

APPENDIX C

Demographic assumptions

Set out below is a summary of the demographic assumptions for the MSBS and the DFRDB.

Contributor exits by death and invalidity

The tables below set out the rates adopted for death and invalidity per 1,000 contributors at each age shown. The rates for males and females are assumed to be the same.

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

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

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

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

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

Contributor exits by retirement and resignation

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

MSBS resignation rates (per 1,000 contributors)

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

DFRDB resignation rates (per 1,000 contributors)

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

Note: The DFRDB has been closed to new entrants since 1991.

DFRDB resignation rates include exits under the Invalidation 'C' provisions.

Retrenchment and redundancy

No allowance has been made for the effects of retrenchments and redundancies as the retrenchment and redundancy decision is unpredictable and impossible to model with any confidence.

New entrants (MSBS)

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

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New entrants

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

Promotional salary increases

An extract from the assumed scale of salary progression (excluding general salary increases due to inflation) is set out below. Officer and cadet promotional salaries are related to both period of service and entry age. Other rank salaries are only related to period of service. Since the officer and cadet promotional salary scales are two-dimensional, they cannot all be tabulated below. A cross-section of the salary scales is presented for a selection of entry ages.

Salary progression — male and female MSBS officers

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

Salary progression — male DFRDB officers

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

Salary progression — female DFRDB officers

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

Salary progression — cadets

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

Salary progression — all other ranks

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

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

Pensioner mortality

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

Pensioner mortality (per 1,000 pensioners)

| Age | Males | | Females | |
|-----|-------------|-----------------|-------------|-----------------|
| | Age retired | Invalid retired | Age retired | Invalid retired |
| 20 | - | 6.50 | - | 6.50 |
| 30 | 0.24 | 6.50 | 0.24 | 6.50 |
| 40 | 0.72 | 6.50 | 0.71 | 6.50 |
| 50 | 2.13 | 11.01 | 2.00 | 11.01 |
| 55 | 3.69 | 12.41 | 3.29 | 12.41 |
| 60 | 6.39 | 15.15 | 5.04 | 15.15 |
| 65 | 11.09 | 21.70 | 7.92 | 21.70 |
| 70 | 19.26 | 36.24 | 13.21 | 36.24 |
| 75 | 33.47 | 58.54 | 22.18 | 58.54 |
| 80 | 58.12 | 87.77 | 37.86 | 87.77 |
| 90 | 146.27 | 188.66 | 111.61 | 188.66 |
| 100 | 283.07 | 322.49 | 253.32 | 322.49 |

Widows are assumed to have the same mortality rates as female age retirements. Likewise widowers are assumed to have the same mortality rates as male age retirements.

Improvements in pensioner mortality

The following table summarises the assumed rates of improvement in future mortality of age retirements. No allowance has been made for future improvements in mortality for invalid retirements.

Assumed rates of mortality reduction (per cent per annum)

| Age | Male | Female |
|-----|------|--------|
| 60 | 2.4 | 1.9 |
| 70 | 2.0 | 2.0 |
| 80 | 1.5 | 1.9 |
| 90 | 1.1 | 1.3 |
| 100 | 1.3 | 1.1 |

Proportions married and age differences

The assumed proportions married at each age is shown below:

Proportions married

| Age | Males (%) | Females (%) |
|-----|-----------|-------------|
| 20 | 2 | 7 |
| 30 | 49 | 55 |
| 40 | 71 | 55 |
| 50 | 73 | 55 |
| 60 | 73 | 50 |
| 70 | 69 | 37 |
| 80 | 60 | 16 |

Married male members are assumed to be married to females four years their junior on death.

Married female members are assumed to be married to males three years their senior on death.

GDP increases adjusted for inflation

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

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GDP growth rates (adjusted for inflation)

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