



BERMUDA CONTRIBUTORY PENSION FUND

ACTUARIAL REVIEW AS AT 1 AUGUST 2011

Prepared June 2013

Table of Contents

1. EXECUTIVE SUMMARY.....	1
2. INTRODUCTION.....	4
3. DATA.....	8
4. DEMOGRAPHIC ASSUMPTIONS.....	11
5. FINANCIAL ASSUMPTIONS.....	15
6. MAIN RESULTS.....	17
7. VARIANT RESULTS.....	22
8. CONCLUSIONS.....	31
9. ACTUARIAL OPINION.....	32
APPENDIX A - MAIN PROVISIONS OF SCHEME FROM AUGUST 2011.....	33
APPENDIX B - BENEFIT AND CONTRIBUTION RATES, 2001 TO 2011.....	35
APPENDIX C - MEMBERSHIP DATA.....	38
APPENDIX D - FINANCIAL DATA.....	40
APPENDIX E - POPULATION PROJECTION.....	42
APPENDIX F - ESTIMATING METHODS.....	46
APPENDIX G - DETAILED RESULTS.....	50
APPENDIX H - PROJECTIONS OF FUND BALANCE.....	53
APPENDIX I - ACCRUED BENEFITS.....	60
 <i>FOR EASE OF REFERENCE A LIST OF THE TABLES AND FIGURES IN THE REPORT CAN BE FOUND AT THE END OF THIS REPORT</i>	
REPORT - LIST OF TABLES and FIGURES.....	62
APPENDICES - LIST OF TABLES.....	63

1. EXECUTIVE SUMMARY

This is the actuarial review for the Bermuda Contributory Pension Fund (the "Fund") as at 1 August 2011 (the "Review Date"). It presents the financial status of the Fund at the Review Date and provides projections of the Fund for the next 40 years to 2051. The last review was done as at 1 August 2008.

HIGHLIGHTS OF THE FUND

- Since the last review the Fund's contributor base fell by 25% due to the downturn in the economy.
- Pension benefits kept pace with inflation and contribution rates were frozen from fiscal years 2009 to 2011 and they were increased by 5.5% in August 2012.
- Based on the population projection figures, the pensioner support ratio has declined marginally since the last review. The ratio was 4.7 in 2008 and is 4.4 in 2011. The ratio is projected to decline to 1.5 over the next 35 years. The comparative ratio using the actual contributors and beneficiaries of the Fund declined by 38% from 4.7 in 2008 to 3.0 in 2011. This was due to the decline in the number of contributors as a result of high unemployment in the 2010/2011 period.
- Contribution income (\$117.9 million) and benefit expenditure (\$115.45 million) increased by 5% and 23% over the three years respectively.
- The expenses of the Fund as a percentage of contributions increased 13.5% over the three years, from 7.1% to 8.0%. As a percentage of the average Fund, total expenses were 0.67% (0.81% in 2005 and 0.61% in 2008). These expenses are inclusive of investment management expenses and custodial fees. Pure administrative expenses were 0.24% of the average Fund at the Review Date.
- The total assets of the Fund grew 18.5% over the three years from \$1,297.5 million to \$1,538.3 million.
- The Asset / Expenditure ratio is a static measure of the size of the Fund to annual expenditure or the number of years cover provided by the Fund based on the current annual expenditure. This ratio decreased over the three years from 12.8 years to 12.3 years.
- The majority of the Fund's assets were invested at the last review and this continues to be the case at the Review Date. 95% of the assets are invested, with the major investments being equities, bonds and alternative assets.
- The Fund earned a nominal rate of return of 6.4% per annum and a real rate of 4.2% per annum over the three years since the last review. This compares with the real rate of return assumption of 3.5% per annum.

A summary of the performance indicators mentioned above is shown in Table 1 below.

Table 1 - Fund Performance Indicators

	July 2005	July 2008	July 2011
Number of beneficiaries in receipt of monthly benefits	8,733	9,509	10,459
Average monthly benefit	\$738.74	\$851.37	\$932.56
Number of contributors	35,339	37,213	25,982
Active Insured as a % of Working Age Population	87%	92%	58%
Pensioner Support Ratio: Number of contributors / Number over age 65	5.2	4.7	3.0
Average number of weekly contributions per month	3.86	3.86	3.73
Weekly Benefit Rate for Contributory Old Age Pension (OAP) ¹	\$183.30	\$209.17	\$226.22
Weekly Contribution Rate ¹	\$25.34	\$30.40	\$30.40
Annual Contribution Income (\$ million)	\$90.60	\$111.90	\$117.90
Annual Benefit Expenditure (\$ million)	\$75.70	\$93.50	\$115.45
Annual Administration & Investment Expenses (\$ million)	\$7.60	\$7.90	\$9.45
Total Assets (Fund) \$ million	\$1,004.40	\$1,297.50	\$1,538.00
Average Nominal Rate of Return for last 3 yrs	11.6%	8.0%	6.4%
Average Real Rate of Return for last 3 yrs	8.0%	3.6%	4.2%
Annual Expenses as a % of Contributions	8.4%	7.1%	8.0%
Annual Expenses as a % of Average Fund	0.81%	0.61%	0.67%
Total Assets / (Benefits and Expenses)	12.1	12.8	12.3
Invested Assets / Total Assets	98%	97%	95%

¹Rates effective from August. The rate increased to \$32.07 in August 2012.

MAIN FINDINGS

- The Fund is projected to increase gradually until 2019 then decline steadily until it is exhausted in 2045 if no changes are made to the contribution and benefit structure. This is an additional 6 years compared to the previous review.
- The total outgo (includes Old Age Pension (OAP) benefits, other benefits, and administration and investment costs) are projected to exceed contribution income throughout the projection period. By the year 2051, contribution income would need to be about 1.49 times the current level in real terms in order to match the increased level of benefit outgo. This will require contributions to be increased by about 2.83% a year more than benefit increases over the next 40 years.

- If contributions were to increase by 1¾% a year more than benefits, and the Fund were to earn a real rate of return of 3 ½% a year, then the Fund is likely to increase for about 8 years and thereafter, decline steadily until it is exhausted in 2045.
- If contributions were to increase by 1¾% a year more than benefits, then the Fund is likely to be exhausted within 29 years with a real rate of return of 3 ½% a year.
- If contributions were to increase by 2½% a year more than benefits, then the Fund is projected to be sustainable throughout the projection period with a real rate of return of 3½% a year.
- If contributions were to increase by 3% more than benefits with future real returns of 2% a year, the Fund is projected to be sustainable throughout the projection period.
- The total number of beneficiaries over age 65, taking into account the impact of Non-Bermudians, is expected to increase steadily, reaching a peak in about 30 years. Thereafter, a gradual decline in numbers is expected.
- The total number of working age persons (age 20 to 64) is projected to decline gradually resulting in a declining pensioner support ratio.
- If the total fertility rate increased from 1.7 to 2, the the Fund remains positive for an additional year. An increase in the total fertility rate to 2.5 is expected to extend the life of the Fund for an additional 4 years, all other assumptions unchanged.

ACCRUED BENEFITS

The present value of benefits accrued up to 31 July 2011 is estimated to be \$2.381 billion. This is based on the contributions made to that date and assumes no further increases to the benefit rate. If future increases to the benefit rate are included and assuming no further contributions, the present value of these benefits increases to \$3.770 billion at the same date. If expected future benefit accruals are included up to the respective retirement dates, the present value is estimated to be \$4.889 billion. All figures are stated in 2011 dollars.

The value of the Fund was \$1.538 billion as at 31 July 2011 which, when compared to the present value of the accrued benefits of \$3.770 billion, assuming benefit rate increases, results in an estimated funded ratio of 40.8%. The present value of future pension payments for the next 10 years for existing beneficiaries is \$790 million. The present value of gratuities expected to be paid over the next 10 years, assuming contribution rates increase at 1¾% a year in excess of benefit increases is estimated to be \$25 million.

2. INTRODUCTION

We have conducted an actuarial review of the Contributory Pension Fund (the Fund) as at 1 August 2011 as requested by the Bermuda Department of Social Insurance (the "Department"). An actuarial review is required every third year by Section 35 of the Contributory Pensions Act 1970 (the Act). The last review was performed as of 1 August 2008 by Morneau Shepell Ltd and the results were presented in our report dated January 2010.

The Act came into effect on 24 December 1970 replacing a repealed Act dated 5 August 1968. Since the last review, there were no significant amendments to the Act aside from amendments to change benefit and contribution amounts.

Under the Act, two classes of benefits are payable:

- *Contributory benefits*: old-age pension and gratuity, widow(er)'s allowance and gratuity, and disability pension;
- *Non-contributory benefits*: old-age pension, and disability pension.

Entitlement to contributory benefits depends on the period for which contributions are paid and on the annual average number of contributions (subject to a minimum contributory period and a minimum annual average). Non-contributory pensions are payable to those ineligible for contributory benefits, subject to certain qualifying criteria. The normal pension age for payments is 65 for both men and women.

Flat-rate contributions are payable by employed persons over school-leaving age, which is now defined in the Act as age 18 or later (previously age 16). An equal contribution is payable by the employer. Self-employed persons pay flat-rate contributions equal to the joint amount payable by an employee and employer.

Appendix A summarises the main provisions relating to benefits and contributions.

Benefit and contribution rates are reviewed annually, taking into account the annual increase in prices, as measured by the Consumer Price Index (CPI) in the calendar year prior and the inflation outlook for the near term. Increases to benefits and contributions come into effect from August each year. Since August 2006, the Government's policy intent for the Fund has been to increase benefit rates broadly in line with prices and contribution rates at 1¼% a year more than benefits (prices). However, contribution rates were frozen from 2009 to 2011. In August 2012, contribution rates increased by 5.5%. Prior to 2006, contribution rates were increased by 1¼% a year more than benefits. Table B1 of Appendix B summarises price inflation and benefit and contribution increases in the period since August 2001. Table B2 summarises the rates of benefits and contributions payable in the years commencing August 1999 to August 2012. This report takes account of the benefit and contribution rates that came into force with effect from August 2012.

PURPOSE OF THE REPORT

The report is prepared in compliance with Section 35(1) of the Act. The purpose is to examine the financial condition and long-term sustainability of the Fund and to investigate the potential financial implications of future contribution and benefit increases for the Fund.

SCOPE OF THE REPORT

The main purpose of the review is to assess the implications for future contribution rates of maintaining benefits at their present levels in real terms. We understand that the Government intends to increase benefit rates in the future broadly in line with increases in the Consumer Price Index, with contribution rates increasing at 1¾% a year more than benefits. This therefore constitutes the central long-term policy assumption for this review, subject to the short-term assumptions discussed under the section 'Subsequent Events'.

The review includes projections of contribution income and expenditure (on benefits, administration and investment), projections of the Fund balance (allowing for an assumed rate of investment return), and projections of the number of years' outgo secured by the Fund. A projection period of 40 years has been used for the review.

The review is based on a long-term population projection, which includes another important indicator of the likely longer-term development of the Fund, namely the projected ratio of the number of people of working age to the number of pensioners. This ratio, known as the "Pensioner support ratio", reflects the maturity of the Fund and the impact of demographic changes.

It is important to recognise that the financial projections for future years are based on reasonable assumptions but they should not be taken as forecasts of the outcome. The projections should be updated at successive actuarial reviews in light of the latest information available. In order to indicate the sensitivity of the results to changes in the main assumptions, the review includes alternative projections. These consider the effects of:

- increasing contribution rates at a lower rate of 1¼% per annum more than benefits and at higher rates of 2½% and 3% per annum more than benefits;
- assuming a higher (4%) and lower (2%) real rate of investment return on the Fund's assets. Although a 5% rate of return scenario was considered in the previous report, it is not considered in the current review since it may be unrealistic in the current low interest rate environment.

Finally, the report includes an assessment of the value of accrued benefits as at the effective date of the review. This is included in Appendix J, together with an estimate of the corresponding funding level at the review date.

The effective date of the review is 1 August 2011. The financial projections are expressed in terms of the benefit and contribution rates applicable from August 2012.

PREVIOUS REVIEW

The previous actuarial review was conducted as at 1 August 2008. The main financial projections were expressed in terms of the benefit and contribution rates in effect at August 2008. Benefits were assumed to increase in line with changes in the assumed Consumer Price Index (CPI) for future years.

The results of the 2008 review indicated that, if contributions were to increase at a rate 1¾% more than the increase in benefits and the Fund were to earn a real return of 3½% a year then the Fund would be likely to increase for about 12 years, and thereafter, decline and be exhausted within 33 years in 2041. The variant results also show that for an assumed real return of 3½% per year that if contributions increase at 1¼% more than benefits then the Fund is projected to be exhausted in 30 years in 2038. Furthermore, if contributions increase at 2½% more than benefits then the Fund is projected to be sustainable throughout the projection period. Reducing the real return assumption to 2% per annum meant that contributions would have to be increased by 3% higher than benefits for the Fund to be sustainable

SUBSEQUENT EVENTS

THE FUND

The Fund performed better than expected over the three year period ending 31 July 2011. The average annual real rate of investment return was 4.2% compared to the assumed rate of 3.5%. The higher than expected return of assets compensated, in part, for the effects of a declining economy characterized by high unemployment, declining contribution income and increasing outlays.

UNEMPLOYMENT

The Bermudian economy continued to experience a decline in economic activity during 2011 on account of the global recession of 2008-2009. High rates of unemployment resulted in a decline of 25% in the number of contributors during 2011 and consequently a decline in contribution income. Benefit outlay and administrative expenses (includes investment expenses) also increased during 2011.

NON-BERMUDIANS

Non Bermudians continue to make up a significant proportion of the working population. Data from the Department of Statistics Employment Survey data for 2010 showed that 23.8% (30.6% for males and 16.8% for females) of the employed workforce were Non-Bermudian. These figures exclude Non-Bermudians married to Bermudians. We understand that since 2007, most work permits for Non-Bermudians have maximum 6 years duration, meaning that if persons were to contribute for the entire period, they would not meet the minimum requirement of 484 weekly contributions to be eligible for a pension from the Fund.

After reviewing and discussing with the Department all other assumptions used in the previous review and the experience of the Fund, it was agreed that the same assumptions should be

adopted for the current review (except where noted in sections 4 and 5) with an additional provision for the effect of the economic downturn on the number of contributors.

2010 CENSUS

Bermuda conducted a census in 2010 and these results were published in a report '2010 Census of Population & Housing Final Results'. The population projection for this review used the results of the 2010 census. The previous review of the Fund was based on the results of the 2000 census.

In this report, totals may differ from the sum of individual numbers due to rounding.

3. DATA

The Department provided Excel files containing data on benefits in payment during the period commencing 16 August and ending 15 September for the years 2009, 2010 and 2011, and data on contributions paid during the calendar months of July 2009, 2010 and 2011. The benefits data was grouped by benefit type, sex, year of birth, monthly benefit amount and the number of payees. The contribution data was grouped by contribution year, year of birth, number of persons contributing split by sex and total number of contributions made in the month, split by sex.

We were also provided with an Excel file from the Department of Statistics showing 'Jobs by Age Group and Bermudian Status of Job Holder, 2010'.

The data was checked for reasonableness by comparing the expected contributions and benefits from the data provided with the contributions and benefits recorded in the accounts. The main discovery was the decline in the number of contributors which was due to high levels of unemployment, as explained by the Department.

We understand from the Department that the data is being converted onto a new administration system and it is hoped that it will be possible to have seriatim data for the next review.

We were also provided with copies of unaudited accounts for the years ending July 31 2009, 2010 and 2011. The statements included 'Statement of Net Assets' and 'Statement of Changes in Net Assets', available for benefits.

BENEFICIARIES AND BENEFITS

Table C1 of Appendix C summarises the numbers and total amount of benefits paid for the period 16 August to 15 September 2011 and, for comparison, for the period 16 August to 15 September 2008. Table C2 of Appendix C summarises the average amount of benefits paid in 2011 and 2008.

The largest group of beneficiaries were those receiving contributory old-age pensions. There were 7,739 such beneficiaries in August 2011, compared to 6,980 in August 2008, an increase of 10.9% over the period. In addition, the average amount of benefits paid was about 9.5% higher, due to the increase in the full rate of weekly pension (excluding increments) from \$209.17 to \$226.22 and incremental increases for new pensioners.

The total number receiving non-contributory old-age pensions increased slightly over the period since the previous review. A spouse's allowance was in payment to 1,143 widows and 96 widowers in August 2011, compared to 1,120 and 81 respectively in August 2008 (increases of 2% and 19% respectively). The number receiving contributory disability benefits increased from 114 to 161, and for non-contributory disability benefits, the number also increased, from 235 to 257.

CONTRIBUTIONS

Table C3 of Appendix C summarises the number of persons earning one or more contributions, and the average number of weekly contributions per month earned, during the months of July 2009, July 2010, and July 2011. The number of persons earning one or more contributions decreased by 30.1% over the 3-year period to July 2011, from 37,813 in June 2008 to 25,982 in July 2011. Most of the decline (25%) was experienced between July 2010 and July 2011. The average number of weekly contributions in July 2011 (3.74) also decreased from the 2008 levels (3.86). We have assumed that persons over pension age who are still contributing are in receipt of pension benefits and have not taken credit for any future contributions that may be made. This is a conservative approach as there is no fixed age at which these contributions would cease as persons are required by law to contribute as long as they are employed. In 2011 annual contributions for this group amounted to over \$2.0 million.

Table C4 presents an age distribution of the number of contributors for July 2008, 2009, 2010 and 2011. It is evident from this table that the number of working-age contributors (20 – 64) declined more significantly than the 65 and over contributing population (30% and 23% respectively) over the three years.

THE FUND

Table D2 of Appendix D shows the market value of the Fund investments as at 31 July 2011 in each of three main investment classes, as shown in the Accounts of the Fund. As at that date, the Fund was invested in equities (42.6%), bonds (19.8%), private equity and hedge funds (32.3%) and short-term deposits (3.5%). Net receivables made up the remaining 1.8% of the assets.

We were also provided with the Bermuda Government Public Funds Investment Committee report as at June 30, 2011 dated August 25, 2011. This report showed that the value of the invested assets, excluding cash, receivables and short term investments increased from \$1,434.1 million at 31 March 2011 to \$1,450.8 million over the quarter ending June 30, 2011, an increase of 11.6% over the three months. The Fund continued to perform strongly and the value of the invested assets has grown to \$1,455.9 million as at 31 July 2011, a growth of 17.8% since 31 July 2010.

As at 31 July 2011, the market value of the total Fund was \$1.538 billion, approximately 12.3 times the outgo in the year ending 31 July 2011. As at 31 July 2008, the Fund balance represented about 12 $\frac{3}{4}$ times the outgo in the year ending 31 July 2008.

INVESTMENT RETURNS

Over the three years ended 31 July 2011, the average nominal rate of return earned on the Fund was 6.4% per annum. Allowing for price inflation over the same period, the average real rate of return earned on the Fund over the three years ended 31 July 2011 was 4.2% per annum (see Table D3 of Appendix D). This was due mainly to the continued high returns experienced by the Fund in 2010 and 2011, with returns of 13.3% and 17.2% respectively, which helped to mitigate the adverse experience in 2009.

Over the ten years ended 31 July 2011, the average rate of return earned on the Fund was 6.8% per annum. Allowing for price inflation over the same period, the average real rate of return earned on the Fund over the ten years ended 31 July 2011 was about 3.7% per annum.

4. DEMOGRAPHIC ASSUMPTIONS

This section describes the estimating methods and demographic assumptions adopted for the review. We have used the same methodology that was used in the previous review, except where noted.

POPULATION PROJECTIONS

We produced a long-term population projection for the 40-year period covered by the review (2012 to 2051). The baseline population for the long-term projection is taken from the 2010 census, which showed total numbers of males and females split into five-year age groups. Appendix E contains a description of the assumptions adopted for the projection and the results.

Table 2 summarises the results of the projection as well as the projected ratio of the number of working age to the number over pension age, commonly known as the “pensioner support ratio”.

Table 2 - Projected Population 2012 - 2051 (Males and Females)

Males and Females						
As at 31 July	Births	Ages 1-19	Working - age (20-64)	Pension age (65 and over)	Total	Pensioner support ratio
2012	737	13,280	41,316	9,341	64,674	4.4
2016	667	13,337	40,628	10,838	65,470	3.7
2021	615	13,074	39,142	13,218	66,049	3.0
2026	592	12,611	37,011	15,899	66,113	2.3
2031	586	11,966	34,974	18,192	65,718	1.9
2036	612	11,449	33,324	19,511	64,896	1.7
2041	598	11,317	31,583	20,236	63,734	1.6
2046	575	11,270	30,112	20,200	62,157	1.5
2051	547	11,149	29,164	19,393	60,253	1.5

The population over pension age is expected to rise steadily over the next 30 years, at which point it is projected to be more than double the present population over pension age. Thereafter the over pension age population is projected to stabilise, and then gradually decline.

The under age 65 population is expected to decline, gradually at first but more quickly towards the end of the projection period. This decline is due to the low birth rate and the projected continuation of a low birth rate.

The pensioner support ratio is a particularly useful indicator of future trends, and Table 2 shows a steady fall in the ratio. As at August 2011, there were 4.4 people of working age per pensioner but, over the next forty years or so, this ratio is projected to fall to 1.5.

The population projections produced using this methodology, are in line with the Bermuda Department of Statistics population projections 2000 – 2030. The higher number of persons over age 65 compared to the census, is a result of the use of mortality rates which reflect future mortality improvement trends. We note that the 2010 census report did not contain a 30 year population projection as was done for the 2000 census.

PROJECTED CONTRIBUTORS AND BENEFICIARIES

The results of the 40-year population projection are used to project the numbers of contributors (and the number of weekly contributions) and beneficiaries. Appendix F describes the methods and assumptions adopted for this purpose – the assumptions generally reflect the recent experience but with some modifications for the longer-term. The following paragraphs summarise the projected numbers of contributors (and the number of weekly contributions) and beneficiaries. It should be noted that the projections are subject to increasing uncertainty in later years.

PROJECTED NUMBERS OF CONTRIBUTORS AND CONTRIBUTIONS

The projected numbers of weekly contributions are based on the projected numbers of contributors and the assumed average annual number of weekly contributions per contributor. The projected number of contributors is derived by applying age-specific factors to the projected population in 5-year age groups, with the factors representing the long-term assumed proportions of the population in each age group that will contribute to the Fund. It has been assumed that the proportion of contributors in each 5-year age group will be similar to that obtained from the data provided for July 2009, 2010 and 2011. However, due to the large decline in the number of contributors in July 2011, it has been assumed that the percentage of contributors to the working population will remain at the average 2010 to 2011 levels for 2012, and at the average 2009 to 2011 levels from 2013 to 2016 and then increase to the 2010 levels in 2017 and the 2009 levels in 2018. We also assume that these percentages will remain at the 2009 levels for the remainder of the projection period. We have assumed that all contributors are under age 65 and therefore have not taken credit for contributions from persons over age 65 as there is no fixed date for cessation of contributions.

Table 3 summarizes the projected number of contributors to the Fund.

Over the 40-year period, the proportion of the working age population contributing to the Fund is projected to increase gradually from 68% in 2012 to 82% in 2051, averaging about 79% over the 40 year projection period. Table 3 indicates that the projected total number of contributors decreases gradually over the projection period to about 85% of the 2012 figure.

The projected number of weekly contributions paid in a year is based on the projected number of contributors multiplied by the average number of weekly contributions paid by each contributor. Each contributor is assumed to contribute, on average, in about 46 weeks a year,

which is consistent with the average number of weekly contributions indicated by the data provided. In the last review we assumed 50 weeks of contributions per year.

Table 3 - Projected numbers of contributors

Year ending 31 July	Males	Females	Total
2012	13,973	14,295	28,268
2016	14,788	14,688	29,476
2021	16,381	15,450	31,831
2026	15,472	14,487	29,959
2031	14,648	13,618	28,266
2036	14,061	12,971	27,032
2041	13,514	12,351	25,865
2046	13,068	11,751	24,819
2051	12,760	11,299	24,059

AVERAGE AGE OF CONTRIBUTORS

Table 4 summarises the projected average age of future contributors to the Fund at five-year intervals over the projection period. The average age decreases gradually over the period from 46.2 years in 2012 to 42.2 years in 2051. This trend is due to the higher level of unemployment projected in the early years of the projections, which occur at the younger ages.

TABLE 4 - PROJECTED AVERAGE AGE OF FUTURE CONTRIBUTORS

Year ending 31 July	Males	Females	Overall
2012	46.8	45.7	46.2
2016	50.5	48.2	49.3
2021	43.9	44.1	44.0
2026	43.8	44.0	43.9
2031	43.2	43.6	43.4
2036	42.6	43.3	42.9
2041	42.0	42.9	42.4
2046	41.8	42.7	42.2
2051	41.9	42.6	42.2

BENEFITS AND BENEFICIARIES

The projected amounts of benefits are based on the projected number of beneficiaries (contributory and non-contributory) and the average benefit payable. It has been assumed that, over the long-term and after accounting for Non-Bermudians, about 95% of men and 85% of women reaching age 65 will qualify for a contributory old age pension, and that the remaining 5% of the male population and 5% of the female population over age 65 will receive a non-contributory old age pension. The remaining 10% of females over age 65 are assumed to receive a widow's pension.

Table 5 summarises the projected total numbers of beneficiaries in receipt of contributory and non-contributory old age pension.

Table 5 - Projected numbers of OAP beneficiaries (aged 65 or over)

Year ending 31 July	Males	Females	Total
2012	3,999	5,342	9,341
2016	4,696	6,142	10,838
2021	5,741	7,477	13,218
2026	6,855	9,044	15,899
2031	7,856	10,335	18,191
2036	8,429	11,082	19,511
2041	8,713	11,523	20,236
2046	8,560	11,640	20,200
2051	8,055	11,337	19,392

Table 5 indicates that the total number of beneficiaries (contributory and non-contributory) over age 65 is expected to increase steadily, reaching a peak in about 30 years. Thereafter, a gradual decline in numbers is expected.

The male to female ratio of over 65 OAP beneficiaries is reflective of the ratio that exists at the Review Date. The impact of higher male mortality has also resulted in a higher number of females than males in this age grouping.

5. FINANCIAL ASSUMPTIONS

As in the previous review, the results are shown at constant 2011 price levels. The projections allow for the assumed increases in benefits and contributions, and are then deflated by the assumed rate of price increases. (The review takes into account the actual benefit and contribution increases implemented with effect from August 2011.)

The main financial assumptions are the rates at which benefits and contributions will increase (relative to prices) from August 2012, the real rate of investment return (in excess of price increases) and rate of increase of the administrative and investment expenses. It is not necessary to make an explicit assumption in respect of future price increases because the assumed increases to both benefit and contribution rates are expressed relative to price increases.

INCREASES TO BENEFIT AND CONTRIBUTION RATES

It has been assumed that, over the long-term, benefits will increase in line with prices. Contributions have been projected on four assumed rates of increase, as follows:

- (a) a rate of 1¾% a year more than benefits (i.e. price increases plus 1¾%);
- (b) a rate of 1¼% a year more than benefits (i.e. price increases plus 1¼%);
- (c) a rate of 2½% a year more than benefits (i.e. price increases plus 2½%); and
- (d) a rate of 3% a year more than benefits (i.e. price increases plus 3%).

The assumed long-term increases to benefit and contribution rates are the same as those adopted for the previous review.

REAL RATE OF INVESTMENT RETURN

In order to project the Fund balance, it has been assumed that the average long-term real rate of investment return (in excess of price increases) will be 3½% a year after the first year. We consider that this represents a reasonable assumption for the real rate of return on a broadly balanced portfolio, invested with a long-term perspective, but it is not intended to be a target level of investment return. This rate is also supported by the experience of the plan over the last ten years. The assumed real rate of return of 3½% a year is the same as that in the previous review.

Alternative projections of the Fund balance have been carried out using assumed real rates of return of 2% a year and 4% a year. This seems a reasonable range for the real rate of return in view of the returns achieved over the past decade.

ADMINISTRATION AND INVESTMENT EXPENSES

For the purposes of the review, we have assumed that administration and investment expenses will increase at a rate of 1½% a year in excess of price increases. Total expenses for the year ending 31 July 2011 amounted to \$9.5 million. Pure Administrative expenses (including audit fees) totalled \$3.7 million as stated in the financial statements. The remaining expenses relate to

investment management charges and custodial fees. It is also expected that Administration expenses may decline in the future after the implementation of a new administration system but no credit has been taken for this in the projections. Appendix F includes a further explanation of the assumed level of administration and investment expenses.

6. MAIN RESULTS

The Fund is projected to increase gradually until 2019, and then decline rapidly until it is completely depleted in 2045, if no changes are made to the contribution and benefit structure. This assumes investment returns of 3.5% per annum in excess of inflation. In the previous review the Fund was expected to be exhausted in 2041.

There are several contributing factors which, when combined, have produced these results. These factors are as follows:

- The Fund continued to perform above expectations in fiscal years ending 31 July 2010 and 2011 with returns of 13.3% and 17.2% respectively, which helped mitigate the impact on the Fund of the loss in fiscal year ending 31 July 2009. The net real return of the Fund over the 3 year period up to the Review Date was 4.2% per annum, above the expected real return of 3.5% per annum.
- These gains were tempered by the fact that benefits increased more than contributions as there was a decision not to increase contributions for the 24 month period 1 August 2010 to 31 July 2012.
- The number of contributors in 2011 declined by 25% over the 2010 levels due to a downturn in the economy and a consequent increase in the rate of unemployment. This led to a lower than expected level of contribution income in 2011 until 2017.

The results of the financial projections over the 40-year period to the year ended 31 July 2051 are expressed in terms of the benefit and contribution rates effective from August 2011.

The results show projections of:

- (i) contribution income and outgo (benefits and expenses); and
- (ii) the progression of the Fund balance allowing for investment returns.

PROJECTED INCOME AND OUTGO

Table 6 summarises, at five-yearly intervals, the projected contribution income, increasing in line with prices plus 1¾% a year starting effective August 2013 and the projected total outgo of the Fund, at 2011 prices. Table G1 of Appendix G shows results for each year of the projection period.

Table 6 - Projected income and outgo (\$million) at constant 2011 prices

Year ending 31 July	Contribution income		Outgo		
	increasing in line with price increases plus 1¾%	OAP benefits	Other benefits	Expenses	Total outgo
(1)	(2)	(3)	(4)	(5)	(6)
2012	79.1	113.4	6.2	9.7	129.2
2016	91.6	125.4	8.8	10.3	144.4
2021	107.9	147.8	11.6	11.1	170.5
2026	110.7	173.3	12.6	11.9	197.8
2031	114.0	193.6	12.1	12.9	218.5
2036	118.8	199.9	11.2	13.9	225.0
2041	124.0	199.6	10.0	14.9	224.5
2046	129.8	190.6	8.9	16.1	215.5
2051	137.2	179.5	8.2	17.3	205.0

Over the next 30 years, total outgo is projected to increase to about 1.7 times its current level, from about \$129.2 million in 2012 to \$224.5 million in 2041. Thereafter, total outgo is projected to fall to about \$205 million by the end of the projection period (2051). Over the same period, contribution income, increasing at 1¾% a year more than prices, is projected to increase from \$79.1 million to \$137.2 million.

Figure 1 illustrates the projected amounts of contribution income and total outgo, as shown in Table 6.

**Figure 1 - Projected contribution income and total outgo
(\$ million at constant 2011 prices)**

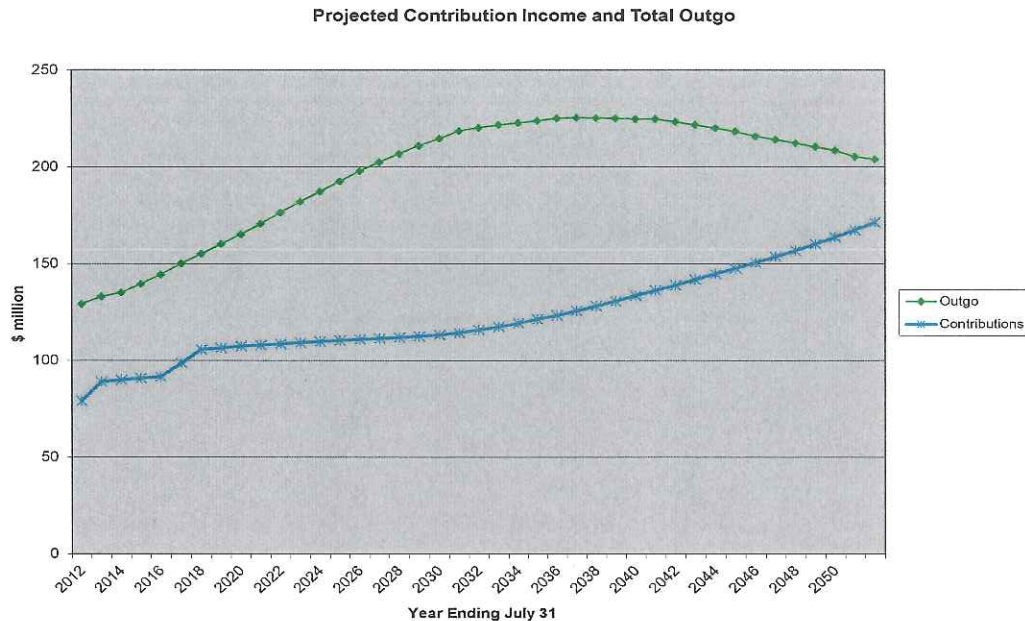


Figure 1 indicates that total outgo exceeds contribution income throughout the projection period. By the year 2051, contribution income would need to be 149% of the 2051 level in real terms in order to match the increased level of benefit outgo. This would require contributions to be increased by about 2.83% a year more than benefit increases over the next 40 years. The 'kink' in the contribution curve in the early years is a result of bringing in the unemployed contributors over the period from the Review Date to the end of the fiscal year in 2017.

PROJECTED FUND BALANCE

Projections of the Fund balance are subject to further uncertainty since they depend not only on the projections of income and outgo, but also on future investment returns and changes in market values. However, this is an important aspect of the financing of the benefits and it is useful to consider the expected long-term pattern of growth under the assumptions adopted for the purpose of the projections.

Figure 2 illustrates the projected balance of the Fund in constant 2011 price terms, assuming a real rate of investment return of 3½% a year.

Figure 2 - Projected fund balance, real rate of return of 3½% a year (\$ million at constant 2011 prices)

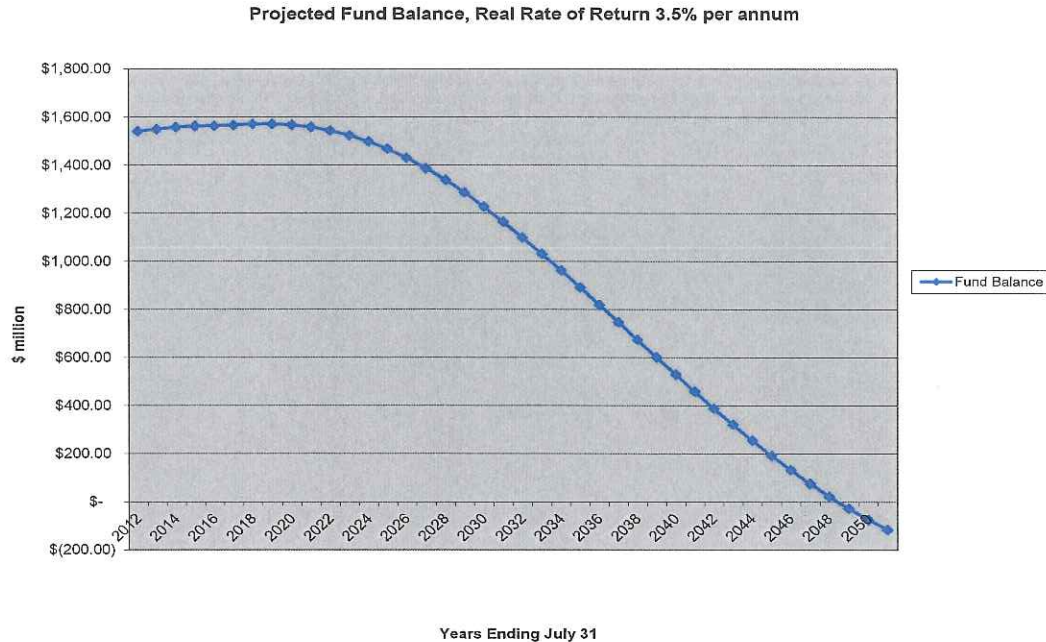


Figure 2 indicates that, if contributions increase at 1¾% a year more than prices, then the Fund may be expected to increase in real terms for about 8 years. Thereafter, the Fund is projected to decline steadily until it is completely exhausted in 2045, or after 34 years.

Table H1 of Appendix H shows the Fund projections in detail under the main assumptions, including the multiple by which the projected Fund balance is estimated to cover annual outgo from the Fund ("ratio of Fund to outgo"). At the Review Date the Fund can cover 12.3 years of annual outgo. The ratio initially decreases gradually and then more rapidly over the projection period.

COMPARISON WITH PREVIOUS REVIEW

The following considers the results of the current review, which are expressed in 2011-2012 dollars, relative to the results of the previous review (expressed in 2008-2009 dollars).

We have maintained the methodology and assumptions adopted for the previous review, except that we removed the freezing of the contribution rate for the twelve months after the Review Date. We have also adjusted the contributory population to phase the unemployed in 2011 back into the future contributors over the 7 years after the Review Date to 2009 levels, and updated the base population from the 2000 to the 2010 Bermuda Census. We also reduced the assumed

average number of weekly contributions in a year to be consistent with the data provided and the average level of benefits being paid. The level of contributory pension to be paid to a new retiree after the Review Date was assumed to be equal to the average benefit for the most recent retirees expressed in 2011 constant dollars. The contributory pension is reduced from August 1, 2017 onwards for new retirees to reflect the expected reduction in average contributions as a result of the unemployment levels between the Review Date and July 31, 2017. The amount of the reduction is equivalent to two bonus increments or \$2.66 per week in 2011 constant dollars.

The following explains the projected outlook for the Fund between the previous and the current reviews:

- Total outgo is expected to exceed contribution income in 2012, the same as projected in the previous review.
- Compared to the previous review in which the Fund was projected to be exhausted in 2041, the projection indicates that the Fund may not run out for an additional 4 years. The improvement in the outlook for the Fund is due primarily to the strong asset growth and investment returns during the three year period to July 31, 2011.
- Contribution income would have to increase by 49% in real terms (\$205m / 137.2m – see year 2051 in Table 6 on page 18) to keep pace with total outgo from the Fund over the next 40 years and this would require an increase in contributions of about 2.83% per annum more than benefits. This compares with an increase in contribution of 2½% per annum more than benefits revealed over the next 40 years in the previous review. The main reason for the higher rate of increase to contribution income is the impact of the decline in contributors in 2011 on the contribution income for that year and the freezing of contributions for 3 years from 2009 to 2011.

7. VARIANT RESULTS

The projections presented earlier in this report are based on assumptions of contribution increases and investment returns relative to prices. In this section, we look at the results of these projections under variants of these assumptions. The projections are based on the benefits and contributions in effect from August 2012 and are expressed in constant 2011 price terms.

The variant results show projections of:

- (i) contribution income and outgo (benefits and expenses); and
- (ii) the progression of the Fund balance allowing for investment returns

VARIANT RATES OF INCREASES TO CONTRIBUTIONS

The main projections assume that contributions will increase at 1¾% more than prices starting with rates effective August 2012. Table 7 summarises (at five yearly intervals) the projected income and outgo of the Fund under the following contribution increase assumptions. The results are in constant 2011 prices.

- (a) prices plus 1¾%
- (b) prices plus 1¾%
- (c) prices plus 2½%
- (d) prices plus 3%

Table 7 - Projected income and outgo (\$million) at constant 2011 prices

Year ending 31 July	Contribution income				Outgo			
	Increasing in line with price increases plus				OAP benefits	Other benefits	Expenses	Total outgo
	1¾%	1¾%	2½%	3%				
(1)	(2a)	(2b)	(2c)	(2d)	(3)	(4)	(5)	(6)
2012	79.1	79.1	79.1	79.1	113.4	6.2	9.7	129.2
2016	91.6	90.3	93.6	95.0	125.4	8.8	10.3	144.4
2021	107.9	103.7	114.4	119.0	147.8	11.6	11.1	170.5
2026	110.7	103.9	121.8	129.8	173.3	12.6	11.9	197.8
2031	114.0	104.3	130.0	142.0	193.6	12.1	12.9	218.5
2036	118.8	106.1	140.7	157.4	199.9	11.2	13.9	225.0
2041	124.0	108.0	152.3	174.6	199.6	10.0	14.9	224.5
2046	129.8	110.3	165.4	194.2	190.6	8.9	16.1	215.5
2051	137.2	113.8	181.4	218.3	179.5	8.2	17.3	205.0

Over the next 40 years, contribution income is projected to increase from \$79.1 million to:

- (i) \$113.8 million under the variant assumption that contribution rates increase at 1¼% more than prices
- (ii) \$181.4 million under the variant assumption that contribution rates increase at 2½% more than prices
- (iii) \$218.3 million under the variant assumption that contribution rates increase at 3% more than prices

Figure 3 gives a graphical illustration of the variant results shown in Table 7, under the four alternative contribution increase assumptions. Contribution income and total outgo are expressed in constant 2011 price terms.

Figure 3 - Projected contribution income and total outgo, main and variant assumptions for contribution rate increases (\$ million at constant 2011 prices)

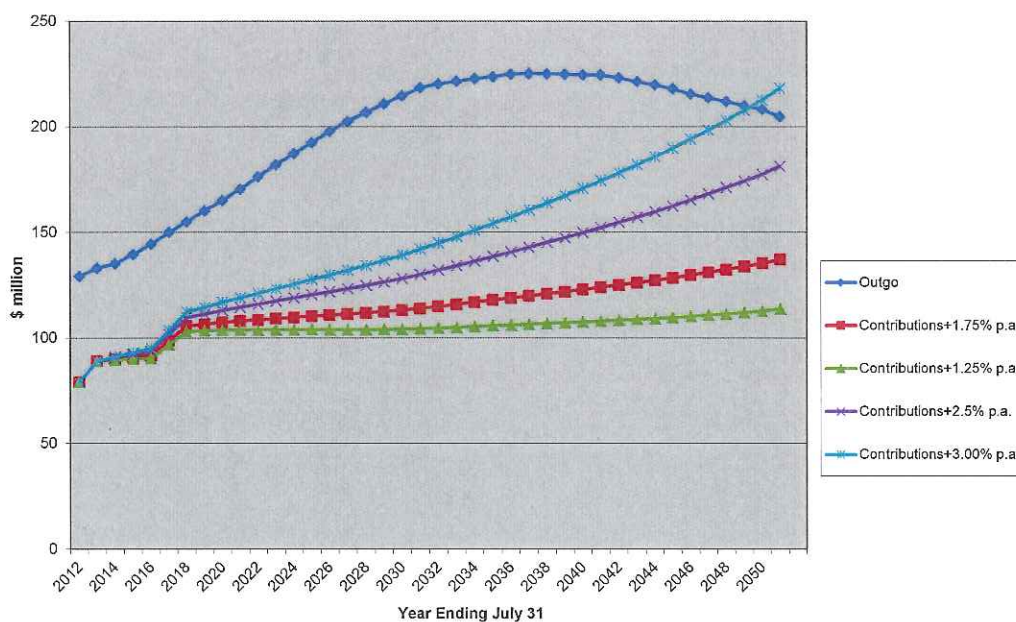


Figure 3 indicates that total outgo exceeds contribution income throughout the projection period for all of the scenarios except where contributions are assumed to increase at a rate of 3.00% more than prices. In this case total income exceeds total outgo after 2050.

PROJECTED FUND BALANCE

Projections of the Fund balance are subject to further uncertainty since they depend not only on the projections of income and outgo, but also on future investment returns and changes in market values. However, this is an important aspect of the financing of the benefits and it is useful to consider the long-term pattern of growth under the assumptions adopted for the purposes of the projections.

Negative projected Fund values are shown to indicate the potential shortfall in the projected Fund, although we anticipate that appropriate action would be taken to address this situation.

Figure 4 shows the effect of the four alternative contribution increases on the projected Fund.

Figure 4 - Projected Fund Balance, main and variant assumptions for contribution rate increases, real rate of return of 3½% a year (\$ million at constant 2011 prices)

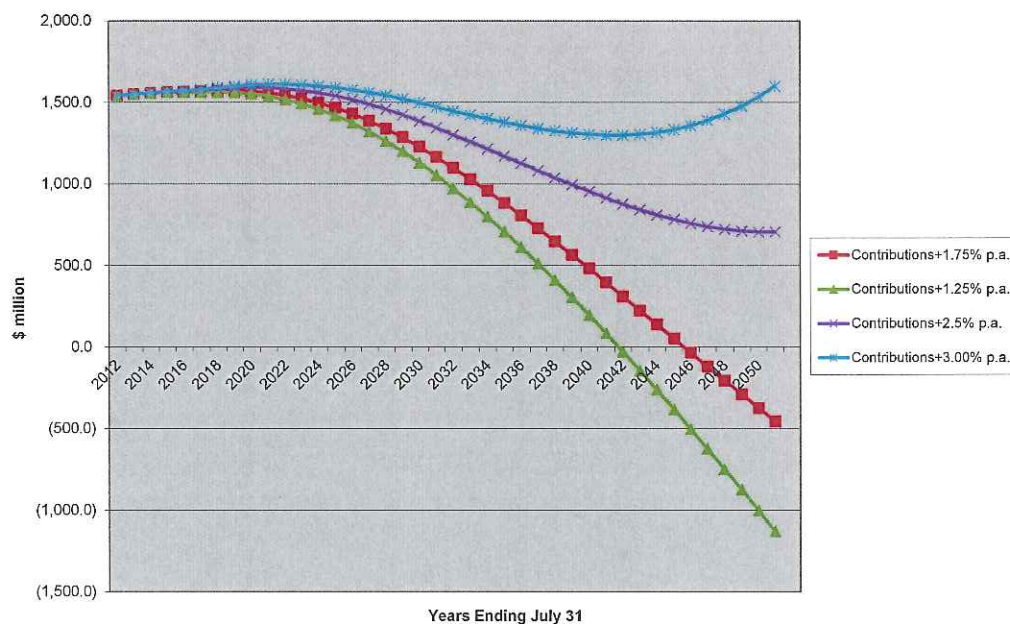


Figure 4 shows that the Fund is expected to remain positive throughout the projection period under all scenarios except where contributions are assumed to increase at 1¾% and 1¼% above prices. In these two scenarios, the Fund runs out in 2045 and 2041 respectively. If contributions are assumed to increase at 2½% and 3% more than prices the fund is sustainable throughout the projection period.

VARIANT FUND RETURNS

Figure 5 illustrates the projected Fund balance in constant 2011 price terms, assuming that contributions increase at 1¾% more than prices and assuming alternative real rates of investment return of 2%, 3½% and 4% a year.

Figure 5 - Projected Fund balance, Real rates of return of 2%, 3½% and 4% a year. Contributions increase at 1¾% a year more than prices (\$ million at constant 2011 prices)

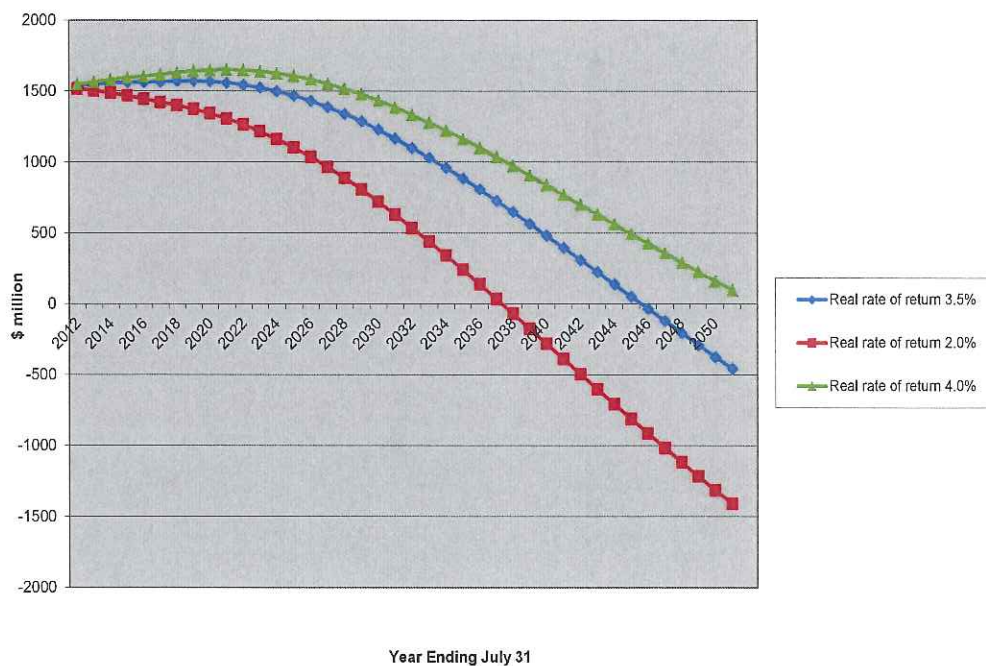


Figure 5 shows that at an assumed investment return of 3.5% a year, the Fund increases for the first 8 years and declines steadily until it is depleted in 2045. If the assumed rate of investment return decreased to 2% per year, the Fund is projected to decline steadily until it is depleted in 2037. If the assumed rate of investment return is increased to 4% per year, the Fund increases for the first 10 years then declines steadily but remains positive at the end of the projection period.

Figure 6 illustrates the projected Fund balance in constant 2011 price terms, assuming that contributions increase at 1¼% more than prices and assuming alternative real rates of investment return of 2%, 3½% and 4% a year.

Figure 6 - Projected Fund balance, Real rates of return of 2%, 3½% and 4% a year Contributions increase at 1¼% a year more than prices (\$ million at constant 2011 prices)

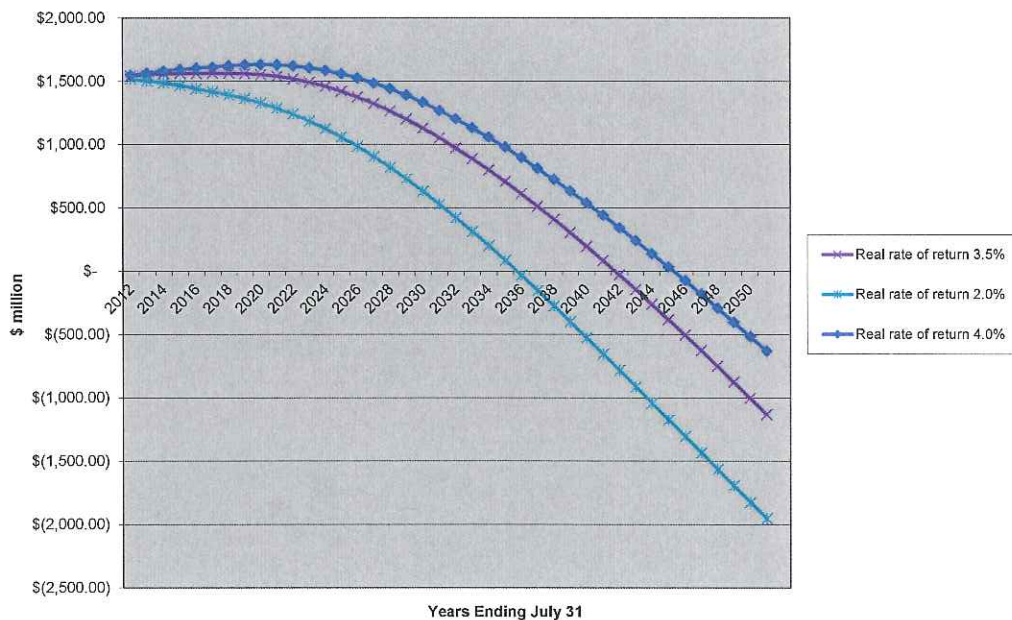


Figure 6 shows that if contributions increase at 1¼% a year more than prices, the Fund balance will be exhausted within 24 years and 30 years with a future real rate of return of 2% and 3.5% a year respectively. If the assumed rate of investment return is increased to 4% per year, the Fund increases for the first 9 years then declines steadily until it is depleted by 2045.

Figure 7 illustrates the projected Fund balance in constant 2011 price terms, assuming that contributions increase at 2½% more than prices and assuming alternative real rates of investment return of 2%, 3½% and 4% a year.

Figure 7 - Projected Fund balance, Real rates of return of 2%, 3½% and 4% a year Contributions increase at 2½% a year more than prices (\$ million at constant 2011 prices)

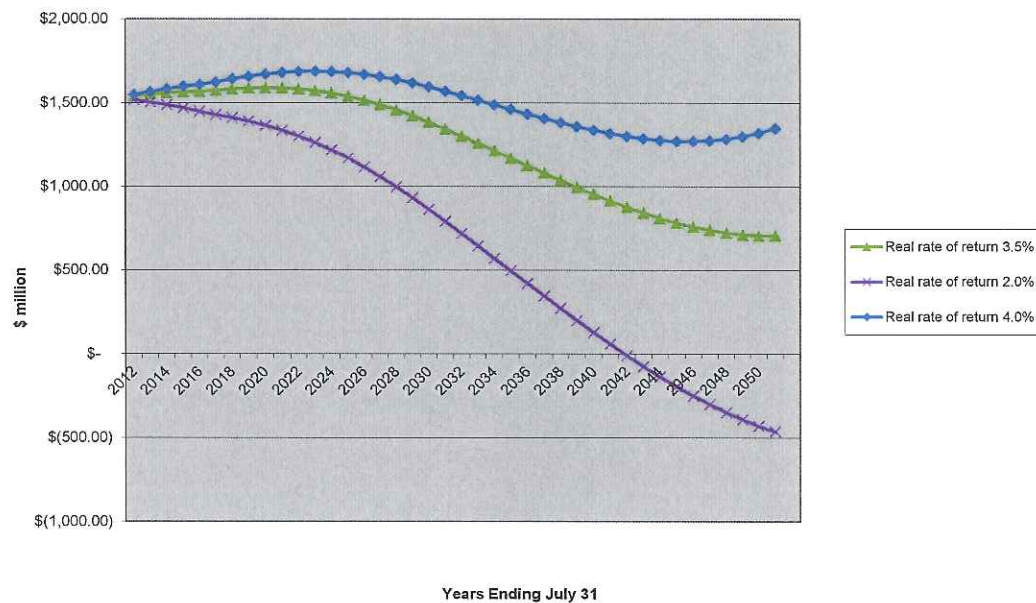


Figure 7 shows that if contributions increase at 2½% a year more than prices, then with a real rate of return of 3½% the Fund remains positive and sustainable at the end of the projection period for all of the assumed real investment return scenarios except for the one where real investment returns of 2% per annum is assumed. Under this scenario, the Fund balance declines steadily until it is projected to be exhausted in 2041.

Figure 8 illustrates the projected Fund balance in constant 2011 price terms, assuming that contributions increase at 3% more than prices and assuming alternative real rates of investment return of 2%, 3½% and 4% a year.

**Figure 8 - Projected Fund balance, Real rates of return of 2%, 3½% and 4% a year
Contributions increase at 3% a year more than prices (\$ million at constant 2011 prices)**

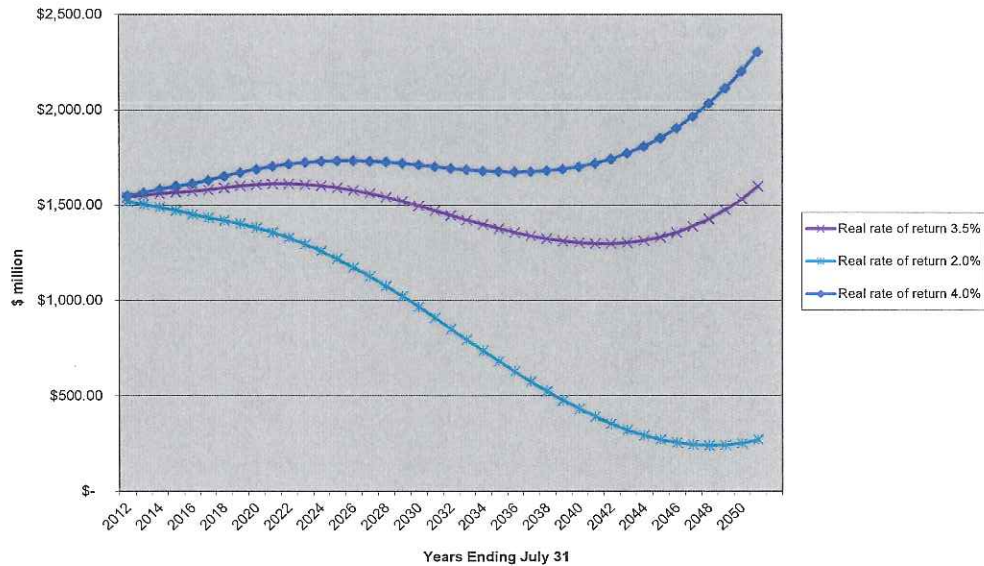


Figure 8 shows that if contributions increase at 3% a year more than prices, the Fund balance remains positive and sustainable for the entire projection period for all of the assumed real rates of investment return scenarios.

VARIANT DEMOGRAPHIC ASSUMPTIONS

Fertility

In this review we used a total fertility rate of 1.7 children per female for females ages 15 to 46. The same assumption was used in the last review of the Fund. If the total fertility rate is assumed to be 2.0 per female, the Fund is projected to remain positive for just one more year. A total fertility rate of 2.5 per female is expected to extend the life of the Fund to 2048

FURTHER COMMENTS

Tables H1 to H12 of Appendix H show the Fund projections in detail, including the multiple by which the projected Fund balance is estimated to cover annual outgo from the Fund ("Ratio of Fund to outgo").

Tables H1, H5 and H6 show the detailed projections underlying Figure 5, Tables H2, H9 and H10 show the detailed projections underlying Figure 6, Tables H3, H7 and H8 relate to Figure 7 and Tables H4, H11 and H12 to Figure 8. As would be expected, these tables demonstrate that a lower real rate of return would cause the Fund to decline more rapidly, whereas a higher real rate of return either delays or reduces the decline of the Fund.

Table H1 indicates that, if contributions increase at $1\frac{3}{4}\%$ a year more than prices and the real return is $3\frac{1}{2}\%$ a year, then the projected Fund balance, expressed as a multiple of outgo, decreases gradually from its current level until the Fund is exhausted in 2045.

Table H2 indicates that, if contributions increase at $1\frac{3}{4}\%$ more than prices, and the real return is $3\frac{1}{2}\%$ a year, then the projected Fund balance, expressed as a multiple of outgo, decreases more rapidly until the Fund is exhausted around 2041.

Table H3 indicates that if contributions increase at $2\frac{1}{2}\%$ a year more than prices and the real return is $3\frac{1}{2}\%$ a year, then the projected Fund balance, expressed as a multiple of outgo, is projected to decrease steadily to about 3.4 by the year 2051.

In Table H4 where contributions are increased at 3% a year more than prices, and the real rate of return is $3\frac{1}{2}\%$ a year, the Fund balance, as a multiple of outgo, is projected to decrease steadily to the year 2041, and increase thereafter to the end of the projection period.

All other things being equal, lower contributions in the short term will give rise to a smaller fund and so, most likely, lead to higher contributions in the longer term.

Overall, the results of the Fund projections demonstrate that there is considerable uncertainty relating to the long-term progress of the Fund in respect of the financial assumptions. The demographic assumptions introduce further uncertainty. Since benefit outgo is projected to increase significantly relative to contribution income, there is an argument for smoothing the impact by raising contributions by more than is necessary in the short term, thus building up a sizeable fund. As a result, however, the future outlook would then be more sensitive to the real rates of return achieved in the Fund. This is evident by the results shown in Table H12 where contributions are increased by 3% a year more than prices and the Fund earns a real rate of return of 4% per annum. The Fund is projected to be more than 11 times the outgo and exhibits an increasing trend towards the end of the projection period.

ACCRUED BENEFITS

We were also asked to provide an assessment of the accrued and projected benefit obligation of the Fund for existing contributors and beneficiaries at the Review Date.

It should be noted that Social Security Funds, unlike occupational pension plans, are designed and funded on the premise that contribution income from future generations is expected to fund the benefits of current beneficiaries. The aim of the Fund should be sustainability rather than full

funding while ensuring that there are sufficient assets to meet several years of benefit payments and expenses at any point in time. At the Review Date the Fund can meet at least 12 years of the current level of benefits and expenses.

Based on the valuation assumptions set out in Appendix I, the Fund is estimated to meet 40.8% of projected benefits accrued up to the Review Date in respect of current beneficiaries of the Fund and the current working age population. This level of funding is relatively unchanged from the last review.

Further details of the calculation and the value of accrued and future benefits can be found in Appendix I.

We also calculate the present value of the expected benefit payments and gratuities over the next 10 years which are \$790 million and \$25 million respectively.

8. CONCLUSIONS

The number of old age pension beneficiaries is projected to grow steadily over the next 30 years, after which time the number is expected to gradually decline. The working-age population is expected to remain broadly stable over the short-term (although participation levels would be lower than expected due to high unemployment levels) but decline more significantly in the longer term. Consequently, the cost of benefits is expected to increase substantially relative to the contribution base represented by the employed population, and so contributions will need to increase at a faster rate than benefits over the long term.

The rate at which contributions should increase relative to benefits will depend on actual experience in the future, both in terms of demographic developments and investment performance of the Fund. Under the four contribution rate scenarios considered, expenditures are projected to exceed contributions throughout the projection period except in the scenario where contributions are increased at a rate of 3% more than prices in which case contributions exceed expenditure in 2050.

If contributions were to increase by 1¾% a year more than benefits and the Fund were to earn a real rate of return of 3½% a year, then the Fund may be expected to increase in real terms for about 8 years. Thereafter, the Fund is projected to decline steadily until it is exhausted in 2045. If the real rate of return were only 2% a year, then the Fund is depleted by 2037, but if the real rate of return were 4% a year, then the Fund increases for the first 10 years then declines steadily thereafter but remains positive at the end of the projection period.

Lower increases in contribution rates relative to benefits will slow down the buildup of the Fund in the short term, all other things being equal. For example, if contributions were to increase by 1¾% a year more than benefits, then the Fund is likely to be exhausted within 30 years with a real rate of return of 3½% a year. Thus, over the longer term, this is likely to necessitate higher increases in contribution rates relative to benefits.

Higher increases in contribution rates relative to benefits will keep the Fund sustainable over the projection period, all other things being equal. For example, if contributions were to increase by 2½% a year more than benefits, then the Fund is sustainable except with a real rate of return of 2% a year, where the Fund is likely to be exhausted in 2041.

With a combination of contribution increases 3% higher than benefits and future real returns of 3½% per annum, the Fund is projected to be sustainable throughout the projection period. Thus, if contributions are increased in the short term and future real returns are relatively high, over the longer term, smaller increases to contributions relative to benefits may be possible.

Due to the inherent uncertainty in both the future demographic experience and investment returns on the Fund, the progress and funding level of the Contributory Pension Fund should be kept under regular review.

9. ACTUARIAL OPINION

This opinion is given with respect to the Bermuda Contributory Pension Fund (the "Fund").

We performed a review of the Fund as at 1 August 2011. Our review reflects the provisions of the Fund in effect on 1 August 2011, and in addition, takes into account the amendments and increase in contribution and benefit rates effective August 2011. The significant decline in number of contributors since the last review date, the better than expected investment returns, as well as the proportion of Non-Bermudians that make up the population, were also taken into account.

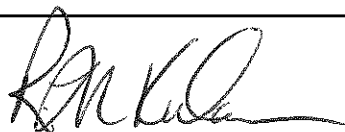
The financial status of the Fund as at 1 August 2011 was determined based on the Fund information and actuarial assumptions appropriate as at that date.

We hereby certify that, in our opinion, as at 1 August 2011:

- The data on which the actuarial review is based is sufficient and reliable for the purposes of the review.
- The assumptions used are, in aggregate, appropriate for the purposes of the review.
- The methods employed in the review are appropriate for the purposes of the review.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice of the Canadian Institute of Actuaries. The assumptions that form each actuarial basis used in the report were reasonable at the time this actuarial review report was prepared.

The opinions are given exclusively from a financial viewpoint. This report does not constitute a legal opinion on the rights or duties of the Government of Bermuda, or the members over the Fund. Actuarial reviews are performed based on assumptions and methods that are in accordance with accepted actuarial practice. Emerging experience differing from these assumptions may result in gains or losses, which may affect future results. These will be revealed in future actuarial reviews. The next actuarial review should be performed not later than as at 1 August 2014.



Richard M. Kular, F.S.A., F.C.I.A.
Principal



Marcia Tam-Marks, F.S.A.
Principal

Date

June 17, 2013

Date

June 17, 2013

MORNEAU SHEPELL LTD
895 Don Mills Road, Suite 700
One Morneau Shepell Centre
Toronto, Ontario M3C 1W3