



## 9TH ACTUARIAL REVIEW



*Striving for Social Justice*

**9<sup>th</sup> Actuarial Review of the  
St. Christopher & Nevis Social Security Fund  
as of 31 December 2008**



**July 2010**



## Table of Contents

Table of Contents .....	i
Abbreviations and Acronyms .....	ii
Introduction .....	iii
Executive Summary .....	v
Chapter 1 Activities & Experience Since Last Actuarial Review .....	1
1.1 Amendments To Act & Regulations .....	1
1.2 Economic Experience .....	1
1.3 Social Security Experience .....	1
1.4 Benefit Branch Experience & Reserves .....	3
1.5 Experience Compared With Projections of 8 <sup>th</sup> Actuarial Review .....	5
1.6 Investments .....	6
Chapter 2 Assessment Of Performance & System Design .....	7
2.1 Historical Performance, 1984 – 2008 .....	7
2.2 Design & Policy Indicators .....	9
2.3 Investments .....	10
Chapter 3 Best-Estimate Projections .....	12
3.1 Population Projections .....	12
3.2 Social Security Projections .....	15
3.3 Sensitivity Analysis .....	20
3.4 Financing Future Social Security Benefits .....	21
Chapter 4 Sensitivity Analysis .....	22
Chapter 5 Social Security Reform .....	24
5.1 Impact of Pension Age and Accrual Rate/Average Wage Changes .....	24
5.2 Unemployment Benefit .....	25
5.3 Branch Allocations & Transfer of Reserves .....	26
Statement of Actuarial Opinion .....	27
References .....	28
Appendix A Summary of Contribution & Benefit Provisions .....	29
Appendix B Methodology, Data & Assumptions .....	36
Appendix C Projection Results – Alternate Scenarios .....	44
Appendix D Income, Expenditure & Reserves, 2006–2008 .....	50
Appendix E Benefit Experience & Branch Analysis .....	51
E.1 Long-term Benefits Branch .....	51
E.2 Short-term Benefits Branch .....	52
E.3 Employment Injury Benefits Branch .....	53

## Abbreviations and Acronyms

EIB	Employment Injury Benefits
GDP	Gross Domestic Product
ILO	International Labour Office
LTB	Long-term Benefits
NPF	National Provident Fund
PAYG	Pay-as-you-go
SS	Social Security
STB	Short-term Benefits
TFR	Total Fertility Rate

## Introduction

St. Christopher & Nevis Social Security began operations in February 1978. Prior to this, a National Provident Fund system was in place. Social Security currently covers all employed and self-employed persons in the Federation and offers three main types of social security benefits – short-term benefits, long-term benefits or pensions and employment injury benefits. The system is financed by contributions which are levied on employment earnings up to a wage ceiling and are paid by employers, employees and self-employed persons. Surplus funds that are not yet needed to pay benefits are invested locally, regionally and internationally in various types of securities.

This is the report of the 9<sup>th</sup> Actuarial Review of Social Security Fund and, in accordance with Section 39 of the St. Christopher & Nevis Social Security Act, 1977, it is being prepared three years after the 8<sup>th</sup> Actuarial Review.

The main purpose of periodic actuarial reviews is to determine if the social security system in St. Kitts-Nevis 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, 60-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 Actuarial Review of the Social Security Fund is due as at December 31, 2011.

This review has been conducted by Mr. Derek Osborne of Horizonow Consultants Ltd. The author wishes to thank Mrs. Sephlin Lawrence, Director, Mr. Donovan Herbert, Manager Research & Statistics, and all other members of the Social Security staff who assisted with this review.



## Executive Summary

Actuarial reviews of the Social Security Fund provide government, workers, employers and pensioners with a comprehensive assessment of the current and projected state of the Federation's primary social security system. They also provide policy recommendations for changes designed to enhance overall system relevance and financial viability. With pension promises extending well into the future, it is important that proactive steps are taken to ensure that appropriate responses to changing socio-economic conditions are made.

This report of the 9<sup>th</sup> Actuarial Review of the Social Security Fund is being prepared as the global economy appears to be rebounding at a sluggish pace from an economic crisis. St. Kitts-Nevis was not spared. With provisional ECCB data suggesting that the economy contracted by almost 10% in 2009, and unemployment increasing significantly, Social Security Fund income from both contributions and investments has been negatively affected.

Although the effects of the current recession began to be felt in 2008, the Social Security Fund performed in line with actuarial projections during the period under review. From 2006 to 2008 contribution income, investment income and benefit expenditure were all slightly higher than projected while administrative costs were much higher than projected. Overall, 2008 year-reserves stood at \$989 million, 0.6% lower than projected in the 8<sup>th</sup> Actuarial Review. In 2008 some 25,300 persons made contributions and, at the end of the year, 3,500 persons were in receipt of pensions.

Although there were no amendments made during the period 2006 to 2008, a significant adjustment to pensions took effect in January 2009.

This report's assessment of Social Security policy and design indicators suggests that current contribution and benefit provisions provide a good level of income protection to workers and pensioners. While the ceiling has not been increased since 1998, it still remains quite high relative to average wages. With inflation averaging 6.2% per annum between 2006 and 2008, the 2009 pension adjustments made up for the loss of purchasing power experienced since the previous pension adjustment in 2005.

Social Security investments continue to be poorly diversified with asset allocations well outside the target ranges established in the Fund's Investment Policy. Significant concentrations are noted in four categories:

- In fixed deposits – 60%
- In government or government associated securities & institutions – 83%
- In one institution – 51%
- In local investments – 96%



While investment returns during the inter-valuation were good, averaging 6.2%, poor diversification and extensive use of short-term deposits to support long-term liabilities makes the overall Fund high risk.

For this report, 60-year projections of the Social Security Fund have been performed. Following is a summary of the key findings and observations of the demographic and financial projections which are described in greater detail in Chapters 3 and 4.

1. If the current 11% contribution rate remains unchanged, total expenditure will exceed contributions for the first time in 2016 and current reserves together with future contributions will be sufficient to meet future expenditure until 2043.
2. Under an alternate projection with a less favourable economic outlook, the Social Security Fund will be depleted two years earlier while under a more favourable assumption set, the current contribution rate would be adequate to meet expenditure for two additional years.
3. Total expenditure expressed as a percentage of insurable earnings, commonly referred to as the pay-as-you-go rate, is projected to increase from 7.3% in 2008 to a relatively stationary level of just under 32% in the late 2060's.
4. The average long-term cost of Fund expenditure over the next sixty years is 21.0%, 10% higher than the current average contribution rate.
5. The number of contributors per pensioner is projected to fall from 7.0 in 2008 to 1.7 in 2068.
6. Reforms, especially those that increase the age at which full pensions are awarded and reduce the average new Age pension amount, will produce significant long-term savings and serve to lower contribution rate required in the future.

Given the effects of the global economic crisis on St. Kitts-Nevis and the tempered outlook for population and economic growth, the projections of this Review are less favourable than those of the 8<sup>th</sup> Actuarial Review. From a Social Security perspective, the main difference is the reduction in projected contribution income.

The analysis conducted and projections of this review confirm that the Social Security scheme operates on sound financial and actuarial bases and provides adequate levels of income protection for workers and their families. While adjustments to the contribution rate will be required in the future, there are benefit reform opportunities that if implemented soon, will reduce long-term costs without compromising benefit adequacy.

## Recommendations

1. While keeping age 62 as the age at which Age pensions are first payable, increase the age at which full pensions are payable from 62 to at least 65. Reduced pensions would then be payable from age 62.
2. Revise pension accrual rates so that there is a more gradual accrual of pensions over one's career instead of the current heavy weighting to the first 10 years when half of the maximum benefit can be earned. In addition, wages used for pension calculations should be averaged over a longer period.
3. Implement a systematic approach to increasing the wage ceiling and pensions in payment. Although the wage ceiling has not been adjusted for over 10 years it is still currently at an acceptable level. Therefore, small annual adjustments should begin in 2011 or 2012. With pensions adjusted in early 2009, annual adjustments to minimum pension rates and all pensions in payment based on actual inflation could begin in 2011 or 2012.
4. If funeral costs, baby supplies and the cost of delivering babies have been affected significantly by inflation in recent years, adjust the amounts for Funeral and Maternity grants by up to 15% as these amounts were not increased when pensions were adjusted in 2009. A smaller adjustment may be justified for the Funeral grant as any increase may simply result in a similar adjustment in the amounts funeral homes charge.
5. As the economy emerges from the current recession, implement a modest unemployment benefit with a 1% contribution rate. If introduced, Social Security would then provide income replacement coverage for all contingencies that could lead to involuntary loss of income for workers.
6. Implement several initiatives aimed at reducing administrative costs, which in 2008, accounted for 18.3% of contribution income. A target of no more than 12% of contribution income should be set.
7. As recommended in previous actuarial reviews, the Board is again encouraged to bring increased diversification to Social Security investments. While the current asset mix generates good returns, the portfolio is high-risk given that almost all assets are linked to the Government of St. Kitts-Nevis and more than 60% is held in short-term deposits. The highly indebted position of the Government of St. Kitts-Nevis also raises the risk level inherent in the portfolio. It is therefore recommended that immediate steps be taken to rebalance investments so that there is a gradual move to the more prudent asset mix that is called for by the Investment Policy Statement - one with a good balance of private and public, local and overseas investments, and assets with longer maturities that better match the nature of Social Security liabilities.
8. With the feedback obtained from the general public during recent pension reform discussions, and the recommendations of this and previous actuarial reviews, implement

reforms to Social Security provisions that enhance the equity, relevance and long-term sustainability of the Fund. Reforms that reduce benefit promises to some groups without jeopardizing benefit adequacy are critical to ensuring that future generations of contributors are not overly burdened by excessive contribution rates.

In 2009 the Social Security Fund surpassed \$1 billion. Also in 2009, the collapse of the CL Financial Group made the recovery of some \$15.4 million doubtful. While the Fund appears strong, inadequate diversification of investments and the government's high debt-to-GDP ratio could hamper the Fund's ability to meet its obligations if future economic shocks impact the ability of Government and the St. Kitts Nevis Anguilla National Bank Ltd. to repay loans, deposits and bonds.

Like all other social security funds, long-term sustainability is closely linked to real economic growth, real wage growth and good governance practices. Since policymakers have limited influence over economic performance, changes aimed at reducing the Fund's investment risk profile, reducing administrative costs and enacting benefit reforms should be priority for the Board and Government.

## Chapter 1 Activities & Experience Since Last Actuarial Review

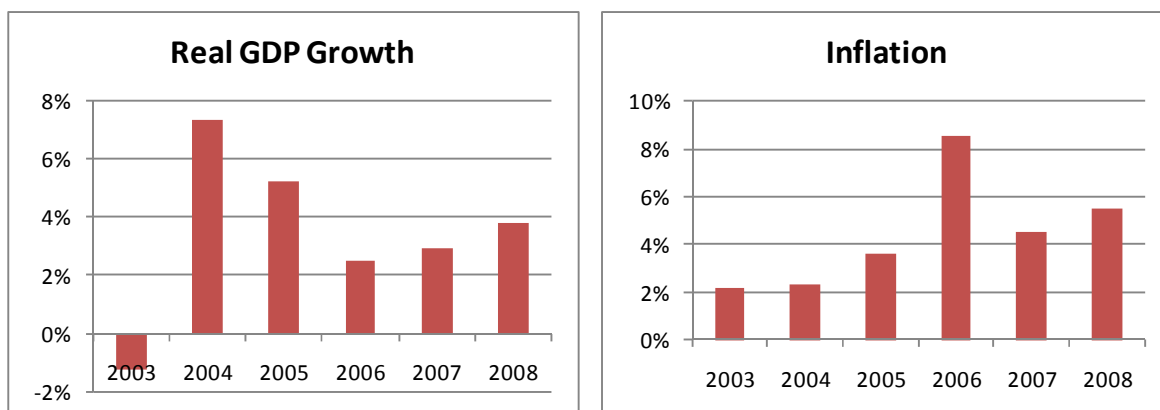
### 1.1 Amendments To Act & Regulations

There were no amendments made to the Social Security Act & Regulations during the period 2006 to 2008. However, all pensions in payment and minimum pension rates were adjusted in January 2009:- the minimum Age pension from \$300 to \$400 per month and pensions in payment by between 15% and 3%, depending on the year of award.

### 1.2 Economic Experience

Social Security finances are closely linked to economic performance and labour market changes. As shown in the two charts in Figure 1.1, while the economy experienced five years of positive real growth from 2004 to 2008, inflation rates in 2005 to 2008 were substantially higher than rates experienced in the years prior.

**Figure 1.1. Key Economic Indicators, 2003 to 2008**



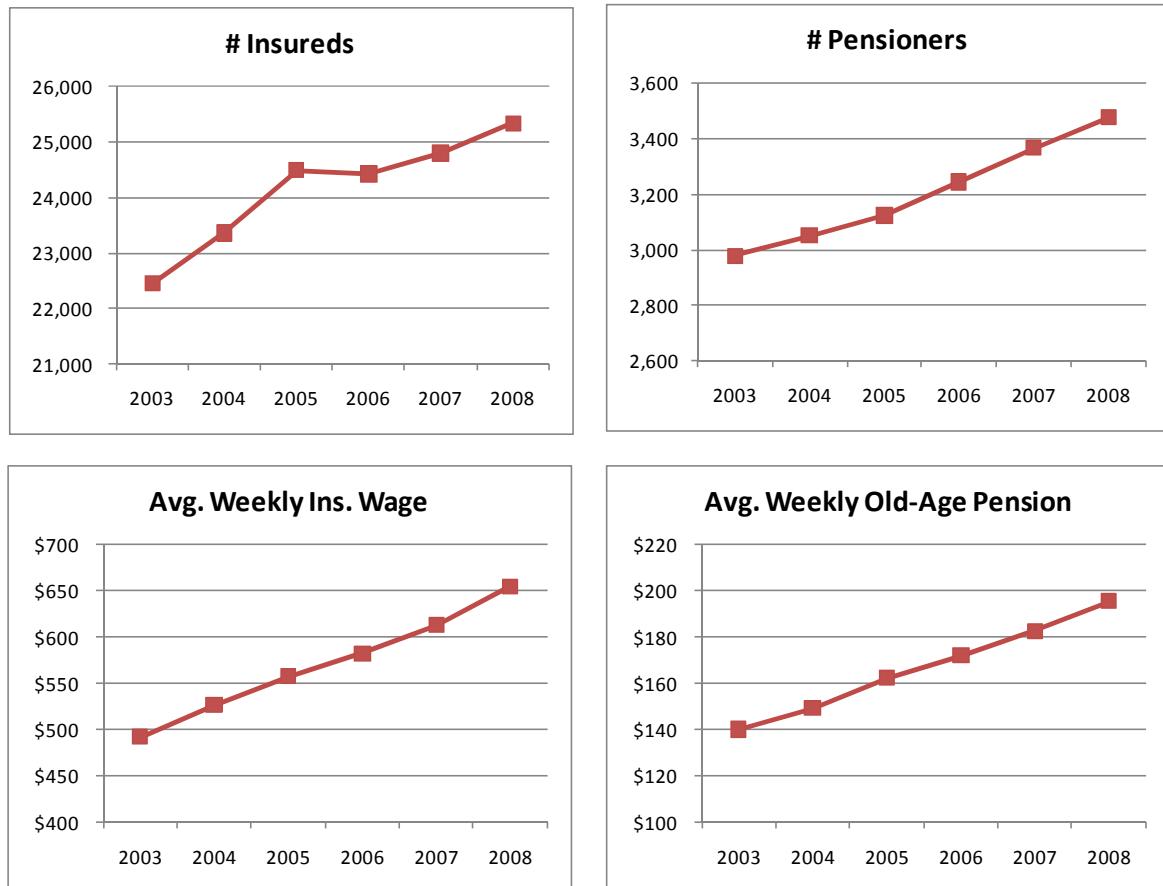
Source: Planning Unit; ECCB

### 1.3 Social Security Experience

Contribution income is directly related to employment and wage levels. Thus, in line with recent economic growth, the number of insured persons making contributions and their wages increased. For pensions, which account for 74% of total benefit expenditure, changes to the number of pensioners and their average pension have greatest influence on year-over-year changes to benefit expenditure. The charts in Figure 1.2 highlight recent changes in the number of contributors and their average insurable wage and the number of

pensioners and the average overall pension. While there has been no increase in the wage ceiling for many years, pensions in payment were increased in 2005 and again in 2009.

**Figure 1.2. Contributors & Pensioners, 2003 to 2008**



The following table provides summary income and expenditure amounts for years 2006 to 2008. A more detailed version of the Social Security finances for these years may be found in Appendix D.

**Table 1.1. Social Security Finances, 2006 – 2008 (millions of \$'s)**

	2006	2007	2008
<b>Income</b>			
Contributions	61.0	64.7	70.7
Investment	46.5	52.4	54.8
Other	0.5	0.5	0.6
<b>Total</b>	<b>108.0</b>	<b>117.5</b>	<b>126.2</b>
<b>Expenditure</b>			
Benefits	27.2	30.2	33.9
Administrative	8.4	10.0	12.9
<b>Total</b>	<b>35.5</b>	<b>40.2</b>	<b>46.9</b>
<b>Excess of Income over Expenditure</b>	<b>72.5</b>	<b>77.4</b>	<b>79.3</b>
<b>Prior year Adjustments</b>	<b>0.7</b>	<b>4.1</b>	<b>(2.2)</b>
<b>Benefit Reserves</b>	<b>807.2</b>	<b>888.7</b>	<b>965.8</b>

Notes: Totals may be off due to rounding.

## 1.4 Benefit Branch Experience & Reserves

Social Security administers three major types of social security benefits – long-term or pensions, short-term benefits and employment injury benefits. While the summary of Social Security finances presented in the previous section shows total income and expenditure, internal accounting procedures separate finances into three branches. Since the three benefit types have different characteristics and financing mechanisms, the separation allows for better monitoring of experience. Each benefit is allocated to one of the three branches and each benefit branch is allocated a certain percentage of contribution income, investment income, and administrative costs.

For the Short-term benefit and Employment Injury benefit branches, 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, relative to annual expenditure. As shown in the following table, the contribution rate allocated to these branches exceeded benefit expenditure (expressed as a percentage of insurable wages) in all years.

**Table 1.2. Summary Branch Experience (% of Insurable Earnings)**

Benefit Branch	Contributions Allocated	Total Expenditure		
		2006	2007	2008
Short-term	2.0%	1.57%	1.65%	1.88%
Employment Injury	1.0%	0.29%	0.31%	0.34%
Long-term	8.0%	4.54%	4.87%	5.08%
<b>All Branches</b>	<b>11.0%</b>	<b>6.40%</b>	<b>6.83%</b>	<b>7.29%</b>

While long-term branch expenditure is expected to increase each year as more pensioners with larger pensioners are added to pension rolls, it is unusual for short-term benefit expenditure to increase as much as it did between 2006 and 2008. A closer analysis of short-term benefit expenditure reveals that Sickness benefit expenditure as a percentage of insurable wages has doubled since 2000. This increase has been attributed to a change in claiming patterns of civil servants who many years ago did not claim as, in most instances, they received full wages when off from work.

Long-term benefits are partially pre-funded with the portion of the contribution rate not allocated to Short-term and Employment Injury benefits. Given that Social Security is still relatively young, expenditure remains well below contribution income. The following table shows changes in total reserves and relative funding levels for each branch between 2005 and 2008. Also shown are suggested funding targets for the Short-term and Employment Injury Benefit branches.

**Table 1.3. Benefit Reserves & Reserve-Expenditure Ratios, 2005 & 2008**

Benefit Branch	Year-end Reserve (in millions)		Reserve-Expenditure Ratio		
	2005	2008	2005	2008	Suggested Target
Short-term	\$ 69.3	\$ 87.9	8.6	7.3	1.0
Employment Injury	\$ 88.4	\$ 118.2	56.0	54.4	2.0
Long-term	\$569.5	\$745.8	24.8	22.9	Not Applicable
<b>Total Benefit Reserves</b>	<b>\$722.7</b>	<b>\$951.9</b>	<b>22.5</b>	<b>20.6</b>	<b>Not Applicable</b>

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

As shown in Table 1.3, reserve levels for all three branches have increased during the 3-year review period and at the end of 2008, actual funding ratios for the Short-term and Employment Injury benefit branches were well in excess of target funding ratios. Therefore, reserve transfers out of these branches to the Long-term branch and a reallocation of the contribution rate between branches are justified. (See Section 5.3)

Additional benefit experience details for years 2006 to 2008 may be found in Appendix E.

In addition to the reserves for the Short-term, Long-term and Employment Injury benefit branches, there are three additional types of reserves included in Social Security financials.

**Table 1.4. Non-Benefit Reserves**

<b>Reserve</b>	<b>Description</b>	<b>Dec. 2008 (in millions)</b>
<b>National Provident Fund Reserve</b>	Accumulated NPF balances less members' claims settled.	\$18.5
<b>Revaluation Reserve</b>	Cumulative gains and losses on revaluation of freehold properties and investments designated as "available for sale"	\$13.9
<b>Staff Supplemental Benefit Reserve</b>	Assets of the Staff Pension Plan	\$ 5.2

While the Staff Supplemental Benefit Reserve is not available for the payment of future Social Security benefits, amounts currently designated as Revaluation Reserves and any remainder of the NPF reserve once all NPF obligations have been met will be available for the payment of future benefits and operating costs. For this report, total reserves considered available for the payment of benefits and other costs are \$965.8 million - the sum of the three benefit reserves and the Revaluation Reserve.

## 1.5 Experience Compared With Projections of 8<sup>th</sup> Actuarial Review

In the 8<sup>th</sup> Actuarial Review, dollar-value projections were presented for the entire Social Security Fund. As shown in Table 1.5, when compared with the *Intermediate* Scenario projections for 2006 to 2008, actual experience was generally in line with projections with the exception of administrative expenditure, which were well in excess of the amount projected.



**Table 1.5. Projections from 8<sup>th</sup> Actuarial Review Compared With Actual Experience**

	<b>2006-2008 Projected</b> (millions of \$'s)	<b>2006-2008 Actual</b> (millions of \$'s)	<b>Difference</b>
<b>Contribution Income</b>	\$194.4	\$196.4	1.0%
<b>Investment Income</b>	\$149.7	\$153.7	2.6%
<b>Benefit Expenditure</b>	\$ 88.1	\$ 91.3	3.5%
<b>Administrative Expenditure</b>	\$ 24.8	\$ 31.3	20.8%
<b>2008 Year-end Reserves</b>	\$971.4	\$965.8	(0.6%)

Note: Total reserves includes the Revaluation Reserve

## 1.6 Investments

At the end of 2008, Social Security investments (including NPF) stood at \$921.5 million, up from \$706.3 million at the end of 2005. During this period the average yield on investments was 6.5%. With inflation averaging 6.2%, however, the average real rate of return over the 3-year period was only 0.3%. At the end of 2008, total investments were approximately 60% of national GDP.

The following table provides a summary of the investment mix of the Social Security Fund at year-end 2008 and 2005. The only significant change in asset mix is the increase in property holdings. Additional analysis of investments may be found in section 2.3.

**Table 1.6. Summary of Investments, Year-end 2008 & 2005** (millions of \$'s)

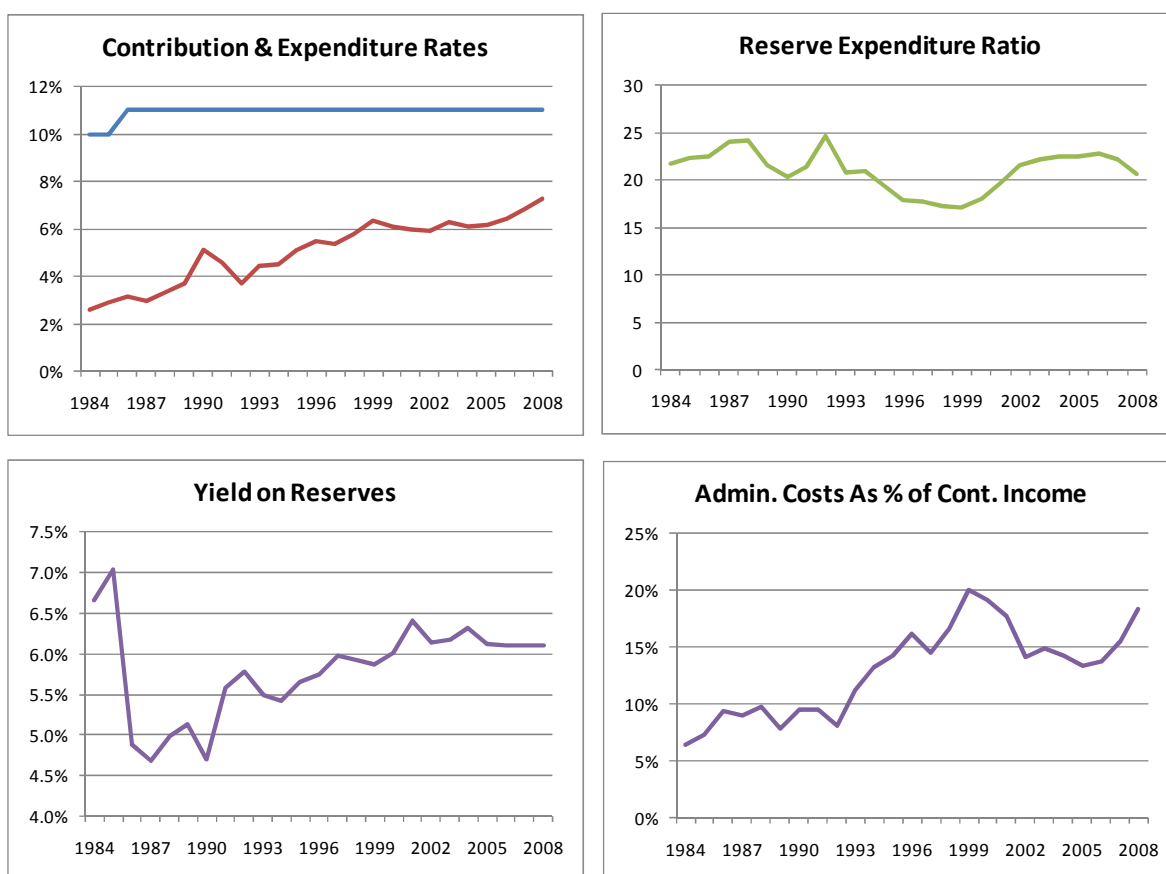
<b>Investment Category</b>	<b>2008</b>			<b>2005</b>		
	<b>\$'s</b>		<b>%</b>	<b>\$'s</b>		<b>%</b>
<b>SKN Gov't Securities &amp; Loans</b>	126.2		13.7%	114.9		16.3%
<b>Fixed Deposits</b>	553.8		60.1%	425.3		60.2%
<b>Notes &amp; Bonds</b>	7.2		0.8%	11.6		1.6%
<b>Other Loans</b>	162.6		17.6%	121.6		17.2%
<b>Equities</b>	25.8		2.8%	26.3		3.7%
<b>Property</b>	45.8		5.0%	6.7		0.9%
<b>Total</b>	<b>921.5</b>		<b>100%</b>	<b>706.3</b>		<b>100%</b>

## Chapter 2 Assessment Of Performance & System Design

### 2.1 Historical Performance, 1984 – 2008

Social security systems have long-term horizons – workers may contribute for over 40 years and then receive pensions for over 30 years. Therefore, an assessment of performance should not be limited to one or two years, but instead entail a review of experience over a long period and an understanding of why changes over shorter periods have occurred. Experience for key financial factors from 1984 to 2008 is presented in the following charts:

**Figure 2.1. Social Security Experience**



As shown above, the pay-as-you-go rate (top-left chart), which is total Fund expenditure as a percentage of insurable earnings, began trending upwards again in 2006 after several years of being relatively constant at around 6%. As a result, the gap between contribution income and total expenditure is narrowing. This pattern of increasing pay-as-you-go rates is expected to continue for many more years. With pay-you-go rates increasing significantly between 2006 and 2008, expenditure increased at a faster rate than reserves leading to

reductions in the reserve-expenditure ratio in 2007 and 2008. (top right chart) This ratio measures the size of the Fund relative to annual payouts.

From 2006 to 2008 the nominal yield on reserves was stable at just over 6%, slightly lower than yields achieved in the preceding few years. After experiencing significant reductions between 1999 and 2005, the ratio of operating costs to contribution income increased substantially over the three-year review period.

Following are values for several key indicators as of the dates of this and the last three actuarial reviews, along with a brief analysis of the changes that have occurred.

**Table 2.1. Social Security Performance Indicators**

	1999	2002	2005	2008	Comments
1. Contribution Rate	11%	11%	11%	11%	Not adjusted since 1986.
2. Expenditure Rate	6.3%	5.9%	6.2%	7.3%	Significant increase in last three years after almost no change in previous six years.
3. Investment Income as % of Total Income	34%	39%	42%	43%	Still a significant part of Fund income.
4. Benefits as % of GDP	1.8%	2.0%	2.1%	2.2%	Benefits and reserves increasing at slightly faster rate than economy.
5. Reserves as % of GDP	48%	57%	62%	63%	
6. Reserve-Expenditure Ratio	17.1	21.5	22.5	20.6	Recent decline indicates that expenditure grew faster than reserves between 2005 & 2008.
7. 3-year average yield on reserves	5.9%	6.2%	6.2%	6.2%	Average yields remain very good.
8. 3-year average real yield on reserves (net of inflation)	0.7%	4.2%	3.5%	0.0%	High inflation between 2006 and 2008.
9. Administrative Expenses as a % of Contribution Income	20.0%	14.1%	13.3%	18.3%	Significant increase between 2005 and 2008 after several years of decline.
10. # of Pensioners Per 100 Contributors	12.3	13.0	12.7	13.7	Fluctuating due to changes in the number of contributors
11. Average Pension as % of Average Insurable Wage	22%	23%	25%	26%	Gradual increases expected.

In general, most Social Security demographic and financial experience has been favourable and in line with expectations. Exceptions to this are the low real rate of return on reserves due to high inflation and the increasing administrative costs.

## 2.2 Design & Policy Indicators

Social security systems have wide-ranging objectives such as the provision of adequate income coverage for all workers which lead to the provision of adequate lifetime pensions for the retired, invalid and survivors of insured persons.

While assessing whether or not these objectives are being met can be somewhat subjective, by setting dollar values to certain key parameters such as the earnings ceiling and minimum pension, or through policy guidance issued to the Social Security Board, policymakers influence to a large extent how well such objectives are achieved. The following table provides an analysis of a few key design parameters and indicators the adequacy of coverage and benefits by reviewing current levels and changes between 1999 and 2008.

**Table 2.2. Assessment of Key Design Parameters & Achievement of Policy Objectives**

Policy	Measured By	1999	2002	2005	2008	Comments
<b>1. Level of Insurance Coverage</b>	Ratio of Ceiling to Average National Wage	3.5	3.1	2.7	2.3	Ceiling still at a high level but gradual decline in insurance coverage since 1999.
<b>2. Minimum Floor of Income Protection</b>	Minimum Age Pension as a % of Average National Wage	11%	12%	13%	11%	Minimum Pension increased in 2009 by 33% so ratio increased to 15%.
	Minimum Age Pension as a % of Poverty Line	69%	79%	89%	76%	Relative value of minimum pension much improved after January 2009 adjustments.
<b>3. Coverage For All Employed Persons</b>	% of Employed Persons Contributing	> 90%				Very good.
	% of Self-employed Persons Contributing	Not Available	15%	20%	24%	Still low but improving.

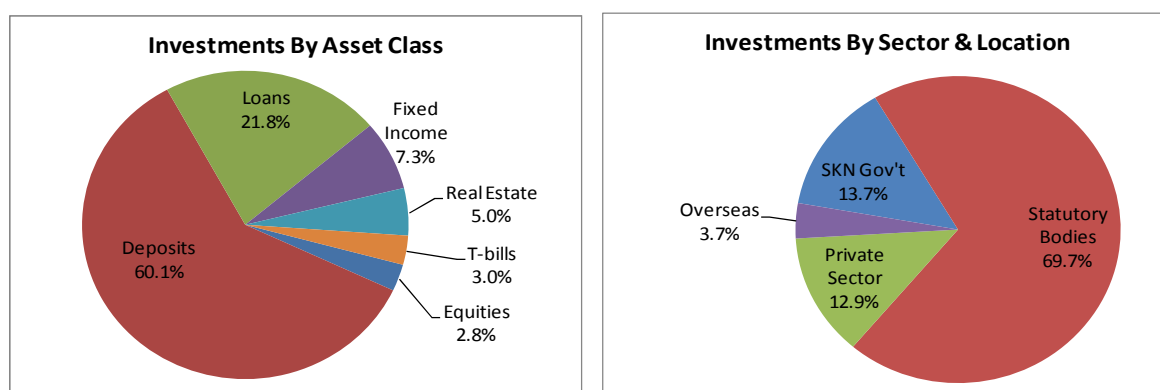
Notes: # of self-employed persons in population taken from 2001 Population Census. Poverty line taken from the 1999 Poverty Assessment Report and adjusted by inflation for 2000 to 2008.

## 2.3 Investments

Given that the St. Kitts-Nevis Social Security system has a large pool of assets which together with future contributions will meet future expenditure, ensuring that these assets realise market rates of return without exposure to excessive risk is also an important objective.

At the end of 2008, Social Security (including NPF) investments stood at \$921.5 million (\$706.3 at end of 2005). The following charts highlight portfolio diversification by asset type, by who issued the securities and the location of these investments as at December 2008.

**Figure 2.2. Distribution of SSF Investments, December 2008**



As illustrated above, fixed deposits account for 60% of the portfolio with 83% of these deposited at the St. Kitts Nevis Anguilla National Bank Ltd., a majority Government-owned bank. This bank is categorised above as a statutory body. With holdings of Government of St. Kitts-Nevis loans, bonds and T-bills, as well as loans to several statutory bodies, 84% of the investments are either fully or partially backed by the Government of St. Kitts-Nevis.

The following table shows target and actual asset allocation as at December 31, 2008.

**Table 2.3 Actual & Target Asset Allocation, December 2008**

<b>Asset Class</b>	<b>Target Asset Allocation</b>	<b>Actual Allocation</b>
<b>T-Bills</b>	5% - 10%	3.0%
<b>Term Deposits</b>	20% - 30%	60.1%
<b>Gov't Securities<sup>^</sup></b>	20% - 30%	27.9%
<b>Corporate Securities</b>	5% - 15%	0.4%
<b>Equities</b>	10% - 20%	2.8%
<b>Real Estate</b>	10% - 20%	5.0%
<b>Other Investments</b>	5% - 10%	0.9%

<sup>^</sup> Includes Loans but excludes T-bills

The target asset allocations are found in the Fund's Investment Policy. As can be seen, the December 2008 allocation of investments is not within the target limits set out in the Investment Policy. While the target allocation provides suitable diversification for the Fund, the current allocation of assets is overly concentrated in deposits, government-backed securities and locally domiciled securities. In addition, with current income from contributions and investments expected to be sufficient to meet expenditure for almost 20 more years, the large holdings of short-term deposits leaves a severe mismatch between assets and liabilities.

As at December 2008, the Social Security Fund held deposits totalling \$15.4 million in CLICO and British American Insurance companies. With the collapse of the CL Financial Group in early 2009, it is uncertain what portion of total deposits will be recovered.

## **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, wage levels and inflation influence Social Security finances. Therefore, to best estimate the Fund's long-term sustainability, projections of St. Kitts-Nevis' total population and the economy are required. For this review 60-year projections have been performed.

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." However, given the significant uncertainty inherent in forecasting such a long period, projections have also been performed using two additional sets of assumptions. These alternative projection sets, which encompass assumptions that are either more optimistic or more pessimistic than best-estimate assumptions, are presented in Chapter 4.

### **3.1 Population Projections**

#### **3.1.1 Assumptions**

Projections of the St. Kitts-Nevis population begin with the results of the 2001 census and in each projection year thereafter, fertility, mortality and migration assumptions are applied. 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 St. Kitts-Nevis. Migration is the most volatile of these three factors and there are no official estimates of migration levels.

The 2001 population census placed the combined St. Kitts-Nevis population at 46,325, an increase of 5,493 over the 1991 census population of 40,618. With births exceeding deaths by 4,565, there was implied net in-migration of some 929 persons, an average of around 93 persons per year over the 10-year period.

The total fertility rate (TFR) represents the average number of children each woman of childbearing age would have if she had all her children in a particular year. If there is no migration, a TFR of 2.1 is required for each generation to replace itself. Based on births between 2001 and 2008, the current St. Kitts-Nevis TFR is estimated at around 1.85, falling

from 2.71 in 1991. For this set of projections it is assumed that future TFR's in St. Kitts-Nevis will remain at around 1.85 in all years.

Current population estimates and the number of deaths in the past few years, suggest life expectancy at birth in 2008 of around 69 for males and 73 for females. For these projections improvements in mortality are assumed to occur in accordance with UN estimates.

The medium and long-term economic assumptions used for this report assume stable and positive economic growth and labour productivity. 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**

<b>Ultimate Total Fertility Rate</b> (from 1.85 in 2008)		1.85
<b>Mortality Improvements</b> <sup>^</sup>		Slow
<b>Net Migration Per Annum</b>		0 from 2001 to 2008, 300 net out in 2009 increasing to 0 in 2015, constant thereafter
<b>Real GDP Growth Rates</b> *	2009 to 2014	0%, 1%, 2%, 2%, 2%, 2%
	2015 to 2035	2.5% decreasing linearly to 1.5%
	2036 to 2068	1.5%
<b>Inflation</b>		2.2% from 2010 to 2014 2.5% thereafter

<sup>^</sup> UN mortality improvement rates

\* GDP growth and inflation rates up to 2014 taken from IMF estimates

Given the recent economic downturn and the tempered forecasts for future global economic growth presented by international agencies, these assumptions are generally less optimistic than those of the 8<sup>th</sup> Actuarial Review.



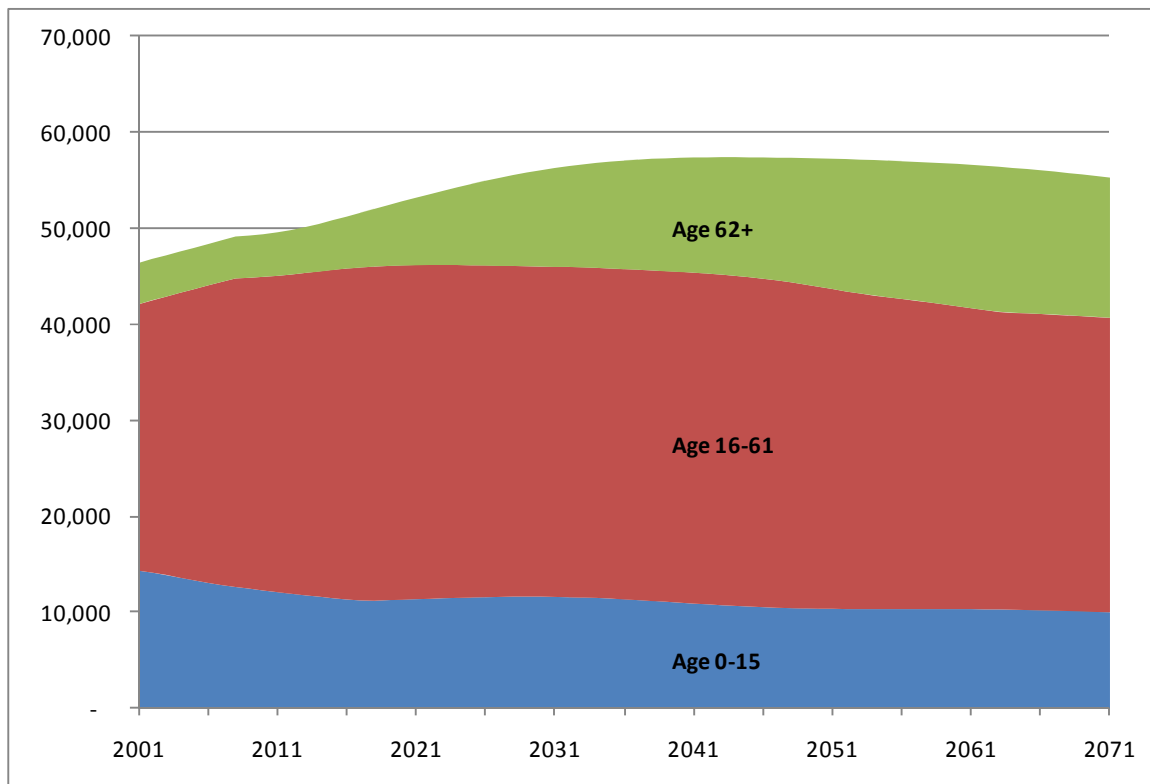
### 3.1.2 Projection Results

From the 2001 Census population of 46,325, the St. Kitts-Nevis population is projected to increase to over 57,000 around 2040, declining slightly thereafter. 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 the bulk of expenditure. For the projections under these best-estimate assumptions, the anticipated ageing pattern is highlighted in the last column of Table 3.2 which shows the ratio of the number of pension age persons to working age persons in the population, projected to increase from 0.14 to 0.48. The inverse of this ratio is the number of working-age people for each person of pension age, which is projected to decrease from 7 to 2.

**Table 3.2. Projected St. Kitts-Nevis Population (*Best-Estimate* scenario)**

Year	Total	Age 0 - 15	Age 16 - 59	Age 62 & over	Ratio of Persons 62+ To Persons
<b>2001</b>	46,325	14,356	27,658	4,311	0.16
<b>2005</b>	47,923	13,365	30,234	4,324	0.14
<b>2010</b>	49,352	12,310	32,575	4,467	0.14
<b>2015</b>	50,799	11,508	34,106	5,186	0.15
<b>2020</b>	52,777	11,349	34,734	6,694	0.19
<b>2025</b>	54,605	11,571	34,532	8,502	0.25
<b>2030</b>	56,031	11,660	34,310	10,060	0.29
<b>2035</b>	56,928	11,456	34,308	11,164	0.33
<b>2045</b>	57,381	10,622	34,231	12,527	0.37
<b>2055</b>	57,044	10,359	32,400	14,286	0.44
<b>2065</b>	56,158	10,274	30,809	15,075	0.49
<b>2070</b>	55,435	10,081	30,626	14,729	0.48

**Figure 3.1. Population Age Structure, 2008 & 2065 - *Best Estimate* scenario**



## 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 and the contribution and benefit provisions in place on January 1, 2009. While increases to the contribution ceiling and pensions in payment are not legislated, periodic adjustments are expected, and thus have been assumed.

### 3.2.1 Assumptions

Key Social Security assumptions are shown below.

**Table 3.3. Social Security *Best Estimate* Assumptions**

<b>Contribution Rate</b>	11% in all years
<b>Insurable Wage Ceiling</b>	Increases annually by the change in average wages beginning in 2011
<b>Short-term Benefits</b>	Increases from 1.45% to 1.6% of insurable earnings over 60 years
<b>Employment Injury Benefits</b>	Increases from 0.11% to 0.2% of insurable earnings over 60 years
<b>Pension Increases</b>	Adjusted annually by inflation starting 2011.
<b>Long-term Yield on Reserves</b>	5.25%
<b>Admin. Expenses as a % of Insurable Wages</b>	Decrease from 1.85% to 1.3% over 20 years

With these assumptions it is being assumed that the current level of coverage and income security made possible by the wage ceiling and the minimum pension will be generally maintained throughout the projection period.

### **3.2.2 Projection Results**

For accounting purposes, Social Security finances are separated into the Short-term, Employment Injury and Long-term Benefit Branches, representing the three major benefit types that are offered. 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 the three benefit branches have been consolidated so that the complete financial picture may be shown. The December 2008 reserve total is the sum of the three benefit branch reserves and the Revaluation Reserve - \$965.8 million.

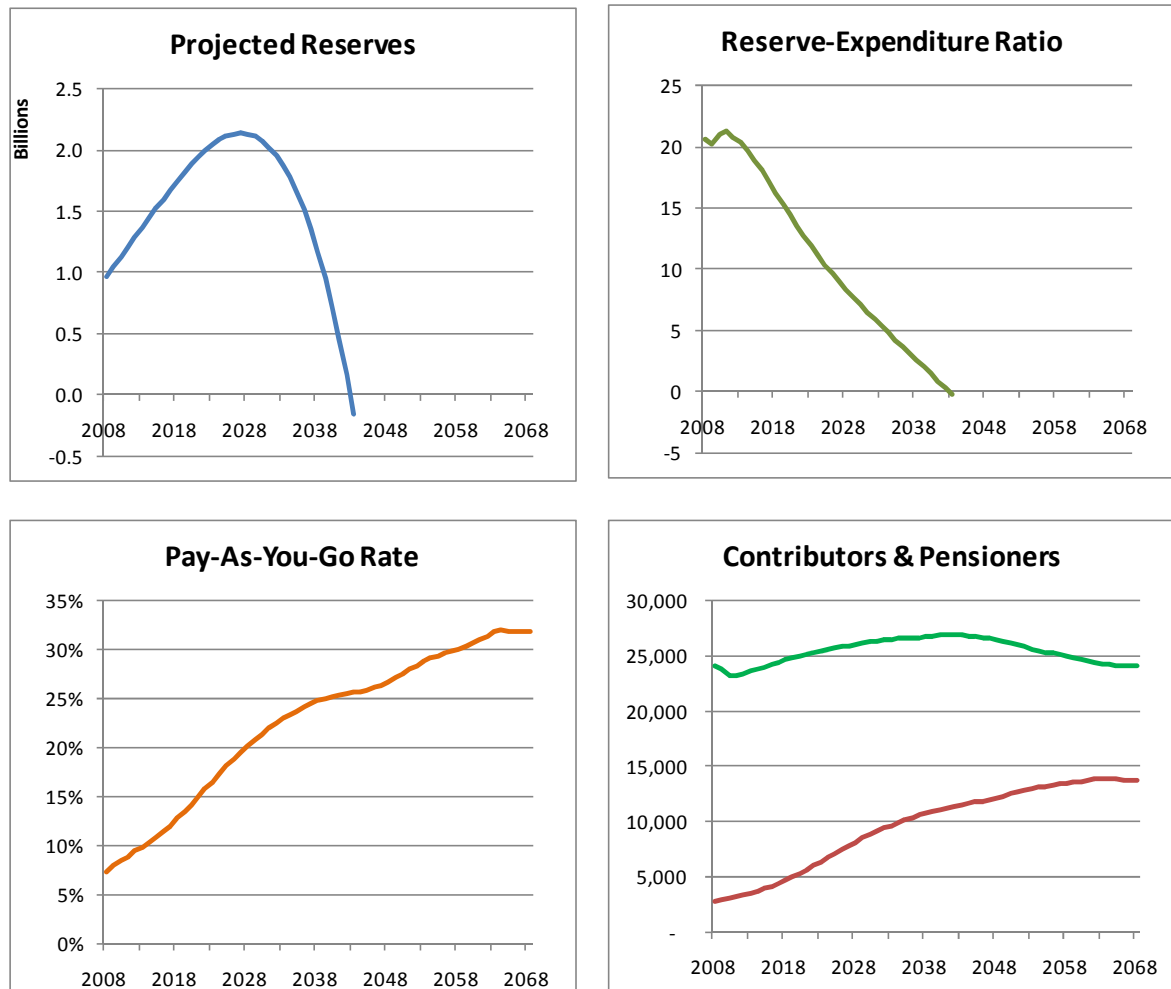
The results of the 60-year projections of the Social Security Fund in this 9<sup>th</sup> Review are considerably less favourable than those of the 8<sup>th</sup> Review. The change in outlook is due primarily to two factors:- the 2009 pension increases which were larger than assumed in the 8<sup>th</sup> Review and less optimistic population and economic projections due to the recent global economic crisis and its impact on St. Kitts-Nevis.

Key findings and observations are summarised below and illustrated in the four charts of Figure 3.2. All observations are based on there being no changes to the current contribution rate and legislated contribution and benefit provisions.

1. Social Security Fund reserves are projected to grow from \$965.8 million at the end of 2008 to \$2.1 billion in 2028. Reserves are projected to be exhausted in 2043.
2. Contributions at current rates will be sufficient to cover all expenditures up to 2015. Thereafter, an increasing portion of investment income will be required to make up the shortfall.
3. Although assets are projected to more than double, the size of reserves relative to annual expenditure (reserve-expenditure ratio) will gradually decline from its current level at just over 20.
4. Social Security Fund reserves will continue to grow at a faster rate than the economy for another seven years increasing from 73% to 81% of GDP.
5. Annual expenditure relative to total insurable wages, commonly referred to as the pay-as-you-go rate, is projected to increase gradually from 7.3% in 2008 to just under 32% towards the end of the projection period.
6. The general average premium, or the level contribution rate required to cover expenditure during the next 60 years if there were no assets is 21.0%, 10% higher than the current average contribution rate.
7. The number of contributors is expected to remain at or below 2008 levels for several years and increasing only slightly over the next 40 years. The number of pensioners, however, will increase four times over the next sixty years.
8. The ratio of the number of contributors to the number of pensioners is expected to fall from 7.0 in 2008 to 1.7 in 2068.

The charts in Figure 3.2 highlight the key projection results of the *Best Estimate* scenario.

**Figure 3.2. Projection Results – *Best Estimate* Scenario**



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			Surplus/ (Deficit)	Reserves	
	Contribution Income	Investment Income	Other Income	Total	Benefits & Pensions	Admin. Expenses	Total		End of Year	# of times current year's expenditure
<b>2006</b>	61.0	46.5	0.5	<b>108.0</b>	27.2	8.4	35.5	<b>72.5</b>	<b>807</b>	22.7
<b>2007</b>	64.7	52.4	0.5	<b>117.5</b>	30.2	10.0	40.2	<b>77.4</b>	<b>889</b>	22.1
<b>2008</b>	70.7	54.8	0.6	<b>126.2</b>	33.9	12.9	46.9	<b>79.3</b>	<b>966</b>	20.6
<b>2009</b>	70.5	57.8	0.7	<b>128.9</b>	39.6	11.8	<b>51.4</b>	<b>77.5</b>	<b>1,043</b>	20.2
<b>2010</b>	68.9	62.0	0.7	<b>131.5</b>	41.9	11.5	<b>53.4</b>	<b>78.1</b>	<b>1,121</b>	21.0
<b>2011</b>	70.3	66.6	0.7	<b>137.5</b>	45.0	11.5	<b>56.5</b>	<b>81.0</b>	<b>1,202</b>	21.3
<b>2012</b>	72.0	70.0	0.7	<b>142.7</b>	50.1	11.6	<b>61.7</b>	<b>81.0</b>	<b>1,283</b>	20.8
<b>2013</b>	74.8	72.1	0.7	<b>147.5</b>	55.2	11.8	<b>67.1</b>	<b>80.5</b>	<b>1,363</b>	20.3
<b>2014</b>	77.7	73.8	0.7	<b>152.2</b>	61.0	12.1	<b>73.1</b>	<b>79.1</b>	<b>1,442</b>	19.7
<b>2018</b>	92.7	87.5	0.9	<b>181.0</b>	94.0	13.5	<b>107.5</b>	<b>73.5</b>	<b>1,746</b>	16.2
<b>2028</b>	139.4	109.1	1.3	<b>249.8</b>	239.2	16.8	<b>256.0</b>	<b>(6.2)</b>	<b>2,129</b>	8.3
<b>2038</b>	202.1	64.4	1.9	<b>268.4</b>	431.2	23.9	<b>455.1</b>	<b>(186.8)</b>	<b>1,163</b>	2.6
<b>2048</b>	289.5	(104.4)	2.7	<b>187.8</b>	668.9	34.2	<b>703.1</b>	<b>(515.3)</b>	<b>-2,303</b>	(3.3)
<b>2058</b>	411.4	(535.3)	3.9	<b>(119.9)</b>	1,076.2	48.6	<b>1,124.8</b>	<b>(1,244.7)</b>	<b>-11,091</b>	(9.9)
<b>2068</b>	603.7	(1,497.8)	5.7	<b>(888.3)</b>	1,674.9	71.3	<b>1,746.3</b>	<b>(2,634.6)</b>	<b>-30,599</b>	(17.5)

*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	Assistance	Short-term	Emp. Injury	Insurable Wages	GDP
<b>2008</b>	17.8	1.7	1.8	1.7	9.3	1.2	5.3%	2.2%
<b>2009</b>	23.3	1.9	2.2	2.0	9.3	1.1	6.2%	2.7%
<b>2010</b>	25.2	2.2	2.3	1.9	9.2	1.2	6.7%	2.7%
<b>2011</b>	27.8	2.4	2.4	1.9	9.3	1.2	7.0%	2.9%
<b>2012</b>	31.9	2.8	2.6	1.9	9.5	1.3	7.7%	3.1%
<b>2013</b>	36.1	3.2	2.7	2.0	9.9	1.4	8.1%	3.2%
<b>2014</b>	41.0	3.4	2.9	2.0	10.3	1.5	8.6%	3.4%
<b>2018</b>	69.5	4.6	3.5	2.1	12.4	1.9	11.2%	4.3%
<b>2028</b>	200.0	7.5	7.0	2.7	19.0	3.1	18.9%	7.1%
<b>2038</b>	370.7	11.8	12.5	3.4	28.0	4.8	23.5%	8.7%
<b>2048</b>	579.1	18.1	19.2	4.4	40.8	7.3	25.4%	9.3%
<b>2058</b>	948.9	24.2	28.3	5.6	58.9	10.2	28.8%	10.4%
<b>2068</b>	1,487.4	34.7	42.8	7.0	87.8	15.1	30.5%	11.1%

**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	Assistance	Death & Disablement		
<b>2008</b>	24,663	1,858	220	758	638	73	<b>3,547</b>	<b>7.0</b>
<b>2009</b>	23,766	1,918	246	771	644	77	<b>3,655</b>	<b>6.5</b>
<b>2010</b>	23,271	1,990	272	777	630	84	<b>3,753</b>	<b>6.2</b>
<b>2011</b>	23,239	2,087	293	791	619	91	<b>3,882</b>	<b>6.0</b>
<b>2012</b>	23,424	2,210	317	805	610	98	<b>4,040</b>	<b>5.8</b>
<b>2013</b>	23,594	2,357	342	813	601	105	<b>4,219</b>	<b>5.6</b>
<b>2014</b>	23,747	2,530	359	819	594	111	<b>4,413</b>	<b>5.4</b>
<b>2018</b>	24,622	3,491	435	792	577	134	<b>5,428</b>	<b>4.5</b>
<b>2028</b>	26,043	6,736	527	907	569	183	<b>8,921</b>	<b>2.9</b>
<b>2038</b>	26,708	9,071	605	1,078	576	238	<b>11,567</b>	<b>2.3</b>
<b>2048</b>	26,437	10,361	654	1,152	575	285	<b>13,028</b>	<b>2.0</b>
<b>2058</b>	24,929	11,707	604	1,161	569	296	<b>14,336</b>	<b>1.7</b>
<b>2068</b>	24,038	11,933	578	1,162	561	313	<b>14,546</b>	<b>1.7</b>

### 3.2.3 General Average Premium

The general average premium is the average level contribution rate required over the next 60 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 the *Best Estimate* projections, the general average premium is 21.0%, 10% higher than the current contribution rate.

## 3.3 Sensitivity Analysis

There is much uncertainty inherent in the population, economic and Social Security projections that extend 60 years. Since greatest concern is related to the risk factors that could hasten depletion of the Fund, the potential variability related to different assumptions for these economic factors have been modelled. In each case, only one assumption is changed so that the impact of differences in outcome for that one risk factor can be determined. In the following chapter, two alternate projection sets that encompass demographic assumptions that are more optimistic and more pessimistic than those of the Best Estimate scenario are presented.

The two factors that are likely to have greatest impact on overall future finances are the yield on reserves and the difference between the rate of growth of wages and inflation - real

wage growth. If either is lower than expected, Social Security finances will be negatively affected as illustrated in the following table. To model the effect of lower real wage growth, the inflation rate, or the rate at which benefits are assumed to increase annually, is adjusted without any change to nominal wage growth.

**Table 3.7. Sensitivity Tests – *Best Estimate***

Assumption	Scenario	General Average Premium	Year Fund Exhausted
	<b><i>Best Estimate</i></b>	<b>21.0%</b>	<b>2043</b>
<b>Long-term Yield on Reserves</b>	½% lower (4.75%)	21.5%	2041
<b>Benefit Increases (Price Inflation)</b>	½% higher (3.0%)	21.7%	2042

As expected, lower yields on investments and higher pension increases will result in increased costs and lower reserve levels.

### 3.4 Financing Future Social Security Benefits

By design, Social Security obligations are only partially funded, a mechanism considered suitable for national pension systems. While depletion of reserves is not expected for more than 30 years, and the current level of funding is higher than that of most Caribbean social security systems, policymakers should not ignore the unsustainable nature of the Fund at current contribution rates. Therefore, reforms aimed at reducing long-term costs along with upward adjustments to the contribution rate should be considered.

There is no right or wrong time to increase the contribution rate. Instead, factors such as affordability, investment opportunities and whether or not advanced funding is considered superior to pay-as-you-go financing should guide this decision. While a rate increase is not recommended at this time, it is recommended that changes aimed at reducing current costs and future benefit promises are adopted first. The Board should therefore seek to reduce administrative costs, reallocate investments and implement the benefit reforms suggested in this and previous actuarial reports.



## Chapter 4 Sensitivity Analysis

*Best Estimate* projections up to 2068 presented in the previous chapter provide estimates of future Social Security demographics and finances under best-estimate assumptions. Given the uncertainty in forecasting such a long period, two alternative scenarios that highlight the sensitivity of results to differences in assumptions re future outlook have been performed.

The two alternative projection sets encompass assumptions that are generally more optimistic and more pessimistic than those of the *Best Estimate* projections. Social Security long-term financial sustainability will be affected by both demographic and economic changes. The scenario which may be considered more optimistic is one with a larger population and economy and higher wages than under the *Best Estimate* scenario, and is referred to as the *Low Cost* scenario. Conversely, the more pessimistic scenario has a smaller population and economy and lower wages than the *Best Estimate* scenario, and is referred to as the *High Cost* scenario.

Following is a summary of the main assumptions that differ between the three projection scenarios. The values for all other assumptions are similar across scenarios.

**Table 4.1. Principal Demographic & Economic Assumptions**

	<i>Low Cost</i>	<i>Best Estimate</i>	<i>High Cost</i>
<b>Ultimate Total Fertility Rate</b> (from 2.0 in 2001)	2.0	1.85	1.7
<b>Mortality Improvements<sup>^</sup></b>	Very Slow	Slow	Medium
<b>Net Migration Per Annum (In less out)</b>	+50 from 2001 to 2008, 200 net out in 2009 increasing to +50 in 2015, constant thereafter	0 from 2001 to 2008, 300 net out in 2009 increasing to 0 in 2015, constant thereafter	-50 from 2001 to 2008, 400 net out in 2009 increasing to -25 in 2015, constant thereafter
<b>Ultimate Real GDP Growth<sup>*</sup></b>	½% higher than <i>Best Estimate</i> in all years	2% in 2010 to 2014 From 2015, 2.5% decreasing linearly to 1.5% in 2035, 1.5% thereafter	½% lower than <i>Best Estimate</i> in all years
<b>Real Wage Growth (p.a.)</b>	1.25%	1.0%	0.75%
<b>Inflation (p.a.)</b>	3.0%	2.5%	2.0%
<b>Yield on Reserves (p.a.)</b>	5.75%	5.25%	4.75%

<sup>^</sup> UN mortality improvement rates

<sup>\*</sup> GDP Growth rates up to 2014 taken are IMF estimates

The main population and Social Security demographic and financial results of the three projection sets are presented below in Table 4.2. As expected, the outlook for Social Security finances is directly related to the size and age distribution of the general population. Social Security performance indicators such as yield on investments and administrative cost rates will also impact future finances, but to a lesser extent when compared to the factors for which different assumptions have been modelled.

**Table 4.2 Summary Results – All Scenarios**

	<i>Low Cost</i>	<i>Best Estimate</i>	<i>High Cost</i>
<b>Expenditure First Exceeds Contributions</b>	2016	2016	2015
<b>Expenditure First Exceeds Total Income</b>	2030	2028	2026
<b>Reserves Depleted</b>	2045	2043	2041
<b>General Average Premium</b>	19.4%	21.0%	22.6%
<b>Pay-as-you-go Rate in 2038</b>	22.3%	24.8%	27.9%
<b>Pay-as-you-go Rate in 2068</b>	26.2%	31.8%	37.9%
<b># of Contributors per pensioner – 2068</b>	2.0	1.7	1.4

## Chapter 5 Social Security Reform

The 8<sup>th</sup> Actuarial Review presented several ideas for reform and recommendations for policy changes. These included:

1. Increasing the age at which full pensions are available to at least 65 while keeping age 62 as the age at which reduced pensions are first payable.
2. Revising the schedule of pension accrual rates so that pensions accrue more gradually.
3. Changing the manner in which average wages are determined for pension purposes from the best 3-year average to one that uses indexed career average wages. Two other options for reducing the average new Age pension are:
  - a. 5-year average insurable wages instead of 3-years average insurable wages, or
  - b. An approach where less than 100% of wages above a certain amount is used for pension purposes. For example, wages used for pension calculations could be 100% of average monthly insurable wages up to \$5,000 + 75% of average monthly insurable wages above \$5,000.
4. Introducing automatic annual adjustments to pensions and wage ceiling.
5. Reviewing the limit on reimbursement of medical care costs related to job-related injuries.
6. Reallocating investments so that fewer investments are held in local short-term deposits and government securities.

Although not extensively discussed in this report, these changes are still relevant and are again recommended in this report.

Since the submission of the 8<sup>th</sup> Actuarial Review a Social Security Reform Committee was established. This Committee has had extensive discussions with stakeholders on these and other reform suggestions but to date, no reforms have been enacted.

### 5.1 Impact of Pension Age and Accrual Rate/Average Wage Changes

The financial implications of changing the normal pension age and changing the schedule of pension accruals and/or method of averaging wages for pensions has been modelled. These three changes could produce significant long-term savings. At the same time, increasing the normal pension age is consistent with changing employment patterns as workers remain employed to older ages. Also, a pension based on career earnings produces greater equity

between insureds as there is a closer relationship between one's actual lifetime earnings and the pension they ultimately receive.

For the change in pension accruals and average wages it is assumed that starting in 2014, the average new Age pension will be 10% lower than the expected average new Age pension under current rules. For changes in pension age, it is assumed that the normal pension age will be increased by one year every 2 years and that early pensions will be reduced by 6% for each year that pension award precedes normal pension age.

As the results indicate, even though the system would still be unsustainable at current contribution rates, these two modifications could produce significant savings.

**Table 5.1. Impact Of Selected Pension Modifications**

Projection Scenario	General Average Premium	PAYG Rate in 2068	Year Reserves Exhausted
<b>Best Estimate Projections</b>	<b>21.0%</b>	<b>31.8%</b>	<b>2043</b>
Age Pension Formula with 10% lower average new pension starting in 2014 years	18.1%	27.1%	2051
Normal Pension Age Increased From 62 to 65 over 6 years	17.9%	28.4%	2053
New Age Pension Formula (as above) and Normal Pension Age Increased From 62 to 65	16.7%	26.0%	2058

## 5.2 Unemployment Benefit

Issues surrounding the introduction of an unemployment benefit were raised in the previous two actuarial reviews and as such are not extensively addressed in this report. While the introduction of an unemployment benefit was considered in early 2009 as the effects of global economic crisis began to affect St. Kitts and Nevis, it was not implemented. With unemployment levels increasing and many workers having reduced incomes, such a benefit would have provided temporary income replacement to individuals and served as an economic stabilizer during the current recession.

Perhaps the best time to introduce an unemployment benefit is when the economy is on the rebound and employment levels are rising. With few claims in early years, the Unemployment Fund would have a good chance to grow sufficiently so that when the economy next goes into recession hits, there will be sufficient reserves to meet increased benefit payout without having to raise the contribution rate. The Board and government are encouraged to once again consider the introduction of a modest unemployment benefit. If

added to the current benefits package, Social Security would then provide coverage for all contingencies that could lead to involuntary loss of employment income.

### 5.3 Branch Allocations & Transfer of Reserves

At the end of 2008, both the Short-term and Employment Injury benefit branches were significantly over funded as shown in the following table. Therefore, reallocations of contribution income and the transfer of reserves from both branches to the long-term benefits branch are recommended.

**Table 5.4. Benefit Branch Reserves, Contribution Allocation & Expenditure**

Benefit Branch	Dec. 2008 Reserves	Reserve-Expenditure Ratio		Current Contribution Allocation	Projected Expenditure
		2008	Target		
Short-term	\$ 87.9	7.3	1.0	2.0%	1.8% to 2.0%
Employment Injury	\$ 118.2	54.4	2.0	1.0%	0.35% to 0.4%

The recommended changes to the allocation of contribution and transfer of reserves between branches are shown below.

**Table 5.5. Recommended Changes to Contribution Allocation & Reserve Transfers**

Benefit Branch	Contribution Income Allocation		Reserve Transfers
	Current	Recommended	
Short-term	2.0%	2.0%	\$70 million to LTB Branch
Employment Injury	1.0%	0.4%	\$100 million to LTB Branch
Long-term	8.0%	8.6%	\$170 million from STB & EIB Branches
<b>All</b>	<b>11.0%</b>	<b>11.0%</b>	

It should be noted that the change in allocations of contribution income and transfer of reserves between branches have 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.

## Statement of Actuarial Opinion

It is my opinion that for this report of the 9<sup>th</sup> Actuarial Review of the St. Christopher & Nevis Social Security Fund:

- the data on which the projections and analysis are based are sufficient and reliable;
- 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 *International Actuarial Association Guidelines of Actuarial Practice For Social Security Programs*.



---

Derek M. Osborne, FSA  
Chief Actuary  
Horizonow Consultants Ltd.

## References

2009 IMF Article IV Consultation Report, IMF  
8<sup>th</sup> Actuarial Review of The Social Security Fund  
Social Security Act & Regulations  
Social Security Financial Statements – 1984 to 2008  
Social Security Statistical Digest  
Statistical Review 2008, Planning Unit, Ministry of Finance, Development & Planning  
Various ECCB Reports, Speeches and Publications

## Appendix A      Summary of Contribution & Benefit Provisions

### I.1      Benefits, Insured Persons & Contribution Rates

St. Christopher & Nevis Social Security provides for the following benefits:

- (a) **Long-term benefits:** Age, Invalidity and Survivors' benefits and Assistance pensions.
- (b) **Short-term benefits:** Sickness benefit, Maternity allowance & grant, Funeral grant.
- (c) **Employment Injury benefits:** Injury benefit, Disablement benefit, Medical Expenses, Death benefit and Burial grant.

Employed, self-employed and voluntary insured persons aged 16-61 are covered for the above contingencies as follows:

- Employed persons: All contingencies.
- Self-employed persons: All contingencies except employment injury benefits.
- Voluntary insured persons are covered for Age & Survivors' benefits only.
- Employed persons under age 16 or over age 61 are covered for employment injury benefits only.

Earnings used for determining contributions and benefits are limited to \$6,500 per month. Earnings include basic salary and all other earnings paid in cash.

The ceiling on insurable wages has increased since 1978 as follows:

1978 to 1983	\$24,000.00 per annum
1984 to 1992	\$48,000.00 per annum
1993 to 1995	\$62,400.00 per annum
1996 to 1997	\$70,200.00 per annum
1998 to present	\$ 6,500.00 per month

Contributions are computed as a percentage of insurable earnings. The contribution rate is 11%, 5% paid by the employee and 6% by the employer. Before Employment Injury Benefits were introduced in 1986, the contribution rate was 10%. Self-employed persons pay a 10% contribution rate and voluntary contributors pay at 5% of insurable earnings. Contributions at 1% of insurable earnings are payable for those less than 16 or over 61.



## **I.2 Summary of Benefits Provisions**

### **I.2.1. LONG-TERM BENEFITS**

#### **(a) OLD-AGE CONTRIBUTORY PENSION**

*Contribution Requirement:* 500 paid or credited weekly contributions of which 150 must be paid.

*Age Requirement:* 62. The pension is not dependent on retirement from the workforce.

*Amount Of Benefit:* 16% of average insurable earnings over the best three years in the last 15, plus 2% for every 50 weeks credited between 150 and 750, plus 1% for every 50 weeks credited over 750.

*Maximum Pension:* 60 % of average earnings over the best three years.

*Minimum Pension:* \$400.00 per month. The minimum pension also applies to Invalidity pension. It was last increased on January 1, 2009 from \$300 per month.

#### **(b) AGE GRANT**

*Contribution Requirement:* 50 paid or credited weekly contributions.

*Eligibility:* Other than for the contribution requirement, the applicant must be eligible for Age Benefit.

*Amount Of Benefit:* 6 times average weekly insurable earnings for each 50 weekly contributions paid or credited. This amount is paid as a lump sum.

#### **(c) INVALIDITY PENSION**

*Contribution Requirement:* 150 paid weekly contributions.

*Eligibility:* The applicant is:

- (i) Less than 62,
- (ii) Medically declared an invalid, other than as a result of an employment injury,
- (iii) Has exhausted the maximum period for sickness benefit.

*Amount Of Benefit:* Calculated in the same manner as for Age benefit, except that the minimum pension is 30% of average insurable earnings or \$400 per month, whichever is higher.

*Duration Of Pension:* Payable as long as invalidity continues. A review of the person's continuing eligibility is made at least every three years.

(d) SURVIVORS' BENEFITS

*Contribution Requirement:* The deceased, at time of death, was receiving or had paid enough contributions to qualify for an Invalidity or Age pension.

*Eligibility:* Widow or widower married for at least three years (includes common-law spouse), child(ren) under 16, 18 if in full-time education or invalid, and dependent parents.

*Amount Of Benefit:* The proportion of Invalidity pension shown below:

Widow or widower: 50%;

Child or parent: 16 2/3%;

Child (orphan or disabled): 33 1/3%;

Maximum benefit: 100% of pension deceased would have been entitled to.

Minimum pensions:       Widow(er) - \$200 per month (increased from \$150 Jan. 2009)  
                                  Child/parent - \$96 per month (increased from \$72 Jan. 2009)

If the claimant is also entitled to an Age Pension, the Age pension plus 50% of the Survivors pension is paid, subject to a minimum of 100% of the Survivors pension.

*Duration Of Benefit:*

- Widow or widower aged 45 or over at time of death, or disabled: life pension or until the beneficiary is entitled to a larger Age pension in his/her own right. The pension will cease upon remarriage or cohabitation;
- For a widow(er) under age 45 and not disabled, or not married for at least 3 years: one year;
- For dependent children, up to age 16, or 18 if attending school or college.
- For an invalid child, for as long as invalidity continues.
- For a parent under 62 and not invalid, one year. If invalid or over 62, pension payable for life.

(e) SURVIVORS' GRANT

*Contribution Requirement:* 50 contributions paid or credited by the deceased insured person.

*Eligibility:* Other than for the contribution requirement of the deceased, the applicant must be eligible for survivors pension.

*Amount Of Benefit:* The same proportion of the Age grant as Survivors' pension bears to the Age pension.

(f) ASSISTANCE PENSION

*Eligibility:* The applicant must be:

- (i) Either aged 62 or over or an invalid,
- (ii) Not gainfully employed,
- (iii) In need,
- (iv) Ordinarily resident in St. Kitts-Nevis,
- (v) Not previously awarded an Age or Invalidity pension.

*Amount Of Benefit:* \$250.00 per month.

I.2.2. SHORT-TERM BENEFITS

(a) SICKNESS BENEFIT

*Contribution Requirements:* 26 paid contribution weeks with at least 8 weeks in the last 13. The insured must be 16 or over and under age 62, and was employed immediately before onset of the illness.

*Waiting Period:* 3 days. If incapacity lasts for more than 3 days, benefit is payable from the first day. Two periods of illness separated by less than eight weeks are treated as one.

*Amount Of Benefit:* 65% of average weekly insurable earnings during the 13 weeks prior to illness.

*Duration Of Benefit:* Maximum of 26 weeks.

(b) MATERNITY ALLOWANCE

*Contribution Requirement:* 39 paid contribution weeks with at least 20 contributions in the last 39 weeks immediately preceding the week that is 6 weeks before the expected week of confinement or the week from which benefit began, if later.

*Amount Of Benefit:* 65% of average weekly insurable earnings during the last 39 weeks.

*Duration Of Benefit:* 13 weeks, starting no earlier than 6 weeks before the expected date of confinement.

(c) MATERNITY GRANT

*Contribution Requirement:* Same as for Maternity Allowance. If the mother fails to qualify for Maternity Allowance but her legally married husband's contributions satisfy these conditions, the Maternity Grant is payable.

*Amount Of Grant:* EC\$450. The Maternity Grant has increased as follows:

1978 – 1983	50.00
1984 – 1998	100.00
1989 – 1992	200.00
1993 – 1995	300.00
1995 – 1998	400.00
1998 – present	450.00

(d) FUNERAL GRANT

*Eligibility:* The insured person must have made at least 26 contributions. A grant is also payable in respect of the death of the spouse or a dependant child of the insured. If death results from employment injury, no prior contributions are required.

*Amount Of Grant:* \$4,000 for the insured or his/her spouse. The amount for a dependant child ranges from \$400 to \$1,600. The funeral grant for the insured has been increased as follows:

1978 – 1983	\$ 200.00
1984 – 1988	500.00
1989 – 1992	1,000.00
1993 – 1994	1,500.00
1995 – 1997	2,000.00
1998 – 2002	2,500.00
2002 - present	4,000.00

### I.2.3. EMPLOYMENT INJURY BENEFITS

#### (a) INJURY BENEFIT

*Eligibility:* Incapable of work as a result of an accident arising out of insured employment, or as a result of an illness related to employment. There are no qualifying contribution requirements for Employment Injury benefits.

*Amount Of Benefit:* 75% of average insurable earnings in the last 13 weeks before the accident or disease occurred (or less if the person was insured for a shorter period.)

*Duration Of Benefit:* 26 weeks.

*Waiting Period:* 3 days. If incapacity lasts 4 or more days, benefit is payable from the first day.

#### (b) DISABLEMENT BENEFIT

*Eligibility:* Partial or total loss of any physical or mental faculty as a result of a job-related accident or disease.

*Waiting Period:* The payment period of injury benefit.

*Amount Of Benefit:* The payment of a pension or a grant is based on the percentage loss of faculty suffered.

- If degree of disablement is less than 20%, a grant equal to 365 times the weekly benefit rate times the degree of disablement is paid.
- If degree of disablement is 20% or more, a weekly benefit of the injury benefit amount times the degree of disablement is paid.
- In the case of temporary disablement, the benefit is payable for as long as the disablement lasts up to a maximum of 365 weeks.

#### (c) DEATH BENEFIT

*Eligibility:* Dependents are defined as for survivors' benefit.

*Amount Of Benefit:* Proportion of disablement pension, the same percentage as for Survivors benefit.

(d) MEDICAL EXPENSES

*Expenses Covered:* Reasonable expenses up to \$25,000 for doctor's fees, medication, hospitalisation, travelling and constant care and other specified and other specified costs incurred as a result of an employment injury or prescribed disease.

(e) BURIAL GRANT

*Eligibility:* The insured person died as a result of an employment injury. No prior contributions are required.

*Amount Of Grant:* \$4,000.

#### 1.2.4 CARICOM Social Security Agreement

St. Kitts-Nevis is a signatory to the CARICOM Agreement on Social Security. By totalising contributions made in all CARICOM countries, persons who have insufficient contributions to qualify for a pension in one or more states, may receive pensions from all systems if the total number of contributions made exceeds the number required in that state. The pension payable would be the proportion that contributions made in that state bear to the total contributions made times the pension that would have been payable for the total number of contributions made. The Agreement covers Old-age, Invalidity, Survivors and Disablement benefits only.

## **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 St. Kitts-Nevis and the Social Security Board. These modelling tools include a population model, an economic model, a labour force model, a wage model, a long-term benefits model and a short-term benefits model.

The actuarial valuation begins with a projection of St. Kitts-Nevis' 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 three assumption sets for which the demographic assumptions vary.

### **B.1      Modelling the Demographic & Economic Developments**

The general St. Kitts-Nevis'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. For the *Best Estimate* scenario the total fertility rate is assumed to remain constant at 1.85. Table B.1 shows ultimate age-specific and total fertility rates. For the *High Cost* and *Low Cost* scenarios, the ultimate total fertility rates are assumed reached in 2015.

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

Age Group	2008	Ultimate Rates		
		High Dependency	Best Estimate	Low Dependency
15 - 19	0.045	0.027	0.025	0.027
20 - 24	0.083	0.068	0.063	0.068
25 - 29	0.097	0.108	0.100	0.108
30 - 34	0.084	0.099	0.092	0.099
35 - 39	0.065	0.085	0.079	0.085
40 - 44	0.015	0.017	0.016	0.017
45 - 49	-	-	-	-
<b>TFR</b>	<b>1.85</b>	<b>2.00</b>	<b>1.85</b>	<b>2.00</b>

Mortality rates have been determined using the United National mortality pattern for Latin America for life expectancies that provide total deaths consistent with recent experience. Life expectancy at birth in 2008 has been assumed at 68.4 and 72.3 for males and females, respectively.

Improvements in life expectancy for the *Best Estimate* scenario have been assumed to follow the “slow” rate as established by the United Nations with a “medium” rate assumed for the *High Cost* scenario and a “very slow”<sup>1</sup> rate for the *Low Cost* scenario. Sample mortality rates for the *Best Estimate* scenario and the life expectancies at birth and at age 62 for sample years are provided in Table B.2.

<sup>1</sup> Midpoint of rates depicted by “slow” improvements and no improvements.



**Table B.2. Sample Mortality Rates & Life Expectancies**

Age	Males				Females		
	2008	2038	2068		2008	2038	2068
0	0.0376	0.0259	0.0048		0.0237	0.0041	0.0044
5	0.0009	0.0005	0.0003		0.0005	0.0001	0.0001
15	0.0006	0.0004	0.0003		0.0004	0.0002	0.0001
25	0.0012	0.0007	0.0010		0.0008	0.0009	0.0005
35	0.0018	0.0011	0.0010		0.0011	0.0009	0.0006
45	0.0035	0.0024	0.0022		0.0024	0.0020	0.0016
55	0.0082	0.0062	0.0061		0.0062	0.0054	0.0043
65	0.0205	0.0165	0.0150		0.0165	0.0129	0.0101
75	0.0505	0.0435	0.0426		0.0436	0.0374	0.0285
85	0.1191	0.1094	0.1226		0.1110	0.1155	0.0877
95	0.2560	0.2495	0.2803		0.2526	0.2743	0.2363
Life Exp at birth:	68.9	73.6	76.2		72.7	76.8	80.0

At age 62, life expectancy is projected to increase from 17.3 to 18.8 years and from 18.4 to 21.3 years for males and females, respectively.

Net migration (in minus out) for each scenario is assumed to fluctuate over the projection period at varying rates and reaching different ultimate levels. For the period 2008 to 2010, a spike in outward migration is assumed. The following table shows the age distribution of net migrants for the periods 2001 to 2008 and after 2015, and for 2009.

**Table B.3. Net Immigration**

Age	2001 to 2008, 2015 to 2068				2009		
	Low Cost	Intermediate	High Cost^		Low Cost	Intermediate	High Cost
0 - 9	4	-	(4)		(16)	(25)	(33)
10 - 19	4	-	(4)		(16)	(23)	(31)
20 - 29	23	-	(23)		(93)	(140)	(187)
30 - 39	13	-	(13)		(54)	(81)	(108)
40 - 49	4	-	(4)		(16)	(24)	(32)
50 - 59	1	-	(1)		(4)	(6)	(8)
60 - 69	0	-	(0)		(1)	(1)	(2)
70+	0	-	(0)		(0)	(0)	(0)
All Ages	50	-	(50)		(200)	(300)	(400)
For High Cost, net migration after 2015 is 50% of the amount shown above.							

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. Between 2008 and 2068, age-specific labour force participation rates are assumed to increase at advanced ages for males and females. Table B.5 below shows the assumed age-specific labour force participation rates in 2008 and 2068. Between these two years, rates are assumed to change linearly.

**Table B.4. Age-Specific & Total Labour Force Participation Rates**

Age	Males		Females		Year	Males	Females
	2008	2068	2002	2062			
17	41%	42%	37%	38%	2008	81%	73%
22	90%	92%	83%	85%			
27	90%	92%	87%	89%	2018	82%	74%
32	92%	94%	89%	91%	2028	83%	75%
37	91%	93%	91%	93%	2038	85%	77%
42	94%	96%	91%	93%			
47	91%	96%	82%	93%	2048	85%	77%
52	87%	93%	73%	84%	2058	85%	76%
57	79%	89%	63%	74%	2068	85%	77%

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 gradual over the projection period from ½% to 1.5%. The inflation assumption affects nominal average wage increases. Actual projection assumptions may be found in Table 4.1.

## **B.2 Projection of Social Security Income & Expenditure**

This actuarial review addresses all St. Kitts-Nevis Social Security revenue and expenditure items. For Short-term and Employment Injury benefits, income and expenditure are projected as a percentage of insurable earnings. For the Long-term and Employment Injury Benefit Branches, projections of pensions are performed following a year-by-year cohort methodology. For each year up to 2068, the number of contributors and pensioners, and the dollar value of contributions, benefits and administrative expenditure, is 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.

### **B.3 Social Security Population Data and Assumptions**

The data required for the valuation of the Social Security Fund is extensive. As of December 31<sup>st</sup>, 2008, 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, contribution density and collection of contributions, are determined with reference to the application of the scheme's provisions and historical experience.

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.

Details of Social Security specific input data and the key assumptions used in this report are provided in tables B.5 through B.9.

**Table B.5. 2008 Active Insured Population, Earnings & Past Credits**

Age	# of Active Insureds		Average Monthly Insurable Earnings		Average # of Years of Past Credits	
	Male	Female	Male	Female	Male	Female
15 - 19	848	701	1,431	1,399	1.1	0.9
20 - 24	1,691	1,774	2,010	1,846	3.7	3.3
25 - 29	1,747	1,839	2,553	2,319	7.0	6.6
30 - 34	1,566	1,749	3,037	2,772	10.5	10.2
35 - 39	1,417	1,633	3,571	2,796	14.1	13.7
40 - 44	1,518	1,547	3,595	2,866	17.6	17.3
45 - 49	1,343	1,450	3,632	2,856	21.0	20.7
50 - 54	1,062	1,133	3,675	2,857	22.5	22.4
55 - 59	694	551	3,865	2,870	22.9	22.8
60 - 61	225	175	3,498	2,362	23.1	22.9
62+	365	232	2,093	1,283	23.2	22.8
<b>All Ages</b>	<b>12,476</b>	<b>12,784</b>	<b>3,022</b>	<b>2,529</b>	<b>12.5</b>	<b>12.3</b>

**Table B.6. Pensions in Payment - December 2008**

Age	Old-Age Benefit		Invalidity Benefit		Survivors Benefits		Disablement & Death Benefits		Assistance Pensions	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0 - 4	-	-	-	-	5	7				
5 - 9	-	-	-	-	44	41				
10 - 14	-	-	-	-	72	66				
15 - 19	-	-	-	-	59	58	-	-	2	1
20 - 24	-	-	-	-	-	1	2	-	9	5
25 - 29	-	-	1	2	1	1	-	-	5	2
30 - 34	-	-	1	5	1	1	-	-	7	11
35 - 39	-	-	3	7	-	2	12	6	5	6
40 - 44	-	-	19	13	2	1	18	4	5	1
45 - 49	-	-	11	24	2	8	8	-	7	15
50 - 54	-	-	26	31	7	34	2	2	10	15
55 - 59	-	-	22	34	10	35	2	2	9	11
60 - 64	221	227	8	13	10	43	2	-	5	12
65 - 69	270	260	-	-	7	52	-	-	16	36
70 - 74	202	188	-	-	7	40	-	-	24	56
75 - 79	152	148	-	-	-	62	2	-	25	80
80 - 84	76	46	-	-	2	45	-	-	43	86
85 - 89	39	22	-	-	1	25	-	-	21	40
90 - 94	2	5	-	-	2	3	-	-	16	38
95 - 99	-	-	-	-	-	1	-	-	-	14
# of Pensioners	962	896	91	129	232	526	48	14	209	429
Avg Monthly Pension	\$ 967	\$ 719	\$ 724	\$ 545	\$ 253	\$ 301	\$ 628	\$ 619	\$ 210	\$ 210

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.7. Density Of Contributions**

Age	Males	Females
17	49%	46%
22	74%	78%
27	78%	86%
32	81%	89%
37	81%	89%
42	81%	90%
47	83%	90%
52	83%	90%
57	83%	88%

The following table shows the expected incidence rates of insured persons (per 1,000 persons) qualifying for Invalidity benefit which is assumed for all projection years.

**Table B.8. Rates of Entry Into Invalidity**

Age	Males			Females		
17	-			-		
22	0.393			0.476		
27	0.591			0.376		
32	0.382			0.544		
37	1.064			1.906		
42	3.058			2.858		
47	3.074			3.878		
52	3.227			4.598		
57	6.905			6.472		

Table B.9, shows the assumed probability of Survivor benefit claims and the average ages of new claimants, groups by the age of the deceased.

**Table B.9. Probability of a Deceased Having Eligible Survivors & Their Average Ages**

Age	Males			Females		
	Probability of Eligible Spouse	Avg # of Eligible Children		Probability of Eligible Spouse	Avg # of Eligible Children	
17	0%	-		0%	-	
22	6%	0.0		0%	0.1	
27	19%	0.1		0%	0.2	
32	26%	0.4		0%	0.6	
37	22%	0.8		6%	1.3	
42	23%	1.2		16%	1.2	
47	35%	1.1		15%	1.1	
52	43%	0.7		6%	0.8	
57	46%	0.5		11%	0.2	
62	41%	0.5		25%	0.1	
67	23%	0.2		22%	-	
72	12%	0.1		8%	-	
77	10%	0.2		2%	-	
82	7%	0.1		2%	-	
87	2%	0.0		1%	-	

## Appendix C      Projection Results – Alternate Scenarios

**Table C.1. Projected St. Kitts-Nevis Population, *High Cost* Scenario**

Year	Total	Age 0 - 15	Age 16 - 59	Age 62 & over	Ratio of Persons 62+ To Persons
<b>2001</b>	46,325	14,356	27,658	4,311	0.16
<b>2005</b>	47,700	13,324	30,052	4,324	0.14
<b>2010</b>	48,641	12,078	32,093	4,470	0.14
<b>2015</b>	49,522	10,922	33,406	5,194	0.16
<b>2020</b>	51,016	10,397	33,913	6,706	0.20
<b>2025</b>	52,358	10,378	33,480	8,500	0.25
<b>2030</b>	53,335	10,406	32,877	10,053	0.31
<b>2035</b>	53,833	10,174	32,474	11,185	0.34
<b>2045</b>	53,433	9,090	31,778	12,566	0.40
<b>2055</b>	51,956	8,503	29,188	14,265	0.49
<b>2065</b>	50,152	8,210	26,579	15,363	0.58
<b>2070</b>	49,009	7,910	25,939	15,160	0.58

**Table C.2. Projected Cash Flows & Reserve, *High Cost Scenario* (millions of \$'s)**

Year	Cash Inflows				Cash Outflows			Surplus/ (Deficit)	Reserves	
	Contribution Income	Investment Income	Other Income	Total	Benefits & Pensions	Admin. Expenses	Total		End of Year	# of times current year's expenditure
<b>2006</b>	61.0	46.5	0.5	<b>108.0</b>	27.2	8.4	35.5	<b>72.5</b>	<b>807</b>	22.7
<b>2007</b>	64.7	52.4	0.5	<b>117.5</b>	30.2	10.0	40.2	<b>77.4</b>	<b>889</b>	22.1
<b>2008</b>	70.7	54.8	0.6	<b>126.2</b>	33.9	12.9	46.9	<b>79.3</b>	<b>966</b>	20.6
<b>2009</b>	70.5	57.8	0.7	<b>128.9</b>	39.6	11.8	<b>51.4</b>	<b>77.5</b>	<b>1,043</b>	20.3
<b>2010</b>	68.7	62.0	0.7	<b>131.3</b>	42.3	11.4	<b>53.7</b>	<b>77.6</b>	<b>1,120</b>	20.9
<b>2011</b>	69.1	62.0	0.7	<b>131.8</b>	45.3	11.3	<b>56.6</b>	<b>75.1</b>	<b>1,195</b>	21.1
<b>2012</b>	70.3	62.4	0.7	<b>133.4</b>	50.4	11.3	<b>61.7</b>	<b>71.7</b>	<b>1,267</b>	20.5
<b>2013</b>	72.4	64.2	0.7	<b>137.2</b>	55.2	11.4	<b>66.7</b>	<b>70.5</b>	<b>1,338</b>	20.1
<b>2014</b>	74.5	65.6	0.7	<b>140.8</b>	60.7	11.6	<b>72.3</b>	<b>68.5</b>	<b>1,406</b>	19.4
<b>2018</b>	85.5	75.5	0.8	<b>161.7</b>	91.6	12.4	<b>104.0</b>	<b>57.7</b>	<b>1,655</b>	15.9
<b>2028</b>	116.4	85.5	1.1	<b>203.0</b>	218.4	14.1	<b>232.4</b>	<b>(29.4)</b>	<b>1,827</b>	7.9
<b>2038</b>	152.6	36.2	1.4	<b>190.2</b>	368.4	18.0	<b>386.5</b>	<b>(196.3)</b>	<b>681</b>	1.8
<b>2048</b>	197.8	(109.6)	1.9	<b>90.1</b>	525.0	23.4	<b>548.4</b>	<b>(458.3)</b>	<b>-2,593</b>	(4.7)
<b>2058</b>	253.0	(430.8)	2.4	<b>(175.4)</b>	768.5	29.9	<b>798.4</b>	<b>(973.8)</b>	<b>-9,775</b>	(12.2)
<b>2068</b>	335.1	(1,081.4)	3.2	<b>(743.2)</b>	1,115.4	39.6	<b>1,155.0</b>	<b>(1,898.2)</b>	<b>-24,260</b>	(21.0)
Negative reserves indicate the indebtedness of the Fund and negative investment income is the current cost of servicing that debt.										



**Table C.3. Projected Benefit Expenditure– *High Cost Scenario* (millions of \$'s)**

Year	Pensions, Grants & Benefits						Benefits as a % of:	
	Age	Invalidity	Survivors	Assistance	Short-term	Emp. Injury	Insurable Wages	GDP
<b>2008</b>	17.8	1.7	1.8	1.7	9.3	1.2	5.3%	2.2%
<b>2009</b>	23.6	1.9	2.2	2.0	9.3	1.1	6.3%	2.7%
<b>2010</b>	25.7	2.2	2.3	1.9	9.1	1.1	6.8%	2.9%
<b>2011</b>	28.2	2.4	2.4	1.9	9.1	1.2	7.2%	3.0%
<b>2012</b>	32.4	2.8	2.6	2.0	9.3	1.3	7.9%	3.2%
<b>2013</b>	36.5	3.1	2.7	2.0	9.6	1.4	8.4%	3.4%
<b>2014</b>	41.2	3.4	2.8	2.0	9.9	1.4	9.0%	3.6%
<b>2018</b>	68.3	4.4	3.4	2.2	11.4	1.8	11.8%	4.7%
<b>2028</b>	184.1	6.6	6.2	2.9	15.9	2.7	20.6%	8.0%
<b>2038</b>	319.7	9.6	10.3	3.9	21.1	3.8	26.6%	10.1%
<b>2048</b>	458.2	13.6	14.8	5.3	27.9	5.3	29.2%	11.0%
<b>2058</b>	682.2	16.2	20.2	7.1	36.2	6.7	33.4%	12.2%
<b>2068</b>	1,001.1	20.5	26.9	9.3	48.7	8.8	36.6%	13.5%

**Table C.4. Projected Contributors & Pensioners, *High Cost Scenario***

Year	# of Contributors	# of Pensioners					Total # of Pensioners	Ratio of Contributors to Pensioners
		Age	Invalidity	Survivors	Assistance	Death & Disablement		
<b>2008</b>	24,663	1,858	220	758	638	73	<b>3,547</b>	<b>7.0</b>
<b>2009</b>	23,662	1,935	246	770	644	77	<b>3,671</b>	<b>6.4</b>
<b>2010</b>	23,053	2,015	272	775	630	84	<b>3,776</b>	<b>6.1</b>
<b>2011</b>	22,909	2,113	293	789	619	91	<b>3,905</b>	<b>5.9</b>
<b>2012</b>	22,981	2,236	317	801	610	98	<b>4,062</b>	<b>5.7</b>
<b>2013</b>	23,037	2,384	342	808	601	105	<b>4,241</b>	<b>5.4</b>
<b>2014</b>	23,075	2,558	359	812	594	110	<b>4,433</b>	<b>5.2</b>
<b>2018</b>	23,696	3,523	432	777	577	133	<b>5,441</b>	<b>4.4</b>
<b>2028</b>	24,412	6,773	509	873	569	176	<b>8,900</b>	<b>2.7</b>
<b>2038</b>	24,325	9,205	578	1,011	576	227	<b>11,597</b>	<b>2.1</b>
<b>2048</b>	24,091	10,477	629	1,079	575	273	<b>13,033</b>	<b>1.8</b>
<b>2058</b>	22,245	11,771	568	1,094	569	279	<b>14,280</b>	<b>1.6</b>
<b>2068</b>	20,557	12,224	520	1,050	561	282	<b>14,637</b>	<b>1.4</b>

**Table C.5. Projected St. Kitts-Nevis Population, Low Cost Scenario**

Year	Total	Age 0 - 15	Age 16 - 59	Age 62 & over	Ratio of Persons 62+ To Persons
<b>2001</b>	46,325	14,356	27,658	4,311	0.16
<b>2005</b>	48,126	13,402	30,405	4,319	0.14
<b>2010</b>	49,986	12,525	33,020	4,441	0.13
<b>2015</b>	52,000	12,078	34,800	5,123	0.15
<b>2020</b>	54,486	12,308	35,604	6,575	0.18
<b>2025</b>	56,811	12,805	35,684	8,321	0.23
<b>2030</b>	58,749	12,984	35,923	9,842	0.27
<b>2035</b>	60,208	12,820	36,432	10,957	0.30
<b>2045</b>	61,940	12,318	37,190	12,432	0.33
<b>2055</b>	62,851	12,560	36,206	14,085	0.39
<b>2065</b>	63,180	12,725	35,844	14,611	0.41
<b>2070</b>	63,130	12,632	36,261	14,237	0.39

**Table C.6. Projected Cash Flows & Reserve, *Low Cost Scenario* (millions of \$'s)**

Year	Cash Inflows				Cash Outflows			Surplus/ (Deficit)	Reserves	
	Contribution Income	Investment Income	Other Income	Total	Benefits & Pensions	Admin. Expenses	Total		End of Year	# of times current year's expenditure
<b>2006</b>	61.0	46.5	0.5	<b>108.0</b>	27.2	8.4	35.5	<b>72.5</b>	<b>807</b>	22.7
<b>2007</b>	64.7	52.4	0.5	<b>117.5</b>	30.2	10.0	40.2	<b>77.4</b>	<b>889</b>	22.1
<b>2008</b>	70.7	54.8	0.6	<b>126.2</b>	33.9	12.9	46.9	<b>79.3</b>	<b>966</b>	20.6
<b>2009</b>	70.5	57.8	0.7	<b>128.9</b>	39.6	11.8	<b>51.4</b>	<b>77.5</b>	<b>1,043</b>	20.3
<b>2010</b>	69.0	62.0	0.7	<b>131.6</b>	42.4	11.5	<b>53.9</b>	<b>77.8</b>	<b>1,120</b>	20.8
<b>2011</b>	70.5	66.5	0.7	<b>137.7</b>	45.4	11.5	<b>56.9</b>	<b>80.8</b>	<b>1,201</b>	21.1
<b>2012</b>	72.4	71.2	0.7	<b>144.3</b>	50.5	11.6	<b>62.2</b>	<b>82.2</b>	<b>1,283</b>	20.6
<b>2013</b>	75.6	74.1	0.7	<b>150.4</b>	55.9	12.0	<b>67.8</b>	<b>82.6</b>	<b>1,366</b>	20.1
<b>2014</b>	78.9	78.7	0.7	<b>158.4</b>	61.9	12.3	<b>74.2</b>	<b>84.2</b>	<b>1,450</b>	19.6
<b>2018</b>	97.9	98.0	0.9	<b>196.8</b>	96.6	14.3	<b>110.9</b>	<b>85.9</b>	<b>1,796</b>	16.2
<b>2028</b>	162.4	132.5	1.5	<b>296.4</b>	257.7	19.6	<b>277.3</b>	<b>19.1</b>	<b>2,379</b>	8.6
<b>2038</b>	259.9	97.5	2.5	<b>359.8</b>	497.6	30.7	<b>528.3</b>	<b>(168.5)</b>	<b>1,657</b>	3.1
<b>2048</b>	411.4	(89.4)	3.9	<b>325.9</b>	833.4	48.6	<b>882.1</b>	<b>(556.2)</b>	<b>-1,882</b>	(2.1)
<b>2058</b>	648.6	(630.6)	6.2	<b>24.2</b>	1,434.9	76.7	<b>1,511.5</b>	<b>(1,487.4)</b>	<b>-12,033</b>	(8.0)
<b>2068</b>	1,051.5	(1,942.9)	10.0	<b>(881.4)</b>	2,385.8	124.3	<b>2,510.0</b>	<b>(3,391.4)</b>	<b>-36,462</b>	(14.5)
Negative reserves indicate the indebtedness of the Fund and negative investment income is the current cost of servicing that debt.										

**Table C.7. Projected Benefit Expenditure— Low Cost Scenario** (millions of \$'s)

Year	Pensions, Grants & Benefits						Benefits as a % of:	
	Age	Invalidity	Survivors	Assistance	Short-term	Emp. Injury	Insurable Wages	GDP
<b>2008</b>	17.8	1.7	1.8	1.7	9.3	1.2	5.3%	2.2%
<b>2009</b>	23.6	1.9	2.2	2.0	9.3	1.1	6.2%	2.7%
<b>2010</b>	25.6	2.2	2.3	1.9	9.2	1.2	6.7%	2.8%
<b>2011</b>	28.1	2.4	2.4	1.9	9.3	1.2	7.1%	2.9%
<b>2012</b>	32.2	2.8	2.6	2.0	9.6	1.3	7.7%	3.0%
<b>2013</b>	36.5	3.1	2.8	2.0	10.0	1.4	8.1%	3.2%
<b>2014</b>	41.5	3.4	3.0	2.0	10.5	1.5	8.6%	3.4%
<b>2018</b>	70.9	4.6	3.8	2.2	13.1	2.0	10.9%	4.2%
<b>2028</b>	212.9	8.1	8.3	2.9	22.1	3.5	17.5%	6.5%
<b>2038</b>	421.5	14.1	16.1	3.9	36.0	6.0	21.1%	7.8%
<b>2048</b>	710.0	23.1	27.2	5.3	57.9	9.9	22.3%	8.2%
<b>2058</b>	1,242.1	34.0	43.6	7.1	92.8	15.3	24.3%	8.8%
<b>2068</b>	2,073.6	55.3	69.4	9.3	152.9	25.2	25.0%	9.2%

**Table C.8. Projected Contributors & Pensioners, Low Cost Scenario**

Year	# of Contributors	# of Pensioners					Total # of Pensioners	Ratio of Contributors to Pensioners
		Age	Invalidity	Survivors	Assistance	Death & Disablement		
<b>2008</b>	24,663	1,858	220	758	638	73	<b>3,547</b>	<b>7.0</b>
<b>2009</b>	23,786	1,931	245	776	644	77	<b>3,673</b>	<b>6.5</b>
<b>2010</b>	23,292	2,007	270	787	630	84	<b>3,779</b>	<b>6.2</b>
<b>2011</b>	23,264	2,101	291	807	619	91	<b>3,910</b>	<b>6.0</b>
<b>2012</b>	23,454	2,220	314	827	610	98	<b>4,068</b>	<b>5.8</b>
<b>2013</b>	23,628	2,361	338	841	601	105	<b>4,248</b>	<b>5.6</b>
<b>2014</b>	23,785	2,529	354	853	594	111	<b>4,440</b>	<b>5.4</b>
<b>2018</b>	24,912	3,457	427	847	577	134	<b>5,441</b>	<b>4.6</b>
<b>2028</b>	27,072	6,578	523	1,010	569	187	<b>8,866</b>	<b>3.1</b>
<b>2038</b>	28,536	8,857	615	1,223	576	249	<b>11,519</b>	<b>2.5</b>
<b>2048</b>	29,013	10,120	665	1,340	575	300	<b>13,000</b>	<b>2.2</b>
<b>2058</b>	28,244	11,301	627	1,375	569	318	<b>14,189</b>	<b>2.0</b>
<b>2068</b>	28,323	11,354	632	1,364	561	348	<b>14,259</b>	<b>2.0</b>

## Appendix D Income, Expenditure & Reserves, 2006–2008

		2006	2007	2008
<b>Income</b>				
	Contribution Income	61,039,067	64,682,330	70,705,352
	Investment Income	46,486,696	52,356,817	54,844,850
	Other Income	491,037	487,549	610,196
<b>Total Income</b>		<b>108,016,800</b>	<b>117,526,696</b>	<b>126,160,398</b>
<b>Expenditure</b>				
	<b>Benefits</b>			
	Sickness Benefit	4,494,706	4,819,945	6,408,494
	Maternity Allowance	1,738,749	2,106,784	2,150,285
	Maternity Grant	224,550	254,700	254,251
	Funeral Grant	517,900	487,047	508,470
	Age Pension	13,980,181	15,931,633	17,791,949
	Invalidity Pension	1,198,299	1,394,829	1,653,008
	Survivors' Pension	1,637,197	1,700,138	1,778,104
	Age Grant	535,271	671,694	502,969
	Age Assistance	1,527,000	1,417,202	1,337,095
	Invalidity Assistance	310,087	312,599	315,035
	Medical Expenses	134,695	156,628	278,052
	Injury Benefit	500,285	512,675	510,994
	Disablement Grant	-	3,179	26,576
	Disablement Benefit	240,363	259,833	259,911
	Death Benefit	95,912	114,157	111,451
	Travel Expenses	18,751	23,634	37,119
	Burial Grant	4,000	-	4,000
	<b>Total Benefit Expenditure</b>	<b>27,157,947</b>	<b>30,166,677</b>	<b>33,927,763</b>
	<b>Administrative Expenditure</b>	<b>8,361,371</b>	<b>10,004,225</b>	<b>12,945,091</b>
	<b>Other Expenses</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Total Expenditure</b>		<b>35,519,318</b>	<b>40,170,902</b>	<b>46,872,854</b>
<b>Excess of Income over Expenditure</b>		<b>72,497,482</b>	<b>77,355,794</b>	<b>79,287,544</b>
<b>Prior Year Adjustments</b>		<b>697,974</b>	<b>4,146,121</b>	<b>(2,217,484)</b>
<b>Social Security Reserves at End of Year</b>		<b>807,212,603</b>	<b>888,714,518</b>	<b>965,784,578</b>
	<b>Short-term Benefits Branch</b>	<b>74,734,002</b>	<b>81,867,933</b>	<b>87,930,638</b>
	<b>Long-term Benefits Branch</b>	<b>623,945,269</b>	<b>683,606,304</b>	<b>745,760,873</b>
	<b>Employment Injury Benefits Branch</b>	<b>96,554,284</b>	<b>107,115,112</b>	<b>118,185,382</b>
	<b>Revaluation Reserves</b>	<b>11,979,048</b>	<b>16,125,169</b>	<b>13,907,685</b>
	<b>Provident Fund Reserves</b>	<b>16,641,943</b>	<b>17,530,605</b>	<b>18,519,070</b>
	<b>Staff Supplemental Benefits Reserve</b>	<b>3,905,268</b>	<b>4,491,444</b>	<b>5,220,612</b>

## Appendix E      Benefit Experience & Branch Analysis

### E.1      Long-term Benefits Branch

**Table E.1. LTB Branch Expenditure As % of Insurable Wages, 2006 - 2008**

	2006	2007	2008
<b>Age Pension</b>	2.52%	2.71%	2.77%
<b>Invalidity Pension</b>	0.22%	0.24%	0.26%
<b>Survivors Pensions</b>	0.30%	0.29%	0.28%
<b>Assistance Pensions</b>	0.33%	0.29%	0.26%
<b>Age Grant</b>	0.10%	0.11%	0.08%
<b>Administrative Expenses</b>	1.09%	1.23%	1.44%
<b>Total</b>	<b>4.54%</b>	<b>4.87%</b>	<b>5.09%</b>
<b>Total Benefits (millions of \$'s)</b>	<b>19.2</b>	<b>21.4</b>	<b>23.4</b>

**Table E.2. Pensions In Payment, Awarded & Terminated, 2006- 2008**

Pension Type	Paid in Dec 2005	Awarded 2006 to 2008	Terminated 2006 to 2008	Paid in Dec 2008	Average Mthly Pension	
					Dec. 2005	Dec. 2008
<b>Age</b>	1,557	502	201	1,858	\$704	\$847
<b>Invalidity</b>	153	173	106	220	\$583	\$602
<b>Survivors</b>	651	294	198	758	\$191	\$209
<b>Assistance</b>	752	139	250	641	\$210	\$210

## E.2 Short-term Benefits Branch

**Table E.3. Sickness Benefit Experience, 2006- 2008**

Year Ended	# Claims Awarded per 1,000 Insureds	Average Benefit Duration (days)	Average Weekly Benefit	Cost as a % of Insurable Wages
2006	323	11.4	\$308	0.81%
2007	335	10.8	\$331	0.82%
2008	419	10.6	\$349	1.00%

**Table E.4. Maternity Allowance Experience, 2006- 2008**

Year Ended	# Claims Awarded per 1,000 Insureds	Average Benefit Duration (days)	Average Weekly Benefit	Cost as a % of Insurable Wages
2006	20	74	\$300	0.31%
2007	22	74	\$315	0.36%
2008	22	75	\$323	0.33%

**Table E.5. Maternity Grant & Funeral Grant Experience, 2006- 2008**

Year	# Births	# Grants Awarded	Cost as a % of Insurable Wages	# Deaths	# Grants Awarded	Cost as a % of Insurable Wages
2006	662	493	0.04%	373	217	0.09%
2007	690	561	0.04%	353	205	0.08%
2008	709	556	0.04%	356	214	0.08%

**Table E.6. Administrative & Total Expenditure – STB Branch**

Year	As a % of Insurable Wages	
	Admin. & Other Expenditure	Total Branch Expenditure
2006	0.30%	1.57%
2007	0.35%	1.65%
2008	0.43%	1.88%

With an allocation of 2% of insurable earnings plus investment returns, the STB Branch incurred surpluses each year.

### E.3 Employment Injury Benefits Branch

**Table E.8. Injury Benefit Experience, 2006- 2008**

Year Ended	# Claims Awarded per 1,000 Insureds	Average Benefit Duration (days)	Average Weekly Benefit	Cost as a % of Insurable Wages
2006	23	14.7	\$379	0.09%
2007	23	14.0	\$388	0.09%
2008	22	14.7	\$386	0.08%

**Table E.9. Medical And Travel Expenses & Disablement Grant Experience, 2006- 2008**

Medical Expenses			Travel Expenses		Disablement Grant	
Year	# Claims Awarded	Cost as a % of Insurable Wages	# Claims Awarded	Cost as a % of Insurable Wages	# Claims Awarded	Cost as a % of Insurable Wages
2006	290	0.02%	26	0.003%	0	0.0%
2007	243	0.03%	19	0.004%	1	0.001%
2008	278	0.04%	22	0.006%	2	0.004%

**Table E.10. Disablement & Death Benefit Awards & Pensions In Payment, 2006- 2008**

Disablement Benefit				Death Benefit		
Year	# Pensions Awarded	Pensioners In Payment (December)	Payments as a % of Ins. Wage	# Pensions Awarded	Pensioners In Payment (December)	Payments as a % of Ins. Wages
2006	3	30	0.04%	-	21	0.02%
2007	12	33	0.04%	-	19	0.02%
2008	4	34	0.04%	-	17	0.02%



**Table E.11. Administrative & Total Expenditure – EIB Branch**

<b>Year</b>	<b>As a % of Insurable Wages</b>	
	<b>Admin. &amp; Other Expenditure</b>	<b>Total Branch Expenditure</b>
<b>2006</b>	0.11%	0.29%
<b>2007</b>	0.12%	0.31%
<b>2008</b>	0.15%	0.34%

With an allocation of 1% of insurable earnings plus investment returns, the EIB Branch incurred large surpluses each year.



*Striving for Social Justice*