The Antigua and Barbuda Social Security Fund

9th Actuarial Review of the Social Security Fund as of December 31st, 2009

Final Report

April 2013

Horizonow
ACTUARIAL & FINANCIAL CONSULTANTS

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Abbreviations and Acronyms

ABSSB	Antigua-Barbuda Social Security Board
EIB	Employment Injury Benefits
GDP	Gross Domestic Product
GOAB	Government of Antigua-Barbuda
ILO	International Labour Office
ISSA	International Social Security Association
LTB	Long-term Benefits
MBS	Medical Benefits Scheme
PAYE	Pay As You Earn
PAYG	Pay-as-you-go
SS	Social Security
SSF	Social Security Fund
STB	Short-term Benefits
TFR	Total Fertility Rate

Introduction

Antigua-Barbuda Social Security began operations in April 1973. All employed and self-employed persons are covered for two main types of social security benefits – short-term benefits and long-term benefits or pensions. Employment injury benefits are currently not offered. The system is financed by contributions which are levied on employment earnings up to an earnings ceiling and are paid by employers, employees and self-employed persons. Surplus funds are invested locally in various types of securities and properties.

This is the report of the 9th Actuarial Review of the Social Security Fund and it is being conducted as of December 31, 2009. Section 18 of The Social Security Act requires that such reviews be conducted at three year intervals. The preparation of this report was delayed due to the unavailability of audited financial statements. Draft audited financial statements for 2009 have been provided. These statements have been qualified.

The main purpose of periodic actuarial reviews is to determine if the social security system in Antigua-Barbuda operates on sound financial and actuarial bases and if it provides adequate and affordable levels of income protection. Where considered necessary, recommendations aimed at ensuring that these objectives can be achieved for current and future generations are made.

For this actuarial review, 50-year demographic and financial projections have been performed. It should be noted that these projections are dependent on the underlying data, methodology and assumptions concerning uncertain future events and that the outcomes and eventual experience will most likely differ, possibly materially, from that indicated in the projections. Therefore, in accordance with the Social Security Act, periodic actuarial reviews should be conducted. The next review of the Social Security Fund is due as of December 31st, 2012.

This review has been conducted by Mr. Derek Osborne of Horizonow Consultants Ltd. The author wishes to thank Mr. Everett Christian, Chairman, Mr. David Matthias, Director, Mr. Luther Mills, IT Manager, Ms. Debra Joseph, Research & Communications Manager, and all other members of the Social Security staff who assisted with this review.

Executive Summary

After years of policymakers not responding to deteriorating finances, the Antigua-Barbuda Social Security Fund is now in crisis and its long-term financial sustainability in jeopardy. In early 2013, over 8,000 monthly pensions are being paid late. With contribution and investment income not being sufficient to meet expenditure, the Fund is incurring deficits of approximately $1.5 million per month. And even though reserves exceeded $680 million at the end of 2009, (and over $600 million at the end of 2012) only a very small portion of these reserves could have been converted to cash. As a result, the Fund currently operates in a true pay-as-you-go state with no cash reserves. Unless immediate steps are taken to either increase contribution income and/or convert existing assets to cash, more lengthy delays of pension payments will occur and there will be further erosion of confidence in the ability of the Fund to meet its future obligations.

Actuarial reviews of the Social Security Fund provide a comprehensive assessment of the current and projected state of Antigua-Barbuda's primary social security system. They also provide policy recommendations for changes designed to ensure a balance between benefit adequacy and financial sustainability. The 8th Actuarial Review which was conducted as at December 2006 and submitted to the Board in early 2008 contained several recommendations for reforms. However, up to early 2013, no amendments have been made. This report contains an extensive set of recommendations which if implemented, could gradually return the Fund to a more secure financial state. Given that this report was prepared three years after the end of the review period, Fund experience between 2010 and early 2013 have been incorporated in the projections and recommendations.

Main Findings & Projection Results

For Social Security's nearly 40 years of operations, expenditure has generally increased in line with expectations. During the 3-year review period economic performance was mixed with positive growth in 2007 and 2008 but contraction in 2009 as the effects of the global economic crisis began to affect Antigua-Barbuda. For Social Security, contribution income fell in 2009 as the number of contributors decreased. However, benefit expenditure continued to increase each year, resulting in expenditure exceeding contribution income (accounting basis) for the first time in 2009. Due to Government and some statutory bodies failing to make regular contributions and not repaying principal and interest on amounts borrowed in cash, some investments had to be liquidated to meet benefit payments.

This report's assessment of Social Security's policy and design indicators suggests that current contribution and benefit provisions provide a fairly good level of benefit adequacy and income protection to most workers and pensioners. Since increases to the wage ceiling and pensions

have not taken place since 1993 and 2005, respectively, both the wage ceiling and minimum pension rates are slightly low.

Projection Results

50-year projections of Social Security finances have been performed. These projections are based on there being no changes to the current contribution rate or benefit rules. Given that a large portion of the Fund is held in receivables and it is uncertain what portion of these receivables will ever be available for the payment of benefits, several scenarios have been modelled.

a) Under all projection scenarios, expenditure will exceed contribution income. Unless assets can be converted to cash, cash flow deficits will continue.
b) In the best case scenario where all reserves can be converted to cash at the current carrying value, reserves will be exhausted by 2025.
c) The pay-as-you-go rate, or rate required to meet annual expenditure, will remain under 11% thru 2015 if the wage ceiling is increased in 2013. In 2025 the projected pay-as-you-go rate is 15.4% and almost 30% in 2061.

While projected long-term pay-as-you-rates are similar to those of the 8th Actuarial Review, depletion of reserves is now projected several years earlier.

Recommendations

With financial deficits growing and over 90% of assets accounted for as receivables, major reforms can no longer be deferred. A contribution rate increase is required to improve short-term finances and benefit reforms are required to reduce long-term costs. Freezing pensions for a few years may be necessary and there is no room for additional benefits unless they are funded with additional contributions. Meaningful changes in all aspects of Social Security's operations aimed at increasing revenues and reducing costs should also be made.

Following are the recommendations made throughout this report.

1. Increase the contribution rate immediately from 8% to 10% for private sector workers and from 7% to 9.5% for public servants. Additional increases in the next few years may be required.
2. Convert amounts held as receivables into investments that produce financial returns.
3. Increase the wage ceiling to at least $6,000 per month.
4. Increase the pension age from 60 to 65 on a phased basis, leaving age 60 as the age at which reduced pensions are first payable.

5. For Age benefit, revise pension accrual rates so that the maximum 50% benefit is reached after 38.5 years of contributions instead of 33.7 years.
6. Change the Age benefit to a Retirement benefit so that no pension is awarded to persons who remain employed between 60 and 65.
7. Equalize Survivor benefit rules for males and females.
8. Eliminate the Transitional Age pension.
9. Enhance links with various government departments that issue licenses and permits so that such licenses and permits are only issued if the employer/business/self-employed person is SS-compliant.
10. Strengthen and enforce existing penalties for late or non-payment of contributions and introduce new legal measures, such as garnishing.
11. Upgrade the financial reporting of Fund finances to so that unqualified audited statements can be prepared.
12. Publish annual audited financial statements and periodic actuarial reviews and share openly with the general public Social Security's financial challenges and reform options.
13. Create an Investment Policy to account for the current investment climate and state of Social Security finances. This statement should include the roles and responsibilities of various parties, investment objectives, strategies and constraints, and asset allocations.
14. Discuss with Government ways of having a single agency collect Social Security contributions, PAYE and Medical Benefits Scheme contributions and the same or another agency handle all pension payments made by the Treasury and Social Security.
15. Establish good governance practices in line with those prepared by the International Social Security Association (ISSA).
16. Any new or expansion of existing benefits, such as Unemployment and Employment Injury must be funded by additional contributions.
17. Conduct a thorough review of all operational procedures and practices with a goal of making each more efficient by using all available tools and technologies.
18. Conduct a thorough review of the Act & Regulations, remove sections that are no longer relevant and ensure that current practices are consistent with international best practices.

Projected pay-as-you go rates, assuming that key reforms as recommended above are made soon, show that while the current contribution rate is still inadequate, long-term costs would be up to 4.5% lower than if the current benefit rules remain in place.

The changes required to place the Social Security Fund on a stronger financial footing are extensive. Some reforms will prove financially burdensome for workers, employers, and even pensioners. Tough decisions will be required. There is very little room to meet the requests for

additional benefits. To ensure that required reforms are implemented soon the support of all aspects of society will be required. The Board should therefore continue to engage all stakeholders and the public at large in reform discussions.

In 2011, the International Social Security Association (ISSA) published the "*ISSA Good Governance Guidelines for Social Security Institutions*." These Guidelines present a governance framework that spans a range of governance issues. It recognizes accountability, transparency, predictability and participation of good governance. It recommends qualified persons be appointed to serve on Boards and in leadership positions and that there be clear roles for the Minister, the Board and management. The Social Security Fund has suffered from poor governance practices. These *ISSA Good Governance Guidelines,* prepared specifically for social security schemes, can help guide its transformation into a well governed, efficient and sustainable system that will be able to consistently deliver on its promises for decades to come.

Chapter 1 Activities & Experience Since The 8th Actuarial Review

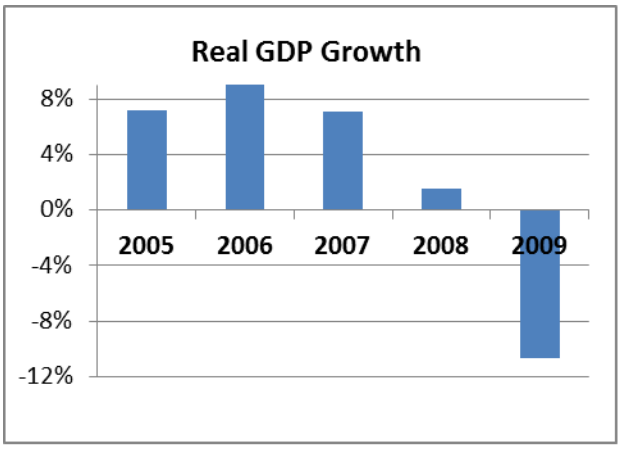
1.1 Amendments To Act & Regulations

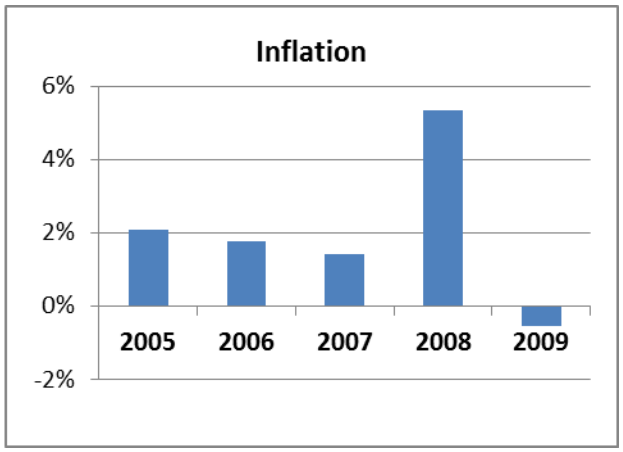
There were no amendments to the Act or Regulations in 2007 to 2009.

1.2 Economic Experience

The Antigua-Barbuda Social Security (ABSS) has two sources of income - contributions and earnings on investments. Both are closely linked to economic performance and labour market changes. Some benefits are also affected by economic circumstances. Figure 1.1 below shows real GDP growth rates and inflation for 2005 to 2009. During the 3-year period 2007 to 2009, real GDP growth averaged -0.7% while inflation was low, averaging 2.1% per annum.

Figure 1.1. Key Economic Indicators, 2005 to 2009

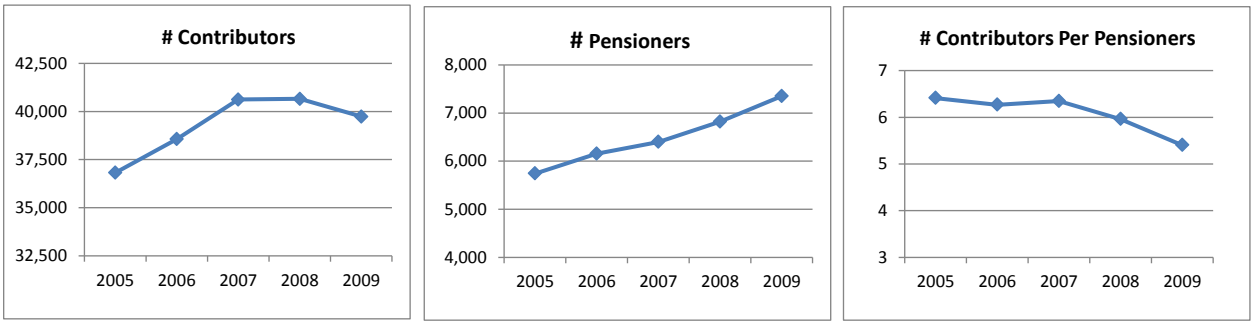




1.3 Social Security Experience

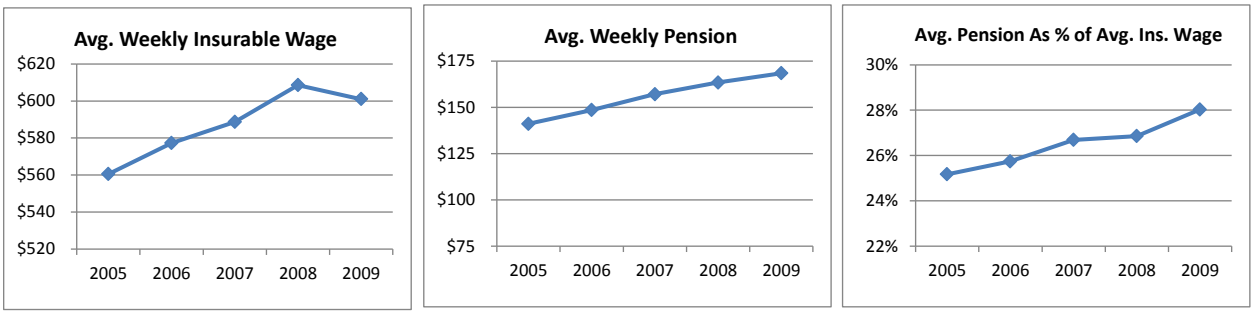
In line with economic experience, the number of insured persons making contributions increased in 2007 and 2008 but declined in 2009 as the economy went into recession. The number of pensions in payment, however, increased each year. This resulted in the number of contributors per pension in payment decreasing from 6.3 in 2006 to 5.4 in 2009. (Figure 1.2).

Figure 1.2. Contributors & Pensioners, 2005 to 2009



Both the average insurable wage and the average pension in payment increased between 2006 and 2009 (Figure 1.3 below). However, since average pensions increased at a faster rate than average insurable wages, the average pension replacement rate (average pension as a percent of average insurable wages) increased each year.

Figure 1.3. Average Insurance Wages & Pensions in Payment, 2005 to 2009



With pensions accounting for over 90% of total benefit expenditure, changes to the number of pensions and the average pension amount have greatest influence on year-over-year changes in benefit expenditure. As shown above, both factors are increasing.

The following table provides income and expenditure amounts for 2007 to 2009. A more detailed version of the Social Security finances for these years may be found in Appendix C.

Table 1.1 SSF Finances – 2007 to 2009 (millions of $'s)

	2007	2008	2009
Income			
Contributions	77.7	84.3	78.6
Investment	5.8	6.7	16.1
Other	0.2	0.1	0.1
Total	**83.6**	**91.1**	**94.8**
Expenditure			
Benefits	59.6	65.7	72.5
Administrative	10.5	12.1	10.7
Total	**70.0**	**77.8**	**83.2**
Excess of Income over expenditure	13.6	13.1	11.4
End-of-year reserves	660.4	673.5	684.9

Notes: Totals may be off due to rounding.

In line with economic and labour market performance, contribution income increased in 2007 and 2008 but fell in 2009. With most of the Fund's assets accounted for as non-interest bearing receivables, investment income was minimal. As expected, benefits continued its upward trend while administrative costs fluctuated slightly. On an accounting basis, the Fund experienced cash flow surpluses in each of the three year in the review period. However, for the first time since inception, total expenditure exceeded contribution income in 2009.

Since pensions represent over 90% of total benefit expenditure Social Security is best described as a national pension system that also pays short-term income replacement benefits. As pension systems mature the number of pensioners grows more quickly than the number of contributors and thus benefit expenditure increases at a faster rate than contribution income. In a partially funded system, like Antigua-Barbuda Social Security, the reserves that have built up in the early years should be available to help meet benefit expenditure when there are shortfalls in current cash flows.

1.4 Benefit Branch Experience & Reserves

Social Security administers two major types of social security benefits – long-term or pensions and short-term benefits. While the summary of Social Security finances presented in the previous section shows total income and expenditure, internal accounting procedures separate finances into two branches – one each for the two groups of benefits.

While the two benefit types have different characteristics and implicit financing mechanisms, the existence of branches does not affect the overall financing or sustainability of the overall Fund. Detailed analysis of individual branch experience may be found in Appendix D.

1.5 Experience Compared With Projections of 8th Actuarial Review

In the 8th Actuarial Review, projections were prepared under three scenarios – *Best Estimate*, *Low Dependency* and High *Dependency*. Shown below is a comparison of actual cumulative experience over the 3-year period with the projections of the *Best Estimate* Scenario.

Table 1.3 Projections from 8th Actuarial Review Compared With Actual Experience

	2007-2009 Projected (millions)	**2007-2009 Actual** (millions)	**Difference**
Contribution Income & Surcharges	$252.7	$240.5	5% below projected
Investment Income	$52.9	$28.6	46% below projected
Benefit Expenditure	$196.8	$197.7	As projected
Administrative Expenditure	$35.2	$33.3	6% below projected
2009 Year-end Reserves	$726.0	$684.9	6% below projected

As described previously, the onset of the economic recession in 2009 negatively affected contribution income. The significant difference between actual and projected investment income was a result of an assumption made in the 8th Review that receivables would have been converted to interest yielding securities during the review period. This did not occur.

Over the 3-year review period, benefits were generally in line with projections and administrative costs were below projected. Overall, year-end 2009 reserves were 6% or $41 million below projected.

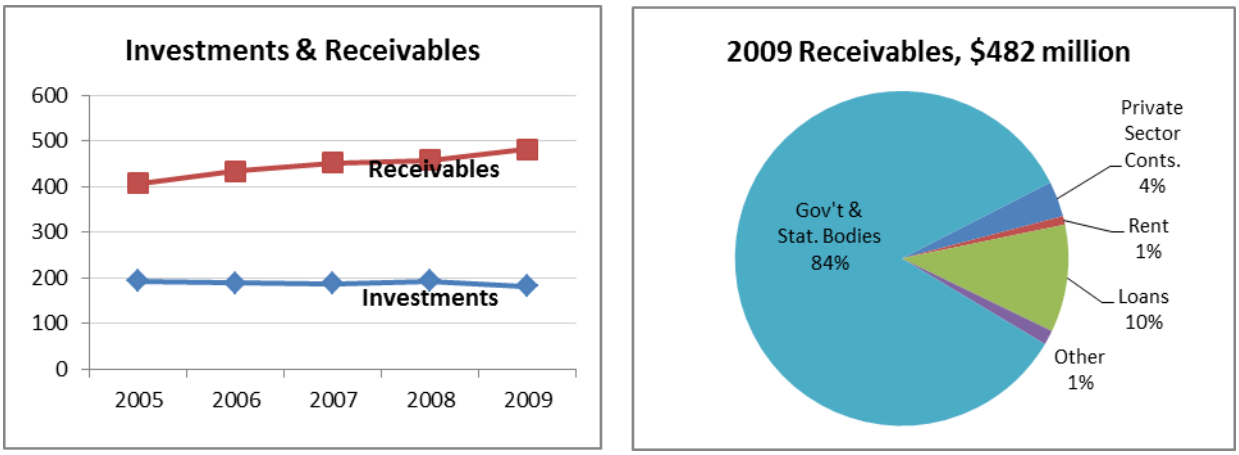
1.6 Investments

At the end of 2009, Social Security investments stood at $181.1 million compared with $193.2 million at the end of 2006. When investments are compared to total reserves, a useful measure of how efficiently available funds are invested, investments at the end of 2009 were only 26% of reserves. Most of the remaining reserves are held as amounts due from Government. This large receivable due from Government is a result of Government's failure to make most of its

contribution, interest and loan/bond payments in cash for the majority of the Fund's first 35 years.

Changes in total investment and total receivables (public and private) from 2005 to 2009, along with the details of 2009 receivables are shown in Figure 1.4 below.

Figure 1.4 SSF Investments & Receivables



During the review period, the average yield on investments was 5.1% while the average yield on reserves was only 1.5%. With inflation averaging 2.1% per annum, the real rate of return on reserves over the 3-year period was negative 0.6%.

The following table provides a summary of the investment mix of the Social Security Fund at year-end 2006 and 2009.

Table 1.4. Summary of Investments, Year-end 2009 & 2006 (millions)

Investment Category	2009		2006	
	$'s	%	$'s	%
Fixed Deposits	35.1	19.4%	46.2	23.9%
Government Securities	99.7	55.1%	94.5	48.9%
Loans	-	0.0%	3.1	1.6%
Properties	32.4	17.9%	38.6	20.0%
Equities	13.8	7.6%	10.7	5.5%
Total	**181.1**	**100%**	**193.2**	**100%**

Most notable from the above table are that total investments declined and the amount held in fixed deposits decreased while the amount held in Government securities increased. The

reduction in both fixed deposits and total investments can be attributed to cash flow challenges which required maturing deposits to be used to meet benefit payments. For a typical social security scheme the above asset mix would be considered reasonable. However, given Government's past experience of not meeting most of its obligations in cash, having more than half of the investments in Government securities has already created cash flow challenges for the Fund.

Chapter 2 Assessment of Performance & Policy Objectives

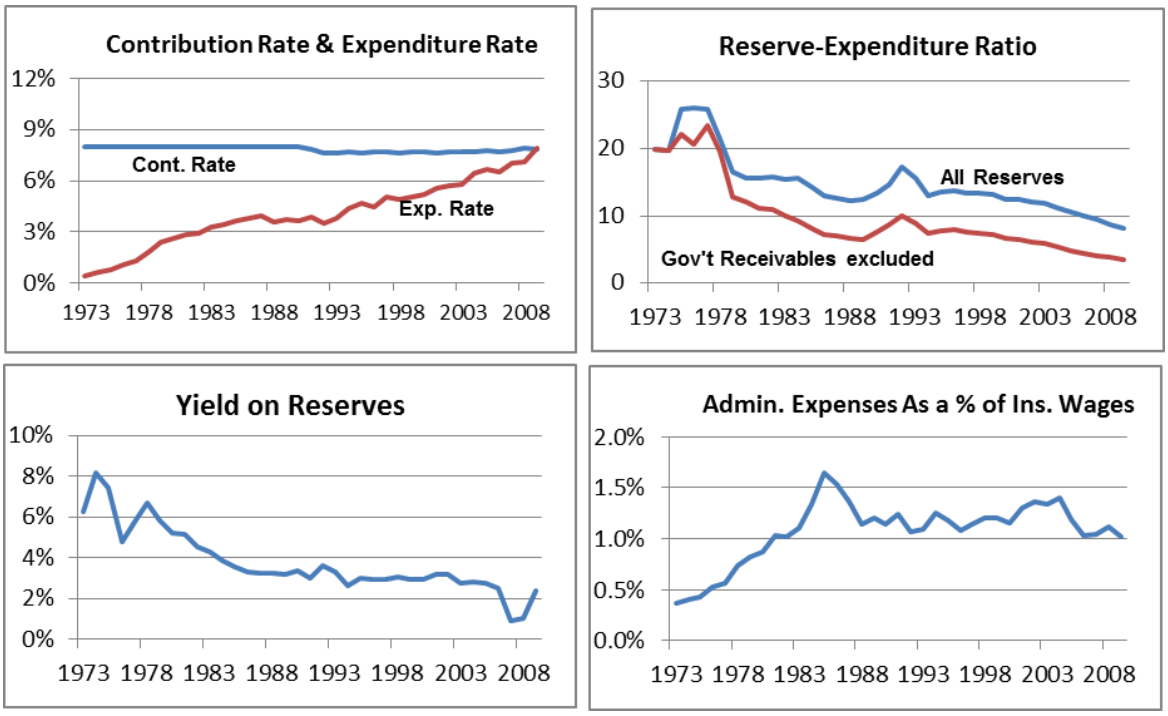
National social security systems must balance benefit adequacy with affordability and long-term sustainability. There is an obvious trade-off between these concepts:- higher benefits provide larger incomes to the elderly, invalid and widowed, but cost more. On the other hand, inadequate pensions result in pressures to increase benefits or add new ones. And when reforms designed to enhance long-term sustainability are continuously deferred, the eventual adjustments will need to be drastic and painful to both contributors and beneficiaries in order to materially impact sustainability.

While past trends for key financial ratios associated with sustainability and an analysis of rules and parameters associated with benefit adequacy are useful, the benefit rules that are likely to govern pension amounts 20 to 40 years from now also need to be assessed. This Chapter contains a review of past trends for key financial indicators, current design parameters and looks at how well key policy objectives are being met.

2.1 Historical Performance, 1973 – 2009

Experience for key financial factors from 1973 to 2009 is presented in the following charts:

Figure 2.1. Social Security Experience



As a social security system matures it is generally expected that expenditure will grow at a faster pace than contribution income and that there would be a gradual deterioration in relative funding levels if the contribution rate is not increased. As shown above, expenditure has generally increased while the contribution rate has never changed. In 2009, expenditure exceeded contributions for the first time.

There are two main factors that drive current expenditure (the pay-as-you-go rate) – the ratio of pensioners to contributors (demographic ratio) and the average pension compared with the average insurable wage (replacement ratio). As discussed in Section 1.3, both of these ratios have been gradually increasing.

Funding levels, as measured by the size of reserves relative to annual expenditure, have gradually decreased since inception. Given that most reserves are backed by receivables from Government, two lines for the reserve-expenditure ratio are shown– one based on accounting numbers and the other assuming that amounts due from Government are excluded. As shown, if Government receivables are excluded, the reserve-ratio is quickly approaching zero.

Also as a result of a large share of investments being held in non-interest bearing debt, the yield on reserves is very low. Administrative costs as a percentage of contributions have fluctuated slightly in recent years at just over 1% of insurable wages.

Table 2.1 shows the values for several key indicators as of the dates of the 6th, 7th and 8th Actuarial Reviews along with a brief analysis of the changes that have occurred over this period.

Table 2.1. Social Security Performance Indicators

	2002	2006	2009	Comments
1. Avg. Contribution Rate	7.7%	7.7%	7.7%	Unchanged since inception
2. Expenditure Rate	5.7%	6.4%	7.9%	Gradual increase expected
3. Benefits as % of GDP	1.7%	2.1%	2.3%	Gradual increase expected
4. Reserve-Expenditure Ratio	12.1	10.0	8.2	Gradual decrease expected
5. 3-year average yield on reserves	3.2%	2.7%	1.4%	Well below market rates
6. 3-year average real yield on reserves (net of inflation)	1.6%	0.7%	-0.6%	Very low real rate of return
7. Administrative Cost as: ▪ % of Contribution Income ▪ % of Insurable Wages	 16.9% 1.3%	 12.6% 1.0%	 13.6% 1.0%	Slight fluctuations in recent years
8. # of Contributors Per Pensioner	7.0	6.5	5.3	Gradual decrease expected

The experience highlighted above is generally in line with expectations except the low yield on reserves, a consequence of a large share of the Fund's investments being held in non-interest bearing receivables.

2.2 Meeting Policy Objectives

The Social Security system is mandatory for all employed and self-employed persons. The system has a defined benefit structure where the rules governing eligibility and the amount payable are defined. Together, the rules and the amounts at which key parameters are set determine benefit adequacy. How well certain rules are enforced and how well the system is managed also impacts how well policy objectives are met.

The OECD in their report "OECD Pensions Outlook 2012" classified a national pension system's primary objectives into six main categories as follows:

- *Coverage* looks at how well workers of all sectors are covered for income security in old age;

- *Adequacy* relates to the ability of pensions to provide a decent standard of living;
- *Financial sustainability* ultimately relates to the affordability of the system to future contributors and tax payers;
- *Work incentives* relate to pension systems having rules that do not encourage or discourage people to cease working and encouraging workers to remain employed longer;
- *Administrative efficiency* regards keeping operating and management costs as low as possible; and
- *Diversification* relates to income security in old age coming from various sources with difference financing mechanisms.

To determine how well these objectives are being met by the Antigua and Barbuda Social Security today, and how likely they are to be met in the future, an analysis of current contribution and benefit provisions, key rates and parameters as well as actual performance indicators have been reviewed. This analysis focuses primarily on pensions which account for nearly 90% of Social Security benefit expenditure.

2.2.1 Coverage

With Social Security participation already mandatory for all employed and self-employed persons, coverage concerns relate to actual participation by formal and informal sectors and both workers and retirees. The following three rates provide a fairly good analysis of coverage levels offered and provided by the SSF.

a)	Estimated % of workers that contribute to (covered by) SS	85%
b)	Estimated % of workers that have their wages fully covered by SS	88%
c)	Estimated % of the elderly resident population receiving a SS pension	85%

Even though it would be expected that close to 100% of the workforce would be making contributions, these rates of participation and coverage are quite good. After nearly 40 years of existence the Social Security Fund provides an adequate level of coverage to both the working and elderly population.

2.2.2 Adequacy

Benefit Adequacy can be broken down into two components:

- Current adequacy: are pensions adequate today?
- Future adequacy: given the current provisions, will pensions be adequate in the future?

Current Adequacy

By design, the minimum Old Age pension is $350 per month. In 2009, this was approximately 13% of the average insurable wage. While reasonable, given that this rate has not been

adjusted since 2005, and cumulative inflation between 2005 and 2009 was around 7%, the minimum pension is slightly low.

For pensioners receiving more than the minimum, their maximum pension is 50% pension replacement rates. This maximum is lower than all others in the English-speaking Caribbean where 60% is the typical the maximum pension replacement rate.

The fact that widows and widowers have different qualifying conditions for Survivors benefit leaves most widowers without any financial support from SSF.

Future Adequacy

A worker who has steady earnings below the wage ceiling and contributes to the Fund for a full career sustaining himself predominantly from his employment earnings, can expect a pension of close to 50% of his pre-retirement earnings from the Social Security. By ILO and other international standards this is adequate and thus meets most reasonable tests of benefit adequacy. The challenge in Antigua and Barbuda, however, is that some workers do not have steady wages and do not consistently work and contribute for 35 or 40 years.

The practice of maintaining a relatively generous minimum pension as described above, will ensure benefit adequacy at the time of award should it continue. The practice of annual pension adjustments will then ensure that the benefit maintains its initial purchasing power.

The uncertainty of future benefit adequacy, therefore, really only relates to those who have employment earnings well in excess of the wage ceiling and those who fail to contribute for at least 10 years.

The Social Security pension is not intended to provide all of the income required to support oneself in old age. Based on the above, current contribution and benefit provisions provide pensions in old-age that meet reasonable tests of future benefit adequacy.

2.2.3 Financial Sustainability

Assessing the sustainability of a national pension system is complicated. Given the perpetual nature of these systems, the rules that apply to private pensions systems are not appropriate. Therefore, whether current reserves plus future contributions at the current contribution rate are sufficient to meet future expenditure should not be used to determine long-term sustainability. Instead, assessing sustainability involves looking at the cost of the system now and in the future, and considering whether or not employers and workers in the future will be able to afford the cost. A definition of financial sustainability that has become widely used in social security discussions is whether the pension system is able to meet the needs of current generations without compromising the needs to future generations.

By design, the Social Security Fund is partially funded and the current contribution rate is inadequate to meet future benefits. It is anticipated that reserves together with contributions at a higher rate will be able to meet future expenditure. It is not possible, however, to determine today the highest contribution rate that workers and employers will be able to afford twenty to thirty years from now. With rates of return on investments falling significantly in recent years, even if most of the receivables are converted to interest yielding securities, contributions will have to account for the greater portion of future Fund income.

Based on regional and international comparisons Social Security provides a sufficient benefits package for a low contribution rate and thus its financial sustainability has come into question. Antigua-Barbuda Social Security has its peculiar challenges given that Government has not met most of its obligations for decades. The key challenge for the current and future Boards regarding financial sustainability will be determining how high the contribution rate needs to be, converting receivables to liquid securities, ensuring that Government starts meeting its obligations and enacting meaningful pension reforms.

2.2.4 Work Incentives

With only a single pension age of 60, Social Security provisions do not include implicit incentives or disincentives to either remain working longer or claim the Age benefit earlier. If the normal pension age is raised to 65 workers would have an incentive to work longer, thus starting pension later leading to reduced pensions costs.

2.2.5 Administrative Efficiency

Around 13% of contribution income, or 1% of insurable wages, goes towards meeting administrative costs. While compared to other social security schemes in the OECS this rate of costs seems quite good, overall administrative costs can be lower.

2.2.6 Diversification Security

Having more than one source of income in old age enhances one's confidence for being able to live comfortably in old age. With mainly public sector workers participating in employer-linked pension plans, and a much smaller percentage having other forms of retirement savings, a pension from Social Security is the only source of regular income for the majority of the elderly population. Ideally, there should be at least one other source of income in old age that is financed differently and possibly administered differently. Examples of other sources of income in old age found around the world include:

- State pensions for the elderly – tax financed
- Registered – individual plans with preferential tax treatments
- Mandatory savings plans – individual or employment linked and privately administered

For each of these categories, recommendations are presented in Chapter 4.

Chapter 3 Best-Estimate Projections

Many demographic and economic factors such as changes in the size and age structure of the population, economic growth, employment and wage levels, and inflation influence Social Security finances. Therefore, to best assess the Fund's long-term sustainability, projections of Antigua and Barbuda's total population and the economy are required. For this review 50-year projections have been performed.

In developing all of the assumptions used for the projections, historical trends and reasonable future expectations, as well as the interrelationships between the various assumptions, have been taken into account. Core projections have been performed using assumptions that reflect best estimates. As a result, the set of demographic and financial projection results based on this assumption set is referred to throughout this report as "*Best Estimate.*"

3.1 Population Projections

3.1.1 Assumptions

Projections of Antigua and Barbuda's population begin with the results of the 2001 Census and in each projection year thereafter, fertility, mortality and migration assumptions are applied. (Detailed results from the 2011 Census are not yet available) Fertility rates are used to estimate the number of births each year while mortality rates determine how many, and at what ages, people are expected to die. Net migration represents the difference between the number of persons who permanently enter and leave Antigua and Barbuda and is the most volatile of the three factors. The 2011 population census placed Antigua and Barbuda's population at 86,295. In 2001, the population was 76,878.

The total fertility rate (TFR) represents the average number of live births per female of childbearing age in a particular year. If there is no migration, a TFR of 2.1 is required for each generation to replace itself. Based on the number of births in recent years the TFR is estimated at around 1.8 in 2009. For these projections it is assumed that TFR's will remain at 1.8.

Using mortality rates from United Nations Life Tables for Latina America, current population estimates and the number of deaths around the last census suggest life expectancy at birth in 2009 of around 72 for males and 78 for females. Improvements in mortality are assumed to occur in accordance with UN estimates.

The economic assumptions used for this report assume stable and positive economic growth and labour productivity in all years. Although simplistic, they approximate usual economic

cycles and volatility that encompass periods of expansion and recession. They also account for projected changes in the population and labour force that will provide the capacity for additional output through more workers and increased productivity (real wages).

The following table indicates the principal demographic and economic best-estimate assumptions. Further details may be found in Appendix B.

Table 3.1. Principal Demographic & Economic Assumptions

		9th Review	8th Review
Ultimate Total Fertility Rate (from 1.8 in 2009)		1.8 in 2020	1.75
Mortality Improvements^		Slow	Slow
Net Outward Migration Per Annum		0	600 in 2001 declining to 500 in 2006, 200 in 2020 and 100 in 2030, constant thereafter
Real GDP Growth Rates	Short-term	2.5%*	3.00%
	Med.-term	2.0%	2.50%
	Long-term	1.0%	1.25%
Inflation		2.5%	2.75%

^ UN mortality improvement rates
* From IMF

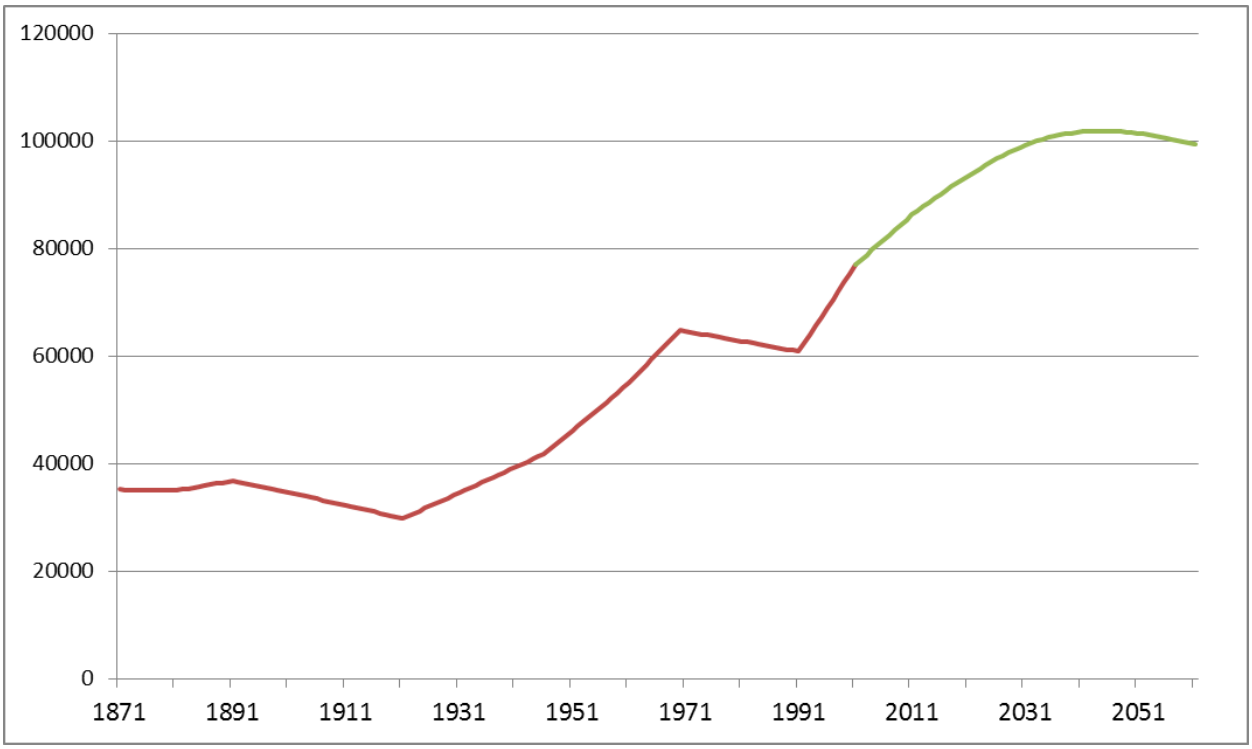
3.1.2 Projection Results

There are no official projections of the Antigua-Barbuda population. It should be noted that the projections presented in this report have been prepared for the sole purpose of determining the implications for Social Security finances.

The last Census for which full details are available was conducted in 2001. For the 2011 population Census, the resident population was estimated at 86,295, up from 79,878 in 2001. The 2011 age and sex distribution of the population was not available up to the time of this report.

The following chart shows historical census populations between 1871 and 2011 and the projection results up to 2061.

Figure 3.1 Past and Projected Populations



As shown above, the population has generally increased since 1921 and further increases are expected, but at a slower rate.

While projected future population size is important, the age distribution of the population is more critical for Social Security, as pensions to the elderly represent around 85% of benefit expenditure. The anticipated ageing of the population is highlighted in the last column of Figure 3.1 and Table 3.2 which shows the ratio of the number of working-age people for each person of pension age. This ratio is projected to decrease from 6.5 in 2001 to 1.8 in 2061.

Figure 3.2 Population 2009 to 2061

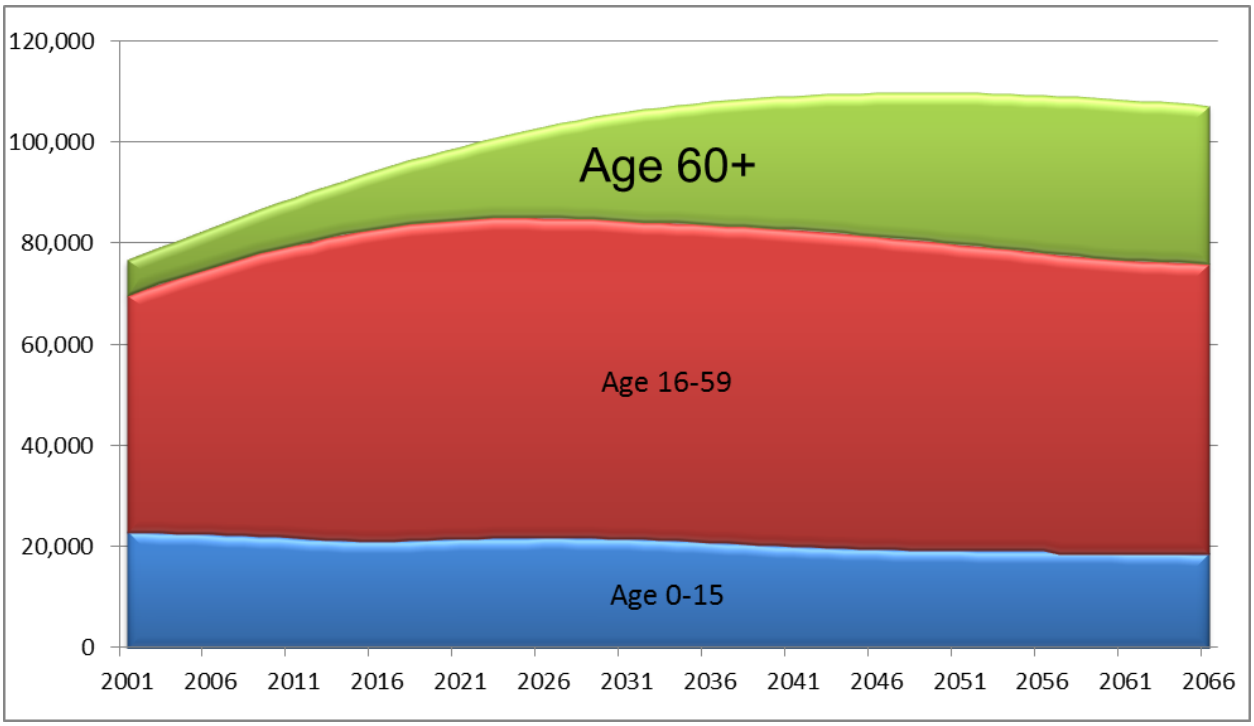


Table 3.2. Projected Antigua and Barbuda Population (*Best-Estimate* scenario)

Year	Total	Age 0 - 15	Age 16 - 59	Age 60 & over	Ratio of # 16-59 To 60 & Over
2001	76,878	22,994	46,718	7,166	6.5
2011*	86,295	21,443	55,747	9,105	6.1
2016	90,050	20,332	58,469	11,250	5.2
2021	93,583	20,226	59,100	14,257	4.1
2026	96,719	20,216	58,585	17,918	3.3
2031	99,191	20,039	57,766	21,385	2.7
2036	100,844	19,600	57,426	23,818	2.4
2041	101,679	18,956	57,291	25,432	2.3
2051	101,417	18,017	55,596	27,804	2.0
2061	99,315	17,611	52,495	29,209	1.8

Compared to the population projections of the 8th Actuarial review, these projections are less optimistic with an estimated 2061 population of 99,315 instead of 108,364. The less optimistic assumptions have been chosen given recent economic performance and the tempered outlook for economic, labour market and population growth.

3.2 Social Security Projections

Building on the population and economic projections presented in the previous section, Social Security demographic and financial projections have been modelled under best-estimate assumptions. These projections encompass several Social Security specific assumptions, the contribution and benefit provisions in place on January 1, 2010. While increases to the contribution ceiling and pensions in payment are not legislated, periodic adjustments have been assumed.

3.2.1 Assumptions

Key Social Security assumptions are shown below.

Table 3.3. Social Security *Best Estimate* Assumptions

	9th Review	8th Review
Avg. Contribution Rate	7.7%	7.7%
Insurable Wage Ceiling	Increased to $6,000 in mid-2013 and then by wage inflation starting 2015	To $5,500 per month in 2009 and annually thereafter by the change in average wages.
Short-term Benefits	0.7% of insurable earnings increasing to 0.8% over 20 years	Increases from 0.72% to 0.85% of insurable earnings over 60 years
Pension Increases	5% in 2015 and then by price inflation thereafter.	Annually by the change in Consumer Price Index beginning in 2009
Long-term Yield on Reserves	1% in 2012 to 2013, 3.5% thereafter	2.5% up to 2009, 5% thereafter
Admin. Expenses as a % of Insurable Wages	1.2%	Decrease from 1.1% to 0.8% over 60 years

3.2.2 Projection Results

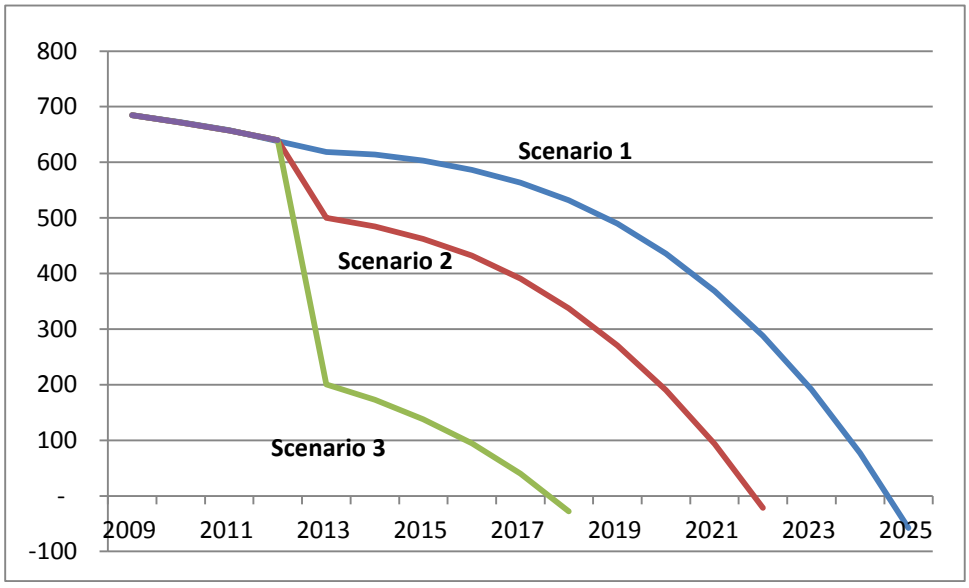
For accounting purposes, Social Security finances are separated into the Short-term and Long-term Benefit Branches. However, provisions exist for transferring reserves between branches and changing income allocations. Therefore, shortfalls in one branch may be met from surplus reserves of another. For this report, the projections for all branches have been consolidated so that the complete financial picture may be shown.

In December 2009, 70% of reserves were accounted for as receivables. The proportion of this amount that Social Security will ultimately receive in a form that can be converted to cash, as well as the timing of such receipt, is unknown. The recoverability of some of the remaining assets are also questionable, especially at the value they are currently being carried at. Therefore, projections of future reserves (on an accounting basis) have been made under three different scenarios (see table below) for the level of recoverability for both Government receivables and other assets. Write-downs are assumed to occur in 2013.

Scenario	Government Receivable	Other Assets	Book Reserves at End of 2013
1	100%	100%	$635
2	75%	80%	$500
3	25%	60%	$200

Figure 3.2 highlights the key projection results of these three scenarios using *Best Estimate* assumptions, assuming that the contribution rate is not increased and that there are no changes to benefit rules.

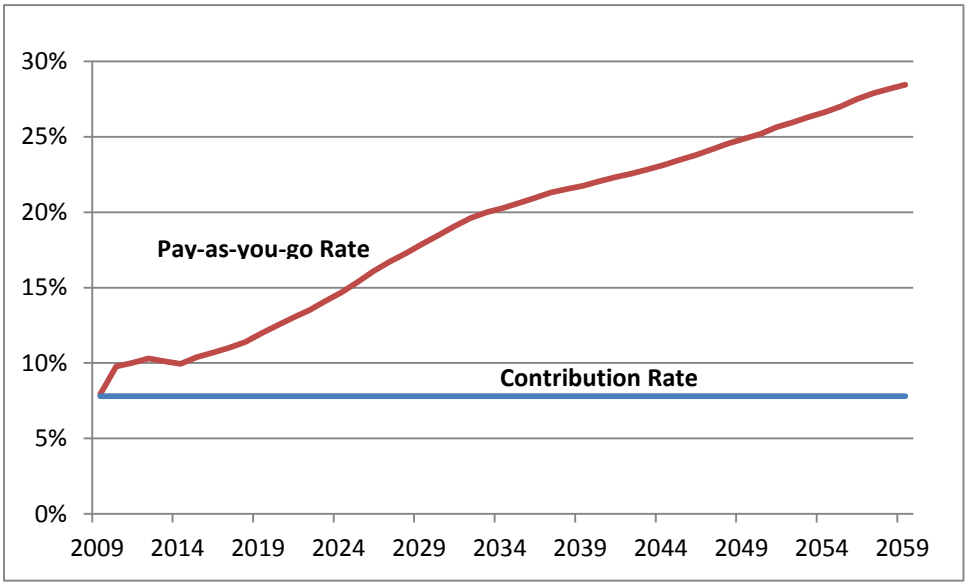
Figure 3.2. Projected Reserves – *Best Estimate* Assumptions



The above chart shows projected accounting reserves. As indicated elsewhere in this report, the Fund (in early 2013) is currently operating on a true pay-as-you-go basis as there are no cash reserves. Projections of reserves on a cash flow basis are not presented in this report as it is not known how soon current investments can be converted to cash.

The annual cost of the Social Security system, commonly referred to as the pay-as-you-go rate, is unaffected by reserves and investments. This rate is critical as if there are no investments that can be sold to meet expenditure, the contribution rate will have to be set to at least the pay-as-you-go rate in order for the Fund to make benefit payments on time. Projected pay-as-you-go rates are shown in Figure 3.3.

Figure 3.3. Projected Pay-As-You-Go Rates - *Best Estimate* Assumptions



Key results from these projections are summarised as follows:

1. Expenditure will exceed contribution income each year and annual cash flow deficits will continue unless the contribution rate is increased.
2. The projected pay-as-you-go rates in 2013 and 2014 are based on there being a ceiling increase in 2013. If this does not occur, then pay-as-you-go rates will be higher than shown above.
3. Even if the full carrying value of all receivables and investments are realised, reserves will be exhausted by 2025.
4. Annual expenditure relative to total insurable wages will approach 30% in 2061 if no pension reforms are made.
5. The general average premium, or the average level contribution rate required over the next 30 years to fully cover total expenditure during that period is 21.3%

6. The number of contributors for each pensioner is expected to fall from 5.3 in 2009 to 1.6 in 2061.

The projection results presented above for the scenario in which all reserves will be realised at their current value less favourable than those of the 8th Actuarial Review with depletion of the Fund projected to be in 2025 instead of 2029.

Numerical details of the financial and demographic projections for the *Best Estimate* scenario are provided in Tables 3.4 to 3.6.

Table 3.4. Projected Income, Expenditure & Reserves - *Best Estimate* (millions of $'s)

Year	Cash Inflows				Cash Outflows				Reserves	
	Contribution Income	Investment Income	Other Income	Total	Benefits	Admin. Expenses	Total	Surplus/ (Deficit)	End of Year	# of times current year's expenditure
2007	77.7	5.8	0.2	**83.6**	59.6	10.5	**70.0**	**13.6**	**660**	9.4
2008	84.3	6.7	0.1	**91.1**	65.7	12.1	**77.8**	**13.3**	**673**	8.7
2009	78.6	16.1	0.1	**94.8**	72.5	10.7	**83.2**	**11.7**	**685**	8.2
2010	71.7	5.0	-	**76.8**	78.6	11.3	**90.0**	**(13.2)**	**672**	7.5
2011	74.5	6.8	-	**81.3**	85.0	10.6	**95.6**	**(14.3)**	**657**	6.9
2012	77.5	6.4	0.2	**84.1**	91.8	12.0	**103.8**	**(19.7)**	**638**	6.1
2013	82.9	6.3	0.2	**89.3**	96.1	12.8	**108.9**	**(19.6)**	**618**	5.7
2014	88.2	21.2	0.2	**109.6**	100.4	13.6	**114.0**	**(4.4)**	**614**	5.4
2015	92.4	20.9	0.2	**113.5**	110.4	14.2	**124.6**	**(11.1)**	**603**	4.8
2016	96.4	20.5	0.2	**117.1**	119.0	14.8	**133.7**	**(16.6)**	**586**	4.4
2017	100.6	19.8	0.2	**120.6**	128.4	15.4	**143.8**	**(23.2)**	**563**	3.9
2018	104.8	18.8	0.2	**123.9**	139.0	16.0	**155.0**	**(31.1)**	**532**	3.4
2019	108.5	17.6	0.2	**126.3**	151.9	16.5	**168.4**	**(42.1)**	**490**	2.9
2024	131.1	4.6	0.3	**136.0**	230.4	19.6	**250.1**	**(114.1)**	**77**	0.3
2029	156.4	(24.7)	0.3	**132.0**	340.4	23.1	**363.4**	**(231.4)**	**(834)**	(2.3)
2039	228.2	(159.3)	0.5	**69.4**	612.1	32.6	**644.8**	**(575.4)**	**(4,919)**	(7.6)
2049	331.9	(451.6)	0.7	**(119.0)**	1,025.6	46.0	**1,071.6**	**(1,190.6)**	**(13,728)**	(12.8)
2059	477.0	(1,037.5)	1.0	**(559.6)**	1,698.5	64.0	**1,762.6**	**(2,322.2)**	**(31,330)**	(17.8)

Negative reserves indicate the indebtedness of the Fund and negative investment income is the current cost of servicing that debt.

Table 3.5. Projected Benefit Expenditure - *Best Estimate* (millions of $'s)

Year	Pensions, Grants & Benefits					Benefits as a % of:	
	Age	Invalidity	Survivors	Old-Age Assistance	Short-term	Insurable Wages	GDP
2007	46.3	1.8	3.2	0.9	7.1	6.0%	1.9%
2008	51.7	2.0	3.5	0.8	7.4	6.0%	2.0%
2009	57.8	2.2	3.7	0.7	7.7	6.9%	2.3%
2010	64.1	2.4	4.0	0.6	7.2	8.6%	-8.5%
2011	70.7	2.4	4.2	0.5	6.7	8.9%	-3.0%
2012	84.9	2.8	4.3	0.4	7.2	7.7%	2.9%
2013	94.0	3.2	4.5	0.2	7.7	7.6%	2.9%
2014	101.7	3.5	4.7	0.1	8.2	7.4%	2.9%
2015	110.2	3.8	4.9	0.1	8.6	7.8%	3.0%
2016	119.9	4.2	5.1	0.0	9.0	8.1%	3.1%
2017	131.9	4.6	5.3	0.0	9.4	8.4%	3.3%
2018	145.1	5.0	5.5	0.0	9.8	8.7%	3.4%
2019	158.8	5.5	5.7	0.0	10.2	9.2%	3.5%
2024	244.7	8.1	7.3	0.0	12.5	11.5%	4.4%
2029	353.8	10.9	9.5	0.0	15.0	14.2%	5.4%
2039	620.4	18.1	16.1	-	22.4	17.6%	6.7%
2049	1,048.0	27.1	26.2	-	33.2	20.2%	7.7%
2059	1,729.4	38.1	42.3	-	48.6	23.3%	8.9%

Table 3.6. Projected Contributors & Pensioners at Year-end - *Best Estimate*

Year	# of Contributors	# of Pensioners				Total # of Pensioners	Ratio of Contributors to Pensioners
		Age	Invalidity	Survivors	Old-Age Assistance		
2007	40,333	5,064	244	815	277	**6,400**	**6.3**
2008	40,287	5,483	262	844	231	**6,820**	**5.9**
2009	39,121	5,977	272	900	203	**7,352**	**5.3**
2010	38,226	6,627	294	937	178	**8,036**	**4.8**
2011	37,460	7,253	278	931	151	**8,613**	**4.3**
2012	38,508	7,865	335	1,009	69	**9,277**	**4.2**
2013	39,186	8,119	359	993	41	**9,511**	**4.1**
2014	39,686	8,417	377	979	24	**9,798**	**4.1**
2015	40,198	8,740	405	969	14	**10,128**	**4.0**
2016	40,673	9,111	428	960	8	**10,507**	**3.9**
2017	41,073	9,590	451	951	4	**10,997**	**3.7**
2018	41,543	10,113	479	944	2	**11,538**	**3.6**
2019	42,007	10,630	506	940	1	**12,078**	**3.5**
2024	43,664	13,527	642	943	0	**15,112**	**2.9**
2029	44,319	16,397	749	1,006	0	**18,152**	**2.4**
2039	44,708	20,104	885	1,152	-	**22,141**	**2.0**
2049	44,158	22,794	908	1,268	-	**24,970**	**1.8**
2059	42,459	24,878	874	1,359	-	**27,111**	**1.6**

For Social Security systems that are partially funded and designed to be perpetual, costs are usually presented in terms of the pay-as-you-go-rate, which represents annual expenditure as a percentage of covered wages. For private pension plans, however, where full funding is the financing objective, there are other measures of the system's cost and, where applicable, financing shortfall, that may be useful for Social Security policy makers to be aware of.

3.2.3 General Average Premium

The general average premium is the average level contribution rate required over the next 50 years to fully cover total expenditure during that period. This rate may be looked at as the average long-term cost of the complete Social Security benefits package. For these *Best Estimate* projections, the general average premium is 21.3%, 13.6% higher than the current average contribution rate.

While the assumed yield on reserves does not affect pay-as-you-go rates, it has significant effects on present value calculations and thus the general average premiums. If the assumed long-term interest rate were 5.0% instead of 3.5%, the general average premium would be 19.8% instead of 21.3%.

3.2.4 Actuarial Balance

Another measure of the financial sustainability of a Social Security system is called "actuarial balance." For a given period, the actuarial balance can be defined as the difference between:

a) the sum of the beginning reserves and the present value of future contributions (money available to meet expenditure), and
b) the present value of future expenditure,

divided by the present value of future insurable earnings. This formula produces a rate that indicates the adequacy or insufficiency of the present contribution rate for a given period. For the Social Security Fund, the deficiency expressed in dollars and as a percent of GDP is shown in Table 3.7.

Table 3.7. Actuarial Balance 2010 – 2061 ($'s are in millions)

	2009 Year-end Reserves	685
Plus	**PV of Future Contributions at 7.8%**	4,441
Minus	**PV of Future Expenditure**	11,341
Equal	**PV of Surplus/(Shortfall)**	(6,215)
	Actuarial Balance (% of Insurable Earnings)	(10.8%)
	Actuarial Balance (% of GDP)	203%

Consistent with previous discussions, the negative actuarial balance indicates that together with reserves, the current contribution rate is insufficient to meet future expenditure for the

next 50 years. The shortfall of 10.8% indicates that the contribution rate would have to be increased to 18.5% for the entire period in order for reserves to last up to 2061.

3.4 Sensitivity Analysis

Given the extensive set of assumptions required for projecting Social Security finances and the length of the projection period, future experience will certainly differ from that projected under best estimate assumptions. Actuarial review reports typically illustrate a reasonable range for the Fund's outlook by presenting projections using additional sets of population, economic as well as Social Security assumptions. Given that Social security is now operating essentially as a pay-as-you go system, with a contribution rate that is more than 2% below the annual expenditure rate, urgent reforms are needed. While a long-term outlook is still necessary, priority should be given to strengthening short-term finances.

This report, therefore, does not include projections of Fund finances under alternative demographic/economic scenarios. Instead, the focus is on the range of reforms that may be considered. Chapter 4 that follows provides an extensive discussion of such changes along with specific recommendations for reform.

Chapter 4 Balancing Adequacy & Sustainability

By design, Social Security pension obligations are only partially funded – that is, assets on hand are not sufficient to meet total liabilities if all payments were due immediately. This funding mechanism is considered suitable for national pension systems that are expected to be perpetual.

Cash flow shortfalls in mid-2012 and the inability to convert investments into cash, has led to Social Security making monthly pension payments late. This late payment of pensions has continued through early 2013. This unfortunate situation has occurred due to the fact that Social Security continued to meet its obligations (benefit payments) to beneficiaries while those who owed Social Security, including GOAB and other public corporations, did not regularly meet their obligations (contribution, interest and loan payments) to Social Security. The current financial situation can be summarised as follows:

- Current contributions are below combined benefit and administrative expenditure;
- Investment earnings are minimal even though investments exceed $600 million;
- Most of the Fund's investments are held in receivables from Government and the remainder cannot be readily converted into cash.
- Benefit payments continue to increase each month.

Unless the contribution rate is increased or investments are converted to cash soon, the late payment of pensions will worsen as deficits keep increasing.

Many national pension systems in the Caribbean and across the world have, or in the process of, reforming their national pension systems. Financial sustainability is often the primary motive of such reforms and they have often been made at the expense of benefit adequacy. Common reforms designed to enhance financial sustainability include:

- Increasing pension age
- Reducing benefit promises
- Changing the method of benefit indexation
- Not paying old-age pensions unless retired or substantially retired
- Increasing the contribution rate
- Prudent and relevant investments strategies
- Reducing administrative costs
- Implementing good governance practices

All of these reforms need to be considered. In an effort to ensure that Social Security continues to provide adequate benefits to beneficiaries, reforms aimed at enhancing financial sustainability should be balanced against benefit adequacy.

Under the headings of the six policy objectives previously discussed in Chapter 2 the following table and sections discuss reforms that if implemented soon, will serve to enhance the Fund's chances of meeting its obligations for years to come.

Table 4.1 Policy Objective Challenges And Options For Reform

	Challenges With Current Situation	Options For Reform
Coverage	▪ Many workers, especially those in informal sector, not covered	▪ Enhance links with other government agencies ▪ More flexible payment options for self-employed contributions ▪ Better enforcement and/or increased penalties for non-compliance
Benefit Adequacy	▪ Many workers have earnings well above the wage ceiling ▪ Different provisions for men and women ▪ Pensions not increased regularly ▪ No Employment Injury benefits ▪ No unemployment benefit	▪ Increase ceiling ▪ Equalize rules for pensions to widows and widowers ▪ Link pension adjustments to inflation ▪ Add Employment Injury benefits ▪ Add unemployment benefit
Financial Sustainability	▪ Majority of assets are receivables from Government ▪ Current contribution rate inadequate ▪ Investment returns very low ▪ Age 60 young for full pension	▪ Convert receivables to cash ▪ Revise investment strategy ▪ Increase the contribution rate ▪ Increase normal pensionable age ▪ Longer averaging period of wages for Age pension ▪ Lower pension accrual rates
Work Incentives or Disincentives	▪ Old age pension payable even if still working	▪ Increase pension age to 65 but keep 60 as early pension age with reduced pension only if retired
Administrative Efficiency	▪ Administrative expenses slightly high ▪ Financial reporting weak	▪ Conduct a Human Resource audit ▪ New or enhanced Information Technology system ▪ Let one agency in Antigua and Barbuda collect taxes and contributions and another pay all SS and state pensions ▪ Design controls to limit abuse & fraud
Diversification/ Security	▪ Most private sector workers have no other reliable source of income in old age	▪ Government initiated mandatory or voluntary savings plans

4.1 Coverage

4.1.1 Links With Government Departments

Although Social Security participation is compulsory for all workers, some employers and many self-employed persons do not regularly make contributions. While it will always be difficult to capture informal sector workers and self-employed persons, creating links with Government departments that issue licenses, permits and approvals to conduct business should be put in place. While such relationships may already be in place with some departments, it is recommended that these relationships be strengthened and new ones established.

4.1.2 Penalties For Delinquent Businesses

Failure to pay contributions on time, for all employees, and for their full wages, is an offence that is punishable by law. The Board should fully enforce all existing avenues available to it and identify new means of ensuring that all who are required to contribute do so on a timely basis. The Board should also consider introducing a garnishee provision whereby SS may place a hold or charge on assets or the payments due to a delinquent employer.

4.1.3 Method For Self-Employed Contributions

Self-employed persons and informal sector workers are required to make monthly contributions in a manner similar to that of employed persons. However, their income flow is often quite different. Therefore, a system whereby someone can make flexible, lump sum payments, or in other words, simply “put money on their account” as their needs allow, should be considered for such workers. A means of converting accumulated amounts to a pension, perhaps using the traditional approach of weeks and average wages, will, however, need to be devised.

Enhanced and sustained public education activities highlighting the benefits of self-employed persons and informal sector workers contributing to Social Security should be put in place.

4.2 Benefit Adequacy

4.2.1 Mechanism for Adjusting Pensions & Wage Ceiling

The wage ceiling has not been adjusted since 1993. Pensions were last increased in 2005. Ideally, ceiling and pension increases should be provided for in regulations so that they occur regularly and the basis for the increases is transparent. It is therefore recommended that an automatic approach to adjusting the wage ceiling, pensions in payment and all fixed-dollar parameters be adopted with regulations clearly prescribing the timing and procedure for

adjusting them. Frequent adjustments to both the wage ceiling and pensions will ensure that Social Security remains relevant to both workers and pensioners, providing adequate levels of income protection as wages and prices increase.

Specific guidelines for increasing the wage ceiling, pensions and all other fixed-dollar rates are described below:

- The wage ceiling, all pensions, grants and other fixed-dollar amounts should be adjusted no less frequently than every 2 years, but ideally, every year.
- The adjustment for pensions in payment should be based on the average of the most recent three years price inflation (as determined by changes in the Retail Price Index).
- Given that Antigua-Barbuda does not have a national wage index, use of the Retail Price Index is acceptable for the purpose of adjusting the wage ceiling. However, since wages tend to increase at a higher rate than inflation, it is recommended that until a reliable national wage index is established, ceiling adjustments be made at a rate of 1% above the three-year average increase in the prices.
- Minimum pension rates, Funeral and Maternity grants should be increased by the same rate as pensions in payment, as determined above.
- There should be a limit on any single pension adjustment (such as 4%) that can be made without written certification from an actuary that the Fund can support the prescribed increase.

As discussed below, while automatic adjustments would improve the design of the system, actual adjustments to pensions may not be desirable at this time.

4.2.2 Wage Ceiling

The wage ceiling which now stands at $4,500 has not been adjusted since 1993. As a result, Social Security benefits have lost their significance to higher paid workers over the past 20 years. At its current level it is estimated that between 85% and 90% of workers and self-employed persons have their wage fully covered. While this is an adequate level of income coverage by international standards, some higher paid persons are not adequately covered.

An increase in the wage ceiling to at least $6,000 per month is therefore recommended. Such an increase will also serve to increase contribution income in the short-term although it will result in higher benefits to higher paid persons in the future. This increase could be lessened by making an adjustment to the formula used for Age pensions so that persons qualifying in the next few years do not receive an excessive pension relative to their career earnings.

4.2.3 Pension Increases

Since minimum pensions have not been increased since 2005 an increase to all pensions in payment would be recommended in normal circumstances. However, given the Fund's current cash flow challenges and the need for a package of reforms that should affect both contributors and pensioners, no increase is being recommended at this time. In fact, a temporary reduction in pension amounts may be required to improve finances.

For the same reasons given above, the Maternity Grant and Funeral benefit should not be increased either.

4.2.4 Survivors Benefits

Differences in qualifying conditions for men and women still remain for Survivors benefits. With very restrictive requirements for men – invalid, married for three years and wholly or mainly supported on the late wife - very few widowers qualify. It is once again recommended that the qualifying conditions for widowers be made the same as those for widows.

4.2.5 Employment Injury Benefits

Unlike most other social security schemes in the Caribbean, Antigua-Barbuda Social Security does not cover explicit coverage for work-related injuries and diseases. Instead, employers are expected to purchase Workers Compensation from private insurance companies.

An extensive discussion of adding Employment Injury benefits was presented in the report of the 8th Actuarial Review. Given the other challenges now faced by the Fund, adding Employment Injury benefits similar to those found in other Caribbean countries, is not considered a top priority. However, if it is felt that the current private coverage for job-related accidents and diseases is inadequate then consideration could be given to adding "social security style" employment injury/disease benefits with a new contribution rate of ½%.

4.2.6 Unemployment Benefit

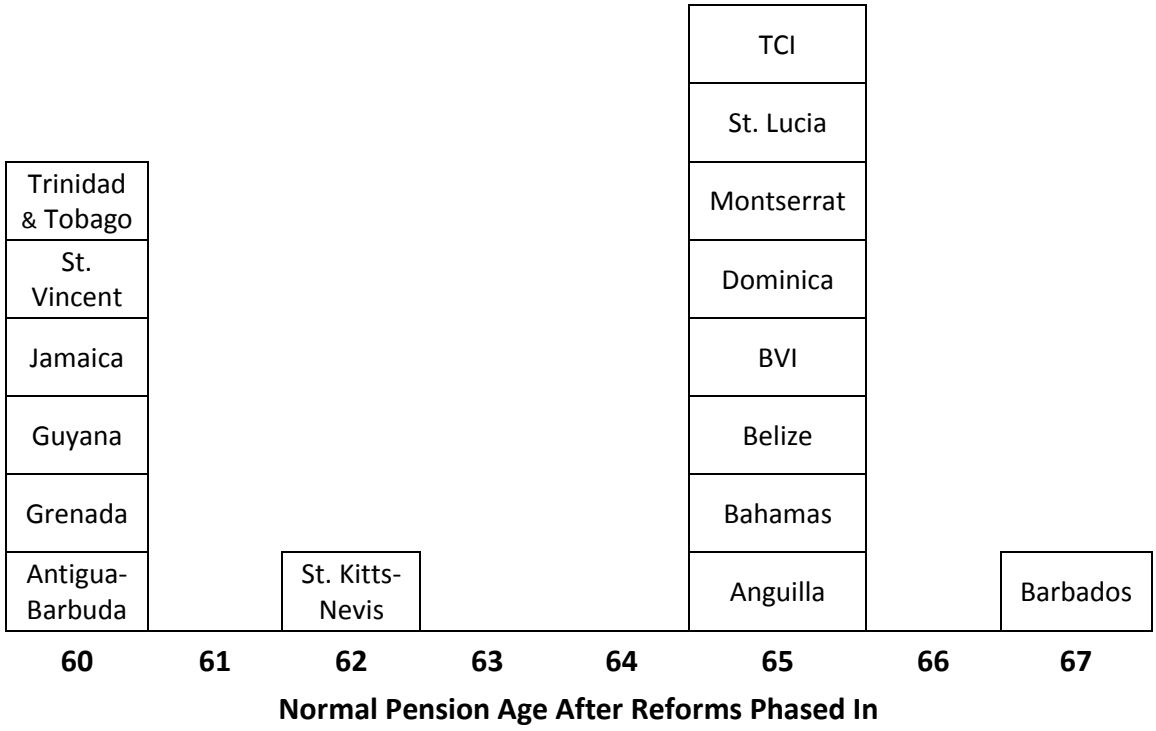
Unemployment benefit is another ILO-recommended, income-replacement benefit that Social Security does not currently offer. In the Caribbean, only Barbados and The Bahamas provide this benefit. Unemployment benefit has a positive impact on both affected individuals and the overall economy during recessions. A minimal unemployment benefit that replaces 50% of average insurable wages for up 13 weeks can be added with a 1% contribution rate increase. However, given the current financial challenges being faced by the Fund and a need for an increased contribution rate to meet the costs for the current benefits package, the addition of an unemployment benefit is not recommended at this time.

4.3 Financial Sustainability

4.3.1 Increasing The Normal Pension Age

The following chart shows the normal pension age that either currently or will soon exist in the sixteen English-speaking CARICOM countries. As shown only 6 countries, including Antigua-Barbuda, still have age 60 as the normal pension age. Most of the countries with normal pension ages of 65 or 67 have age 60 as the age at which reduced Age pensions are first payable.

Figure 4.1. Normal Pension Ages In English-Speaking Caribbean Social Security Schemes



Increases to the pension age are not only justifiable since people are living longer and are healthier at age 60 than they were forty years ago, but it is also a very effective means of reducing long-term costs to a national pension system.

When increases to pension ages take place they are usually phased in so that those close to pension age are not significantly affected by the change. However, the longer the phase-in period, the lower the long-term savings will be. Given that reducing long-term costs is now critical to the survival of the Fund, it is recommended that the normal pension age be increased to 65 over a period of no more than 9 years. Two options for gradual increases are:

i. Increase by ½ year every year

ii. Increase by 1 year every 2 years

As the normal pension age increases, age 60 could be kept as the first age at which Age pensions can be awarded. However, any pension awarded prior to the prevailing normal pension age should be reduced by 6% for each year (1/2% per month) below the normal pensionable age.

4.3.2 Age Pension Formula

There are two ways by which the formula used to calculate Age pensions can be revised so that pensions above the minimum rate will be slightly smaller:–

- use a longer averaging period for insurable wages of say 7 or 10 years instead of 5 years, and
- reduce the replacement rate for the first 10 years of contributions from 25% to 20%. With 1% accrual per annum thereafter, the maximum 50% would be reached after 38.5 years instead of only 33.7 years of contributions.

These two changes would reduce the average new Age pension but would not affect those who whose wages are low or who have short contribution histories as they would still qualify for the minimum pensions.

4.3.3 Contribution Rate Increases

Contribution rate increases are inevitable and now that financial deficits are being experienced, one should be enacted immediately. A minimum increase of 2% is recommended. The most equitable way to distribute this increase would be 1% by the employer and 1% by the employee.

Even with a 2% increase in contributions and the sale of some investments, additional rate increases will be needed in the coming years. Therefore, a contribution rate adjustment policy is recommended. Such a policy will set out when a rate increase should occur and how much that rate increase should be. Suggested factors on which this this policy should be based on the following two principles:

- All pension payments will be met on time
- Liquid reserves will not be allowed to fall below 2 times annual expenditure

At the end of 2012, the Fund had no liquid reserves. Therefore, achieving a reserve-ratio of 2 will require the conversion of almost $250 million to assets that are considered liquid. This will require a combination of timely contribution payments by Government, sale of properties and the conversion of a significant portion of receivables from Government to cash or liquid securities. If these are not successful, a rate increase of up to 3% would be necessary for the Fund to meet its obligations thru 2015.

The recommended contribution rate adjustment policy is as follows:

> Maintain a minimum level of liquid reserves of 2 times annual expenditure for the next 10 years and adjust the contribution rate each year by the estimated amount required to achieve this. (A reasonably sized buffer fund is required to meet any future unexpected shocks that may occur.)

The above recommendation hinges on the ability of Government to pay a large portion of its receivables in cash soon. This may not be possible. Therefore, an alternate contribution rate increase strategy based on the presumption that pensions will be met on time is to increase the contribution rate so that at a minimum, contribution income is able to meet all expenditure.

Based on the projections presented in earlier sections, with the key assumption that the ceiling will be increased in mid-2013, the following table shows the contribution rates (private sector) for the next 5 years that would meet these funding objectives:

Table 4.2 Required Contribution Rates To Meet Funding Objectives

	Maintain Liquid Reserves of 2 Times Total Expenditure	Contribution Income Meets Total Expenditure
2013	10.0%	10.0%
2014	10.5%	10.0%
2015	11.5%	10.5%
2016	12.5%	10.5%
2017	13.5%	11.0%

A larger initial increase of 3% starting in 2013 would immediately strengthen/improve short-term finances.

For civil servants, a 2½% increase (from 7.0% to 9.5%) in their contribution is the recommended. On average, Sickness benefit costs for which civil servants are not covered are slightly less than ½% of insurable wages. The rate difference between private and public sector workers should generally reflect the cost of the benefits not offered to one group. Therefore, the contribution rate paid by civil servants should be brought in line with that paid by private workers for the benefits offered to both groups, and thus the rate difference should be reduced from 1% to ½%.

4.3.4 Investments

Almost 90% of the Fund's reserves are currently held as amounts due from GOAB. Most of the remainder is either in properties or securities that cannot be readily converted into cash. To help meet short-term cash flows, it is expected that some properties and securities will be sold. Also, efforts should be made to have Government provide cash or interest bearing securities for a portion of the receivables, with the remainder being paid off via regular monthly payments.

If a significant portion of these receivables can be converted to cash or tradable securities a formal approach to managing assets and selecting new investment avenues should be put in place. Typically, a fund of this size has an Investment Policy Statement. Investment Policy Statements set out the investment principles and guidelines for the Fund and define the management structure and monitoring procedures adopted for on-going operations. They also include a desired asset allocation policy for the Fund. Specific issues that should be considered and addressed in a new Policy are:

a) The current financial position of the Fund and current market conditions.
b) Liquidity and safety of investments should take priority over rate of return.
c) The investment strategy should match the liability and cash flow profile of the Fund.
d) Asset diversification is important for risk management.

4.4 Administrative Efficiency

Administrative efficiency relates to both how well tasks are done and how much it costs to perform them. In both respects, Social Security appears to perform reasonably but there is some room for improvement.

Regarding operating costs, between 13% and 14% of contribution income was spent over the review period. While slightly on the high side, this rate is not excessive by regional standards when compared to schemes of similar size. Some cost savings can be achieved by reviewing all operational procedures and finding new ways of making all processes as efficient as available technology allows.

As a means of enhancing administrative efficiency, both the Social Security Board and Government should consider having a single agency collect taxes, Social Security contributions and Medical Benefits Scheme contributions. Not only should such an entity (could be Social Security) be less costly to operate, it should also be able to collect more revenue given its access to information from various sources. Using a single agency to pay pensions, Social Security as well as pensions to former public officers, would further result in cost savings to both Social Security and Government.

While there is no single target rate for all social security schemes, reducing costs to 10% over 10 years by a combination of increasing collections and reducing operating costs should be set as a core Board objective.

4.5 Diversification Security

While most public sector workers are covered by pension plans, most private sector workers in Antigua-Barbuda are not enrolled in employer-linked pension plans. As a result, the Social Security Age pension will be the only reliable source of income in old age for most workers. The Government is, therefore, encouraged to consider adopting innovative ways and strategies to encourage alternative avenues for reliable sources of income in old age. These include:

(i) Social dialogue between Government, employers and employee associations to promote occupational pension plans,
(ii) Social Security to spearhead public awareness programs that encourage individuals to save for retirement, and
(iii) Social Security to promote the work and initiatives of the Report on Pension & Pension Administration Reform in the Eastern Caribbean Currency Union.

A more detailed review of a national pension policy is beyond the scope of this review.

Table 4.3 Recommended Reforms

Policy Objective	Changes Recommended To Enhance Achievement of Objective
Coverage	▪ Government to link issuance of permits, licenses, etc. issued to businesses and self-employed persons to Social Security contribution status ▪ Introduce a zero-tolerance approach to failure to enforce current penalties ▪ New way for self-employed persons to contribute
Adequacy	▪ Increase the wage ceiling to at least $6,000 per month ▪ Revise the eligibility conditions for Survivor benefit to widows to the same as now in place for widowers
Financial Sustainability	▪ Increase the contribution rate by at least 2% ▪ Increase normal pension age to 65: keep age 60 as early pension age with pensions reduced by 6% per year below normal pension age ▪ Revise the Old age formula so that wages are averaged over 7 years and the 50% maximum is reached after 38 years of contributions

Policy Objective	Changes Recommended To Enhance Achievement of Objective
	▪ Change the Age benefit to a Retirement so that persons under the normal pension age who remain employed or return to employment will not be entitled to a pension ▪ Adopt a policy for minimum level of liquid reserves and future contribution rate increases ▪ Implement prudent and relevant Investment strategies
Administrative Efficiency	▪ Find ways to reduce administrative costs ▪ Review and implement ISSA Best Practices & Good Governance Guidelines
Diversification Security	▪ Promote the benefits of individuals having additional sources of income in old age

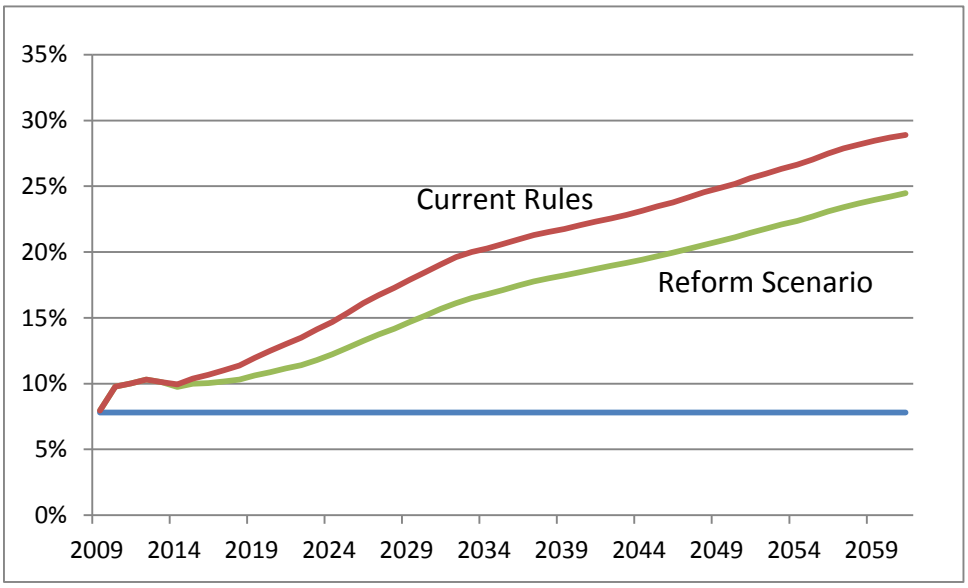
4.6 Impact of Recommended Changes

From the list of changes shown above, the ones with greatest financial effect are:

a) Increase in normal pension age to 65 in steps of 1 year every 2 years starting in 2014, and reduced pensions payable if awarded prior to normal pension age.
b) Revised Age pension schedule of accrual rates:– 20% for first 500 weeks years plus 1% per set of 50 weeks thereafter instead of 25% for the first 500 weeks plus 1% per set of 50 weeks thereafter. (starting 2014)

The financial implications of these changes are illustrated by projected pay-as-you-go rates.

Figure 4.2. Pay-as-you-go Rates – Current Rules and Reform Scenario



As shown above, projected pay-as-you-go rates are almost 5% lower in the long run but still well above the current 7.7% average contribution rate. Most of these gains will be generated by the change in normal pension age.

Chapter 5 Good Governance

Public sector agencies are often affected by political interference and the failure to adopt and follow good governance practices. Among the many poor governance practices that have plagued Antigua-Barbuda Social Security for years include government failing to pay contributions and repay amounts borrowed, failing to implement actuarial recommendations and failing to publish annual financial statements and actuarial review reports. Several Caribbean social security schemes are now facing major financial challenges as well, due to poor governance practices related to human resources and poor investment diversification.

To assist social security schemes the International Social Security Association (ISSA) in 2011 published *ISSA Good Governance Guidelines for Social Security Institutions*. These guidelines provide ISSA member organizations with guiding principles and practical guidelines on good governance. It also presents a virtual checklist of essential elements that help engender and support good governance within the institution. It is strongly recommended that the Board adopt the principles and guidelines included in ISSA's *Good Governance Guidelines* and initiate steps to ensure that good governance practices are commonplace in all aspects of Social Security's administration and operations.

5.1. ISSA Good Governance Guidelines

ISSA defines governance as:

> *"the manner in which the vested authority uses its powers to achieve the institution's objectives, including its powers to design, implement and innovate the organisation's policies, rules, systems and processes, and to engage and involve stakeholders."*

ISSA's *Good Governance Guidelines* further suggests that "good governance implies that the exercise of the vested authority is accountable, transparent, predictable, participative and dynamic." It describes these five principles as follows:

Accountability is the ability to hold legally responsible the officials who are in charge of the institution for managing the program prudently, efficiently and equitably.

Transparency is the availability and accessibility of accurate, essential and timely information to stakeholders and in reference to the decision-making process, promotes honesty, integrity and competence, and discouraging wrongdoing.

Predictability refers to the consistent application of the law, policies, rules and regulations. Surprises and sudden changes in contribution rates, benefit entitlements or other features could undermine the credibility of the programme.

Participation refers to the active education, engagement and effective involvement of stakeholders to ensure the protection of their interests.

The principle of *dynamism* is defined as the element of positive change in governance. While the first four principles of governance may well be applied in the context of maintaining the status quo, dynamism refers to changing and improving by doing things more efficiently and equitably, and by responding to the evolving needs of insured persons.

In addition to outlining in detail the five good governance principles as they specifically relate to Boards and Management, the *Good Governance Guidelines* include further guidelines in six specific areas that are of common concern to social security institutions. These guidelines, which support and promote the good governance principles listed above, are provided for the following areas:

(a) Actuarial soundness

(b) Enforcing the prudent person principle in investment management

(c) Prevention and control of corruption and fraud

(d) Service standards

(e) Staffing policies & performance appraisals

(f) Investments in Information and Communication Technology infrastructure

The third component of the ISSA Good Governance Guidelines is the "Questionnaire on Good Governance." Through hundreds of specific multiple choice questions on general governance practices of the Board and Management as it relates to the five principles and six specific areas of social security administration, institutions are able to determine the extent to which they practice good governance and where improvements are required. Completion of this document will be the ideal start to the Board's adoption of ISSA's recommended good governance principles and guidelines.

Statement of Actuarial Opinion

It is my opinion that for this report of the 9th Actuarial Review of the Social Security Fund:

- the data on which the projections and analysis are based are sufficient for the nature of the projections;
- the assumptions used are, in the aggregate, reasonable and appropriate, and
- the methodology employed is appropriate and consistent with sound actuarial principles.

This report has been prepared in accordance with the Caribbean Actuarial Association draft Actuarial Practice Standard #3 for Social Security Programs.

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Derek M. Osborne, FSA
Chief Actuary

References

2010 Article IV Consultation Staff Report, IMF

8th Actuarial Review of The Social Security Fund, Horizonow Consultants

Final Report of the Social Security Reform Committee, November 2007

ISSA Good Governance Guidelines, ISSA, 2009

Population Projections Antigua and Barbuda, 2005 to 2025, Bureau of Statistics, Antigua and Barbuda

Social Security Act & Regulations

Social Security Fund Financial Statements – 1975 to 2009

United Nations Population Division, World Population Prospects

Various data and provided by the Social Security Scheme and the Antigua and Barbuda Statistics Division

Appendix A. Summary of Contribution & Benefit Provisions

Following is a general description of the coverage, contributions and benefits provisions of the Antigua-Barbuda Social Security Board (ABSSB) as at December 31st, 2009.

A.1 Contingencies Covered & Benefits Provided

The ABSSB provides for the following benefits:

(a) ***Short-term Benefits:*** Sickness benefit, Maternity allowance & grant and Funeral grant.

(b) ***Long-term Benefits:*** Age, Invalidity and Survivors' pensions and grants.

A.1.1 Insured Persons

Employed, self-employed and voluntary insured persons from age 16 to 60 as follows:

(a) Employed persons in the private sector are covered for all benefits;

(b) Employed persons in the public sector are covered for all benefits except Sickness benefit;

(c) Self-employed persons are covered for all benefits;

(d) Voluntary insured persons are covered for long-term benefits only.

Coverage and payment of contributions by all employed and self-employed persons are mandatory.

A.1.2 Insurable Earnings and Contributions

In addition to salary, insurable earnings include overtime pay, cost of living allowance, commissions, gratuities and service charge payments, additional payments in respect of dependants, payment for night or shift work, production bonus, danger or thrift money etc. and employees liability paid by employer.

Earnings that are covered for the purpose of determining contributions and benefits, are limited to EC$1,040 per week or EC$4,500 per month. The monthly ceiling on insurable earnings has been adjusted as follows:

April 1973 – May 1986	$	1,500.00
June 1986 – June 1993		2,500.00
July 1993 – present		4,500.00

Contributions are computed as a percentage of insurable earnings. The following table shows the contribution rates payable by employers and employees for the various categories of insureds.

Table A.1 Contribution Rates

Insured Category	Employee	Employer	Total
Private sector	3%	5%	8%
Public sector	2%	5%	7%
Self-employed	-	-	8%
Voluntary	-	-	8%

Note: Prior to August 1991, the combined rate for all employed persons was 8%.

A.2 Benefit Provisions

A.2.1 Long-Term Benefits

(a) AGE PENSION

CONTRIBUTION REQUIREMENT:

Transitional pension: 156 weekly paid or credited contributions if his/her first contribution was made before 1975.

Reduced pension: paid or credited 350 to 499 contributions

Full pension: At least 500 contributions

AGE REQUIREMENT: 60. The pension is not dependent on retirement from the workforce.

AMOUNT OF BENEFIT: 25 per cent of average insurable earnings over the best 5 years out of the last 10 years, plus 1% for every set of 50 contributions over 500.
If between 350 and 500 credits have been paid, the insured qualifies for a *Reduced Age* Pension of 25% of average insurable earnings times the number of paid weeks divided by 500.

- Maximum: 50% of average insurable earnings.
- Minimum: EC$350 per month. The minimum pension also applies to Invalidity and Survivors spouse pensions.

(b) AGE GRANT

CONTRIBUTION REQUIREMENT: At least 26 paid contributions starting before 1975 or at least 50 contributions starting any time after 1974.

ELIGIBILITY: The person must be ineligible for Age Pension.

AGE REQUIREMENT: 60.

AMOUNT OF BENEFIT: 75% of the total contributions (employer & employee) paid or $1,200, whichever is greater. This amount is paid as a lump sum.

(c) INVALIDITY PENSION

CONTRIBUTION REQUIREMENT: 156 weekly contributions paid.

ELIGIBILITY: The insured is:

(i) less than 60,

(ii) unable to take part in any further employment because of illness that is likely to remain permanent.

AMOUNT OF BENEFIT: 25 per cent of average insurable earnings over the best 5 years out of the last 10 years, plus 1% for every set of 50 contributions over 500. If less than 5 years contributions have been made, the average will be taken over those years only.

DURATION OF PENSION: Payable for as long as invalidity continues.

(d) INVALIDITY GRANT

CONTRIBUTION REQUIREMENT: At least paid for 52 weeks or 12 months.

ELIGIBILITY: Other than for not meeting the contribution requirements, the person must be eligible for Invalidity Pension.

AMOUNT OF BENEFIT: 75% of the total contributions (employer & employee) paid or $1,200, whichever is greater. This amount is paid as a lump sum.

(e) SURVIVORS' PENSION

CONTRIBUTION REQUIREMENT: The deceased, had paid at least 156 contributions.

ELIGIBILTY: Survivors of the deceased who may be entitled to payments are widows, invalid widowers, unmarried children (including adopted & step-children). For widows and

widowers, marriage (legal or common law) must have taken place before the insured person started receiving a pension.

- *Widows* must have been married to or living with the deceased for at least 3 years.
- *Widowers* must have been married to or living with the deceased for at least 3 years, invalid, and were wholly or mainly maintained by the deceased.
- *Children* up to age 16, or 18 if attending school, or invalid of any age.

AMOUNT OF BENEFIT: The proportion shown below of the pension either being received by the deceased or the Invalidity Pension the deceased would have been entitled to:

- Widow or widower: 50%;
- Children: 25% per child. Where there is an eligible spouse and 3 or more children, the remaining 50% is divided equally among the children but no child shall receive less than the minimum child pension. However, where the pension available for all children is insufficient, the maximum number of children possible will receive the minimum pension rate.
- Minimum widow/widower benefit: $350 per month
- Minimum child benefit: $87.50 per week
- Maximum family benefit: 100% of Age pension.

DURATION OF BENEFIT:

Widows' pension:

(i) For life, if at the date of death she was either at least 50 or less than 50 but invalid, and married for at least 3 years

(ii) For 1 year only, if at the date of the spouse's death she was less than 50 and not an invalid, or she was at least 50 but married for less than 3 years.

For a widower, pension is payable as long as conditions for invalidity eligibility continue or until remarriage/cohabitation with a woman.

For dependent children/orphans, pension will be paid up to age 16, or 18 if attending school, or until recovery from invalidity.

(f) SURVIVORS' GRANT

CONTRIBUTION REQUIREMENT: Qualify for Age or Invalidity grant.

AMOUNT OF BENEFIT: The same proportion of the Age Grant as Survivors' Pension bears to the Age Pension.

(g) OLD- AGE (Non-Contributory) PENSION

CONTRIBUTION REQUIREMENT: None

AGE REQUIREMENT: At least 65 in 1993. However, if the applicant has attained age 60 and is blind or disabled, is unable to earn a living and his/her total annual income is less than EC$5,000 per annum the pension may be awarded.

OTHER REQUIREMENTS: Must be a citizen of Antigua and Barbuda who has ordinarily resided in Antigua and Barbuda for at least fifteen years; or be a non-national who has ordinarily resided in Antigua and Barbuda for at least twenty years preceding the date of application for assistance. Also, income from all sources must be less than EC$5,000 per annum

AMOUNT OF BENEFIT: $255 per month.

A.2.2 Short-Term Benefits

(a) SICKNESS BENEFIT

ELIGIBILITY REQUIREMENTS: Must have been engaged in insurable the day before the onset of the illness, paid at least 26 weekly contributions and have worked at least 8 weeks in the 3 calendar months before the illness began. The insured must also be under age 60.

WAITING PERIOD: 3 days. If a subsequent period of illness is separated by less than eight weeks from the first period, benefits will be paid from the first day.

AMOUNT OF BENEFIT: 60% of the total insurable earnings during the three calendar months immediately prior to the illness, divided by the number of weeks worked.

DURATION OF BENEFIT: Maximum of 39 weeks of continuous illness provided that there is a second medical opinion after 26 weeks.

(b) MATERNITY ALLOWANCE

CONTRIBUTION REQUIREMENT: At least 26 paid contribution weeks in the 52-week period immediately preceding:

(i) 6 weeks before the expected week of confinement, or

(ii) the week from which the allowance is claimed.

AMOUNT OF BENEFIT: 60% of the total insurable earnings during the 52 weeks immediately preceding the 6-week period before the expected date of delivery, divided by the number of weeks worked, which cannot be less than 26.

DURATION OF BENEFIT: Maximum of 13 weeks, starting no earlier than 6 weeks before the expected date of confinement.

(c) MATERNITY GRANT

CONTRIBUTION REQUIREMENT: At least 26 weekly contributions paid since entering the scheme and at least 26 weekly contributions in the year immediately before confinements either by the woman or her husband.

AMOUNT OF GRANT: $560. The Maternity Grant has increased on an ad-hoc basis as follows:

1973 – 1978	25.00
1978 – 1986	40.00
1986 – 1993	60.00
1994 – 2000	400.00
2001 - present	560.00

(d) FUNERAL GRANT

ELIGIBILITY: A person or persons who have paid or will pay the cost of the funeral of a deceased insured person who:

- had been receiving Sickness or Maternity benefit, or would have been entitled to such benefit at the time of death, or
- had been receiving, had received or had satisfied the conditions for receiving Invalidity or Age benefits, or
- had paid at least 26 contributions in the 12 months immediately before death.

AMOUNT OF GRANT: $2,000 for the insured, $1,500 for an uninsured spouse, and $750 for a dependent child. The funeral grant for the insured has been increased on an ad-hoc basis as follows:

1973 – 1978	$ 150
1978 – 1986	250
1986 – 1993	500
1994 – 2000	2,000
2001 – present	2,500

Appendix B Methodology, Data & Assumptions

This actuarial review makes use of the comprehensive methodology developed at the Financial and Actuarial Service of the ILO (ILO FACTS) for reviewing the long-term actuarial and financial status of a national pension scheme. The review has been undertaken by modifying the generic version of the ILO modelling tools to fit the specific case of Antigua and Barbuda and the Social Security Scheme. These modelling tools include a population model, an economic model, a labour force model, wage model, long-term and short-term benefits models.

The actuarial valuation begins with a projection of Antigua-Barbuda's future demographic and economic environment. Next, projection factors specifically related to Social Security are determined and used in combination with the demographic/economic framework to estimate future cash flows and reserves. Assumption selection takes into account both recent experience and future expectations, with emphasis placed on long-term trends rather than giving undue weight to recent experience. Projections have been made under one core assumption set.

B.1 Modelling the Demographic & Economic Developments

Antigua-Barbuda's population has been projected beginning with totals obtained from the results of the 2001 national census and by applying appropriate mortality, fertility and migration assumptions. Assumptions for 2001 to 2011 were specifically selected so that the projected population in 2011 matched the 2011 Census count of 86,295. The total fertility rate is assumed to remain constant at 1.8. Table B.1 shows ultimate age-specific and total fertility rates.

Table B.1. Age-Specific & Total Fertility Rates

Age Group	2009	*Ultimate Rates 2015+*
15 - 19	0.038	0.024
20 - 24	0.074	0.062
25 - 29	0.092	0.097
30 - 34	0.081	0.089
35 - 39	0.064	0.077
40 - 44	0.014	0.016
45 - 49	-	-
TFR	**1.80**	**1.80**

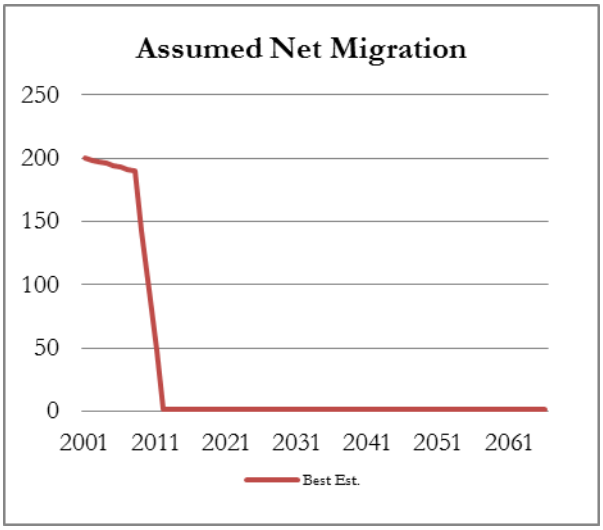
Mortality rates have been determined using United National Life tables. Improvements in life expectancy assumed to follow the "slow" rate as established by the United Nations. Sample mortality rates and life expectancies at birth and at age 60 for sample years are provided in Table B.2.

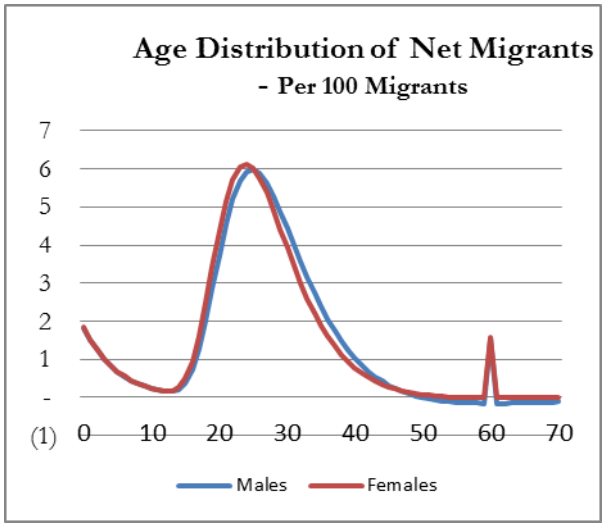
Table B.2. Sample Mortality Rates & Life Expectancies

Age	Males			Females		
	2009	2031	2061	2009	2031	2061
0	0.0136	0.0100	0.0022	0.0038	0.0042	0.0050
5	0.0010	0.0006	0.0003	0.0001	0.0001	0.0001
15	0.0006	0.0004	0.0004	0.0002	0.0001	0.0001
25	0.0012	0.0008	0.0010	0.0009	0.0006	0.0002
35	0.0018	0.0013	0.0010	0.0009	0.0006	0.0004
45	0.0036	0.0027	0.0024	0.0018	0.0016	0.0015
55	0.0084	0.0067	0.0064	0.0051	0.0044	0.0039
65	0.0209	0.0175	0.0160	0.0119	0.0102	0.0092
75	0.0511	0.0453	0.0448	0.0350	0.0292	0.0248
85	0.1199	0.1120	0.1249	0.1121	0.0912	0.0701
95	0.2565	0.2512	0.2810	0.2715	0.2416	0.2097
Life Expectancy at:						
Birth	72.3	75.1	76.5	78.4	80.4	82.4
Age 60	23.1	24.4	20.4	26.2	27.7	24.5

Net migration (in minus out) after 2011 is assumed to be zero. The charts on the following page show the age distribution of 100 net migrants years and the total number of net migrants.

Figures B.1. Net Immigration – Total Annual & Age-Specific Rates





The projection of the labour force, i.e. the number of people available for work, is obtained by applying assumed labour force participation rates to the projected number of persons in the total population. Table B.3 below shows the assumed age-specific labour force participation rates in 2009 and 2061.

Table B.3 Age-Specific & Total Labour Force Participation Rates

Age	Males		Females	
	2009	2061	2009	2061
17	39%	39%	36%	37%
22	87%	87%	79%	82%
27	96%	96%	89%	92%
32	96%	96%	89%	92%
37	97%	97%	89%	93%
42	95%	95%	89%	93%
47	94%	94%	85%	88%
52	93%	93%	80%	85%
57	87%	89%	70%	77%
62	69%	77%	45%	57%
67	43%	54%	24%	33%

Year	Males	Females
2009	83%	74%
2011	82%	74%
2016	82%	74%
2021	83%	74%
2031	83%	74%
2041	83%	75%
2051	83%	75%
2061	83%	74%

The projected real GDP divided by the projected labour productivity per worker gives the number of employed persons required to produce total output. Unemployment is then measured as the difference between the projected labour force and employment.

Estimates of increases in the total wages as well as the average wage earned are required. Annual average real wage increases are assumed equal to the increase in labour productivity as

it is expected that wages will adjust to efficiency levels over time. Such increases are assumed to be 1.0%.

B.2 Projection of Social Security Income & Expenditure

This actuarial review addresses all Social Security Fund revenue and expenditure items. For Short-term benefits, income and expenditure are projected as a percentage of insurable earnings. Projections of pensions are performed following a year-by-year cohort methodology. For each year up to 2061, the number of contributors and pensioners, and the dollar value of contributions, benefits and administrative expenditure, are estimated.

Once the projections of the insured (covered) population, as described in the previous section, are complete, contribution income is then determined from the projected total insurable earnings, the contribution rate and contribution density. Contribution density refers to the average number of weeks of contributions persons make during a year.

Benefit amounts are obtained through contingency factors based primarily on plan experience and applied to the population entitled to benefits. Investment income is based on the assumed yield on the beginning-of-year reserve and net cash flow in the year. Social Security's administrative expenses are modelled as a percentage of insurable earnings. Finally, the end-of-year reserve is the beginning-of-year reserve plus the net result of cash inflow and outflow.

Projecting investment income requires information of the existing assets at the valuation date and past performance of each class. Future expectations of changes in asset mix and expected rates of return on each asset type together allow for long-term rate of return expectations.

B.3 Social Security Population Data and Assumptions

The data required for the valuation of the Social Security Fund is extensive. As of December 31st, 2009, required data includes the insured population by active and inactive status, the distribution of insurable wages among contributors, the distribution of paid and credited contributions and pensions in payment, all segregated by age and sex.

Scheme specific assumptions such as the incidence of invalidity, the distribution of retirement by age, density and collection of contributions, are determined with reference to the application of the scheme's provisions and historical experience.

Details of Social Security specific input data and the key assumptions used in this report are provided in tables B.4 through B.8.

Table B.4 2009 Active Insured Population, Earnings & Past Credits

Age	# of Active Insureds		Average Weekly Insurable Earnings		Average # of Years of Past Contributions	
	Male	Female	Male	Female	Male	Female
15 - 19	416	421	405	363	0.3	0.2
20 - 24	2,098	2,508	518	483	1.6	1.4
25 - 29	2,539	2,988	613	553	3.8	3.5
30 - 34	2,480	3,266	680	575	6.2	6.0
35 - 39	2,487	3,228	717	575	9.0	8.6
40 - 44	2,309	3,127	736	574	11.7	11.2
45 - 49	2,005	2,700	739	565	14.0	13.8
50 - 54	1,624	2,059	748	571	17.2	17.1
55 - 59	1,087	1,254	737	571	18.7	19.1
All Ages	**17,045**	**21,551**	**673**	**555**	**9.05**	**8.95**

Table B.5 Pensions in Payment - December 2009

Age	Old-Age Benefit		Invalidity Benefit		Survivors Benefits	
	Male	Female	Male	Female	Male	Female
0 - 4	-	-	-	-	17	3
5 - 9	-	-	-	-	37	13
10 - 14	-	-	-	-	107	42
15 - 19	-	-	-	-	74	35
20 - 24	-	-	-	-	-	1
25 - 29	-	-	1	-	2	-
30 - 34	-	-	2	5	-	-
35 - 39	-	-	5	9	3	-
40 - 44	-	-	8	16	4	-
45 - 49	-	-	15	27	5	-
50 - 54	-	-	27	44	17	-
55 - 59	-	-	39	73	35	-
60 - 64	1,115	1,310	1	1	70	-
65 - 69	696	787	-	-	93	-
70 - 74	477	488	-	-	110	-
75 - 79	315	341	-	-	117	1
80 - 84	198	184	-	-	96	1
85 - 89	111	91	-	-	51	-
90 - 94	37	27	-	-	20	-
95 - 99	2	3	-	-	-	-
# of Pensioners	**2,951**	**3,231**	**98**	**175**	**858**	**96**
Avg Weekly Pension	**$ 207**	**$ 164**	**$ 186**	**$ 147**	**$ 29**	**$ 78**

The following table shows assumed density factors, or the average portion of the year for which contributions are made. These rates are assumed to remain constant for all years.

Table B.6 Density Of Contributions

Age	Males	Females
17	49%	44%
22	65%	67%
27	72%	76%
32	76%	78%
37	76%	80%
42	77%	81%
47	78%	82%
52	79%	85%
57	79%	86%

The following table shows the expected incidence rates of insured persons qualifying for Invalidity benefit which are assumed for all projection years.

Table B.7 Rates of Entry Into Invalidity Per 1,000 Insureds

Age	Males	Females
17	-	-
22	-	-
27	0.106	0.083
32	0.211	0.322
37	0.316	0.541
42	0.432	1.162
47	1.046	1.290
52	2.201	2.041
57	6.096	5.755

Table B.8, shows the assumed probability of Survivor benefit claims and the average number of eligible dependent children following the death of an insured person.

Table B.8 Survivor Characteristics

Age	Males		Females	
	Probability of Eligible Spouse	Avg # of Eligible Children	Probability of Eligible Spouse	Avg # of Eligible Children
17	0%	-	0%	-
22	8%	0.0	0%	0.0
27	5%	0.0	0%	0.1
32	25%	0.2	0%	0.2
37	23%	0.3	0%	0.5
42	26%	0.5	0%	0.5
47	31%	0.4	0%	0.4
52	29%	0.3	0%	0.3
57	32%	0.2	0%	0.1
62	31%	0.2	0%	0.0
67	26%	0.1	0%	-
72	10%	0.1	0%	-
77	9%	0.1	0%	-
82	8%	0.0	0%	-
87	6%	0.0	0%	-

Appendix C Income, Expenditure & Reserves, 2007–2009

(Expressed in Thousands of $'s)

	2007	2008	2009
Income			
Contribution Income	77,661	84,282	78,557
Investment Income	5,767	6,714	16,122
Other Income	192	68	131
Total Income	**83,620**	**91,065**	**94,810**
Expenditure			
Benefits			
Sickness Benefit	3,338	3,518	3,159
Maternity Benefit	2,698	2,794	3,441
Maternity Grant	424	443	498
Funeral Benefit	601	647	617
Age Pension	46,309	51,707	57,785
Invalidity Pension	1,842	1,999	2,241
Survivors Pension	3,237	3,497	3,686
Assistance Pension	892	762	690
Age Grant	222	279	356
Invalidity Grant	4	5	1
Survivors Grant	-	12	3
Total Benefit Expenditure	59,567	65,662	72,477
Administrative Expenditure	10,458	12,127	10,677
Total Expenditure	**70,025**	**77,789**	**83,154**
Excess of Income over Expenditu	**13,596**	**13,100**	**11,368**
Reserves at End of Year	**660,383**	**673,483**	**684,851**
Short-term Benefits Branch	161,933	174,222	187,108
Long-term Benefits Branch	472,857	473,668	472,151
Revaluation Reserve	25,593	25,593	25,593
Total Reserves	**660,383**	**673,483**	**684,851**

Appendix D Benefit Experience & Branch Analysis

Social Security regulations require a separation of income and expenditure into two benefit branches. Although the separation is only theoretical, as actual funds are not held in separate accounts, this separation allows for better monitoring of experience. Each benefit is allocated to one of the two branches and each benefit branch is allocated a certain percentage of contribution income, investment income, and administrative costs.

For the Short-term benefits branch a pay-as-you-go method of financing is used. Under this method current contributions are expected to meet current benefits with only a small reserve. Therefore, the contribution rate allocated to these benefits should approximate expected expenditure and reserve levels should be small. The remainder goes to the Pensions branch.

As shown in the following table, contributions allocated to the Short-term branch exceed expenditure while Long-term branch expenditure exceeded contributions allocated.

Table D.1 Summary Branch Experience (% of Insurable Earnings)

Benefit Branch	Contributions Allocated	Total Expenditure		
		2007	2008	2009
Short-term	1.9%	1.0%	1.0%	1.0%
Long-term	5.8%	6.0%	6.1%	6.9%
All Branches	**7.7%**	**7.0%**	**7.1%**	**7.9%**

Note: The average contribution rate is 7.7%

Table D.2 Benefit Reserves & Reserve-Expenditure Ratios, 2006 & 2009

Benefit Branch	Year-end Reserve (in millions of $'s)		Reserve-Expenditure Ratio		
	2006	2009	2006	2009	Suggested Target
Short-term	151.2	187.1	15.9	17.4	1.0
Long-term	469.7	472.2	8.5	6.5	Not applicable
All Branches	**621.0**	**659.3**	**9.6**	**7.9**	Not applicable

Note: The Reserve-Expenditure ratio is the size of the year-end reserve relative to total expenditure in that year.

The Short-term benefits branch has both excess reserves and a high allocation of contribution income than necessary. Therefore, reallocations of contributions and the transfer of reserves between branches are recommended. The recommended changes to the allocation of contribution and transfer of reserves between branches are shown below.

Table D.3 Recommended Changes to Contribution Allocations & Reserve Transfers

Benefit Branch	Contribution Income Allocation		Reserve Transfer
	Current	Recommended	
Short-term	1.9%	1.2%	$170 million to Long-term
Long-term	5.8%	6.5%	$170 million from Short-term
All	**7.7%**	**7.7%**	

It should be noted that the change in allocations of contribution income and transfer of reserves between branches has no impact on the overall present or future funded position of the Social Security Fund. These adjustments are for internal accounting purposes only and are consistent with the manner in which Social Security has elected to finance and account for the various types of benefits. In fact, given that this accounting approach has no real financial advantages the Board may consider ceasing this separate accounting approach.

Following is detailed experience for each benefit.

Table D.4 Pensions in Payment

Pension Type	Paid in Dec. 2006	Awarded 2007-2009	Terminated 2007-2009	Paid in Dec. 2009	Average Pension (pw)	
					Dec. 2006	Dec. 2009
Age	5,011	1,558	387	6,182	$724	$799
Invalidity	226	160	113	273	$640	$698
Survivors'	842	332	220	954	$299	$319
Assistance	320	22	132	210	$255	$255

Table D.5 LTB Branch Expenditure As % of Insurable Wages, 2007 – 2009

Benefit	2007	2008	2009
Age pensions	4.64%	4.74%	5.52%
Invalidity pensions	0.18%	0.18%	0.21%
Survivors' pensions	0.32%	0.32%	0.35%
Assistance pensions	0.09%	0.07%	0.07%
Administrative expenses	0.79%	0.83%	0.76%
Total LTB	**6.02%**	**6.14%**	**6.91%**
Total LTB (millions)	**$52.3**	**$58.0**	**$64.4**

Table D.6 STB Branch Expenditure As % of Insurable Wages, 2007 – 2009

Benefit	2007	2008	2009
Sickness Benefit	**0.33%**	**0.32%**	**0.30%**
Maternity Benefit	**0.27%**	**0.26%**	**0.33%**
Maternity Grant	**0.04%**	**0.04%**	**0.05%**
Funeral Benefit	**0.06%**	**0.06%**	**0.06%**
Administrative expenses	**0.26%**	**0.28%**	**0.25%**
Total STB	0.97%	0.96%	0.99%
Total STB (millions)	**$7.3**	**$7.7**	**$8.1**