

# PSS and CSS Long Term Cost Report 2008



A report on the long term cost of  
the Public Sector Superannuation  
Scheme and the Commonwealth  
Superannuation Scheme

Prepared by Mercer (Australia) Pty Ltd  
using data as at 30 June 2008

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Department of Finance and Deregulation  
Financial Management Group

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one Executive Summary



one

# one Executive Summary

We are pleased to present this report on the actuarial investigation of the long term costs of the Public Sector Superannuation Scheme (PSS) and the Commonwealth Superannuation Scheme (CSS) prepared at the request of the Department of Finance and Deregulation. This investigation has been carried out based on membership data as at 30 June 2008.

The previous actuarial investigation of the long term costs of the PSS and CSS was carried out by Mercer (Australia) (Mercer), formerly known as Mercer Human Resource Consulting in 2005 based on data as at 30 June 2005.

## Results Produced in this Report

- 1.1 The main aim of this investigation is to identify the long-term cost of the PSS and CSS that will be charged to the Consolidated Revenue Fund (CRF). The long-term cost has been estimated in three ways:

- **Projected Employer Costs**

We have projected the outlay in respect of PSS and CSS benefits in each of the next 40 years and expressed these amounts as a percentage of projected Gross Domestic Product (GDP).

- **Unfunded Liability**

We have estimated the Unfunded Liability of the PSS and CSS as at 30 June 2008. The Unfunded Liability represents an estimate of the present value of the total accrued superannuation liabilities of the Australian Government in respect of service up to 30 June 2008 that will be charged to the CRF.

- **Notional Employer Contribution Rates**

These are the employer contribution rates necessary to ensure that employer-financed benefits from the PSS and CSS would remain fully funded in three years time, if they were fully funded now. The contribution rates are reduced to allow for any additional lump sums paid in the previous three years under the expanded agency assessment framework.

## Results – Projected Employer Costs

- 1.2 The projected Employer Costs are expected to reduce as a percentage of projected GDP from 0.28% in the year ending 30 June 2009 to 0.11% in the year ending 30 June 2048.

## Results – Unfunded Liability

1.3 The accrued Unfunded Liability is summarised in the following table:

Accrued Unfunded Liability (\$ billions)			
Report as at	PSS	CSS	Combined
30 June 1999	5.7	40.3	46.0
30 June 2002	9.1	49.3	58.4
30 June 2005	13.8	50.6	64.4
30 June 2008	20.9	59.2	80.1

- 1.4 The accrued Unfunded Liability has been calculated using actuarial assumptions that differ from those used at the last actuarial investigation. The assumptions have been developed based on current economic expectations and the actual demographic experience of the schemes particularly over the three years to 30 June 2008.
- 1.5 The accrued Unfunded Liability as at 30 June 2008 for current members, preserved members and pensioners has been calculated to be \$80.1 billion, which is 6.6% of current GDP. The corresponding figure as at 30 June 2005 was \$64.4 billion, which was 7.8% of GDP as at that date.
- 1.6 Total Unfunded Liability is expected to reduce as a percentage of projected GDP from 6.6% as at 30 June 2008 to 0.9% as at 30 June 2048, mainly due to the closure of the schemes and the ageing of the membership.
- 1.7 We have projected the accrued Unfunded Liability as at 30 June 2005 to 30 June 2008 on the basis of the actuarial assumptions used in the 30 June 2005 actuarial investigation. The projected accrued Unfunded Liability on this basis as at 30 June 2008 is \$72.1 billion. The difference between the projected and actual unfunded liabilities is mainly due to differences between the actual experience of the schemes over the period and assumptions made. These differences included:
- salary increases being higher than expected;
  - average notional crediting interest rates being higher than expected for both the PSS and CSS;
  - the indexation of pensions in payment being higher than expected; and
  - the take-up of pension benefits being higher than expected.

In addition part of the difference between the projected and actual unfunded liabilities is due to the assumptions adopted for the 2008 investigation being different from those adopted for the 2005 investigation. In total the changes in assumptions have resulted in an increase in the combined Unfunded Liability of the PSS and CSS of approximately \$2.57 billion as at 30 June 2008.

There has been a change in calculation methodology from the 2005 Long Term Cost Report. The change relates to methodology used to apportion the total liability between past and future membership. This change brings the Long Term Cost Report more closely into line with the approach used in Australian Accounting Standards and the Budget process. This change has resulted in an increase in the combined Unfunded Liability of the PSS and CSS of approximately \$670 million at 30 June 2008.

There have been several changes to the Schemes' benefit designs since 1 July 2005 (refer Section 3). These changes have resulted in a decrease in the combined Unfunded Liability of the PSS and CSS of approximately \$80 million at 30 June 2008.

## Results – Notional Employer Contribution Rates

- 1.8 The Notional Employer Contribution Rates (NECRs) for the two schemes (including contributions towards the 3% productivity superannuation benefit) are summarised in the following table:

Notional Employer Contribution Rates (% of Superannuation Salaries)			
Report as at	PSS	CSS	Combined
30 June 1999	14.2	21.9	17.2
30 June 2002	15.4	28.3	19.3
30 June 2005	15.6	28.2	18.3
30 June 2008*	16.3	21.4	17.1

\* new methodology

- 1.9 The NECRs as at 30 June 2008, excluding the employer productivity contribution rate of approximately 3%, are:

	PSS	CSS
30 June 2008	13.3	18.4

The CSS rate of 18.4% of superannuation salaries is the actual CSS 2008 rate for those agencies with separate productivity superannuation arrangements.

- 1.10 The combined rate in Section 1.8 broadly represents the cost to the Australian Government of the superannuation benefits that are accruing for employees at the present time.

- 1.11 The contribution rate for the PSS as at 30 June 2008 has increased by 0.7% of superannuation salaries compared to the rate as at 30 June 2005. The contribution rate for the CSS as at 30 June 2008 has decreased by 6.8% of superannuation salaries compared to the rate as at 30 June 2005.
- 1.12 The significant decrease of NECR for CSS is primarily due to the change in calculation methodology.

## Scheme Membership

- 1.13 The following tables summarise the membership of the schemes since 1999.

Contributing Membership			
	PSS	CSS	Total
30 June 1999	106,141	52,880	159,021
30 June 2002	129,683	39,986	169,669
30 June 2005	154,897	32,006	186,903
30 June 2008	132,274	22,162	154,436

Preserved Membership			
	PSS	CSS	Total
30 June 1999	51,176	12,521	63,697
30 June 2002	76,357	13,969	90,326
30 June 2005	85,709	12,227	97,936
30 June 2008	103,628	11,461	115,089

Pensioners			
	PSS	CSS	Total
30 June 1999	4,950	81,415	86,365
30 June 2002	7,598	83,370	90,968
30 June 2005	10,912	85,028	95,940
30 June 2008	15,759	86,901	102,660

Dependent Pensioners			
	PSS	CSS	Total
30 June 1999	210	26,962	27,172
30 June 2002	331	27,930	28,261
30 June 2005	507	28,560	29,067
30 June 2008	693	28,531	29,224

- 1.14 In the PSS fewer contributory members exited during the period from 1 July 2005 to 30 June 2008 than anticipated in the actuarial assumptions (mainly due to there being fewer retrenchments than expected). However, in the CSS more contributors exited during the period than expected. Overall, the actual contributory membership at 30 June 2008 was higher than expected.
- 1.15 The number of PSS preserved members at 30 June 2008 was lower than expected mainly due to a lower than expected number of contributor exits. The number of CSS preserved members at 30 June 2008 was higher than expected mainly since there were fewer than expected contributor exits.

The number of PSS and CSS pensioners at 30 June 2008 was broadly in line with that expected.

## Methodology

- 1.16 For the purposes of this actuarial investigation we have used the "Actual" accruals method of apportioning the total liability between past and future membership method (refer Section 5). This differs from the method adopted for the 2005 actuarial investigation.
- 1.17 This change in methodology has resulted in an increase in the combined Unfunded Liability of the PSS and CSS of approximately \$670 million at 30 June 2008.
- 1.18 The investigation has been performed having regard to all relevant legislation that has been enacted.

## Economic Assumptions

- 1.19 The key economic assumptions adopted for this investigation are shown in the table below. The assumptions adopted for the previous investigation are shown for comparative purposes.

Item	2008 Actuarial Investigation	2005 Actuarial Investigation
CPI Increases	2.5% per annum	2.5% per annum
Investment Returns	6.0% per annum (nominal) 3.5% per annum (real)	6.0% per annum (nominal) 3.5% per annum (real)
General Salary Increases	4.0% per annum (nominal) 1.5% per annum (real)	4.0% per annum (nominal) 1.5% per annum (real)
GDP Increases*	2.4% per annum (real)	2.3% per annum (real)

\* The GDP increase rate shown is the average of the annual rates over the forty year period from the date of each investigation. Full details are shown in Appendix B.

- 1.20 Of the economic assumptions only the GDP increase assumption is different between the 2005 investigation and the 2008 investigation.
- 1.21 As the schemes are unfunded, our view is that the best determinant of the investment return is the expected return on government bonds over the long term, as this would be the cost to the Australian Government were they to “fund” the schemes via borrowings. Based on historic margins between the yield on Government bonds and the rate of inflation we believe that a real yield of 3.5% per annum (6% per annum nominal) continues to be appropriate.

## Demographic Assumptions

- 1.22 The demographic assumptions have been reviewed based on the experience of the schemes over the three years to 30 June 2008. The most significant changes are:
- Increase in the take-up of resignation benefits for CSS members aged 54;
  - Change in the rate of mortality improvement for pensioners; and
  - Increase in the take-up of pension benefits by PSS members.
- 1.23 In total the changes in assumptions have resulted in an increase in the combined Unfunded Liability of the PSS and CSS of approximately \$2.57 billion as at 30 June 2008.



two Introduction



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# two Introduction

## Background

- 2.1 This report estimates the long term cost of providing superannuation benefits to members of the Public Sector Superannuation Scheme (PSS) and the Commonwealth Superannuation Scheme (CSS). The estimate has been determined based on an actuarial investigation of the schemes as at 30 June 2008.
- 2.2 This investigation has been carried out by Martin Stevenson FIAA FIA and Darren Wickham FIAA, of Mercer (Australia) (Mercer) at the request of the Department of Finance and Deregulation.
- 2.3 This report satisfies the requirements of Professional Standard No. 401 of The Institute of Actuaries of Australia to the extent that the Standard is relevant to the investigation. Professional Standard No. 401 relates to the preparation of reports commenting on the financial condition of defined benefit superannuation funds.
- 2.4 Martin Stevenson FIAA FIA carried out the previous actuarial investigation of the schemes as at 30 June 2005. The results of that investigation were set out in a report dated November 2005.

## Purpose of the Investigation

- 2.5 The main aim of this investigation is to identify the long-term cost of the PSS and CSS that will be charged to the Consolidated Revenue Fund (CRF). The long term cost has been estimated in three ways.

- **Projected Employer Costs**

We have projected the Australian Government's outlay in respect of superannuation benefits in each of the next 40 years and expressed these amounts as a percentage of projected Gross Domestic Product (GDP).

- **Unfunded Liability**

We have estimated the Unfunded Liability of the PSS and CSS as at 30 June 2008. The Unfunded Liability represents an estimate of the present value of the total accrued superannuation liabilities of the Australian Government in respect of service up to 30 June 2008 that will be charged to the CRF.

- **Notional Employer Contribution Rates**

These are the employer contribution rates necessary to ensure that employer-financed benefits from the PSS and CSS would remain fully funded in three years time, if they were fully funded now. The contribution rates are reduced to allow for any additional lump sums paid in the previous year under the expanded agency assessment framework.

## three The PSS and CSS

three

## three The PSS and CSS

### Introduction

- 3.1 The PSS was established on 1 July 1990 on the basis of a Policy Statement (“the Reform Statement”) made by the then Minister for Finance on 15 October 1989. The Superannuation Act 1990 and a Trust Deed and Rules govern its operations. The PSS was closed to new members from 1 July 2005. Employees of Australian Government agencies prior to 1 July 2005 were eligible for membership of the PSS.

Most employees of Australian Government agencies who commence employment on or after 1 July 2005 are eligible to join the Public Sector Superannuation Accumulation Plan (PSSAP) that was established on 1 July 2005.

- 3.2 The CSS was introduced on 1 July 1976. Its operations are governed by the Superannuation Act 1976, as amended, and associated regulations. The CSS has been closed to new members since 1 July 1990. All CSS contributors at 1 July 1990 were given the option of transferring to the PSS. A further option to transfer to the PSS was provided in 1996 for a limited period of time. The current membership of the CSS covers Australian Government employees who were members on 30 June 1990 and who have not transferred to the PSS.
- 3.3 Prior to July 1976 the superannuation of Australian Government public servants was covered by the Superannuation Act 1922. There are no longer any members contributing under the Superannuation Act 1922. However, some pensioners remain entitled to benefits under this Act and the liabilities in respect of these members are included in the CSS Unfunded Liability.

### Benefits

- 3.4 The PSS and CSS are defined benefit schemes. The PSSAP is an accumulation scheme.
- 3.5 In the PSS the primary benefit is expressed as a lump sum based on a multiple of final average salary that is related to a member’s average contribution rate and total service. On exit, the benefit may be wholly or partially taken as an indexed pension.
- 3.6 The CSS provides a retirement benefit equal to the sum of:
- employer-financed indexed pension – being a percentage of final salary based on the period of contributory service and discounted for early retirement before age 65;
  - productivity component – made up of accumulated productivity contributions; and
  - member-financed benefit – made up of accumulated basic and supplementary contributions.

The member can elect to take the productivity component and member-financed benefit either as a non-indexed pension or a lump sum.

- 3.7 Further details of the benefits provided by the PSS and CSS are set out in Appendix A.

## Contributions

- 3.8 Generally agencies pay productivity superannuation contributions in respect of their employees to the PSS or CSS. However, there are some agencies that have made alternative arrangements in respect of their CSS members.
- 3.9 Member and productivity superannuation contributions paid to the PSS and CSS are invested by the Trustee of the two schemes, the Australian Reward Investment Alliance (ARIA). Prior to 30 June 2003 these contributions were accumulated at a crediting rate periodically declared by the Trustee. The crediting rate was based on the investment returns achieved by the scheme assets. With effect from 1 July 2003 to 30 June 2007 the Trustee suspended allocation of earnings through annual crediting rates, with earnings allocated through the exit rate, which was the total earnings rate from 1 July 2003 to the date of exit. From 1 July 2007 contributions are again accumulated at a crediting rate periodically declared by the Trustee.
- 3.10 The PSS and CSS are partly funded to the extent that real assets are held in respect of member contributions and productivity superannuation contributions. These assets, as appearing in the reports of the schemes' Trustee, were:

Assets of the PSS and CSS (\$ millions)			
Date	PSS	CSS	Total
30 June 1999	3,481	5,591	9,072
30 June 2002	4,468	5,337	9,805
30 June 2005	7,583	6,015	13,598
30 June 2008	11,346	6,073	17,419

## Changes to Benefits Since 2005

- 3.11 There have been several changes to the benefits provided by the PSS and CSS since the previous actuarial investigation as at 30 June 2005.
- 3.12 From 1 July 2008, PSS members have access to Choice of Fund. If members exercise choice, their benefits are preserved in the PSS with future contributions paid into the PSSAP.
- 3.13 PSS members' benefits are capped by a Maximum Benefit Limit (MBL). Prior to 1 January 2008, most members were subjected to an MBL of 8 times Average Salary, with the MBL varying depending on the members' average salary. From 1 January 2008, MBLs have been simplified. Members with an average salary less than \$50,000 have an MBL of \$500,000. All other members have an MBL of 10 times average salary. These amounts are indexed annually.
- 3.14 Prior to 1 July 2008, PSS members were required to make contributions of 2% to 10% of their salaries and CSS members were required to make contributions of at least 5% of their salaries. From 1 July 2008, members have the option to not contribute to the schemes.
- 3.15 On 24 November 2008, legislation was passed allowing partners in same-sex relationships to be eligible for reversionary pensions.
- 3.16 In total, the changes in benefit design have resulted in a decrease in the combined Unfunded Liabilities of the PSS and CSS of approximately \$80 million as at 30 June 2008.

four Membership and Data

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## four Membership and Data

4.1 Data relating to the membership of the PSS and CSS was provided for this actuarial investigation by ComSuper, the schemes' administrator, on behalf of the schemes' Trustee. Data provided included:

- Details of contributory members, pensioners and preserved members of the PSS and CSS as at 30 June 2008; and
- Details of Exits by contributory members and preserved members from the PSS and CSS during the three year period from 1 July 2005 to 30 June 2008.

A range of validity checks were conducted by ComSuper on the data prior to it being provided to Mercer.

4.2 A range of checks have been carried out by our firm to test the integrity of the data and the variation reports produced by ComSuper. In addition, a reconciliation of the current data with the data utilised for the previous investigation as at 30 June 2005 has been carried out.

4.3 We are satisfied that the data is sufficiently accurate for the purposes of this report.

4.4 The tables below summarise the total membership of the PSS and CSS as at 30 June 2008.

<b>PSS Membership as at 30 June 2008</b>			
	<b>Male</b>	<b>Females</b>	<b>Total</b>
Number of Contributors	55,369	76,905	132,274
Total Salaries of Contributors	\$4,123m	\$5,081m	\$9,204m
Number of Preserved Members	42,331	61,297	103,628
Number of Age Pensioners	7,080	6,694	13,774
Number of Invalidity Pensioners	939	1,046	1,985
Number of Reversionary Pensioners	219	474	693

<b>CSS Membership as at 30 June 2008</b>			
	<b>Male</b>	<b>Females</b>	<b>Total</b>
Number of Contributors	14,397	7,765	22,162
Total Salaries of Contributors	\$1,291m	\$611m	\$1,902m
Number of Preserved Members	8,363	3,098	11,461
Number of Age Pensioners	51,543	17,920	69,463
Number of Invalidity Pensioners	12,756	4,682	17,438
Number of Reversionary Pensioners	1,313	27,218	28,531

- 4.5 The combined number of contributors to the schemes reduced significantly over the six years to 30 June 1999, increased over the next six years to 30 June 2005 and reduced again over the most recent three years to 30 June 2008. This can be seen from the following table:

<b>Movements in Contributors</b>			
	<b>PSS</b>	<b>CSS</b>	<b>Total</b>
30 June 1993	97,891	109,591	207,482
30 June 1996	115,873	76,864	192,737
30 June 1999	106,141	52,880	159,021
30 June 2002	129,683	39,986	169,669
30 June 2005	154,897	32,006	186,903
30 June 2008	132,274	22,162	154,436

- 4.6 Between 1 July 2005 and 30 June 2008 the number of PSS contributors reduced by 14.6%.
- 4.7 Between 1 July 2005 and 30 June 2008 the number of CSS contributors reduced by 30.7%.



## five Valuation Methodology

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## five Valuation Methodology

- 5.1 The main aim of this investigation is to identify the long-term cost of the PSS and CSS that will be charged to the Consolidated Revenue Fund (CRF). The long term cost has been estimated in three ways:
- Projected Employer Costs
  - Unfunded Liability
  - Notional Employer Contribution Rates (NECRs)
- 5.2 This section of the report describes the methodology adopted in determining the above estimates.

### Unfunded Benefits

- 5.3 When a member becomes entitled to a benefit from the PSS or CSS, the member's accumulation accounts (i.e. funded member and productivity contributions plus interest) are paid by the Trustee of the schemes to the CRF. The total benefit payment to the member is then made from the CRF.
- 5.4 The indexed pension benefit from the CSS is therefore financed from the CRF on an unfunded basis. Similarly the benefit from the PSS after deducting the accumulated value of the member contributions and productivity superannuation contributions is also financed from the CRF on an unfunded basis.

### Employer Costs

- 5.5 The Employer Cost in each year is the total of funded contributions paid during the year plus benefits paid in that year that have been financed on an unfunded basis. The cost in each year is calculated as:
- Productivity superannuation contributions paid by the employer to the PSS and CSS Funds; plus
  - benefit payments made from the CRF (including payments made under the Superannuation Act 1922); less
  - payments made from the PSS and CSS Funds to the CRF.
- 5.6 We have projected the Employer Costs over the next 40 years from 30 June 2008. This has been done by projecting the membership into the future based on the assumptions for the level of future salary increases, and the timing and nature of exits from the schemes.

## Unfunded Liability

- 5.7 The Unfunded Liability represents an estimate of the total accrued superannuation liabilities of the Australian Government in respect of service up to 30 June 2008 that will be charged to the CRF.
- 5.8 The Unfunded Liability has been calculated as the present value of expected benefit payments from the CRF in respect of service accrued to 30 June 2008 less the accumulation of member and productivity superannuation contributions.
- 5.9 Section 8 of this report sets out the Unfunded Liability of the Australian Government as at 30 June 2008.
- 5.10 The valuation methodology values only the part of future benefits relating to membership accrued at the date of the valuation. There are two main approaches to determine the part of future benefits relating to membership accrued:

### 5.11 ***Uniform Accrual / Straight Line***

In the 2005 and prior Long Term Cost Reports, a “uniform accrual” (also known as “straight line”) apportionment approach was used. This involves the following calculation:

$$\begin{array}{r} \text{Projected unfunded benefit} \\ \text{at the midpoint of the year of exit} \end{array} \times \frac{\begin{array}{r} \text{Membership at valuation date} \\ \text{at the midpoint of the year} \end{array}}{\begin{array}{r} \text{Membership at the midpoint} \\ \text{of the year of exit} \end{array}}$$

### 5.12 ***Actual Accrual/ Accounting Standards approach***

The approach used in the AASB 119 accounting standard calculations involves an “actual accrual” or “Projected Unit Credit Method” (or PUCM) approach.

For the PSS/CSS, this involves determining the total benefit using:

$$\begin{array}{r} \text{Accrued Multiple} \\ \text{calculated using} \\ \text{membership to the date} \\ \text{of the valuation} \end{array} \times \begin{array}{r} \text{Final Average Salary} \\ \text{at future date} \end{array}$$

The benefit is then adjusted to be the unfunded benefit by deducting accumulated member and productivity contributions.

- 5.13 The Unfunded Liability has been estimated using the Actual Accrual Method. This method differs from that adopted for the 2005 Long Term Cost Report (which used the Uniform Accrual method). The reason for the change in method was to bring the calculations into line with the Budget process and Australian Accounting Standards.
- 5.14 The steps involved in the adopted method are as follows:
- The membership of each scheme as at 30 June 2008 is projected into the future based on assumptions relating to future salary growth and rates of exit of members (as set out in Section 6).
  - The total value of unfunded benefits payable to the projected exits and pensions in each future year are determined (using the accrual approach) taking into account salary growth in each future year but members' service to 30 June 2008 only.
  - The Unfunded Liability as at 30 June 2008 is determined as the sum of the present values of the unfunded benefits payable to the projected exits over all future years.

### **Notional Employer Contribution Rates**

- 5.15 The NECRs are the employer contribution rates necessary to ensure that employer-financed benefits payable from the PSS and CSS would remain fully funded in three years time, if they were fully funded now. The contribution rates are reduced to allow for any additional lump sums paid in the previous year under the expanded agency assessment framework.
- 5.16 Section 9 of this report sets out our estimate of the NECRs for the PSS and CSS. The NECRs have been estimated using the method adopted for the 2005 Long Term Cost Report although because the method of apportioning the liability has changed, the NECRs have changed (particularly for the CSS). The method used is a variant of the Projected Unit Credit Method.
- 5.17 The calculation method is as follows:
- It is assumed that notional assets are held that exactly equal to the Unfunded Liability as at 30 June 2008.
  - The Unfunded Liability is projected to 30 June 2011 based on the projected future membership using the assumptions set out in Section 6 and assuming there are no new entrants to the schemes.
  - The unfunded component of the expected benefit payments to exits during the three years to 30 June 2011 is estimated.

- The NECR for each of the PSS and CSS is set at a rate such that:
  - notional assets at 30 June 2008; *plus*
  - employer contributions at the NECR; *less*
  - expected benefit payments to exits;

accumulated with interest to 30 June 2011, is exactly equal to the projected Unfunded Liability as at that date.
- The NECRs are increased by 3% of superannuation salaries to allow for the cost of future productivity superannuation contributions.

### **Family Law and Co-contributions**

- 5.18 It is assumed for this report that benefits subject to Family Law splitting orders or agreements that have already been implemented as at 30 June 2008 have been allowed for in the data as at 1 July 2008. The member spouse has had their benefit reduced due to the split. The Family Law spouse is included as a dependent pensioner.
- 5.19 Co-contributions are treated as fully funded additional member accounts and have no effect on the Unfunded Liability or Notional Employer Contribution Rates.



## six Assumptions

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## six Assumptions

- 6.1 In order to value liabilities, it is necessary to make assumptions regarding the incidence, timing and amount of future benefits. These assumptions fall into two broad categories:
- **Economic Assumptions:** assumptions that relate to the general economic environment and not directly to the membership of the schemes; and
  - **Demographic Assumptions:** assumptions that relate to the experience of the membership of the scheme.
- 6.2 This section sets out details of the assumptions adopted for the 2008 actuarial valuation and highlights any changes from those adopted for the 2005 investigation.
- 6.3 In total the changes in assumptions have resulted in an increase in the combined Unfunded Liability of the PSS and CSS of approximately \$2.57 billion as at 30 June 2008. On top of the assumption changes, the change in the valuation method has resulted in a further increase in the combined unfunded liability of the PSS and CSS of approximately \$670 million as at 30 June 2008.
- 6.4 The assumptions are summarised in Appendix B.

### Economic Assumptions

#### *Key Economic Assumptions*

- 6.5 The economic assumptions of greatest significance in the valuation process are:
- future increases in the Consumer Price Index (CPI) which links to the level of pension increases;
  - future rate of investment return;
  - general increases in salaries (i.e. increases in salaries other than those arising from promotions); and
  - rate of future increases in Gross Domestic Product (GDP).
- 6.6 The relationships between the assumptions adopted for these factors have a greater bearing on the long term cost estimates of the PSS and CSS than do the individual assumptions. This is due to the effect of one assumption being used to project the liability into the future (e.g. future salary increases) and another assumption being used to discount that liability to current day values (investment return).

- 6.7 The key economic assumptions adopted for this investigation are shown in the table below. The assumptions adopted for the previous investigation are shown for comparative purposes.

Item	2008 Actuarial Investigation	2005 Actuarial Investigation
CPI Increases	2.5% per annum	2.5% per annum
Investment Returns	6.0% per annum (nominal) 3.5% per annum (real)	6.0% per annum (nominal) 3.5% per annum (real)
General Salary Increases	4.0% per annum (nominal) 1.5% per annum (real)	4.0% per annum (nominal) 1.5% per annum (real)
GDP Increases*	2.4% per annum (real)	2.3% per annum (real)

\* The GDP increase rate shown is the average of the annual rates over the forty year period from the date of each investigation. Full details are shown in Appendix B.

- 6.8 Of the key economic assumptions only the GDP increase assumption is different between the 2005 investigation and the 2008 investigation.
- 6.9 The assumed rate of future CPI increases remains at 2.5% per annum. This rate was set based on the following considerations:
- The Reserve Bank target for CPI increase is 2% to 3% per annum;
  - The average CPI increase rate for the last ten years to 30 June 2008 was 3.0% per annum;
  - The level of inflation projected by the 2007 Intergenerational Report is 2.5% per annum.
- 6.10 The assumed rate of future investment returns remains at 6.0% per annum (nominal). As the schemes are largely unfunded our view is that the best determinant of the investment return is the expected return on government bonds over the long term, as this would be the cost to the Australian Government were it to “fund” the schemes via borrowings. Based on historic margins between the yield on Government bonds and the rate of inflation we believe that a real yield of 3.5% per annum continues to be appropriate. For example, the average real yield of ten year government bonds over the ten years to 30 June 2008 has been consistent with this long term assumption. Note that this yield is not the market yield at a specific date.
- 6.11 The assumed rate of future general salary increases remains at 4.0% per annum (nominal). Since the early 1990s wage inflation increases have ranged from 2% per annum to 6% per annum, with an average of 3.2% per annum. While the margin of AWOTE over CPI has averaged 1.0% per annum since the early 1990s, the margin has been in the order of 1.3% if taking a longer term view (since the early 1970s). Real wages growth (ie above price inflation) is expected to be in line with labour productivity growth. The Intergenerational Report 2007 assumes that productivity growth will be in the order of 1.75% suggesting long wage growth

of 4.25% (assuming long term price inflation of 2.5%). Taking into account both the actual past experience and the forward looking assumptions of productivity growth, an expectation for general salary increases of 4.0% per annum continues to be appropriate.

- 6.12 The GDP growth rates adopted for this investigation were based on real GDP growth projections provided by the Department of the Treasury.

### ***Taxation***

- 6.13 Allowance has been made for 15% tax payable on superannuation productivity contributions.
- 6.14 The PSS and CSS are treated as complying superannuation funds within the meaning of the Superannuation Industry (Supervision) Act 1993 and tax is generally payable at a concessional rate of 15% on net investment earnings and employer contributions with deductions allowable for administration expenses.
- 6.15 In determining the employer cost, no adjustment has been made for tax on the unfunded portion of the benefits paid from the PSS and CSS.

### ***Superannuation Guarantee***

- 6.16 It has been assumed that the Superannuation Guarantee rate will be maintained at 9% of salaries.
- 6.17 From 1 July 2008, scheme minimum benefits have been determined using Ordinary Time Earnings instead of the relevant scheme salary. We do not believe this has any material impact on the Unfunded Liability or the NECRs.

### **Demographic Assumptions**

- 6.18 Based on a detailed analysis of the membership experience for the three years from 1 July 2005 to 30 June 2008, the following decisions regarding the assumptions to be used in this investigation have been made. In all cases details of the revised assumptions adopted for this investigation are set out in Appendix B.

### ***Promotional Increases in Salaries***

- 6.19 Salary increases consist of general salary increases due to salary inflation together with increases due to promotion.
- 6.20 The general salary increases over the three years 1 July 2005 to 30 June 2008 have been higher than expected. This has led to the overall level of salary increases being higher than expected. As discussed in Section 6.12 the assumed rate of future general salary increases remains at 4.0% per annum.
- 6.21 The actual promotional salary increase experience of members of the PSS and CSS over the three years from 1 July 2005 to 30 June 2008 has broadly been in line with the rates of promotional salary increase assumed for the investigation as at 30 June 2005. Therefore the same assumptions for future promotional increases have been adopted for the investigation as at 30 June 2008.

### ***Mortality (Contributors and Preserved Members)***

- 6.22 The overall rate of mortality experience of contributors and preserved members has been lower than expected. We have therefore revised both the male and female mortality assumptions to more closely reflect the actual experience of the schemes.

### ***Invalidity Retirements***

- 6.23 The number of male contributors and preserved members retiring from the PSS due to invalidity has been lower than expected. The number of female contributors and preserved members retiring from the PSS due to invalidity has been higher than expected. We have revised the invalidity assumptions to more closely reflect the actual experience of the schemes.
- 6.24 The number of male contributors and preserved members retiring from the CSS due to invalidity has been lower than expected. We have revised the male invalidity assumptions to more closely reflect the actual experience of the schemes. The female invalidity assumptions remain unchanged.

### ***Retirement Assumptions***

- 6.25 A higher proportion of PSS and CSS contributors and preserved members are now assumed to retire at age 60 than was assumed in the 2005 Long Term Cost Report to reflect the effect of recent tax changes. The proportion of contributors and preserved members retiring between ages 55 and 59 are assumed to decrease as a result.

### **Resignation**

- 6.26 For all PSS members and CSS members aged less than 54, resignation experience has been higher than expected. However, we have retained the resignation assumptions from the 2005 investigation for these categories of members as the actual experience may reflect short term economic conditions. For CSS members aged 54, more members resigned than expected – for these members we have revised the assumptions to more closely reflect the experience of the schemes.

### **Retrenchments**

- 6.27 The retrenchment assumptions remain unchanged.

### **Mortality of Pensioners**

- 6.28 The analysis of experience over the three years to 30 June 2008 suggests that the mortality of male age pensioners is slightly lower than expected while the mortality for females is slightly higher than expected. We have revised the assumptions to reflect the actual experience.
- 6.29 For invalidity Pensioners, the experience analysis suggests that the mortality of invalidity pensioners with duration less than three years is lower than expected. We have revised the assumptions to reflect part of the actual experience. The ultimate mortality experience of the invalidity pensioners are broadly consistent with that expected. The ultimate mortality assumptions remain unchanged.
- 6.30 The assumptions for male dependent pensioners (widowers) remain unchanged. Lower mortality rates are assumed for female dependent pensioners (widows) to reflect the actual experience.
- 6.31 In addition we have applied the mortality improvements assumed in the 2005 actuarial investigation for the three year period 1 July 2005 to 30 June 2008 to obtain updated pensioner mortality assumptions for the year 1 July 2008 to 30 June 2009.

### **Future Mortality Improvements**

- 6.32 For the purposes of this investigation allowance for future improvements in the mortality rates of age pensioners has been made in accordance with the short and long term rates derived by the Australian Bureau of Statistics in conjunction with the Australian Government Actuary (as published in the Australian Life Tables 2000-02).
- 6.33 Our analysis of the experience of the PSS and CSS as well as other public sector schemes shows that recent mortality improvements have exceeded the short

term rates. Due to this, we have extended the period of short term (faster) improvements from 2009 (assumed in the 2005 Long Term Cost Report) to 2015.

### ***Retention of Benefits***

6.34 The proportion of benefits retained within the schemes on resignation and retrenchment has broadly been as expected. Therefore the same assumptions as for the 2005 investigation have been adopted for the 2008 investigation.

### ***Pension Option in the PSS***

6.35 The proportion of benefits taken as a pension from the PSS has been higher than expected. We have therefore increased the assumed proportion of benefits taken as a pension from 50% to 60%.

### ***Member Contributions to the PSS***

6.36 Members of the PSS are able to contribute at any integral rate from 2% to 10% of superannuation salary and the rate of benefit accrual is dependent on this contribution rate. As at 30 June 2008 the average contribution rate to the PSS was 5.8%.

6.37 However, despite this recent experience from 1 July 2008, members have the option to not contribute to the PSS. We have reduced the assumed contribution from 5.0% to 4.75% to reflect this change.

### ***Spouse Assumptions (Proportion Married and Age Difference)***

6.38 The experience analysis indicated that fewer female members were married than assumed for the 2005 investigation. We have revised the proportion married assumptions to more closely reflect the experience of the schemes.

6.39 The proportion of marriage of male members is broadly consistent with the expected experience. The assumptions for male members remain unchanged.

6.40 For the 2005 actuarial investigation it was assumed that male members were three years older than their spouse and that female members were two years younger than their spouse.

6.41 The experience analysis indicated that the assumption was broadly reasonable. There has been no change to our assumptions.

6.42 We have also made an allowance for same-sex dependants.

***Future New Entrants***

- 6.43 The PSS has been closed to new members since 1 July 2005. The CSS has been closed to new members since 1 July 1990. This actuarial investigation assumes that there are no future new entrants to either the PSS or CSS. In practice there may be some new entrants to the schemes in the future – for example members who had previously left employment with the Australian Government returning to work. However the level of future new entrants is not material.

seven Projected Employer Costs

seven

## seven Projected Employer Costs

7.1 The Employer Cost in each year is the total of funded contributions paid during the year plus benefits paid in that year that have been financed on an unfunded basis. The cost in each year is calculated as:

- Productivity superannuation contributions paid by the employer to the PSS and CSS Funds; plus
- benefit payments made from the CRF (including payments made under the Superannuation Act 1922); less
- payments made from the PSS and CSS Funds to the CRF.

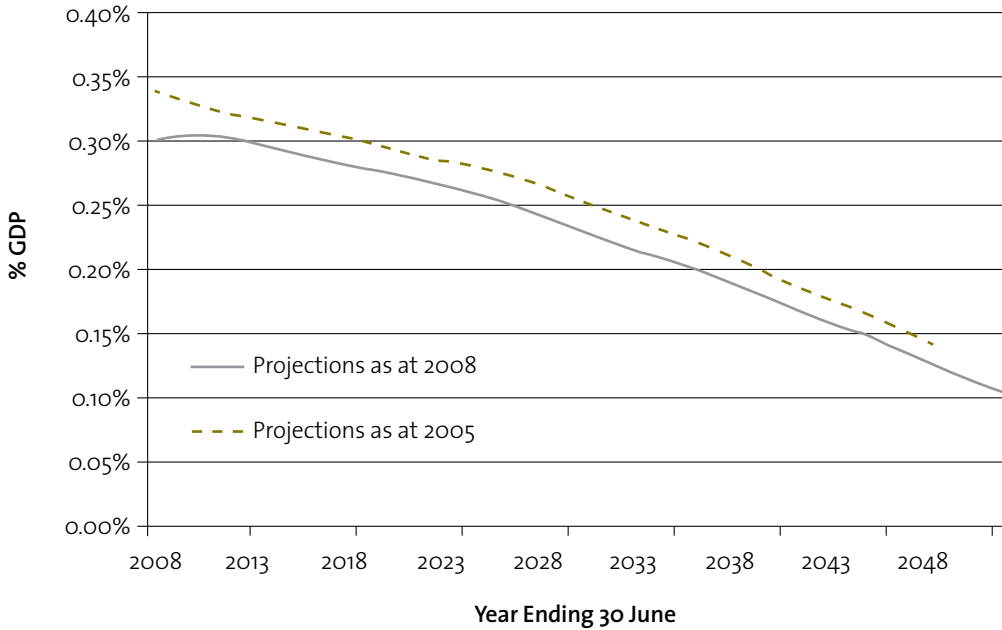
7.2 We have projected the outlay for the next 40 years based on the assumptions set out in Section 6. The table below summarises the projected outlay separately for the PSS and CSS and for the two schemes combined.

Projected Future Employer Costs							
Year ending 30 June	Nominal Costs (\$ millions)			Discounted Costs (\$ millions)			Nominal Costs as % of GDP
	PSS	CSS	Total	PSS	CSS	Total	
2009	521	3,150	3,671	506	3,059	3,566	0.30%
2010	568	3,241	3,809	521	2,969	3,490	0.31%
2011	611	3,365	3,975	528	2,909	3,436	0.31%
2012	650	3,483	4,134	530	2,841	3,371	0.31%
2013	699	3,596	4,295	538	2,767	3,304	0.30%
2014	768	3,702	4,470	558	2,687	3,245	0.30%
2015	842	3,799	4,640	576	2,601	3,177	0.30%
2016	918	3,892	4,810	593	2,514	3,107	0.29%
2017	1,005	3,980	4,985	612	2,425	3,038	0.29%
2018	1,109	4,060	5,170	638	2,334	2,972	0.28%
2019	1,219	4,136	5,355	661	2,243	2,904	0.28%
2020	1,337	4,202	5,540	684	2,150	2,834	0.28%
2023	1,756	4,356	6,112	754	1,872	2,626	0.26%
2028	2,618	4,419	7,037	840	1,419	2,259	0.24%
2033	3,619	4,225	7,844	868	1,013	1,882	0.21%
2038	4,636	3,774	8,410	831	676	1,507	0.18%
2043	5,638	3,092	8,730	755	414	1,169	0.15%
2048	6,063	2,267	8,331	607	227	834	0.11%

Notes: 1. The Discounted Costs have been adjusted to 2008 dollars using the discount rate of 6% per annum.  
2. The Projected Future Employer Costs include productivity superannuation contributions by approved agencies to schemes outside the CSS.

7.3 Employer Costs are expected to reduce as a percentage of projected GDP from 0.28% in the year ending 30 June 2009 to 0.11% in the year ending 30 June 2048.

7.4 The graph below shows projected outlays expressed as a percentage of GDP over the next 40 years compared to the equivalent figures from the previous investigation.



7.5 The main reason for the decline in costs compared with the 2005 projections is larger than expected growth in GDP since 1 July 2005.

7.6 The main reason for the decline over the next 40 years is that the schemes are closed to new entrants and the membership is ageing.



eight Unfunded liability

eight

## eight Unfunded Liability

- 8.1 The Unfunded Liability is the total accrued superannuation liability of the Australian Government in respect of service up to 30 June 2008 for which no assets are held.
- 8.2 The Unfunded Liability represents an estimate of the total accrued superannuation liabilities of the Australian Government in respect of service up to 30 June 2008 that will be charged to the Consolidated Revenue Fund (CRF).
- 8.3 The Unfunded Liability has been calculated as the present value of expected benefit payments from the CRF in respect of service accrued to 30 June 2008 less the accumulation of member and productivity superannuation contributions.
- 8.4 The table below shows the total Unfunded Liabilities for the PSS and CSS as at 30 June 2008. The liabilities are split between those in respect of contributors, pensioners, preserved members (former contributors who have preserved their benefits) and transferred members. The results calculated in 1999, 2002 and 2005 are also shown for comparison purposes.

All outstanding deferred transfer values in respect of the Telstra Superannuation Fund and the Australia Post Superannuation Fund were fully paid by the Australian Government during the period 1 July 2002 to 30 June 2005.

Estimate of Unfunded Liability as at 30 June (\$ billions)			
Liability for	2002	2005	2008
– Contributors	19.1	22.6	26.5
– Pensioners	30.5	35.2	44.6
– Preserved Members	6.0	6.6	9.0
– Transferred Members	2.8	0.0	0.0
<b>Total Unfunded Liability</b>	<b>58.4</b>	<b>64.4</b>	<b>80.1</b>
<b>Total Unfunded Liability (as a percentage of GDP)</b>	<b>8.4%</b>	<b>7.8%</b>	<b>6.6%</b>

Note: The prior year figures have not been adjusted to 2008 dollars.

8.5 The table below shows the total Unfunded Liabilities as at 30 June 2008 split between the PSS and CSS:

Estimate of Unfunded Liability as at 30 June 2008 (\$ billions)			
Liability for	PSS	CSS	Total
– Contributors	12.7	13.8	26.5
– Pensioners:			
1922 Pensioners	-	1.2	1.2
1976 Pensioners	-	37.8	37.8
1990 Pensioners	5.5	-	5.5
Total Pensioners	5.5	39.0	44.5
– Preserved Members	2.7	6.4	9.1
<b>Unfunded Liability</b>	<b>20.9</b>	<b>59.2</b>	<b>80.1</b>

## Summary of Changes in Unfunded Liability

8.6 We have projected the accrued Unfunded Liability as at 30 June 2005 to 30 June 2008 on the basis of the actuarial assumptions used in the 30 June 2005 actuarial investigation. The projected accrued Unfunded Liability on this basis as at 30 June 2008 is \$72.1 billion. The difference between the projected and actual unfunded liabilities is mainly due to differences between the actual experience of the schemes over the period and assumptions made. These differences included:

- salary increases being higher than expected;
- average notional crediting interest rates as implied by the exit rate at 30 June 2008 being higher than expected for both the PSS and CSS;
- the indexation of pensions in payment being higher than expected; and
- the takeup of pension benefits being higher than expected.

In addition part of the difference between the projected and actual unfunded liabilities is due to the assumptions adopted for the 2008 investigation being different from those adopted for the 2005 investigation. In total the changes in assumptions have resulted in an increase in the combined Unfunded Liability of the PSS and CSS of approximately \$2.57 billion as at 30 June 2008.

There has been a change in calculation methodology for the apportionment of the total liability between past and future membership from the 2005 Long Term Cost Report. This change has resulted in an increase in the combined Unfunded Liability of the PSS and CSS of approximately \$670 million as at June 2008.

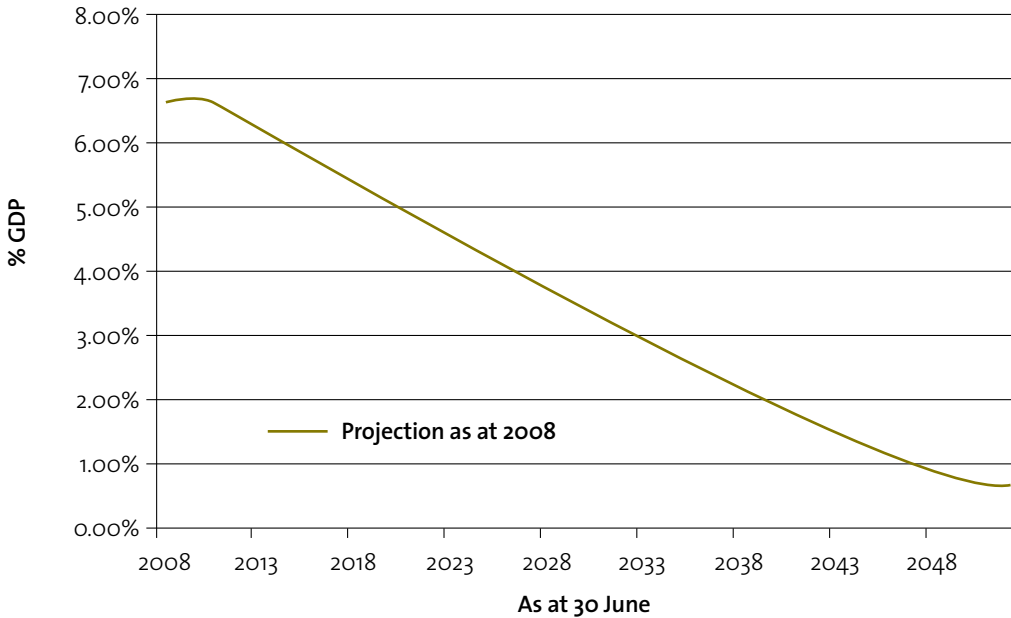
There have been several changes to the schemes' benefit designs since 1 July 2005 (refer Section 3). These changes have resulted in a decrease in the combined Unfunded Liability of the PSS and CSS of approximately \$80 million at 30 June 2008.

8.7 The table below shows the projected Unfunded Liability separately for the PSS and CSS and for the two schemes combined. It also reflects the combined Unfunded Liability as a percentage of future GDP.

Projected Unfunded Liability							
As at 30 June	Nominal Costs (\$ millions)			Discounted Costs (\$ millions)			Nominal Costs as % of GDP
	PSS	CSS	Total	PSS	CSS	Total	
2008	20.9	59.2	80.1	20.9	59.2	80.1	6.63%
2009	23.0	59.8	82.8	21.7	56.4	78.1	6.70%
2010	25.2	60.3	85.5	22.4	53.7	76.1	6.63%
2011	27.4	60.7	88.1	23.0	50.9	73.9	6.55%
2012	29.6	60.9	90.6	23.5	48.3	71.7	6.40%
2013	32.0	61.1	93.0	23.9	45.6	69.5	6.24%
2014	34.3	61.0	95.4	24.2	43.0	67.2	6.08%
2015	36.7	60.9	97.6	24.4	40.5	64.9	5.91%
2016	39.1	60.6	99.8	24.5	38.1	62.6	5.75%
2017	41.6	60.3	101.9	24.6	35.7	60.3	5.59%
2018	44.1	59.8	103.8	24.6	33.4	58.0	5.43%
2019	46.6	59.1	105.7	24.5	31.1	55.7	5.26%
2020	48.9	58.4	107.3	24.3	29.0	53.3	5.09%
2023	56.1	55.4	111.5	23.4	23.1	46.5	4.58%
2028	66.6	48.6	115.2	20.8	15.1	35.9	3.73%
2033	73.7	39.9	113.6	17.2	9.3	26.5	2.90%
2038	76.0	30.3	106.3	13.2	5.3	18.5	2.14%
2043	72.5	20.8	93.3	9.4	2.7	12.1	1.48%
2048	63.0	12.6	75.7	6.1	1.2	7.4	0.95%

Note: The discounted figures in the above table have been adjusted to 2008 dollars using the discount rate of 6% per annum, which has been used to calculate the present value of the liability at each date.

8.8 The graph below shows the projected Unfunded Liability as a percentage of future GDP.



8.9 The graph and table show that the Unfunded Liability as a percentage of projected GDP is expected to reduce steadily over time, mainly due to the closure of the Schemes and the ageing of the membership.



nine Notional Employer Contribution Rates



nine

## nine Notional Employer Contribution Rates

- 9.1 The Notional Employer Contribution Rates (NECRs) are the employer contribution rates necessary to ensure that employer-financed benefits payable from the PSS and CSS would remain fully funded in three years time, if they were fully funded now. The contribution rates are reduced to allow for any additional lump sums paid in the previous three years under the expanded agency assessment framework.
- 9.2 The table below sets out our estimate of the NECRs as at 30 June 2008. The corresponding rates calculated at previous investigations have also been shown for comparison purposes. These rates include the contributions towards the 3% productivity superannuation benefit.

Notional Employer Contribution Rates (% of Superannuation Salaries)			
Report as at	PSS	CSS	Combined
30 June 1999	14.2	21.9	17.2
30 June 2002	15.4	28.3	19.3
30 June 2005	15.6	28.2	18.3
30 June 2008*	16.3	21.4	17.1

\* New methodology

Note: The combined rates are weighted average rates based on the superannuation salaries of the members of the two schemes

- 9.3 The NECRs as at 30 June 2008, excluding the 3% employer productivity contributions are:

	PSS	CSS
30 June 2008	13.3%	18.4%

The CSS rate of 18.4% of superannuation salaries is the actual CSS 2008 rate for those agencies with separate productivity superannuation arrangements.

- 9.4 The combined rate represents the cost to the Australian Government of the superannuation benefits that are accruing for employees at the present time and has fallen as the PSS becomes relatively more dominant.
- 9.5 The contribution rate for the PSS as at 30 June 2008 has increased by 0.7% of superannuation salaries compared to the rate as at 30 June 2005. The contribution rate for the CSS as at 30 June 2008 has decreased by 6.8% of superannuation salaries compared to the rate as at 30 June 2005.
- 9.6 As described in Section 5, the significant change in the CSS NECR can be explained by the change in methodology relating to the apportionment of the total liability.



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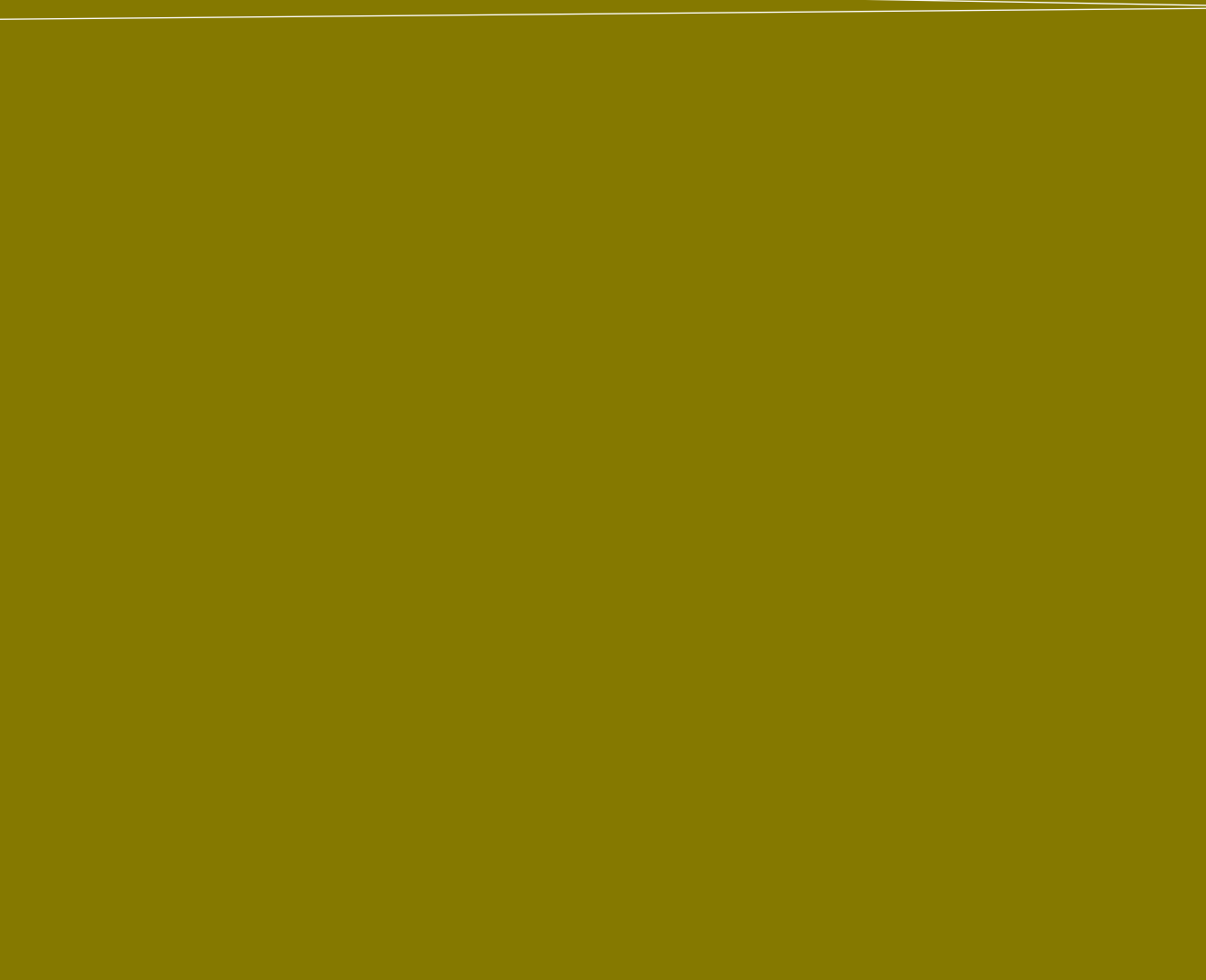


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December 2008



## appendix a Summary of Benefit Provisions



# appendix a Summary of Benefit Provisions

## The Superannuation Act 1990 (PSS)

### **Membership**

The PSS was closed to new entrants from 1 July 2005.

### **Superannuation Salary**

Generally, superannuation salary is basic salary plus any recognised allowances. Superannuation salary is the salary on commencement subject to adjustment on each birthday.

### **Final Average Salary**

Final Average Salary (FAS) is generally the average superannuation salary on the three birthdays before leaving the PSS.

### **Member Contributions**

Members can choose to contribute at any rate between 2% and 10% of superannuation salary. Members can also choose not to contribute to the PSS. The rate of contribution can be varied at any time.

### **Benefits**

The benefits from the PSS consist of three parts:

- the employer-financed component is determined as the Total Benefit net of the productivity and member component. This component is an untaxed benefit.
- the productivity component is made up of accumulated productivity contributions. This is a “taxed benefit”.
- the member-financed component is made up of accumulated member contributions. The investment earnings are a “taxed benefit”.

### **Total Benefit**

A member’s Total Benefit is calculated by multiplying the member’s Benefit Multiple by his or her FAS. A member’s Benefit Multiple increases with each contribution made. The Benefit Multiple consists of the Member’s share and the Employer’s share.

Total Benefit Multiple = Member's share of Benefit Multiple + Employer's share of Benefit Multiple

Member's share of Benefit Multiple = Member Contribution Rate (per year of service)

Employer's share of Benefit Multiple = Member Contribution Rate + 0.11 (per year of service)

### **10 year Rule – Restriction on Employer's Share of Benefit Multiple**

Employer's share of Benefit Multiple cannot be greater than that which would have accrued if member contributions had been made at 5% for 10 years (or total membership if less) and 10% for any membership in excess of that 10 years.

On death or disablement the 5% maximum average applies to prospective service until the 10-year period is notionally completed.

### **Maximum Benefit**

The maximum benefit allowable under the PSS is known as the Maximum Benefit Limit (MBL). For most members the MBL is 10 times the member's Final Average Salary. On reaching the MBL, a member will cease contributing to the scheme.

### **Retirement Benefits**

Retirement benefits are payable upon retirement on or after minimum retiring age (usually age 55), subject to general superannuation preservation rules.

The four options on retirement are as follows:

- Total pension – The benefits can be taken in the form of a total pension.
- Lump sum benefit – The three benefit components can be taken as a lump sum.
- Lump sum plus pension benefit – The benefits can be taken as a pension (subject to a minimum of 50% of the total benefit) and a lump sum.
- Preserve total benefit – The total benefit can be preserved in the PSS and later taken as a lump sum, indexed pension or a combination of both.

While a benefit is being preserved in the PSS, member and productivity components are increased at the Scheme allocation rate and the employer-financed component is adjusted annually in accordance with changes in the CPI.

### ***Invalidity Retirement***

The following benefit choices are available on retirement on medical grounds:

- Invalidity pension with no lump sum – This option provides for the payment of the three benefit components as an indexed pension. Under this option, the total benefit is calculated based on potential service to age 60 (assuming that the member will continue to contribute at their rate at retirement or 5% if more, but subject to a maximum average contribution of 5% for the first 10 years of service, actual or potential).

The total benefit is converted to an indexed pension using the same factors used to convert a lump sum to a pension on age retirement but assuming that the member is aged 60 at the time of invalidity retirement.

- Invalidity pension with a lump sum – Under this option, the member component can be taken as a lump sum. The remainder must be taken as an indexed pension.

The total benefit is calculated based on potential service to age 60 and the amount in excess of the member component is converted to an indexed pension.

### ***Death of a Contributor***

- Full pension with no lump sum  
A pension payable at the rate of 67% of the invalidity pension that would have been payable to the deceased plus 11% of the invalidity pension for each eligible child (until age 16 or if a full-time student, until age 25) with total pension limited to 100% of the invalidity pension.
- Part pension and part lump sum  
The spouse can convert up to half of the pension to a lump sum. The lump sum value of any children's pensions for children not living with the spouse is deducted from the lump sum. The benefits for the children are paid as a pension.
- Maximum lump sum and no pension  
This allows the spouse to take the benefit wholly as a lump sum except for the lump sum value of any pension payable to children who are not living with the spouse.

### ***Death of a Pensioner***

Pension payable based on the percentages that apply in respect of the death of a contributor, but using the pension payable to the deceased at the time of death. Therefore, if the retirement benefit was taken wholly as a lump sum then no further benefit is payable to the spouse or children.

### **Resignation**

The three benefit options are as follows:

- Preserve all benefits in the PSS.
- Immediate refund of member-financed benefit and preserve all employer-financed benefits in the PSS. Note that due to general superannuation preservation rules and the Scheme Rules under most circumstances all post 1 July 1999 contributions will be preserved within the scheme.
- Transfer all benefits to an eligible superannuation scheme.

### **Retrenchment**

On retrenchment, a PSS member has the option of:

- (a) taking his/her personal contributions and interest in cash, up to the limit allowed under general superannuation preservation rules, and preserving the rest of the benefit in the PSS; or
- (b) preserving the whole of the benefit in the PSS; or
- (c) transferring his/her benefit to another complying superannuation scheme; or
- (d) transferring his/her benefit to an eligible superannuation fund; or
- (e) taking his/her personal contributions and interest in cash, up to the limit allowed under general superannuation preservation rules, and taking the rest of the benefit as an immediate, non commutable, indexed pension; or
- (f) taking the whole benefit in the form of an immediate, non-commutable, indexed pension that has reference to a person's age.

### **Indexation**

Pensions are indexed twice yearly in line with changes in the CPI.

## The Superannuation Act 1976 (CSS)

### **Membership**

The CSS has been closed to new entrants since 1 July 1990.

### **Salary**

The salary used for contribution purposes is, in most cases, the annual rate of salary. Generally, the annual rate of salary is basic salary plus any recognised allowances on a member's last birthday.

### **Final Salary**

The salary used for calculating benefits is, in most cases, the annual rate of salary on a member's date of exit.

### **Member Contributions**

Basic contributions are 5% of salary. Supplementary contributions of up to a further 5% may be made. Contributions are accumulated with interest based on the crediting rates of the CSS Fund. Members can also choose not to contribute to the CSS. Any period where the member does not contribute does not count towards their contributory service.

### **Retirement Benefits**

Retirement benefits are payable upon retirement at maximum retirement age (usually age 65) or early retirement at ages 55 or above.

The amount of retirement benefit is the sum of:

- employer-financed indexed pension being a percentage of final salary based on the period of contributory service and discounted for early retirement before age 65;
- productivity component made up of accumulated productivity contributions or if a member elects can be taken as a non-indexed pension; and
- member-financed benefit made up of accumulated basic and supplementary contributions or an equivalent non-indexed pension.

### ***Employer-financed indexed pension***

The employer-financed pension is calculated as a percentage of final salary based on the period of contributory service and discounted for early retirement before age 65.

The discount factors for retirement prior to age 65 are age-dependent. They reduce at the rate of 0.02 per year from 1 at age 65 to 0.90 at age 60 and then at the rate of 0.03 per year to 0.75 at age 55.

The accrual rates are based on years of contributory service and on whether the member joined the:

- CSS before 1 July 1976,
- Former Provident Account before 1 July 1976, or
- CSS after 30 June 1976.

Generally, the accrual rates are 2% per annum for the first 20 years of membership, 1% per annum for the next 10 years, and 0.25% per annum for each of the next 10 years. The maximum percentage is 52.5% of salary.

### ***Invalidity Retirement***

The following benefits are payable on invalidity retirement:

- an employer-financed indexed pension being a percentage of final salary based on the period of prospective service to maximum retirement age (usually 65).
- a lump sum of accumulated basic contributions or an additional non-indexed pension being a percentage of final salary based on the period of prospective service to maximum retirement age (usually age 65).
- a lump sum of accumulated supplementary and productivity contributions.

### ***Death of a Contributor***

A pension payable at the rate of 67% of the invalidity pension that would have been payable to the deceased, plus 11% of the invalidity pension for each eligible child (until age 16 or if a full-time student, until age 25) with total pension limited to 100% of the invalidity pension.

The accumulated productivity contributions and any supplementary contributions are also payable.

### ***Death of a Pensioner***

A pension payable based on the percentages that apply in respect of the death of a contributor, but using the pension payable to the deceased at the time of death.

### ***Resignation***

A lump sum benefit of accumulated member and productivity contributions is payable on resignation. A minimum employer-financed benefit of the SG contributions, accumulated with investment earnings is payable.

Alternatively, the member may elect to receive a preserved benefit. Under this option, generally on reaching age 55 and having retired from the workforce, the member will receive the following:

- an indexed pension based on 2.5 times the basic contributions accumulated to the date of payment converted to a pension;
- productivity contributions accumulated to the date of payment or if the member elects can be taken as a non-indexed pension; and
- member contributions (basic and supplementary) accumulated to the date of payment or an equivalent non-indexed pension.

Alternatively, the member can choose to take a transfer value of 3.5 times the accumulated basic contributions plus supplementary and productivity contributions, to an eligible superannuation arrangement.

### ***Retrenchment***

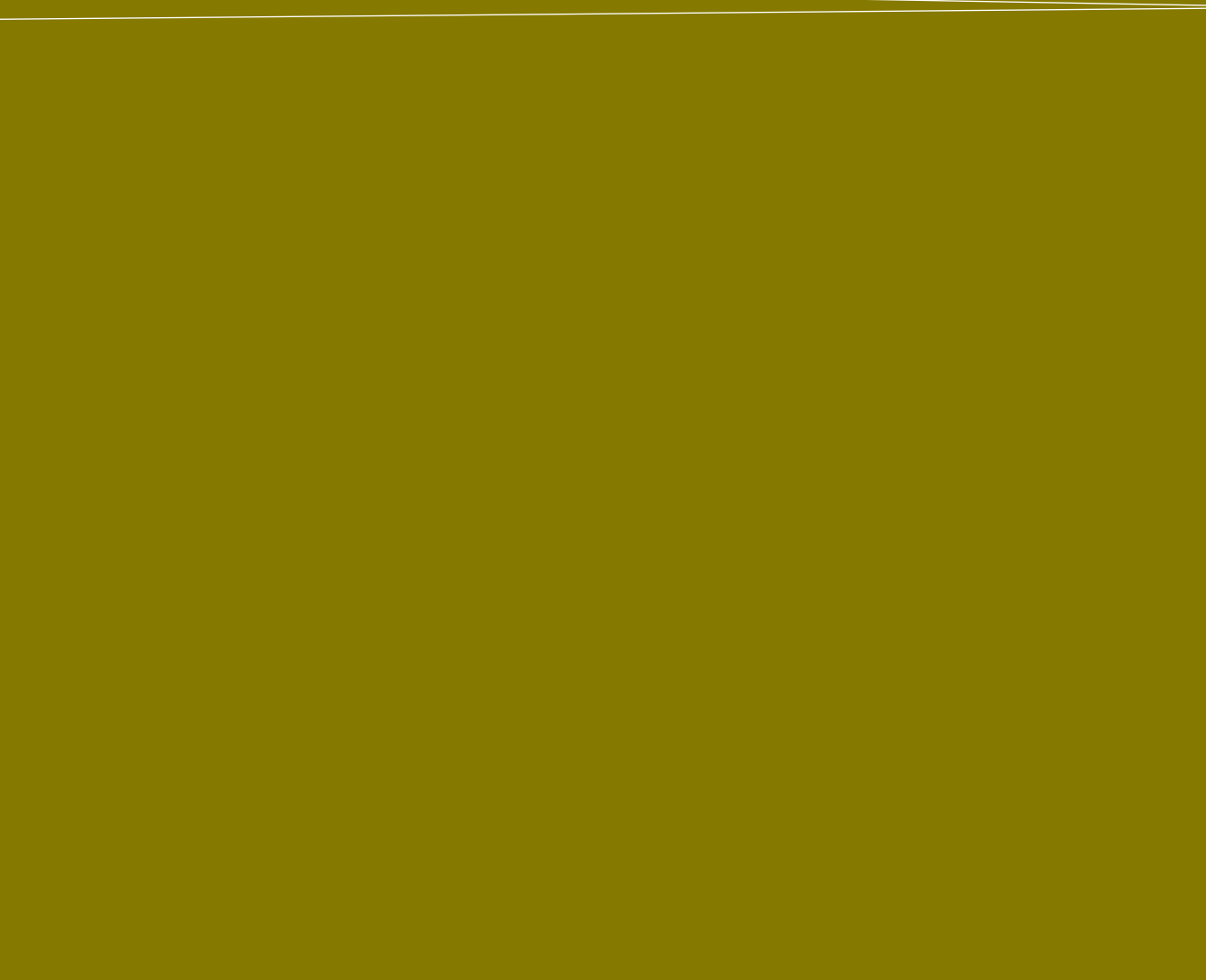
The benefit options available to a CSS member who is retrenched are similar combinations of pension (based on age) and lump sum as are available on age retirement.

In addition, the member may choose to preserve all benefits in the scheme, roll over the accrued benefit to a preservation fund if aged less than 55, or take the accrued benefit as a cash lump sum if aged 55 or more. For the purposes of rollover the accrued benefit is a lump sum of 2.5 times personal basic (5%) contributions together with all personal contributions and interest and any productivity contributions plus interest. Where the rollover is chosen the member may take their member contributions and interest in cash up to the limit allowed under the superannuation regulatory regime.

### ***Indexation***

Pensions are indexed twice yearly in line with changes in the Consumer Price Index. Pensions purchased with accumulated member contributions and productivity contributions are fixed in dollar terms and not subject to indexation.

## appendix b Detailed Assumptions



## appendix b Detailed Assumptions

### Economic Assumptions

The following table summarises the key economic assumptions adopted for this investigation.

Item	Assumption
CPI Increases	2.5% per annum
Investment Returns	6.0% per annum (nominal) 3.5% per annum (real)
General Salary Increases	4.0% per annum (nominal) 1.5% per annum (real)

### GDP Increase Rates

The table below reflects a sample of the expected nominal and real rates of GDP growth over the next 40 years.

Year	Rate per annum (nominal)	Rate per annum (real)
2008/2009	6.7%	4.2%
2009/2010	2.4%	-0.1%
2013/2014	5.3%	2.8%
2018/2019	4.9%	2.4%
2023/2024	4.8%	2.3%
2028/2029	4.8%	2.3%
2033/2034	4.8%	2.3%
2038/2039	4.8%	2.3%
2043/2044	4.7%	2.2%
2048/2049	4.6%	2.1%

The average assumed nominal GDP growth rate over the forty year period from 30 June 2008 is 4.9% per annum.

### Taxation

Allowance has been made for 15% tax payable on superannuation productivity contributions.

### Superannuation Guarantee

Allowance has been made for the Superannuation Guarantee rate to remain at 9% of salaries from 1 July 2002.

## Demographic Assumptions

### Promotional Salary Increases

The following tables show examples of the annual assumed percentage increase in salary due to promotion (excluding general salary increases due to inflation). Promotional salary increases are assumed to depend on both age and years of membership for the first 8 years of service and on age only thereafter.

Promotional Salary Increase Assumptions – Males (% per annum at age and membership shown)			
Age Attained	Membership Less than 4 Years	Membership 4 to 8 Years	Membership Greater than 8 Years
20	8.0%	4.0%	–
25	5.3%	3.1%	4.2%
30	3.5%	2.2%	2.7%
35	2.8%	1.6%	0.9%
40	2.8%	1.0%	1.5%
45	1.3%	0.5%	1.0%
50	0.4%	0.4%	0.0%
55	0.4%	0.4%	0.0%
60	0.4%	0.4%	0.0%
65	0.4%	0.4%	0.0%

Promotional Salary Increase Assumptions – Females (% per annum at age and membership shown)			
Age Attained	Membership Less than 4 Years	Membership 4 to 8 Years	Membership Greater than 8 Years
20	9.9%	2.6%	-
25	5.1%	1.8%	2.4%
30	4.0%	1.3%	2.1%
35	3.3%	1.1%	1.8%
40	3.3%	1.0%	0.0%
45	2.2%	1.0%	0.0%
50	1.0%	1.0%	0.0%
55	1.0%	1.0%	0.0%
60	1.0%	1.0%	0.0%
65	1.0%	1.0%	0.0%

For example a male aged 30 with 4 years of membership is assumed to have a promotional salary increase in the following year of 2.2% together with a general salary increase of 4.0%.

### ***Death and Invalidity Assumption***

Death and Invalidity Assumptions (per 1,000 contributors at age shown)						
Age Attained	PSS and CSS Deaths		PSS Invalidities		CSS Invalidities	
	Males	Females	Males	Females	Males	Females
25	0.23	0.12	0.09	0.09	0.18	0.12
30	0.31	0.14	0.18	0.19	0.32	0.32
35	0.40	0.21	0.35	0.41	0.57	0.61
40	0.50	0.28	0.57	0.71	0.79	1.03
45	0.69	0.45	1.16	1.06	1.27	1.64
50	0.97	0.68	2.21	1.49	1.94	2.55
55	1.38	1.14	3.40	2.88	3.05	4.26
60	2.03	1.86	n/a	3.34	6.01	6.46
64	2.78	2.62	n/a	n/a	6.93	8.04

### ***Age Retirement Assumptions***

Age Retirement Assumptions – PSS (per 1,000 contributors at age shown)				
Age Attained	Contributors		Preserved Members	
	Males	Females	Males	Females
55	70	80	240	290
56	55	70	60	60
57	55	68	55	60
58	55	70	52	50
59	70	75	55	60
60	140	150	118	120
61	92	130	75	80
62	90	200	82	80
63	80	100	95	100
64	60	100	150	150
65	1,000	1,000	1,000	1,000

Age Retirement Assumptions – CSS (per 1,000 contributors at age shown)				
Age Attained	Contributors		Preserved Members	
	Males	Females	Males	Females
55	40	80	740	740
56	30	40	240	160
57	39	49	190	150
58	39	58	190	140
59	57	67	240	120
60	180	199	450	270
61	93	152	350	200
62	98	157	330	200
63	116	171	350	300
64	116	179	400	500
65	1,000	1,000	1,000	1,000

### ***Contributor exits by Resignation***

Resignation Assumptions – PSS (per 1,000 contributors at age shown)				
Age Attained	Males		Females	
	Membership 0	Membership 10	Membership 0	Membership 10
20	109.7	0.0	104.1	0.0
25	121.0	60.1	125.7	36.8
30	106.4	53.1	108.9	61.2
35	93.1	46.7	90.0	43.9
40	81.3	41.1	75.9	33.8
45	69.3	32.7	66.6	27.6
50	60.2	29.6	61.0	26.9
<b>Factor*</b>	<b>0.86</b>	<b>0.89</b>	<b>0.92</b>	<b>0.95</b>

Resignation Assumptions – CSS (Age less than 54) (per 1,000 contributors at age shown)				
Age Attained	Males		Females	
	Membership 0	Membership 10	Membership 0	Membership 10
20	86.2	0.0	59.2	0.0
25	84.0	45.5	62.2	30.7
30	71.5	35.5	49.3	43.3
35	70.3	30.8	47.1	36.5
40	74.0	29.4	41.1	30.2
45	74.9	28.7	33.0	24.4
50	81.7	31.2	30.1	23.2
<b>Factor*</b>	<b>0.88</b>	<b>0.91</b>	<b>0.90</b>	<b>0.95</b>

\* These factors are used to determine rates for membership periods other than 0 and 10. The rate for membership period “y” where “y” is in the range 0-9 is derived by multiplying the membership 0 rate by the membership 0 factor raised to the power of “y”. For membership periods greater than 10 the rate for membership 10 is multiplied by the membership 10 factor raised to the power of “y-10”.

Resignation Assumptions – CSS (Age 54) (per 1,000 contributors at membership shown)		
Membership (Years)	Males	Females
0 - 20	600.0	600.0
Over 20	600.0	600.0

## Retrenchments

The table below shows the retrenchment rates assumed for PSS and CSS members.

Age Attained	Retrenchment Assumptions (per 1,000 contributors at age shown)			
	Males		Females	
	PSS	CSS	PSS	CSS
20	2.3	0.0	1.0	0.0
25	3.2	38.4	3.3	18.9
30	5.2	29.6	7.4	18.7
35	7.5	16.9	9.1	11.1
40	9.6	15.3	9.0	9.5
45	12.6	15.3	9.1	11.9
50	17.4	27.8	11.1	19.0
55	26.1	67.8	22.3	36.7
60	42.9	96.8	31.0	55.1

## Choice of Fund

PSS contributors have access to Choice of Fund from 1 July 2008. In the year to 30 June 2009, it is assumed that 7.5% of members exercise choice. From 1 July 2009 onwards, it is assumed that 0.75% of members exercise choice annually.

## Preservation on resignation or retrenchment

Members are generally required to retain their employer-financed benefits within the schemes. Members who join the PSS after 1 July 1999 are required to retain all their benefits within the scheme. For members who joined the PSS before 1 July 1999 the member-financed benefits may be taken as a lump sum on termination of service (subject to general preservation rules) or retained within the scheme. CSS members who elect not to retain their member financed benefit within the CSS on termination of service forfeit a significant part of their employer-financed benefit.

In the PSS it has been assumed that 60% of male and female members that joined the scheme before 1 July 1999 and resign will also retain their member accumulations within the PSS. Of the members who retain their member-financed benefits within the scheme it has been assumed that 60% of the lump sums will be converted to pensions.

In the CSS, it has been assumed that 90% of all benefits are retained within the scheme.

### ***Rate of take up of pension***

It has been assumed for the PSS that 60% of lump sum entitlements of age retirees and spouses of deceased contributors and 60% of the lump sum entitlements of members, who resign and preserve their entire benefit, will be converted to pensions. Invalid retirees must take a pension and members who do not preserve their member accumulations on resignation cannot take a pension.

Generally in the CSS, the employer component of the benefit must be taken as a pension.

### ***Pensioner Mortality***

The table below shows the mortality rates assumed for normal and dependent pensioners in the year 1 July 2008 to 30 June 2009.

<b>Pensioner Mortality Assumptions (per 1,000 pensioners at age shown)</b>				
<b>Age Attained</b>	<b>Males</b>		<b>Females</b>	
	<b>Age Retired</b>	<b>Widower</b>	<b>Age Retired</b>	<b>Widow</b>
20	0.43	0.90	0.20	0.28
30	0.55	1.16	0.25	0.34
40	0.69	1.42	0.49	0.67
50	1.30	2.91	1.12	1.65
55	1.99	4.84	1.83	2.69
60	3.47	8.15	2.90	4.14
65	6.91	13.89	4.77	6.48
70	12.94	24.07	8.88	10.78
75	24.31	38.48	15.96	18.37
80	48.29	64.28	30.83	34.23
90	162.04	174.28	122.40	118.76
100	379.48	373.59	362.67	352.79

The table below shows the mortality rates assumed for invalid pensioners with duration less than three years. The duration refers to the time since the member became an invalid pensioner.

Invalid Pensioner Mortality (per 1,000 pensioners at duration shown)		
Duration (Years)	Males	Females
0 - 1	86.45	43.70
1 - 2	42.75	24.70
2 - 3	28.50	23.75

The table below shows the mortality rates assumed in the 1 July 2008 to 30 June 2009 year for invalid pensioners with duration greater than three years.

Invalid Pensioner Mortality – Duration Greater than 3 Years (per 1,000 pensioners at age shown)		
Age Attained	Males	Females
20	0.79	0.44
30	0.96	0.54
40	1.29	1.04
50	2.46	2.40
55	3.93	4.08
60	7.04	6.65
65	13.05	10.99
70	22.40	18.43
75	36.37	29.99
80	63.92	47.81
90	171.52	156.51
100	373.59	371.36

### ***Improvements in Pensioner Mortality***

Improvements in mortality for age dependent pensioners, dependent pensioners and invalid pensioners with duration greater than three years have been taken from Australian Life Tables 2000-02. The 25 year experience in the Australian Life Tables 2000-02 has been used for the short term assumptions and the 105 year experience has been used for the long term assumptions.

No improvements in mortality are assumed in respect of invalid pensioners with duration less than three years.

The following table summarises the assumed rates of improvement in future pensioner mortality.

Assumed Rates of Mortality Reduction (% per annum)				
Age Attained	Short Term (1 July 2008 to 30 June 2015)		Long Term (1 July 2015 onwards)	
	Male	Female	Male	Female
60	3.27	2.46	1.20	1.40
70	2.75	2.40	0.90	1.21
80	2.06	2.14	0.73	1.05
90	1.40	1.44	0.46	0.61
100	0.83	0.89	0.64	0.71

### ***Member Contributions to the PSS***

Members of the PSS are assumed to contribute at the rate of 4.75% of superannuation salary throughout their future membership.

### ***New Entrants***

The PSS has been closed to new members since 1 July 2005. The CSS has been closed to new members since 1 July 1990. This actuarial investigation assumes that there are no future new entrants to either the PSS or CSS.

### ***Spouse Assumptions***

It has been assumed that the proportion of males who are married at 30 June 2008 (or at the commencement date of their pension if later) will gradually increase with age to 60% at age 42; remain constant to age 69; increase to 75% for ages 70 to 72 and then reduce.

It has been assumed that the proportion of females who are married at 30 June 2008 (or at the commencement date of their pension if later) will gradually increase with age to 44% at age 27; remain constant to age 62; and then reduce.

It has been assumed that 1% of males and females are in same-sex relationships.

It is assumed that male members are three years older than their spouses, and that female members are two years younger than their spouses.