Report to the Government

Strengthening financial governance

Tenth actuarial valuation of the National Insurance Board of Bahamas as of 30 June 2013

Abstract

This report presents the results of the 10th actuarial valuation of the National Insurance Board of the Bahamas as of 31 December 2013. It includes projections until 2088, conclusions and recommendations.

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Executive summary

As of 2013 the National Insurance Board (NIB) covers about 149,000 workers, about 85 per cent of the employed population. It offers comprehensive protection for old age, disability, death, employment injury, unemployment insurance, maternity and sickness benefits, and a prescription drugs plan for the covered population with chronic diseases.

The social security system in the Bahamas is quite comprehensive, and is universal in the sense that those who are not able to qualify for a pension can receive assistance payments. This system should be preserved. The Short-term Benefits Branch is in a good financial condition, while some small adjustments need to be made. The main recommendations of this report are about the need to adjust the Long-term (Pension) Branch in order to make the scheme sustainable over the long term and to improve equity among the various categories of beneficiaries.

Since the NIB has been in operation for 40 years, the Pension Branch has not yet reached a state of maturity and the cost of pensions expressed as a percentage of insurable earnings is still increasing.

This 10th Actuarial Valuation of the Bahamas National Insurance Board was carried out as at 31 December 2013. The methodology used for the Pension Branch is based on a model developed by the ILO for reviewing the long-term actuarial and financial status of national pension schemes.

In this actuarial valuation, each branch has been separately analysed and an explicit contribution rate has been calculated for each. It is recommended to divulgate a contribution rate for each branch and that the contributions be levied and allocated to each branch according to these contribution rates. In our opinion, this way of proceeding is more transparent and increases people's awareness and understanding of the scheme. Tables ES1 and ES2 present the recommended contribution rate and amount of reserve that should be held for each branch.

Table ES1. Recommended contribution rates by branch (in percentage)

Branch	Contribution rate
Short-term benefits (excluding unemployment insurance)	1.45
Unemployment insurance	0.70
Medical	0.65 *
Industrial benefits	1.45
Pension benefits	At least 10% and according to the funding policy

* New source of funding expected from external financing.

Table ES2. Recommended reserve levels by branch, relative to last year's benefit expenditure (in percentage)

Branch	Reserve level
Short-term benefits (excluding unemployment insurance)	0.5
Unemployment insurance	1.50
Medical *	1.00
Industrial benefits	0.75 + actuarial present values
Pension benefits	According to the funding policy

* Should be revised due to the expansion of coverage and merging with the National Health Insurance scheme (NHI).

This actuarial valuation clearly demonstrates that an increase in contributions is necessary to make the scheme more sustainable for future generations, and that it should start now. In fact, according to this actuarial valuation:

1. Total expenses will be higher than income (contributions plus investment income) in 2016 for the Pension Branch, meaning that the reserve is going to decrease.

2. The reserve will be exhausted in 2029 and the required contribution rate will then be 12.3 per cent.

3. The required contribution rate to pay all the expenses during the next 75 years is 18.9 per cent.

4. If the reserve is used during the next 75 years to pay for expenses along with contributions and investment income (with this strategy the reserve will be 0 in 2088), the contribution rate required is 17.8 per cent.

It is recommended that over the short term, the contribution rate for the Pension Branch be increased to a level that is at least equal to the pay-as-you-go (PAYG) rate. In the next few years this will be around 9-10 per cent. It is consequently suggested to put in place a schedule of increases in the contribution rate for the Pension Branch so that in 2020 the contribution rate should be at least at 10 per cent, an increase of 3.8 per cent from its current level of 6.2. Of course, the schedule of increases should take into account the situation of the country and the Government's plans regarding, for example, the implementation of the National Health Insurance (NHI) scheme.

If the contribution rates for short-term benefits, unemployment benefits and industrial benefits (respectively 1.45, 0.70 and 1.45 per cent) are added to the required 10 per cent for the long-term pension, the global contribution rate that is necessary is 13.6 per cent. This contribution rate takes into account the fact that the National Prescription Drug Plan (NPDP) is going to be financed from external sources. If this turns out not to be the case, an additional increase of 0.65 is needed to finance the current structure of the NPDP.

This actuarial valuation shows that, unless the benefits are reduced, an increase in the contribution rate is necessary. The magnitude of such an increase should therefore depend on clear financing and funding objectives. Such objectives do not currently exist at the NIB. It is therefore recommended that the NIB adopt a funding policy in order to:

(a) formalize the long-term funding objectives of the scheme: for example, targeting an appropriate level of reserve over the long term. This objective is the major driver of the contribution rate;

(b) better understand the risks and advantages of financing options;

(c) ensure that plan assets plus future contributions are sufficient to deliver the promised benefits; and

(d) enhance corporate governance by increasing transparency.

This funding policy should be closely linked to the investment policy, which should clearly state the result of the actuarial valuation and the financial risk that the scheme faces. A specific investment policy should be adopted for each branch. For the Pension Branch, the investment policy should reflect the long-term nature of the branch and be invested in long-term assets. Diversification by investing a higher proportion in foreign investments should also be considered.

The normal retirement age in the Bahamas is 65. This is a good situation compared to other countries in the region, but it is probably not sufficient for the future. It should be borne in mind that one efficient way to solve the problem of unsustainability in a social security pension scheme is to increase the retirement age. This should be normally implemented over a long period so as not to affect current members who are close to retiring. It is however time to think about the next increase in the retirement age. This report presents a scenario of an increase in the retirement age, which should be discussed by the stakeholders and can also be analysed and designed in the context of the establishment of a funding policy.

Other recommendations of this actuarial valuation (under Recommendation No. 5) are:

A. From July 2013, gratuities for those working in the hospitality sector have been included in the insurable salary for the calculation of benefits and contributions. The contributions to be paid on gratuities are paid entirely by the employees. Given the current total contribution rate and the recommended allocation to the Industrial Benefit Branch, requesting employees to pay 100 per cent of the contribution on gratuities does not comply with ILO Convention No. 102 for all employees for whom gratuities represent more than 10.3 per cent of their insurable earnings. It is recommended that employers also contribute on the gratuities.

Solutions to decrease the burden on hospitality sector employees include, among others:

–   That the employers contribute their part related to social security on the gratuities.

–   That a special tax be levied directly on the gratuities to pay the social security contribution portion of the employers.

–   A combination of the two.

B. Under Section 22 of the Act, an employer can adjust the amount of contractual sick or maternity leave pay to make sure that the sum of these benefits plus the amount of NIB benefit is not over the wage of the insured. It is recommended that the wage to be used for this calculation should comprise the total of basic salary and the gratuities, and that the NIB benefit be calculated on the total of basic salary plus the gratuities.

C. This actuarial analysis clearly illustrates that the branch that is going to be under financial pressure is the Pension Branch, and in our opinion it is preferable to finance each branch separately. For that reason, it is suggested to levy an explicit contribution rate to finance the Medical Branch. If there is money to be transferred from another branch to the Medical Branch, it should be on a temporary basis only. It is not recommended to transfer an amount of reserve from the Pension Branch to the Medical Branch. Assets can be exchanged between the Pension Branch and the Medical Branch or assets can be transferred from the Sickness benefits and the Industrial Branch. It is up to the Board of the NIB to ensure that this amount of money is going to be used in the best interest of members.

D. A target on the level of administrative expenditure should be shown and discussed in the financial statements.

E. The tables of actuarial present value as described in the third schedule of the National Insurance Financial & Accounting Regulations for the Industrial Branch should be

revised frequently and should be used in the actuarial valuation as well as in the financial statements.

F. A discussion between stakeholders concerning the financing of the assistance benefits should take place. In fact, the design of the assistance benefits may discourage people from contributing to the scheme. The fact that the cost of these assistance benefits is paid by contributors may also create an additional financial pressure on the scheme.

Acronyms and abbreviations

BSD	Bahamian dollar
GAP	general average premium
GDP	gross domestic product
ILO	International Labour Office/Organization
IMF	International Monetary Fund
NHI	National Health Insurance Scheme
NIB	National Insurance Board
NIF	National Insurance Fund
NPDP	National Prescription Drug Plan
PAYG	pay-as-you-go
PV	present value
RER	reserve-to-expenditures ratio
TFR	total fertility rate
VAT	value-added tax

Introduction

The National Insurance Board (NIB) began its operations in October 1974. It offers comprehensive protection for old age, disability, death, employment injury, unemployment insurance, maternity and sickness benefits, and a drugs plan for the covered population with chronic diseases.

Section 48 of the National Insurance Act (the Act) requires that an actuarial review of the Fund be conducted at least every five years. This is the 10th Actuarial Valuation of the National Insurance Fund; it has been performed as at 31 December 2013, two years after the previous review.

This valuation was carried out under the terms of an agreement concluded between the National Insurance Board and the International Labour Office (ILO).

There are seven sections in the report. The first presents the scheme experience and new developments since the last actuarial valuation, together with investment performance and funding issues. The second concentrates on the projection of the general population and of the global economy in the Bahamas. Section 3 concerns demographic and financial projections of all branches on a best-estimate basis and according to the legal provisions of the scheme. Section 4 deals with the reconciliation of results between the 9th and 10th valuations. Section 5 presents the sensitivity analysis, while Section 6 proposes certain pension reforms such as an increase in the retirement age, and discusses other issues. Section 7 concludes the valuation and makes recommendations.

1. Review of NIB performance and developments since the 9th Actuarial Valuation of 2011

1.1. Amendments since the 9th Actuarial Valuation

Many amendments to the Act and Regulations have been implemented since the 9th Actuarial Valuation of the NIB. They have been integrated into the present actuarial valuation. The principal modifications are:

■ Automatic pension adjustment every two years to the level of inflation. The first automatic adjustment took place in July 2012.

■ The ceiling on insurable earnings has been increased from BSD 500 to 600 per week in July 2012. It will adjusted automatically every two years starting in July 2014. The automatic adjustment is inflation over the last two years plus 2 per cent.

■ The weekly insurable salary used to calculated pensions (old-age, disability and survivors) was limited to BSD 110 for pensionable civil servants. Since July 2013, for the Pension Branch the pensionable salary for future years of service is subject to the same rules as those that apply to other insured persons.

■ Since July 2013, gratuities for workers in the hospitality sector are now included in the insurable wage. These workers have to contribute the full contribution rate on the gratuities.

1.2. Trends in financial developments over the last eight years

The following charts illustrate trends in the main indicators of the financial experience of the NIB over the last ten years. Figure 1.1 compares the legal contribution rates, the effective contribution rates (the legal contribution rates that take into account, for example, the fact that civil servants were not subject to the same legal rate before July 2013) and the pay-as-you-go (PAYG) rates for the period 2004 to 2013. [1] The PAYG rate is the rate that is necessary to pay all expenditures (benefits and administrative expenditures) in a given year. At the beginning of the scheme, this rate is closed to zero but increases with time. In the last ten years, the PAYG rate has continued its upward trend to reach 11.9 per cent in 2013. It is usual that, when a scheme is maturing, the PAYG rate increases year after year as more and more people retire with more past years of service. The difference between the effective contribution rate and the PAYG rates is used to accumulate a reserve. For the NIB the difference is negative, meaning that the Board uses investment returns to pay the expenditures. The amount of reserve accumulated at the end of 2013 is BSD 1,686.6 million. The importance of the reserve is shown in figure 1.2, where its level is shown in relation to gross domestic product (GDP) for the last ten years. In 2004, the amount of reserve represented 18.1 per cent of GDP in the Bahamas, in 2013, the ratio was 20.0 per cent. However, the amount of reserve relative to GDP has been decreasing in the last two years; part of the investment income on the reserve is now used to pay benefits.

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[1] To calculate the PAYG rates, the total salary has been used even for civil servants.

Figure 1.1.   Legal and effective contribution rates and PAYG rates (2004-2013)
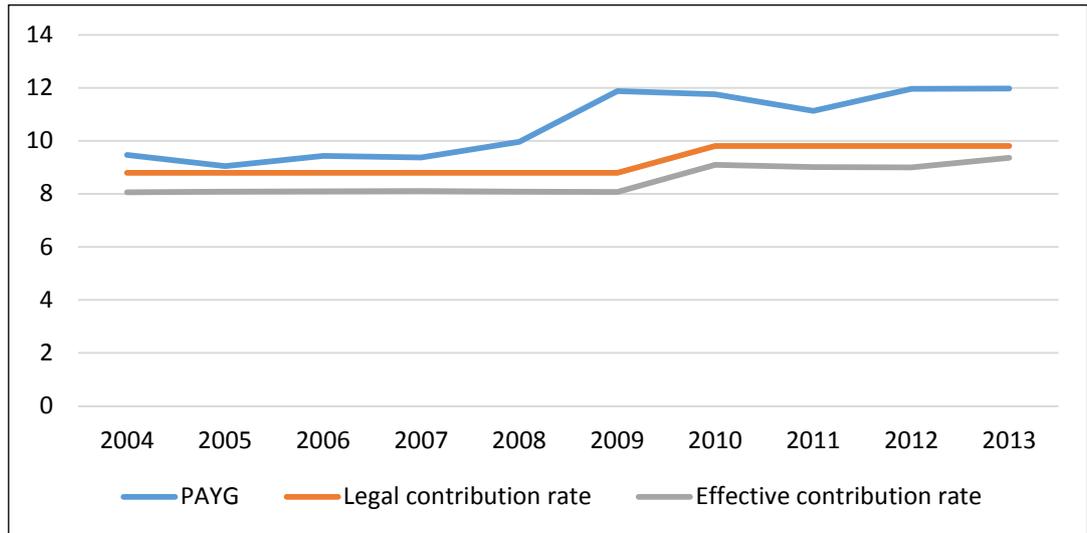
Figure 1.2.   Ratio of reserve to GDP, end of year (2004-2013)
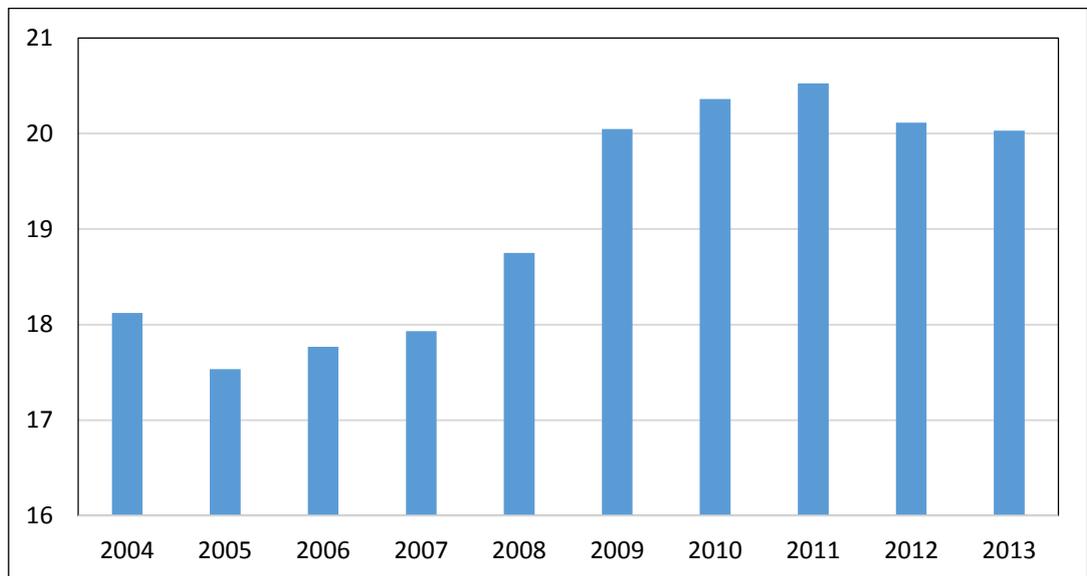
Figure 1.3 presents the reserve-to-expenditures (RER) ratio that reflects the size of the year-end reserve relative to that year's total expenditures. It is a useful measure indicating the funding level at a particular point in time, but it is not representative of the long-term pattern of the scheme, especially in the case of a still immature pension system such as the NIB. The RER ratio has generally trended downwards since 2004 to stand at 6.0 at the end of 2013.

Figure 1.3.   Reserve-to-expenditures ratio (RER) (2004-2013)
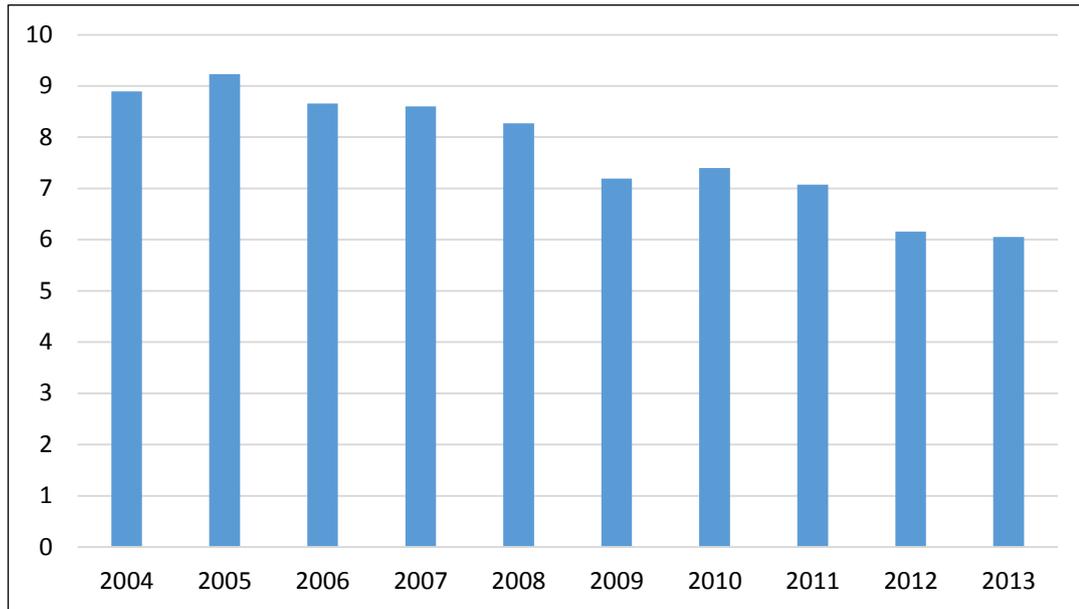
Figure 1.4 shows the proportion of each type of benefit paid relative to the total amount of benefit expenditures. It clearly illustrates that, as time goes by, long-term benefits become more and more important when compared to other types of benefit. In 2004, long-term contributory benefits represented 61 per cent of all benefits, but 66 per cent in 2013; the proportion should continue to rise in future, so that these benefits will drive the cost of the NIB. The bump in 2009 for short-term benefits is due to the introduction of unemployment benefits in the context of the financial crisis. The proportion of non-contributory pension benefits decreased from 14.1 per cent in 2004 to 6.9 per cent in 2013.

Figure 1.4.   Benefit expenditures, shares by branch (2004-2013)
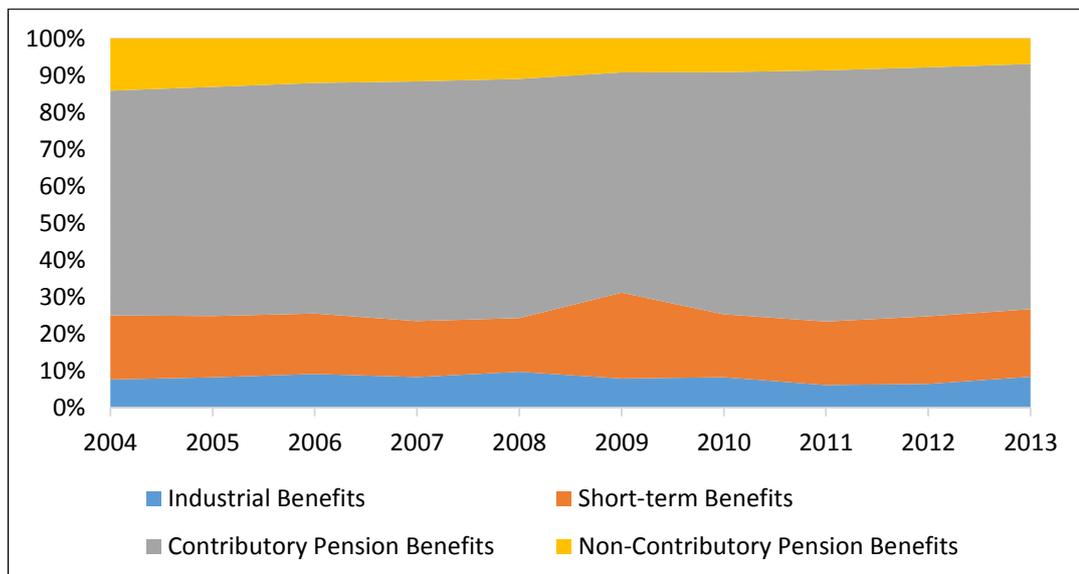
Figure 1.5 shows the increase in the number of contributors and pensioners over the last ten years, by 15.2 and 34.9 per cent respectively. Since the last crisis in 2008, the rhythm of the increase in the number of contributors has been reduced. The future evolution of the financial performance of the NIB will be driven considerably by the ratio of contributors to pensioners. Figure 1.6 shows the evolution of this ratio since 2004. In 2004, there were 5.1 contributors for each pensioner. This ratio is now 4.3.

Figure 1.5.   Evolution of the number of pensioners and contributors (2004-2013)
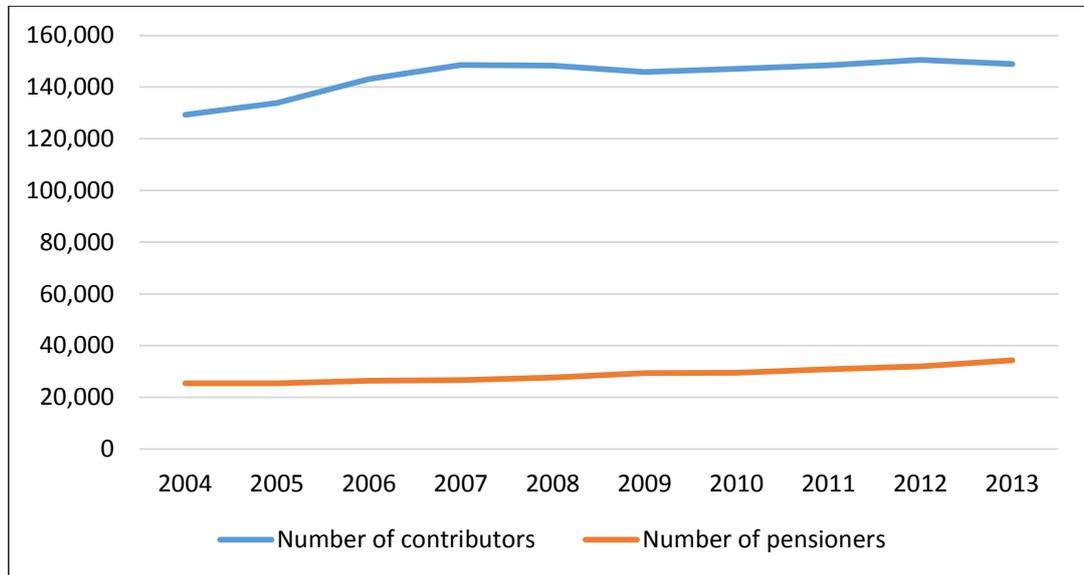
Figure 1.6.   Ratio of contributors to pensioners (2004-2013)
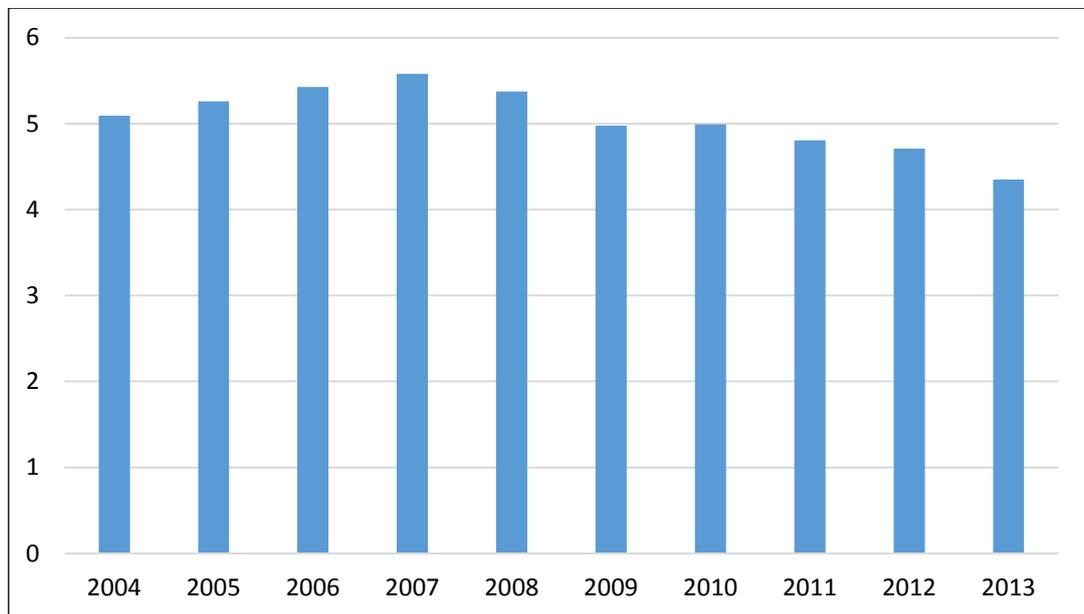
1.3.   Financial experience since the 9th Actuarial Valuation

Table 1.1 shows the statement of account for the period 2011 to 2013. In all these years, income exceeded expenditures.

Table 1.1.   Statement of account 2011-2013 (BSD '000s)

	2011	2012	2013
Total income	**277 369**	**294 035**	**318 366**
Contributions received	190 488	203 044	229 369
Investment Income	83 210	88 604	86 280
Other income	3 671	2 387	2 717
Total expenditures	**234 218**	**270 996**	**280 726**
Benefits paid	187 128	205 493	231 118
General and administrative costs	43 003	60 606	47 954
Other expenses	4 087	4 897	1 654
Surplus	**43 151**	**23 039**	**37 640**
Net assets at year end	**1 627 858**	**1 652 968**	**1 686 620**

Note: Benefit expenditure of the NPDP has been transferred from administrative expenditure to benefits paid.
Source: NIB.

According to the statements of account, total income increased by 14.8 per cent between 2011 and 2013, while for the same period total expenditures increased by 20.0 per cent. Contributions income has followed the increase in total expenditure with an increase of 20.4 per cent. Investment income has increased by only 3.7 per cent.

1.4.   Experience compared with projections of the 9ᵗʰ Actuarial Valuation

Table 1.2.   Expectations in the last actuarial valuation compared with actual experience (2012-13) (in percentage)

	2012	2013	Average
Ratio of total expenses to total earnings			
Last actuarial valuation	11.0	11.0	11.0
Experience	11.9	11.9	11.9
Ratio of benefit expenses to total earnings			
Last actuarial valuation	9.0	9.0	9.0
Experience	9.2	9.8	9.5
Ratio of administrative costs to total earnings			
Last actuarial valuation	2.0	2.0	2.0
Experience	2.7	2.0	2.4
Reserve ratio			
Last actuarial valuation	6.6	6.3	6.5
Experience	6.2	6.0	6.1

Source: Annual reports, calculation from authors. Differences may exist due to rounding.

The comparison in table 1.2 shows that on average the emerging experience is 1 per cent higher than the expected experience. In fact, during the two years, the ratio of total

benefits expenditure plus the administrative expenses to total earnings was 11.9 per cent compared to an expectation of 11.0 per cent. The RER ratio over the observed period was lower than that projected in the last actuarial valuation. High administrative expenditure in 2012 is mainly due to the recognition in the financial statements of the liabilities of the private pension plan for NIB employees.

Table 1.3 presents a picture of the main factors explaining the differences between the experience of the last two years and the expectations in the previous actuarial valuation. The average annual increase in the level of contributions was 9.7 per cent, which is higher than the expectation of 8.2 per cent. Both the growth in the number of contributors and the evolution of the average insurable salary are responsible for the difference. The growth in the insured population was lower than expected while the increase in insurable salary was higher. For the average insurable salary increase, one should keep in mind that it was driven by the increase in the ceiling (+20%); that starting in July 2013, gratuities for those working in the hospitality sector are now fully covered by the scheme; and that pensionable civil servants are now contributing for all the benefits on the total salary below the ceiling. Before July 2013, for the Pension Branch the weekly insurable salary was subject to a maximum of BSD 110. The average annual increase in benefits paid was 11.1 per cent compared to the expectation of 7.4 per cent. If the NPDP is excluded from the calculation, the growth is 10.0 per cent instead of 11.1 per cent. The number of long-term pensioners has increased more than expected, with an annual growth of 5.3 per cent compared to an expectation of 2.3. Table 1.3 also shows that inflation was higher than the assumption used in the previous actuarial valuation. A higher annual return on investment compared to the expectation was obtained on a nominal basis but not on a real basis.

Table 1.3. **Comparison of expectations in the last actuarial valuation with actual experience, selected indicators, average annual variation** (2011-2013) (in percentage)

	Nominal	Real
Annual average increase in contributions		
Expectation from last actuarial valuation	8.2	7.0
Experience	9.7	7.1
Annual average growth in the insured population		
Expectation from last actuarial valuation	0.8	n.a.
Experience	0.2	n.a.
Annual average increase in average salary		
Expectation from last actuarial valuation	7.5	6.2
Experience	9.5	6.9
Annual average increase of total benefits paid		
Expectation from last actuarial valuation	7.4	6.2
Experience	11.1	8.4
Annual average increase in the number of pensioners		
Expectation from last actuarial valuation	2.3	n.a.
Experience	5.4	n.a.
Annual average inflation rate		
Expectation from last actuarial valuation	1.2	n.a.
Experience	2.5	n.a.
Annual average return on assets		
Expectation from last actuarial valuation	4.5	3.3
Experience	5.4	2.9

Note: The higher increase than expected in the number of pensioners is mainly due to a high increase in the number of beneficiaries regarding the Survivors' pension. In the experience and the analysis, those who are receiving both an Old Age pension and a Survivors' pension are counted twice.

The ratio of administrative expenditures to insurable earnings is quite high when compared to those observed in other social security schemes in the region and in the world. At the NIB it is around 2 per cent, while it can be around 1 per cent in other islands of the region and even lower for larger countries. A level of 2 per cent of insurable earnings is used for the projections of this actuarial valuation. It is beyond the scope of this report to justify whether the administrative fees are reasonable or not. However, many stakeholders have expressed concern about this level of administrative fees. It is consequently suggested to better inform the public and justify the level of administrative fees to them. It is also suggested to put in place indicators and targets on the administrative fees and to discuss these each year in the financial statements. Keeping the administrative fees low will of course have an important positive effect on the sustainability of the scheme.

There are some general principles regarding limits to administrative expenditure that should guide the construction of such indicator.

For a mature scheme, administrative costs usually represent a rather low proportion of the overall insurable earnings. In a starting scheme, obviously several costs are incurred that are linked to the initiation of the scheme: staff training, building the IT structure, and the implementation of a mechanism to collect contributions and pay benefits. Therefore, there is no ready mechanism available to assess the appropriateness of administrative costs at the inception of a scheme.

However, several useful tools can be considered in order to assess benchmarks that help to fully appreciate the size of these expenditures. Ratios are used in many countries as limits that cannot be exceeded. These are:

- *Administrative costs/contribution income.* This ratio is sensitive to the contribution rate. As the contribution rate will probably evolve during the scheme's lifetime, it has to be used carefully. It is also sensitive to the size of the covered population, or limits to insurable earnings.

- *Administrative costs/insurable earnings.* More robust than the previous ratio, this one is sometimes proposed as a benchmark. However, as insurable earnings are usually increasing at a higher pace than inflation, this may lead to relatively high administrative costs in relative and absolute values over the long term. The ratio is sensitive to the inclusion/exclusion of new groups of covered persons. It can also be influenced by an eventual limit on insurable earnings.

- *Administrative costs/total or benefits expenditures.* For a scheme that is not mature, this ratio is not recommended, as benefit payments are very low at the inception of the scheme unless very sizeable transitory measures are put in place. This ratio will naturally decrease steeply as benefits grow, but will by no means signify that a more efficient administration exists. This ratio is also affected by adjustments to benefits following, for example, a reform in the pension system.

- *Annual increase limited to inflation.* This option may be interesting several years after the inception of the scheme. Before this benchmark is considered, any costs related to the inception of the scheme should be reduced to their minimum, and a careful analysis of relevant expenditures should also be made.

Internal accounting procedures at the NIB separates finances into four branches: long-term pension benefits, short-term benefits, employment injury benefits (industrial) and medical benefits (NPDP). It is a very good monitoring approach, since these four branches have different characteristics (frequency, severity, duration of payment) and financing mechanisms. Contributions for each branch are allocated according to a stated proportion

and the allocation of investment income and administrative expenses is made according to internal accounting procedures.

Table 1.4 shows the PAYG rates for each branch of benefits. For short-term benefits, the rates are very stable over the period. For other branches, there is an upward tendency. While this actuarial analysis will put more emphasis on the Long-term (Pension) Benefits Branch, it will be recommended that the NIB be more explicit concerning estimates of the cost of each branch and the way that reserves are going to be taken into account in the financial statements.

Table 1.4.   **PAYG rates by branch, percentage of total insurable earnings** (2011-2013)

Branch of benefits	2011	2012	2013
Pensions	8.2	8.8	8.7
Short-term	1.8	2.0	1.8
Industrial	0.7	0.8	1.0
Medical	0.3	0.4	0.5
Total	**11.0**	**12.0**	**12.0**

Table 1.5 shows the level of reserve by branch and the corresponding reserve to expenditures ratio (RER). There are discussions on reallocating some amount of money to the Medical Benefits Branch to minimize financial pressure in coming years. The sections related to the actuarial valuation will discuss more in detail this topic since before reallocating the money; one should verify the adequacy of the financing of each branch.

Table 1.5.   **Reserve and reserve-to-expenditure ratio (RER) by branch, 2011 and 2013**

Branch	Reserve (BSD'000)		RER ratio	
	2011	2013	2011	2013
Pensions	1 379 019	1 427 202	8.0	7.1
Short-term	22 748	46 805	0.6	1.1
Industrial	133 239	133 810	9.3	5.8
Medical	92 276	78 227	14.5	6.9
Total	**1 627 282**	**1 686 044**	**7.1**	**6.0**

1.5.   Investment performance

As of 31 December 2013, the total assets of the NIB on the balance sheet represent an amount of BSD 1,771 million (table 1.6). The assets can be divided in two main components:

1. Financial investments, which represent 89.2 per cent of total assets, are composed principally of government bonds (36.6%), government corporations bonds (13.9%), certificates of deposit (10.9%), loans and leases to government (7.8%), equities (6.6%), bonds and notes from corporations (5.9%), overseas bonds and notes (3.9%), investments in associates (3.4%) and property (0.3%).

2. Other assets, which represent 10.8% of the total, are composed of cash and bank balances (0.9%), accounts receivable and prepaid expenses (1.2%), property and equipment (5.7%) and construction in progress (3.0%).

As of 31 December 2013, there is a total liability of BSD 84.4 million, meaning that the total available assets are BSD 1,686.6 million.

Table 1.6.   Asset values, end of year, 2011 and 2013

		December 2013		December 2011	
		Million of Bahamian $'s	%	Million of Bahamian $'s	%
A.	**Financial investments**	**1 580.2**	**89.2**	**1 519.0**	**88.6**
	Bahamian Equities	104.5	5.9	58.3	3.4
	US Equities	12.1	0.7	6.7	0.4
	Investment – Overseas (bonds and notes)	68.9	3.9	46.4	2.7
	Government bonds	647.5	36.6	659.8	38.5
	Certificates of deposit	193.6	10.9	289.8	16.9
	Bonds from Government Corporations	246.3	13.9	255.3	14.9
	Bonds and notes from Non-Government Corporations	104.0	5.9	87.3	5.1
	Loans to Government Corporations	10.2	0.6	3.2	0.2
	Net Investment in finances leases (Government)	127.7	7.7	46.1	2.7
	Property	5.1	0.3	5.1	0.3
	Investment in associates	60.2	3.4	61.0	3.6
B.	**Cash and bank balances**	**15.2**	**0.9**	**9.2**	**0.5**
C.	**Account receivable and prepaid expenses**	**21.8**	**1.2**	**7.1**	**0.4**
D.	**Property, plant and equipment**	**100.2**	**5.7**	**65.0**	**3.8**
E.	**Construction in progress – finance leases**	**53.6**	**3.0**	**114.6**	**6.7**
F.	**Total assets (A + B + C + D + E)**	**1 771.0**	**100.0**	**1 714.8**	**100.0**
G.	**Liabilities**	**84.4**		**61.7**	
H.	**Net assets available (F-G)**	**1 686.6**		**1 653.10**	

Source: NIB, Annual Report.

Over the last ten years, the average return on the total assets has been 5.5 per cent. If we exclude the effect of inflation, the real average return on assets was 3.5 per cent. While this performance has been higher than the assumptions used in the last two actuarial valuations, it does not mean that this past performance is going to continue in the future. The low interest rate context that currently prevails and the need for liquidity because of the expected decreasing surplus are going to continue to put downward pressure on the return (see figure 1.7).

Figure 1.7.   Return on total assets (2004-2013)
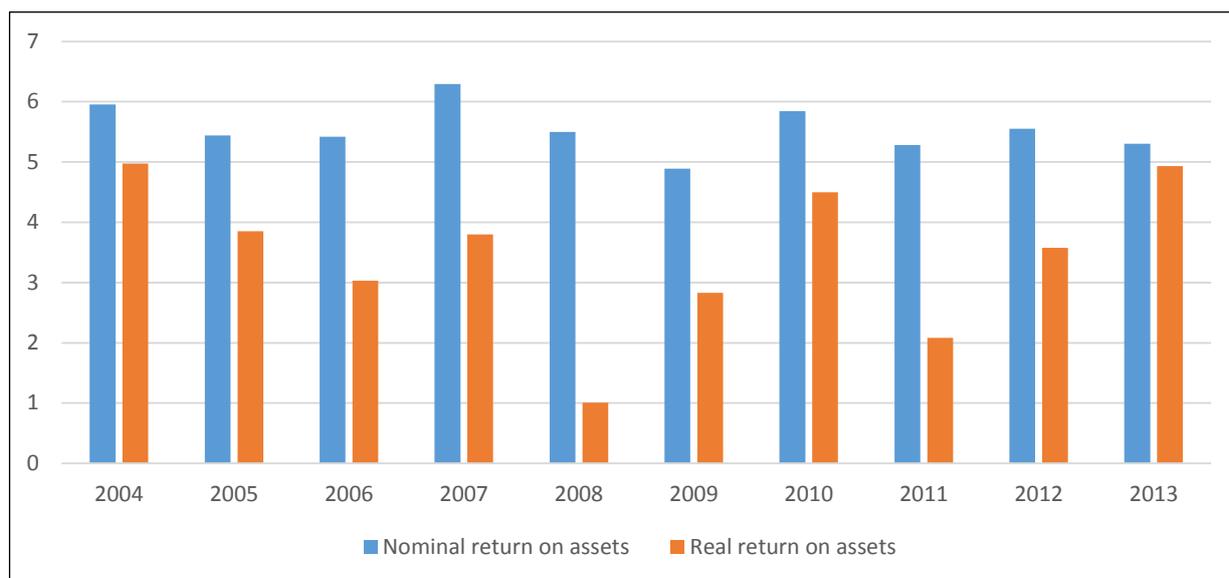
Source: Annual reports, calculations from authors.

Sections 1.6 and 1.7 deal with further elements concerning the structure of the investment policy and the rate of return on assets.

1.6.   Investment policy

The investment policy of the NIB was revised in July 2014, when strategic objectives for investments were established. These focused on:

1.   *Safety.* Investments shall be made with care, skill, prudence and diligence. Investments shall be diversified so as to minimize the risk and maximize the rate of return. All security transactions shall be executed by registered and reputable broker/dealers at best price.

2.   *Yield.* The objective is to minimize the risk while attaining growth of the principal in excess of inflation. A targeted real rate of return of 3 per cent per annum on the overall portfolio is considered.

3.   *Liquidity.* Investments should have the aim of ensuring liquidity to meet expected and unexpected cash flow needs. To the extent possible, the Board should invest in instruments with active secondary and resale markets.

The investment policy statement describes the structure, responsibilities and duties of the investment committee, the responsibilities of the Board, the role of the Director and of the Officer for executive management with responsibility for investments, as well as the external investment managers. The investment policy should be reviewed and approved at least every three years. The investment policy statement also includes guidelines on investments and limits on single investments:

■   The Board shall not invest outside the Bahamas without the general or specific direction of the Minister of Finance.

■   Investment in one company is subject to a maximum of 5 per cent of the total investment of the fund.

- The Board's deposits with commercial banks shall not exceed 12.5 per cent of the bank's total customer deposits excluding NIB deposits.

- The Board's holdings of common shares shall not exceed 10 per cent of the outstanding common shares of the company or 20 per cent of the public float of the company (shares publicly traded).

- The Board shall not make investments in any company that has not recorded profits in each of the last five years immediately preceding the proposed investment.

- Investments made in real estate through financed lease arrangements shall not exceed 15 years and at a rate of at least the Bahamas prime rate.

- The Board can invest in any securities which are investments authorized by the Trustee Act. The Board has the power to invest in securities other than trustee securities under defined conditions.

The current asset mix and targets are presented in table 1.7. The investment policy also specifies the benchmark returns to compare the performance of the fund.

Table 1.7.   Asset mix and investment benchmarks, current and target (in percentage)

Investment category	Targeted allocation	Acceptable range
Cash & cash equivalent	10	10-15
Fixed income securities		
Bonds		
Domestic – Government	50	40-60
Domestic – Other	7	4-10
International	4.5	3-7
Loan		
Domestic – Government	4	3-7
Equities		
Domestic	12	10-20
International	5	3-7
Alternative investments	0.5	0.5-1.5
Bahamian real estate	7	5-10

1.7.   Comments on the investment policy

Pension plans have long-term liabilities, so that a long-term investment policy should be in place. There is a long period of time between the payment of contributions on behalf of an individual and the time a benefit will become payable. Assets are normally accumulated for the payment of future benefits. The accumulation of assets has a secondary role of equalizing contributions paid by various generations of contributors. A pension plan should therefore adopt an investment policy with a long-term perspective in order to maximize the expected return of the fund. Variable income investments (for example, stocks, real estate, infrastructure and private equities) have, by nature, a long-term horizon. It has been observed that they produce a higher return than bonds over the long run.

At December 2013, about 11 per cent of total assets were invested in deposit certificates, an investment of a short-term nature. Investing in short-term vehicles is a reasonable strategy for short-term benefits. For long-term pension benefits, this could create a mismatch between the time horizon of assets and liabilities. It has been observed that the investment policy document does not refer to the different benefit branches of the NIB. Usually, a different investment strategy should be adopted for each type of benefit. In our opinion, the investment policy should take into account the benefit offered by the scheme and address investment issues for each type of benefit. For the Pension Branch, it is important to note that there should be a proper balance between the objective of efficiency and higher investment returns on the one hand, and the long-term stability and security of the assets on the other.

It has been observed that the investment policy does not refer in any circumstances to the results of the actuarial valuation. The investment strategy is of course affected by the future outlook of the social security scheme. In the current situation, the total PAYG rate is higher than the legal contribution rate. This means that investment income should be used for the payment of benefits or administrative expenditures. With the expected downward trend in the reserve ratio, it is normal to direct investment toward a strategy that will be based on liquidity in the future. What is questionable in the current system is that there are no clear financing objectives related to the financial sustainability of the scheme. It is known that a scheme such as the NIB, offering such comprehensive long-term pension benefits and short-term benefits, cannot stay forever at a contribution rate of 9.8 per cent. This situation is even more striking in a context where the legal contribution rate is below the contribution rate needed to pay all expenses. In our opinion, for a system to be effective an efficient and optimal investment policy should be linked to a clear road map related to the financing strategy: the funding policy. Section 1.8 below gives more details about such a funding policy.

Diversification is a way of reducing the overall risk of the portfolio, and can be carried out in both the local and foreign portions of the portfolio. The current assets portfolio has about 65 per cent in government securities or related investments. This is a high concentration in one type of risk exposure, and the investment policy should address this issue. In July 2014, about BSD 130 million of finance leases has been renegotiated downward with the Government. Debt restructuring can considerably affect a social security scheme where a large proportion of the portfolio is invested in government securities. A more detailed risk analysis should be included in the investment policy.

Considering the relative size of the Bahamas investment market, the allocation of investment outside the country could be increased to improve diversification. At December 2013, around 5 per cent of investments were in outside bonds, notes and equities. This low figure shows that there is room to invest overseas in private equities, real estate, infrastructure investments and emerging markets.

It could be advisable to increase the proportion of shares (for example, by buying commodity shares) and real estate in the portfolio since these types of investments generally provide better protection against inflation. Inflation normally affects all elements of pension plan expenditures. The levels of new pensions depend on salaries at the time of retirement; salaries are affected by inflation; pensions in payment are adjusted over time to preserve the purchasing power of retirees; and most components of administrative expenses are also affected by inflation. It is thus important that revenues derived from investments also provide a hedge against inflation. This would also allow for a higher expected return on assets, meaning that investment income could be higher in the future. Obviously, a higher expected return means higher risk of short-term fluctuations, but the long-term nature of the scheme allows for such fluctuations. There is a need to maximize the expected return on invested assets for future generations of contributors.

Where investments are made in foreign currency, the fund may be subject to currency risk. If the NIB decides to invest more heavily in foreign currency (or to maintain the present proportion of its assets in foreign currency) it may be appropriate to adopt strategies to manage the currency risk.

1.8. Financial system

It is a common practice in social security that contribution rates must be fixed so that the total income makes it possible to cover the technical expenses as well as part of the administrative costs. Furthermore, a specified reserve amount should be constituted as a way to diversify the risk, to increase the expected return of the scheme, to cushion the impact of economic downturns and to increase equity among generations of contributors. However, there are different factors that will affect the achievement of this goal:

1. The natural increase in the level of expenditures over a long period (especially for a non-mature scheme such as the NIB when more and more pensions will be paid).

2. The desire to have a stable contribution rate (making it more likely that employees and employers will remain confident in the scheme) and to have a contribution rate that will not become a burden on the people who contribute to it.

3. The duration of the equilibrium period (the period where the contribution rates and the investment income are sufficient to pay the expenditures of the scheme) and the amount (level) of reserve that will be attained throughout this period.

There are currently no formal financing objectives for the NIB. Thus, the following questions are not answered: For which period should the contribution rate be adequate? What is the desired level of reserve-to-expenditure ratio or funding? Is a stable contribution rate desirable to maintain equity among generations? What happens if experience is worse than expected? Who shares the risk of the scheme?

Some countries are beginning to be aware of this problematic and are including in their financing strategy some explicit financing objectives. Some are also trying to put in place automatic adjustment provisions to take into account changes in demography or in the economy.

One way to deal with financing problems is to put in place a funding policy. In the pension plan area there is a growing interest towards funding policies; many major pension plans already have one in place. A funding policy is a useful tool to:

– formalize the long-term funding objectives of the scheme;

– better understand the risks and advantages of financing options;

– ensure that plan assets are sufficient to deliver the promised benefits; and

– enhance corporate governance by increasing transparency.

Funding rules must address the interests of stakeholders:

– plan participants and former participants, as beneficiaries of the system and often as contributors to the financing of the system;

–   employers, as one of the parties bearing responsibility for financing the pension system; and

–   the general public and the government.

The funding policy would specify:

(1)   contribution rates;

(2)   risks faced by the scheme and how these risks can be managed;

(3)   risk tolerance;

(4)   allocation of risks among participants and employers;

(5)   funding objectives (such as contribution stability or improving the RER ratio);

(6)   frequency of actuarial valuation and the method of actuarial projection;

(7)   funding method;

(8)   goals related to intergenerational equity;

(9)   all other funding issues.

We suggest that the NIB hold discussions with stakeholders on the possibility of implementing an explicit written funding policy. The funding policy should be well thought out and periodically reviewed. For this actuarial valuation, we present results in the same way as in the previous actuarial valuation.

Appendix 4 describes the basic concepts behind the funding of social insurance.

2. Projections of the general population and the economy

2.1. Population projection

Future NIB income and expenditures will be closely linked to changes in the size and age structure of the population, employment levels, economic and wage growth, inflation, and rates of return on investments. To improve the projections of the future NIB finances, projections of the Bahamas' total population and economic activity are required.

Population projection is the basis to estimate the size and composition of the labour force, while projections of gross domestic product (GDP) and worker productivity growth indicate how many workers are needed in the economy and what their likely income will be. Since these factors are interrelated, population and economic projections are performed together to ensure that consistent assumptions are used. For this review, 75-years projections of the population, the economy and the NIB finances have been performed. This is an important difference from the period of 60 years used in the previous valuation. A period of 75 years takes into account the moment where the long-term cost becomes more stable.

Given the significant uncertainty inherent in forecasting such a long period, a sensitivity analysis has been made on the population projection to capture the effect on the future financial position of the scheme.

2.1.1. Demographic assumptions

The determinants of future population changes are fertility, mortality and net migration.

Fertility rates determine the number of births 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 the Bahamas and is the most difficult assumptions to make in this kind of projection because internal factors as well as external ones will affect migration. The results of the actuarial valuation can be very sensitive to the net migration assumption.

The last official population census occurred in 2010. At that moment there were 351,461 persons in the Bahamas.

The total fertility rate (TFR) represents the average number of children each woman would have between ages 15 and 49. If there is no migration, a TFR of 2.1 is required for each generation to replace itself. In 2011, the Bahamas' TFR is estimated at 1.80, a continuing decrease since 1990 where its level was 2.64. It is expected for the projection that the TFR will remain at 1.80 throughout the projection period. This fertility rate reproduces a crude birth rate[1] of 14.1 in 2011, which is the one appearing in the report on vital statistics.

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[1] Number of live births per 1,000 people per year.

Figure 2.1.   Total fertility rate (1960-2010)

Life expectancy at birth in 2010 has been estimated at 70.7 for males and 76.8 for females and is in line with the information published in the 2010 Census. For these projections, improvements in mortality are assumed to occur in accordance with UN medium estimates. With these assumptions, life expectancy at birth in 2060 is estimated to be 79.6 for males and 83.7 for females. A more important figure for the NIB is life expectancy at the moment old-age pensions begin. Life expectancy at age 60 is projected to increase over the first 50 years of the projection from 19.4 to 23.4 years and from 22.5 to 26.1 years for males and females, respectively.

According to the last 2010 Census Migration report, 29,157 persons were considered as recent immigrants (from 2000 to 2010). According to the UN World Population Prospects for the same period there were 30,000 net migrants in the Bahamas. For this actuarial valuation 2,000 net migrants are assumed at the beginning of the projection in 2010. This level is projected to fall slowly to reach 500 in 2025 and stay level thereafter. The ratio of the net migrants over the total population is 0.6 per cent at the beginning of the projection period and 0.1 per cent 50 years later.

2.1.2. Results of the population projection

Figures 2.2 and 2.3, and table 2.1, show the expected evolution of the population of the Bahamas over the next 75 years. The changes in the relative size of each age group – 0-14 years old, 15-59, and 60 and over – is a direct result of reducing birth rates, improvements in longevity and the migration of mainly working-age persons.

Figure 2.2. **Projected population distribution** (2010-2088)
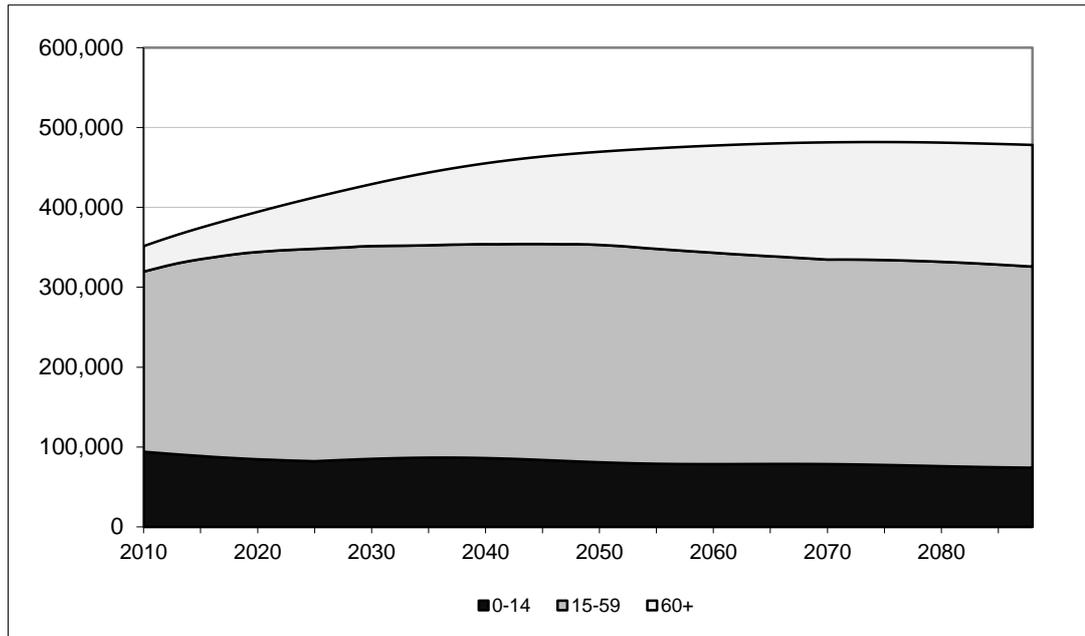
Figure 2.3. **Population pyramids** (2010-2085)
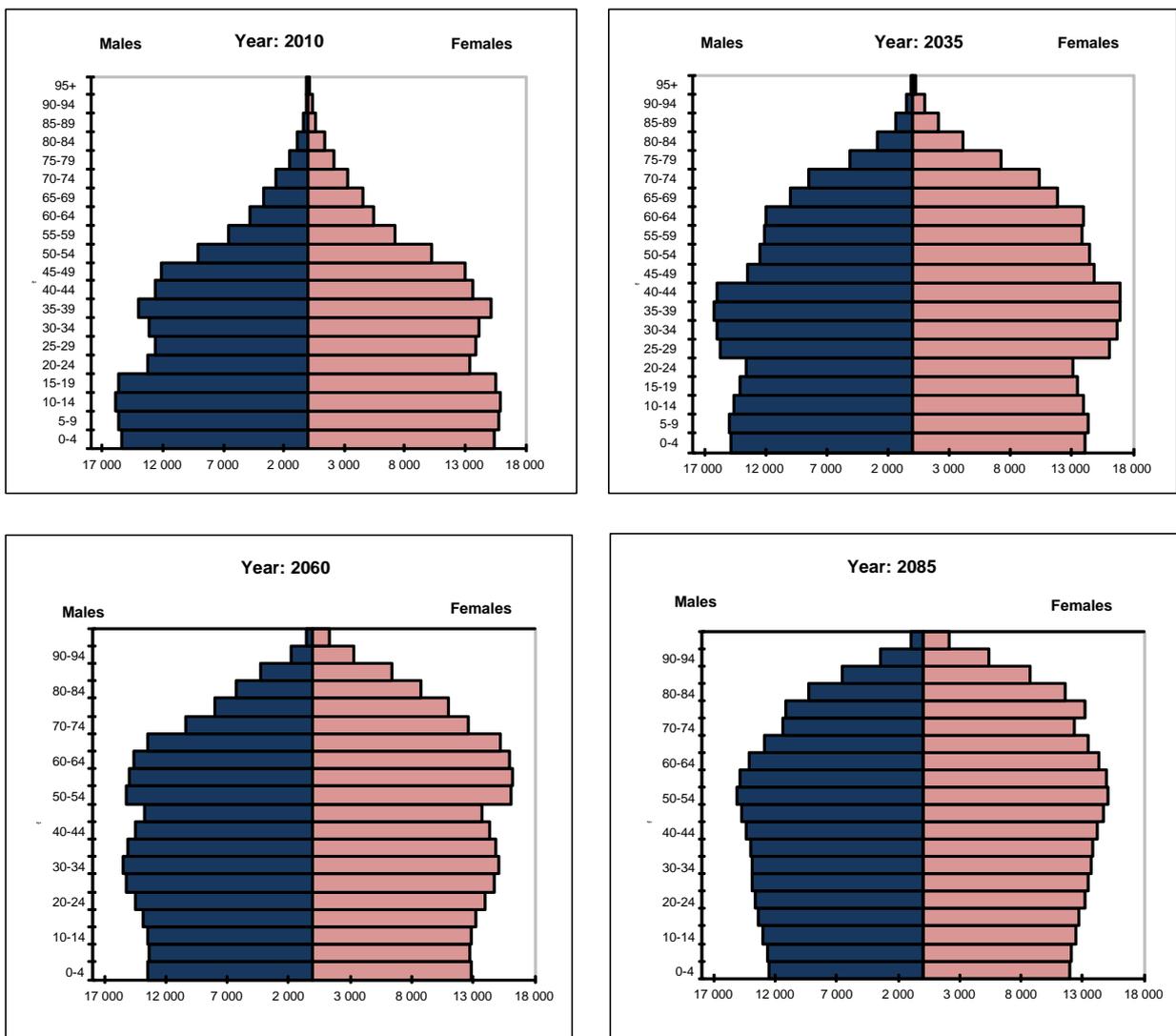
Table 2.1.   Population and dependency ratio (2010-2080)

Year	Total	Age			
		0-14	**15-65**	**65+**	**Ratio 15-65/65+**
2010	351 461	94 119	235 621	21 721	10.8
2015	374 500	88 804	259 437	26 259	9.9
2020	394 335	84 695	277 098	32 542	8.5
2030	429 031	85 214	289 693	54 124	5.4
2040	455 116	86 216	292 520	76 380	3.8
2050	469 547	80 942	298 149	90 456	3.3
2060	477 308	78 641	295 093	103 574	2.8
2070	481 344	78 657	285 911	116 775	2.4
2080	480 987	76 073	283 063	121 851	2.3

Highlights of the population projection are:

1.   Average annual growth of the population over the projection period is 0.3 per cent.

2.   The total population will increase to reach 481,717 in 2074 and then will begin to decrease gradually.

3.   The number of people aged 15-65 (the working-age population) will begin to decrease in 2055.

4.   Starting in 2064, there are more deaths than births.

5.   In 2010, there are 10.8 persons aged 15-59 for each person aged 65 and over. Seventy-five years later, this ratio drops to 2.3.

6.   The average age of the population is 31 years old in 2010 and will increase to 46 in 2088.

2.2.   Economic assumptions

The Bahamian economy contracted in 2008 and 2009 by 2.3 and 4.2 per cent respectively, due mainly to the global crisis. For the four following years, real GDP growth was 1.5 per cent on average. For the NIB, the impact has been a decrease of 0.2 and 1.7 per cent respectively in the number of contributors. For the future, the performance of the economy will continue to have a major impact on the NIB experience. Last October, the International Monetary Fund (IMF) has revised its projection downward relative to the economic growth of the Bahamas for the year 2015, from 2.8 to 2.1 per cent. The late opening of the Baha Mar hotel and the possible negative impact from the new value-added tax (VAT) that will be implemented in January 2015 is probably responsible for this revision.

While the short-term economic outlook is important, it should be borne in mind that it is the performance of the economy and the investment over the entire projection period that will drive the financial performance of the scheme.

Figures 2.4, 2.5 and 2.6 show that the economic performance of the Bahamas is closely related to that of the United States. A large part of consumption goods are imported

from the United States, which also provides the largest number of tourists to the Bahamas annually. Direct and indirect tourist activities account for about 60 per cent of GDP and provide employment to close to 50 per cent of the labour force, according to Index Mundi (www.indexmundi.com). Given this past experience, economic growth and inflation will probably not differ much in future from that expected in the United States. Over the last 20 years, average real GDP growth in the Bahamas has been 2.0 per cent compared to 2.6 per cent for the United States. For the inflation rate, the average was 2.0 per cent in the Bahamas while it was 2.5 per cent in the United States. Finally, for unemployment, the respective figures were 10.4 and 6 per cent.

Figure 2.4.   Real growth of GDP, Bahamas and United States (1971-2012) (5 years moving average)
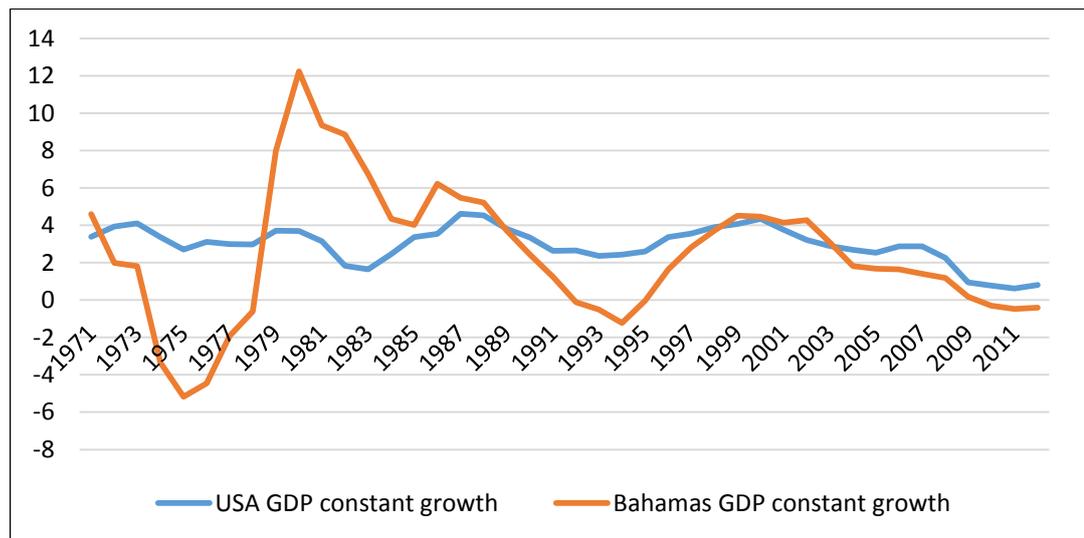
Source: World Bank.

Figure 2.5.   Inflation rate, Bahamas and United States (1971-2012) (5 years moving average)
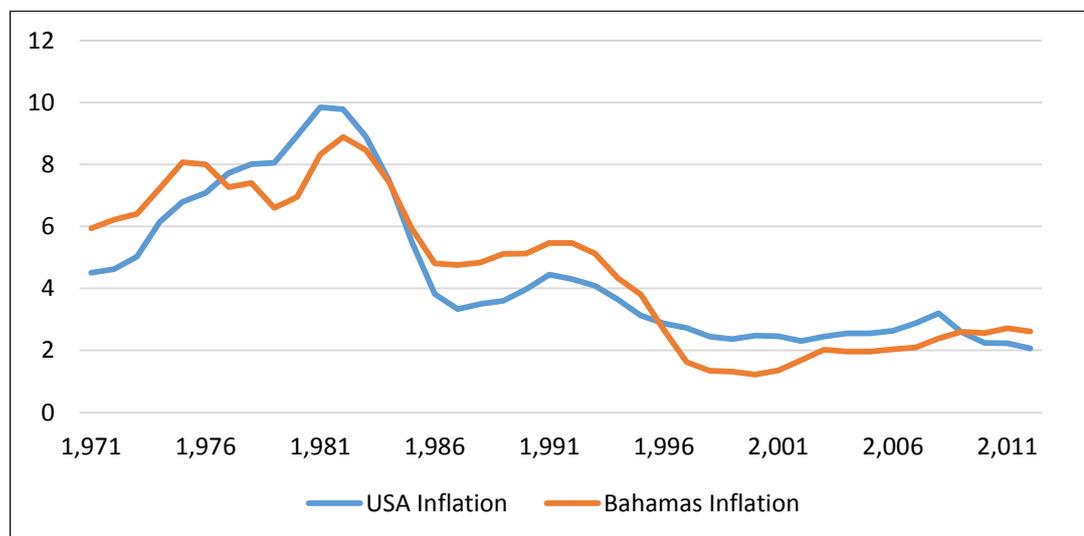
Source: World Bank.

Figure 2.6. **Unemployment rate, Bahamas and United States** (1986-2012)
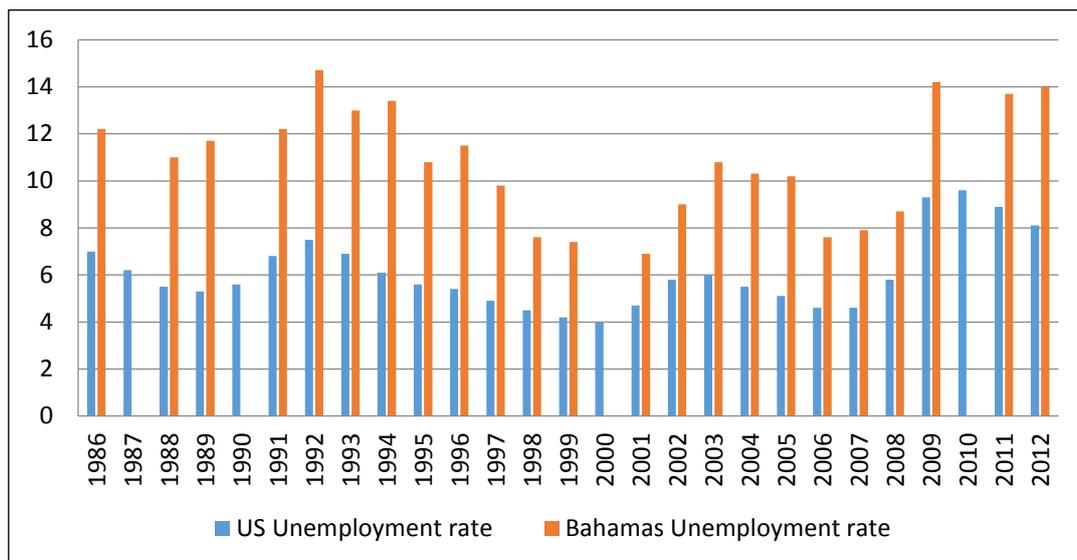
Source: World Bank.

2.2.1. Labour force and employed population

Figure 2.7 presents the evolution of the labour force participation rate (labour force population divided by the general population aged 15 and more) over the period of 11 years to 2012.

Figure 2.7. **Total labour force participation rate** (2002-2012)
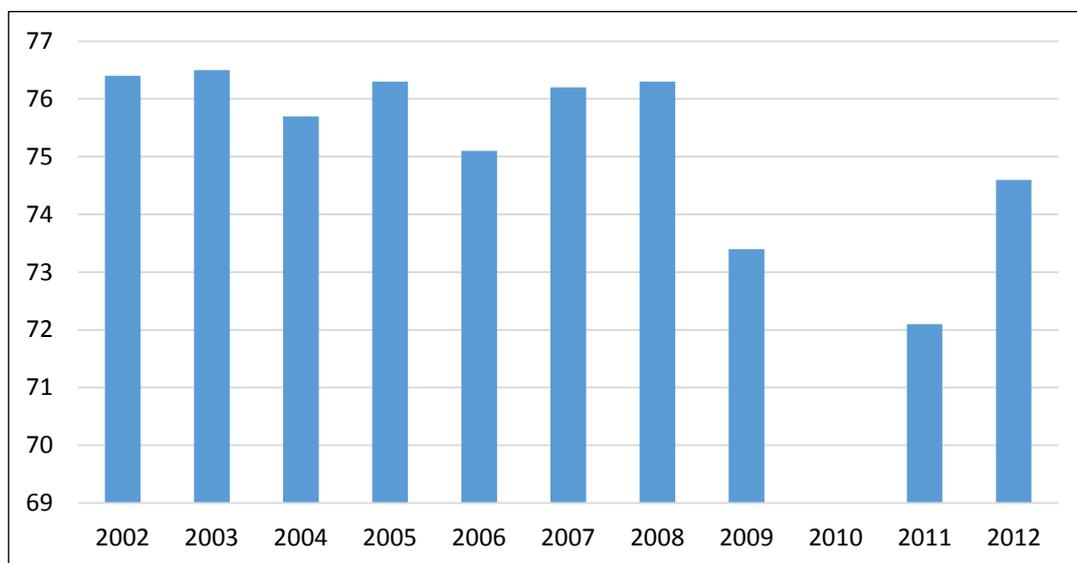
Source: World Bank, national estimate (2010 unavailable).

In this actuarial valuation, the projection of the labour force is performed by applying labour force participation rates to the corresponding projected population groups of the Bahamas. A long history of labour force participation rates by gender, age and year is not available. Labour force participation rates in 2011 and 2013 by age are available but present some inconsistencies. For that reason, the labour force participation rates by age and gender published by the ILO have been used for this actuarial valuation and have been slightly adjusted to replicate the total labour force. For the year 2013, a total labour force

of 196,400 people is targeted to reconstitute that of the labour force survey. When compared to the population aged between 15 and 69, the labour force participation rate is 76.6 per cent.

For the projection, the following assumptions have been made: for males and females, labour force participation rates by age are quite stable during the whole projection period. They have been slightly increased at older ages to reflect the effect of the increase in the early retirement reduction factor in 2012 as well as the implementation of a factor for late retirement. Figure 2.8 presents the labour force participation rates used in the present actuarial valuation.

Figure 2.8. **Labour force participation rates used in this actuarial study, by age and sex, 2013 and 2028** (in percentage of population)
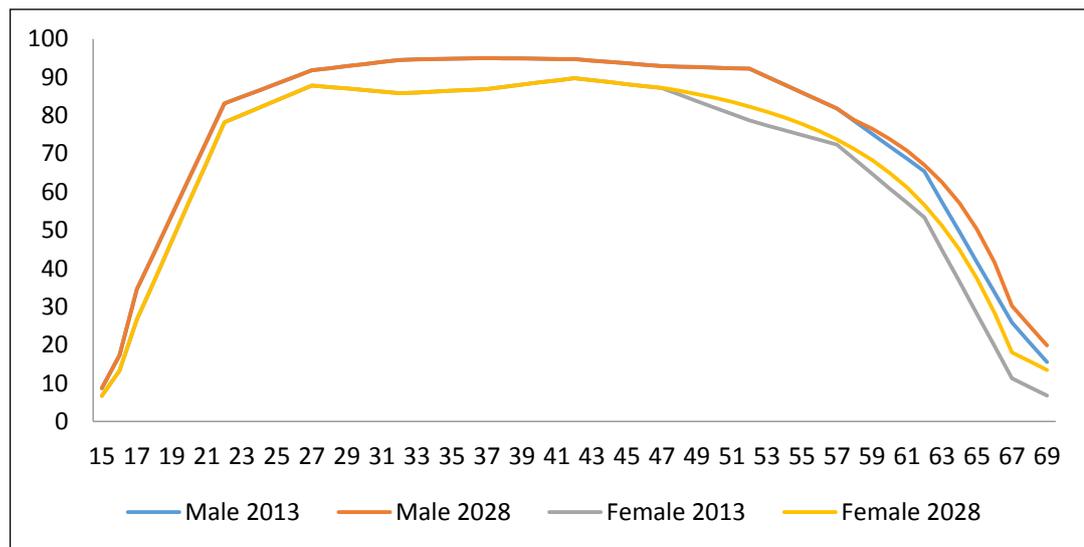
Figures 2.9 and 2.10 show information related to the unemployment rate in the Bahamas since 2002. It can be seen that the overall unemployment rate has increased considerably because of the global financial crisis. The unemployment rates are higher at younger ages. In fact, they are over 20 per cent for those aged under 25.

Figure 2.9. **Unemployment rate** (2002-2012)
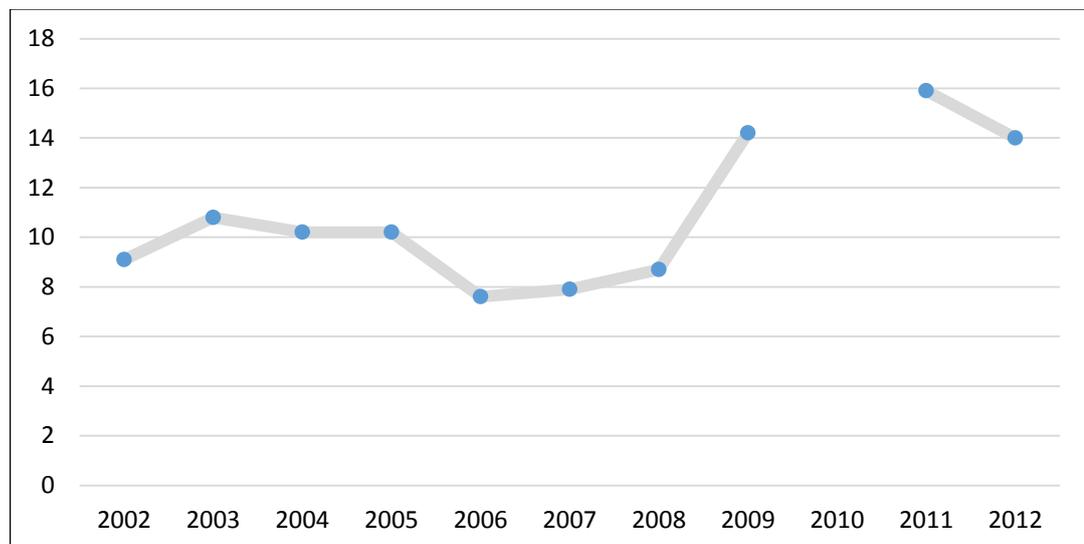
Source: World Bank, national estimate (2010 unavailable).

Figure 2.10. Unemployment rate, by age and sex (2013)
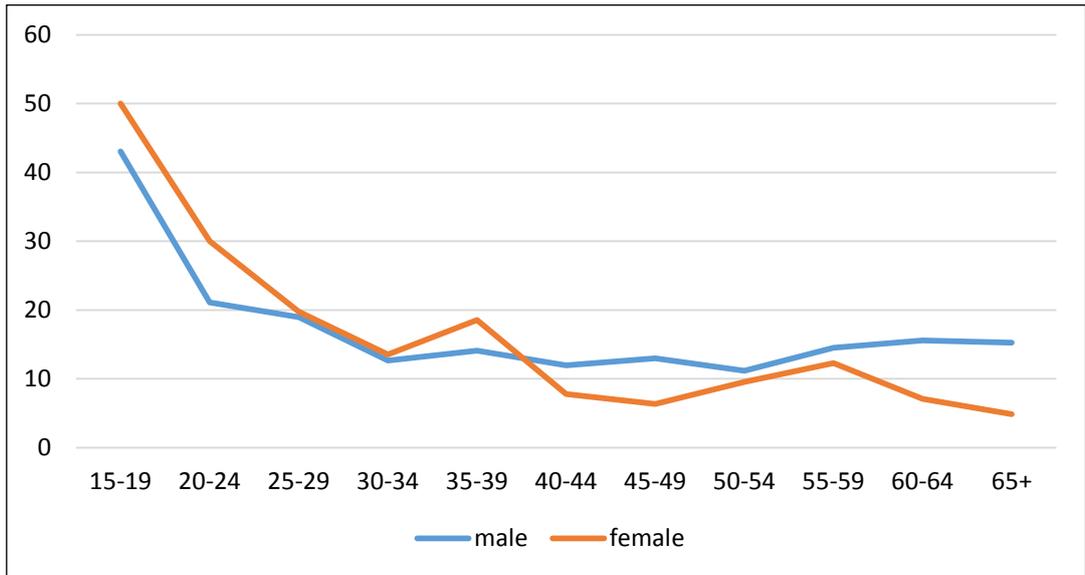
Source: Department of Statistics of the Bahamas.

For the projection, the unemployment rate is expected to continue at the current level and to be 14.3 per cent in 2019, like the level shown in the last IMF projection. After this period, it will decrease at a faster rate to reach an historical level of 10.0 per cent in 2026, as shown in figure 2.11. After that, the unemployment rate will decrease slowly to reach an ultimate level of 9.4 per cent. The decrease in the total unemployment rate is due to the ageing process of the labour force. The proportion of older workers with lower unemployment rates is increasing, causing the total unemployment rate to decrease. The resulting labour market balance for the Bahamas is presented in table 2.2.

Figure 2.11. Unemployment rate (2014-2088)
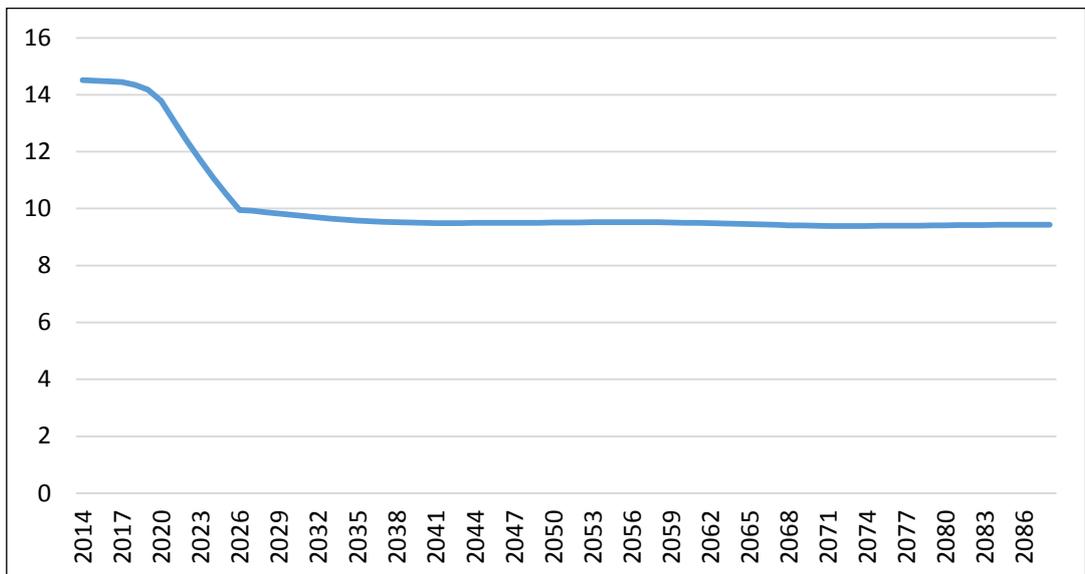
Table 2.2. Labour force and employed population, projections 2013-2088, selected years

	2013	2038	2063	2088
Population (no. of persons)				
Males	176 924	217 634	233 230	235 943
Females	188 913	233 238	245 698	242 163
Total	365 837	450 873	478 928	478 105
Population aged 15-69 (no. of persons)				
Males	124 908	152 519	159 514	154 796
Females	134 624	162 803	161 966	152 976
Total	259 532	315 322	321 480	307 771
Labour force participation rate (%)				
Males	79	81	80	80
Females	72	73	72	72
Total	76	77	76	76
Labour force (no. of persons)				
Males	99 278	122 784	127 678	124 349
Females	97 093	118 608	116 344	110 542
Total	196 371	241 392	244 022	234 890
Unemployment rate (%)	**15.5**	**9.6**	**9.5**	**9.4**
Employed persons (no. of persons)				
Males	84 161	110 985	115 464	112 505
Females	81 731	107 425	105 433	100 220
Total	165 892	218 411	220 897	212 725

2.2.2. Inflation and salary increases

The annual increase in the remuneration of an insured person consists of three components: the changes in the cost of living, the general economic productivity increase and the increase in personal productivity for work experience and seniority.

The increase in the cost of living can be measured through the Bahamas Consumer Price Index. The cost of living has increased at an annual rate of 2.1 per cent over the last ten years (see table 2.3).

Table 2.3. Inflation (2004-2013)

Year	
2004	1.0
2005	1.6
2006	2.4
2007	2.5
2008	4.5
2009	2.1
2010	1.3
2011	3.2
2012	2.0
2013	0.4
Average	2.1

Source: World Bank, Bahamas Consumer Price Index.

For this actuarial valuation, inflation rates of 1.2 and 4.5 are expected respectively for the years 2014 and 2015. The large increase in 2015 is due to the introduction of the new value-added tax (VAT). For the year 2016 and on, the assumption rate for the annual inflation rate is 2.25 per cent.

Salary adjustments depend to some extent on the evolution of the productivity of employees, namely labour productivity (GDP divided by the number of employed workers). For the period 2006−12, the real labour productivity has been –0.2 per cent.

Figure 2.12 shows the evolution of the average insured salary and the inflation rate over the last nine years (2005 to 2013). On average, the insurable salary has increased by an annual rhythm of 3.0 per cent while the annual growth of inflation was on average 2.2 per cent during the same period. As a result, average real insurable salary growth was 0.8 per cent from 2005 to 2013. It should be borne in mind that the effective insurable salary growth was not so high during that period; in fact, the increase in the average insurable salary was boosted by adjustment to the ceiling in 2011 (from BSD 400 to 500) and in 2012 (from BSD 500 to 600) and by the inclusion of the gratuities starting in July 2013. This is why the increase in insurable salary is so high for the years 2011 to 2013.

Figure 2.12. Annual insurable salary increase of the insured population, and inflation rate (2005-2013)
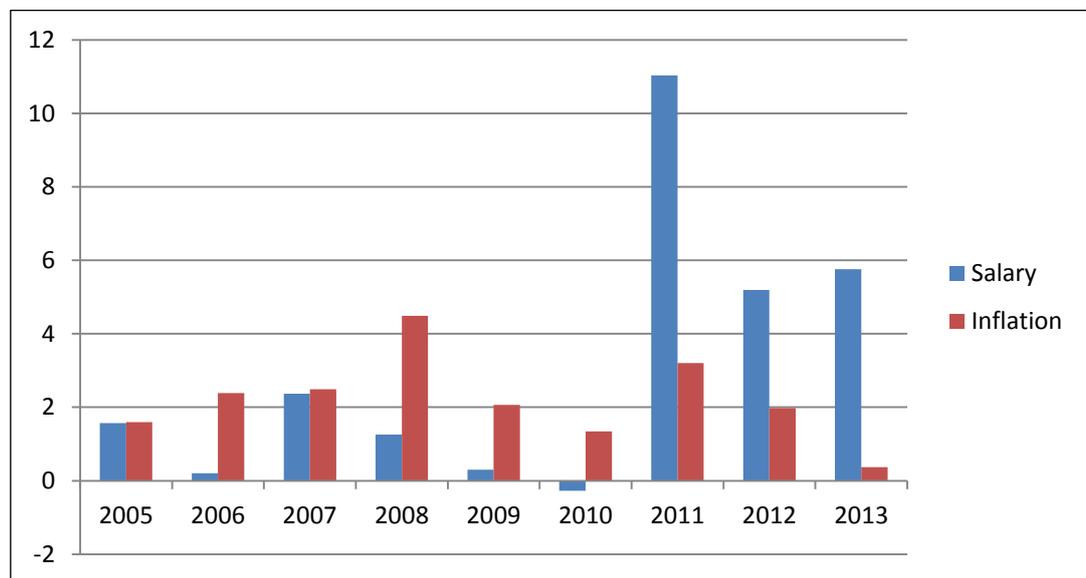
For this actuarial study, it is assumed that both labour productivity and salary increases will move in the same direction and in the same percentage. The real salary increase assumption is an increase of 0 per cent in 2014 and rising to 1.0 per cent in 2019. The real salary increase stays at this level for the rest of the projection.

The increase in personal productivity for work experience and seniority is reflected in the salary scale distribution. This is presented in Appendix 3.

In June 2011, the Central Bank of the Bahamas reduced the prime rate by 0.75 per cent, from 5.5 to 4.75 per cent. A large part of NIB investments are linked to the prime rate, so the low level of the interest rate affects the return on investment. An ultimate annual nominal interest rate of return of 4.5 per cent is used in this actuarial study. For the year 2014, the return is 5.0 per cent, and 4.75 per cent for the year 2015.

Figure 2.13 indicates the growth rates in the principal macroeconomic indicators used in the projection.

Figure 2.13. Growth rates in real GDP, employment, real salary, real investment return and inflation
(2014-2084)
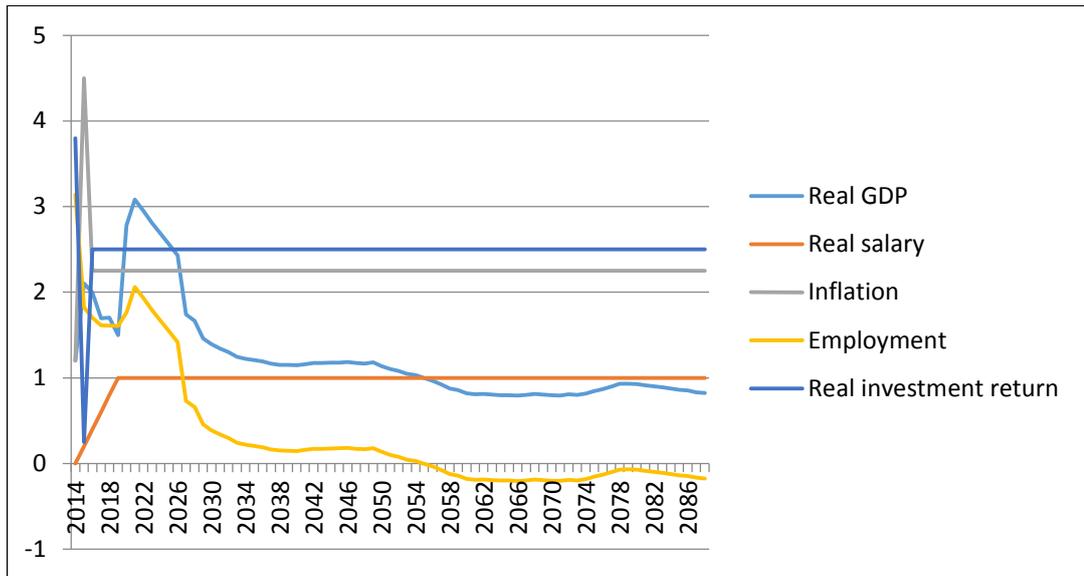
3. Demographic and financial projections

This valuation deals with the ability of the social security scheme to meet its future obligations at the time they fall due. This is done under an open-group approach. It is assumed that workers will continue to be insured with the NIB indefinitely, thus paying contributions and accruing benefit entitlements, and later receive benefits in accordance with the current practice of the NIB. Future contributions and benefits are calculated according to the demographic and economic assumptions presented in section 2 and on the basis of the database and the scheme-specific assumptions presented in Appendix 3.

This review has been separated into four parts: valuations of the Short-term Benefits Branch, Medical (prescription drugs) Benefits Branch, Industrial Benefits Branch, and Long-term (Pension) Benefits Branch. There is no need to project short-term benefits and industrial benefits over a very long period to estimate if the contribution rates are adequate. The approach used in this actuarial valuation is to analyse short-term benefits, industrial benefits and medical benefits separately and then to calculate and to allot to them a separate contribution rate. In a next step, these contribution rates will be subtracted from the total contribution rate of 9.8 per cent to undertake the pension projection. It will then be possible to know the current contribution rate allocated to the pension branch. Using this approach permits more emphasis to be put on the pension projection.

Instead of separating the contribution on a predetermined proportion in the financial statement, it is recommended to levy an explicit contribution rate for each type of benefit. This approach has many advantages:

– simplicity of understanding;

– transparency;

– people's awareness of the cost and the stakes of each benefit; and

– better risk management.

The recommended contribution rate is displayed at the end of each subsection.

3.1. Valuation of the Short-term Benefits Branch

The expression "short-term benefits" refers to Sickness benefits, Maternity benefits, Unemployment insurance and Funeral benefits. These benefits are not part of the stakes of this actuarial valuation since their cost is not significant and is quite stable over time, except for unemployment benefit, as shown in figure 3.1.

Figure 3.1. **Short-term Benefits Branch, PAYG rates** (2009-2013)
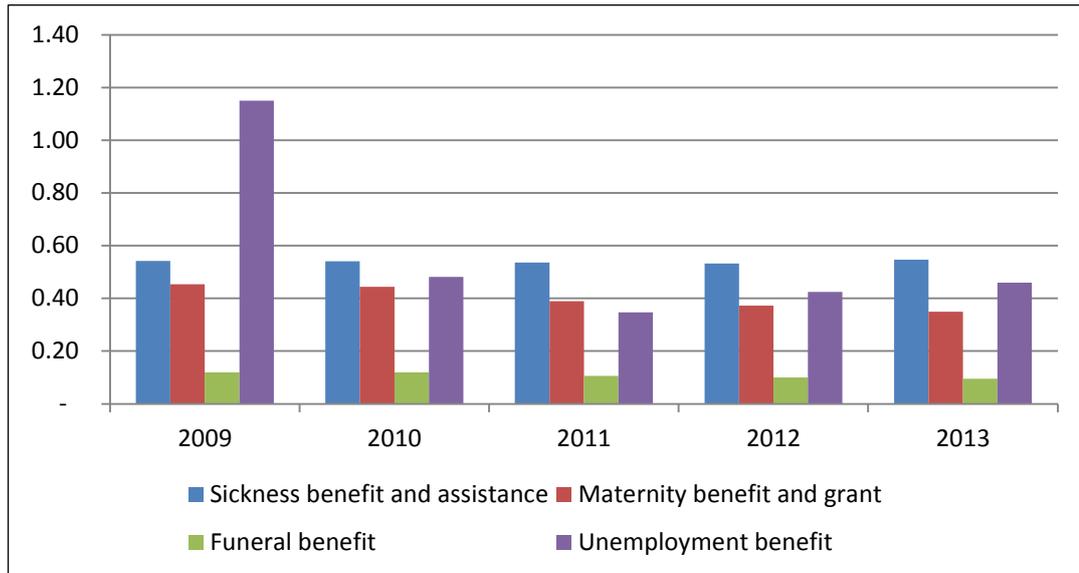
Even if emphasis must be put on long-term benefits, it is still important to understand how short-term benefits have evolved over the last few years. Here are some points of interest concerning these benefits:

1. During the last five years, Funeral benefit has been quite stable with an average ratio of 0.11 per cent of the contributing insurable salary (PAYG rate).

2. The Maternity benefit in relation to the insurable salary is continuing its downward trend, like the fertility rate. In 2013, the cost of Maternity benefits in relation to the contributory salary was 0.35 per cent.

3. Over the last five years, the cost of Sickness benefits has oscillated between 0.53 and 0.55 per cent of the contributory salary.

4. While the cost of Unemployment benefit has been quite stable during the last three years, it has decreased from 1.15 per cent of the insurable salary in 2009, the first year of implementation, to 0.46 per cent in 2013.

5. According to the information on the financial statement, the average administrative expenditure for short-term benefits in relation to the insurable salary has been 0.44 per cent over the last five-year period, with a peak of 0.55 per cent in 2012 due to the recognition of the pension liabilities of the NIB employees' pension plan in the financial statement.

A projection of the cost of the Short-term Benefits Branch in relation to the insurable salary has been undertaken to estimate the upcoming cost over the next five years. No margin is used in the valuation except the fact that investment income and other income represent additional revenue to finance the benefits and that the results have been rounded up to the highest 0.5 per cent. The contribution rate is the rate that is necessary to pay all the benefits related to a given year. Table 3.1 presents the results of the projection. In the contribution rate, a loading of 0.4 per cent of the insurable salary to pay the administrative expenditure has been distributed among the benefits. For those having to finance all their short-term benefits, the recommended contribution rate is 2.15 per cent of the insurable salary. For unemployment insurance, the contribution rate is 0.70 per cent of the insurable salary. Table 3.2 displays the projected cash flows related to the expenditure on the Short-

term Benefits Branch, while table 3.3 presents an overall projection including the cash flows and reserve.

Table 3.1. Short-term Benefits Branch, contribution rates (2014-2018) (in percentage)

	Cost of benefits	Administrative expenditure	Total cost	Recommended contribution rates
Sickness benefit and assistance	0.60	0.20	0.80	0.85
Maternity benefit and grant	0.36	0.07	0.43	0.45
Funeral benefit	0.11	0.02	0.13	0.15
Unemployment benefit	0.54	0.11	0.65	0.70
Total	**1.61**	**0.40**	**2.01**	**2.15**

Table 3.2. Short-term Benefits Branch, projected cash flows (2014-2018) (BSD '000)

	Sickness	Maternity	Funeral	Unemployment insurance	Administrative Expenditure	Total
2014	14 978	9 066	2 787	13 161	10 029	50 022
2015	15 893	9 066	2 985	13 923	10 629	52 496
2016	16 735	10 019	3 163	14 553	11 154	55 625
2017	17 612	10 518	3 334	15 217	11 705	58 387
2018	18 544	11 060	3 496	15 923	12 289	61 311

Table 3.3. Short-term Benefits Branch, overall projections (2014-2018) (BSD '000)

Years	Income			Expenses		Surplus (deficit)	Reserve (end year)	PAYG (%)
	Contributions *	Investment earnings	Others	Benefits	Administrative expenses			
2014	53 511	1 213	107	39 992	10 029	4 810	51 615	2.0
2015	56 708	1 343	113	41 867	10 629	5 669	57 284	2.0
2016	59 513	1 480	119	44 471	11 154	5 487	62 771	2.0
2017	62 454	1 620	125	46 681	11 705	5 811	68 582	2.0
2018	65 566	1 767	131	49 023	12 289	6 153	74 735	2.0

* With current allocation of contribution.

An amount of reserve is written into the financial statement for the Short-term Benefits Branch. It is derived from that in the previous year plus the residual amount of the cash flows of the year (surplus or deficit). Table 3.4 presents the value of the reserve in dollars as well as the value in relation to the last year of benefits.

Table 3.4. Short-term Benefits Branch, amounts of reserve and reserve ratio (2009-2013)

	2009	2010	2011	2012	2013
Reserve (BSD '000)	6 603	11 579	22 748	30 909	46 805
Reserve in relation to the last year of benefits (reserve ratio)	0.1	0.3	0. 6	0.7	1.1

Source: Financial statements.

According to our valuation, there is no need to accumulate too high an amount of reserve for the Short-term Benefits Branch. The reserve should include the benefits to be paid regarding contingencies that took place in previous years as well as a contingency reserve to avoid too frequent modifications in the contribution rate. We recommend that a maximum amount of reserve be written in the financial statements. The higher amount for Unemployment insurance takes business cycles into account. Table 3.5 presents the amounts of reserve that should appear in the financial statement for the year 2013. Instead of BSD 46.8 million (table 3.4), a total reserve of BSD 27.4 million (table 3.5) would have been enough. The excess amount of reserve (BSD 19.4 million) has been transferred to the long-term pension branch for the actuarial valuation.

Table 3.5. **Short-term Benefits Branch, recommended amount of reserve in the financial statements** (December 2013)

	Reserve expressed as a number of years of benefits	Amount of reserve December 2013 (BSD '000)
Sickness benefit and assistance	0.5	4 066
Maternity benefit and grant	0.5	6 360
Funeral benefit	0.5	1 307
Unemployment benefit	1.5	15 648
Total	**–**	**27 380**

Appendix 2 displays statistics on which the valuation of the Short-term Benefits Branch has been performed.

3.2. Valuation of the Medical Benefits Branch and National Prescription Drug Plan

The National Prescription Drug Plan (NPDP) began to be implemented in 2010, with the implementation process planned in three phases. The first phase targeted people diagnosed by a licensed physician as suffering from one or more of the chronic diseases covered. The second phase began in May 2011 with the extension of coverage to indigent persons, civil servants, members of the police and the defence forces, persons receiving antenatal care, persons in receipt of Disablement benefit assessed at 100 per cent disability, persons receiving the NIB Retirement grant and persons aged 60 and over in receipt of NIB Survivors' benefit/assistance who have been diagnosed with one or more of the chronic conditions covered under the Plan.

In phase 1 only the following groups were covered:

– NIB old-age pensioners;

– NIB invalids;

– Bahamian citizens aged 65 or over;

– Children under 18 years of age or young adults under 25 years of age (if full-time students).

With phase 3, all those insured (employed, self-employed and voluntarily insured) at the NIB are going to be covered. It is also planned that in 2016 the NPDP will be incorporated into the new National Health Insurance scheme.

In the financial statements, the NPDP is accounted under the Medical Benefits Branch; 0.5 per cent of the total contribution income is allocated to the Medical Branch, roughly corresponding to a contribution rate of 0.05 per cent of the insurable salary. According to the discussion held, it is expected that the Medical Branch will come under pressure in future years. One solution discussed is to transfer reserve amounts from other branches to finance the shortfall. According to the Financial and Accounting Regulations:

–   transfers among the branches specified in regulation 3 of the accumulated Reserve Funds may be authorized by the Board with the prior approval of the Minister, if recommended as a result of an actuarial review of the fund.

According to the data transmitted, there were 23,156 beneficiaries [1] active in 2013, of whom 11,038 were registered in 2010, the first year of NPDP implementation. Table 3.6 and figure 3.2 present information on active members in 2013.

Table 3.6.   National Prescription Drug Plan, number of active beneficiaries in 2013, by year of registration

Year of registration	Number of beneficiaries registered in year
2010	11 038
2011	5 377
2012	3 689
2013	3 052
Total in 2013	**23 156**

Figure 3.2.   National Prescription Drug Plan, number of active beneficiaries in 2013, by age and year of registration
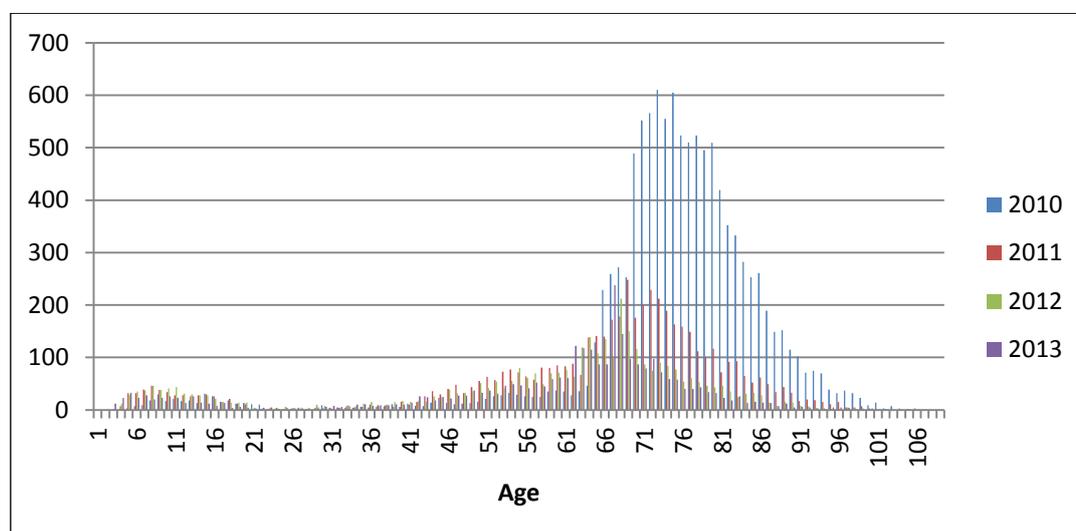
The NPDP covers 14 chronic diseases: arthritis, asthma, benign prostate hypertrophy, breast cancer, diabetes, epilepsy, glaucoma, high cholesterol, hypertension, ischaemic disease, prostate cancer, psychiatric illness, sickle cell anemia and thyroid disease. According to the data transmitted, hypertension, diabetes and hypercholesterolemia are the three conditions most encountered. They account respectively for 36.5, 22 and 18 per cent of all prescriptions in 2013 (see figure 3.3).

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[1] This number is lower than that anticipated in the previous review, where about 35,000 beneficiaries were expected.

Figure 3.3.   National Prescription Drug Plan, distribution by type of medical condition (2013)

■ DIABETES   ■ GLAUCOMA
■ HYPERCHOLESTEROLEMIA   ■ HYPERTENSION
■ ISCHAEMIC DISEASE   ■ PROSTATE CANCER
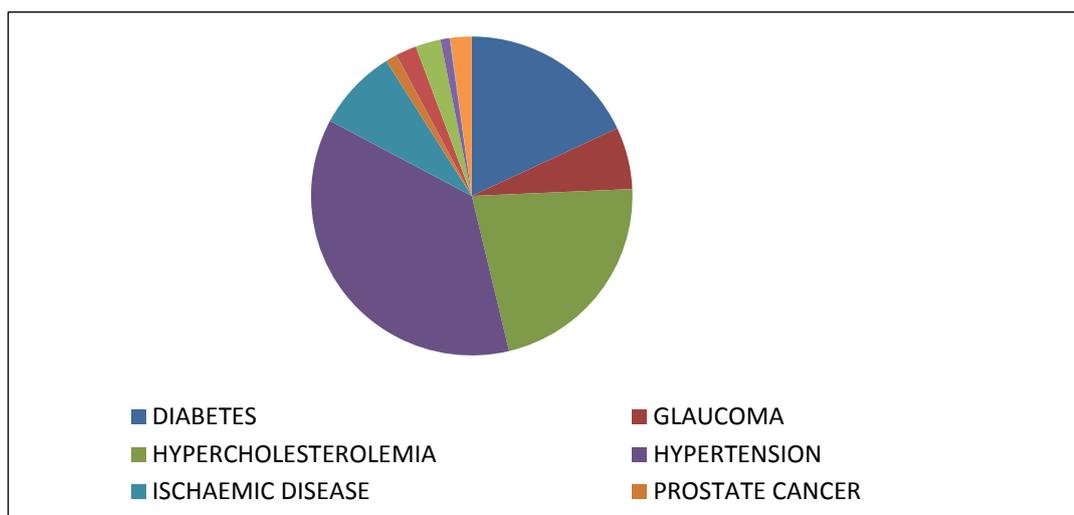
Table 3.7 shows the financial statement of the Medical Branch for the last three years. This branch is in deficit and it is foreseen that, with the increase in drug expenditure, the assets are going to be exhausted in coming years. In the data gathering process it has been observed that the amounts of money reimbursed for medicaments are not shown separately in the financial statements. To remedy this situation, adjustments have been made to the numbers in the table.

Table 3.7.   Medical Benefits Branch, statement of account (2011-2013) (BSD '000)

	2011	2012	2013
Total income	**3 615**	**3 587**	**3 330**
Contributions received	952	1 015	1 146
Investment Income	2 587	2 508	2 068
Other income	76	64	116
Total expenditure	**6 345**	**8 446**	**11 316**
Benefits paid (drugs)	3 289	5 688	8 429
General and administrative costs	3 056	2 758	2 887
Surplus	**(2 809)**	**(5 299)**	**(8 750)**
Assets at year end	**92 276**	**86 977**	**78 227**

Note: Benefit expenditure of the NPDP has been transferred from administrative expenditure to benefits paid.
Source: NIB.

It is important to bear in mind that a transfer of assets of BSD 20 million has been made in 2014 from the Short-Term to the Medical Benefits Branch. This amount of money represents the reimbursement, without interest, of a loan from the Medical Branch to the Short-Term Branch made in 2009 to rectify a temporary insufficiency in the Short-Term Benefits Branch. This insufficiency was corrected by the 2010 amendment of the allocation of contributions to the branches of the National Insurance Fund (NIF). Subsequent to this amendment the Short-Term Benefits Branch has recorded annual surpluses, so that it had no further need of the BSD 20 million.

For the year 2015, the Government has agreed to put in its budget the cost of the NPDP and of the preparatory activities for the coming National Health Insurance (NHI)

plan. This means that external financing mechanisms will to be available to mitigate the financial pressure on the Medical Benefits Branch, at least for the year 2015.

It is also important to bear in mind that the NPDP is going to be merged with the NHI in 2016. Depending on the financing mechanisms that will to be adopted, the future of the NPDP can be very different from that described in this report. For this actuarial valuation, we have assumed that external financing will be available to finance the NPDP. It should be borne in mind that from an actuarial valuation point of view, charging an explicit contribution rate and maintaining a lower reserve or charging no contribution rate at all and maintaining a higher reserve at the beginning until it is exhausted and then charging a contribution rate is all the same. It is only allocation of money over time. We however prefer to charge an explicit contribution rate to show the real cost of each branch.

Table 3.8 displays statistics concerning the NPDP for the last four years.

Table 3.8.   National Prescription Drug Plan statistics (2010-2013)

	Number of beneficiaries	Average no. of prescriptions	Average cost by prescription (BSD)
2010	4 416	4.7	17.9
2011	11 602	15.9	19.0
2012	14 950	20.3	19.6
2013	17 355	23.9	20.4
Source: NIB.			

Using these statistics, a short-term projection of cash flows of the next five years has been performed (table 3.9). The main assumptions are:

■ BSD 20 million are transferred from the Short-term Branch to the Medical Branch in 2014.

■ The Government pays for the cost of the NPDP in 2015.

■ In 2016, the NPDP is merged with the NHI, and external financing is available to finance this scheme.

■ The potential population covered is that targeted by the first two phases of implementation (about 181 persons).

■ Incidence rates (beneficiaries who claimed), average number of prescriptions and average cost by prescription have been projected by single age, according to the information transmitted. The following assumptions has been made to perform the projection:

  – The increase in the incidence rate starts at 7 per cent for the first year of projection and decreases by 1 per cent in each subsequent year.

  – The increase in the number of prescriptions is 5 per cent for the first projection year and decreases by 0.5 per cent for the following years.

  – The cost of medicaments increases by 2.5 per cent over the inflation rate each year.

  – The return on reserves is 2.5 per cent per year.

- All the general assumptions used for this actuarial valuation related to increases in salary, the inflation rate and mortality rates are used in this short-term projection.

Table 3.9.   Medical Benefits Branch and NPDP, overall projections (2014-2018) (BSD '000)

Years	Income			Expenses		Surplus (deficit)	Reserve (end year)	PAYG (%)
	Contributions *	Investment earnings	Others	Benefits	Administrative expenses			
2014	1 204	1 802	98	10 613	2 964	–10 474	87 753	0.54
2015	15 892	2 194	103	12 751	3 141	2 297	90 049	0.60
2016	18 519	2 251	114	15 223	3 297	2 366	92 415	0.66
2017	21 184	2 310	134	17 725	3 460	2 444	94 859	0.72
2018	24 000	2 371	164	20 368	3 632	2 535	97 395	0.78

* In this projection we make the assumptions that the contributions are paid according to the current rules for the year 2014: 0.5% of all contributions are allocated to the Medical Benefits Branch. In that year an additional amount of BSD 20 million is transferred from the Short-Term Benefits Branch to the Medical Benefits Branch. It is also assumed that, starting in 2015, external financing is available to pay the cost of the NPDP, and that all assets and expenditures of the Medical Benefits Branch will be transferred to the Long-term Branch in the base scenario.

The average cost would be 0.65 over the next five years, of which 0.15 per cent is for administrative purposes. This would then be the recommended contribution rate. A sensitivity analysis has been performed related to the inclusion of all the insured in the potential covered population. According to this sensitivity analysis, the cost of the NPDP would increase by 40 per cent, so that instead of 0.66 per cent in 2016, the PAYG in 2016 would be 0.95 per cent.

It is however important to note that with the assumption that external financing will be available to fund the NPDP, starting in 2015, the amount of reserve in the Medical Benefits Branch will be no longer necessary and can be transferred to the Long-Term (Pension) Branch. In the financial statements, it is suggested to hold a maximum amount of reserve equal to 1 year of benefits (this amount could be decreased in the future when the Pensions Branch reaches a state of maturity state). At the end of 2014, according to the projection, the reserve would amount to BSD 10.6 million. However, on 31 December 2014 a reserve of BSD 87.8 million is expected to appear in the financial statement for the Medical Benefits Branch. In our base scenario, the excess of the BSD 77.2 million at the end of 2014 (87.8 – 10.6) will be transferred to the Pension Branch for this actuarial valuation.

A sensitivity analysis has also produced (see below table 5.6), showing that if no external financing is made available to finance the NPDP an additional contribution rate of 0.65 will be necessary to finance the plan, which would have to be taken from the Long-Term Branch. In other words, by not having external financing for the NPDP, the part of the allocation of the current contribution rate (9.8 per cent) available for the Long-term Pension Benefits would be decreased.

3.3.   Valuation of the Industrial Benefits Branch

A separate actuarial valuation has been performed to evaluate the sustainability of the Industrial Benefits Branch. Data provided by the NIB were analysed and used to perform the valuation. The benefits paid are the following (more details can be found in Appendix 1):

- Temporary Employment Injury benefit;
- Disablement pension for permanent total disability;

–   Pension and Funeral benefit for death;

–   Medical care.

Although the financial implication of this scheme is much smaller than that for the general old-age, invalidity and survivors' pension scheme, an actuarial valuation must be performed to ensure that the contribution rate of occupational insurance is on track. Figure 3.4 illustrates the contribution rates necessary to finance the branch according to the financial statements. The rate is shown for each type of benefit. Medical care represents the largest part of the cost. Globally, over the last five years, the contribution rate is under 1 per cent.

Figure 3.4.   Industrial Benefits Branch, contribution rates (2009-2013)
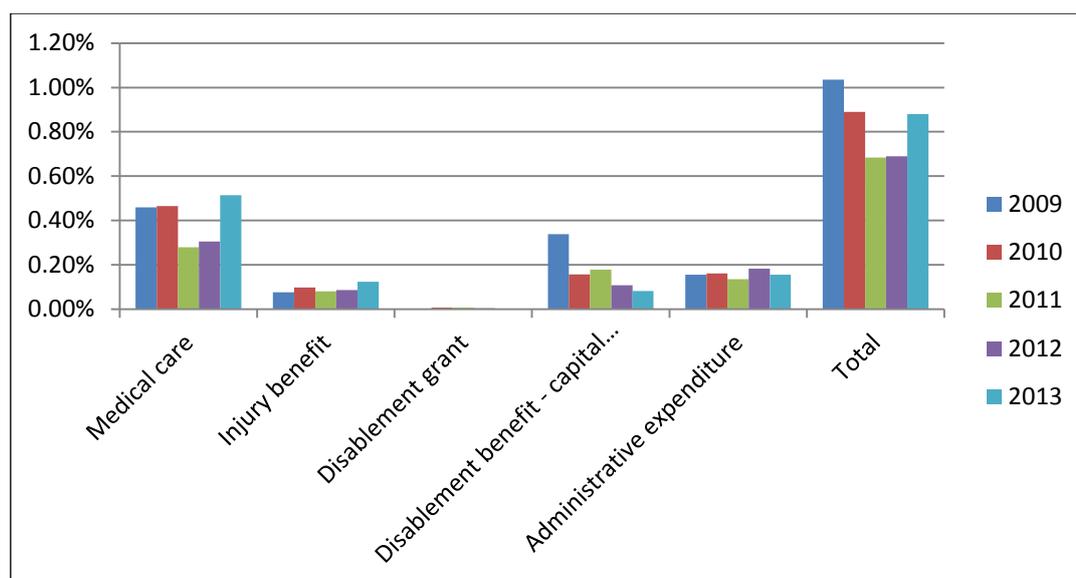
As shown in figure 3.4, the contribution rate for medical care increased considerably in 2013. Some information related to the year 2014 shows that the upward trend in medical care costs is continuing. According to the NIB, a preference for using private hospitals and private medical facilities instead of public ones explains the cost increase. This actuarial valuation is mainly based on the experience for the years 2009 to 2013. For medical care, however, an adjustment of 243 per cent has been brought to the projected cost to take into account this new and risky trend. Special attention should be given in the next actuarial valuation to the evolution in the cost of medical care benefits.

Table 3.10 shows the incidence rate per 1,000 persons insured for each of the principal benefits offered.

Table 3.10.   Industrial Benefits Branch statistics (2009-2013)

	Number of Injury benefits awarded per 1,000 insured	Number of Medical care claims per 1,000 insured	Number of Disablement benefits per 1,000 insured
2009	10	23	0.4
2010	12	19	0.4
2011	12	17	0.5
2012	12	18	0.6
2013	14	20	0.5

Note: On average, over the last five years fewer than four deaths related to employment injury have occurred.

A projection has been made of the costs of the Industrial Benefits Branch using the same methodology as was used to evaluate the Short-term Benefits Branch. The results are based on best-estimate assumptions; they are shown in tables 3.11, 3.12 and 3.13.

Administrative expenditures were assumed to be 0.15 per cent of total insurable salary, which represents the proportion related to employment injuries that appears in the financial statements. Again, it is important to mention that the main purpose of the valuation is to ascertain whether the financing of the NIB Industrial Benefits Branch is on course, and not to exactly forecast numerical values.

Table 3.11.   **Industrial Benefits Branch, contribution rates** (2014-2018) (in percentage)

Injury benefit	0.14
Medical care	0.89
Disablement benefit	0.25
Death benefit	0.02
Administrative expenditure	0.15
Total	**1.45**

A contribution rate of 1.45 per cent is thus recommended for the Industrial Benefits Branch.

Table 3.12.   **Industrial Benefits Branch, expected cash outflows** (2014-2018) (BSD '000)

	Injury benefit	Medical care	Disablement benefit	Death benefit	Administrative expenditure	Total
2014	3 421	22 390	6 263	478	3 758	36 310
2015	3 674	23 869	6 618	498	3 982	38 641
2016	3 906	24 957	6 937	525	4 180	40 505
2017	4 151	26 076	7 265	551	4 387	42 430
2018	4 411	27 289	7 613	577	4 605	44 494

Table 3.13.   **Industrial Benefits Branch, overall projections** (2014-2018) (BSD '000)

Years	Income			Expenses		Surplus (deficit)	Reserve (end year)	Contribution rate (%)
	Contributions	Investment earnings	Others	Benefits	Administrative expenses			
2014	36 326	4 684	254	32 552	3 758	4 954	138 764	1.45
2015	38 497	4 854	269	34 659	3 982	4 979	143 743	1.45
2016	40 409	5 029	283	36 324	4 180	5 216	148 960	1.45
2017	42 408	5 213	297	38 043	4 387	5 488	154 448	1.45
2018	44 514	5 406	312	39 889	4 605	5 738	160 185	1.45

In the financial statements an amount of BSD 133.8 million (112.5 plus 21.3) is held in reserve for the Industrial Benefits Branch. An exercise has been carried out to estimate a level of reserve by using the actuarial present values factor for the computation of capital values described in the third schedule of the National Insurance Financial & Accounting Regulations. According to this exercise, an amount of BSD 49 million is necessary to be held in reserve for Death pension and Disablement benefit. This illustrates that the amount of reserve maintained in the financial statements is not necessarily in line with the actuarial

valuation. It is recommended to update these actuarial factors frequently and to use them in establishing the required amount of reserve to be held in the financial statements, as well as for the actuarial valuation.

For this actuarial valuation. in addition to a reserve of BSD 49 million, a 0.75 year of payment of benefits for Injury, Medical, Death and Disablement benefits has been maintained as a contingency reserve. According to this, the total amount of reserve that should be in the financial statement for the industrial branch on 31 December 2013 is BSD 63.2 million. The excess of the current reserve (BSD 133.8 million) over this amount has been transferred to the Pension Branch in this actuarial valuation: BSD 70.7 million.

During discussions, some stakeholders have expressed concern regarding the fact that some employers are not paying the Industrial Benefits contribution according to their risks. It is well known that the risk of employment injury varies widely among different economic activities. For that reason, a structure of risk classification and ratemaking process depending on the economic activities can be seen as good practice. Inside a given group of employers (risk classification), some employers are also performing more than others relative to the management of the employment injury risk (number of cases, duration of benefits, implementation of safe work environment and return to work programme) while others are less efficient. For those who are performing well, it can be a fair practice to reward them for their good management. This can be achieved by recognizing in the contribution rates efforts carried on prevention activities and on the management of a return to work programme. When such a system is implemented, all the activities related to good risk management of the employment injury risk could make sense economically.

Such a classification system, based on the risks and the recognition of the experience of some employers in the ratemaking process, is however highly dependent on the availability, significance and quality of information. The size of the economy of a country should of course be taken into account during the design process of this kind of system. The economy of the Bahamas is of course smaller than in some countries that have adopted an approach based on the recognition of risks.

Developing a comprehensive rating system that takes into account risk classification and the risk and efficiency of employers is beyond the scope of the present review. It is however suggested to being a feasibility study on how the economic activities of employers could be taken into account in the ratemaking process of the Industrial Benefits Branch of the Bahamas.

3.4. Valuation of the Long-term (Pension) Benefits Branch

This review deals with expenditures and income. Long-term benefits will attain a mature state only after the youngest people of the first generation of contributors have become pensioners, have died and all survivors' pensions paid on their behalf have ceased. This requires that the situation of the scheme be analysed over a period that is long enough. For the current valuation, the projection period is 75 years, from 2013 to 2088.

The general methodology of the valuation is described in Appendices 3 and 5. For the present actuarial valuation, a basic scenario was produced based on best-estimate assumptions. Also, additional scenarios were produced to better understand major factors that have an impact on the financial soundness of the NIB and to assess uncertainties concerning possible modifications to the scheme that could be part of a future potential reform of pensions.

The main purpose of the valuation is to ascertain whether the financing of the NIB is on course over the long term, and not to exactly forecast numerical values. For example, in the past years, a lot of new retirees were not contributing to the scheme at the moment of retirement but were classified as inactive members. This creates some uncertainties concerning the number of retirees and the moment of the retirement. It is very important to take all these inactive members into account because they have accumulated rights in the scheme. Due to the long-term nature of assumptions, absolute figures include a high degree of uncertainty. Therefore, results have to be interpreted carefully and future actuarial reviews will have to be undertaken on a regular basis to revise actuarial assumptions in light of the actual experience of the scheme.

3.4.1. Demographic projections

Demographic projections are shown in table 3.14. Demographic ratios for old age, invalidity and survivors' benefits are also shown in figure 3.5 to better see the trends in the evolution of this indicator. The demographic ratio is the ratio of pensioners to active participants. The total number of contributors follows a rate of growth derived from the projection of the general population, labour force and employed population, as described in Section 2.1 above. The number of pensioners grows rapidly during the projection period. This is due to the fact that the scheme is not yet mature. As a result, the ratio of pensioners to contributors (demographic ratio) grows from 25.4 to 72.7 per cent in 2088. The same conclusion can be drawn from figure 3.5, showing that the scheme will become more mature over the next 75 years. Toward the end of the projection period, the old age benefits demographic ratio becomes more stable as the scheme enters into a more mature state. The ratio of pensioners to contributors is normally a good indicator of the increasing cost of the scheme. This directly affects the PAYG cost of the scheme, as presented in the next section.

Table 3.14. Long-term (Pension) Benefits Branch, demographic projections (2014-2088)

| Years | Numbers and actives members and beneficiaries | | | | | Cash benefits | Demographic ratio (in percentage) | | | | | |
| | Contributors | Pension | | | | | Pension | | | | | |
		Old Age	Disability	Survivors	Assistance	Old Age + Survivors	Old Age	Disability	Survivors	Assistance	Total	Cash benefits
2014	152 026	23 452	2 779	7 050	5 290	240	15.4	1.8	4.6	3.5	25.4	0.2
2015	155 071	24 805	2 923	7 630	5 243	293	16.0	1.9	4.9	3.4	26.2	0.2
2016	157 982	25 514	3 081	8 175	5 189	327	16.1	1.9	5.2	3.3	26.6	0.2
2017	160 782	26 292	3 256	8 662	5 135	407	16.4	2.0	5.4	3.2	27.0	0.3
2018	163 596	27 136	3 446	9 094	5 232	428	16.6	2.1	5.6	3.2	27.5	0.3
2019	166 430	28 053	3 646	9 471	5 372	444	16.9	2.2	5.7	3.2	28.0	0.3
2020	169 550	29 026	3 852	9 804	5 535	504	17.1	2.3	5.8	3.3	28.4	0.3
2021	173 205	30 090	4 063	10 102	5 770	557	17.4	2.3	5.8	3.3	28.9	0.3
2022	176 662	31 226	4 276	10 374	6 020	578	17.7	2.4	5.9	3.4	29.4	0.3
2023	179 905	32 401	4 491	10 630	6 280	582	18.0	2.5	5.9	3.5	29.9	0.3
2028	190 751	39 358	5 546	11 848	8 076	657	20.6	2.9	6.2	4.2	34.0	0.3
2033	192 840	48 094	6 473	13 149	10 016	731	24.9	3.4	6.8	5.2	40.3	0.4
2038	193 348	56 166	7 214	14 461	11 957	863	29.0	3.7	7.5	6.2	46.4	0.4
2043	194 743	62 795	7 778	15 635	14 010	917	32.2	4.0	8.0	7.2	51.5	0.5
2048	197 251	67 597	8 246	16 603	16 074	957	34.3	4.2	8.4	8.1	55.0	0.5
2053	199 283	71 969	8 700	17 328	17 673	786	36.1	4.4	8.7	8.9	58.0	0.4
2058	199 084	76 942	9 146	17 729	18 358	477	38.6	4.6	8.9	9.2	61.4	0.2
2063	196 662	82 318	9 533	17 789	17 325	623	41.9	4.8	9.0	8.8	64.6	0.3
2068	193 686	87 287	9 802	17 581	16 609	594	45.1	5.1	9.1	8.6	67.8	0.3
2073	191 150	91 265	9 938	17 317	16 130	594	47.7	5.2	9.1	8.4	70.4	0.3
2078	190 165	93 491	10 011	17 116	15 672	501	49.2	5.3	9.0	8.2	71.7	0.3
2083	189 939	94 295	10 138	17 086	15 127	523	49.6	5.3	9.0	8.0	71.9	0.3
2088	188 988	95 049	10 339	17 044	14 890	542	50.3	5.3	9.0	7.9	72.7	0.3

Figure 3.5.   Long-term (Pension) Benefits Branch, demographic ratios by type of benefit
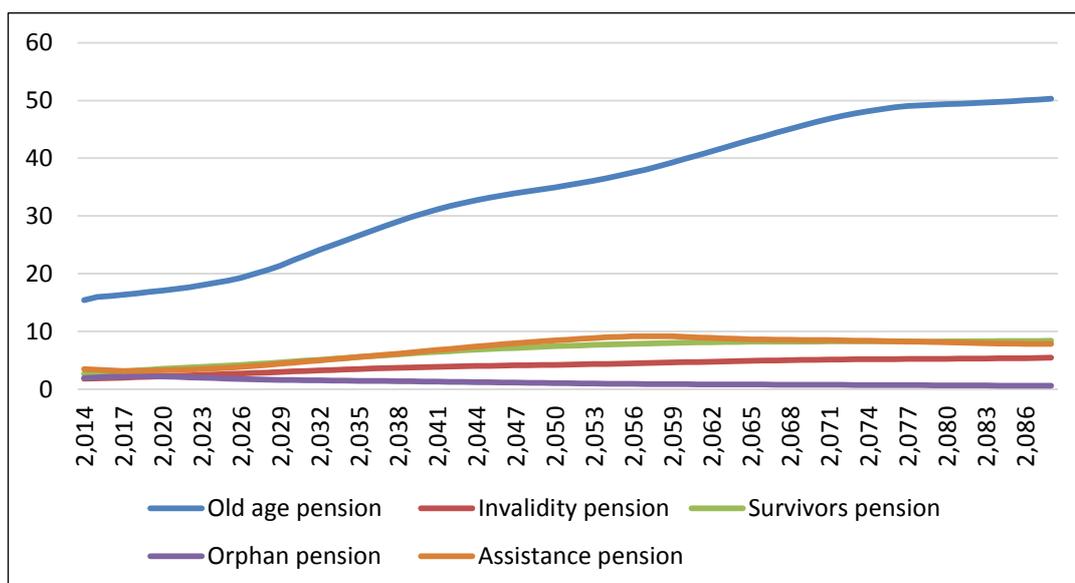
3.4.2. Financial projections

Tables 3.15 and 3.16 show the breakdown of benefits paid throughout the projection period. Old age benefits will become increasingly important with time.

Table 3.15.   Long-term (Pension) Benefits Branch, projected benefit amounts (2014-2088) (BSD '000 000)

Years	Pension				Cash benefits	Total
	Old age	Disability	All Survivors	Assistance	Grants	
2014	131	14	17	16	2	180
2015	142	15	18	15	3	194
2016	157	18	21	16	3	215
2017	164	19	22	16	5	226
2018	179	21	25	17	5	247
2019	188	23	26	17	6	260
2020	207	26	29	19	7	286
2021	218	28	30	20	8	303
2022	240	31	33	21	8	333
2023	254	33	34	22	9	352
2028	391	49	46	33	12	531
2033	582	66	60	46	15	770
2038	853	88	79	63	21	1 104
2043	1 134	109	99	82	26	1 449
2048	1 502	138	126	106	31	1 905
2053	1 868	169	151	131	30	2 349
2058	2 423	215	185	152	27	3 003
2063	3 011	259	212	160	42	3 684
2068	3 850	319	251	172	49	4 641
2073	4 631	370	283	187	56	5 526
2078	5 679	445	333	203	55	6 716
2083	6 531	517	377	219	68	7 712
2088	7 865	632	443	242	83	9 265

Table 3.16. Long-term (Pension) Benefits Branch, projected benefit percentages (2014-2088)

Years	Pension				Cash benefits	Total
	Old age	Disability	All Survivors	Assistance	Grants	
2014	72.8	7.9	9.4	8.7	1.2	100.00
2015	73.1	7.9	9.5	8.0	1.6	100.00
2016	73.0	8.2	9.8	7.5	1.6	100.00
2017	72.6	8.4	9.9	7.0	2.1	100.00
2018	72.5	8.6	10.0	6.8	2.1	100.00
2019	72.3	8.8	10.1	6.7	2.1	100.00
2020	72.1	9.0	10.0	6.5	2.3	100.00
2021	71.9	9.1	9.9	6.5	2.6	100.00
2022	72.1	9.2	9.8	6.4	2.5	100.00
2023	72.1	9.3	9.7	6.4	2.5	100.00
2028	73.5	9.3	8.7	6.3	2.2	100.00
2033	75.6	8.6	7.7	6.0	2.0	100.00
2038	77.2	8.0	7.2	5.7	1.9	100.00
2043	78.2	7.5	6.8	5.7	1.8	100.00
2048	78.9	7.3	6.6	5.6	1.7	100.00
2053	79.5	7.2	6.4	5.6	1.3	100.00
2058	80.7	7.2	5.8	5.1	0.9	100.00
2063	81.7	7.0	5.8	4.3	1.1	100.00
2068	83.0	6.9	5.4	3.7	1.1	100.00
2073	83.8	6.7	5.1	3.4	1.0	100.00
2078	84.6	6.6	5.0	3.0	0.8	100.00
2083	84.7	6.7	4.9	2.8	0.9	100.00
2088	84.9	6.8	4.8	2.6	0.9	100.00

Figure 3.6 shows the evolution of the system replacement ratio by type of benefit. This ratio is defined as the average pension of pensioners over the average insurable salary of active members. The old-age replacement ratio increases for the first 40 years of the projection. That those who were considered as pensionable civil servants are now contributing on their full salary (subject to the ceiling) since 2013, that the ceiling was increased considerably during the last few years (in 2011 and 2013) and that the gratuities are now included in the insurable salary are all factors that contribute to the increase in the old age system replacement ratio. The replacement ratio for the invalidity benefits follows the same pattern as the old-age benefit, but to a lesser extent. The replacement ratio for the assistance benefit and the orphan pension decreases during the projection period because these benefits are adjusted to inflation, which grows less rapidly than the insurable salary.

There are some jumps in figure 3.6. This is because the benefits are adjusted for inflation every two years.

Figure 3.6. Long-term (Pension) Benefits Branch, system replacement ratios by benefit type (2014-2088)
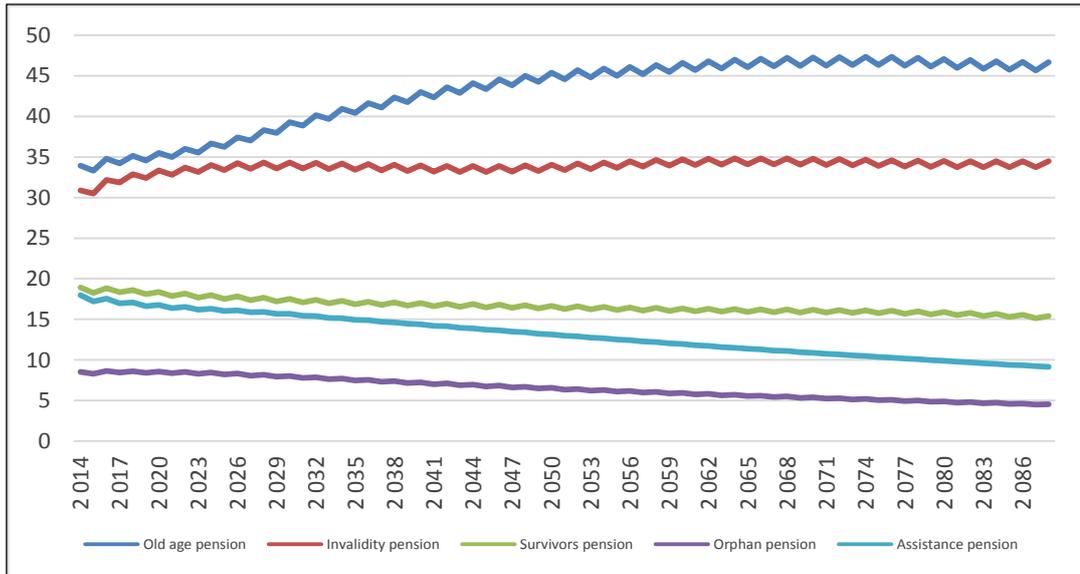
The PAYG rate rises from 8.5 per cent in 2013 to 28.9 per cent in 2088. This rate is the total expenditures as a percentage of insurable earnings (figure 3.7). It represents the contribution rate that would be required to pay all the expenditures of the scheme (benefits, administrative and other expenses), year after year, in the absence of a reserve. The high increase in the PAYG rate is mainly due to the increase of the demographic ratio, as explained in the previous section. In fact, there are more and more pensioners receiving benefits, while the number of contributors does not grow as fast.

Figure 3.7. Long-term (Pension) Benefits Branch, projected PAYG rates (2014-2088)
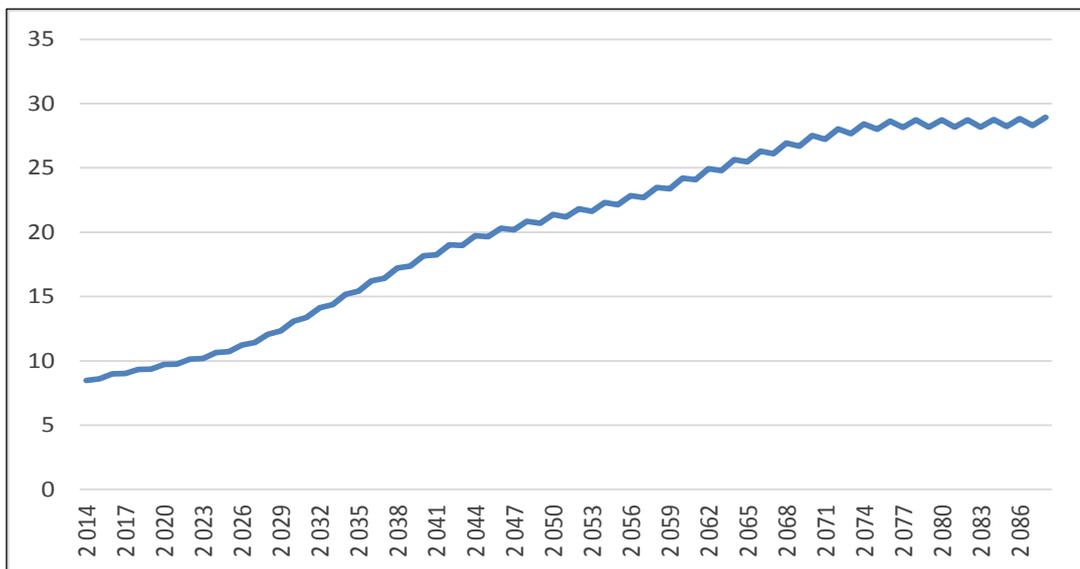
Table 3.19 shows the results of the financial projections in terms of cash flows and reserve. For the projection of the pension branch, a 6.2 per cent contribution rate and a reserve of BSD 1,585.9 at the beginning of the projection period are used. The contribution rate is derived by subtracting from the global contribution rate of 9.8 per cent, all the contribution rates recommended for the other branches. The same process applies to the allocation of reserve. It is recommended to read the section related to each benefit for a better understanding of the approach. Tables 3.17 and 3.18 summarize the exercise.

Table 3.17. Breakdown of the contribution rates by branch (in percentage)

Branch	Contribution rate
All branches	9.8
Short-term benefits (excluding unemployment insurance)	1.45
Unemployment insurance	0.7
Medical benefits	External financing
Industrial benefits	1.45
Pension benefits	6.20

Table 3.18. Financial projections, breakdown of the reserve by branch (December 2013) (BSD millions)

Branch	Reserve
All branches	1 686.6
Short-term benefits	27.4
Industrial benefits	63.2
Medical benefits *	10.1
Pension benefits	1 585.9

* BSD 10.6 million in December 2014, or 10.1 million in December 2013.

Table 3.19. Long-term (Pension) Benefits Branch, financial projections, cash inflows, cash outflows and reserve (2014-2088) (contribution rate of 6.2 per cent)

Years	Income			Expenses		Surplus (Deficit)	Reserve (end year)	PAYG (%)	Reserve ratio
	Contributions	Investment earnings	Others	Benefits	Administrative expenses				
2014	156	76	5	180	33	19	1 609	8.5	7.6
2015	165	73	5	194	35	9	1 623	8.6	7,1
2016	173	69	5	215	36	–9	1 620	9.0	6.5
2017	182	69	4	226	38	–13	1 611	9.0	6.1
2018	191	68	3	247	40	–28	1 586	9.3	5.5
2019	200	67	2	260	42	–35	1 553	9.3	5.1
2020	211	65	1	286	44	–55	1 499	9.7	4.5
2021	222	62	0	303	47	–65	1 435	9.7	4.1
2022	234	59	0	333	49	–90	1 345	10.1	3.5
2023	246	54	0	352	52	–103	1 242	10.2	3.1
2028	306	14	0	331	64	–275	258	12.1	0.4
2033	365	0	0	770	76	–481	0	14.4	0.0
2038	430	0	0	1 104	90	–764	0	17.2	0.0
2043	508	0	1	1 449	107	–1 047	0	19.0	0.0
2048	604	0	1	1 905	127	–1 427	0	20.9	0.0
2053	716	0	1	2 349	150	–1 783	0	21.6	0.0
2058	839	0	1	3 003	176	–2 340	0	23.5	0.0
2063	972	0	1	3 684	204	–2 915	0	24.8	0.0
2068	1 122	0	1	4 641	235	–3 754	0	26.9	0.0
2073	1 299	0	1	5 526	272	–4 500	0	27.7	0.0
2078	1 517	0	2	6 716	318	–5 517	0	28.7	0.0
2083	1 779	0	2	7 712	373	–6 306	0	28.2	0.0
2088	2 078	0	2	9 265	436	–7 622	0	28.9	0.0

Figures 3.8 and 3.9 show the evolution of the reserve over the projection period. The main observations are:

1. As it is currently the case, annual contributions are not sufficient to pay for all annual expenditures.

2. Investment income must be used to pay for annual expenditures. The reserve still grows, but at a slower pace.

3. Starting in 2016, total income (contributions, investment income and other income) are no longer sufficient to pay for annual expenditures. The reserve starts to decrease.

4. During the year 2029, the reserve drops to zero.

5. Starting in 2029, the required annual contribution rate to pay for all expenditures becomes the PAYG rate. As an illustration, this rate is 12.3 per cent in 2029.

6. The reserve ratio, which is the ratio of the end-of-year reserve over the annual expenditures for the year, moves from 7.6 to 0 between 2014 and 2029. This ratio can be interpreted as the number of years during which annual expenditures could be paid by the reserve if there were no contributions, no investment income and no other income.

Figure 3.8. Projection of the reserve (2014-2028) (BSD '000 000)
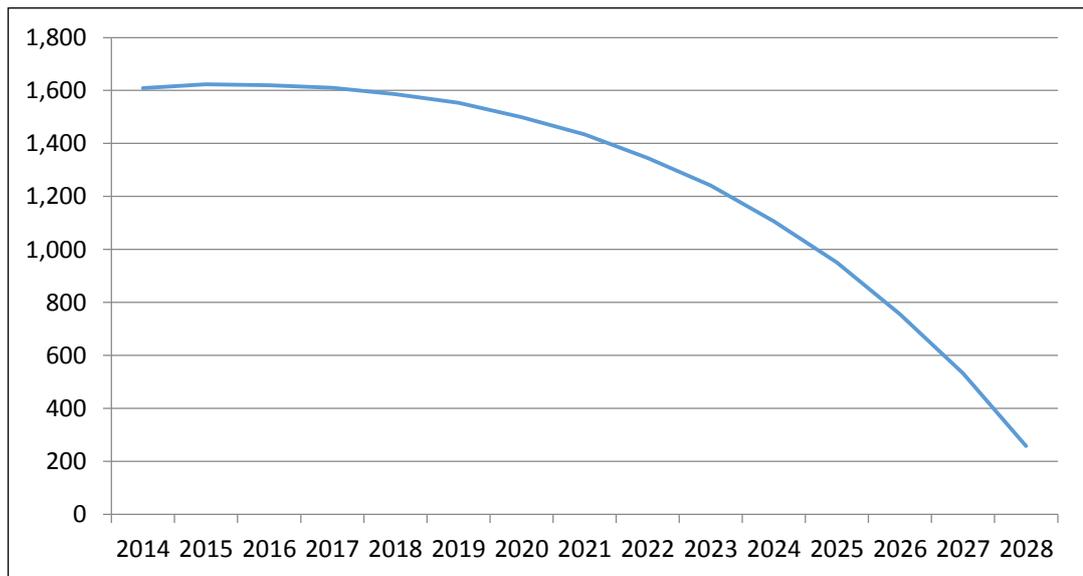
Figure 3.9. **Projection of the reserve-to-expenditures ratio** (2014-2028)
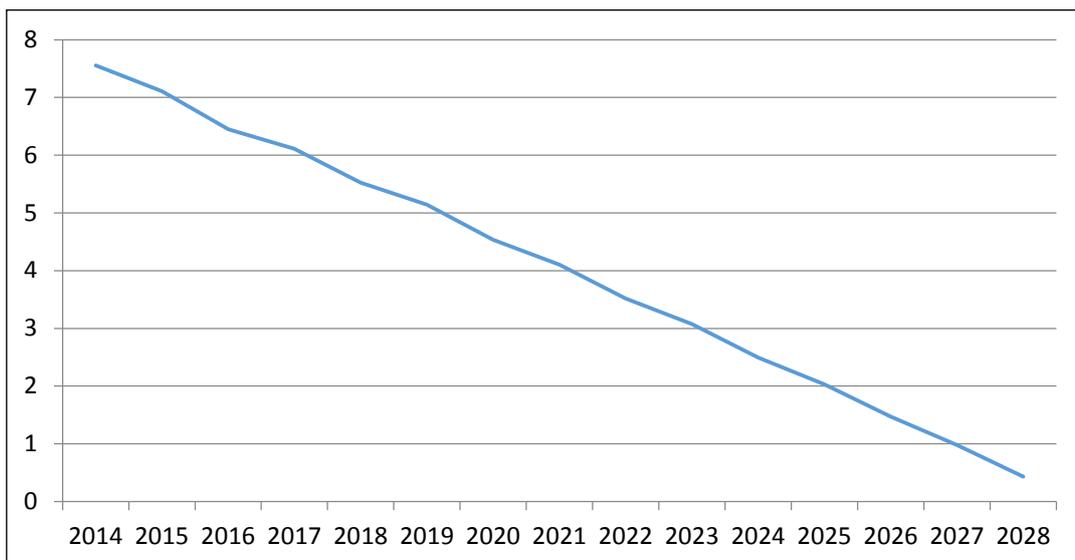
Another very important result of the financial projection is the general average premium (GAP). The GAP can be calculated in two ways:

1. The annual contribution, as a percentage of insurable earnings, necessary to pay for all expenditures over the entire projection period, without considering the reserve. In the current valuation, this GAP is 18.9 per cent. Figure 3.10 shows the evolution of the RER ratio if a contribution rate of 18.9 per cent is used throughout the projection period.

2. The annual contribution, as a percentage of insurable earnings, necessary to pay for all expenditures over the entire projection period, but assuming that the initial reserve will be exhausted at the end of the projection period. In the current valuation, this GAP is 17.8 per cent. The problem with this definition of the GAP is that by financing the scheme at a contribution rate of 17.8 per cent, there would be no reserve left in 2088, meaning that the contribution rate would have to increase instantly to around 29 per cent (the PAYG rate) in 2088. Such an increase would not be viable for the scheme.

Figure 3.10. **Projection of the reserve-to-expenditures ratio, contribution rate of 18.9 per cent** (2014-2088)
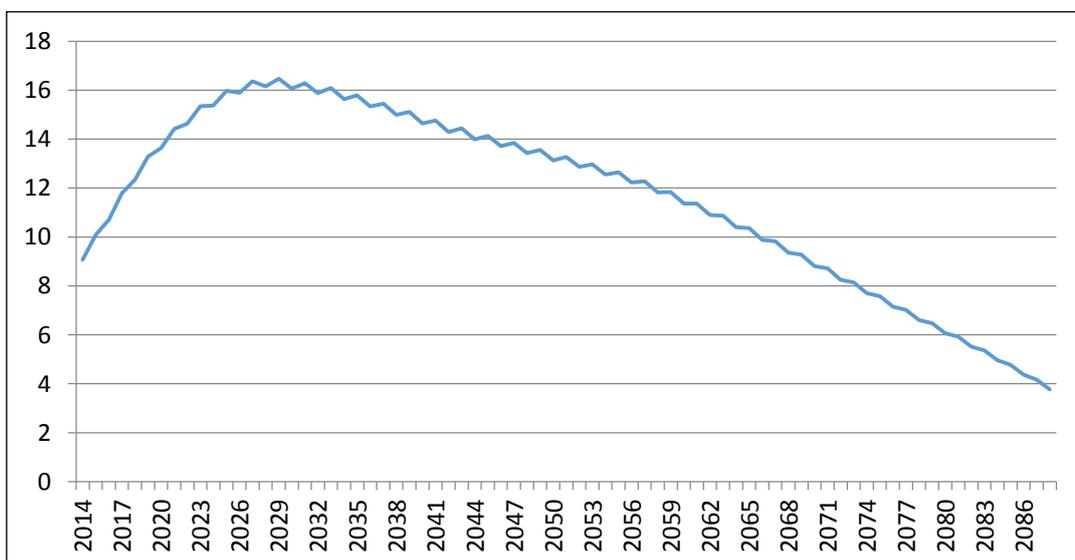
Table 3.20 shows the actuarial balance of the scheme, based on the second definition above. Taking into account the initial reserve and the present value of future contributions and benefits, there is a cumulative shortfall, in present value, of BSD 17,557 million. By increasing the contribution rate by 11.6 per cent (which means a total contribution rate of 17.8 per cent), there would be no shortfall as the present value of future contributions and the initial reserve would be sufficient to pay for the present value of future benefits.

Table 3.20. **Actuarial balance, financial projection** (2014-2088) (BSD millions)

	2013 year-end reserve	1 585
Plus	Present value (PV) of future contributions	9 352
Minus	Present value of future expenditures	28 494
Equal to	Present value of future surplus (shortfall)	(17 557)
	Actuarial balance (% of PV of future insurable earnings)	**−11.6%**

4. Reconciliation with the previous actuarial valuation

The long-term projected cost of the NIB in this valuation is different from that projected in the last review. There are elements related to the methodology and the assumptions that, when taken alone, produce different results from those expected in the previous valuation. This section explains these differences based on a comparison of the GAP in the 2011 valuation versus the actual GAP in the 2013 valuation. The effect of the GAP over 60 years is used, rather than other indicators of cost, to capture the long-term impact and the magnitude of the changes between the two valuations.

In the previous valuation, the GAP over the next 60 years was 20 per cent, which can be broken down into three main components as shown in table 4.1. It is important to keep in mind that the definition of the GAP is the contribution rate that is necessary to pay all expenditure over the next 60 years, without reference to the level of the reserve. In other word, after 60 years, there is a reserve and the reserve ratio is 4.7.

Table 4.1.   Decomposition of the GAP, 9th Actuarial Valuation (2011) (in percentage)

Description	GAP
Administrative and other expenditure	2.0
Other expenditure (includes the NPDP)	0.4
Short-term benefits (benefits only)	1.5
Industrial benefits (benefits only)	0.7
Pension benefits (benefits only)	15.4
Total	**20.0**

Note: The total may not balance due to rounding.

As explained previously, in this actuarial valuation (as in the previous one) each type of benefit is analysed separately. But benefits are not all combined together into one projection. In our opinion, it does not make sense to project short-term benefits over 60 years, and the actuarial valuation should take into account the nature of each benefit offered. Short-term benefits are projected over a short-term period, while pension benefits are projected over a long period. From table 4.1, it is easy to realize that the challenges the NIB will face in the future principally apply to pensions. The current total contribution rate is 9.8 per cent.

Table 4.2 compares the results of the present actuarial valuation with the previous one. For pensions, the contribution rate is equivalent to the GAP calculated over a period of 60 years. Differences in the contribution rate exist for the Medical Benefits Branch, the Short-term Benefits Branch and the Industrial Benefits Branch. Globally, for these three branches the difference is 0.95 per cent higher in this actuarial valuation. The differences can be explained by the use of a different methodology and different assumptions.

Table 4.2. GAP and contribution rates, comparison of 9th and 10th Actuarial Valuations, 2011 and 2013

Description	GAP 2011 (%)	Contribution rate 2013
Administrative expenditure and other expenditure	2.0	2.00
Other expenditure (includes the NPDP)	0.4	0.50
Short-term benefits (benefits only)	1.5	1.75
Industrial benefits (benefits only)	0.7	1.30
Pension benefits (benefits only)	15.4	16.10
Total	**20.0**	**21.65**

Notes: Totals may not balance due to rounding. Administrative expenditure as a percentage of insurable salary for the Pension Branch is 1.3 per cent.

The rest of this section is devoted to the difference in the Pension Branch. To carry out the reconciliation between the two actuarial valuations, the GAP calculated over a period of 60 years is used, as defined in the previous actuarial valuation. It is important to bear in mind that for the current actuarial valuation the GAP is calculated over a period of 75 years in order to be able to see the ultimate trend in the long term.

For the Pension Branch, the GAP as of the end of the year 2013, calculated using all the new data, assumptions and methodologies of the 2013 valuation, is 16.1 per cent. [1] This is an increase of 0.7 per cent compared to the previous actuarial valuation. The increase is due to many factors that can offset each other, some having a minor effect and others with a major impact. The most important factors are explained below:

1. If the results expected in the 2011 valuation had been realized in 2012 and 2013, and if the same assumptions and methodologies as in that valuation were used in the 2013 valuation, the 60 years GAP as of the end of the year 2013 would have been 15.9 per cent, a 0.5 per cent increase over the previous GAP calculated at 15.4 per cent.

2. The methodology of the projection has been modified, increasing the contribution rate by 0.3 per cent. The most important modification refers to the explicit recognition of the pension formula of those who are pensionable civil servants.

3. The mortality tables for males and females have been modified in the current valuation. Compared to 2011, a higher improvement in mortality is assumed, increasing the GAP by 0.6 per cent.

4. Family assumptions have been modified in the 2011 valuation based on data submitted by the NIB. This change increases the GAP by 0.2 per cent.

5. The initial and projected covered population of the 2011 valuation, including the inactive population, is different from that used in this valuation. The net impact is a decrease of 2.1 per cent in the GAP.

6. Based on new data available, the density factors were recalculated. The new assumption decreases the GAP by 0.5 per cent.

7. The disability rates were updated to take into account the experience of the last two years. This has contributed to increase the GAP by 0.2 per cent.

[1] Note that the GAP used for the reconciliation between the two valuations is the contribution rate required to pay all expenditures over the projection period without considering the reserve. The same conclusions would have been drawn using the GAP that considers the initial reserve.

8.   The changes in the salary scale and in the economic assumptions have produced an increase of 0.8 per cent in the GAP.

9.   The distribution of years of service at the beginning of the projection period has increased the GAP by 0.1 per cent.

10.   The increase in the number of initial beneficiaries has produced an increase of 0.4 per cent in the GAP.

11.   The number of people receiving the assistance payment in this actuarial valuation is higher than expected in the previous actuarial valuation. This higher number has occasioned an increase in the GAP of about 0.6 per cent.

12.   The inflation rate is lower in this actuarial valuation than in the previous one, occasioning a decrease in the adjustment to pensions in payment. This has created a decrease in the GAP of 0.4 per cent.

Table 4.3 summarizes the reconciliation of the 2011 GAP starting from the expectations in the 9th Actuarial Valuation.

Table 4.3.   Pension benefits, reconciliation between the 9th and 10th Actuarial Valuations, 2011 and 2013

GAP (60 years) (Pension benefits only)	**15.4**
Change in the projection period from 2012-2071 to 2014-2073	0.5
Change in the methodology	0.3
Change in the mortality rates	0.6
Change in the family statistics	0.2
Change in the population (active and inactive)	(2.1)
Change in the density of contributions	(0.5)
Change in the invalidity rates	0.2
Change in the insurable salary	0.8
Distribution of year of service	0.1
Pension in payment	0.4
Assistance	0.6
Adjustment to pensions in payment	(0.4)
GAP 2013 (60 years) (Pension benefits only)	**16.1**
GAP 2013 (75 years) (Pension benefits only)	**17.6**
GAP 2013 (75 years) (all expenditure)	**18.9**

5.   Sensitivity analysis

The following section considers only the Pension Benefits Branch. The previous section showed that, under the basic scenario, a contribution rate of 18.9 per cent is necessary to pay all the expenditures of the Pension Branch for the next 75 years, without taking into account the initial reserve. This section will discuss some other scenarios built to better understand the risks and what is at stake for the NIB. The scenarios discussed here are the following:

(1)   Return on assets;

(2)   Population growth;

(3)   Mortality rates;

(4)   Average salary increase.

5.1.   Return on assets

The assumption concerning the return on assets in the base scenario is 5.0 per cent at the beginning of the projection period, decreasing to the ultimate level of 4.5 per cent after two years. Table 5.1 shows the impact of having a return 0.5 per cent lower and 0.5 per cent higher than in the base scenario. A change in the return on assets has no impact on the PAYG rate, because when calculating this rate the amount of reserve is not taken into account.

Table 5.1.   Sensitivity analysis, return on assets

Scenarios	GAP (%)	PAYG 2088 (%)	Year reserve = 0
Base	18.9	28.9	2029
+0.5%	18.2	28.9	2029
–0.5%	19.6	28.9	2028

Having a higher or lower return on assets of 0.5 per cent will not affect the moment of the depletion of the reserve. Even with a return of 10 per cent per year, which is impossible to maintain over a long period, the reserve will be depleted in 2036. This scenario shows that even if the NIB Fund performs very well in terms of investment returns, it will not be sufficient to eliminate the coming financial problems of the scheme.

5.2.   Population growth

The PAYG rate is very sensitive to the assumption related to population growth. Two sets of sensitivity analyses have been performed, assuming a higher or a lower population growth throughout the projection period: one related to the fertility rate and the other to the employed population (table 5.2).

(1)   *The fertility rate:*

(a)   In the low fertility rate scenario we assumed that the fertility rate falls to reach 1.5 in 2025.

(b) In the high fertility rate scenario we assumed that the fertility rate rises to reach 2.1 in 2025.

(2) *Employed population:*

(a) In this scenario economic activity is much higher than is projected in the base scenario. The activity rates by age of male and female increase by 3 per cent over the next ten years, and the unemployment rate decreases to 7 per cent over the same period.

In our base scenario, the insured population grows at an annual rate of 0.34 per cent over the projection period. In the low fertility scenario, this growth is 0.05 per cent, while in the high fertility scenario it is 0.60 per cent. For the high employment scenario, the growth is 0.43 per cent.

In all scenarios the GAP is still over 18 per cent and the PAYG rate is very high 75 years later. Important modifications in the employment situation or in the fertility rates are not enough to change the upcoming trends.

Fertility rates have a high impact on partially funded schemes such as the NIB, especially where the reserve will be exhausted rapidly. Under the fertility rate scenarios, the reserve reaches zero at the same time as in the base scenario. Also in these scenarios, the effect on the contribution rate begins 20 years later, when people are entering the labour force. Under the high employment scenario the situation is different; the reserve reaches zero one year later. In fact, in this scenario, the effect is felt more in the short and medium term because after ten years the labour force participation rate and the unemployment rate stay constant.

It is very important to understand the impact of population growth in a pension scheme such as the NIB. Even if the labour force participation rate increases and the unemployment rate decreases in the coming years, the effect is not going to last forever. It will be good in the short and medium run, but in the long run there will be few changes. It is for this reason that under the high employment scenario, the PAYG rate at the end of the projection period will be close to that in the base scenario. But a permanent modification in the level of fertility rates can affect the scheme forever, all other things being equal. The cost can be lower in the long run if the fertility rates improve, but changes to the scheme will still be needed in future to make the scheme more sustainable.

Table 5.2.   Sensitivity analysis, population growth

Scenarios	GAP (%)	PAYG 2088 (%)	Year reserve = 0
Base	18.9	28.9	2029
Low fertility	19.6	34.4	2029
High fertility	18.2	24.9	2029
High employment	18.4	28.8	2030

5.3.   Mortality rates

The next two scenarios (table 5.3) show the impact on the projection of having mortality rates that are 10 per cent higher or lower than our best-estimate assumption. At age 60, a reduction in the mortality rates of 10 per cent increases life expectancy by about 10 months. The reverse is true for an increase of 10 per cent in the mortality rates.

Table 5.3.   Sensitivity analysis, morality rates

Scenarios	GAP (%)	PAYG 2088 (%)	Year reserve = 0
Base	18.9	28.9	2029
Low	19.5	30.0	2029
High	18.3	27.9	2029

5.4.   Average salary increase

Very often in pension plans, pensions are indexed annually according to the increase in inflation while salaries increase faster according to inflation plus a productivity component. The fact that the annual increase in salaries is higher than the pension adjustment has the effect of lowering the PAYG cost in the future because the basis for calculating contributions increases more rapidly than the average amount of benefits. As stipulated in the legislation, the pensions in payment will increase every two years according to inflation. The relation between the salary increase and the benefit increase is important in an actuarial valuation. In our base scenario it is expected that, in the long run, the increase in the average salary will be 1 per cent higher than the inflation rate. A sensitivity analysis has been produced to show the financial impact of an increase in real salaries that is 0.5 per cent higher or lower than in the base scenario. Table 5.4 shows the results.

Table 5.4.   Sensitivity analysis, salary increase

Scenarios	GAP (%)	PAYG 2088 (%)	Year reserve = 0
Base	18.9	28.9	2029
+0.5%	18.3	26.8	2029
–0.5%	19.4	31.2	2029

5.5.   Improvement in the compliance rate

In the base scenario we make the assumptions that there are no modifications to the expected experience regarding the compliance of employers. However, an internal study at NIB shows that improvement is possible in that area. According to the preliminary results of the study, an increase in the compliance rate can increase the participation rate, and the income, by about 10 per cent. A sensitivity analysis has been performed to illustrate the effect of such an increase on the results of the actuarial valuation. We make the assumptions that, during the first year of projection, participation in the scheme increases by 10 per cent. Table 5.5 shows that the results are slightly different, but not enough to change the conclusion. When the compliance rate is increased, new money enters the scheme at the beginning. However, over the long term, additional benefits are paid because of the additional liabilities that have emerged. So over the long run it does not make a lot of difference. This is shown in figure 5.1.

Table 5.5.   Sensitivity analysis, Increase in compliance rate

Scenarios	GAP (%)	PAYG 2088 (%)	Year reserve = 0
Base	18.9	28.9	2 029
Better compliance	18.2	28.7	2 031

Figure 5.1.   Sensitivity analysis, PAYG increase in compliance rate vs. base scenario
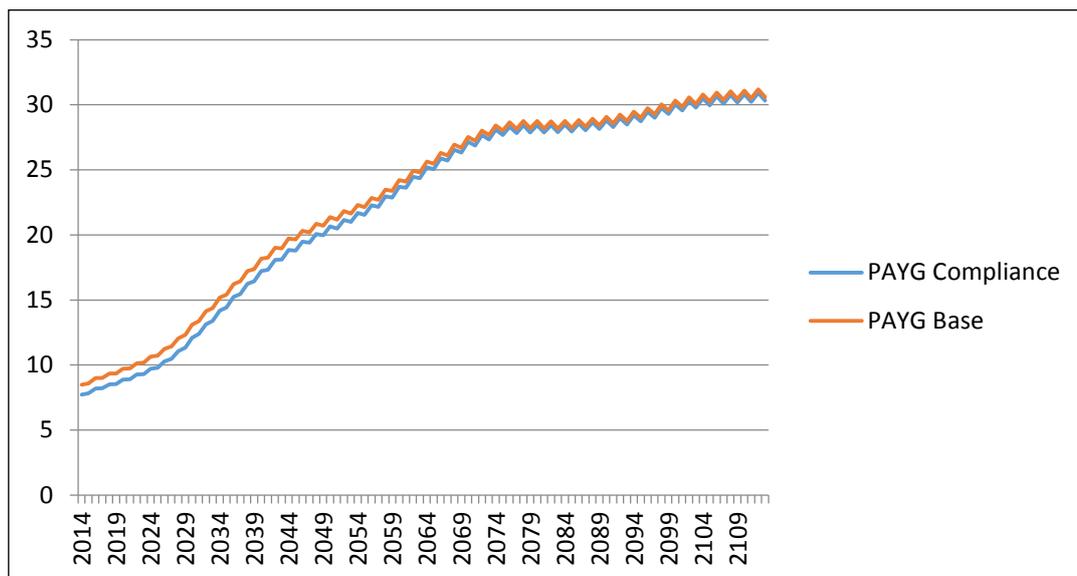
5.6.   No external financing for the NPDP

In the base scenario an assumption has been made regarding the existence of external sources of money to finance the NPDP: that, starting in 2015, the Government is going to finance the cost. A sensitivity analysis has been performed to measure the effect on the actuarial valuation if there are no such external sources of financing. In such a situation, a contribution rate of about 0.65 per cent should be levied to finance the NPDP. We make the assumption that this amount of money will come from the Long-term (Pension) Branch. The contribution rate for the Pension Branch would consequently decrease from 6.2 to 5.55 per cent, which would create additional pressure on the branch, as illustrated in table 5.6. The moment when the reserve would reach zero is now 2028 instead of 2029.

Table 5.6.   Sensitivity analysis, no external financing for the NPDP

Scenarios	GAP (%)	PAYG 2088 (%)	Year reserve = 0
Base	18.9	28.9	2029
5.55% contribution rate	18.9	28.9	2028

6.   Pension reform options and other issues

6.1.   Increase in the retirement age (from 65 to 67)

The current retirement age at the NIB is in line with the majority of the Caribbean islands. Some countries such as Grenada are still at age 60. In Barbados, an increase to age 67 is on process. The United States and many European countries have moved to higher age than 65. In Canada, for one part of the social security system, the retirement age is going to be increased to 67 years in 2029. Even if life expectancy in the Bahamas is lower than in some European countries, an increase in retirement age can be considered as a way to decrease the financial pressure over the long term. Such an increase should be normally planned over a long period so as not to affect the current population which is close to retirement.

In the sensitivity analysis (table 6.1), an increase in retirement age to age 67 is planned to occur in 35 years in a phased process whereby the retirement age will first move to age 66 in 25 years and to 67 in 35 years.

Table 6.1.   Sensitivity analysis, increase in the retirement age from 65 to 66 in 25 years, and from 66 to 67 in 35 years

Scenarios	GAP (%)	PAYG 2088 (%)	Year reserve = 0
Base	18.9	28.9	2029
Increase in retirement age	18.2	27.0	2029

The modification to the retirement age can also be accompanied by the application to the minimum pension of the early retirement reduction factors. Currently, for those who are taking their retirement before age 65 and receiving the minimum pension, the reduction that is applied is less than that obtained by the application of the early reduction retirement factor.

6.2.   Increasing the contribution rate

It is impossible to expect that the contribution rate for the Pension Branch can stay as low as it is at present. A contribution rate of 6 per cent to obtain the possibility of having 60 per cent of your last five best salaries at age 65 is a bargain – a bargain that future generations will have to pay if the current generation of contributors do not increase the contribution rate. One way to decrease the financial pressure for future generations is to start now with such an increase. Currently, the PAYG rate for the Pension Branch is 8.4 per cent. The contribution rate should be increased rapidly to at least this level.

Figures 6.1 and 6.2 show the effect of increasing the contribution rate according to three scenarios:

Scenario A

Increasing the contribution rate by 2 per cent every 5 years starting in 2016. In this scenario the contribution rate stops increasing in 2066 to stay at 28 per cent. The reserve ratio in this scenario is levelled at the end of the projection period at 2.3.

Scenario B

Increasing the contribution rate by 3 per cent in 2016 and 2021 and by 2 per cent in each of the following five years. In this scenario, the contribution rate stops increasing in 2056 to stay at 26 per cent. The reserve ratio is at 6 at the end of the projection period. It is specifically because the contribution rate has increased at a faster rhythm at the beginning of the projection period that the rate at the end is 2 per cent lower and the reserve ratio is much higher.

Scenario C

This is the same increase as in scenario B, but the assumption related to the return on investment is 0.75 per cent higher (the assumption related to nominal return on assets is 5.25 per cent). In this scenario, the contribution rate is 24 per cent at the end and the reserve ratio is at 7.

**Figure 6.1.** **Scenarios of different contribution rates** (in percentage)
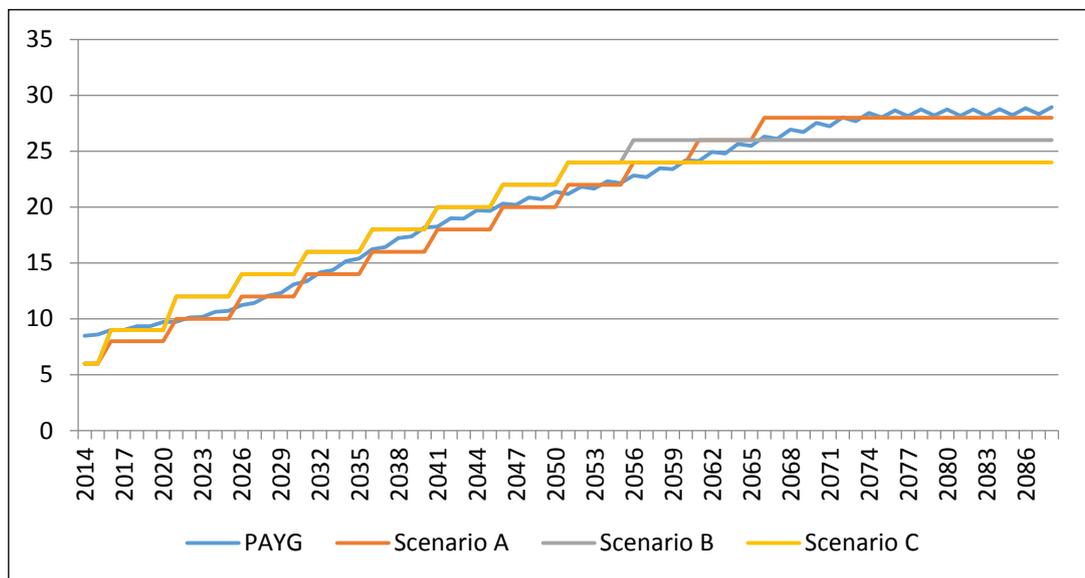
Figure 6.2. **Scenarios of different contribution rates, reserve ratio**
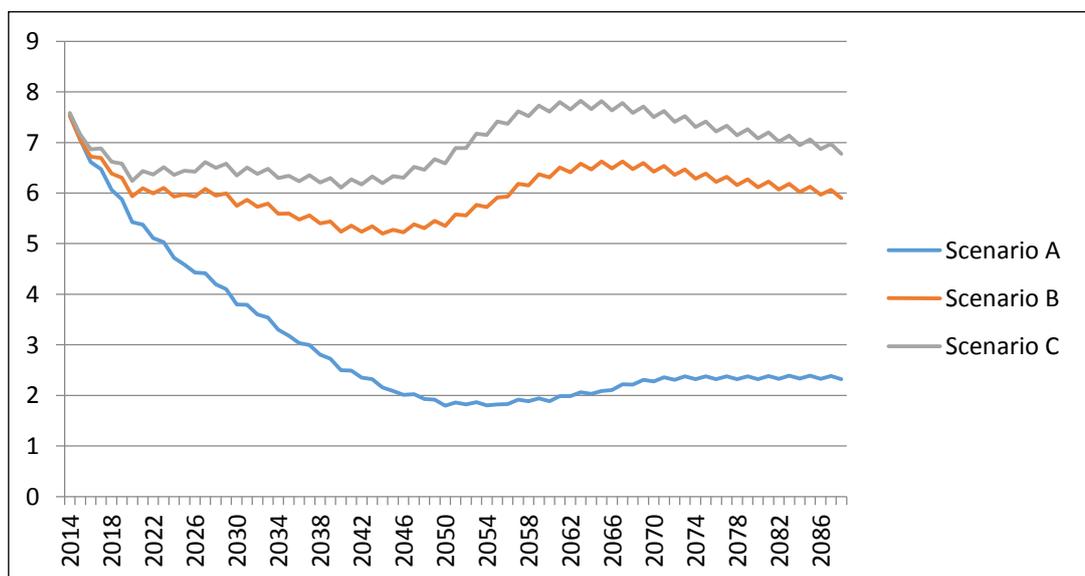
These scenarios illustrate that the sooner the increase in contribution rate takes place, the better it is for future generations. If the increase is accompanied by modifications in the investment policy to better reflect long-term objectives, this will also be beneficial for future generations.

6.3. Assistance benefits

On 1st July 2010, the Government ceased to pay for the assistance benefits. Since this date, the total cost of these benefits is borne by the contributors to the scheme, employers and employees. It is also noteworthy that this kind of benefit does not encourage people to contribute to the scheme. In fact, without contributing to the scheme, a person could receive a monthly pension of BSD 262, around 45 per cent of the average new Old Age pension.

There is probably a need to start a discussion between stakeholders concerning the design of the assistance benefits. The recent modification in the eligibility criteria of the pension formula is going to increase the number of persons who are expected to receive assistance benefits. This will create additional financial pressure on the scheme. An increase in the contribution rate can also have the effect of discouraging people from contributing to the scheme. This situation can be exacerbated when the level of social assistance (pension without contribution) is high when compared to the level of pension requiring payment of contributions.

6.4. Modifications to the pension formula

No sensitivity analysis has been performed on eventual modifications to the pension formula. The formula has been modified recently to increase the early retirement factor and the eligibility conditions. Of course, decreasing the pension benefits will decrease the financial pressure on the scheme. If important decreases in benefits are planned, for example, this should also be well coordinated with the role that private pension plans can play. We are now talking about major pension reform.

Another possibility for the future would be to put in place automatic adjustment mechanisms where, for example, the adjustment in pensions in payment can be conditional on the financial performance of the scheme. For example, if the financial performance is lower than expected, the increase in pension could be less than inflation. It is better to introduce such mechanisms in a global revision of the financing objectives of the scheme. Such automatic adjustment mechanisms can be designed in the elaboration of a funding policy.

6.5. Gratuities and Employment Injury benefits

Starting in July 2013, gratuities for people working in the hospitality sector are included in the insurable salary for the calculation of benefits and contributions. Contributions on the gratuities are paid entirely by the employees. This is based on a political decision related to the idea that when the gratuities are paid, no amount of money goes to the employer, but to the employee only. This idea is correct, but without the existence of gratuities the salary of the individual would have probably been higher and contributions would have been paid by the employer on these earnings.

In many countries (Canada, United States), tips or gratuities are part of the global remuneration and the employer's contribution should be paid on it. The idea on which the political decision has been taken in the Bahamas is thus not a universal rule and its

foundation can be questioned. The fact that employers pay contributions on gratuities also recognizes the fact that each stakeholder has a role to play in the social security system.

One element that is inacceptable in this logic relates to the fact that employers do not pay the cost on gratuities of the Industrial Benefits Branch. Employers are responsible for providing a safe work environment. If an accident happens, it is the employee who is denied compensation, basic salary and tips included. For that reason, contributions on the gratuities for at least the Industrial Benefits Branch should be made by the employer.

Moreover, this is not in accordance with the ILO Social Security (Minimum Standards) Convention, 1952 (No. 102) which states:

> The total of the insurance contributions borne by the employees protected shall not exceed 50 per cent of the total of the financial resources allocated to the protection of employees and their wives and children. For the purpose of ascertaining whether this condition is fulfilled, all the benefits provided by the Member in compliance with this Convention, except family benefit and, if provided by a special branch, employment injury benefit, may be taken together.

(Art. 71, para. 2)

Thus, employees should not pay more than 50 per cent of the contributions, excluding contributions for employment injury benefits.

With the current total contribution rate of 9.8 per cent of insurable wage and the recommended allocation of 1 per cent of insurable wage to the Industrial benefits, in order to comply with ILO Convention No. 102, employees should not contribute more than 4.4 per cent of their insurable wage (e.g. 50% x (9.8% − 1%)). With a contribution rate of 3.9 per cent on basic insurable salary plus 8.8 per cent on gratuities, all employees for whom gratuities represent more than 10.3 per cent of total insurable earnings contribute more than 4.4 per cent of their insurable wage.

So, even without considering the problem of the Industrial Branch, by letting the employees pay the entire amount of contributions on gratuities, there are situations where the breakdown of contributions between employers and employees does not comply with ILO Convention No. 102

Unions in the hospitality sector are trying to find ways to decrease the burden of the contribution payments related to gratuities. For example, they are analysing the possibility of excluding some benefits to avoid paying contributions. In our opinion, the social protection system should be mandatory for everybody. Compared to many countries, the Bahamas is performing well in this matter and should continue.

Solutions to decrease the burden on hospitality sector employees include, among others:

■   that the employers contribute their part related to social security on the gratuities;

■   that a special tax be levied directly on the gratuities to pay the social security contribution portion of the employers. This tax can come from, for example, an additional tax paid by tourists on their bill;

■   a combination of the two.

6.6.   Coordination of Sickness and Maternity benefits

Under Section 22 of the Act, an employer can adjust the amount of contractual sick or maternity leave pay to make sure that the sum of these benefits plus the amount of NIB benefit is not above the wage of the insured. It has been asked whether the adjustment in contractual sick or maternity leave pay should be limited to the portion of national insurance payment that relates to the basic pay only, not taking into account gratuities. According to some, this would seem logical since the employer is only contributing on the basic pay.

It is an insurance principle that you should not receive more money when disabled than the earnings you had before disability or sickness. It is not certain that the problem is really related to who is paying; it is more related to the fact that you should not profit (make money) when such a contingency happens. Of course, having two different payers always complicates things.

The individual who is paying contributions on gratuities is not in a situation of loss or of gain. Such an individual who becomes sick and receives the benefit calculated on the gratuities is going to receive benefits for what he or she has paid. Section 22 of the Act is only saying that the contractual sick or maternity leave pay is a second payer, and that there is a maximum, which is the total salary before the contingency. It is recommended that the wage used for this calculation comprise the total of the basic salary and the gratuities, and that the NIB benefit be calculated on the total of basic salary plus the gratuities.

6.7.   Transfer of assets to the Medical Benefits Branch

We have been asked to analyse the possibility of transferring assets from other branches to the Medical Benefits Branch because this branch is going to face financial pressure in the coming year. In fact, there is a need to finance the works related to the implementation of the new National Health Insurance scheme: BSD 50 million is needed according to the estimates discussed. This amount is supposed to be reimbursed by the Government. This actuarial valuation shows that at the end of 2015, the assets of the Medical Branch are expected to be BSD 54.8 million, but a large part of this amount is illiquid since it is invested in clinics and mini-hospitals.

This actuarial analysis clearly illustrates that the branch that is going to be under financial pressure is not the Medical Branch but the Pension Branch. In this actuarial analysis, it is opined that it is preferable to finance each branch separately. For that reason, it is suggested to levy an explicit contribution rate to finance the Medical Branch. It is understood that the introduction of the NHI scheme and the expansion of coverage to all insured persons is going to change the dynamic. But in our opinion, the logic remains the same and each branch should be financed explicitly.

If there is money to be transferred from another branch to the Medical Branch, it should be on a temporary basis only. It is not recommended to transfer an amount of reserve from the Pension Branch to the Medical Branch. According to this actuarial valuation, there is an excess amount of money of about BSD 90 million (19.4 million (Sickness) +70.7 million (Industrial benefits) that can be used to finance the additional temporary need of money in the Medical Branch. It is up to the NIB Board to make sure that this amount of money is going to be used in the best interest of members.

Another way to help to solve the issue is to exchange the illiquid assets of the Medical Branch with liquid and short-term assets of the Pension Branch. In fact, investing in clinics and mini-hospitals is more a long-term investment strategy. By proceeding in this

way, liquid assets could be used to finance the Medical Branch through a rapid decrease of the reserve. It is important to bear in mind however that if the amount of reserve is depleted because of an important use of it to fund current expenditure, the contribution rate will have to be increased to pay the expenditures.

7. Conclusion

This actuarial valuation of The Bahamas National Insurance Board was carried out as at 31 December 2013. The methodology used for the Pension Branch is based on a model developed by the ILO for reviewing the long-term actuarial and financial status of national pension schemes. The model has been adjusted to fit the particular situation of the NIB. The data related to the NIB (contributors, beneficiaries, financial statements) and those related to the general population used in this actuarial valuation are complete and of good quality. The data concerning the labour force (unemployment rates and participation rates) bring some uncertainties to the projections. However, globally the data used are complete enough to obtain a good picture of the financial soundness of the NIB.

An actuarial valuation requires many assumptions. These assumptions are adequate individually and coherent as a whole. They are established on a best-estimate basis and are selected to reflect long-term trends rather than giving undue weight to recent experience. It is not the objective of pension projections to forecast the exact development of the scheme's income and expenditures, but to verify its financial viability.

The social security system in the Bahamas is quite comprehensive, and is universal in the sense that those who are not able to qualify for a pension can receive assistance payments. This system should be preserved.

These are the main recommendations of this report.

Recommendation No. 1: An explicit contribution rate for each branch

In this actuarial valuation, each branch has been separately analysed and an explicit contribution rate has been calculated for each. It is recommended to divulgate a contribution rate for each branch and that the contributions be levied and allocated to each branch according to these contribution rates. In our opinion, this way of proceeding is more transparent and increases people's awareness and understanding of the scheme. Tables 7.1 and 7.2 present the recommended contribution rate and amount of reserve that should be held for each branch. The reader will notice that the contribution rate and amount of reserve for the Pension Branch is left blank; this is the topic of the next recommendation.

Table 7.1. **Breakdown of contribution rates by branch, excluding pensions** (in percentage)

Branch	Contribution rate
Short-term benefits (excluding unemployment insurance)	1.45
Unemployment insurance	0.70
Medical care	0.65 *
Industrial benefits	1.45
Pension benefits	

* New source of funding expected from external financing.

Table 7.2. **Reserve level of each branch in relation to last year's benefit expenditure, excluding pensions** (in percentage)

Branch	Reserve level
Short-term benefits (excluding unemployment insurance)	0.5
Unemployment insurance	1.50
Medical care *	1.00
Industrial benefits	0.75 + actuarial present values
Pension benefits	

* Should be revised due to the expansion of coverage and merging with the NHI

Recommendation No. 2: An immediate increase in the contribution rate for the pension branch is needed to achieve financial sustainability

According to this actuarial valuation:

1. Total expenses will be higher than income (contributions plus investment income) in 2016, meaning for the Pension Branch that the reserve is going to decrease.

2. The reserve will be exhausted in 2029 and the required contribution rate will then be 12.3 per cent.

3. The required contribution rate to pay all the expenses during the next 75 years is 18.9 per cent.

4. If the reserve is used during the next 75 years to pay for expenses along with contributions and investment income (with this strategy the reserve will be 0 in 2069), the contribution rate that is required is 17.8 per cent.

This actuarial valuation clearly demonstrates that an increase in contributions is necessary to make the scheme more sustainable for future generations and that it should start now. It is recommended that over the short term, the contribution rate for the Pension Branch be increased to a level that is at least equal to the PAYG rate. This level in the next few years is going to be around 9-10 per cent. It is consequently suggested to put in place a schedule of increase in contribution rate for the Pension Branch, so that in 2020 the contribution rate will be at least at 10 per cent, an increase of 3.8 per cent from its current level of 6.2. Of course, the schedule of increase should take into account the situation of the country and the Government's plans regarding, for example, the implementation of the NHI scheme.

If the contribution rates for Short-Term benefits, Unemployment benefits and Industrial benefits (respectively 1.45, 0.70 and 1.45 per cent) are added to the required 10 per cent for the Long-Term (Pension) Benefits Branch, the global contribution rate that is necessary is 13.6 per cent. This rate takes into account the fact that the NPDP is going to be financed from external sources. If this turns out not to be the case, an additional increase of 0.65 is needed to finance the current structure of the NPDP.

Because this level of contribution will not be sufficient in future, it is strongly recommended that future contribution increases and their frequency be discussed by the stakeholders and become part of a funding policy.

An increase in the compliance level can of course reduce the short-term pressure. If the compliance rate increases by 10 per cent, the target contribution rate in 2020 can be 9 per cent instead of 10 per cent. It is however important to bear in mind that this is a short-term relief and that in the long run the pressure on the scheme will still be there.

Recommendation No. 3: Adoption of a funding policy and a linked investment policy

This actuarial valuation shows that unless the benefits are reduced, an increase in the contribution rate is necessary. The magnitude of such an increase should therefore depend on clear financing and funding objectives. Such objectives do not currently exist at the NIB. It is therefore recommended that NIB adopts a funding policy in order to:

(a) formalize the long-term funding objectives of the scheme: for example, targeting an appropriate level of reserve over the long term. This objective is the major driver of the contribution rate;

(b) better understand the risks and advantages of financing options;

(c) ensure that plan assets plus future contributions are sufficient to deliver the promised benefits; and

(d) enhance corporate governance by increasing transparency.

Funding rules must address the interests of stakeholders:

– plan participants and former participants, as beneficiaries of, and often as contributors to, the financing of the system;

– employers, as one of the parties bearing responsibility for financing the pension system; and

– the general public and the Government.

The funding policy would specify:

1. Contribution rates

2. Risks faced by the scheme and how these risks can be managed

3. Risk tolerance

4. Allocation of risks among participants and employers

5. Funding objectives (such as contribution stability or improving the RER)

6. Frequency of actuarial valuation and the method of actuarial projection

7. Funding method

8. Goals related to intergenerational equity

9. All other funding issues

We suggest that the NIB hold discussions with stakeholders on the possibility of implementing an explicit written funding policy. The policy should be well thought out and periodically reviewed.

This funding policy should be closely linked to the investment policy. The investment policy should clearly take into account the result of the actuarial valuation and the financial risk that the scheme is going to face. A specific investment policy should be adopted for each branch. For the Pension Branch, the investment policy should reflect the long-term nature of the branch and be invested in long-term assets. Diversification by investing a higher proportion in foreign investments should also be considered.

Recommendation No. 4: Increase in the retirement age

The normal retirement age in the Bahamas is 65. This is a good situation compared to other countries in the region, but it is probably not adequate for the future. It should be borne in mind that among efficient ways to solve the unsustainability problem of a social security pension scheme is to increase the retirement age. This should be normally implemented over a long period so as not to affect current members who are close to retirement age. It is however time to think about the next increase in the retirement age. This report has presented a scenario of increases in the retirement age. This should be discussed by the stakeholders, and can also be analysed and designed in the context of the establishment of a funding policy.

Recommendation No. 5: Miscellaneous

A. From July 2013, gratuities for those working in the hospitality sector have been included in the insurable salary for the calculation of benefits and contributions. The contributions to be paid on gratuities are paid entirely by the employees. Given the current total contribution rate and the recommended allocation to the Industrial Benefit Branch, requesting employees to pay 100 per cent of the contribution on gratuities does not comply with ILO Convention No. 102 for all employees for whom gratuities represent more than 10.3 per cent of their insurable earnings. It is recommended that employers also contribute on the gratuities.

Solutions to decrease the burden on hospitality sector employees include, among others:

- that the employers contribute their part related to social security on the gratuities;

- that a special tax be levied directly on the gratuities to pay the social security contribution portion of the employers;

- a combination of the two.

B. Under Section 22 of the Act, an employer can adjust the amount of contractual sick or maternity leave pay to make sure that the sum of these benefits plus the amount of NIB benefit is not over the wage of the insured. It is recommended that the wage to be used for this calculation should comprise the total of basic salary and the gratuities, and that the NIB benefit be calculated on the total of basic salary plus the gratuities.

C. This actuarial analysis clearly illustrates that the branch that is going to be under financial pressure is the Pension Branch, and in our opinion it is preferable to finance each branch separately. For that reason, it is suggested to levy an explicit contribution rate to finance the Medical Branch. If there is money to be transferred from another branch to the Medical Branch, it should be on a temporary basis only. It is not recommended to transfer an amount of reserve from the Pension Branch to the Medical Branch. Assets can be exchanged between the Pension Branch and the Medical Branch or assets can be transferred from the Sickness benefits and the Industrial Branch. It is up to the Board of the NIB to ensure that this amount of money is going to be used in the best interest of members.

D. A target on the level of administrative expenditure should be shown and discussed in the financial statements.

E. The tables of actuarial present value as described in the third schedule of the National Insurance Financial & Accounting Regulations for the Industrial Branch should be revised frequently and should be used in the actuarial valuation as well as in the financial statements.

F. A discussion between stakeholders concerning the financing of the assistance benefits should take place. In fact, the design of the assistance benefits may discourage people from contributing to the scheme. The fact that the cost of these assistance benefits is paid by contributors may also create an additional financial pressure on the scheme.

Appendix 1

Summary of contribution and benefit provisions

The following is a general description of the coverage, contributions and benefit provisions of the Bahamas National Insurance Board as at 1st January 2014.

1.   Contingencies covered

The Bahamas National Insurance Board provides for the following benefits:

- **Short-term Benefits**: Sickness Benefit, Maternity Benefit, Maternity Grant, Funeral Benefit and Unemployment Benefit.

- **Short-term Assistance**: Sickness.

- **Long-term Contributory Benefits**: Retirement, Invalidity and Survivors' Benefits and Retirement and Survivors' Grants.

- **Long-term Assistance Benefit**: Retirement, Invalidity and Survivors' Pensions.

- **Industrial Benefits**: Injury Benefit, Disablement Benefit, Medical Care, Industrial Death Benefit and Industrial Funeral Grant.

- **National Prescription Drug Plan** (**NPDP**): Medication for specified chronic diseases and Healthy People Program.

2.   Insured persons

The Scheme covers employed, self-employed and voluntarily insured persons from ages 16 and over as follows:

- Employed persons in the private and public sector are covered for all contingencies, except Unemployment Benefit, up to age 64.

- Self-employed persons are covered for all contingencies except Unemployment Benefit.

- Voluntarily insured persons are covered for long-term contributory benefits and Funeral Benefit only.

Contributions by self-employed persons are mandatory. Employed persons who receive Retirement Benefit are covered for Industrial Benefits only.

3.   Insurable earnings and contributions

Insurable earnings include the basic wage (pay in lieu of notice but excluding overtime pay, cost of living allowance, commission), tips and gratuities.

Since July 2014, earnings that are covered for the purpose of determining contributions and benefits are limited to BSD 620 per week or BSD 2,687 per month. The monthly ceiling on insurable earnings has increased as follows:

	BSD
1974-1984	110.00
1984-1998	250.00
1999-2010	400.00
July 2011-June 2012	500.00
July 2012-June 2014	600.00
July 2014-June 2016	620.00

Every two years, the ceiling is increased based on the change in the Retail Price Index of the Bahamas over the immediately preceding two calendar years plus 2 per cent.

Contributions are computed as a percentage of insurable earnings. Tables A1.1 and A1.2 display the different contribution rates.

Table A1.1. **Contribution rates for employed/self-employed persons, including pensionable civil servants as of 1st July 2013** (in percentage)

Category of insured person	Employed/ Self-employed person	Employer	Total
Employed persons (other than those in categories listed below)	3.9	5.9	9.8
Employed persons 65 years or over not in receipt of Retirement benefit	3.9	5.9	9.8
Employed persons earning less than 50% of ceiling or age 65 years and over, in receipt of Retirement benefit	–	2.0	2.0
Persons employed during the summer (Industrial benefits)	–	2.0	2.0
Voluntarily insured persons (covered for Retirement, Invalidity, Survivors' and Funeral benefits)	–	–	5.0
Self-employed persons not in receipt of Retirement benefit	–	–	8.8
Self-employed persons earning less than 50% of ceiling or aged 65 years and over, in receipt of Retirement benefit	–	–	2.0

Source: NIB website.

Table A1.2 **Contribution rates for persons remunerated partly by tips and gratuities as of 1st July 2013** (in percentage)

Insurable wage & gratuities	Employee	Employer	Total
Basic wage	3.9	5.9	9.8
Gratuities	9.8	–	9.8

For years of service before July 2013, special rules applied to pensionable civil servants. The coverage was separated depending on the salary over or below BSD 110 per week. Protection for long-term pensions and short-term benefits applied to salaries below BSD 110, while for salaries over that amount only short-term benefits were offered.

Self-employed persons can choose their level of insurable earnings, subject to the same ceiling as stated above.

4. Benefit provisions

Contributory long-term benefits

(a) Retirement benefit

Contribution requirement: 500 weekly contributions paid or credited.

Age Requirement: 65. Reduced pension can be paid starting at age 60 if earning is not more than 50% of the insurable wage ceiling. If the benefit is awarded prior to age 65 the amount is reduced by 7/12% for each month that the insured is less than 65. Starting in July 2012, if benefit is awarded after age 65, the amount is increased by 7/12% per month for each month the insured is above age 65 up to a maximum of 35%.

Amount of benefit: 30% of average insurable earnings over the best 5 years, plus 1% for every set of 50 weeks credited over 500.

- **■** Maximum: 60% of average insurable earnings.

- **■** Minimum:

    - – BSD 301.08 if pension awarded at age 65 and over;

    - – BSD 289.03 if pension awarded between age 62 and 64;

    - – BSD 278.76 if pension awarded between age 60 and 61;

For pensionable civil servants, the insurable earning for Retirement and other pensions will still be affected by the previous BSD 110 per week ceiling for service prior to July 2013 and will result in a weighted average assessment.

Initial Contribution Credits: Persons over age 35 in October 1974 who made at least 150 contributions in the programme's first 3 years were awarded special credits at the rate of 25 contributions for each year their age exceeded 35, subject to a maximum of 600 credits.

(b)   Retirement grant

Contribution requirement: 150 weekly paid or credited contributions.

Eligibility: The person must be ineligible for Retirement Pension.

Age requirement: 65.

Amount of benefit: 6 times average weekly insurable earnings for each set of 50 weekly contributions paid or credited. This amount is paid as a lump sum.

(c)   Invalidity benefit

Contribution requirement: 150 weekly contributions paid.

Eligibility: The insured is:

(i)   less than 65,

(ii)   incapable of work as a result of a specified disease or bodily or mental disablement which is likely to remain permanent; and

(iii)   not a result of an employment injury.

Amount of benefit:

16% of average insurable earnings over the best 3 years for the first 150 weeks of contribution
plus
2% for every set of 50 weeks between 150 and 500 weeks of contribution
plus
1% for every set of 50 weeks over 500 weeks of contribution

- **■** Maximum: 60% of average insurable earnings.
- **■** Minimum: $301.08 per month.

Duration of pension: Payable for as long as invalidity continues.

Article 57, paragraph 1(a), in conjunction with the Schedule to Part XI of ILO Convention No. 102 requires that *an invalidity pension of at least 40 per cent of former earnings has to be guaranteed after 15 years of contributions or employment*. Under the NIB, an invalidity pension will amount to a replacement rate of only 35 per cent after 15 years of contributions or employment.

(d)   Survivors' benefit

Contribution requirement: The deceased, at time of death, had paid at least 150 weekly contributions.

Eligibility:

■   Widows or widowers must have been married to the deceased (includes common-law spouse).

■   Children up to age 16, or 21 if in full-time education, or invalid of any age.

■   Parents who were dependent on the deceased. Payable for life.

To continue to receive the Survivors' pension, the widow/widower of a deceased insured person should satisfy at least two conditions - that he/she:

(1)   was dependent on (supported by) the deceased spouse; and

(2)   was either:

(i)   an invalid or is older than 40 years of age and incapable of earning more than half the insurable wage ceiling; or

(ii)   (in the case of the widow) was pregnant by her late husband at the time of his death; or

(iii)   has the care of a child of his/hers/theirs who is:

(a)   younger than age 16 years; or

(b)   older than age 16 years but younger than age 21 years, and receiving full-time education or training for which he/she is not being paid; or

(c)   an invalid.

Amount of benefit: Shown below is the proportion of the pension (Invalidity benefit or Retirement benefit) being received by the deceased the beneficiary would have been entitled to:

■   Widow or widower: 50%.

■   Child: 10% by child subject of a maximum of 5 children or 10 children if no spouse.

■   Parent: 50%.

■   Minimum widow/widower benefit: BSD 301.08 per month (effective July 2012).

■   Minimum child benefit: BSD 122.63 per month (effective July 2012).

■   Minimum benefit for orphan: BSD 139.36 per month (effective July 2012).

■   Maximum family benefit: 100% of Retirement pension. However, due to minimum pensions, the total family benefit can be more than 100%.

A widow/widower who does not qualify for Survivors' benefit can now qualify for a one-time Survivors' grant.

> Article 63, paragraph 1(a), in conjunction with the Schedule to Part XI of ILO Convention No. 102 stipulates that a survivors' pension of at least *40 per cent of former earnings has to be guaranteed after 15 years of contributions or employment of the deceased insured person.* However, under the NIB, a Survivors' benefit after 15 years of contributions or employment will amount to a replacement rate of only a proportion of the Invalidity or Retirement pension, which is equal to 35 per cent after 15 years of contributions or employment.

(e)   Survivors' grant

Contribution requirement: 150 weekly contributions paid or credited.

Eligibility: Widows or widowers must have been married to the deceased (includes common-law spouse).

Amount of benefit: Lump sum of one year's worth of the deceased's Retirement benefit.

(f)   Maximum pension

If a person entitled to Retirement pension or Invalidity pension becomes eligible to a Survivors' pension, she/he can receive the full Retirement pension or the full Invalidity pension in addition to 50% of the Survivors' pension.

Non-contributory assistance

Before 2010, these benefits were previously financed from government revenue.

(a)   Old age non-contributory pension

Eligibility:

- Age 65; *and*

- Insufficient credits to qualify for Retirement benefit; *and*

- Bahamian citizen or resident in the Bahamas as an employed or self-employed person for at least 12 months in the 15 years immediately before claiming; *and*

- Has a share of household income of less than BSD 59.18.

Amount of benefit: BSD 256.45 per month.

Where a Retirement grant was previously awarded, assistance shall not be awarded until the effective number of months of assistance paid using the monthly rate of assistance at the time of claiming Old Age Non-contributory pension has elapsed.

(b)   Invalidity assistance

Eligibility:

- Age less than 65; *and*

- Insufficient credits to qualify for Invalidity benefit; *and*

- Be medically declared an invalid, other than as a result of an employment injury.

Amount of benefit: BSD 256.45 per month.

(c)   Survivors' assistance

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

Amount of benefit:

- Widow/Parent: BSD 256.45 per month.

- Child: BSD 102.57 per month.

- Orphan: BSD 111.93 per month.

Short-term benefits

(a)   Sickness benefit

Contribution requirement: Have been insured the day prior to the sickness with at least 40 paid weekly contributions *and* one of the following:

- at least 13 contributions in the 26 weeks preceding sickness;

- at least 26 contributions in the last 52 weeks;

- at least 26 contributions in the preceding contribution year.

Waiting period: 3 days.

Amount of benefit: 60% of average weekly insurable earnings during the qualifying period above subject to a minimum of BSD 69.48 per week.

Duration of benefit: Maximum of 26 weeks. May be extended to 40 weeks subject to approval of the Medical Officer. Any two or more periods of incapacity separated by not more than eight weeks shall be treated as a continuous period of incapacity.

(b)   Sickness assistance

Eligibility requirement: Gainfully employed in the contribution year or the 52 week period preceding incapacity but fails to qualify for Sickness benefit and meets the means test.

Waiting period: 3 days.

Amount of benefit: BSD 59.18 per week.

Duration of benefit: Maximum of 26 weeks. May be extended to 40 weeks subject to approval of the Medical Officer. Any two or more periods of incapacity separated by not more than eight weeks shall be treated as a continuous period of incapacity.

(c)   Maternity benefit

Contribution requirement: Have at least 50 paid weekly contributions and one of the following:

- at least 26 contributions in the last 40 weeks;
- at least 26 contributions in the preceding contribution year.

Amount of benefit: 66 2/3% of average weekly insurable earnings during the qualifying period above subject to a minimum of BSD 69.48 per week.

Duration of benefit: 13 weeks, starting no earlier than 6 weeks before the expected date of confinement. This may be extended by up to 2 weeks if confinement is delayed.

(d)   Maternity grant

Contribution requirement: Same as for Maternity Allowance. If the mother fails to qualify for Maternity Allowance, she can qualify if she or her insured husband has been insured for at least 50 contribution weeks.

Amount of grant: BSD 450.

(e)   Funeral benefit

Eligibility: Death of an insured person, other than as a result of an employment related accident, *or* the deceased is the spouse of an insured. The insured person must have paid at least 50 contributions.

Amount of grant: BSD 1,680.

(f)   Unemployment benefit

Contribution requirement: Have at least 52 paid weekly contributions *plus*:

- at least 7 weeks of contributions in the 13 weeks preceding unemployment; *and*
- at least 13 weeks of contributions in the 26 weeks preceding unemployment; *and*
- must be able to satisfy the Department of Labour's conditions for registration.

Waiting period: 3 days.

Amount of benefit: 50% of average weekly insurable earnings during the qualifying period above subject to a minimum of BSD 69.48 per week.

Duration of benefit: up to 13 weeks.

Industrial benefits

(a)   Injury benefit

Eligibility: Incapable of work as a result of a work-related accident or a disease related to employment. There are no qualifying contribution requirements for any Employment Injury benefits.

Waiting period: 3 days.

Amount of benefit: 66 2/3% of average insurable earnings in the last 26 weeks before the accident occurred (or less if the person was in employment for a shorter period).

Duration of benefit: Maximum of 40 weeks.

(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 period of payment of Injury benefit.

Amount of benefit: Percentage of average insurable earnings by reference to percentage loss of faculty suffered.

If the degree of disablement is less than 25%, a lump sum is paid and is calculated as follows: 100 times the percentage degree of disablement.

If the degree of disablement is 25% or more, a pension is paid and is calculated as follows: the Injury benefit amount times the degree of disablement. A grant of BSD 500 is also paid for disablement assessed at 25-66%, and BSD 1,000 for disablement assessed at greater than 66%.

If degree of disablement is 100% and the insured requires constant care and attendance, an allowance of 20% of the disablement benefit shall also be paid.

(c)   Industrial death benefit

Eligibility: Dependants are defined as for Survivors' benefit.

Amount of benefit: Proportion of Disablement pension, the same percentage as for Survivors' pension.

(d)   Funeral benefit

Eligibility: Death was due to an accident arising out of and in the course of employment.

Amount of benefit: BSD 1,680.

(e)   Medical care

Eligibility: Insured suffers injury or illness arising out of and in the course of employment.

Expenses covered: Reasonable expenses for doctor's fees, medication, hospitalization, travelling and constant care and other specified costs incurred as a result of an employment injury or prescribed disease.

Duration: 40 weeks from the date of injury unless the degree of disablement is greater than 25% in which case it is payable for 2 years from the date of injury. This may be extended at the discretion of the Director.

National prescription drug plan

Conditions covered under the Drug Plan (as of 12 March 2012) **include:** Arthritis, Asthma, Benign Prostate Hypertrophy, Breast Cancer, Diabetes, Epilepsy, Glaucoma, High Cholesterol, Hypertension, Ischaemic Disease, Prostate Cancer, Psychiatric Illness, Sickle Cell Anemia, Thyroid Disease.

In order to register for the National Prescription Drug Plan a person must:

- Have a valid National Insurance number.
- Be included among those to be covered:
    - NIB pensioners
    - NIB invalids
    - Bahamian citizens age 65 or over
    - Child under 18 years of age or a young adult under 25 years of age (if full-time student)
    - Government employees
    - Indigents
    - Persons receiving NIB Retirement grant
    - Persons age 60 and over in receipt of NIB Survivors' benefit/assistance
    - Persons receiving 100% NIB Disablement benefit
    - Women receiving antenatal and postnatal care
- Complete a registration form (DP-1) and any other required form.
- Be diagnosed with one or more of the covered chronic diseases by a licensed physician.
- Bring NIB card and valid government-issued ID when registering and collecting ACE Rx Card.

Caricom agreement on social security

The Bahamas is a signatory to the CARICOM Agreement on Social Security. As a result, some former contributors with fewer contributions than required for Retirement, Invalidity and Survivors' pensions may qualify for these pensions under the Agreement based on the total number of contributions they have made in participating countries.

Appendix 2

Statistics related to short-term benefits

Table A2.1. **Sickness benefit experience** (2009-2013)

	Number of claims awarded per 1,000 insured	Average duration of benefits (days)	Average weekly benefit (BSD)
2009	118	17.6	200
2010	120	17.3	203
2011	131	16.4	216
2012	122	16.6	233
2013	122	16.9	255

Source: NIB.

Table A2.2 **Maternity benefit experience** (2009-2013)

	Number of claims awarded per 1,000 insured	Average duration of benefits (days)	Average weekly benefit (BSD)
2009	20	75.0	186
2010	20	75.6	187
2011	18	75.3	191
2012	17	74.9	202
2013	17	75.1	210

Source: NIB.

Table A2.3 **Unemployment benefit experience** (2009-2013)

	Number of claims awarded per 1,000 insured	Average duration of benefits (days)	Average weekly benefit (BSD)
2009	94	72.1	134
2010	41	69.2	136
2011	35	55.4	144
2012	47	50.7	149
2013	46	55.4	148

Source: NIB.

Appendix 3

Methodology, data and assumptions

This actuarial review makes use of the comprehensive methodology developed at the Public Finance, Actuarial and Statistics Services Branch of the ILO (SOC/PFACTS) 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 Bahamas and the National Insurance Board (NIB). 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 the future demographic and economic environment in the Bahamas. Next, projection factors specifically related to social security are determined and used in combination with the demographic and economic framework to estimate future cash flows and the scheme reserve. 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.

1. Modelling demographic and economic developments

The Bahamas' general population has been projected with information obtained from the Department of Statistics of the Bahamas and by applying appropriate mortality, fertility and migration assumptions. The following tables describe those assumptions.

Table A3.1. Population of Bahamas, by age and sex (2010)

Age	Male	Female	Total
0-4	15 376	15 354	30 730
5-9	15 704	15 827	31 531
10-14	15 942	15 916	31 858
15-19	15 686	15 496	31 182
20-24	13 203	13 411	26 614
25-29	12 687	13 893	26 580
30-34	13 165	14 135	27 300
35-39	14 002	15 178	29 180
40-44	12 689	13 662	26 351
45-49	12 096	13 000	25 096
50-54	9 068	10 281	19 349
55-59	6 533	7 254	13 787
60-64	4 770	5 413	10 183
65-69	3 720	4 489	8 209
70-74	2 622	3 292	5 914
75-79	1 552	2 118	3 671
80-84	889	1 329	2 218
85-89	369	664	1 032
90+	184	493	677
Total	**170 257**	**181 204**	**351 461**

Source: Department of Statistics of the Bahamas

Table A3.2. Age-specific and total fertility rates, 2010 and 2025

Age group	2010	2025
15-19	0.02713	0.01057
20-24	0.07926	0.06111
25-29	0.08844	0.08618
30-34	0.08379	0.09783
35-39	0.05708	0.07193
40-44	0.02086	0.02783
45-49	0.00343	0.00455
TFR	**1.80**	**1.80**

The total fertility rate is assumed to remain constant at 1.80 during the projection period. Table A3.2 shows ultimate age-specific and total fertility rates.

Mortality rates in 2010 were those obtained from the last Census. Life expectancy at birth in 2010 has been assumed at 70.7 and 76.8 for males and females, respectively. Improvements in life expectancy have been assumed to follow the "medium" rate as established by the United Nations. This mortality pattern is also used to project Survivors' benefits payable on a participant's death.

The life expectancies at birth, at age 20 and at age 60 and sample mortality rates for sample years are provided in tables A3.3 and A3.4 respectively.

Table A3.3. Life expectancy at different periods of time, by age and sex (2010-2085)

Year	Male			Female		
	At 0	At 20	At 60	At 0	At 20	At 60
2010	70.7	52.0	19.4	76.8	58.1	22.5
2035	75.2	56.0	21.1	80.3	61.0	24.1
2060	79.6	60.1	23.4	83.7	64.1	26.1
2085	82.7	63.0	25.5	86.2	66.4	27.9

Table A3.4. Sample mortality rates (2010, 2035 and 2060)

Selected ages	Male			Female		
	2010	2035	2060	2010	2035	2060
0	9.6	5.5	2.9	9.3	5.3	2.8
5	0.4	0.2	0.1	0.4	0.2	0.1
10	0.1	0.1	0.1	0.1	0.1	0.1
15	0.7	0.4	0.2	0.4	0.2	0.1
20	2.2	1.3	0.7	1.1	0.6	0.3
25	3.4	1.9	1.0	0.9	0.5	0.3
30	3.3	1.9	1.0	1.7	1.0	0.5
35	4.0	2.3	1.3	2.0	1.2	0.6
40	5.2	3.2	1.8	2.4	1.4	0.8
45	5.9	3.8	2.3	4.2	2.7	1.6
50	8.3	5.7	3.5	5.5	3.7	2.3
55	10.8	7.9	5.2	6.4	4.6	3.1
60	15.1	11.3	7.6	9.5	7.1	4.8

Selected ages	Male			Female		
	2010	2035	2060	2010	2035	2060
65	21.7	16.8	11.6	14.3	11.0	7.6
70	31.4	25.4	18.4	18.7	15.1	11.0
75	63.7	52.7	39.8	40.4	33.4	25.3
80	59.7	50.7	39.9	52.7	44.8	35.2
85	106.1	93.4	77.4	91.6	80.7	66.9
90	174.3	159.2	139.2	129.4	118.1	103.3
95	236.9	224.4	207.1	170.6	161.6	149.1

Net migration (in minus out) is assumed to decline over the projection period at varying rates and reaching different ultimate levels. Figures A3.1 and A3.2 show the evolution of the net migrants' population and the age distribution by sex and single age of net migrants. This distribution is held constant for the entire projection period.

Figure A3.1. Net migration, number of persons (2010-2088)
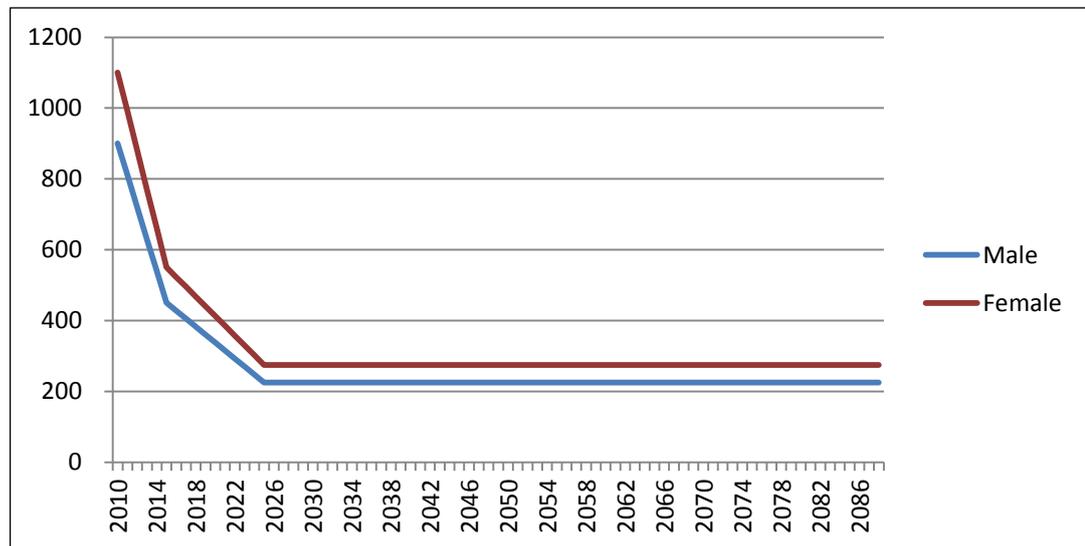
Figure A3.2. Net migration, distribution by age and sex of the net migration population (% per age)
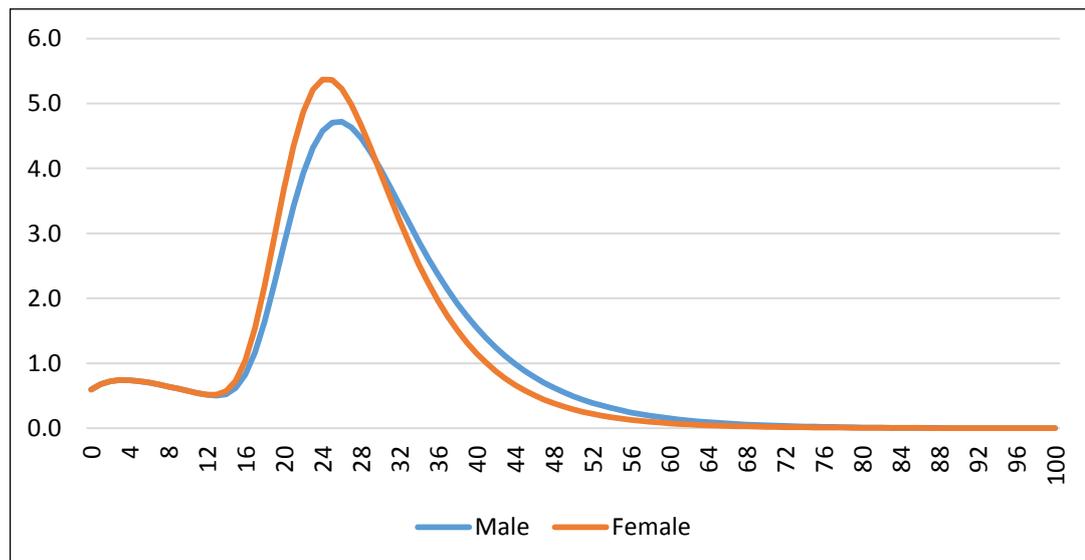
2. Projection of NIB income and expenditure

This actuarial review addresses all Bahamas National Insurance Board revenue and expenditure items. For short-term (sickness and maternity) benefits and Employment Injury benefits, the NPDP and Industrial Benefits, different models have been developed separately from the pension model. For the Long-term benefits (pensions), and for Funeral benefits and grants, projections are performed following a year-by-year cohort methodology. For each year up to 2088, the number of contributors and pensioners, and the Bahamian dollar value of contributions, benefits and administrative expenditure, is estimated. Once the projections of the insured (covered) population, as described in the next section, are complete, contribution income is then determined from the projected total insurable earnings, the contribution rate, contribution density and the collection rate. 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. The NIB's administrative expenses are modelled as a flat percentage of insurable earnings. Finally, the year-end reserve is the beginning-of-year reserve plus the net result of cash inflow and outflow.

Based on recent experience, the administrative expenses assumption is 2.0 per cent of total insurable earnings each year for all the branches. This level of administrative fees has been distributed among each branch according to the breakdown in the financial statements. This is in line with the assumption used in the previous valuation.

3. NIB population data and assumptions

The projection of the insured population requires a certain amount of information and a number of assumptions. Projections start with the number of contributors as at the date of the analysis. The growth of this population is mainly based on the growth of the employed population. Other assumptions of decrement are required, namely prevalence rate of disability and mortality rates by age and sex. Finally, the distribution of new entrants and new retired come from the evolution of the employed population.

3.1. Insured population as of the valuation date

Data on the insured population was obtained from the NIB. Validation of information transmitted was done to ensure that all the data are comprehensive and consistent. Table A3.5 shows the number of members who contributed during the last financial year preceding the valuation date, by age and sex. The distribution of the contributors in 2013 comes from extraction of the computerized system of the NIB. Adjustments have been brought to this population to reflect the particularities of each branch. For example, for the Pension Branch, the population has been divided in two (tables A3.6 and A3.7) to take into account the fact that those who are pensionable civil servants have a different pensionable salary before 2013 (limited to BSD 110) than other insured. For each branch, those who are not required to contribute have been subtracted from the global population (for example, self-employed for Unemployment benefit).

Table A3.5. Distribution of active members (contributors) by age and sex, all insured (2013)

Age	Male	Female	Total
15-19	2 710	2 396	5 106
20-24	8 929	8 354	17 283
25-29	8 619	9 219	17 838
30-34	8 787	9 351	18 138
35-39	8 814	9 425	18 239
40-44	9 044	9 770	18 814
45-49	8 205	9 092	17 297
50-54	7 125	8 001	15 126
55-59	5 103	5 752	10 855

Age	Male	Female	Total
60-64	2 974	3 027	6 001
65-69	1 437	1 096	2 533
70-74	789	494	1 283
75-79	329	192	521
Total	72 866	76 168	149 034

Table A3.6. Distribution of active members (contributors) by age and sex, other than pensionable civil servants (2013)

Age	Male	Female	Total
15-19	2 710	2 396	5 106
20-24	8 929	8 354	17 283
25-29	8 619	9 219	17 838
30-34	8 787	9 351	18 138
35-39	8 814	9 425	18 239
40-44	9 044	9 770	18 814
45-49	8 205	9 092	17 297
50-54	7 125	8 001	15 126
55-59	5 103	5 752	10 855
60-64	2 974	3 027	6 001
65-69	1 437	1 096	2 533
70-74	789	494	1 283
75-79	329	192	521
Total	72 866	76 168	149 034

Age	Male	Female	Total
15-19	2 706	2 389	5 095
20-24	8 764	8 197	16 961
25-29	8 319	8 544	16 863
30-34	8 497	8 414	16 911
35-39	8 327	8 104	16 431
40-44	8 399	8 121	16 520
45-49	7 458	7 344	14 802
50-54	6 377	6 131	12 508
55-59	4 374	4 105	8 479
60-64	2 540	2 137	4 677
65-69	1 356	946	2 302
70-74	786	493	1 279
75-79	327	192	519
Total	68 231	65 116	133 347

Table A3.7. **Distribution of active members (contributors) by age and sex, pensionable civil servants** (2013)

Age	Male	Female	Total
15-19	4	7	11
20-24	165	157	322
25-29	300	675	975
30-34	290	937	1 227
35-39	487	1 321	1 808
40-44	645	1 649	2 294
45-49	747	1 748	2 495
50-54	748	1 870	2 618
55-59	729	1 647	2 376
60-64	434	890	1 324
65-69	81	150	231
70-74	3	1	4
75-79	2	–	2
Total	**4 635**	**11 052**	**15 687**

3.2. Projection of the insured population

The projection of the insured population constitutes the basis for projections of the scheme's costs. Generally, these projections require the use of assumptions pertaining specifically to the population, such as retirement rate by age and sex.

The insured population was projected by applying coverage rates to the employed population. The coverage rates have been smoothed and kept constant throughout the projection period. Mortality and disability rates are all estimated by age, sex and group. It is possible that for some ages, the coverage rate is higher than 100 per cent. This is because the definition of the employed population is different from the insured population: the employed population is defined as those who are employed at a precise moment during the year, while the insured population refers to those who have been contributors the year before the actuarial valuation (see figure A3.3).

Figure A3.3. Coverage rates of the insured population in relation to the employed population, by sex and age (in percentage)
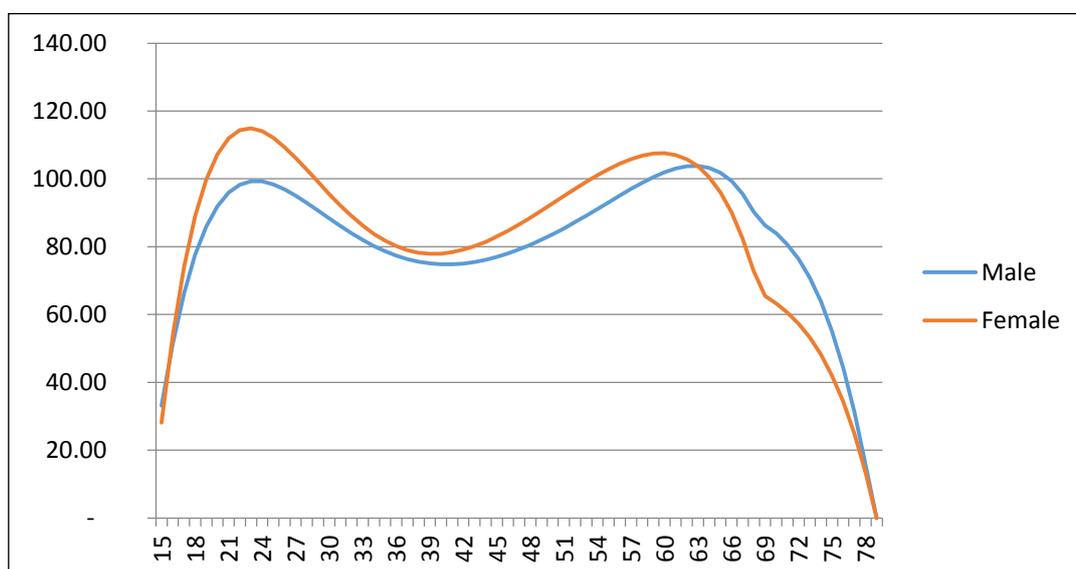
3.2.1. Growth of the insured population

The growth of the insured population reflects long-term trends in the evolution of the employed population. Over the short and the medium term, the growth of the insured population is higher because more people are entering the labour force (table A3.8).

Table A3.8 Insured population growth assumption, by sex and period (2013-2088) (in percentage)

	2013-2033	2033-2053	2053-2073	2073-2088	Average
Males	1.4	0.3	–0.1	–0.1	0.4
Females	1.4	0.1	–0.3	–0.1	0.3
Total	1.4	0.2	–0.2	–0.1	0.3

3.2.2. Disability incidence rates

Table A3.9 shows the expected incidence rates of insured persons qualifying for Disablement benefit, which is assumed for all projection years.

Table A3.9. Disability rates per 10,000 insured

Age	Male	Female
20	13.3	12.0
25	7.5	5.6
30	12.6	5.5
35	11.9	6.1
40	14.6	9.1
45	16.5	14.8
50	29.8	22.2
55	36.9	38.5
60	68.3	72.0

Disabled people generally have a higher mortality rate than active participants. The mortality rates assumed are five times those of the insured population. This assumption is based on the analysis of experience.

3.2.3. Retirement rates

Retirement rates are derived implicitly from the evolution of the employed population and the coverage rate.

3.3. *Salary scale and density of contribution*

Figure A3.4 shows the salary scale used at the beginning of the projection period. Earnings are projected using the assumptions described earlier.

For the purpose of projection, the actuarial model distributes average wages into three sections (low, medium, high) with the aim of measuring the effect of the minimum pension and the ceiling. It is estimated that the dispersion observed in the distribution of the earnings will remain constant throughout the projection period. The distribution of insurable salary in 2013 has been adjusted to take into account the fact that the gratuities in the hospitality sector are now part of the insurable wage.

Figure A3.4. Distribution of monthly earnings by age and sex, 2013 (BSD)
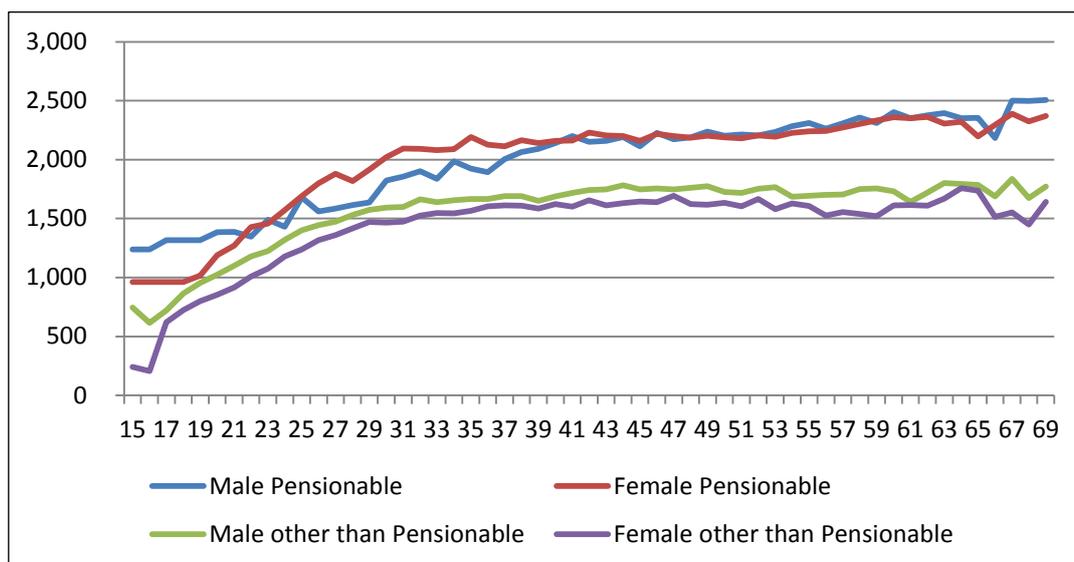
The density of contribution represents the proportion of the year during which participants pay contributions to the scheme. A high contribution density means that participants will accumulate pension benefits quickly and that the proportion of those entitled to a pension will increase to the detriment of those entitled only to a grant benefit. In the private sector, it is normal that the density of contribution be less than the one observed in the public sector, due to less stability in employment. The density of contribution for the pensionable civil servants is 100 per cent for all ages. The density of contribution assumed in this actuarial valuation for the other insured, mainly in the private sector, is shown in table A3.10 and is based on the analysis of the experience of the last five years.

Table A3.10. Density of contributions by age and sex, for other than pensionable insured
(in percentage)

Age	Male	Female
15-19	45.8	42.4
20-24	71.6	68.1
25-29	79.4	81.4
30-34	81.4	85.6
35-39	82.9	88.3
40-44	84.7	89.7
45-49	85.2	90.6
50-54	85.8	90.4
55-59	86.1	90.2
60-64	86.8	90.0
65-69	82.0	83.7
70-74	48.5	48.2
75-79	48.5	48.2

3.4. Past service

Credited service for the active and inactive insured populations was transmitted by the NIB. Tables A3.11 and A.3.12 show, for active members, the total number of years of contributions, by age and sex.

Table A3.11. Average past contribution years for pensionable civil servants, as at December 2013

Age	Male	Female
15-19	1.8	1.6
20-24	4.1	3.9
25-29	7.5	6.2
30-34	11.2	10.2
35-39	15.2	14.4
40-44	19.8	18.2
45-49	21.9	21.1
50-54	23.9	23.2
55-59	26.5	25.9
60-64	29.0	29.2
65-69	35.9	35.4

Table A3.12. Average past contribution years for insured other than pensionable civil servants, as at December 2013

Age	Male	Female
15-19	1.3	1.3
20-24	3.0	2.8
25-29	5.9	5.7
30-34	8.6	8.9
35-39	11.1	12.0
40-44	13.9	15.2
45-49	16.2	18.3
50-54	18.4	20.8
55-59	20.5	22.6
60-64	21.6	25.0
65-69	22.4	25.8
70-74	22.4	24.2
75-79	22.4	24.2

3.5. Inactive population

In this actuarial valuation the structure of the inactive population has been analysed over a period of ten years (those who have not contributed during 2013 but have contributed to the scheme in the last ten years). The experience of the inactive population related to their retirement pattern has also been analysed. In the past, there was a high proportion of new retirees each year who were inactive the year before, sometimes over 50 per cent. With the modifications to eligibility conditions, this of course is not going to be the same. Based on these analyses, the inactive population used in this actuarial valuation is shown in table A3.13.

Table A3.13. Distribution used for this actuarial valuation of inactive members by age and sex and their average years of past service

Age	Male		Female	
	Number	Average years of past service	Number	Average years of past service
15-19	29	2.1	15	2.1
20-24	1 081	2.7	962	2.6
25-29	2 683	3.6	2 266	3.7
30-34	3 735	4.8	2 814	5.0
35-39	4 257	5.8	3 101	6.4
40-44	4 442	7.1	3 197	8.4
45-49	3 987	8.3	2 906	10.4
50-54	3 504	9.9	2 796	12.5
55-59	2 803	12.0	2 243	15.1
60-64	1 400	10.9	889	14.2
65-69	648	9.7	362	12.9
70-74	274	9.7	129	13.7
75-79	84	8.8	28	13.1

3.6. Pensioners as of the valuation date

Tables A3.14-A3.21 show the distribution of pensioners used for this actuarial valuation as of the valuation date.

Table A3.14. Old Age monthly pensions in payment, by age and sex (December 2013)

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
0-4	–	–	–	–
5-9	–	–	–	–
10-14	–	–	–	–
15-19	–	–	–	–
20-24	–	–	–	–
25-29	–	–	–	–
30-34	–	–	–	–
35-39	–	–	–	–
40-44	–	–	–	–
45-49	–	–	–	–
50-54	–	–	–	–
55-59	–	–	–	–
60-64	1 325	475	1 864	424
65-69	2 756	573	3 332	488
70-74	2 513	536	2 828	455
75-79	1 562	489	1 826	424

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
80-84	829	483	1 009	415
85-89	326	480	415	407
90-94	95	528	150	387
95+	27	415	36	430
Total	**9 433**	**523**	**11 460**	**448**

Table A3.15. Old Age monthly assistance in payment, by age and sex (December 2013)

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
0-4	–	–	–	–
5-9	–	–	–	–
10-14	–	–	–	–
15-19	–	–	–	–
20-24	–	–	–	–
25-29	–	–	–	–
30-34	–	–	–	–
35-39	–	–	–	–
40-44	1	256	–	–
45-49	–	–	–	–
50-54	–	–	–	–
55-59	–	–	–	–
60-64	–	–	–	–
65-69	114	256	175	264
70-74	184	256	250	256
75-79	185	256	246	256
80-84	104	256	223	256
85-89	62	256	171	259
90-94	29	256	127	256
95+	11	256	76	263
Total	**690**	**256**	**1 268**	**258**

Table A3.16. Invalidity monthly pensions in payment, by age and sex (December 2013)

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
0-4	–	–	–	–
5-9	–	–	–	–
10-14	–	–	–	–
15-19	–	–	–	–
20-24	–	–	–	–
25-29	10	311	7	315
30-34	27	320	12	312
35-39	46	369	29	334
40-44	78	377	71	380
45-49	99	418	105	396
50-54	171	448	143	427
55-59	175	469	237	458
60-64	178	534	232	456
65-69	143	485	235	466
70-74	94	482	222	425
75-79	56	443	92	392
80-84	13	404	48	405
85-89	4	406	9	318
90-94	1	420	–	–
95+	–	–	–	–
Total	**1 095**	**457**	**1 442**	**431**

Table A3.17. Invalidity monthly assistance in payment, by age and sex (December 2013)

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
0-4	–	–	–	–
5-9	–	–	–	–
10-14	–	–	–	–
15-19	57	256	25	277
20-24	115	256	80	256
25-29	127	262	85	256
30-34	161	274	96	256
35-39	162	256	116	256
40-44	153	256	136	260
45-49	145	256	125	265
50-54	152	256	134	260
55-59	132	260	100	256

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
60-64	65	256	80	263
65-69	54	256	85	262
70-74	35	256	84	256
75-79	29	256	74	256
80-84	13	256	42	256
85-89	3	256	16	256
90-94	–	–	–	–
95+	–	–	–	–
Total	**1 403**	**259**	**1 278**	**259**

Table A3.18. Survivors' monthly pensions in payment, by age and sex (December 2013)

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
0-4	–	–	–	–
5-9	–	–	–	–
10-14	–	–	–	–
15-19	–	–	–	–
20-24	1	301	–	–
25-29	6	302	1	301
30-34	41	309	4	301
35-39	71	301	16	299
40-44	150	321	36	350
45-49	209	331	44	332
50-54	269	320	43	320
55-59	322	327	39	333
60-64	324	278	28	270
65-69	465	235	39	231
70-74	535	234	44	192
75-79	466	239	41	184
80-84	287	263	36	198
85-89	150	268	10	167
90-94	54	297	2	226
95+	10	301	1	180
Total	**3 360**	**272**	**384**	**266**

Table A3.19. Survivors' monthly assistance in payment, by age and sex (December 2013)

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
0-4	–	–	–	–
5-9	–	–	–	–
10-14	–	–	–	–
15-19	–	–	–	–
20-24	1	256	–	–
25-29	–	–	–	–
30-34	3	359	–	–
35-39	4	225	1	256
40-44	6	244	–	–
45-49	6	256	2	156
50-54	17	251	1	225
55-59	13	256	–	–
60-64	9	245	–	–
65-69	21	256	1	256
70-74	29	255	–	–
75-79	32	256	–	–
80-84	24	246	–	–
85-89	18	239	–	–
90-94	5	256	–	–
95+	–	–	–	–
Total	**188**	**253**	**5**	**210**

Table A3.20. Orphans and dependent children, monthly pensions in payment, by age and sex (December 2013)

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
0-4	80	125	68	125
5-9	250	126	312	125
10-14	526	126	522	125
15-19	577	126	574	125
20-24	83	119	102	121
25-29	17	105	32	107
30-34	6	105	4	94
35-39	6	87	4	38
40-44	–	–	–	–
45-49	–	–	–	–
50-54	–	–	–	–
55-59	–	–	–	–
60-64	–	–	–	–

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
65-69	–	–	–	–
70-74	–	–	–	–
75-79	–	–	–	–
80-84	–	–	–	–
85-89	–	–	–	–
90-94	–	–	–	–
95+	–	–	–	–
Total	**1 545**	**125**	**1 618**	**124**

Table A3.21. Orphans and dependent children, monthly assistance in payment, by age and sex
(December 2013)

Age	Male		Female	
	Number	Average amount (BSD)	Number	Average amount (BSD)
0-4	16	104	16	106
5-9	27	106	34	104
10-14	70	107	72	107
15-19	75	106	63	108
20-24	15	100	13	104
25-29	3	90	3	99
30-34	1	70	1	80
35-39	–	–	1	50
40-44	–	–	3	68
45-49	1	103	2	50
50-54	–	–	–	–
55-59	–	–	–	–
60-64	–	–	–	–
65-69	–	–	–	–
70-74	–	–	–	–
75-79	–	–	–	–
80-84	–	–	–	–
85-89	–	–	–	–
90-94	–	–	–	–
95+	–	–	–	–
Total	**208**	**105**	**208**	**105**

3.7. Family structure

Information on the family structure of the insured population is necessary for the projection of survivors' benefits. Assumptions have to be established on the probability of being married at death, the average age of spouses, the average number of orphans and their average age. Examples of the assumptions appear in table A3.22.

Table A3.22. Family statistics (in percentage)

Age	Probability of being married		Average age soupse		Average number of dependent children		Average age of the children	
	Male	Female	Male	Female	Male	Female	Male	Female
15	0.0	0.0	15	18	0.0	0.0	0.0	0.0
20	0.9	0.0	19	23	0.1	0.2	1.0	1.3
25	8.4	0.0	24	28	0.4	0.6	3.9	4.3
30	16.2	27.5	29	33	0.8	0.8	5.5	6.2
35	18.6	36.5	34	38	1.0	1.5	9.0	13.5
40	28.6	31.8	38	43	1.2	1.3	10.9	15.3
45	27.1	35.8	43	48	0.9	1.0	12.0	15.5
50	36.8	29.6	47	53	0.9	0.6	12.9	15.5
55	36.8	14.3	52	58	0.5	0.2	13.9	15.5
60	39.0	19.6	56	63	0.3	0.0	14.0	15.5
65	32.2	29.8	61	68	0.2	0.0	14.0	15.5
70	22.2	18.1	66	73	0.1	0.0	14.0	15.5
75	52.6	19.2	70	78	0.0	0.0	14.0	15.5
80	43.4	9.4	74	83	0.0	0.0	14.0	15.5
85	50.0	2.1	79	88	0.0	0.0	14.0	15.5
90	48.5	3.5	84	93	0.0	0.0	14.0	15.5
95	32.4	0.0	89	98	0.0	0.0	14.0	15.5

Appendix 4

General concepts on the funding of social insurance

1. Pure assessment – pay-as-you-go (PAYG) system

Under this financial system, the contribution rate during a given period, for example, one year (annual assessment) or a few years, is determined in such a way that income from contributions during a period will just cover the expenditure of the scheme during the same period, with a small margin to allow the constitution of a contingency reserve. This is the system usually applied to finance short-term benefits such as sickness and maternity cash benefits. Annual benefit expenditure is expected to remain at a relatively constant level once the scheme has attained a certain maturity, unless the benefit provisions themselves have been changed. The contingency reserve enables coverage of unexpected expenditure due to temporary fluctuations of the risk factors involved. The reserve should, therefore, be maintained in a sufficiently liquid form so that it can be readily resorted to when necessary. If a pure assessment system were applied to a new pension scheme, it would involve frequent revisions of the contribution rate. The annual expenditure under a new pension scheme would begin at a comparatively low level and increase continuously over a long period of time. This is because there will be an increasing number of surviving pensioners. Another reason for escalating annual expenditure is that each new group of pensioners will be drawing higher rates of pension due to longer insurance periods compared to the previous generations of pensioners. Pure assessment is not appropriate for a new pension system. For a mature scheme, however, this financial system could be adopted.

2. General average premium system

A general average premium (GAP) system provides for a theoretically constant rate of contribution ensuring financial equilibrium ad infinitum. At any time, the present values of all probable future contributions income plus accumulated reserves should be equal to the present value of all probable future outlays, both in respect of the initial population and of future entrants. The contribution rate determined under this system would be relatively high and would lead to a formation of high reserves. Though theoretically constant, the contribution rate is likely, in practice, to be revised at periodic actuarial reviews. If this system were applied to a new pension scheme from the start, the rate of contribution would be relatively high and this could cause an undue burden on the economy and on the contributing parties.

3. Scaled premium system

It is possible to devise many intermediate systems of finance between the basically unfunded (PAYG) pure assessment system and the fully-funded GAP system. The following factors frequently lead to the adoption of an intermediate system of finance:

1. The contribution rate must not be excessive (with respect to the capacities of the members and the economy in general).

2. The initial and any subsequent contribution rates established under the system of finance applied to the scheme should remain relatively stable for reasonable periods of time. Increases in the contribution rate should be gradual, particularly when they are not accompanied by an improvement in benefits.

An example of an intermediate level of funding is the scaled premium system of finance. Under this system, a contribution rate is established so that during a specified period, which is known as the period of equilibrium, the contribution income and the interest income on the reserves of the scheme will, in each year, be adequate to meet the expenditure on benefits and administration in that year. In order to avoid a decrease in the reserves after the end of a period of equilibrium, the contribution rate must be revised prior to this and a new higher contribution rate applied during a

new period of equilibrium. Thus, the financial equilibrium would be assured for limited periods, such as 20, 15 or 10 years, within each of which the contribution rate is supposed to remain stable. Subsequently, it would be increased by stages – 20, 15 or 10 years, respectively. There would be a moderate accumulation of funds, the amount of which depends on the length of the period of equilibrium. A short period of equilibrium would result in a low contribution rate, which would have to be increased rather frequently, and would bring about a low degree of accumulation of funds, thus approaching the system of annual assessment. However, a long period of equilibrium would result in a relatively high initial contribution rate and a larger accumulation of funds, and consequently approaches the GAP system. The scaled premium system is flexible, as it permits adaptation to changes in the conditions determining the financing of the scheme. It should be emphasized, however, that the system requires periodic increases of the contribution rate, which are not accompanied by benefit improvements. Although the contribution rate during the initial period of equilibrium will be lower than that under the GAP system, eventually a stage will be reached when it will exceed the contribution rate required under the latter financial system.

4. A fully funded system

A fully funded system is a system where liabilities are fully funded. Instead of relying on younger generations of workers to pay the benefits, each generation is required to set aside enough money to pay their own benefits. At each moment during the life of the pension plan, accumulated contributions and investment income shall be enough to pay all the promises. If not, the deficit should be filled in during a stated period. This kind of financing system is more prevalent in the private pension world because it protects workers if the pension plan ends.

Appendix 5

General methodology of the actuarial valuation

This actuarial review makes use of a comprehensive methodology developed at the Financial, Actuarial and Statistical Services of the ILO for reviewing the long-term actuarial and financial status of national pension schemes. The review was undertaken by modifying the generic version of the ILO modelling tools to fit the situation of the NIB. 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.

1. Modelling the demographic and economic developments

The use of the ILO actuarial projection model requires the development of demographic and economic assumptions related to the general population, the economic growth, the labour market and the increase and distribution of wages. Other economic assumptions are related to the future rate of return on investments, the indexation of benefits and the adjustment of parameters, such as the maximum insurable earnings and the future level of flat-rate benefits.

The selection of assumptions for projections took into account the recent experience of the NIB to the extent that this information was available. These assumptions were selected to reflect long-term trends rather than giving undue weight to recent experience. The detailed description of the demographic and economic assumptions is presented in Appendix 3.

2. General population

General population is projected starting with the most current data on the general population, and applying appropriate mortality, fertility and migration assumptions.

3. Economic growth and inflation

Labour productivity increases and inflation rates are exogenous inputs to the economic model. Real rates of economic growth are derived using the ILO economic projection model.

4. Active population and employed population

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 people in the general population. An unemployment rate is assumed for the future, and aggregate employment is calculated as the difference between labour force and unemployment. Growth in the insured population is linked to the growth in the employed population. This assumption is adequate since close to 85 per cent of the employed population is covered by the NIB. In this model, the insured population is projected starting with the most current data on insured participants, and then applying appropriate mortality, disability and retirement rates.

5. Salaries

Based on an allocation of total GDP to capital income and to labour income, a starting average wage is normally calculated by dividing the wage share of GDP by the total number of employed. In the medium term, real wage development is checked against labour productivity growth. In specific labour market situations, wages might grow faster or slower than productivity. However, due to the long-term perspective of the present study, the real wage increase is assumed to gradually converge with real labour productivity. It is expected that wages will adjust to efficiency levels over time. In this model, in order to take into account the long-term perspective of the actuarial valuation, the

long-term real wage increase is based upon a long-term assumption which is in line with assumptions observed in other actuarial valuations and a long-term view of the economy.

Wage distribution assumptions are also needed to simulate the possible impact of the social protection system on the distribution of income, for example, through minimum and maximum pension provisions. Data on the wages by age and sex as well as on the dispersion of wages are used in the projection. Average earnings, which are used in the computation of benefits, are also projected.

6.   Modelling the financial development of the social insurance scheme

The present actuarial review addresses all income and expenditure items of the long-term (pension) benefits and the short-term benefits. Projections for pensions are made separately for each sex. Due to the importance of the long-term benefits at the NIB, more importance is given to these projections.

7.   Purpose of pension projections

The purpose of the pension model is twofold. First, it is used to assess the financial viability of the branch. This refers to the measure of the long-term balance between income and expenditure of the scheme. In case of an imbalance, a revision of the contribution rate or the benefit structure is recommended. Second, the model may be used to examine the financial impact of different reform options, thus assisting policy-makers in the design of benefit and financing provisions. More specifically, the model is used to develop long-term projections of expenditure and insurable earnings under the scheme, for the purpose of:

1.   Assessing the options for building up a contingency or technical reserve.

2.   Proposing schedules of contribution rates consistent with the funding objective.

3.   Testing how the system reacts to changing economic and demographic conditions.

4.   Analysing financial impact of possible modifications to the scheme.

8.   Pension data and assumptions

Pension projections require the demographic and macroeconomic framework already described and, in addition, a set of assumptions specific to the social insurance scheme.

The database, as at the valuation date, includes the insured population by active and inactive status, the distribution of insurable wages among contributors and the distribution of past credited service and pensions in payment. Data are disaggregated by age and sex.

Scheme-specific assumptions, such as disability incidence rates, are determined with reference to scheme provisions and the scheme's historical experience. The data and assumptions specific to the NIB are presented in detail in Appendix 3.

9.   Pension projection approach

Pension projections are made following a year-by-year cohort methodology. The existing population is aged and gradually replaced by successive cohorts of participants on an annual basis according to the demographic and coverage assumptions. The projections of insurable earnings and benefit expenditures are then made according to the economic assumptions and the scheme's provisions.

Pensions are long-term benefits. Hence, the financial obligations that a society accepts when adopting financing provisions and benefit provisions for them are also of a long-term nature: participation in a pension scheme extends over a whole adult life, either as contributor or beneficiary, i.e. up to 70 years for someone entering the scheme at the age of 16 years, retiring at the age of 65 years and dying some 20 or so years later. During their working years, contributors gradually build entitlement to pensions that will be paid even after their death, to their survivors.

It is not the objective of pension projections to forecast the exact progression of a scheme's income and expenditure, but to verify its financial viability. This entails evaluating the scheme with regard to the relative balance between future income and expenditure. This type of evaluation is essential, especially in the case of the NIB, which has not yet reached its mature stage.