KPMG

Modelling of Retirement Outcomes for DFRDB Members

Commonwealth Ombudsman
October 2019

*Modelling of Retirement Outcomes for members
of the Defence Force Retirement and Death Benefits Scheme
22 October 2019*

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Disclaimer

Inherent Limitations

This report has been prepared as outlined in the Approach section. The services provided in connection with this engagement comprise an advisory engagement, which is not subject to assurance or other standards issued by the Australian Auditing and Assurance Standards Board and, consequently no opinions or conclusions intended to convey assurance have been expressed.

No warranty of completeness, accuracy or reliability is given in relation to the statements and representations made by, and the information and documentation provided by, the Commonwealth Ombudsman personnel consulted as part of the process.

KPMG have indicated within this report the sources of the information provided. We have not sought to independently verify those sources unless otherwise noted within the report.

KPMG is under no obligation in any circumstance to update this report, in either oral or written form, for events occurring after the report has been issued in final form.

The findings in this report have been formed on the above basis. We have relied on the data and information provided by the Commonwealth Ombudsman and have assumed that it is prima facie accurate and complete. While generally we have satisfied ourselves that the data and information provided is reasonable and consistent with other data and information provided, and/or with data and information otherwise known to us, we have not sought to verify independently nor establish the reliability, accuracy or completeness of the data and information provided or used for this review. A list of the data provided to us is listed in Appendix 1.

Third Party Reliance

This report is solely for the purpose set out in the Approach section and for the Commonwealth Ombudsman's information.   Where the Ombudsman seeks to publish this report in support of the Ombudsman's report on its investigation of the administration of the DFRDB scheme, the entire report must be published.

This report has been prepared at the request of the Commonwealth Ombudsman in accordance with the terms of KPMG's Work Order dated 8 August 2019. Other than our responsibility to the Commonwealth Ombudsman, neither KPMG nor any member or employee of KPMG undertakes responsibility arising in any way from reliance placed by a third party on this report. Any reliance placed is that party's sole responsibility.

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1 Introduction

1.1 Introduction

The Commonwealth Ombudsman is undertaking an investigation into the administration of the Defence Force Retirement and Death Benefits (DFRDB) scheme. This investigation has a focus on the issue of commutation, specifically around the accuracy of information about commutation provided to scheme members by the Department of Defence and/or the Australian Defence Force and scheme administrators (including the Commonwealth Superannuation Corporation (CSC)).

As part of this investigation, the Commonwealth Ombudsman is seeking actuarial/financial modelling of the potential financial outcomes for a sample of members who retired from the Australian Defence Force (ADF) and commenced receipt of a pension from the DFRDB scheme between 1976 and 2015.

The Commonwealth Superannuation Corporation (CSC) has provided information for a sample of 12 retired members of the DFRDB scheme.   The information has been de-identified for these sample members and includes the following data items which are relevant to the actuarial modelling:

- Date of discharge from the ADF;

- Age at retirement from the ADF;

- Uncommuted Retirement Pay (pension level) at retirement;

- Retirement Pay, after commutation, at retirement;

- Commutation amount at retirement (the lump sum commutation taken);

- Life expectancy factor at retirement (used to calculate the reduction in pension due to the commutation).

The data also included the individual's Retirement Pay at 1 July 2019 and total pension received from commencement to 1 July 2019.

The Commonwealth Ombudsman requires modelling to compare the potential outcomes under two scenarios relating to the individual's election around the commutation of their pension upon retirement from the ADF in accordance with the options available under the *Defence Force Retirement and Death Benefits Act 1973* (DFRDB Act):

- Scenario 1: 'Actual scenario' - Commutation of the maximum portion of the pension payable from the DFRDB, with a commensurate permanent reduction of their fortnightly/annual pension (in accordance with the DFRDB Act).   This represents the actual decisions made by the sample individuals, i.e. all sample individuals made the election to commute the maximum amount of their pension.   Based on amounts

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commuted and in accordance with the DFRDB Act, the full amount of the reduced pension is subject to indexation; and

- Scenario 2: 'No commutation' – A hypothetical scenario, under which the member did not commute, hence did not receive any lump sum at retirement and there was no reduction in pension, as paid in the past or in the future.   In accordance with the DFRDB Act a portion of the pension paid and payable is indexed, with the remaining portion not being subject to indexation.

The Ombudsman's office specifically requested that the model compares the financial outcome from the two scenarios by accumulating the cash flows with the cash rate, and separately with the home loan rate and term deposit rate, to 1 July 2019 and into the future.

KPMG's role is to produce results using this methodology. We have projected the accumulated cash flows under each scenario to age 100 for each individual.

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2 Approach

KPMG has developed an actuarial model that projects the potential financial outcomes under the two given scenarios for the sample cases of individuals who have retired from the ADF and, at retirement, were eligible for a pension from the DFRDB scheme.

The financial outcome under each scenario is measured as the accumulated potential value had any lump sum commutation amount paid at retirement and all subsequent pension payments been accumulated with interest outside of the DFRDB scheme.   As such the outcome ignores any impact of the individual's use of the lump sum commutation amount and pension payments, effectively assuming that this would have been the same under both scenarios.

As requested by the Ombudsman, the model has calculated the financial outcome on three bases for the interest earned on the accumulated value outside of the DFRDB scheme:

- The cash rate – as if the individual had held any lump sum commutation amount and all pension payments in a cash savings account, which received monthly interest based on a cash rate;

- The term deposit rate – as if the individual had invested any lump sum commutation amount and all pension payments in rolling one year term deposits; and

- The home loan rate – as if the individual had utilised any lump sum commutation amount and all pension payments to reduce a home loan debt, which was subject to interest at the home loan rate.

Section 2.2 describes the sources and assumptions used for these rates.

The accumulated values have been calculated and compared at all ages from retirement to age 100. All sample cases provided commuted the maximum pension at retirement, illustrated as the 'Actual scenario'. Where the calculated accumulated values are higher under the 'No commutation' scenario, the increase in the accumulated values represents the potential financial detriment to the individual resulting from having made the decision to commute the maximum pension.

2.1 Data

This model has utilised the data for the twelve de-identified individuals supplied by the CSC, encompassing a range of individual profiles, in particular by date and age at retirement. A copy of the data is provided in Appendix 1.

We note that the exact dates of birth for the individuals have not been supplied and agreed with the Ombudsman that we should assume a date of birth of 1 July in the year indicated by the supplied age at retirement.

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For one individual, the data in relation to the commutation amount paid at retirement, and the commuted and uncommuted Retirement Pay indicated that a 'debt' amount owed by the individual to the DFRDB scheme was deducted from the commutation amount paid. It was agreed with the Ombudsman that we should adjust the data for this case so that the commutation amount was not reduced by this debt amount.

2.2   Financial inputs and assumptions

A range of financial inputs and assumptions were required in constructing the model.

The cash rate, used to apply interest to the accumulated values outside of the DFRDB scheme where it is assumed that the individual held any lump sum commutation amount and all pension payments in a cash savings account with a bank, was sourced from:

- The RBA's published Cash Rate Target from 2 August 1990, being the first date at which this data is available, to 1 July 2019;

- The Interbank Overnight Cash Rate published by the RBA for the period from 7 April 1976 to 1 August 1990;

- Deposit interest rates for the period prior to 7 April 1976.

The term deposit rate, used where it is assumed that the individual invested any lump sum commutation amount and all pension payments in rolling one year term deposits, was sourced from:

- The series 'Retail deposit and investment rates; Banks' term deposits ($10,000); 1 year', published by the RBA for the period from 1 July 1982, being the first date at which this data is available, to 1 July 2019; and

- The One Year Term Deposit rates provided by the Ombudsman for the period from 1 July 1976 to 30 June 1982.

The home loan rate, used where it is assumed that the individual utilised any lump sum commutation amount and all pension payments to reduce a home loan debt, was sourced from the series 'Lending rates; Housing loans; Banks; Variable; Standard; Owner-occupier' published by the RBA for the period to 1 July 2019.

The model assumes that interest on accumulated values at the cash rate and home loan rate is compounded monthly; whereas interest earned on term deposits is compounded annually on 1 July each year. Where interest is accumulated using the term deposit rates, the model conservatively assumes that pension payments received during a year attract interest at that year's term deposit rate, pro-rated for the part-year, even though the pension payments are not invested for the full year.

The following assumptions were provided by the Ombudsman:

- For periods post 1 July 2019:

  - The cash rate will be 2.0% per annum;

  - The term deposit rate will be 2.0% per annum;

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- The home loan rate will be 4.0% per annum;

- Indexation of the portion of pensions payable from the DFDRB scheme which are subject to indexation, reflecting changes in the Consumer Price Index (CPI), Pensioner and Beneficiary Living Cost Index (LCI) and male AWOTE indexation (MTAWE) as described below, will be at 2.0% per annum for recipients aged under 55 years, and 3.0% per annum for recipients aged 55 years and above.

The Ombudsman's requirement is that no allowance for tax – on any commutation amount, pension payments or interest – would be made in the comparisons for this purpose.

2.3   Indexation of pensions paid from the DFRDB scheme

A key driver of the modelled outcomes is the indexation of the pensions paid from the DFRDB scheme.   The model incorporates how pensions are indexed and how the indexation of pensions under the DFRDB Act has changed over time, as summarised below:

- Where the individual doesn't commute or commutes less than four times their annual retirement pay at retirement, a portion of the pension payable is subject to indexation, with the remaining portion of the pension not being indexed.   The portion of the pension that is subject to indexation is the amount of retirement pay which would be payable if the member had decided to commute four times their annual retirement pay entitlement.

- In relation to the portion of the pension that is subject to indexation:

  - Prior to 1 July 1976, the DFRDB Act did not provide for the indexation of DFRDB pensions. Increases to DFRDB pensions were authorised through separate annual Acts between 1 October 1972 and mid-1976 with increases assessed as the lesser of 1.4 times the increase in CPI, or the respective change in male average weekly earnings.

  - Effective from 1 July 1976 the *Defence Force (Retirement and Death Benefits Amendments) Act 1977* introduced annual inflation, effective each 1 July, as measured by the positive movement in the 'All Groups Consumer Price Index (CPI) number for the weighted average of 6 State capital cities' published in respect of the March quarter, including looking back to March 1975 index value (in the event that the index had dropped since this date).

  - Effective from 1 July 1986, the *Defence Legislation Amendment Act 1987* amended the prior method of indexation to look back to the March 1986 index value onwards.

  - Between 10 October 1986 and 20 October 1989 the *Superannuation and Other Benefits Legislation Amendment Act 1986* reduced the pensions payable under the DFRDB scheme by 2%.

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- Effective from 1 January 2002, the *Superannuation Legislation Amendment (Indexation) Act 2001* amended the frequency of indexation to bi-annual increases, still based on positive movements in the prior quarter's CPI, applied each 1 January and 1 July, continuing to look back to March 1986.

- Effective from 1 July 2014, the *Defence Force Retirement Benefits Legislation Amendment (Fair Indexation) Act 2014* introduced an age-based method of indexation. For individuals under 55, the prior method of indexation linked to positive movements in CPI continued. For individuals over 55, this involved a 'triple indexation' approach based on the greater of:

  - Increases in CPI;

  - Increases in the All Groups Pensioner and Beneficiary Living Cost Index for the weighted average of the 8 capital cities (LCI); and

  - Increases in an 'indicative pension amount' which is linked to annualised male Average Weekly Earnings (MTAWE).

Under the DFRDB Act, all rates of pension indexation are rounded to the nearest 0.1%.

Appendix 3 details the historic rates of interest and indexation that have been utilised in the model.

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3   Results

3.1   Comparison of Retirement Pay and total pension received to 1 July 2019

As part of validating the modelled indexation to the pensions paid, we compared the calculated level of Retirement Pay as at 1 July 2019 and total pension received to 1 July 2019 under the model with these data points.

The below table compares the calculated and actual Retirement Pay and total pay as at 1 July 2019 for each case:

As at 1 July 2019	Actual Retirement Pay	Calculated	Difference	Actual total pension received	Calculated	Difference
Case #1 Retired 1976	$ 27,786	$ 29,724	7.0%	$ 700,261	$ 733,840	4.8%
Case #2 Retired 1976	$ 30,868	$ 33,021	7.0%	$ 761,903	$ 815,244	7.0%
Case #3 Retired 1986	$ 22,573	$ 22,847	1.2%	$ 501,594	$ 507,478	1.2%
Case #4 Retired 1990	$ 31,578	$ 33,074	4.7%	$ 658,704	$ 690,143	4.8%
Case #5 Retired 1991	$ 23,696	$ 23,772	0.3%	$ 478,605	$ 476,867	-0.4%
Case #6 Retired 1993	$ 30,270	$ 30,382	0.4%	$ 574,057	$ 576,593	0.4%
Case #7 Retired 1996	$ 67,702	$ 69,349	2.4%	$ 1,199,722	$ 1,229,765	2.5%
Case #8 Retired 2000	$ 81,966	$ 83,787	2.2%	$ 1,256,616	$ 1,285,502	2.3%
Case #9 Retired 2003	$ 29,444	$ 29,386	-0.2%	$ 390,649	$ 392,253	0.4%
Case #10 Retired 2007	$ 33,240	$ 33,209	-0.1%	$ 363,316	$ 363,565	0.1%
Case #11 Retired 2013	$ 52,604	$ 53,021	0.8%	$ 281,302	$ 284,721	1.2%
Case #12 Retired 2015	$ 90,445	$ 90,505	0.1%	$ 380,700	$ 383,201	0.7%

It is noticeable that there is greater variation between the actual and calculated Retirement Pay and total pensions paid for the individuals who retired earliest (Case #1 and Case #2 having retired in 1976).

All of the differences are 5% or below, except for Case #1 and Case #2 who retired in 1976.

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3.1.1 Financial outcome comparisons **as at 1 July 2019 – cash rates**

The below table shows the accumulated values under each scenario **as at 1 July 2019** for each case and the differences in the accumulated values under the 'No commutation' scenario compared to the 'Actual' scenario. The accumulated lump sum and pension payments are assumed to receive interest at the cash rate.

The table also shows the average cash rate applicable for each case over the period since their retirement.

As at 1 July 2019	Actual	Hypothetical No commutation	Difference in value	Average interest rate since retirement
Case #1 Retired 1976	$ 2,812,921	$ 2,508,695	$ (304,226)	7.7%
Case #2 Retired 1976	$ 3,111,741	$ 2,755,407	$ (356,333)	7.7%
Case #3 Retired 1986	$ 1,294,795	$ 1,101,482	$ (193,313)	6.2%
Case #4 Retired 1990	$ 1,543,540	$ 1,361,991	$ (181,549)	5.2%
Case #5 Retired 1991	$ 1,014,255	$ 886,546	$ (127,709)	4.7%
Case #6 Retired 1993	$ 1,166,290	$ 1,010,342	$ (155,948)	4.5%
Case #7 Retired 1996	$ 2,416,422	$ 2,176,430	$ (239,992)	4.3%
Case #8 Retired 2000	$ 2,386,260	$ 2,131,785	$ (254,474)	4.1%
Case #9 Retired 2003	$ 698,543	$ 552,407	$ (146,136)	3.8%
Case #10 Retired 2007	$ 646,559	$ 492,920	$ (153,639)	3.3%
Case #11 Retired 2013	$ 648,077	$ 395,886	$ (252,192)	1.9%
Case #12 Retired 2015	$ 1,011,404	$ 540,035	$ (471,369)	1.7%

For all cases, the scenario where there was no commutation has resulted in a lower accumulated value at 1 July 2019.

Cases #1 and #2 have exceeded the notional life expectancy which was used to calculate the reduction in their pension payments at retirement. As such they have received lower pension payments for a longer period than the period underlying the lump sum commutation amount at retirement. However the relatively high interest rates earned

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on the lump sum commutation amount have more than compensated for the lower total pension payments.

For Cases #3 to #12, who are within their notional life expectancy at 1 July 2019, the fact that they have received lower pension payments for a lesser period than the period used to calculate the lump sum commutation amount, contributes to the Actual scenario generating higher accumulated savings.

3.1.2 Financial outcome comparisons **as at 1 July 2019 – term deposit rates**

The below table shows the same results where the accumulated lump sum and pension payments are assumed to be invested in rolling twelve month term deposits.

As at 1 July 2019	Actual		Hypothetical No commutation		Difference in value		Average interest rate since retirement
Case #1 Retired 1976	$	2,636,232	$	2,417,058	$	(219,174)	7.1%
Case #2 Retired 1976	$	2,918,304	$	2,656,490	$	(261,815)	7.1%
Case #3 Retired 1986	$	1,345,343	$	1,158,301	$	(187,041)	6.2%
Case #4 Retired 1990	$	1,635,047	$	1,442,404	$	(192,643)	5.4%
Case #5 Retired 1991	$	1,073,105	$	938,756	$	(134,349)	4.9%
Case #6 Retired 1993	$	1,230,574	$	1,072,022	$	(158,552)	4.7%
Case #7 Retired 1996	$	2,562,265	$	2,316,519	$	(245,746)	4.5%
Case #8 Retired 2000	$	2,544,721	$	2,278,523	$	(266,198)	4.4%
Case #9 Retired 2003	$	747,794	$	590,591	$	(157,203)	4.3%
Case #10 Retired 2007	$	696,875	$	523,164	$	(173,710)	4.2%
Case #11 Retired 2013	$	671,744	$	404,693	$	(267,051)	2.7%
Case #12 Retired 2015	$	1,039,199	$	549,204	$	(489,995)	2.4%

Where savings are accumulated in rolling term deposits the scenario where there was No commutation has also resulted in a lower accumulated value at 1 July 2019 compared to the Actual scenario.

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For Case #1 and Case #2, who retired in 1976, and Case #3 who retired in 1986, the historic data for term deposit rates indicates that, for periods, these were lower than cash rates. This results in a lower differential in accumulated values between the Actual and No commutation scenarios than where cash rates are used.

For Case #4 to Case #12, the higher historic term deposit rates compared to cash rates result in higher differences in accumulated values than where cash rates are used.

3.1.3 Financial outcome comparisons **as at 1 July 2019 – home loan rates**

The below table shows the same results where the accumulated lump sum and pension payments are assumed to attract the home loan rates.

As at 1 July 2019	Actual	Hypothetical No commutation	Difference in value	Average interest rate since retirement
Case #1 Retired 1976	$ 5,555,157	$ 4,868,088	$ (687,070)	9.7%
Case #2 Retired 1976	$ 6,142,437	$ 5,343,124	$ (799,313)	9.7%
Case #3 Retired 1986	$ 2,451,874	$ 1,940,562	$ (511,313)	9.1%
Case #4 Retired 1990	$ 2,755,087	$ 2,243,832	$ (511,255)	8.2%
Case #5 Retired 1991	$ 1,754,970	$ 1,408,875	$ (346,095)	7.8%
Case #6 Retired 1993	$ 1,914,555	$ 1,542,927	$ (371,627)	7.5%
Case #7 Retired 1996	$ 3,795,352	$ 3,209,660	$ (585,692)	7.2%
Case #8 Retired 2000	$ 3,539,898	$ 2,970,689	$ (569,209)	7.1%
Case #9 Retired 2003	$ 986,035	$ 733,058	$ (252,976)	7.0%
Case #10 Retired 2007	$ 870,187	$ 621,083	$ (249,104)	6.8%
Case #11 Retired 2013	$ 771,959	$ 441,688	$ (330,271)	6.0%
Case #12 Retired 2015	$ 1,160,071	$ 588,201	$ (571,870)	5.6%

As expected, the differences in accumulated values under the scenarios are greater than if cash rates and term deposit rates are used, reflecting the higher interest rates.

The conclusions are similar to under Section 3.1.1 where cash rates were used to accumulate the cash flows.

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3.2 Projected financial outcomes

Appendix 2 shows the projected financial outcomes, in terms of projected accumulated values and differentials in accumulated values at the three interest rates, for all cases, from retirement to age 100 – as graphs for all cases, and additionally as tables for Case #8.

The tables below summarise each individual's current age, the age when the accumulated value under the 'No commutation' scenario is expected to exceed the value under the Actual scenario and the individual's notional life expectancy at retirement.

Where no age is shown in the column where the 'No commutation' scenario is expected to match the Actual scenario, this is not projected to occur before age 100.

3.2.1 Projected ages when accumulated values are higher under the hypothetical 'No commutation' scenario – **cash rates**

	Current age at 1 July 2019	Age when Hypothetical 'no commutation' value is higher	Notional life expectancy
Case #1 Retired 1976	87		72
Case #2 Retired 1976	81		72
Case #3 Retired 1986	69		72
Case #4 Retired 1990	77		78
Case #5 Retired 1991	63		72
Case #6 Retired 1993	65		77
Case #7 Retired 1996	72	99	73
Case #8 Retired 2000	71	88	74
Case #9 Retired 2003	54		77
Case #10 Retired 2007	53	89	72
Case #11 Retired 2013	65	82	80
Case #12 Retired 2015	60	77	74

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3.2.2 Projected ages when accumulated values are higher under the hypothetical 'No commutation' scenario – **term deposit rates**

	Current age at 1 July 2019	Age when Hypothetical 'no commutation' value is higher	Notional life expectancy
Case #1 Retired 1976	87		72
Case #2 Retired 1976	81		72
Case #3 Retired 1986	69		72
Case #4 Retired 1990	77		78
Case #5 Retired 1991	63		72
Case #6 Retired 1993	65		77
Case #7 Retired 1996	72		73
Case #8 Retired 2000	71	89	74
Case #9 Retired 2003	54		77
Case #10 Retired 2007	53	94	72
Case #11 Retired 2013	65	83	80
Case #12 Retired 2015	60	77	74

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3.2.3 Projected ages when accumulated values are higher under the hypothetical 'No commutation' scenario – **home loan rates**

	Current age at 1 July 2019	Age when Hypothetical 'no commutation' value is higher	Notional life expectancy
Case #1 Retired 1976	87		72
Case #2 Retired 1976	81		72
Case #3 Retired 1986	69		72
Case #4 Retired 1990	77		78
Case #5 Retired 1991	63		72
Case #6 Retired 1993	65		77
Case #7 Retired 1996	72		73
Case #8 Retired 2000	71		74
Case #9 Retired 2003	54		77
Case #10 Retired 2007	53		72
Case #11 Retired 2013	65	97	80
Case #12 Retired 2015	60	87	74

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4   Conclusion

The comparison between the Actual scenario and the hypothetical scenario where No commutation was elected by the individual is influenced by the year when the individual retired and the interest rates applicable over the period since retirement.

If the financial outcome is measured as the accumulated value of lump sum commutation amounts and pension payments, given interest rates and pension indexation, where the **interest rate is the cash rate**:

- As at 1 July 2019 all cases have a higher financial outcome under the 'Actual' scenario than under the 'No commutation' scenario [Section 3.1.1];

- If future pension payments are taken into account [Section 3.2.1]:

  - Cases #1 to Case #6 and Case #9 continue to have a higher financial outcome under the 'Actual' scenario up to age 100;

  - Case #7, Case #8, Case #10, Case #11 and Case #12 are projected to have a higher financial outcome under the 'No commutation' scenario at some age before age 100. We can see this in the graphs in Appendix 2 when the projections cross over.

Where the accumulated lump sum and pension payments are assumed to earn **interest reflecting rolling one year term deposits**:

- As at 1 July 2019 all cases continue to have a higher financial outcome under the 'Actual' scenario than under the 'No commutation' scenario [Section 3.2.1]:

  - For Cases #1 to Case #3, the differential between the 'Actual' scenario and 'No commutation' scenario is less than under cash rates;

  - For Cases #4 to Case #12, the differential is higher than under cash rates due to the more recent higher term deposit rates;

- If future pension payments are taken into account [Section 3.2.2]:

  - Cases #1 to Case #7 and Case #9 continue to have a higher financial outcome under the 'Actual' scenario up to age 100;

  - Case #8, Case #10, Case #11 and Case #12 are projected to have a higher financial outcome under the 'No commutation' scenario at some age before age 100.

Where the accumulated lump sum and pension payments are assumed to earn **interest at the home loan rate**:

- As at 1 July 2019 all cases have a higher financial outcome under the 'Actual' scenario than under the 'No commutation' scenario, with a higher differential than under cash and term deposit rates [Section 3.1.3];

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- If future pension payments are taken into account, only Case #11 and Case #12 are projected to be in a position where the accumulated values are higher under the 'No commutation' scenario at an age before age 100 [Section 3.2.3].

We note that, by requirement of the Ombudsman, the modelled outcomes do not allow for any tax paid – on the commuted lump sum, pension payments or income earned on accumulated amounts. Allowing for tax would impact the results to the extent that there are different tax treatments and tax rates applicable to lump sums, pensions and income, noting that tax treatments and rates, as well as marginal income tax rates, have varied over time.

Also by requirement of the Ombudsman, the modelled outcome ignores any impact of the individual's use of the lump sum commutation amount and pension payments, effectively assuming that this would have been the same under the three scenarios. By measuring outcome in terms of accumulated values only the model is not attributing any value to the economic enjoyment of having access to money earlier.

Finally, the modelling also does not provide a single result, in terms of the relative value of the three scenarios for each case. It also assumes that all individuals have survived from their date of retirement to 1 July 2019. A reasonable, alternative approach to determine a single value and to take into account the fact that some individuals will not have survived would be to apply mortality rates to the modelled outcomes, i.e. weighting the outcome at each age with the probability of surviving to and then dying at that age, based on appropriate mortality tables.
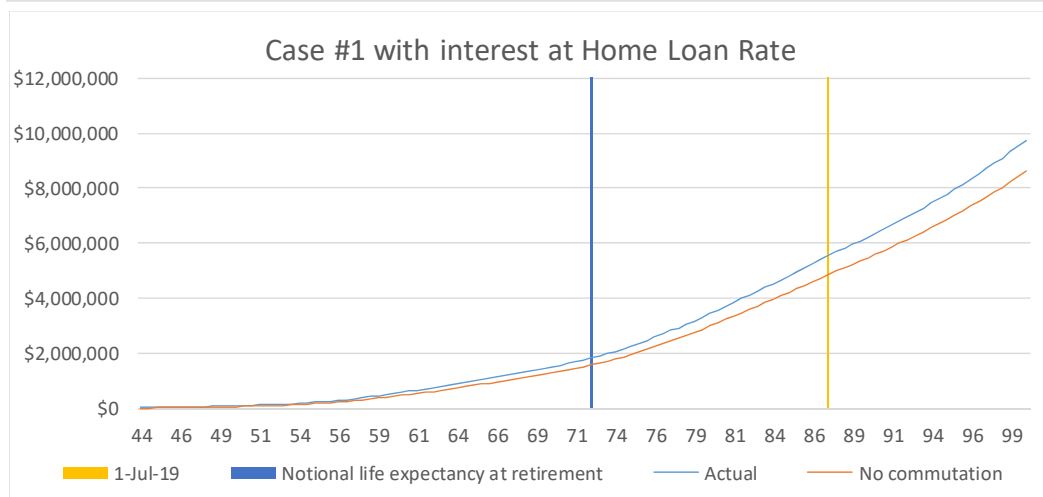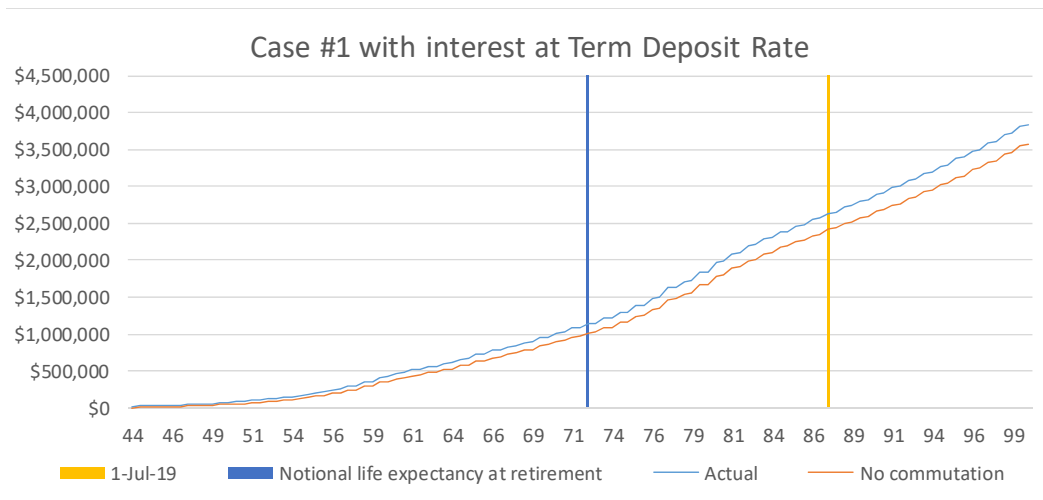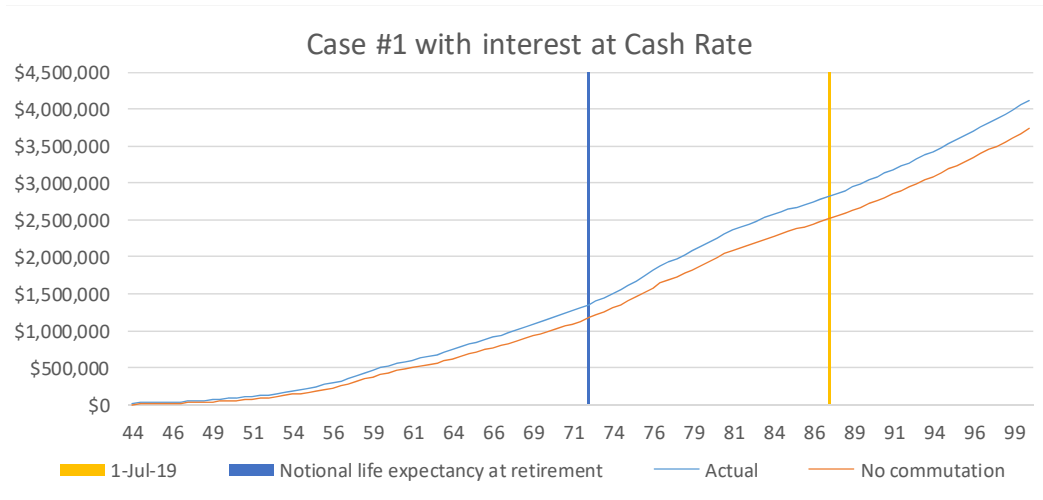
Appendix 1 - Data

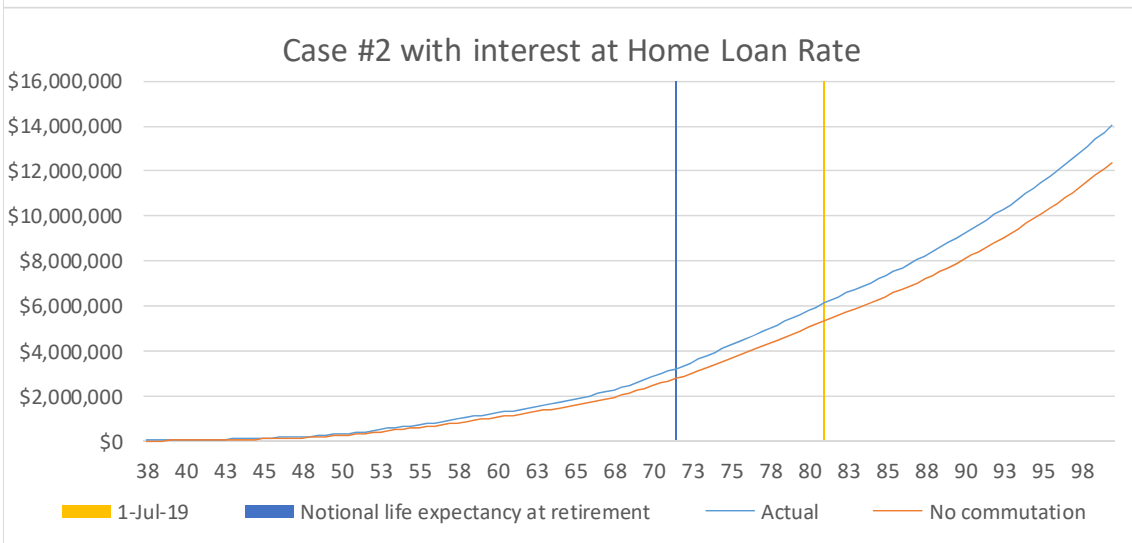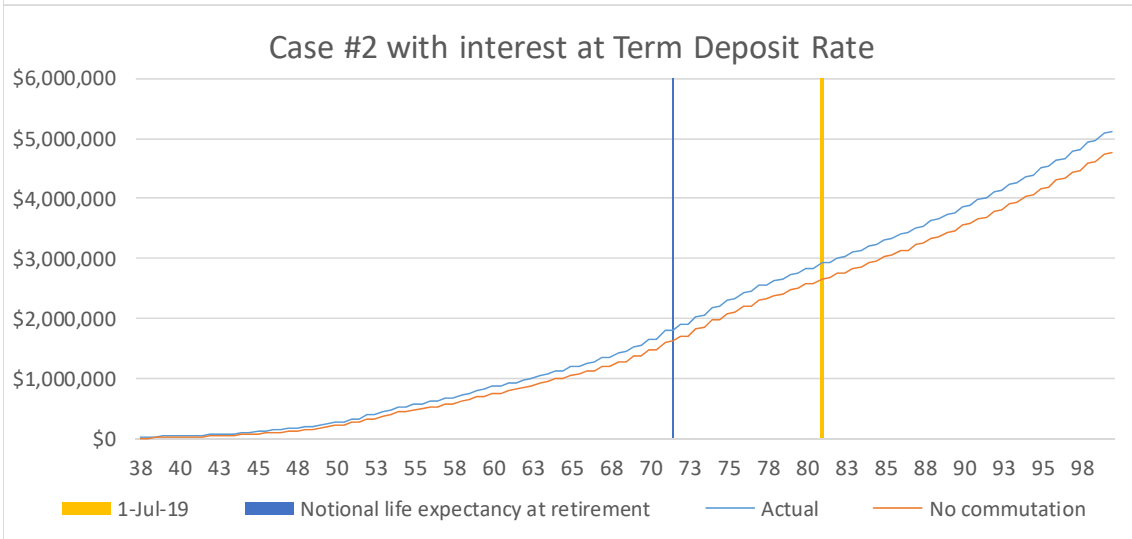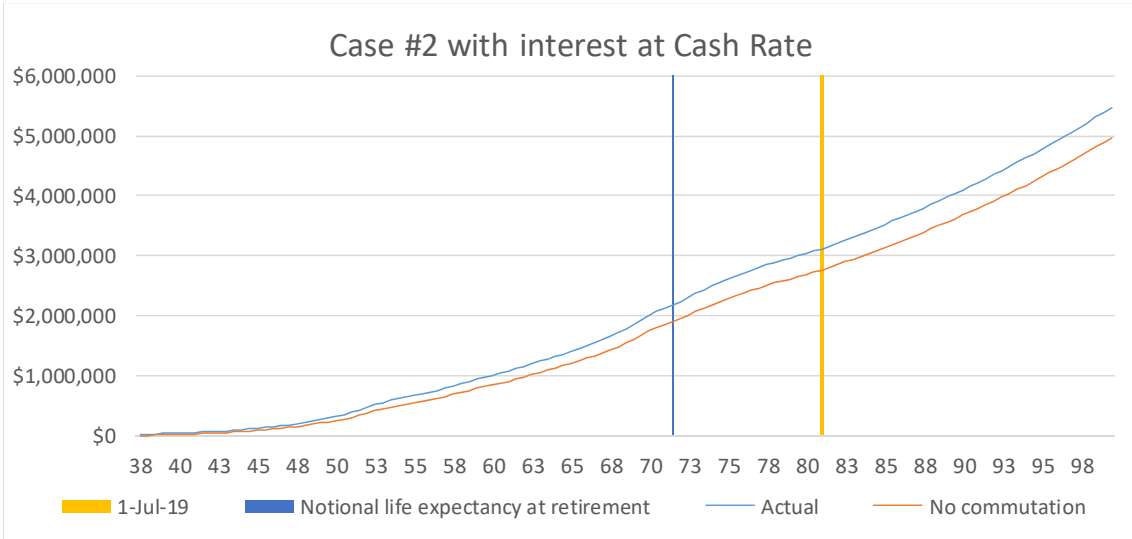| Case	Year of discharge	Salary used in calculations (Final salary)	Length of Effective Service	Percentage of Retirement Pay applicable to years of service	Actual Retirement Pay at retirement (Uncommuted)	Commutation multiplier	Commutation amount	Age at retirement	Life expectancy factor	Retirement Pay after commutation at retirement	Retirement pay at 1 July 2019	Total pension received from commencement to 1 July 2019	How much the member contributed (Actual dollars)
Case #1	1976	$12,536.00	21	36.50%	$4,575.64	4	$18,302.56	44	28.25	$3,927.76	$27,785.88	$700,260.58	$4,850.40
Case #2	1976	$12,536.00	23	39.50%	$4,951.72	4	$19,806.88	38	33.67	$4,363.46	$30,868.05	$761,903.10	$4,318.29
Case #3	1986	$26,558.00	20	35%	$9,295.30	4.2	$39,040.26	37	34.59	$8,166.64	$22,572.90	$501,594.40	$12,264.02
Case #4	1990	$49,364.00	20	35%	$17,277.40	4.35	$75,156.69	48	29.69	$14,746.02	$31,577.97	$658,703.97	$27,669.81
Case #5	1991	$37,818.00	21	36.50%	$13,803.57	4.45	$61,425.89	36	35.51	$12,073.75	$23,696.06	$478,604.59	$21,017.69
Case #6	1993	$56,066.00	22	38%	$18,109.32	4.55	$82,397.40	40	36.99	$15,881.76	$30,270.23	$574,056.84	$30,940.57
Case #7	1996	$84,518.00	33	57.75%	$47,344.87	4.65	$220,153.65	49	23.96	$38,156.49	$67,701.50	$1,199,722.01	$52,913.87
Case #8	2000	$96,972.00	36	6525%	$63,274.23	4.85	$306,880.02	52	21.51	$49,007.38	$81,966.22	$1,256,616.01	$73,475.55
Case #9	2003	$61,339.00	22	38%	$23,308.82	5	$116,544.10	39	37.92	$20,235.40	$29,444.02	$390,648.89	$39,800.93
Case #10	2007	$73,394.00	24	41%	$30,091.54	5	$150,457.70	41	30.93	$25,227.08	$33,240.28	$363,315.67	$51,128.79
Case #11	2013	$93,023.00	37	67.75%	$63,023.08	5	$315,115.40*	60	19.51	$46,871.60	$52,603.54	$281,301.56	$92,626.68
Case #12	2015	$149,339.00	40	76.50%	$114,244.33	5	$571,221.65	56	18.43	$83,250.21	$90,444.91	$380,700.24	$120,580.08

* For Case #11 the data in relation to the Commutation amount paid at retirement, the commuted and uncommuted Retirement Pay indicated that a 'debt' amount owed by the individual to the DFRDB scheme was deducted from the Commutation amount paid.   It was agreed with the Ombudsman that we should adjust the data for this case so that the Commutation amount was not reduced by this debt amount.   The figure used for Commutation amount is after this adjustment.
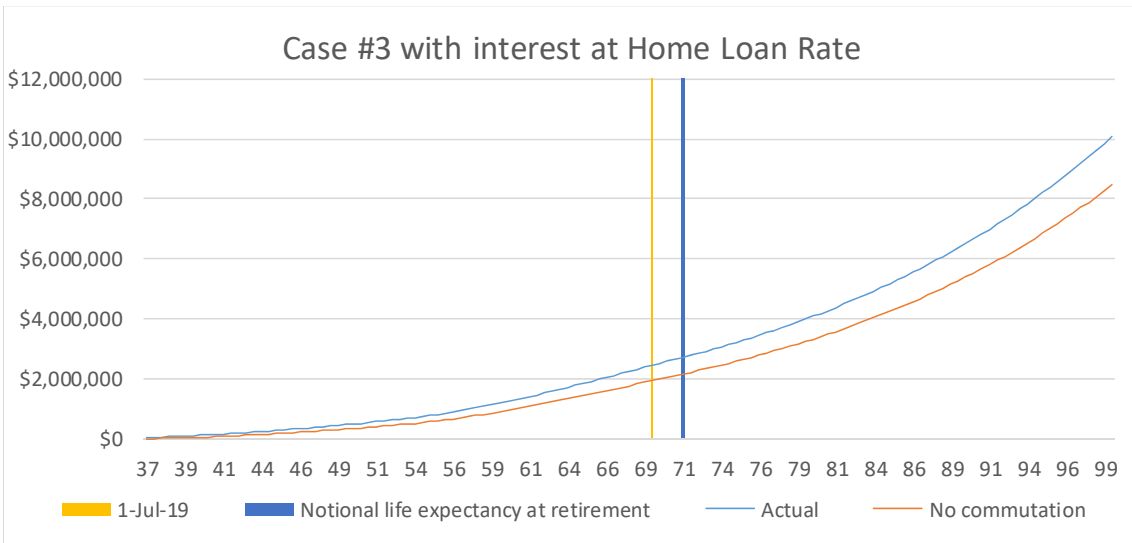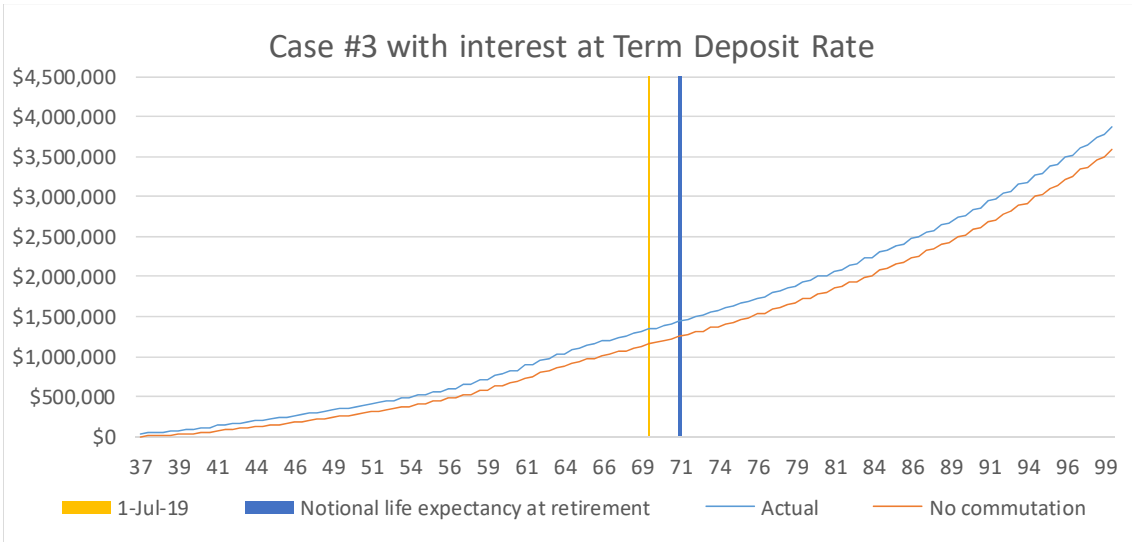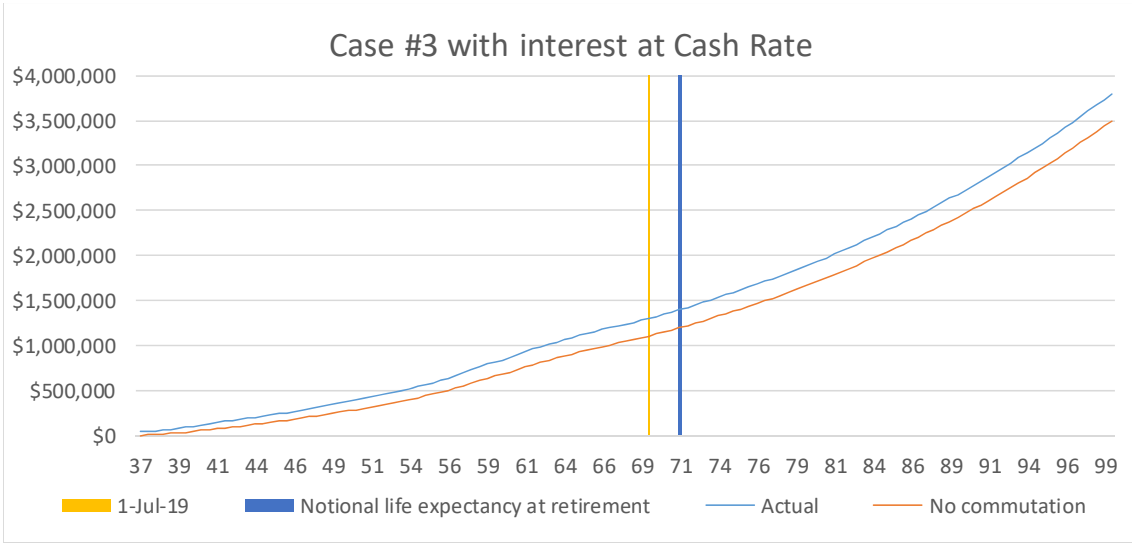
*Modelling of Retirement Outcomes for members
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Appendix 2 – Individual case outcomes

Case #1

Case #1 with interest at Cash Rate

Legend: 1-Jul-19 | Notional life expectancy at retirement | Actual | No commutation

Case #1 with interest at Term Deposit Rate

Legend: 1-Jul-19 | Notional life expectancy at retirement | Actual | No commutation

Case #1 with interest at Home Loan Rate

Legend: 1-Jul-19 | Notional life expectancy at retirement | Actual | No commutation

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Case #2

Case #2 with interest at Cash Rate

Case #2 with interest at Term Deposit Rate

Case #2 with interest at Home Loan Rate

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Case #3

Case #3 with interest at Cash Rate

Case #3 with interest at Term Deposit Rate

Case #3 with interest at Home Loan Rate

Modelling of Retirement Outcomes for members
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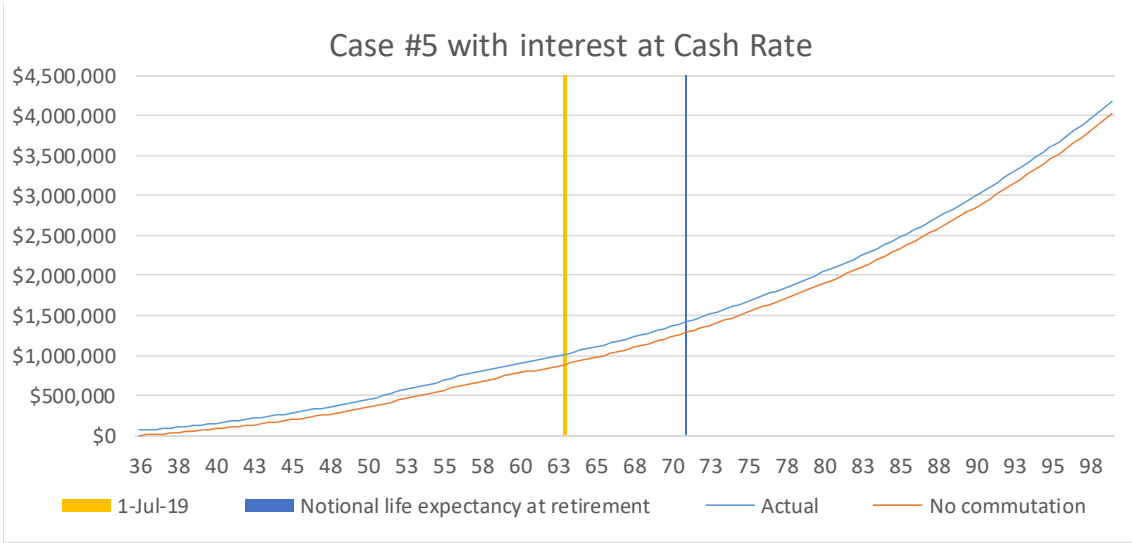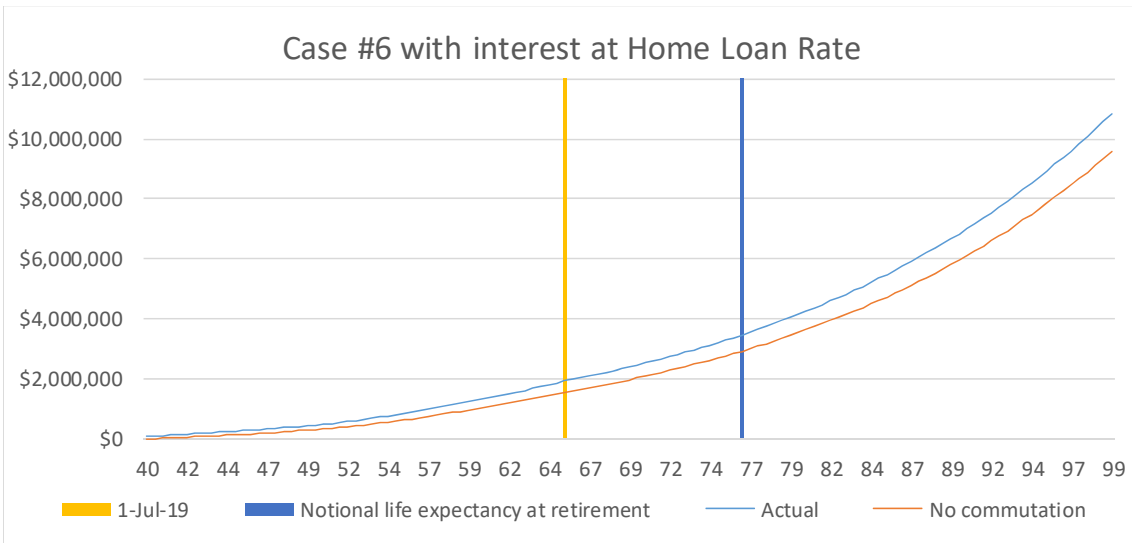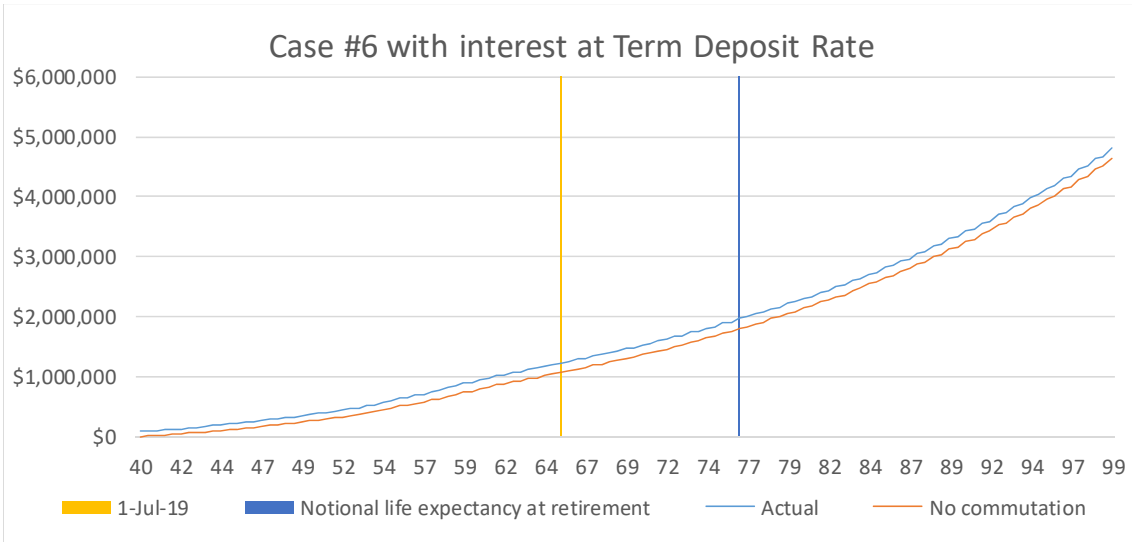*22 October 2019*

Case #4

Note: The notional life expectancy at retirement for Case #4 falls on 23 June 2019, one week prior to 1 July 2019 and is not visible in the graphs below.

Case #4 with interest at Cash Rate

Case #4 with interest at Term Deposit Rate

Case #4 with interest at Home Loan Rate

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Case #5

Case #5 with interest at Cash Rate

Case #5 with interest at Term Deposit Rate

Case #5 with interest at Home Loan Rate

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Case #6

Case #6 with interest at Cash Rate

Legend: 1-Jul-19 | Notional life expectancy at retirement | Actual | No commutation

Case #6 with interest at Term Deposit Rate

Legend: 1-Jul-19 | Notional life expectancy at retirement | Actual | No commutation

Case #6 with interest at Home Loan Rate

Legend: 1-Jul-19 | Notional life expectancy at retirement | Actual | No commutation

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Case #7

Modelling of Retirement Outcomes for members
of the Defence Force Retirement and Death Benefits Scheme
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Case #8

Case #8 with interest at Cash Rate

Legend: 1-Jul-19 | Notional life expectancy at retirement | Actual | No commutation

Case #8 with interest at Term Deposit Rate

Legend: 1-Jul-19 | Notional life expectancy at retirement | Actual | No commutation

Case #8 with interest at Home Loan Rate

Legend: 1-Jul-19 | Notional life expectancy at retirement | Actual | No commutation

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Case #9

*Modelling of Retirement Outcomes for members
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Case #10

Case #10 with interest at Cash Rate

Case #10 with interest at Term Deposit Rate

Case #10 with interest at Home Loan Rate

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Case #11

Case #11 with interest at Cash Rate

Case #11 with interest at Term Deposit Rate

Case #11 with interest at Home Loan Rate

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Case #12

Case #12 with interest at Cash Rate

Case #12 with interest at Term Deposit Rate

Case #12 with interest at Home Loan Rate

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Case #8

At the request of the Ombudsman, we have included the detailed modelling outcomes for Case #8 to age 100 in this report.

Case #8 – Cash rate

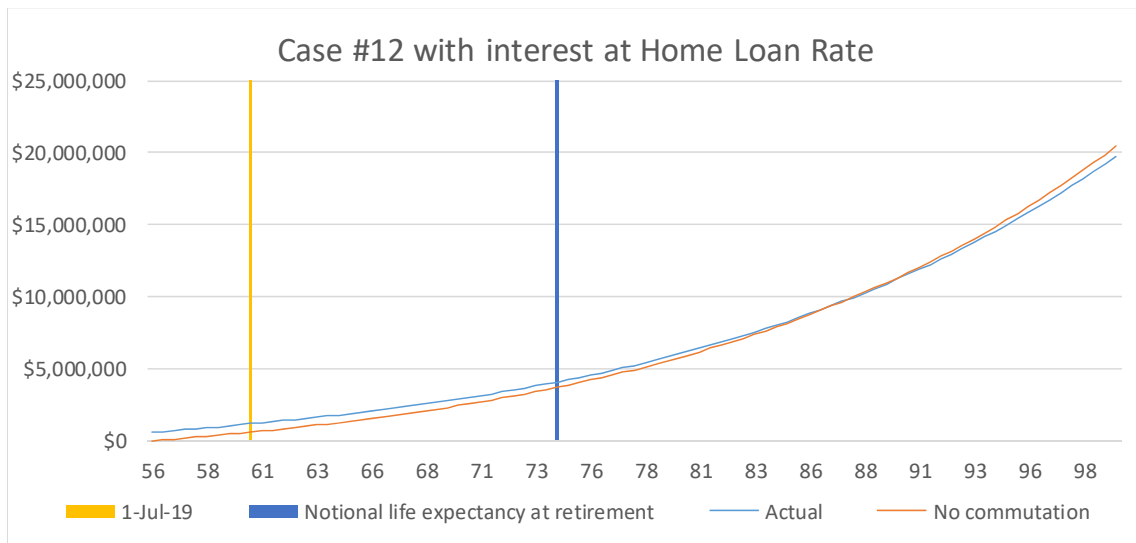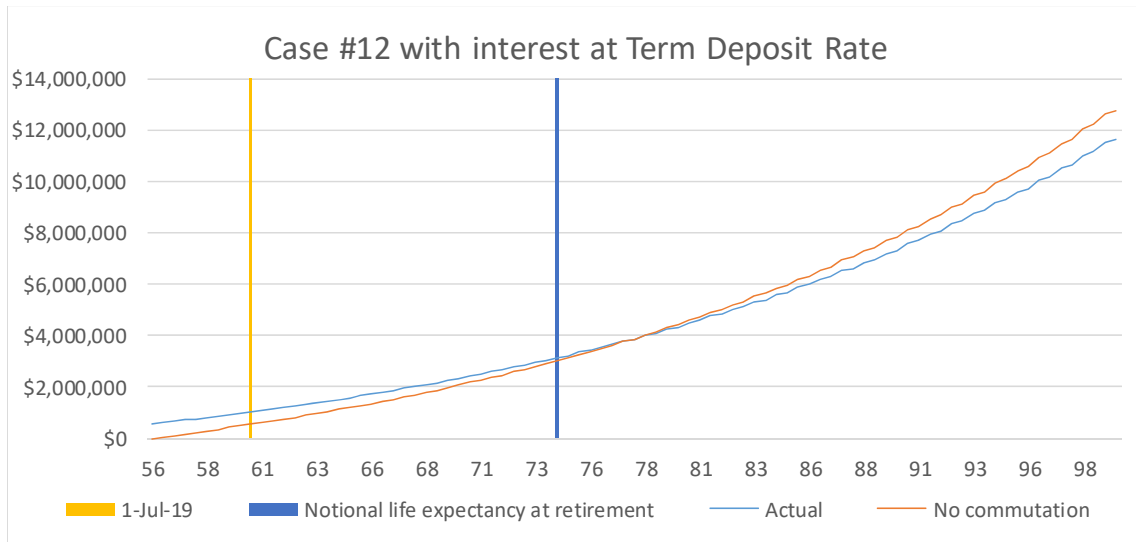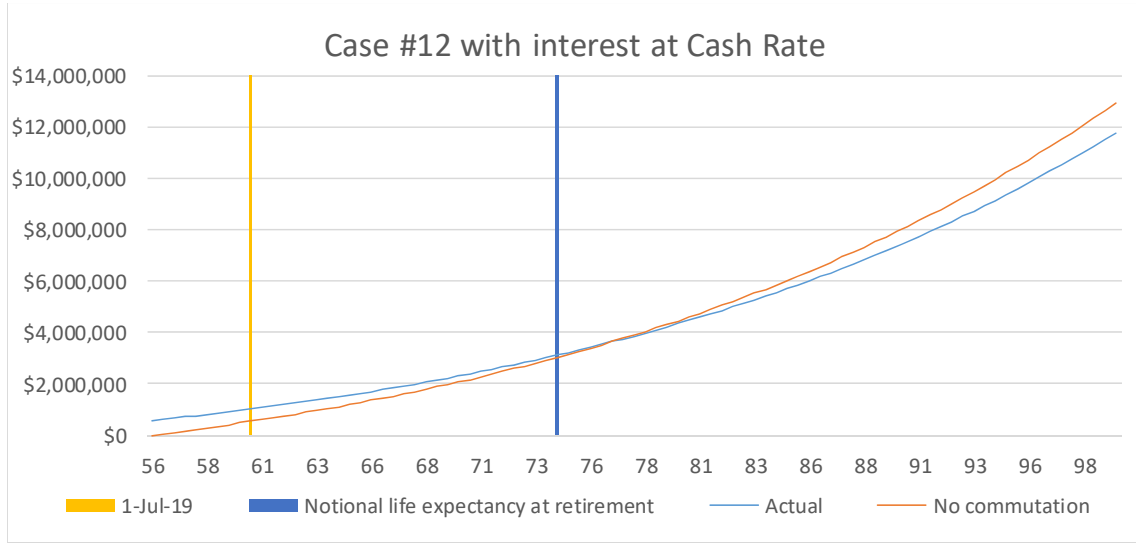| Date	Age	Actual scenario	Hypothetical No commutation scenario	Difference
8/05/2000	51.85	$306,880	$0	-$306,880
1/07/2000	52.00	$316,943	$9,397	-$307,546
1/07/2001	53.00	$387,467	$76,459	-$311,008
1/07/2002	54.00	$460,046	$149,625	-$310,421
1/07/2003	55.00	$538,904	$228,426	-$310,478
1/07/2004	56.00	$625,279	$313,858	-$311,421
1/07/2005	57.00	$718,771	$405,636	-$313,134
1/07/2006	58.00	$820,712	$505,146	-$315,565
1/07/2007	59.00	$935,715	$615,810	-$319,905
1/07/2008	60.00	$1,066,749	$740,012	-$326,738
1/07/2009	61.00	$1,186,032	$858,842	-$327,191
1/07/2010	62.00	$1,298,476	$974,691	-$323,785
1/07/2011	63.00	$1,430,523	$1,107,129	-$323,393
1/07/2012	64.00	$1,566,605	$1,244,795	-$321,811
1/07/2013	65.00	$1,689,970	$1,373,726	-$316,244
1/07/2014	66.00	$1,808,434	$1,499,917	-$308,517
1/07/2015	67.00	$1,928,887	$1,628,900	-$299,987
1/07/2016	68.00	$2,045,423	$1,755,471	-$289,952
1/07/2017	69.00	$2,155,995	$1,877,542	-$278,452
1/07/2018	70.00	$2,269,503	$2,002,886	-$266,617
1/07/2019	71.00	$2,386,260	$2,131,785	-$254,474
1/07/2020	72.00	$2,519,957	$2,276,604	-$243,353
1/07/2021	73.00	$2,658,557	$2,426,650	-$231,907
1/07/2022	74.00	$2,802,604	$2,582,509	-$220,095
1/07/2023	75.00	$2,952,287	$2,744,382	-$207,905
1/07/2024	76.00	$3,108,239	$2,912,949	-$195,290
1/07/2025	77.00	$3,269,807	$3,087,499	-$182,308
1/07/2026	78.00	$3,437,621	$3,268,709	-$168,912
1/07/2027	79.00	$3,611,896	$3,456,807	-$155,089
1/07/2028	80.00	$3,793,363	$3,652,578	-$140,785
1/07/2029	81.00	$3,981,258	$3,855,192	-$126,065
1/07/2030	82.00	$4,176,306	$4,065,429	-$110,877
1/07/2031	83.00	$4,378,754	$4,283,549	-$95,206
1/07/2032	84.00	$4,589,445	$4,510,454	-$78,991
1/07/2033	85.00	$4,807,486	$4,745,179	-$62,307
1/07/2034	86.00	$5,033,714	$4,988,622	-$45,092
1/07/2035	87.00	$5,268,410	$5,241,079	-$27,331
1/07/2036	88.00	$5,512,543	$5,503,588	-$8,955
1/07/2037	89.00	$5,765,074	$5,775,026	$9,952
1/07/2038	90.00	$6,026,967	$6,056,426	$29,458
1/07/2039	91.00	$6,298,541	$6,348,124	$49,583
1/07/2040	92.00	$6,580,912	$6,651,314	$70,402
1/07/2041	93.00	$6,872,871	$6,964,693	$91,822
1/07/2042	94.00	$7,175,527	$7,289,447	$113,919
1/07/2043	95.00	$7,489,243	$7,625,958	$136,715
1/07/2044	96.00	$7,815,301	$7,975,598	$160,297
1/07/2045	97.00	$8,152,298	$8,336,855	$184,558
1/07/2046	98.00	$8,501,509	$8,711,093	$209,584
1/07/2047	99.00	$8,863,345	$9,098,746	$235,400
1/07/2048	100.00	$9,239,279	$9,501,383	$262,105

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Case #8 – Term deposit rate

Date	Age	Actual scenario	Hypothetical No commutation scenario	Difference
8/05/2000	51.85	$306,880	$0	-$306,880
1/07/2000	52.00	$315,916	$9,382	-$306,534
1/07/2001	53.00	$386,371	$76,513	-$309,858
1/07/2002	54.00	$458,193	$149,526	-$308,668
1/07/2003	55.00	$534,885	$227,547	-$307,338
1/07/2004	56.00	$612,284	$308,827	-$303,457
1/07/2005	57.00	$701,194	$398,260	-$302,935
1/07/2006	58.00	$794,553	$492,841	-$301,713
1/07/2007	59.00	$900,893	$598,213	-$302,681
1/07/2008	60.00	$1,019,358	$714,249	-$305,110
1/07/2009	61.00	$1,165,341	$852,762	-$312,579
1/07/2010	62.00	$1,275,830	$967,474	-$308,356
1/07/2011	63.00	$1,423,653	$1,112,558	-$311,095
1/07/2012	64.00	$1,583,191	$1,269,310	-$313,881
1/07/2013	65.00	$1,730,520	$1,418,043	-$312,477
1/07/2014	66.00	$1,874,018	$1,565,231	-$308,788
1/07/2015	67.00	$2,013,752	$1,710,710	-$303,042
1/07/2016	68.00	$2,143,135	$1,848,466	-$294,668
1/07/2017	69.00	$2,274,396	$1,988,634	-$285,761
1/07/2018	70.00	$2,408,300	$2,132,029	-$276,271
1/07/2019	71.00	$2,544,721	$2,278,523	-$266,198
1/07/2020	72.00	$2,681,147	$2,425,881	-$255,266
1/07/2021	73.00	$2,822,500	$2,578,486	-$244,014
1/07/2022	74.00	$2,969,329	$2,736,928	-$232,402
1/07/2023	75.00	$3,121,824	$2,901,406	-$220,418
1/07/2024	76.00	$3,280,622	$3,072,605	-$208,017
1/07/2025	77.00	$3,445,058	$3,249,804	-$195,254
1/07/2026	78.00	$3,615,767	$3,433,683	-$182,084
1/07/2027	79.00	$3,792,964	$3,624,471	-$168,494
1/07/2028	80.00	$3,977,386	$3,822,955	-$154,431
1/07/2029	81.00	$4,168,254	$4,028,295	-$139,959
1/07/2030	82.00	$4,366,300	$4,241,274	-$125,026
1/07/2031	83.00	$4,571,771	$4,462,153	-$109,618
1/07/2032	84.00	$4,785,513	$4,691,837	-$93,676
1/07/2033	85.00	$5,006,621	$4,929,350	-$77,271
1/07/2034	86.00	$5,235,937	$5,175,592	-$60,345
1/07/2035	87.00	$5,473,740	$5,430,859	-$42,881
1/07/2036	88.00	$5,721,006	$5,696,193	-$24,813
1/07/2037	89.00	$5,976,681	$5,970,458	-$6,222
1/07/2038	90.00	$6,241,734	$6,254,692	$12,958
1/07/2039	91.00	$6,516,483	$6,549,229	$32,746
1/07/2040	92.00	$6,802,047	$6,855,265	$53,217
1/07/2041	93.00	$7,097,206	$7,171,485	$74,280
1/07/2042	94.00	$7,403,072	$7,499,080	$96,009
1/07/2043	95.00	$7,720,005	$7,838,430	$118,424
1/07/2044	96.00	$8,049,292	$8,190,905	$141,613
1/07/2045	97.00	$8,389,517	$8,554,987	$165,470
1/07/2046	98.00	$8,741,959	$8,932,039	$190,080
1/07/2047	99.00	$9,107,026	$9,322,492	$215,466
1/07/2048	100.00	$9,486,191	$9,727,918	$241,726

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Case #8 – Home loan rate

Date	Age	Actual scenario	Hypothetical No commutation scenario	Difference
8/05/2000	51.85	$306,880	$0	-$306,880
1/07/2000	52.00	$324,914	$9,516	-$315,398
1/07/2001	53.00	$404,143	$77,642	-$326,502
1/07/2002	54.00	$486,305	$153,121	-$333,184
1/07/2003	55.00	$576,392	$235,741	-$340,650
1/07/2004	56.00	$676,037	$326,653	-$349,384
1/07/2005	57.00	$785,775	$426,080	-$359,695
1/07/2006	58.00	$907,219	$535,676	-$371,543
1/07/2007	59.00	$1,045,048	$658,920	-$386,128
1/07/2008	60.00	$1,202,342	$798,210	-$404,132
1/07/2009	61.00	$1,373,815	$950,827	-$422,988
1/07/2010	62.00	$1,531,143	$1,096,830	-$434,313
1/07/2011	63.00	$1,723,397	$1,270,866	-$452,531
1/07/2012	64.00	$1,932,368	$1,460,573	-$471,795
1/07/2013	65.00	$2,140,047	$1,651,932	-$488,115
1/07/2014	66.00	$2,350,029	$1,847,598	-$502,431
1/07/2015	67.00	$2,572,029	$2,055,169	-$516,860
1/07/2016	68.00	$2,798,316	$2,268,313	-$530,003
1/07/2017	69.00	$3,032,378	$2,489,607	-$542,772
1/07/2018	70.00	$3,277,378	$2,721,883	-$555,495
1/07/2019	71.00	$3,539,898	$2,970,689	-$569,209
1/07/2020	72.00	$3,770,711	$3,194,695	-$576,016
1/07/2021	73.00	$4,012,879	$3,429,931	-$582,948
1/07/2022	74.00	$4,267,585	$3,677,558	-$590,027
1/07/2023	75.00	$4,535,419	$3,938,167	-$597,252
1/07/2024	76.00	$4,817,790	$4,213,144	-$604,647
1/07/2025	77.00	$5,113,802	$4,501,629	-$612,173
1/07/2026	78.00	$5,424,882	$4,805,031	-$619,851
1/07/2027	79.00	$5,751,734	$5,124,050	-$627,684
1/07/2028	80.00	$6,096,060	$5,460,366	-$635,694
1/07/2029	81.00	$6,456,746	$5,812,907	-$643,839
1/07/2030	82.00	$6,835,515	$6,183,372	-$652,143
1/07/2031	83.00	$7,233,206	$6,572,599	-$660,606
1/07/2032	84.00	$7,651,866	$6,982,612	-$669,254
1/07/2033	85.00	$8,090,124	$7,412,085	-$678,039
1/07/2034	86.00	$8,550,053	$7,863,065	-$686,988
1/07/2035	87.00	$9,032,650	$8,336,551	-$696,099
1/07/2036	88.00	$9,540,379	$8,834,980	-$705,399
1/07/2037	89.00	$10,071,554	$9,356,715	-$714,839
1/07/2038	90.00	$10,628,667	$9,904,224	-$724,443
1/07/2039	91.00	$11,212,904	$10,478,693	-$734,211
1/07/2040	92.00	$11,827,223	$11,083,052	-$744,171
1/07/2041	93.00	$12,469,560	$11,715,293	-$754,267
1/07/2042	94.00	$13,142,907	$12,378,379	-$764,527
1/07/2043	95.00	$13,848,671	$13,073,721	-$774,950
1/07/2044	96.00	$14,590,400	$13,804,837	-$785,562
1/07/2045	97.00	$15,365,577	$14,569,270	-$796,306
1/07/2046	98.00	$16,177,785	$15,370,576	-$807,209
1/07/2047	99.00	$17,028,698	$16,210,431	-$818,267
1/07/2048	100.00	$17,922,562	$17,093,051	-$829,510

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Appendix 3 – Financial modelling rates

Below is a table summarising the interest and indexation rates that have been used in the retirement income model effective as at 1 July each year. The Term Deposit rates for periods prior to 1 July 1982 were provided by the Ombudsman.

The actual rates used in the model reflect changes in the cash and home loan rates between 1 July of each year and changes in CPI and LCI indexation on a biannual basis from 1 January 2002.

	Cash (%)	Home Loan (%)	Term Deposit (%)	CPI (%)	LCI (%)
1/07/1975	10.8	10.1	*8.2*		
1/07/1976	8.8	9.9	*8.0*	13.1	
1/07/1977	9.9	9.9	*7.8*	13.3	
1/07/1978	10.3	9.4	*7.3*	8.7	
1/07/1979	12.0	9.1	*7.5*	8.0	
1/07/1980	20.0	10.3	*9.0*	10.4	
1/07/1981	17.5	11.5	*11.9*	9.4	
1/07/1982	19.6	13.5	13.5	10.8	
1/07/1983	14.5	12.5	11.9	11.4	
1/07/1984	13.8	11.5	11.5	5.8	
1/07/1985	16.1	12.5	12.2	4.4	
1/07/1986	15.9	15.5	13.7	9.2	
1/07/1987	12.8	15.5	13.4	9.4	
1/07/1988	12.9	14.5	12.2	6.8	
1/07/1989	17.5	17.0	15.6	6.8	
1/07/1990	15.0	16.4	14.5	8.7	
1/07/1991	10.5	13.0	10.0	4.8	
1/07/1992	6.5	10.3	6.2	1.7	
1/07/1993	5.3	9.5	5.2	1.2	
1/07/1994	4.8	8.8	5.6	1.5	
1/07/1995	7.5	10.5	7.1	3.7	
1/07/1996	7.5	9.9	7.1	3.8	
1/07/1997	5.5	7.0	4.9	1.4	
1/07/1998	5.0	6.7	4.5	0.0	
1/07/1999	4.8	6.6	3.9	1.0	
1/07/2000	6.0	7.8	5.9	2.8	
1/07/2001	5.0	6.8	4.4	6.0	
1/07/2002	4.8	6.6	4.4	1.9	
1/07/2003	4.8	6.6	3.6	1.9	
1/07/2004	5.3	7.1	4.8	1.4	
1/07/2005	5.5	7.3	4.6	1.5	

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	Cash (%)	Home Loan (%)	Term Deposit (%)	CPI (%)	LCI (%)
1/07/2006	5.8	7.6	5.4	1.3	
1/07/2007	6.3	8.1	5.9	0.0	
1/07/2008	7.3	9.6	7.6	2.3	
1/07/2009	3.0	5.8	3.6	0.0	
1/07/2010	4.5	7.4	6.0	1.5	
1/07/2011	4.8	7.8	6.0	1.9	
1/07/2012	3.5	6.8	4.6	0.1	
1/07/2013	2.8	6.2	3.9	0.6	
1/07/2014	2.5	5.9	3.3	1.3	1.5
1/07/2015	2.0	5.5	2.5	0.4	0.3
1/07/2016	1.8	5.4	2.4	0.2	0.4
1/07/2017	1.5	5.2	2.3	1.0	1.3
1/07/2018	1.5	5.2	2.2	1.1	1.5
1/07/2019				0.5	1.0