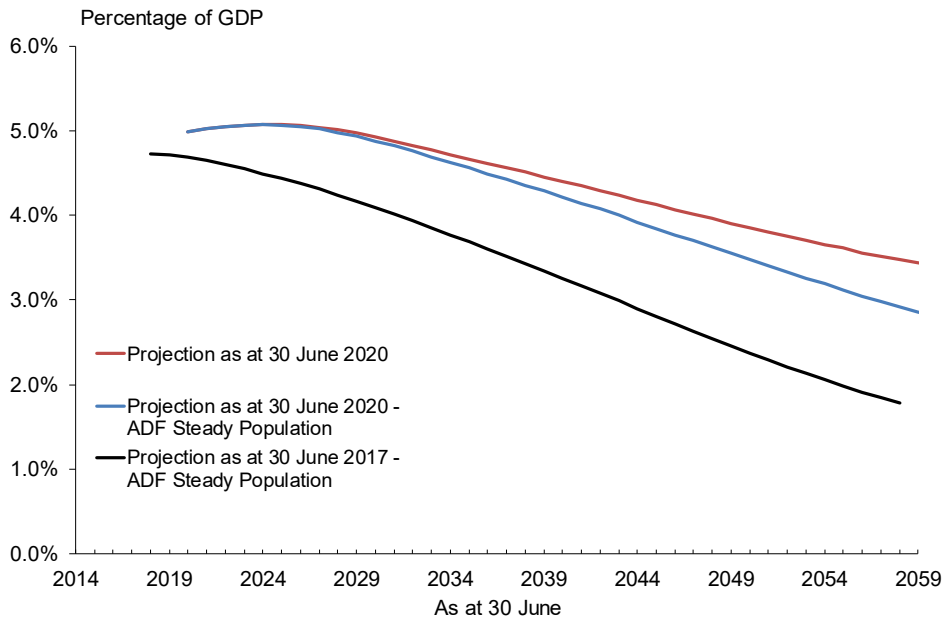
The unfunded liability in respect of benefits that have already accrued for current employees, former employees and pensioners has been estimated as $98.9 billion as at 30 June 2020 of which $0.3 billion relates to the DFRB, $32.2 billion to the DFRDB, $65.6 billion to the MSBS and $0.8 billion to ADF Cover. This is 5.0 per cent of GDP. This compares with the figure appearing in the 2017 Report of $83.1 billion or 4.7 per cent of GDP as at 30 June 2017.

The following chart illustrates the projected fall off in the total unfunded liabilities as a percentage of GDP. The trend is clearly favourable with this measure of liabilities falling by around 30 per cent over the 40 year projection period.

As the inclusion of a growth rate in the ADF population of 1 per cent per annum has significant bearing on the reported unfunded liabilities, an additional projection has been included, which assumes a steady population similar to that of the 2017 Report. This projection is thus directly comparable with the projection in the 2017 Report. The difference largely reflects the changes in the demographic assumptions, principally the

increase in the assumed rates of invalidity exits for serving ADF personnel. It also reflects that GDP growth since 2017 has been lower than assumed at that time. It can also be seen that the population increase has an effect in the longer term, though it is less than that of the demographic changes.

PROJECTED UNFUNDED LIABILITIES AS A PERCENTAGE OF GDP



Scheme membership

Over the three years to 30 June 2020, the total number of serving ADF personnel covered by the schemes increased to around 60,524 individuals, approximately 600 more than in 2017. The total number of pensioner members across all schemes has increased by around 5,000, with almost 75,000 pensioners being valued for the current review. The number of MSBS members with a preserved benefit increased by approximately 6,000 over the three years from 2017 to 2020, to over 114,000. More details on the scheme membership are provided in Chapter 3.

CHAPTER 1: INTRODUCTION

1.1 The purpose of this report is to provide estimates of the long-term costs of the military defined benefit superannuation schemes. The schemes covered are the Military Superannuation and Benefits Scheme (MSBS), the Defence Force Retirement and Death Benefits Scheme (DFRDB), Defence Forces Retirement Benefits Scheme (DFRB) and ADF Cover that will be charged to the Commonwealth. The estimates are based on scheme data supplied by the Commonwealth Superannuation Corporation (the schemes' administrator) as at 30 June 2020. This report does not cover the ADF Super arrangements as they are fully funded accumulation arrangements.

1.2 This report also aids the consideration of the changes in these costs over time due to changing demographic experience. Estimates of the long-term costs of military superannuation have been provided by the Australian Government Actuary in a series of reports since the commencement of the DFRDB on 1 October 1972. The most recent estimate of the long-term costs of the military superannuation schemes was carried out using data as at 30 June 2017 and was presented in my report dated June 2018.

1.3 This report has been prepared by the Australian Government Actuary, Mr Guy Thorburn, FIAA, and members of his office, at the request of the Department of Defence.

1.4 This report has been completed in accordance with the principles recommended in the actuarial paper 'The Financing and Costing of Government Superannuation Schemes'.

1.5 Three measures of long-term costs are provided:

- Notional employer contribution rate

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

ADF Cover only provides insurance type benefits and the notional employer contribution rate represents the estimated contribution rate, on the assumptions made, that would be required to pay a notional premium for the insurance cover provided to those members in the coming year.

- Projection of employer cash costs

  This is a projection of the expected cash outlays payable annually by the Commonwealth in respect of superannuation benefits for ADF personnel, excluding the employer superannuation contributions under the ADF Super arrangements. The items included are set out in paragraph 2.23. The cost has been projected over the next 40 years in nominal dollars and expressed as a percentage of GDP.

- Net present value of unfunded liabilities

  This is the excess of the accrued Commonwealth liability for superannuation benefits in respect of service up to 30 June 2020 over the value of assets held by the schemes.

1.6 These measures of costs represent the Commonwealth's direct costs for these superannuation arrangements. If these costs are incurred by the Commonwealth, there should be some partial offsets to these costs in other Commonwealth programs through the consequential reduction in the Commonwealth's Age and Service Pension outlays. In addition, there should also be an increase in taxation receipts from the superannuation benefits being provided. I have not provided estimates of these items in this report. Such estimates would be highly uncertain, involving assumptions about future Age Pension and taxation parameters as well as the private savings and spending behaviour of scheme members.

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

ADF Super and ADF Cover

1.8 From 1 July 2016, new ADF personnel have their retirement superannuation provided under the ADF Super arrangements, where employer superannuation contributions of 16.4 per cent of Ordinary Time Earnings are paid to the

superannuation fund of the individual's choice. The default superannuation fund for new ADF personnel is ADF Super. Insurance benefits for death and invalidity are provided by the associated ADF Cover scheme.

1.9 ADF Super and alternative funds chosen by individuals are fully funded accumulation arrangements. There is no residual unfunded liability or employer risk. As this report deals with defined benefit schemes where there is residual employer risk, projections of ADF Super arrangements have not been included in this report. ADF Cover is a defined benefit scheme with no advance funding. Accordingly, projections for ADF Cover have been included in this report.

Future Fund

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

1.11 The current investment mandate for the Future Fund is to achieve a return, on average, over the long term of four to five percentage points higher than increases in the Consumer Price Index (CPI). This is higher than the interest rate assumed for this report of two and a half percentage points higher than CPI increases. Were this report to adopt an interest rate consistent with the investment mandate for the Future Fund, the estimates of the notional employer contribution rates and the unfunded liabilities would be lower than in this report. The sensitivity analysis in Appendix E can be used to gauge the impact of different economic assumptions.

Compliance with professional standards

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

CHAPTER 2: THE MILITARY SUPERANNUATION SCHEMES

2.1 Current and many former Australian Defence Force personnel, (other than Reservists who are not rendering continuous full-time service) are covered under one of four superannuation arrangements: the Defence Forces Retirement Benefits Scheme (DFRB); the Defence Force Retirement and Death Benefits Scheme (DFRDB); the Military Superannuation and Benefits Scheme (MSBS); and the combined ADF Super and ADF Cover arrangements. It is possible for individuals to have benefits in all of the DFRDB, the MSBS and the combined ADF Super and ADF Cover arrangements.

The Defence Forces Retirement Benefits Scheme

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

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

The Defence Force Retirement and Death Benefits Scheme

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

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

The Military Superannuation and Benefits Scheme

2.6 The Military Superannuation and Benefits Scheme was introduced on 1 October 1991. It was closed to new ADF personnel with effect from 1 July 2016. Former serving members with a preserved benefit can re-join MSBS on re-joining the ADF. The documents setting out the provisions of the MSBS are the *Military Superannuation and Benefits Act 1991* and the Trust Deed and Rules of the Scheme.

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

2.8 The MSBS has an ancillary section which provides fully funded accumulation benefits which arise from a number of sources. Contributions to the ancillary section include employer salary sacrifice contributions and employer Superannuation Guarantee contributions in respect of Ordinary Time Earnings (OTE) items that are not included in superannuation salary.

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

ADF Super and ADF Cover

2.10 The ADF Super and associated ADF Cover arrangements apply to new ADF personnel from 1 July 2016. The documents setting out the provisions of ADF Super are the *Defence Act 1903* and the *Australian Defence Force Superannuation Act 2015*. The documents setting out the provisions of ADF Cover are the *Australian Defence Force Cover Act 2015*.

2.11 ADF Cover is a defined benefit scheme. The Scheme has no external insurance arrangements. The Scheme is an exempt public sector superannuation scheme under the *Superannuation Industry (Supervision) Act 1993*.

Overview of Benefits

2.12 The benefits payable under the MSBS, the DFRDB, ADF Super and ADF Cover are summarised in Appendices A, B and C respectively. They can be described briefly as follows:

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

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

ADF Super and ADF Cover: ADF Super provides for the payment of employer superannuation contributions of 16.4 per cent of the individual's Ordinary Time Earnings (OTE) to the accumulation superannuation fund of their choice. ADF Cover provides separate invalidity pensions and lump sum death benefits which a surviving spouse can choose to convert into a pension.

Funding and payment of benefits

2.13 In respect of the employer provided component of the MSBS defined benefit arrangements, after-tax productivity superannuation contributions are accumulated with interest at the actual investment earning rates of the MSBS Fund. When employer provided defined benefits are first paid to a member, the accumulated productivity contributions are transferred to the Consolidated Revenue Fund (CRF) and the employer benefit is financed from the CRF on an unfunded basis. In any given year, the unfunded benefits paid from CRF will be the total amount of benefits paid less the transfers from the MSBS Fund relating to members who have exited in that year.

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

2.15 In respect of the standard member (non-ancillary) account in MSBS, member contributions are accumulated with interest at the actual investment earning 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.

2.16 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.

2.17 All benefits from ADF Cover are provided from the CRF on an unfunded basis.

2.18 Since 1 July 2008, employers with personnel in defined benefit schemes have been required to assess their SG obligations against ordinary time earnings (OTE). OTE for ADF personnel includes allowances which are not included in the schemes' definitions of superannuation salary.

2.19 In order to ensure compliance with SG obligations for DFRDB and MSBS, 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 $32 million in 2019-20 based on the applicable SG rate of 9.5 per cent.

2.20 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 of those in DFRDB and MSBS. A starting point of $32 million for 2020-21 has been used for projections of SG contributions. 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 to 1 July 2025.

2.21 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.

2.22 There are a number of other contributions made to the MSBS ancillary benefits section. Government co-contributions and low income superannuation 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 and low income superannuation contributions (for reference, these amounted to $1.2 million in 2019-20). 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.

2.23 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 (entirely unfunded) paid from the CRF

(iv) Superannuation Guarantee Contributions (OTE assessment)

Funded contributions paid to the ancillary section of the MSBS Fund

(v) ADF Cover

Benefits (entirely unfunded) paid from the CRF.

CHAPTER 3: MEMBERSHIP, DATA AND ASSETS

Data

3.1 This report is based on data supplied by the Commonwealth Superannuation Corporation (CSC) which administers the schemes. CSC 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 CSC. 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 2020)

	Number	Salaries ($m pa)
DFRDB		
Male officers	366	60
Female officers	19	3
Male other ranks	584	65
Female other ranks	18	2
Total DFRDB	**987**	**129**
MSBS		
Male officers	9,562	1,281
Female officers	2,447	311
Male other ranks	24,504	2,181
Female other ranks	4,384	373
Cadets	71	5
Total MSBS	**40,968**	**4,152**

	Number	Salaries ($m pa)
ADF Cover		
Male officers	1,559	153
Female officers	559	50
Male other ranks	11,022	737
Female other ranks	3,907	260
Cadets	1,522	81
Total ADF Cover	**18,569**	**1,281**
Total All Schemes	**60,524**	**5,562**

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

3.5 The number of MSBS contributors valued is 40,968, a decrease of around 11,400 compared to the equivalent figure of 52,371 for the 2017 Report. Data on MSBS contributors provided by the Department of Defence showed 39,716 contributing members as at the last payday of 2019-20 plus 182 non-effective members and 1,224 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 987, a decrease of around 750 compared to the equivalent figure of 1,740 for the 2017 Report. Data on DFRDB contributors provided by the Department of Defence showed 913 contributors as at the last payday of 2019-20 plus 74 members not contributing. Superannuation salary related checks did not reveal any cause for concern. In my opinion, the DFRDB contributor data valued was effectively complete.

3.7 The number of ADF Cover contributors valued is 18,569, an increase of around 12,700 compared to the equivalent figure of 5,839 for the 2017 Report. A check on ADF Super accumulation arrangement membership found 17,719 effective members and 56 non-effective members in ADF Super and 717 members who had exercised choice of fund and were not in the default fund, ADF Super. Superannuation salary related checks did not reveal any cause for concern. In my opinion, the ADF Cover contributor data valued was effectively complete.

3.8 A summary of the pensioners valued is set out below. There are also a number of children's pensions payable (refer footnote two, below).

PENSIONERS (AS AT 30 JUNE 2020)

	Number	Pensions[1] ($m pa)
DFRB		
Age pensioners	222	3
Invalid pensioners	462	10
Reversionary pensioners[2]	1,277	22
Associate pensioners[3]	0	0
Total DFRB	**1,961**	**35**
DFRDB		
Age pensioners	40,197	1,257
Invalid pensioners	2,123	98
Reversionary pensioners[2]	8,320	187
Associate pensioners[3]	776	11
Total DFRDB	**51,416**	**1,552**
MSBS		
Age pensioners	7,340	254
Invalid pensioners	12,736	622
Reversionary pensioners[2]	604	16
Associate pensioners[3]	169	2
Total MSBS	**20,849**	**894**
ADF Cover		
Invalidity pensioners	317	13
Reversionary pensioners[2]	0	0
Total ADF Cover	**317**	**13**
Total All Schemes	**74,543**	**2,495**

Note: Pension amounts may not add up to totals due to rounding.
1. The pension amounts include the July 2020 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.

3.9 The equivalent figures for pensioners as at 30 June 2017 were 14,933 MSBS pensioners with total annual pensions of $541 million, 52,347 DFRDB pensioners with total annual pensions of $1,467 million, 2,484 DFRB pensioners with total annual pensions of $42 million, and 3 pensioners for ADF Cover.

3.10 The 2019-20 CSC Annual Report has the number of MSBS pension accounts as 20,895 compared to the 20,849 pensioners valued. The corresponding figures for the DFRDB are 51,560 (including children's pensions) and for DFRB are 1,970 (including children's pensions).

3.11 Checks were also done for the DFRB, the DFRDB, MSBS and ADF Cover by comparing the pensions valued with the CSC pension payroll figures for the last

two pays of 2019-20 and the first two pays of 2020-21. The payroll figures showed payments being made to 1,970 DFRB pensioners, 51,560 DFRDB pensioners, 20,894 MSBS pensioners, and 305 ADF Cover pensioners on the first pension payday of the 2020-21 financial year. The equivalent annual pension amounts paid were $35 million for the DFRB, $1,586 million for DFRDB, $1,146 million for MSBS, and $18.0 million for ADF Cover. These numbers include children's and orphan's pensions.

3.12 Given the apparent discrepancy between the payroll check for the first pay of 2020-21 and the MSBS and ADF Cover pension data valued, the payrolls for the second pay of 2020-21 and the last pay of 2019-20 were looked at. The prior payroll and the second pay for ADF Cover had lower payroll amounts and were consistent with the ADF Cover pension data that was valued. The prior payroll for MSBS, which was the last payroll for 2019-20, was more consistent with the data that was valued. However, using the pension payroll as a check on MSBS pension data is unreliable due to significant amounts of back payments of pensions, which are particularly associated with the commencement of invalidity pensions. Taking all factors into account, this suggests that the pension data was essentially complete.

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 114,579 preserved beneficiaries valued, with total nominal preserved benefits of $12,364 million valued. At 30 June 2017, there were 108,597 preserved beneficiaries with total nominal preserved benefits of $10,146 million.

3.14 At 30 June 2020, there were 3,057 non-pensioner associate beneficiaries in the MSBS with total associate benefit amounts, both funded and unfunded, of $486 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

3.15 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 2020, the net assets of the MSBS amounted to $10,313 million. The equivalent figure as at 30 June 2017 was $8,299 million.

3.16 The net assets of the MSBS include an Operation Risk Reserve (ORR). The ORR is a requirement of the prudential regulator, the Australian Prudential

Regulation Authority (APRA). It is a provision within a scheme's assets designed to provide the funds to cover corrective actions in the event of operational failures. The ORR at 30 June 2020 was $40 million. The equivalent ORR at 30 June 2017 was $28 million.

3.17 Most of the net assets relate to member accounts and the 3% Productivity employer account. However, aside from the ORR, approximately $1,321 million relates to the fully funded ancillary accounts.

3.18 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.

3.19 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 approach adopted by the MSBS Fund for allocating investment earnings to accounts is suitable.

3.20 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 2017 Report.

4.3 Appendix E 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 numbers of serving ADF personnel by scheme valued since the 1993 review.

CONTRIBUTORY MEMBERSHIP AT LAST TEN REVIEWS

Valuation year	MSBS[1]	DFRDB	ADF Cover[2]	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
2017	52,371	1,740	5,839	59,950
2020	40,968	987	18,569	60,524

1. Excludes those in DFRDB who only have an ancillary benefit in MSBS.
2. Covered for insurance only. Retirement benefits are provided under the fully funded ADF Super accumulation arrangements.

4.5 The progress of the total contributory membership over the twenty-seven 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. This period was one where the ADF was involved with a significant overseas operation. After a fall in membership between 2011 and 2014, steady growth has resumed from 2014 to 2020.

4.6 As would be expected, DFRDB membership has fallen significantly over the last 27 years. However, it is anticipated to be around another 15 to 20 years before DFRDB contributory membership is close to zero. With the closure of MSBS to new ADF personnel with effect from 1 July 2016, the contributory membership of MSBS has started to decline.

4.7 I have assumed that the total scheme membership will increase over the long term, roughly in line with the rate of increase in population of around 1 per cent per annum. It is assumed that all new entrants will be in ADF Cover. The 2017 Report assumed that total membership would remain constant. This revised assumption results in higher projected membership compared to that which was assumed in the 2017 Report but this reflects the experience over the last 20 years more closely.

Economic assumptions

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

- the rate of future increases in those pensions and benefits which are linked to increases in the 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.

4.9 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 reported 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.

4.10 Given the long-term purpose of this report, I have adopted the following financial assumptions:

CPI increases	2.5 per cent per annum (base)
General salary increases and MTAWE increases	1.5 per cent per annum (in excess of CPI) (4.0 per cent nominal)
Interest rate	2.5 per cent per annum (in excess of CPI) (5.0 per cent nominal)

4.11 These assumptions are consistent with those adopted in my 2017 Report. Stability of assumptions is desirable to avoid introducing unnecessary volatility into the results over time. Such volatility may mask genuine underlying effects. Inevitably, some judgement is required when setting the financial assumptions.

4.12 The CPI increases assumption of 2.5 per cent per annum has been retained as it is still in the middle of the Reserve Bank of Australia's target band for average inflation over economic cycles. It is also consistent with Treasury's expectation for long term CPI inflation rates.

4.13 In Australia, historically, salary increases have averaged around 1.5 percentage points more than CPI increases. This has been the prime rationale underpinning our assumption around general salary increases.

4.14 The long-term interest rate assumption has next to no bearing on the future cash flows of the schemes. This assumption is used to determine the net present value of the liability and when calculating the Notional Employer Contribution Rate. This assumption is based on expectations of long run yields on

government debt in the light of long-term relationships between inflation, GDP growth and productivity growth.

4.15 The interest rate assumed has also been used as the rate of investment return on the funded component of members' benefits, the rate earned on MSBS funded assets and the crediting rate applicable to unfunded lump sum accumulation benefits.

4.16 A potential reference point when considering the long-term interest rate assumption is provided by considering long term expectations for nominal GDP growth. GDP growth can be considered as the combined outcome of productivity growth, employment growth and underlying inflation. Intergenerational Report projections anticipate average long term productivity growth of 1 per cent per annum, employment growth of broadly 1.5 per cent per annum (noting employment growth is expected to fall over time due to the impact of ageing and slowing population growth on the labour force) and price inflation of 2.5 per cent per annum. This suggests that an expectation for long term nominal GDP growth is in the order of 5 per cent per annum.

4.17 Current interest rates are clearly lower than this and recent volatility in CPI during the COVID-19 pandemic, suggest that this relationship does not hold at this time. Historically there have been other periods where these relationships have deviated substantially from long term averages. Given the purposes of the report and given that the report has estimates covering the next 40 years I have retained the assumptions based on long term relationships for this report.

4.18 While it has had no direct bearing on the economic assumptions I have adopted, I note that the Future Fund has a substantial body of assets. These assets are hypothecated against the unfunded liabilities of the Commonwealth superannuation schemes which include DFRB, DFRDB, MSBS and ADF Cover. The investment mandate of the Future Fund targets a long term average investment return of 4.0 to 5.0 per cent per annum in excess of the CPI.

4.19 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 D). This projection is specifically for the purpose of this report and 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.

4.20 Appendix E 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. This includes a scenario illustrating the effect of including economic assumptions about the short term informed by known short term wage increases and inflation assumptions informed by Treasury forecasts.

Experience assumptions

4.21 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 2019-20 for long enough to conduct analysis on the assumptions apart from the MSBS invalidity rates, and hence the analysis was largely based on the three-year period from 2016-17 to 2018-19.

4.22 Analysis of the data over the long term indicates that experience may differ according to scheme, gender, and the rank of the member (whether officer, officer cadet or other rank). Assumptions have been set accordingly. Details of assumptions are set out in Appendix D.

Mortality of contributors

4.23 The assumed contributor mortality rates are unchanged from those used for the 2017 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

4.24 Invalidity retirements can impose a significant cost on the MSBS and ADF Cover, particularly when they affect young members. As a result, care needs to be taken in setting invalidity assumptions. At the same time, invalidity experience in recent years has not been stable with substantial increases in the annual numbers of new MSBS invalidity pensioners.

4.25 The table below shows the number of new MSBS invalidity pensions commencing in each of the last 11 years.

NEW MSBS INVALIDITY PENSIONS COMMENCING IN THE LAST ELEVEN YEARS

Year	Invalidity A	Invalidity B	Total	Invalidity A %
2009-10	147	152	299	49%
2010-11	182	142	324	56%
2011-12	289	236	525	55%
2012-13	364	224	588	62%
2013-14	325	390	715	45%
2014-15	496	362	858	58%
2015-16	537	322	859	63%
2016-17	754	305	1,059	71%
2017-18	1,060	193	1,253	85%
2018-19	1,107	152	1,259	88%
2019-20	1,193	166	1,359	88%

4.26 I also obtained data on new invalidity pensions from the Commonwealth Superannuation Corporation (CSC) for the first nine months of the current financial year. The total number of new MSBS invalidity A and B pensioners was 1,421 of which 1,291 were invalidity A and 130 invalidity B. Commencements are seasonal and factoring this in suggests that the number of new MSBS invalidity pensions commencing in 2020-21 could be of the order of 1,900. In addition, the total number of new ADF Cover invalidity A and B pensioners for the first nine months was 247 of which 212 were invalidity A and 35 were invalidity B.

4.27 Trends noted in the 2017 Report have continued. The number of new invalidity pensions commencing each year has continued to increase. In addition, there has been an increase in the proportion of new pensions commencing that are the larger and more expensive invalidity A pensions.

4.28 This experience is very difficult to interpret from the perspective of setting assumptions and there clearly exists substantial uncertainty about the likely underlying long-term invalidity exit rates.

4.29 With the benefit of hindsight, the assumptions made for the 2017 Report were too low. My office also met with both Defence and CSC personnel to try to obtain a better understanding of the current and likely future experience. There was an acknowledgement that there had been further changes in the workplace environment which meant that there had been permanent changes in the underlying likely levels of invalidity exits.

4.30 The main factors noted in the 2017 Report appear to continue to be contributing to the experience since that report, specifically:

- A growing acknowledgment of Post-Traumatic Stress Disorder (PTSD) and other mental health conditions. CSC advised that the proportion of new invalidity pensions relating to these conditions had increased significantly.

- Defence continues to encourage individuals in the ADF to report injuries, incidents and conditions that might affect the health of the individual earlier. Consequently, it has become culturally more acceptable for individuals to claim these benefits.

4.31 A further consideration for setting assumptions is that, in any year, a number of the new invalidity pensions that commence are in respect of individuals that left the Defence Forces quite some time before the pension commenced, in some instances many years before. I term these pensions retrospective invalidities. Essentially, it is agreed that, with the benefit of hindsight, the individual should have originally exited the Defence Forces with an invalidity benefit. Where this occurs, the pension is deemed to have commenced on exit from the Defence Forces and the individual receives back payments of the pension.

4.32 These retrospective pensions have been a feature of the experience for many years, typically representing around 10 per cent of the new invalidity pensions commencing each year. Recent years have seen an increase in the numbers of new retrospective invalidity pensions, such that they now comprise around 25 per cent of the new invalidity pensions. Much of this increase is again associated with PTSD and other mental health conditions.

4.33 CSC has noticed a very sharp increase in the number of enquiries in the last few years from former ADF personnel regarding possible claiming of an invalidity pension.

4.34 There is also a view that the flow-on effect from the ending of overseas deployments is a factor in the recent experience. Individuals with an injury or condition that was acquired during deployment may have been reluctant to acknowledge its presence while involved in active deployment. However, changing attitudes towards reporting and the reduced prospect of future deployment mean the invalidity is reported retrospectively. The backdated pension data seems to support this, with definite spikes in the number of new retrospective invalidity pensions relating to exits from the ADF in the mid-2000's and early 2010's.

4.35 For this report, I have assumed that there will be a high level of new retrospective pensions in the near term, dropping off as the impact of the growing awareness wears off. Specifically, 450 new retrospective invalidity

pensions are assumed for 2020-21, and dropping by 50 every year after that until it reaches 0 in 2029-30.

4.36 In very broad terms, the 2017 Report assumed that the level of new MSBS and ADF Cover invalidity pensions commencing each year would initially be around 1,150, before trending down towards an underlying 1,000 over time as the commencement of new retrospective invalidity pensions decreased. For the current report, I assumed that the total number of new invalidity pensions for MSBS and ADF Cover will be initially around 2,150 per annum trending down towards an underlying 1,700 over time as the commencement of new retrospective invalidity pensions decreases. This change in assumptions substantially increases the estimated costs relative to the 2017 Report.

4.37 Consistent with recent experience I have assumed that proportionately more of the invalidity pensions commencing are invalidity A pensions, compared to the 2017 Report. These pensions are larger than invalidity B pensions and have a higher cost.

4.38 At the time of preparing the 2017 Report and based on relatively small experience, it appeared that the proportions married on the death of MSBS male invalidity pensioners were much lower than for other types of pensioners. If, as seemed likely, a much greater proportion of these pensions were a result of PTSD/mental health conditions where it is often difficult to maintain relationships, this would not have been a surprising outcome. The proportions assumed married were reduced and assumed to be the same as for female proportions assumed married. The experience since the 2017 Report appears to be broadly similar to that assumed for the 2017 Report and this assumption has been retained.

4.39 Based on experience, invalidity pensioner mortality rates have been slightly reduced for ages 60 to 75 and increased for ages over 80, compared to the 2017 Report.

4.40 There is little experience for ADF Cover as it has only been in operation for four years and most of those covered by ADF Cover are under age 25. Invalidity exit rates for MSBS and ADF Cover have been based on their combined experience. I have assumed the ongoing MSBS invalidity exit rates for those over age 25 will be applicable for ADF Cover.

4.41 There is considerable uncertainty about future invalidity exit rates for MSBS and ADF Cover. While I believe the assumptions adopted for the current report are not unreasonable, there is a risk that the numbers of new invalidity pensions commencing each year will continue to increase. Given this uncertainty, I have

included a scenario in the sensitivity analysis in Appendix E which allows for the ongoing level of invalidity exits rates to be 40 per cent higher than the assumed rates. This sensitivity analysis effectively assumes that initially there would be around 3,000 new invalidity pensions commencing each year trending down towards an underlying level of around 2,400 over time.

4.42 As with the 2017 Report, I 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 a little higher than those expected. The invalidity exit rate assumptions do not have a material impact on projected costs for DFRDB and the same uniform invalidity A exit rate used for the 2017 Report has been assumed for both officers and other ranks and for all ages.

4.43 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.

4.44 Historically, the invalidity rates for the MSBS have been higher than the comparable DFRDB rates and this remains very much 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. However, it would appear likely that there are other factors in play which are not obvious.

Resignation

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

4.46 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, all contributory DFRDB members now have the 20 years of service needed to qualify for a pension benefit on resignation.

4.47 Given the relatively low number of contributors remaining for DFRDB, the officer and other rank resignation rates adopted for the 2017 Report were retained.

4.48 Exit rates for MSBS other ranks were similar to those assumed in the 2017 Report except for those with more than 20 years of service, where they were a little lower, reflecting observed experience. The differences between male and female experience were not found to be significant enough to justify setting separate assumptions. As such, exit rates for MSBS other ranks have been adopted which apply to both genders.

4.49 Exit rates for MSBS officers were lower than expected in the 2017 Report but exhibited a broadly similar pattern. The rates for the current report were generally reduced to reflect the observed experience. As with the other ranks, the differences between male and female experience were not found to be significant enough to justify setting separate assumptions. As such, exit rates for MSBS officers have been adopted which apply to both genders.

Retirement

4.50 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. In the 2011 Report, it was 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 the somewhat arbitrary assumption that the exits of those still in service at age 55 would be evenly spread over the period to age 60 was adopted. Individuals over age 60 at the valuation date were assumed to immediately retire. The experience since then does not appear to be inconsistent with the assumptions adopted for the 2011 Report and these assumptions have been retained.

Retrenchment and redundancy

4.51 No allowance has been made for the effect of retrenchments and redundancies as their occurrence is unpredictable and impossible to model with any confidence. Past experience indicates that exit by this means from the ADF is uncommon. Generally, the effect of retrenchments and redundancies is to advance outlays.

New entrants

4.52 With the closure of MSBS to new ADF personnel with effect from 1 July 2016, there are only a few former MSBS contributors who were MSBS preserved

members re-joining MSBS at the current time. These numbers are small enough to be ignored for valuation purposes and it is assumed that there will be no further new contributor members of MSBS.

4.53 For ADF cover projections, it is necessary to model new ADF personnel. The size of the total membership covered by DFRDB, MSBS and ADF Cover is assumed to increase broadly in line with long term population growth, i.e. 1 per cent per annum. All resulting new entrants are assumed to join ADF Cover.

4.54 For modelling the future ADF Cover population, I have used the MSBS new entrant distribution assumptions and the MSBS promotional increases from the 2017 Report updated for salary increases over the period.

Promotional increases in salaries

4.55 For other ranks in both MSBS and DFRDB, promotional increases appear to be related to period of service. The promotional increases adopted for the 2017 Report do not appear inconsistent with the observed experience and they have been retained for the current report.

4.56 For MSBS cadets and officers, promotional increases appear to be related to both period of service and the age at joining. The level of promotional increases observed was not dissimilar to the 2017 Report and the promotional increases assumed have been retained for the current report.

Mortality of pensioners

4.57 The combined experience of DFRB, DFRDB and MSBS has been used to set the assumptions.

4.58 The numbers of deaths of age and reversionary pensioners (that is, pensioners other than invalid pensioners) were generally close to what was expected based on the assumptions adopted in the 2017 Report after allowing for mortality improvement at the assumed rates over the intervening period.

4.59 For male retirements, the rates were largely consistent with the 2017 assumptions (after allowing for mortality improvement) with two exceptions. The rates in this report were slightly reduced for the younger ages (50 to 70) and increased for the older ages (85 plus) compared to the rates used for the 2017 Report. Overall, the rates adopted for males are around the same or a little less than the mortality rates for the general population, except for very advanced ages, where they were higher.

4.60 For spouse females (widows), the rates were slightly lower at ages 75 and less than the assumptions used in the 2017 Report (after allowing for mortality improvement).

4.61 For female retirements, the rates were not noticeably different to those for spouse females (widows). This experience was quite different to that underpinning the 2017 Report assumptions where it appeared that female retirements has significantly lower mortality rates than female spouse pensioners. Given this experience, I have decided to return to having a single assumption for age retirement females and spouse females.

4.62 As noted in the invalidity exit assumptions discussion, the rates of mortality for invalidity pensioners have been reduced in line with the changing experience at younger ages and increased for the same reason at older ages.

4.63 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. While a slight selection effect has been observed, it has been coming from those who have taken their pension 10 to 15 years ago. 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, and that proportion has continued to increase. This suggests that the impact on future MSBS pensioner mortality rates due to MSBS retirees selecting a full lump sum is likely to be small. Thus, for the time being, the same assumptions are used across all schemes.

4.64 Allowances for future improvements in mortality rates of age and reversionary pensioners have been made in accordance with the trend in improvements shown in the series of Australian Life Tables published over a period of 40 years to 2015-17. For the 2017 Report, the rates were based on the trend in improvements over a period of 40 years to 2000-02. No allowance was made for improvement in the mortality of invalidity pensioners.

Retirements of preserved beneficiaries in the MSBS

4.65 All Long Term Cost Reports covering the MSBS from 1993 to 2014 assumed that all preserved benefits in the MSBS would be taken when first eligible, i.e. at age 55 or immediately if the individual was already over age 55. This approach was initially taken because there was little experience to analyse and the

approach was conservative (i.e. the reported costs of the MSBS would be slightly higher). Apart from the allowance for new retrospective invalidity pensions noted earlier in this Report, no further allowance has been made for death and invalidity of preserved beneficiaries prior to retirement in this Report.

4.66 For the 2017 Report, it was found that most members exiting over the period from 1 July 2014 to 30 June 2017 took their benefits at ages 55 and 56, but there was a tail of members taking their benefits for many years after that. It was then decided to create a table of retirement rates for current preserved members from ages 55 to 65, with most of the exits being at ages 55 and 56. Serving members who were projected to exit with a preserved benefit were still assumed to retire at age 55.

4.67 For this report, the analysis has been further updated which indicated that, compared to the assumptions in the 2017 Report, retirement rates were lower at ages 55 and 56 and higher at 60 and 64. The rates assumed have been updated to reflect this experience. All members remaining at age 65 are assumed to retire then.

4.68 For current serving members who exit with a preserved benefit entitlement, the same retirement rates as are used for current preserved members have been assumed. This is a change from the 2017 Report when it was assumed that these individuals would retire at age 55.

Proportions married and age differences

4.69 There was no evidence to suggest that the assumptions on age differences between spouses should be altered from those adopted in the 2017 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.

4.70 The data on the proportions married suggested that the assumptions for males at higher ages should be slightly reduced relative to those adopted for the 2017 Report and this has been done.

4.71 As noted in the discussion around invalidity exits above, there is clear evidence that the proportions married on death for MSBS male invalidity pensioners are much lower than for other pensioners. However, there is insufficient experience on which to base detailed assumptions. For this report, I have again used the assumed female proportions married as the assumed proportions married for MSBS male invalidity pensioners to reflect the lower average proportions married on death.

Children Pensions

4.72 For the military schemes, an allowance for pensions for children and orphans is made in the valuation via an adjustment to the spouse pension valuation. The allowances for pensions for children and orphans have been updated for this report based on recent experience. For the 2017 Report, the same allowances were used for DFRDB, MSBS and ADF Cover. There was no allowance made for pensions for children and orphans for DFRB. The ageing of the DFRDB. membership makes it less likely that pensions for children and orphans will be payable compared to the younger membership of MSBS and ADF Cover. Separate assumptions have been made for DFRDB in this Report.

4.73 For DFRDB contributors, the retirement reversionary spouse loading was reduced from 2.0 per cent to 0.5 per cent, the invalidity reversionary spouse loading was reduced from 5.0 per cent to 2.0 per cent, and the spouse death in service loading was reduced from 10.0 per cent to 5.0 per cent.

4.74 For DFRDB pensions in the course of payment, the retirement reversionary spouse loading was reduced from 2.0 per cent to zero, the invalidity reversionary spouse loading was reduced from 5.0 per cent to 2.0 per cent, and the spouse pension in payment loading was reduced from 2.0 per cent to 1.0 per cent.

4.75 For MSBS contributors and ADF personnel in ADF Cover, the retirement reversionary spouse loading was reduced from 2.0 per cent to 1.0 per cent, the invalidity reversionary spouse loading was increased from 5.0 per cent to 7.5 per cent, and the spouse death in service loading was unchanged at 10.0 per cent.

4.76 For MSBS and ADF Cover pensions in payment, the retirement reversionary spouse loading was reduced from 2.0 per cent to zero, the invalidity reversionary spouse loading was unchanged at 5.0 per cent, and the spouse pension in payment loading was effectively reduced from 10.0 per cent to 7.5 per cent.

4.77 For MSBS preserved members, the retirement reversionary spouse loading was reduced from 2.0 per cent to 1.0 per cent.

4.78 As DFRB only covers those who were in receipt of a pension in 1973 and their surviving spouses, most pensioners are of advanced ages and it is unlikely that many pensions would be payable in respect of children and orphans. Accordingly, no allowance has been made for pensions for children and orphans in the valuation of DFRB.

Pension option in the MSBS

4.79 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 an impact on the reported costs of the MSBS as the actuarial value of the pension is significantly greater than the value of the lump sum given up.

4.80 The analysis of the experience over many Long Term Cost Reports indicates a trend towards an increased take up of the pension option. This trend was again evident in the inter valuation experience for this report compared to the equivalent experience for the 2017 Report.

4.81 An analysis was also done of pension take up rates by size of the employer accounts. This found that pension take up rates varied by the size of the employer account with those with larger employer accounts much more likely to take up the pension option. Those with small employer accounts, typically under $50,000, were more likely to take the benefit as a lump sum. It also found that officers were more likely to take up the pension option compared to other ranks where both had similar sized employer accounts.

4.82 In setting assumptions for this report, both the experience since the 2017 Report and the trend towards increased take up rates of the pension option seen over time have been factored in.

4.83 For those that retired directly from service, there were very high take-up rates of the pension option. This should not be a surprise as these individuals are likely to have a significant length of service and have a sizeable lump sum member account that would also be payable. The lump sum member account would provide readily accessible funds in retirement, meaning that the lack of flexibility and accessibility with the pension would not be perceived as a drawback. The take-up rates for officers were again higher than the take-up rates for other ranks. Based on the experience, I have assumed a 100 per cent pension take-up rate for direct retirements for officers and 95 per cent for other ranks. The equivalent assumptions for the 2017 Report were that there would be a 95 per cent pension take-up rate for direct retirements for officers and 85 per cent for other ranks.

4.84 For current preserved member retirements, I have assumed a pension take-up rate of 90 per cent for officers and 85 per cent for other ranks. This reflects the lower average size of employer accounts of these members relative to direct retirements from the ADF. The equivalent assumptions for the 2017 Report were

that there would be an 85 per cent pension take-up rate for officers and 65 per cent for other ranks.

4.85 For those current serving members who are projected to exit with a preserved benefit and then retire sometime later, I have assumed the same pension take up rates as for current preserved members. The assumed pension take-up rates are 90 per cent for officers and 85 per cent for other ranks. The equivalent assumptions for the 2017 Report were that there would be an 90 per cent pension take-up rate for officers and 80 per cent for other ranks.

4.86 Where a member dies in service, a surviving spouse may choose to take all or part of the employer account benefit in pension form. It had been assumed that pension take-up rates are 90 per cent for spouses of officers and 85 per cent for spouses of other ranks.

Commutation option in the DFRDB

4.87 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 most members choose to take the maximum allowable lump sum. The conversion factors generally provide for a lump sum which is greater than the actuarial value of the forgone pension at most ages. Accordingly, it has been assumed that all retiring members commute their pension to the maximum extent permissible.

MSBS Associate accounts

4.88 Following a Family Law superannuation split for a non-pensioner member of the DFRDB or the MSBS, associate accounts are set up for the non-member spouse in the MSBS. The benefit provided for the non-member spouse is an accumulation lump sum that is payable on the non-member spouse satisfying a release provision under the *Superannuation Industry (Supervision) Act 1993*.

4.89 A non-member spouse can have two associate accounts. The Associate A account is a fully funded accumulation account. As it is fully funded, there are no unfunded cash flows or liabilities associated with this account. The Associate B account is an unfunded accumulation account. Interest is added to this account at a rate derived from the yields on Commonwealth bonds. For projection purposes, it is assumed that the yield on Commonwealth bonds will be 5 per cent per annum. To derive the cash expenditure for these accounts, it is assumed that the account will be paid out when the non-member spouse attains age 60 or be paid out immediately if the non-member spouse were over age 60 at 30 June 2020.

ADF Cover

4.90 At 30 June 2020, ADF Cover had only been in place for 4 years. Around 90 per cent of individuals covered by ADF Cover at 30 June 2020 are under age 30. Consequently, there is insufficient experience to fully analyse the scheme, particularly at older ages.

4.91 The key assumptions affecting costs for ADF Cover are the invalidity exit rates. In the absence of other information, the MSBS experience is likely to provide the best guide for the likely future invalidity exit experience of ADF Cover. Generally, other assumptions for MSBS are also used for ADF Cover.

4.92 There are reasons that invalidity exit rates may be lower for ADF Cover than MSBS. The main reason is that with the decline in the operational tempo for the ADF, fewer personnel will be involved in overseas missions compared to the past. This should result in lower invalidity rates for those under ADF Cover due to less exposure to the risk of accidents and injuries, and less exposure to situations that might result in PTSD/mental health conditions. However, it is very difficult to quantify what difference there will be in invalidity exit rates between the two arrangements. Inevitably some judgement is required.

4.93 To examine this possibility further, crude analysis was performed on ADF Cover invalidity rates. Given the limitations of the data and the underlying uncertainties around the MSBS invalidity exit rates themselves, I have adopted the MSBS invalidity exit assumptions for ADF cover for ages above 30, and blended it with the ADF Cover experience for younger ages, where ADF Cover had the most experience.

4.94 There is a feature of practice around medical discharges and invalidities that needs to be factored into the projected costs for ADF Cover. When an individual has an incident or injury that might lead to a medical discharge, that medical discharge normally does not happen immediately after the incident. In most instances, Defence retains that individual in the ADF aiming to manage the individual's condition with the intention of rehabilitating the individual so that they can continue to serve. If it subsequently becomes clear that the individual can no longer continue in the ADF, the individual is medically discharged. This means that it is often 12 to 24 months between the date of the incident or injury and the date of discharge when an invalidity pension might be payable.

4.95 ADF Cover is a new arrangement where the number of individuals being covered by the insurance benefits is growing rapidly. If the MSBS invalidity exit rates were used unadjusted for ADF Cover, it would result in an overstatement of cash outlays, particularly in the short term. To allow for current Defence

practice with medical discharges, it has been assumed that of all incidents and injuries that eventually result in an invalidity pension in a particular year, 50 per cent exit in that year, 30 per cent exit in the following year and the remaining 20 per cent exit two years after. In the previous report, where there was very limited experience, these percentages were 20 per cent, 50 per cent and 30 per cent respectively.

4.96 The assumed mortality rates for serving ADF personnel are those used for the other schemes which are unchanged from those used for the 2017 Report. The spouse pension take-up rates where a death benefit is payable are the same as for MSBS.

4.97 The serving ADF personnel population covered by the insurance arrangements needs to be projected. The demographic assumptions used are those for MSBS. The new entrant assumptions used are generally those used for MSBS in the 2017 Report updated for the general salary increases over the period from 2017 to 2020.

Changes to future Superannuation Guarantee Contribution Rates

4.98 The current SG rate of 9.5 per cent is legislated to increase to 12 per cent over the period from 1 July 2021 to 1 July 2025. The cashflow projections in the current report have taken this into account.

Taxation

4.99 The DFRDB, DFRB and ADF Cover are entirely unfunded. They are untaxed schemes and hence no tax is levied on the schemes. The current valuation for the DFRDB 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. For the purposes of the valuation, the interest rate credited is assumed to be the same as the valuation interest rate, that is, 2.5 per cent per annum in excess of the CPI assumption.

4.100 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, 2.5 per cent per annum in excess of the CPI assumption.

Superannuation surcharge

4.101 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 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

4.102 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 $250,000 and imposes an additional 15 per cent tax on the employer's notional superannuation contributions for the individual (or the component thereof which results in the income for Division 293 purposes exceeding $250,000 if less).

4.103 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.

4.104 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

4.105 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. It should be noted that there were special hardship release provisions in place for 2019-20 and 2020-21 due to COVID-19. Releases made in 2019-20 have not had a material impact.

Conflict situations

4.106 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 for DFRDB and MSBS 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 for MSBS are accrued either on a pro rata basis over service to exit or attaining MBL, if earlier.

5.2 ADF Cover only provides insurance type benefits. The notional employer contribution rate for ADF Cover has also been calculated 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 pay a notional premium for the insurance cover provided to those covered at 30 June 2020 for the coming year.

5.3 The table below shows the notional employer contribution rates for the schemes. These rates include the 3 per cent productivity contributions for the MSBS and DFRDB, 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 that are paid to the ancillary section of the MSBS Fund amounted to around $32 million in 2019-20. This equates to around 0.8 per cent of superannuation salary across the membership of both schemes. The DFRB scheme has no serving ADF personnel members and hence has no notional employer contribution rate. For comparison, the rates from the 2017 Report are also shown.

NOTIONAL EMPLOYER CONTRIBUTION RATES AS A PERCENTAGE OF SUPERANNUATION SALARY

	MSBS (%)	DFRDB (%)	ADF Cover (%)
2017 Report	52.0	43.0	21.6
Current Report	53.7	41.8	54.6

5.4 Compared to the 2017 Report, the most significant increase in the notional employer contribution rate is for ADF Cover. This is primarily attributable to the significant increase in the level of expected invalidity benefits payable. As noted in the assumptions section, the overall level of invalidity exits assumed across the whole ADF that result in a new invalidity pension has been increased by around 70 per cent for this Report and this accounts for the majority of the increase in reported costs. The assumptions made in this Report also assume a higher proportion of the more expensive invalidity A pensions compared to the 2017 Report. Furthermore, the assumptions made for this Report assume a higher weighting towards exits at a younger age with associated higher costs compared to the 2017 Report.

5.5 As noted earlier in this Report, there is a different approach for calculating the notional employer contribution rate for ADF cover. The notional employer contribution rate is a notional insurance premium for the relevant population covered for the coming year.

5.6 In the 2017 Report I foreshadowed a likely increase in the reported contribution rate for ADF Cover on the assumptions then made, from 22 per cent of the relevant salaries to 30 per cent, as the scheme's age profile matured. If the revised assumptions used in this report are borne out in practice, the reported contribution rate would be expected to remain at similar levels to the current reported rate.

5.7 The MSBS is closed to new entrants. The notional employer contribution rate is similar to that disclosed in the 2017 Report. This would appear to be a surprising outcome given the size of the increases to the invalidity assumptions which would have been expected to result in a significant increase in the Notional Employer Contribution Rate. This would have been the outcome had the MSBS not been closed to new members in 2016.

5.8 The reason behind the relatively small increase in costs is mainly to do with the accrual methodology used.

5.9 The accrual methodology assumes that invalidity benefits are accrued uniformly over the period to date of exit. For instance, if a member is projected to exit after 7 years of service and currently has 5 years of service 5/7ths of the benefit is

assumed to have been accrued at the valuation date and the remaining 2/7ths will be accrued after the valuation date. The part of the benefit that accrues over the next three years is included in the calculation of the Notional Employer Contribution Rate. In this instance, it would be the remaining 2/7ths of the benefit. As MSBS is now closed to new ADF personnel, there are now no remaining members that can exit through invalidity with very short periods of service. The cost of the invalidity pension for these individuals would be high, with the invalidity impact on the Notional Employer Contribution Rate also being high. The closure of MSBS to new ADF personnel means that these high cost short serving invalidity exits are no longer included in the calculation of the MSBS Notional Employer Contribution Rate. Consequently, the impact of increased invalidity assumptions on the MSBS Notional Employer Contribution Rate is not as significant as it is for ADF Cover. More generally, the accrual methodology used would be expected to result in the reported Notional Employer Contribution Rate for MSBS gradually declining over time.

5.10 The DFRDB is also closed to new entrants. The small reduction in the DFRDB notional employer contribution rate is almost entirely attributable to minor changes in the demographic assumptions and the ageing of the population covered by this scheme.

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

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 then for each of the years since 2013-14 for the DFRB, DFRDB, the MSBS, ADF Cover and the four schemes combined. Prior to 2010-11, DFRB outlays are included in DFRDB outlays. It also shows projected outlays for the next eight years and then every fifth year from 2029-30.

ACTUAL AND PROJECTED COMMONWEALTH OUTLAYS[1]

Year	DFRB[2] ($m)	DFRDB ($m)	MSBS ($m)	SG contributions ($m)	ADF Cover ($m)	Total ($m)	As a percentage of GDP
Actual[3]							
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
2010-11[4]	65	1,423	386	44		1,918	0.13
2013-14	53	1,455	505	28		2,041	0.13
2014-15	50	1,504	571	33		2,158	0.13
2015-16	47	1,514	642	39	-	2,243	0.14
2016-17	46	1,549	712	39	0	2,346	0.13
2017-18	41	1,575	775	37	2	2,430	0.13
2018-19	41	1,621	897	34	6	2,599	0.13
2019-20	38	1,619	1,065	32	13	2,767	0.14
Projected							
2020-21	34	1,657	1,219	31	32	2,973	0.14
2021-22[5]	34	1,747	1,414	30	64	3,289	0.15
2022-23	31	1,721	1,516	29	98	3,394	0.15
2023-24	30	1,752	1,667	28	146	3,622	0.15
2024-25	28	1,785	1,821	26	205	3,865	0.16
2025-26	27	1,817	1,977	25	276	4,122	0.16
2026-27	25	1,847	2,141	24	360	4,397	0.16
2027-28	24	1,876	2,309	23	456	4,688	0.16
2029-30	22	1,929	2,658	21	690	5,319	0.17
2034-35	16	2,010	3,779	16	1,552	7,373	0.18
2039-40	11	2,020	5,046	11	2,896	9,983	0.19
2044-45	6	1,904	6,418	5	4,854	13,186	0.19
2049-50	3	1,648	7,788	1	7,585	17,025	0.19
2054-55	1	1,272	8,839	0	11,238	21,350	0.19
2059-60	0	836	9,209	-	15,863	25,908	0.19

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

1. These figures have **not** been adjusted to 2020 dollars and do not include cash outlays relating to ADF Super accumulation arrangements.
2. Prior to 2010-11, DFRB outlays are included in the DFRDB figures.
3. The figures up to 2019-20 reflect the actual expenditure in those years.
4. 2010-11 was a 27 pension pay day year and hence had higher expenditure than normal.
5. 2021-22 is a 27 pension pay day year and hence has higher projected expenditure than normal.

6.2 DFRB outlays are rapidly declining both in nominal dollar and GDP terms. DFRDB outlays are increasing slowly in nominal dollar terms but are declining in GDP terms. This is not surprising as there are few serving ADF personnel left in DFRDB and the deaths of pensioners reduces the expenditure in GDP terms. MSBS outlays are still increasing in both nominal dollar and GDP terms. Most members of MSBS are still under age 55 and generally not entitled to receive benefits until sometime in the future. ADF Cover is a new scheme and will provide insurance type benefits to new ADF personnel. Its outlays will increase over time as the number of ADF personnel covered grows.

6.3 Actual outlays, in nominal terms, across 2017-18 to 2019-20 were similar to those projected in the 2017 Report. In GDP terms, the outlays were similar to those projected in the 2017 Report.

6.4 Projected DFRDB outlays are a little lower in nominal dollar terms than those projected in the 2017 Report. This is primarily due to pension increases over the three years to 30 June 2020 being lower than those assumed for the 2017 Report.

6.5 Projected MSBS outlays are higher in nominal dollar terms than those projected in the 2017 Report. This is primarily due to the impact of assuming much higher invalidity exit rates compared to those assumed for the 2017 Report.

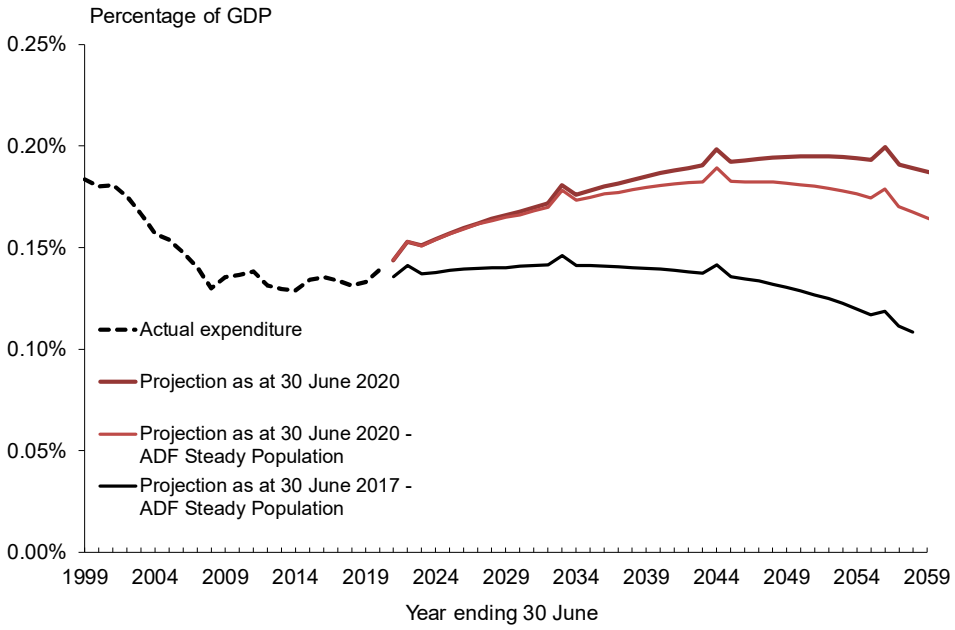
6.6 Projected ADF Cover outlays are substantially higher in nominal dollar terms than those projected in the 2017 Report. This is primarily a combination of two factors. The main factor in play is the impact of assuming much higher invalidity exit rates compared to those assumed for the 2017 Report. Further, assuming that total ADF personnel numbers would grow by 1 per cent per annum rather than there being zero growth has had a lesser, but still significant, impact on projected outlays.

6.7 The chart below shows total projected outlays as a percentage of GDP over the next 40 years. The projection as at June 2020 is higher than the projection as at June 2017. The chart also illustrates the impact of assuming growth in the number of serving ADF personnel.

6.8 A further factor behind the increase in cash outlays expressed as a percentage of GDP was that over the three years to 2020, growth in nominal GDP was lower

than projected in the 2017 Report. Most of this difference can be seen in the 2019-20 financial year. This is most likely due to the impact of COVID-19 on the economy in the first half of 2020. In addition, the projections incorporate lower levels of future GDP increases relative to the 2017 Report.

ACTUAL AND PROJECTED COMMONWEALTH OUTLAYS AS A PERCENTAGE OF GDP



6.9 Overall, the projected outlays for the next 40 years, both in nominal terms and as a percentage of GDP, are much higher than the projections from the 2017 Report.

CHAPTER 7: UNFUNDED LIABILITIES

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

7.2 The assets attributable to the fully funded ancillary section of MSBS and the associated accumulation benefit liabilities are excluded from this calculation.

7.3 The net present value of unfunded liabilities was calculated to be $98.9 billion as at 30 June 2020. This is 5.0 per cent of GDP. The net present value of unfunded liabilities reported as at 30 June 2017 was $83.1 billion or 4.7 per cent of GDP.

7.4 The 2017 Report projected that unfunded liabilities would be $96.0 billion as at 30 June 2020, or 4.6 per cent of GDP. Liabilities are therefore higher than was projected at the last report in both dollar and GDP terms. The key driver of this outcome has been the larger than expected number of commencements of new MSBS invalidity pensioners over the last three years and the accompanying changes to the assumptions regarding future commencements of MSBS invalidity pensions. This has added around $7 billion to the unfunded liability which is equivalent to around 0.3 per cent of GDP.

7.5 Had the assumptions used for the 2017 Report been retained for this report, the unfunded liabilities would have been $93.0 billion. The shortfall, relative to that projected in the 2017 Report, is largely due to actual rates of salary increases, CPI increase and the rates of pension increases for those in DFRDB for those aged 55 or more being lower than the long term assumptions in the 2017 Report. The impact of these lower rates of increases was offset to some extent by the higher numbers of new invalidity pension commencements in MSBS compared to those assumed in the 2017 Report.

7.6 The unfunded liability for the DFRB is $0.3 billion, for the DFRDB is $32.2 billion, for the MSBS is $65.6 billion and for ADF Cover is $0.8 billion. These figures are lower than the estimates used for the Financial Statements for the Department of Defence as at 30 June 2020 of $0.5 billion for the DFRB, of $51.6 billion for the

DFRDB, of $134.5 billion for MSBS and $1.6 billion for ADF Cover. The major reason for this is the interest rates which are required to be used under the relevant accounting standard, AASB 119, to value the liabilities for Financial Statement purposes. The nominal interest rates used for AASB 119 reporting were 1.7 per cent per annum for MSBS, DFRDB and ADF Cover, and 1.0 per cent per annum for DFRB compared with the nominal 5 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. Likewise, the premium liability for ADF Cover includes those who are expected to commence an invalidity pension in the near future due to an accident that occurred prior to 1 July 2020.

7.7 A breakdown of the unfunded liabilities between contributors, pensioners, preserved members and non-pension associate members by scheme is shown in the following table. The pension liability for MSBS includes the allowance for future retrospective invalidity pensions.

ESTIMATE OF UNFUNDED LIABILITIES AS AT 30 JUNE 2020

Category of members	DFRB ($b)	DFRDB ($b)	MSBS ($b)	ADF Cover ($b)
Contributors	-	2.1	28.1	-
Pensioners	0.3	30.1	24.6	0.8
Preserved members	-	-	12.5	-
Non-pension associate members	-	-	0.4	-
Total	**0.3**	**32.2**	**65.6**	**0.8**

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

7.8 The table below shows the projected unfunded liability for the DFRB, the DFRDB, the MSBS, and ADF Cover and for the four schemes combined. The projections are in nominal dollars and have not been adjusted to 2020 dollars. To enable a proper comparison of the projected liabilities with the position in 2020, projections of the combined unfunded liability as a percentage of GDP are also shown.

PROJECTED UNFUNDED LIABILITIES [1]

Year ending 30 June	DFRB ($b)	DFRDB ($b)	MSBS ($b)	ADF Cover ($b)	Total[2] ($b)	As a % of GDP
2020	0.3	32.2	65.6	0.8	98.9	5.0
2021	0.3	32.2	69.9	1.6	104.0	5.0
2022	0.3	32.0	74.1	2.7	109.1	5.1
2023	0.3	31.9	78.2	4.0	114.4	5.1
2024	0.3	31.7	82.3	5.7	120.0	5.1
2025	0.2	31.5	86.3	7.7	125.7	5.1
2030	0.2	29.7	105.3	22.6	157.8	5.0
2035	0.1	26.6	121.7	46.6	195.0	4.7
2040	0.1	22.5	134.2	81.1	237.9	4.4
2045	0.0	17.5	140.6	127.4	285.5	4.2
2050	0.0	12.3	139.4	187.8	339.5	3.9
2055	0.0	7.6	130.2	264.2	401.9	3.6
2060	0.0	3.8	114.1	359.3	477.3	3.4

1. These figures have **not** been adjusted to 2020 dollars.
2. Totals may differ from the sum of DFRB, DFRDB, MSBS and ADF Cover due to rounding.

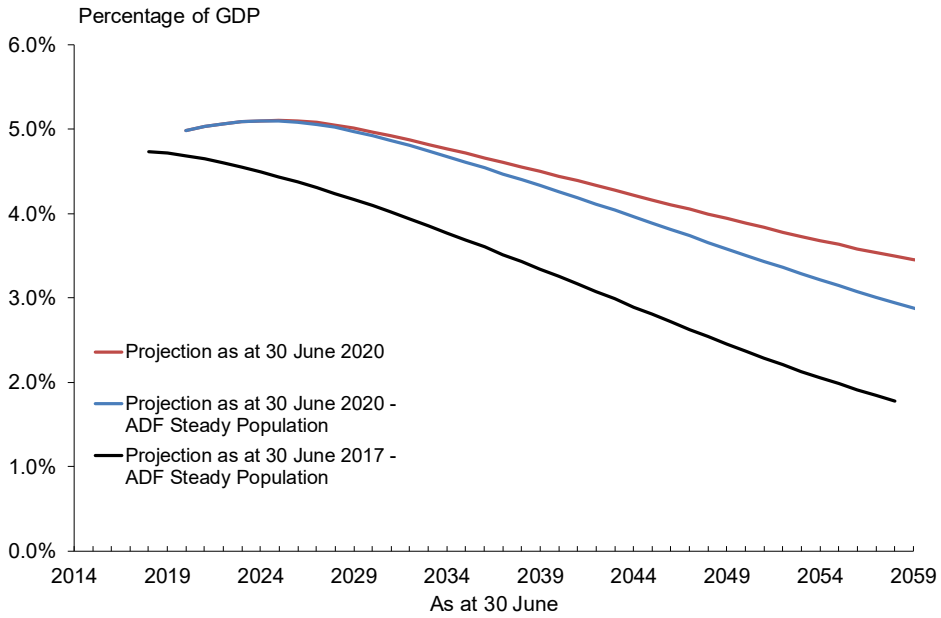
7.9 The chart below shows the projected unfunded liabilities as a percentage of GDP together with the equivalent projection from the 2017 Report.

7.10 As the inclusion of a growth rate in the ADF population of 1 per cent per annum has a significant bearing on the reported unfunded liabilities, an additional projection has been included. This additional projection that assumes a steady ADF personnel population so as to be comparable with the projection in the 2017 Report.

7.11 The difference between this projection and that in the 2017 Report largely reflects the changes in the demographic assumptions, principally the increase in the assumed rates of invalidity exits for serving ADF personnel in MSBS and ADF Cover, as well as the increased allowance for MSBS retrospective invalidities. However, the impact of lower GDP growth than that which was assumed for the 2017 Report is also a factor.

7.12 It can also be seen that the projection that incorporates a population increase in ADF personnel numbers similar to population growth has an effect in the longer term, though it is less than that of the demographic changes made for this report.

PROJECTED UNFUNDED LIABILITIES AS A PERCENTAGE OF GDP



7.13 Over the longer term, the main feature of the projection is the steady fall in unfunded liabilities relative to GDP with the liabilities at the end of the period being around 70 per cent of their current level relative to GDP. Given this, 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.

7.14 Relative to the 2017 Report, the projected unfunded liabilities as a proportion of GDP are noticeably higher. This is primarily due to the higher MSBS invalidity exit rates assumed, which have also been used for ADF Cover. The inclusion of a growing ADF population also has a clear influence. Lower GDP growth is also a contributing factor.

AASB 119

7.15 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 Government bond rates 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.

7.16 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 relative value of the reported unfunded liabilities under AASB 119.

7.17 Under AASB 119, the interest rate is set separately for each scheme. The interest rate is based on the relevant Commonwealth bond whose mean discounted term approximates the mean discounted term of the liabilities. The table below sets out the interest rates used as at 30 June 2020. As would be expected given the low interest rates used for AASB 119 as at 30 June 2020, the reported unfunded liabilities in the Department of Defence financial statements were much higher than those given in this report.

Scheme	Interest rate (per cent per annum)
ADF Cover	1.7
MSBS	1.7
DFRDB	1.7
DFRB	1.0

AASB 1056

7.18 Since the 2016-17 financial year, CSC has been required to comply with Australian Accounting Standard AASB 1056 Superannuation Entities when reporting on superannuation obligations in its financial statements for MSBS. AASB 1056 Superannuation Entities replaced AAS 25 Financial Reporting by Superannuation Plans.

7.19 The previous AAS 25 Standard only required the MSBS to include the value of the vested benefits in the financial statements. The new AASB 1056, in addition requires the inclusion of an accrued liability figure in the financial statements. The accrued liability is the combined liability for accrued funded and unfunded components of benefits.

7.20 The assumptions for AASB 1056 are set by CSC. One of the key assumptions in the accrued benefit calculations is the expected return on a portfolio of assets. CSC's current investment objective for the default balanced investment option is a return of 6.0 per cent per annum relative to assumed CPI increases of 2.5 per cent per annum.

7.21 For the accrued liability as at 30 June 2020, CSC set the economic assumptions as investment returns of 6.0 per cent per annum; general salary increases of 4.0

per cent per annum; and CPI increases of 2.5 per cent per annum. The demographic assumptions used were those from the 2017 Long Term Cost Report.

7.22 The accrued liability reported for MSBS at 30 June 2020 was $57.8 billion of which $10.3 billion was the funded component and $47.5 billion was the unfunded component. The unfunded component is less than the unfunded liability for MSBS included in this report of $65.6 billion. The main reason for the difference is the difference in assumed fund earnings rate/interest rate used to discount future cash flows with the rate for AASB 1056 purposes being one percentage point higher, which leads to a lower liability. Another significant reason for the difference is the changes made to the demographic assumptions for this report, particularly the higher assumed rates of commencements of new invalidity pensions which have increased the unfunded liability.

Guy Thorburn FIAA
Australian Government Actuary

11 June 2021

APPENDIX A

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

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

Membership

Membership of the Scheme is closed to new ADF personnel with effect from 1 July 2016.

Definitions

Salary: Salary is actual salary including higher duties allowance, service allowance, and some qualifications and skills allowances.

Final average salary: Average annual salary received over the last three years prior to termination of service.

Accrual rates: The accrual rate is variable and calculated on a daily basis. The rate is 18 per cent for each of the years of service 0 to 7, 23 per cent for each of the years 8 to 20 and 28 per cent for year 21 and each year thereafter.

Total accrued multiple: The sum of the accrual rates for the total period of service.

Member contributions

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

Scheme structure

Member component This consists of the member contributions paid into the MSBS together with accumulated earnings on the contributions.

Employer component This consists of a defined benefit equal to:

Total accrued multiple x Final average salary

3 per cent benefit This consists of employer contributions of 3 per cent of salary less 15 per cent employer contribution tax together with accumulated earnings.

The 3 per cent benefit forms part of the employer component.

Retirement benefits (on or after age 55)

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

Member component + Employer component

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

Resignation benefit (before age 55)

On resignation, the member would be entitled to:

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

The Preserved Employer Benefit is payable from 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:

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

Invalidity B benefit

A benefit equal to:

- an immediate lump sum of the member component; plus

- a pension equal to the better of:

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

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

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:

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

If the pension option is taken and there are dependent children, an 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 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 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 Defence Force Retirement and Death Benefits Scheme (DFRDB)

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

Membership

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

Definitions

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

Member contributions

Member contributions are 5.5 per cent of salary.

Retirement pay (pension)

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

RETIREMENT PAY

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

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

Commutation

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

Resignation benefit (no entitlement to retirement pay)

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

Retrenchment or redundancy benefit

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

Invalidity benefits

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

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

Invalidity A benefit

A pension of 76.5 per cent of final salary.

Invalidity B benefit

A pension of 38.25 per cent of final salary.

Invalidity C benefit

A lump sum of 1.5 times member contributions.

Death benefits for contributory members

If the member is survived by a spouse, the spouse receives a pension of 62.5 per cent of the pension that would have been paid to the member on being classified Invalidity 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 indexed pensions are increased twice each year according to the age of the pensioner. Where an age retirement retiree elected to commute their pension for a lump sum of less than four times the pension before commutation, part of the pension payable will be a non-indexed pension.

For pensioners less than age 55, indexed pensions are indexed in line with the movement in the CPI. For pensioners aged 55 or more, indexed pensions are 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 an index based on a percentage of 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). Where the pension is paid following the death of a retired member, part of the pension is unindexed.

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

Productivity (3 per cent) superannuation benefit

A productivity superannuation benefit based on a notional contribution 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 that are not included in the DFRDB superannuation salary 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

Summary of membership, contribution and benefit provisions of the ADF Super and ADF Cover schemes

The principal provisions of these arrangements are set out below. They should not be used to calculate benefits for individuals.

The documents setting out the provisions of ADF Super are the *Defence Act 1903* and the *Australian Defence Force Superannuation Act 2015.* The documents setting out the provisions of ADF Cover are the *Australian Defence Force Cover Act 2015.*

Membership

The ADF Super and ADF Cover arrangements apply to all new ADF personnel with effect from 1 July 2016.

ADF Super

Under the ADF Super arrangements, employer superannuation contributions of 16.4 per cent of the individual's Ordinary Time Earnings (OTE) are paid to the accumulation superannuation fund of the individual's choice. If the individual does not choose a superannuation fund, the default fund is the ADF Super fund administered by CSC.

ADF Cover

ADF Cover provides associated death and invalidity cover for ADF personnel under the ADF Super arrangements.

Death in service benefits

The benefits provided under ADF Cover on the member's death in service can be summarised as follows:

A lump sum equal to:

- (60 – Member's age in years at the date of death) x 25% x Superannuation salary at exit; or

If there is a surviving spouse, the surviving spouse may instead of the lump sum, opt for an annual lifetime pension of:

- (60 – Member's age in years at the date of death) x 1.5% x Superannuation salary at exit

The lifetime pension is indexed twice a year for CPI increases. Additional pension benefits may be payable if there are dependent children.

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%

The benefits provided on a member's invalidity exit under ADF Cover where the individual is classified invalidity Class A can be summarised as follows:

- A lifetime pension of:

  (60 – Member's age in years at invalidity exit) x 2.2% x Superannuation salary at exit; plus

- A temporary top up pension payable to age 60 of

  Completed years of service at exit x 2.2% x Superannuation salary at exit

Both the lifetime pension and the temporary top up pension are indexed twice a year for CPI increases. If the invalid pensioner were to die, and there were to be a surviving spouse, a lifetime reversionary pension would be payable to the surviving spouse at 67% of the rate of lifetime pension that would have been payable to the invalidity pensioner. Additional pension benefits may be payable to the reversionary spouse if there are dependent children. There is no reversionary pension payable in respect of the temporary top up pension.

The benefits provided on a member's invalidity exit under ADF Cover where the individual is classified invalidity Class B are half of those provided where the individual is classified invalidity Class A. That is, the benefit percentage of 2.2% in the formula for calculating invalidity Class A benefits is replaced by 1.1%.

No benefits are provided under ADF Cover where the individual is classified invalidity Class C.

APPENDIX D

Demographic assumptions

Set out below is a summary of the demographic assumptions for the DFRB, DFRDB, MSBS and ADF Cover.

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 AND ADF COVER DEATH AND INVALIDITY RATES (PER 1,000 CONTRIBUTORS)

		Invalidity 'A'		Invalidity 'B'		Invalidity 'C'	
Age	**Death**	**Officers and cadets**	**Other ranks**	**Officers and cadets**	**Other ranks**	**Officers and cadets**	**Other ranks**
20	0.49	2.95	20.00	1.50	3.15	1.76	2.70
25	0.54	3.44	31.06	1.15	4.00	2.41	2.70
30	0.56	4.62	35.50	1.15	3.20	1.00	2.70
35	0.58	4.95	37.42	1.15	2.00	0.77	2.70
40	0.59	7.80	37.41	1.15	2.00	0.63	2.70
45	0.61	10.25	36.21	0.80	2.00	0.60	2.70
50	0.76	13.68	37.52	0.80	2.00	0.60	2.70
55	1.30	15.79	49.74	0.80	3.85	0.60	2.70
59	1.92	15.79	66.00	0.80	3.85	0.60	2.70

DFRDB DEATH AND INVALIDITY RATES (PER 1,000 CONTRIBUTORS)

		Invalidity 'A'		Invalidity 'B'	
Age	**Death**	**Officers and cadets**	**Other ranks**	**Officers and cadets**	**Other ranks**
40	0.59	3.68	3.68	0.00	0.00
45	0.61	3.68	3.68	0.00	0.00
50	0.76	3.68	3.68	0.00	0.00
55	1.30	3.68	3.68	0.00	0.00
59	1.92	3.68	3.68	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 resignation

The tables below set out the rates adopted for resignation for contributors. Resignation is assumed to only occur below age 55. The figures represent the numbers leaving per 1,000 contributors by duration of service. Retirement rates for those aged 55 or more are a separate assumption.

Resignation rates for MSBS and ADF Cover are set out below.

MSBS AND ADF COVER RESIGNATION RATES (PER 1,000 CONTRIBUTORS)

	Officers & Cadets	Other ranks
Years of service	**Male & female**	**Male & female**
0	200	130
1	60	70
2	35	35
3	30	35
4	31	120
5	32	80
6	40	100
7	40	100
8	40	70
9	40	40
10	50	90
11	50	70
12	50	63
13	50	60
14	45	50
15	45	45
16	42	40
17	41	38
18	40	35
19	40	38
20	60	45
21	55	30
22	50	30
23	30	30
24	20	25
25	10	25
26	10	25
27	30	25
28	30	25
29	39	30
30	48	30

For DFRDB members younger than 55, the assumed resignation rates are set out below.

DFRDB SERVICE DURATION RESIGNATION RATES FOR AGE LESS THAN 55 (PER 1,000 CONTRIBUTORS)

	Officers	Other Ranks
Years of service	Male & Female	Male & Female
25	84	79
26	84	79
27	84	79
28	84	79
29	84	79
30	84	79
31	84	79
32	84	79
33	84	79
34	84	79
35	84	79
36	84	79
37	84	79
38	84	79
39	84	79
40	84	79

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

Contributor exits by retirement

The following retirement rates have been assumed for all serving members in both the MSBS and DFRDB from age 55. Members attaining age 60 are all assumed to retire.

MSBS, DFRDB AND ADF COVER RETIREMENT RATES FROM AGE 55 (PER 1,000 CONTRIBUTORS)

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

Contributor exits by 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 (ADF Cover)

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

NEW ENTRANTS

	Officers			Other ranks			Cadets		
Age	**Males %**	**Females %**	**Average salary ($)**	**Males %**	**Females %**	**Average salary ($)**	**Males %**	**Females %**	**Average salary ($)**
17				9.7	10.0	59,827	20.7	20.7	44,555
18	0.5		61,693	18.9	20.0	60,318	31.5	31.5	45,325
19	1.0		64,036	16.0	15.0	60,810	13.1	13.1	47,797
20	1.5		66,378	10.6	10.0	61,178	8.6	8.6	50,291
21	2.0	1.0	68,721	8.2	8.0	61,547	5.6	5.6	52,807
22	3.4	4.1	71,063	6.8	6.5	61,915	5.0	5.0	55,219
23	6.0	6.0	73,406	5.6	5.5	62,284	4.3	4.3	58,844
24	6.3	10.0	75,748	4.4	4.5	62,653	3.7	3.7	58,844
25	5.5	8.2	78,090	3.5	3.6	63,021	3.1	3.1	58,844
26	5.2	7.2	80,433	2.9	2.9	63,267	2.5	2.5	58,844
27	5.1	6.1	82,775	2.4	2.5	63,512	1.9	1.9	58,844
28	4.5	5.3	85,118	1.9	2.0	63,758	1.2	1.2	58,844
29	4.1	4.5	87,460	1.6	1.6	64,004	0.6	0.6	58,844
30	3.5	3.9	89,802	1.3	1.4	64,500			
31	3.3	3.4	92,145	1.1	1.2	65,100			
32	3.0	3.0	94,487	1.0	1.0	65,700			
33	2.9	2.8	96,830	0.8	0.9	66,300			
34	2.7	2.5	99,172	0.7	0.7	66,800			
35	2.5	2.4	100,000	0.6	0.6	67,300			
36	2.5	2.3	100,000	0.5	0.5	67,906			
37	2.4	2.2	100,000	0.4	0.4	69,000			
38	2.4	2.2	100,000	0.4	0.4	70,000			
39	2.4	2.2	100,000	0.3	0.3	71,200			
40	2.4	2.2	100,000	0.3	0.3	72,988			
41	2.4	2.2	100,000	0.2	0.2	74,264			
42	2.4	2.2	100,000						
43	2.4	2.2	100,000						
44	2.4	2.2	100,000						

NEW ENTRANTS (CONTINUED)

	Officers			Other ranks			Cadets		
Age	Males %	Females %	Average salary ($)	Males %	Females %	Average salary ($)	Males %	Females %	Average salary ($)
45	2.4	2.2	100,000						
46	2.4	2.2	100,000						
47	2.4	2.2	100,000						
48	2.1	2.2	100,000						
49	1.8	1.2	100,000						
50	1.5		100,000						
51	1.2		100,000						
52	0.9		100,000						
53	0.6		100,000						

Promotional salary increases

MSBS and ADF Cover officer and cadet promotional salaries are dependent on the period of service and entry age. Since the salary scale is two-dimensional, a cross-section of the salary scales is presented below for a selection of entry ages. DFRDB officer salaries, and ADF Cover, MSBS and DFRDB other rank salaries only relate to period of service.

DFRDB, MSBS AND ADF COVER SALARY PROGRESSION

	MSBS and ADF Cover Officers			MSBS and ADF Cover Cadets				
Duration	Entry Age 20	Entry Age 23	Entry Age 27	Entry Age 18	Entry Age 21	Entry Age 25	DFRDB Officers	Other Ranks
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	1.089	1.088	1.073	1.125	1.060	1.040	1.065	1.100
2	1.174	1.173	1.144	1.272	1.134	1.081	1.130	1.194
3	1.257	1.255	1.212	1.444	1.291	1.250	1.194	1.242
4	1.336	1.333	1.277	1.557	1.423	1.426	1.259	1.284
5	1.412	1.408	1.340	1.688	1.554	1.570	1.309	1.321
6	1.484	1.479	1.400	1.814	1.673	1.686	1.337	1.357
7	1.554	1.547	1.457	1.938	1.790	1.798	1.365	1.390
8	1.620	1.611	1.512	2.059	1.901	1.904	1.392	1.421
9	1.682	1.672	1.565	2.176	2.010	2.007	1.420	1.451
10	1.742	1.729	1.615	2.288	2.113	2.104	1.447	1.480
11	1.798	1.783	1.662	2.394	2.210	2.195	1.474	1.507
12	1.851	1.834	1.707	2.494	2.302	2.281	1.502	1.533
13	1.900	1.881	1.749	2.590	2.390	2.362	1.529	1.559
14	1.947	1.924	1.788	2.681	2.472	2.440	1.557	1.583

DFRDB, MSBS AND ADF COVER SALARY PROGRESSION (CONTINUED)

	MSBS and ADF Cover Officers			MSBS and ADF Cover Cadets				
Duration	Entry Age 20	Entry Age 23	Entry Age 27	Entry Age 18	Entry Age 21	Entry Age 25	DFRDB Officers	Other Ranks
15	1.990	1.964	1.825	2.766	2.550	2.513	1.622	1.607
16	2.030	2.001	1.859	2.847	2.624	2.581	1.689	1.629
17	2.066	2.034	1.891	2.923	2.692	2.645	1.755	1.651
18	2.100	2.064	1.920	2.993	2.756	2.705	1.820	1.672
19	2.130	2.090	1.947	3.059	2.815	2.760	1.883	1.693
20	2.157	2.113	1.971	3.119	2.870	2.811	1.946	1.712
21	2.180	2.133	1.992	3.175	2.920	2.858	2.004	1.731
22	2.200	2.149	2.011	3.225	2.964	2.900	2.058	1.749
23	2.217	2.161	2.027	3.271	3.005	2.938	2.108	1.767
24	2.231	2.172	2.040	3.311	3.040	2.972	2.154	1.784
25	2.242	2.183	2.051	3.347	3.071	3.001	2.197	1.800
26	2.253	2.194	2.061	3.377	3.097	3.025	2.237	1.816
27	2.265	2.205	2.071	3.403	3.119	3.046	2.273	1.831
28	2.276	2.216	2.082	3.424	3.138	3.065	2.305	1.845
29	2.287	2.227	2.092	3.443	3.155	3.081	2.334	1.859
30	2.299	2.238	2.102	3.461	3.171	3.097	2.359	1.873
31	2.310	2.249	2.113	3.479	3.187	3.113	2.381	1.886
32	2.322	2.261	2.123	3.496	3.203	3.129	2.401	1.898
33	2.333	2.272	2.134	3.514	3.219	3.144	2.420	1.909
34	2.345	2.283	2.145	3.531	3.236	3.160	2.437	1.921
35	2.357	2.295	2.155	3.549	3.252	3.176	2.452	1.931
36	2.369	2.306	2.166	3.567	3.268	3.192	2.466	1.941
37	2.380	2.318	2.177	3.585	3.284	3.208	2.478	1.951
38	2.392	2.329	2.188	3.602	3.301	3.224	2.491	1.960
39	2.404	2.341	2.199	3.620	3.317	3.240	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 2.113 times the commencing salary at age 21.

Pensioner mortality

The table below shows the mortality rates assumed for pensioners for DFRB, DFRDB, MSBS and ADF Cover. The age retired rates and invalidity rates are based on combined MSBS and DFRDB experience. Male spouse rates are assumed to be the same as male age retired rates, while female spouse rates are derived from DFRDB female spouse pension experience.

PENSIONER MORTALITY (PER 1,000 PENSIONERS)

	Males			Females		
Age	**Age retired**	**Invalid retired**	**Spouse**	**Age retired**	**Invalid retired**	**Spouse**
20	0.11	1.62	0.11	0.12	1.62	0.12
30	0.22	1.67	0.22	0.22	1.67	0.22
40	0.62	2.45	0.62	0.56	2.45	0.56
50	1.57	4.09	1.57	1.27	4.09	1.27
55	2.49	5.70	2.49	2.06	5.70	2.06
60	3.96	8.54	3.96	3.63	8.54	3.63
65	6.75	13.78	6.75	6.01	13.78	6.01
70	12.32	23.42	12.32	10.77	23.42	10.77
75	23.21	40.66	23.21	19.58	40.66	19.58
80	43.39	69.67	43.39	35.48	69.67	35.48
90	141.31	190.94	141.31	115.68	190.94	115.68
100	422.84	502.08	422.84	281.63	502.08	281.63

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 invalidity retirements.

ASSUMED RATES OF MORTALITY REDUCTION (PER CENT PER ANNUM)

Age	**Male**	**Female**
60	2.7	2.3
70	2.8	2.3
80	2.1	2.0
90	1.0	1.0
100	0.0	0.0

MSBS retirement ages for preserved members

The following table summarises the assumed rates of retirements for current and future preserved members. Preserved members aged 65 or more at the valuation date are assumed to retire immediately.

PRESERVER RETIREMENTS (PER 1,000 PRESERVED MEMBERS)

Age	Age Retirement
55	400
56	200
57	150
58	100
59	100
60	300
61	150
62	100
63	100
64	400
65	1,000

Proportions married at death and age differences

The assumed proportions married at death at each age are shown below.

PROPORTIONS MARRIED

Age	Males non-invalidity (%)	Males invalidity[1] (%)	Females (%)
20	2	7	7
30	49	55	55
40	70	55	55
50	70	55	55
60	70	50	50
70	68	37	37
80	58	16	16
90	44	6	6

[1] Male DFRDB invalidity pensioners are assumed to have the same proportion married as male non-invalidity pensioners

Married male members are assumed to be married to females four years younger on death. Married female members are assumed to be married to males three years older on death.

MSBS pension take-up rates for retirements

For those members retiring from ADF service aged 55 or more, it is assumed that 100 per cent of the lump sum would be converted to a pension for officers and 95 per cent would be converted for other ranks.

MSBS pension take-up rates for preserved members

For current preserved members retiring aged 55 or more, it is assumed that 85 per cent of the lump sum would be converted to a pension for former other ranks and 90 per cent would be converted for former officers.

For current serving members who become preserved members in the future who retire aged 55 or more, it is assumed that 95 per cent of the lump sum would be converted to a pension for former other ranks and 100 per cent would be converted for former officers.

DFRDB commutation

Those members retiring from ADF service are assumed to take the maximum commutation lump sum available. This is generally 5 times the retirement pay prior to commutation.

Accrual recognition

For pensioners and preserved benefits all cash flows and associated unfunded liabilities are accrued at the valuation date.

For MSBS serving members (contributors), the proportion of the benefit taken to be accrued is as follows:

- for retirement and resignation benefits, the employer component of the benefit is assumed to accrue uniformly over the period from the date of commencement of the current period of service to the projected date of exit, or the projected date of attaining MBL status, whichever is earlier.

- for death and invalidity A and B benefits, the employer component of the benefit is assumed to accrue uniformly over the period from the date of commencement of the current period of service to the projected date of exit.

For DFRDB serving members (contributors), the proportion of the benefit taken to be accrued is as follows:

- for all benefits, the employer component of the benefit is assumed to accrue uniformly over the combined periods of service that count for benefit purposes to the projected date of exit. That is, where the serving member is a re-entered recipient, prior periods of service to the current period are included.

For serving members under the ADF Super arrangements that have insurance type cover provided by ADF Cover, there is no unfunded liability in respect of ADF Cover in respect of events (incidents and injuries) that are expected to occur in the future. There

is, however, an Incurred But Not Reported (IBNR) type of reserve included to cover those that have incurred an injury or condition prior to the measurement date that will result in an invalidity pension commencing after the measurement date. This reserve is calculated on the basis that of the injuries or conditions incurred during a year, 50 per cent of them will result in an invalidity pension commencing in the same year, 30 per cent will result in an invalidity pension commencing in the subsequent year and 20 per cent will result in an invalidity pension commencing in the year after.

GDP increases adjusted for inflation

GDP growth rates are assumed to be 2.5 per cent per annum and are based on Commonwealth Treasury projections of nominal GDP values adjusted for consistency with the inflation and wage growth assumptions adopted for this valuation. Given this adjustment, they should not be regarded as official Commonwealth Treasury projections.

APPENDIX E

Sensitivity Analysis

Sensitivity analysis has been undertaken on a variety of factors to show the impact of a range of scenarios on the unfunded liabilities for all schemes and the notional employer contribution rates for the DFRDB, MSBS and ADF Cover.

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;
- an increase of 1 percentage point in the annual interest rate used;
- a decrease of 1 percentage point in the assumed annual rate of general salary (and MTAWE) inflation;
- an increase of 1 percentage point in the assumed annual rate of general salary (and MTAWE) inflation;
- a decrease of 1 percentage point in the assumed annual rate of CPI inflation; and
- an increase of 1 percentage point in the assumed annual rate of CPI inflation.

In each of the above cases, 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:

- 2.5% per annum CPI
- 4% per annum general wage increase (2.5% CPI plus 1.5% productivity growth)
- 5% interest rate (2.5% CPI plus 1.5% productivity growth plus 1% population growth)

It should be noted that the general salary inflation assumption is not only used for the indexation of military salaries but is also used for the indexation of DFRB and DFRDB pensions for those aged 55 or more.

In addition, the impacts of a 100 per cent pension take-up rate for MSBS and changes in invalidity rates for MSBS and ADF Cover on the unfunded liabilities and Notional Employer Contribution Rates has been modelled. 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.

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 continues to increase, with around 2,400 new invalidity pensions commencing each year for MSBS and ADF Cover combined from direct exits from the ADF. In addition, the numbers of future retrospective invalidity pensions commencing have been increased by 40 per cent. As an alternative, I have also considered the impact of assuming that invalidity pensions from direct exits from the ADF return to similar levels to those assumed for the 2017 Report, implying around a 40 per cent reduction in assumed invalidity rates. Similarly, the assumed numbers of future retrospective invalidity pensions commencing have been reduced by 40 per cent. A summary of the invalidity A and B exit assumptions for MSBS underlying this analysis are set out later in this Appendix.

Given that CPI increases and general salary increases have been below those assumed for this report for some time and it may take some time before they return to the long term levels assumed, a sensitivity analysis has been performed incorporating short term economic assumptions which gradually revert to the long term assumptions over time. The results of this analysis are shown separately.

The results of the analyses are as follows:

	DFRB & DFRDB			MSBS		ADF Cover	
	DFRB Unfunded Liability $m	DFRDB Unfunded Liability $m	Notional Employer Contribution Rate (%)	MSBS Unfunded Liability $m	Notional Employer Contribution Rate (%)	ADF Cover Unfunded Liability $m	Notional Employer Contribution Rate (%)
2020 Long-Term Cost Report	324	32,218	41.8	65,595	53.7	810	54.6
Interest rate (-1% pa)	350	36,956	50.2	82,872	70.5	1,013	68.9
Interest rate (+1% pa)	301	28,400	35.3	53,002	41.9	665	44.4
Salary increases (-1% pa)	301	28,519	35.4	63,701	50.3	810	54.3
Salary increases (+1% pa)	349	36,702	49.9	67,734	57.6	810	54.8

	DFRB & DFRDB			MSBS		ADF Cover	
	DFRB Unfunded Liability $m	DFRDB Unfunded Liability $m	Notional Employer Contribution Rate (%)	MSBS Unfunded Liability $m	Notional Employer Contribution Rate (%)	ADF Cover Unfunded Liability $m	Notional Employer Contribution Rate (%)
Inflation (CPI) (-1% pa)	324	32,118	41.7	54,712	45.1	663	44.3
Inflation (CPI) (+1% pa)	324	32,322	41.9	79,874	65.0	1,014	68.8
100% pension take-up	324	32,218	41.8	67,137	54.7	810	54.6
Higher invalidity rates (+40%)	324	32,218	41.8	69,280	58.9	810	76.2
Lower Invalidity rates (-40%)	324	32,218	41.8	61,637	47.8	810	33.0

The first six scenarios 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 MSBS 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.

The pension take-up scenario primarily affects the MSBS. When an individual in MSBS opts to receive a pension on retirement, the actuarial value of the pension is much greater than the value of the lump sum benefit forgone. Higher pension take-up rates increase costs. This scenario provides a theoretical upper bound on the cost impact from this process, all else remaining equal. 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.

There are situations where individuals commencing benefits in the DFRDB and ADF Cover have a choice between pension benefits and lump sums benefits. Sensitivities to these choices have not been modelled as the results are not materially sensitive to reasonably conceivable changes in take-up behaviour.

A summary of the invalidity A and B exits rates used for the higher invalidity rates scenario are set out in the table below:

HIGHER MSBS INVALIDITY RATES (PER 1,000 CONTRIBUTORS)

	Invalidity 'A'		Invalidity 'B'	
Age	**Officers and cadets**	**Other ranks**	**Officers and cadets**	**Other ranks**
20	4.13	28.00	2.10	4.41
25	4.82	43.48	1.61	5.60
30	6.47	49.70	1.61	4.48
35	6.93	52.39	1.61	2.80
40	10.92	52.37	1.61	2.80
45	14.35	50.69	1.12	2.80
50	19.16	52.53	1.12	2.80
55	22.11	69.64	1.12	5.39
59	22.11	92.40	1.12	5.39

A summary of the invalidity A and B exits rates used for the lower invalidity rates scenario are set out in the table below:

LOWER MSBS INVALIDITY RATES (PER 1,000 CONTRIBUTORS)

	Invalidity 'A'		Invalidity 'B'	
Age	**Officers and cadets**	**Other ranks**	**Officers and cadets**	**Other ranks**
20	1.77	12.00	0.90	1.89
25	2.06	18.64	0.69	2.40
30	2.77	21.30	0.69	1.92
35	2.97	22.45	0.69	1.20
40	4.68	22.45	0.69	1.20
45	6.15	21.73	0.48	1.20
50	8.21	22.51	0.48	1.20
55	9.47	29.84	0.48	2.31
59	9.47	39.60	0.48	2.31

Short Term Economic Assumptions

In addition to the above sensitivity analyses, I have included a scenario with the same long-term assumptions but with the substitution of the following assumptions in the short term;

Year	General salaries (%)	CPI (%)	DFRDB and DFRB pension increases (55 plus) (%)
2020-21	2.0	1.1	1.3
2021-22	2.0	2.0	2.2
2022-23	2.0	2.5	2.7
2023-24	2.5	2.5	2.7
2024-25	3.0	2.5	2.7
2025-26	3.5	2.5	2.7
2026-27 onwards	4.0	2.5	4.0

The short term CPI increases assumed are based on Treasury forecasts for inflation. The general salary increases take account of the current Remuneration Arrangement for ADF personnel and, on its expiry, assume a gradual transition back to the long term rate assumed.

Pension increases for those aged 55 or more in DFRDB and DFRB are complex. The rate of increase every six months is the better of CPI and PBLCI increases for the relevant six month period. On average, these have been around 0.2 percentage points per annum higher than CPI increases and this has been factored into the short term assumptions. In addition, pension increases are referenced to a notional floor based on MTAWE. Over the long term, pension increases would be expected to be increased in line with MTAWE as salaries would be expected to increase faster than CPI. However, in the recent past, salary increases have been low and the notional floor based on MTAWE is about 3 percentage points below the current pension rate. Accordingly, it will take some time before the notional floor based on MTAWE impacts pension increase rates for DFRDB. This has been factored into the short term assumptions for DFRDB pension increases for those aged 55 or more.

A projection of annual Commonwealth cash outlays based on the economic assumptions set out above has been carried out to compare the cash impact to the Commonwealth with the results from the base case presented in this Report. The Table below shows the projected outlays for the next eight years and then every fifth year from 2029-30.

PROJECTED COMMONWEALTH OUTLAYS – SHORT TERM ECONOMIC ASSUMPTIONS

Year	DFRB ($m)	DFRDB ($m)	MSBS ($m)	SG cont's ($m)	ADF Cover ($m)	Total for Scenario ($m)	2020 Long Term Cost Report ($m)
Projected							
2020-21	34	1,646	1,216	31	32	2,958	2,973
2021-22	33	1,695	1,394	29	63	3,214	3,289
2022-23	30	1,644	1,485	27	95	3,281	3,394
2023-24	28	1,653	1,628	26	141	3,476	3,622
2024-25	26	1,664	1,774	25	197	3,685	3,865
2025-26	24	1,673	1,921	23	262	3,905	4,122
2026-27	23	1,686	2,075	22	339	4,147	4,397
2027-28	22	1,713	2,234	21	428	4,418	4,688
2029-30	20	1,761	2,564	19	643	5,006	5,319
2034-35	15	1,836	3,624	15	1,434	6,923	7,373
2039-40	10	1,846	4,822	10	2,667	9,355	9,983
2044-45	6	1,742	6,111	5	4,463	12,327	13,186
2049-50	3	1,512	7,397	1	6,967	15,880	17,025
2054-55	1	1,172	8,376	0	10,317	19,866	21,350
2059-60	0	775	8,712	-	14,556	24,044	25,908

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

The introduction of the short term economic assumptions reduces the expected cash outlays over the projection period owing to the effect of lower initial inflation. This is particularly so for DFRDB and DFRB where it takes time for pension increases to revert to the salary linked increases based on the notional floor based on MTAWE.

Consequently, the short term economic assumptions reduce the value of the unfunded liability when utilising the same discount rate as adopted in the 2020 Long Term Cost Report. This comparison is shown below.

	DFRB & DFRDB			MSBS		ADF Cover	
	DFRB Unfunded Liability $m	DFRDB Unfunded Liability $m	Notional Employer Contribution Rate (%)	MSBS Unfunded Liability $m	Notional Employer Contribution Rate (%)	ADF Cover Unfunded Liability $m	Notional Employer Contribution Rate (%)
2020 Long Term Cost Report	324	32,218	41.8	65,595	53.7	810	54.6
Short term economic assumptions	302	29,834	39.4	63,258	51.8	796	53.4