Trinidad and Tobago

Ninth Actuarial Review of the National Insurance System as of 30 June 2013

ENAP International
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Abbreviations and acronyms

CPI	Consumer Price Index
CSO	Central Statistical Office
GAP	General Average Premium
GDP	Gross Domestic Product
EI	Employment Injury
ILO	International Labour Office
ISSA	International Social Security Association
MIE	Maximum Insurable Earnings
NIF	National Insurance Fund
NIS	National Insurance System
NIBTT	National Insurance Board of Trinidad and Tobago
PAYG	Pay-as-you-go
SCP	Senior Citizens' Pension
SEP	Self-employed persons
TFR	Total fertility rate
TT$	Trinidad and Tobago Dollar
UN	United Nations

Executive summary

The present actuarial review covers the 3-year period up to 30 June 2013 and presents a projection of the financial situation of the National Insurance System for the next 50 years.

Experience of the NIS since the last actuarial review

Financial results. Accumulated assets have been very close to projections every year since the last actuarial review. This is the result of different cancelling effects. Investment income has been lower than expected in 2011-12, but higher than expected in 2012-13. During these two years, lower than expected contribution income was partially offset by lower than expected benefit expenditures.

Adjustments to contributions and benefits. In March 2013, pensions in payment were increased by 25 per cent, while fixed-rate benefits and minimum survivors' benefits were increased by 50 per cent (a further increase of 20 per cent of pensions in payment took place in March 2014). In March 2013, the maximum insurable earnings (MIE) was increase to TT$10,000 and the contribution rate to 11.7 per cent. In March 2014, the MIE was increased to TT$12,000 and the contribution rate to 12.0 per cent. All these modifications are reflected in the present actuarial review.

Economic developments. Over the last three years, globally, real GDP growth has been close to zero. The inflation rate was on average 7.4 per cent per year during that period. On the other hand, it is estimated that salaries have increased by only 4.3 per cent per year on average. These factors are considered in the recommendations concerning the adjustment of benefits and the increase of the MIE in 2016.

Mortality analysis. The report presents the results of an analysis of the mortality of NIS pensioners. It shows that mortality rates experienced by NIS pensioners during the period from 1 July 2010 to 30 June 2013 are lower that the mortality rates assumed for the same period in the 2010 valuation. It also shows that the new mortality table used for the 2013 valuation appears appropriate for estimating the mortality of NIS insured persons.

Population projections

It is projected that the total population of Trinidad and Tobago will increase from 1,345,095 in 2013 to 1,415,917 in 2033 and will then initiate a slow decrease to 1,269,073 in 2063. The number of persons at pensionable age (60 and over) will grow from 192,286 in 2013 to 404,723 in 2063, while the population aged 16 to 59 (the group who potentially supports the retirees though their contributions) will decrease by 24 percent over the same period. The number of working-age persons for each person aged 60 and over will fall dramatically from 4.5 to 1.6 over the projection period.

NIS demographic and financial projections

Demographic projections

The total number of pensioners is projected to increase significantly in the future, from 135,049 in 2013-14 to 353,255 in 2062-63, while at the same time the number of contributors will be just below 500,000 for the next 10 years, but will then gradually decrease to 378,352 in 2062-63. The ratio of contributors to pensioners will decrease from 3.7 to 1.1 over the next 50 years.

Evolution of the reserve

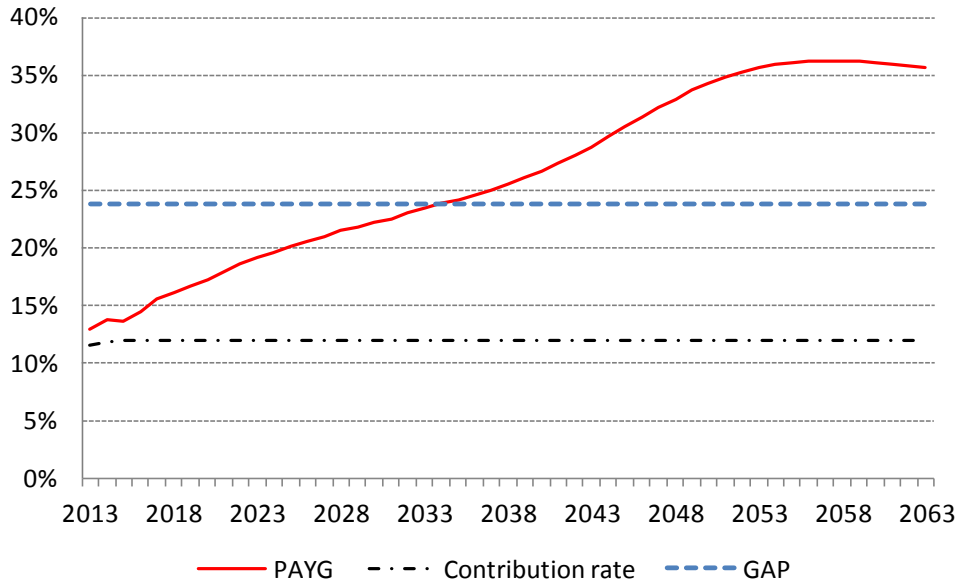
Financial projections reveal that, under the present conditions, system's expenditures exceed contribution income in financial year 2013-14. The total assets of the NIS will however continue to increase until 2018-19 because part of the investment income will be used, in addition to contributions, to support the expenditures of the system. From 2019-20, assets will rapidly decrease and the NIS funds will be completely depleted in 2029-30 if nothing is modified in terms of contributions or benefits.

Pay-as you go cost

The pay-as-you-go (PAYG) cost rate is projected to increase from its current level of 13.8 percent in 2013-14 to 35.7 percent in 2062-63.

General average premium

The general average premium of the system (the constant contribution rate necessary to finance all NIS benefits over the next 50 years) is 23.8 percent. It may be compared to the present contribution rate of 12.0 percent.



The financial situation of the scheme has significantly deteriorated since the last actuarial review, due in large part to recent unfavourable economic developments. Action must be taken to restore its financial health. The present contribution rate of 12.0 is not sufficient to support the present level of benefits in the long run. It is not even sufficient to meet current benefit expenditures which represent 13.8 per cent of the payroll in 2013-14. Investment earnings have to be used presently to support the expenditures of the system.

There is a need to plan for a combination of future contribution rate increases and measures to reduce the cost of the system. On the basis of this actuarial review and the observations of this report, it is recommended to gradually increase the contribution rate. An automatic mechanism should be introduced in the law for the determination of future contribution rates, on the basis of periodic actuarial reviews. The report proposes such a mechanism illustrating the very high level of contribution rates that would be required in the long term (higher than 35 per cent) if the conditions of the system are not modified. Other measures aimed at reducing the cost of the system, described hereunder, would help mitigate the impact of these contribution rate increases.

Analysis of modifications to the NIS

Adjustment of system's parameters

Different elements of the system need to be adjusted to keep their value over time: the maximum insurable earnings (MIE), minimum and maximum pension rates, grants and pensions in payment.

It is recommended that the MIE be increased by 13.5 percent (to TT$13,600) on 29 February 2016. It is also recommended that the earnings classes limits be increased by the same percentage of 13.5 percent. Corresponding contributions and benefit schedules are presented in Appendix 5. There should be an annual

adjustment of the MIE starting in March 2017. The adjustment should be based on the evolution of the average earnings of all workers aged 15 to 64 in the Trinidad and Tobago's economy, according to CSO data.

It is also recommended that, starting in March 2017, benefits and earnings class limits be adjusted on an annual basis in line with the lesser of price inflation and the national wage increase.

Level of the minimum retirement pension

The present NIS minimum retirement pension is very high by international standards and also when put in relation to the national average wage and the official minimum wage. Because of the generosity of the minimum pension, the pension formula of the scheme (the "earned" pension) does not really apply to a large part of new retirees. The minimum pension should normally play the role of taking care of persons with low earnings or interrupted careers.

The Senior Citizens' Pension (SCP) has been increased to $3,500 on 1 October 2014. This may create pressure to increase the NIS minimum pension to the same level. The government should adopt a clear policy concerning the future evolution of Senior Citizens' Pension (SCP) and the NIS minimum pension since they affect, to a certain extent, the same clientele.

The base scenario of the valuation assumes that the NIS minimum retirement pension will remain at $3,000 in 2015, that it will be indexed by 13.5 per cent in February 2016 (in line with the other benefits of the scheme) so that it reaches $3,404 in 2016, and that it will be indexed with inflation thereafter.

Four additional scenarios of modification of the minimum pension have been analysed:

1. Increase of the minimum pension at $3,500 on 1 April 2015 (fully indexed thereafter);
2. Increase of the minimum pension at $3,500 on 1 April 2015, but the amount of the minimum pension would vary depending on the age at start of the pension, for encouraging people to delay retirement. It would be paid at the following levels for life (except for future periodic indexation at full rate):
   - Retirement at 61: $3,100
   - Retirement at 62: $3,200
   - Retirement at 63: $3,300
   - Retirement at 64: $3,400
   - Retirement at 65 or above: $3,500
3. Partial indexation of the minimum pension of $3,000 from March 2017 at 50 per cent of the indexation rate applied to other benefits, in order to reduce its importance over time.
4. Freezing the minimum pension at $3,000 forever.

The third measure (partial indexing of the current minimum pension of $3,000) would reduce the GAP from 23.8 to 21.2 per cent.

Retirement age

An increase of the NIS retirement age would be justified considering the projected increase of the life expectancy in Trinidad and Tobago. The increase of the retirement age may also be justified by the labour force shortage that is anticipated for Trinidad and Tobago in the future, namely on account of the shrinking of the population aged 16 to 59. In most countries where such a measure has been implemented, a transition period has been introduced in order to allow people to adjust their retirement planning to the new rules.

It is recommended to gradually increase the retirement age at which a pension is paid without reduction from age 60 to age 65 over the period from 2025 to 2060. It would be possible to continue to allow people to claim their retirement pension from age 60 with a lifetime actuarial reduction of their pension. The increase of the retirement age would reduce the GAP of the system from 23.8 per cent to 21.8 per cent.

Global financial impact of the reform package

The report presents financial projections of the NIS if the following measures are adopted:

1. Partial indexation of the minimum pension of $3,000 from March 2017, at 50 per cent of the indexation rate applied to other benefits;
2. Increase of the retirement age from 60 to 65 over the period from 2025 to 2060.

With the implementation of these measures, the long-term PAYG cost of the system would be reduced from 35.7 per cent to 28.1 per cent. The GAP (calculated over the next 50 years) would be reduced from 23.8 per cent to 19.4 per cent. Hence, the contribution rate would not have to increase to levels as high as those required under status quo. Here is a possible contribution rate schedule under reform:

Year	Contribution rate
2016-17	13.2%
2017-18	14.4%
2018-19	15.6%
2019-20 to 2021-22	16.8%
2022-23 to 2027-28	18.0%
2028-29 to2038-39	19.2%
2039-40 to 2051-52	20.4%
2052-53 to 2060-61	21.6%
2061-62 +	22.8%

These represent fundamental changes. The coherence of the national retirement system requires that discussions take place for the adoption of appropriate reforms

for all components of the system, including the Senior Citizens Pension and the civil service pension scheme.

Investment policy

The asset mix of the NIS fund has been relatively stable during the last six years. As of 30 June 2013, 45 per cent of the portfolio is invested in fixed-income securities (government securities, corporate bonds, debentures, mortgages, fixed-deposits and money market instruments) and 55 per cent in equities. Because of the limited equity market in Trinidad and Tobago, local equities are concentrated in a small number of enterprises, hence diversification may be achieved only by investing overseas. The proportion of overseas investments in the NIBTT portfolio has increased from 11 to 14 percent of the total portfolio over the period 2009-2013. It is hoped that the legislative constraints applied to overseas investments will be relaxed, so that the NIBTT will have more flexibility to diversify its portfolio.

The recently adopted NIBTT *Investment Policy Statement* 2014-2015 has been analysed with reference to the ISSA *Guidelines on Investment of Social Security Funds*. The principal elements coming out of this analysis are:

- The target asset mix of the NIBTT investment policy is well designed for maximizing long-term return and is well diversified in terms of asset categories and geographical focus (through overseas investments). Certain investments (real estate) provide an inflation protection that is appropriate given the nature of NIS liabilities.
- The new investment policy has greatly improved compared to the preceding one by making the link between the investment policy and the results of the most recent actuarial review. However, for assessing the real liquidity needs of the NIS, the investment policy should take into account the fact that measures are taken after each actuarial review to ensure the increase of the reserve in nominal value (namely by increasing the contribution rate) and avoid liquidity problems.
- The investment policy should present measures of risk by asset class. It should also discuss the question of risk tolerance of the social security fund (taking into account its long horizon).
- The rate of return benchmarks chosen for each asset class appear appropriate.

Level of administrative expenditures

Actuaries can provide significant advice in all aspects of social security schemes. However, in the matter of administrative expenditures, especially when the administering entity has reached a certain stage of maturity, it is questionable whether the actuary’s opinion should be given precedence over the combined efforts of budget people and the governing body of a social security institution. Thus, it is recommended that Section 22 of the National Insurance Act be reviewed so that the target administrative expenditure level be established with consideration of a more comprehensive analysis of the NIBTT administration components and not only on the actuaries' opinion.

The Board of Directors of the NIBTT has established a limit on administrative expenditures at 7.5 percent of contribution income. In 2012-13, administrative expenditures have represented 5.6 percent of contribution income. Before the National Insurance Act is modified in line with the recommendation of the preceding paragraph, the ratios appearing in Table 5.5 may be considered as a reasonable benchmark for administrative expenditure targets (allowing for a margin given that fluctuations can be expected). Hence the present limit established at 7.5 percent of contribution income should remain the same until the next actuarial review.

In the NIS financial statements, administrative expenditures are allocated by branch of benefits in proportion of contributions. This may not properly reflect the workload that each branch generates. In particular, it seems that the Short-term fund may not support its appropriate share of administrative expenditures.

Extension of coverage to self-employed persons

The report presents updated demographic and financial projections regarding the coverage of self-employed persons by the NIBTT.

Benefits offered to self-employed persons would include long-term and short-term benefits. The contemplated long-term benefits are similar to those applicable to salaried workers. For short-term benefits, there exist certain differences aimed at reducing anti-selection. In addition, SEP would be offered age credits (for persons age 50 and over at implementation) and contribution subsidy (for persons with low-income).

A contribution rate of 11.2 per cent (10.8 per cent for Long-term benefits and 0.4 per cent for Short-term benefits) is recommended for SEP. This contribution rate should be increased to 12.4 per cent (12.0 per cent for Long-term benefits and 0.4 per cent for Short-term benefits) on 29 February 2016 for consistency with the increase recommended for salaried workers.

Financial projections show that, on the basis of the contribution rate of 11.2 per cent, the fund would increase continuously until 2048-49 and would become negative only at the very end of the projection period (2059-60).

New cost estimates regarding the age credits and the contribution subsidy for low-income SEP have been performed based on the most recent SEP profile and taking into account the actuarial bases and assumptions of this valuation. The new cost estimates are:

- Age credits: TT$108 million.
- Co-payment of contributions for low-income SEP: TT$3 million in the first year of application and TT$44 million in total for the first 5 years. This includes the cost of the full subsidy during the first year.

Conversion from an earnings class system to a system based on percentage of earnings

The report presents alternative pension formulas based on the career average re-valued earnings, with the financial implications of each formula. It comments on

advantages and disadvantages of each one and outlines factors to be considered in the choice of an appropriate formula.

The three possible formulas are:

- Formula 1 – Reproduction of the present pension formula
  Example: 2% for the first 15 years of contribution, plus 1.1% for each year over 15

- Formula 2 – Fixed-rate per year of contribution
  Example: 1.6% per year

- Formula 3 – Redistributive formula putting more weight on low earnings
  Example: 1.8% per year for earnings below 50% of the MIE, plus 1.2% per year for earnings above 50% of the MIE

Very few cases would be affected negatively by any of the three alternative formulas, especially if the number of years of contribution is high.

Advice is provided on possible approaches to recognize the accrued rights (before the reform) of the present insured population, with a view to operate a smooth transition between the old and the new system. The recognition of accrued rights before the implementation of the new system would be done under different methods for different cohorts of insured.

It is shown that none of the three formulas would significantly affect the global cost of the system.

Among the three pension formulas, it is recommended to adopt Formula 3 which would effect a certain redistribution in favour of persons with low earnings (thus reducing the importance of the minimum pension in the longer term) and would encourage participation to the NIS by rewarding long contribution histories.

List of recommendations

1. The "earned" part of pensions in payment (i.e. excluding the minimum pension top-up) and fixed-rate benefits should be increased by 13.5 percent on 29 February 2016. At the same time, the maximum insurable earnings should be increased to TT$13,600. Appendix 5 presents the recommended benefit rates and contribution schedule.
2. The minimum retirement pension should be maintained at its present level of $3,000 until the beginning of 2017.
3. From March 2017, all system’s parameters should be subject to an automatic annual adjustment.
   - Pensions in payment (the "earned part", excluding the minimum pension top-up), fixed-rate benefits and the earnings class limits should be adjusted based on the lesser of the rate of inflation and the rate of increase of the national average wage.
   - The minimum retirement pension should be partially indexed at 50 per cent of the indexation rate applied to other benefits. Full indexation could be applied only once

the partial indexation will have taken back the level of minimum pension at an appropriate percentage of the minimum wage.

- The maximum insurable earnings should be adjusted according to a wage index.

4. The contribution rate (presently at 12.0 per cent of insurable earnings) should be increased to 13.2 per cent on 29 February 2016. In addition, an automatic mechanism should be introduced in the law for the determination of future contribution rates, based on fixed rules and on the results of the most recent actuarial review.

5. Contribution income should be allocated to the three benefit funds according to the following proportions:

   - Long-term fund: 90 per cent
   - Short-term fund: 6 per cent
   - Employment injury fund: 4 per cent

6. Reserve objectives to be maintained for each fund should continue to be established as follows:
   - Short-term: 2 times the annual benefit expenditure
   - Employment injury: 10 times the annual benefit expenditure
   - Long-term: the remaining excess of income over expenditure

7. The retirement age for an unreduced pension should be gradually increased from age 60 to age 65 over the period from 2025 to 2060. Actuarially reduced pensions would be available from age 60.

8. The investment policy should discuss more extensively and provide indications on the risk tolerance of the social security fund, given its long horizon. The NIBTT should continue its representations for an increase of the limit imposed on overseas investments. If an automatic mechanism is adopted for the determination of future contribution rates (see item 4 above), its effect on the NIS cash flows should be considered in the investment policy.

9. Section 22 of the National Insurance Act should be reviewed so that the target administrative expenditure level be established with consideration of a more comprehensive analysis of the NIBTT administration components and not only on the actuaries' opinion. The present limit established at 7.5 percent of contribution income should remain the same until the next actuarial review.

   Administrative expenditures of the NIBTT should be allocated by branch according to contribution income and benefit expenditure in equal proportions, instead of the present practice which is based on contributions only.

10. The contribution rate for self-employed persons should be established at 11.2 per cent (10.8 per cent for Long-term benefits and 0.4 per cent for Short-term benefits). This contribution rate should be increased to 12.4 per cent (12.0 per cent for Long-term benefits and 0.4 per cent for Short-term benefits) on 29 February 2016 for consistency with the increase recommended for salaried workers.

11. In the context of the revision of the pension formula, it is recommended to adopt a career average revalued earnings method (indexed according to price inflation). Among the three alternative pension formulas presented in the report, it is recommended to adopt Formula 3 which would effect a certain redistribution in favour of persons with low earnings (thus reducing the importance of the minimum pension in the longer term) and would encourage participation to the NIS by rewarding long contribution histories.

Introduction

Section 70 of the Trinidad and Tobago National Insurance Act 35 of 1971 requires that an actuarial review of the National Insurance System (NIS) be undertaken at five-yearly or shorter intervals as the Board may determine. The present actuarial review covers the 3-year period up to 30 June 2013. The main objectives of this review are to assess the long-term financial condition of the National Insurance Fund (NIF) and study possible ways to improve contribution and benefit provisions.

This report has been prepared by *École nationale d'administration publique* (ENAP) of Quebec, Canada, based on the information provided by the NIBTT. ENAP appointed Mr. Pierre Plamondon, Senior Actuary, Mr. Gilles Binet, Senior Actuary, Ms. Doan-Trang Phan, Actuarial Modelling Expert and Mr. Vincent Plamondon, Actuarial Modelling Expert, to conduct this actuarial review. The actuaries worked in close cooperation with Ms. Lisette Alexander, Actuarial Assistant at the NIBTT.

Statistical data and information for this valuation have been obtained via electronic transfers between the NIBTT staff and the actuaries. Subsequently, the model of the International Financial and Actuarial Service of the ILO was used to prepare the demographic and financial projections associated with the actuarial review.

Section 1 of the report presents a review of the experience of the three-year period from 1 July 2010 to 30 June 2013. Section 2 describes the projection of the general population and the macro-economic framework used for the valuation. Section 3 presents the NIS demographic and financial projections on the basis of the present provisions of the system. Section 4 presents the analysis and financial implications of certain modifications to the system. Section 5 analyses the investment policy and the level of administrative expenditures. Section 6 discusses the coverage of self-employed persons and Section 7 presents the analysis and recommendations concerning the conversion from a system based on earnings classes to a system based on percentage of earnings. The appendices contain a summary of key NIS contribution and benefit provisions, a description of the methodology used for the valuation, key data inputs and assumptions, detailed information on NIS finances for the three-year period ending on 30 June 2013 and the proposed contribution and benefit levels recommended for 2016. They also include detailed information on the mortality experience and examples of application of the alternative pension formulas. Finally, an appendix presents an international comparison of indicators on the adequacy of benefits and pension sustainability.

ENAP would like to express its appreciation to Ms. Niala Persad-Poliah, Executive Director of the NIBTT, and its Executive Committee, particularly Mr. Ramlakhan Seecharan, Executive Manager, Technology, and Mr. Feyaad Khan, Executive Manager, Policy, Planning and Actuarial Services, for the cooperation of the Institution in providing information and timely support to the actuaries. In addition, Ms. Lisette Alexander offered invaluable and timely assistance.

1. Review of the experience of the NIS

This section discusses the evolution of the financial situation of National Insurance System (NIS) between 1 July 2010 and 30 June 2013 (the financial year of the National Insurance Board of Trinidad and Tobago runs from 1 July to 30 June). NIBTT's audited financial statements present detailed information for each of the three branches of the social security system: long-term benefits, short-term benefits and employment injury benefits. More detailed information on the reconciliation of financial and demographic data of the NIS over the past three years appears in Appendix 4.

1.1 Amendments since the last actuarial review

The following modifications have been introduced in the legislation since the last actuarial review.

Maximum insurable earnings and contribution rate

- On 4 March 2013, the maximum insurable earnings (MIE) was increased to TT$10,000.00 and the contribution rate to 11.7 per cent of insurable earnings;
- On 3 March 2014, the maximum insurable earnings (MIE) was increased to TT$12,000.00 and the contribution rate to 12.0 per cent of insurable earnings

Retirement benefits

- Increase of the minimum Retirement pension from TT$2,000.00 to TT$3,000.00 per month.
- Increase of the minimum Retirement grant from TT$2,000.00 to TT$3,000.00.

Survivors' benefits

- Increase of the minimum monthly Widows/widowers pension from TT$400.00 to TT$600.00.
- Increase of the minimum Child allowance from TT$400.00 to TT$600.00 per month.
- Increase of the minimum monthly Dependent parent pension from TT$400.00 to TT$600.00 (TT$300.00 each if both are alive).
- Increase of the minimum Orphan allowance from TT$800.00 to TT$1,200.00 per month.

Maternity benefits

- Increase of the Maternity grant from TT$2,500.00 to TT$3,750.00.

Employment injury and related benefits

- Increase of the maximum medical expenses reimbursement to TT$33,750.00.

Funeral grant

- Increase in the Funeral grant from TT$5,000.00 to TT$7,500.00.

Adjustment of other pensions in payment

– Other pensions in payment were increased by 25 per cent in March 2013 and by 20 per cent in March 2014.

1.2 Experience from 1 July 2010 to 30 June 2013, comparison with assumptions

Table 1.1 presents consolidated revenues and expenditures for all branches. Miscellaneous income and expenditure, which represent minor amounts, are not included in the table. Results of the financial year 2010-11 were available at the time of production of the 8th Actuarial Review. This is the reason why no differences appear in Table 1.1 between projected and observed results for that year.

The last actuarial review was recommending an increase of pensions by 52.3 percent in January 2013, while the increase has been done in two steps: 25 percent in March 2013 and 20 percent in March 2014. Regarding contributions, the last actuarial review was recommending to increase the contribution rate in January 2013 to 12.0 percent and the maximum insurable earnings to TT$11,800, while the contribution rate and ceiling increases have also been implemented in two steps: contribution rate at 11.7 percent and MIE at TT$10,000 in March 2013 and contribution rate at 12.0 percent and MIE at TT$12,000 in March 2014. The later application of these measures have caused slightly lower observed contributions and benefits compared to the projections of the last review.

In 2011-12, observed contribution income has been 9.4 per cent lower than the projections of the last review. In 2011-12, observed benefit expenditures were 3.4 per cent lower than projections. Total benefit expenditures were close to projections over the last three years. Over the two-year period 2011-12 and 2012-13, the observed number of retirement pensioners was in line with projections, while the observed number of survivors pensioners was 14 percent higher than projections.

Short-term benefit expenditures were in line with projections. Regarding Employment injury benefits, lower benefit expenditures relate mainly to lower than expected Injury allowances paid over the three-year period from 2010-11 to 2012-13.

Table 1.1 Comparison of projected versus actual results of the NIS regarding the different components of revenue and expenditure (million TT$)

	2010-11 **	2011-12	2012-13
Projections of the 8th Actuarial Review			
Contribution income	2,723	3,086	3,453
Investment income *	2,066	1,778	1,921
Benefit expenditure	2,295	2,849	3,594
Administrative expenses	128	136	144
Observed results			
Contribution income	2,723	2,822	3,304
Investment income *	2,066	1,051	2,431
Benefit expenditure	2,295	2,754	3,556
Administrative expenses	128	141	185
Contribution to surplus (deficit)			
Contribution income	0	-264	-149
Investment income *	0	-727	511
Benefit expenditure	0	95	38
Administrative expenses	0	-5	-41

* Investment income includes realized and unrealized gains.
** Results of the financial year 2010-11 were available at the time of production of the 8th Actuarial Review.

Sources: NIBTT audited financial statements and *Eighth Actuarial Review of the National Insurance System as of 30 June 2010.*

Chart 1.1 Evolution of contributions and benefits (all funds combined)

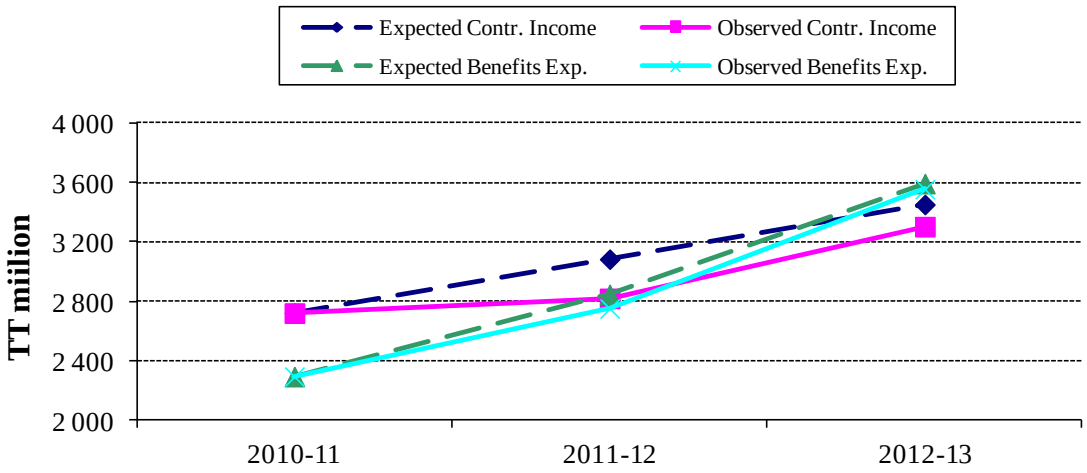


Table 1.2 presents a comparison of NIS total funds projected according to the 8th Actuarial Review with the corresponding actual balance sheet data (minor items, namely "Other liabilities and borrowings", are not considered as they are not relevant to actuarial reviews).

Table 1.2 Evolution of funds as at 30 June (million TT$)

	2010	2011	2012	2013
Projections of the 8th Actuarial Review	18,533	20,863	22,741	24,377
Observed results	18,533	20,860	22,460	24,445 *
Ratio Observed / Projected		100%	99%	100%

* This amount has been restated to TT$24,156 million in the provisional financial statements 2013-2014. The restated amount of TT$24,156 million has been used as starting reserve as of 30 June 2013 for the financial projections of this actuarial review.

Sources: NIBTT audited financial statements and *Eighth Actuarial Review of the National Insurance System as of 30 June 2010.*

Accumulated assets have been very close to projections every year since the last actuarial review. This is the result of different cancelling effects. Investment income has been lower than expected in 2011-12, but higher than expected in 2012-13. During these two years, lower than expected contribution income was partially offset by lower than expected benefit expenditure.

The average annual rate of return of the fund over the three-year period since the last review has been 9.1 percent, compared to the average return of 9.3 percent assumed for that period in the actuarial review. A comparison of actual versus projected rates of return is presented in Table 1.3.

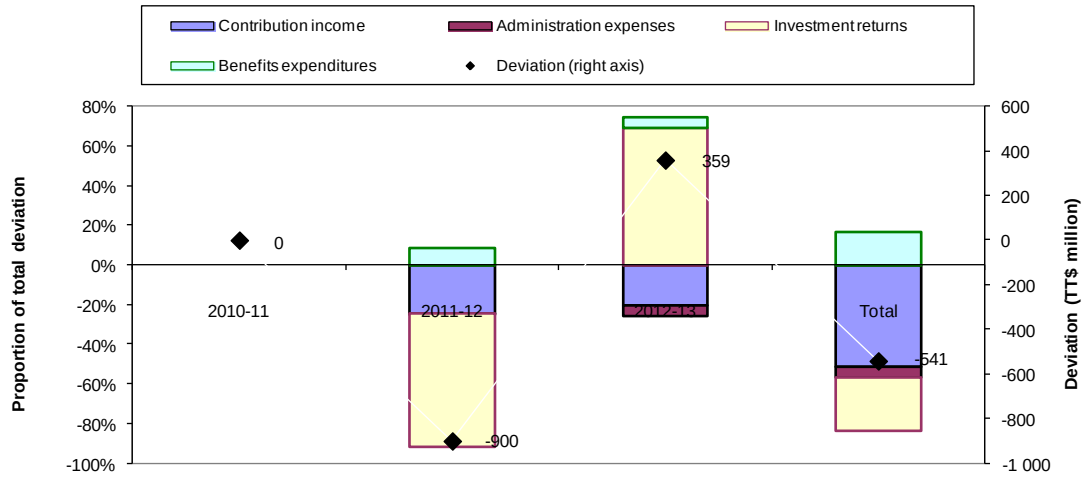
Table 1.3 Rate of return of the fund (2010/11 to 2012/13)

Year	Rate of return	
	Projected	Observed [a]
2010-11	11.1%	11.1%
2011-12	8.5%	5.0%
2012-13	8.5%	11.2%
Geometric average	9.3%	9.1%

a Calculated as 2 X I / (A + B - I), where I is the annual investment income, A is the fund at beginning of the year and B is the fund at the end of the year

Chart 1.2 presents, for each financial year, the contribution of the various components of revenue and expenditure to the deviation in projected assets as at 30 June 2013. In this chart, bars showing the distribution of sources of deviations in each financial year have all the same size. Consequently, it has no relationship with the size of the total deviation, which is indicated separately with reference to the right axis.

Chart 1.2 Sources of deviations in the projected increase of assets from 2010-11 to 2012-13

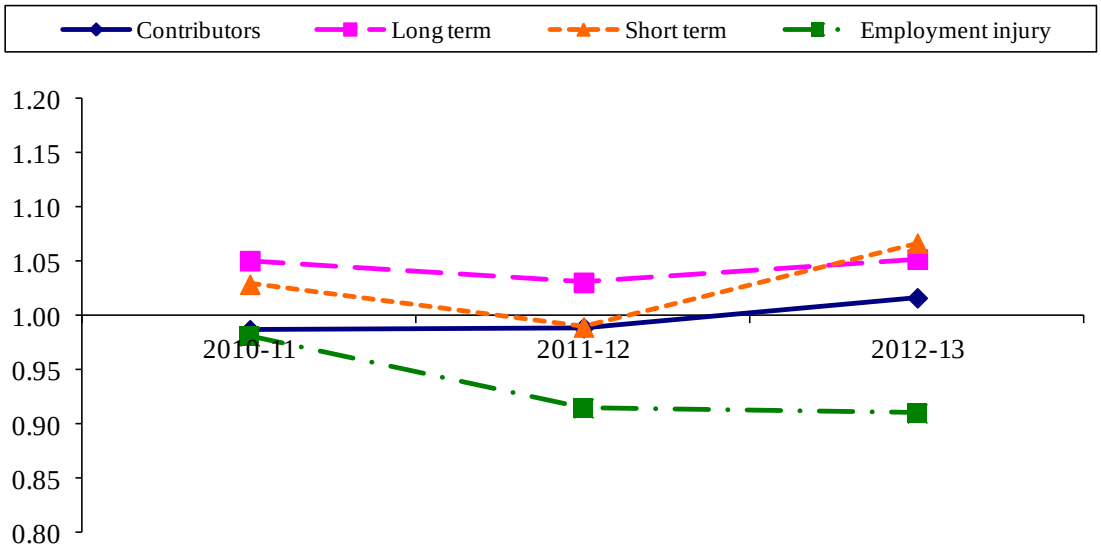


The major part of the TT$727 million deficit caused by lower than expected investment income in 2011-12 was cancelled to a large extent by the extra TT$509 million investment income of in 2012-13. Lower than expected contribution income in 2012-13 and 2013-14 have caused a TT$494 million deficit.

Analysis of NIS demographic data

Chart 1.3 shows the ratio of observed to projected number of contributors and beneficiaries. The number of contributors has been close to projection during the three-year period. In 2009-10, the observations matched the projection. It appears that the macroeconomic framework of the 8th Actuarial Review was a reasonable and prudent forecast of the economic outlook.

Chart 1.3 Ratio of observed to expected contributors and beneficiaries



Long-term benefit recipients in 2010-2011 amounted to 122,656 or 4.8 percent higher than the projected number of recipients of 116,990. The decreasing trend of the ratio is driven by the fall in the number of invalidity and survivors pensions. The number of retirement pensions has been close to the projection during the period, but the number of survivor pensioners was 14 percent higher than anticipated.

Regarding Short-term benefits, the number of sickness beneficiaries has been slightly lower than projected in both 2011-12 and 2012-13. The number of Funeral grants is systematically higher than projected (15 percent on average over the last three years). In 2012-13, the number of Maternity benefits has been 11.5 percent higher than projected.

Regarding Employment injury benefits, the number of injury allowances has been 22 per cent lower than projections over the three-year period from 2010-11 to 2012-13. This phenomenon was also observed in the last actuarial review and deserves investigation. It could be related to an improvement of the injury experience, increasing delays in claiming or an emerging disincentive to claim.

Allocation of administrative expenditures

Concerning the allocation of administrative expenditures by branch, this is presently done with reference to contributions. It must be recalled that the 7th and 8th Actuarial Reviews were recommending to allocate administrative expenditures according to contribution income and benefit expenditures in equal proportions. This method should be applied in the preparation of future financial statements.

1.3 Mortality experience

As part of the terms of reference of this valuation, it has been requested to conduct an analysis of the mortality experience of the NIS. For that analysis, we have used the data on the retirement pensioners of the scheme. The NIS database on persons below the retirement age (mainly inactive insured persons) is not complete and reliable enough to be included in the analysis. The population of NIS retirement pensioners exposed to the risk of mortality during the period of three years from 1 July 2010 to 30 June 2013 includes 157,405 males and 80,884 females, which provides a representative sample for the mortality analysis.

Comparison of mortality experience with the 2010 mortality table

Table 1.4 compares the observed number of deaths among NIS retirement pensioners over the last three years with the number of deaths that were expected according to the mortality table used in the last actuarial review. For males, observed/expected ratios are almost constant around 90 per cent. For females, ratios are lower, with an average of 64 per cent. It must be noted that the exposure of female cases is lower than the exposure of males and may explain the greater fluctuations by age.

Table 1.4 Observed and expected deaths of NIS retirement pensioners for the period 2010-11 to 2012-13

		Deaths		
Age group	**Exposure**	**Observed**	**Expected**	**Obs/Exp**
MALES				
60-64	50,848	752	879	86%
65-69	42,264	1,005	1,123	90%
70-74	26,952	1,006	1,113	90%
75-79	17,941	1,025	1,133	91%
80-84	10,679	923	1,021	90%
85-89	5,818	777	828	94%
90 +	2,902	610	678	90%
Total	**157,405**	**6,098**	**6,773**	**90%**
FEMALES				
60-64	28,169	188	337	56%
65-69	21,381	245	408	60%
70-74	12,963	268	397	68%
75-79	8,611	248	419	59%
80-84	5,326	263	406	65%
85-89	2,866	238	340	70%
90 +	1,568	248	333	74%
Total	**80,884**	**1,698**	**2,640**	**64%**

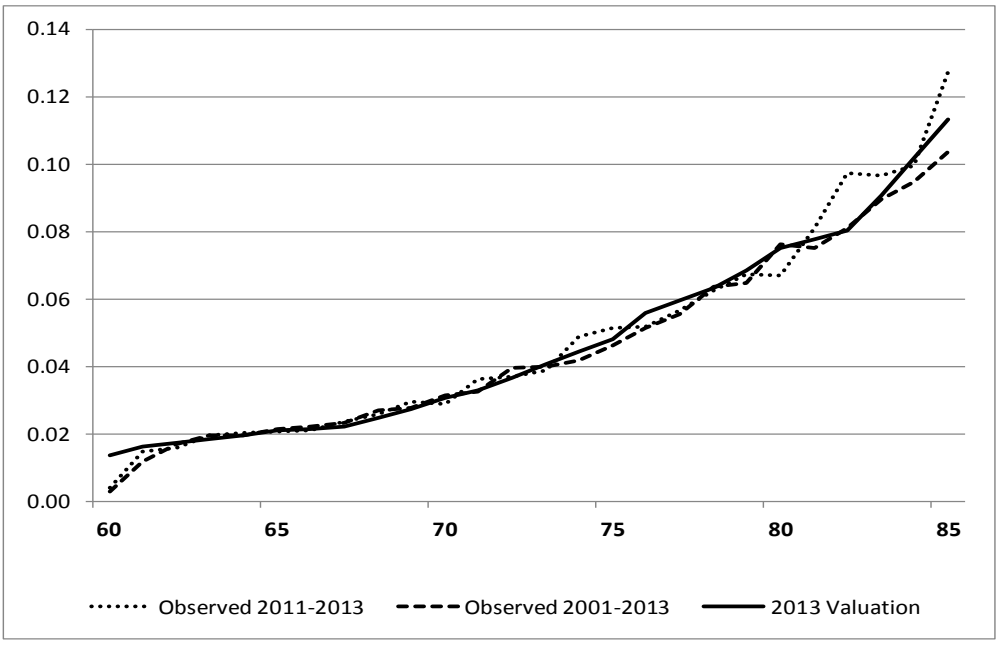
Detailed information on observed and expected mortality (based on the 2010 mortality table) appear in Appendix 6.

Comparison of mortality experience with the 2013 mortality table

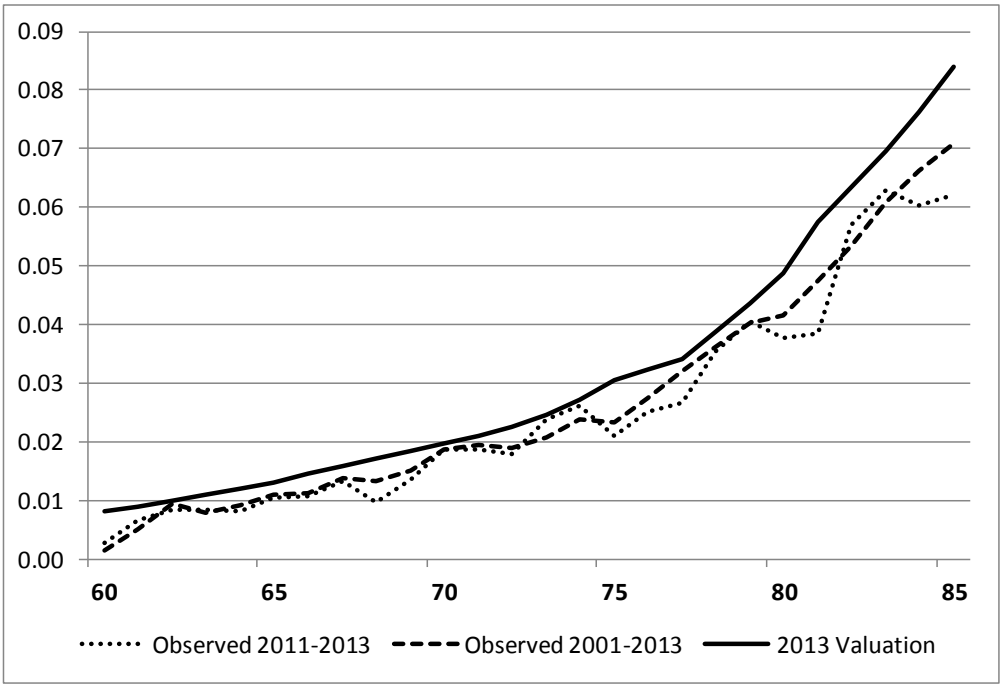
The present actuarial review (2013) uses mortality rates that are lower than those used in the previous actuarial review (2010). The ratios lower than 100% observed in Table 1.4 justify the use of the new mortality table. In fact, the mortality rates of the 2013 mortality table are close to 90 percent of those of the 2010 mortality table, which is the observed/expected ratio for males. Chart 1.4 presents a comparison of the mortality rates observed for both genders at ages 60 to 85 for the period 2001-2013 and for the period 2011-2013 with the mortality rates used in the present actuarial review.

Chart 1.4 Comparison of mortality experience with the mortality table used in the 2013 valuation

MALES



FEMALES



It shows that the rates used for males in the 2013 valuation are very close to the experience under the NIS (for both periods). For females, the differences are slightly more important, but still in an acceptable range. Globally, for the ages considered, the ratio of the observed mortality rates over the period 2011-2013 to the mortality table used in the 2013 valuation is 97 per cent for males and 81 per cent for females.

2. Projected demographic and macroeconomic environment of Trinidad and Tobago

Future income and expenditure of the NIS will be closely linked to changes in the size and age structure of the population of the country, employment levels, economic and wage growth, inflation, and rates of return on investments. Therefore, in order to estimate future NIS finances, a projection of Trinidad and Tobago's total population and economic activity is required. Demographic projections provide estimates of the size and composition of the labour force, while projections of the gross domestic product (GDP) and the growth of labour productivity are necessary to project the number of workers and their earnings. Population and economic projections are interrelated. They are thus performed together to ensure consistency of results.

Demographic and macroeconomic variables were projected for a period of 50 years, following an analysis of past trends and an estimate of plausible future experience. Population and economic projections are an intermediary step to derive NIS projections.

2.1 Population projection

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 people who permanently enter and leave Trinidad and Tobago and is the most volatile of the three factors.

The last official population census took place in 2011, where the resident population was estimated at 1,328,018.

Fertility

The total fertility rate (TFR) represents the average number of children each woman of childbearing age would have if she had all her children in a particular year. If there is no migration, a TFR of 2.1 is required for each generation to replace itself. The TFR has been fairly stable over the last decade, fluctuating between 1.6 and 1.8 child per woman, with a slight increase in recent years. It has been assumed in this valuation that the age-specific fertility rates of 2008 continue to apply in 2011 and will gradually reach over a 30 year period the age-specific fertility rates projected by the United Nations for the period 2040-2045. These assumptions result in a total fertility rate of 1.793 in 2011 slightly increasing to 1.803 in 2041 and remaining constant thereafter.

Table 2.1 Historical fertility rates in Trinidad and Tobago (2000-2008)

Year	Total fertility rate
2000	1.70
2001	1.70
2002	1.60
2003	1.70
2004	1.60
2005	1.60
2006	1.60
2007	1.70
2008	1.80

Source: Central Statistical Office of Trinidad and Tobago

Mortality

Starting mortality rates for this valuation are based on the information contained in the 2011 Census of Trinidad and Tobago. According to these data, life expectancy at birth is estimated at 71.4 years for males and 77.8 years for females in 2011. For the future, life expectancy and improvements in mortality are assumed to occur in accordance with UN estimates. Under this pattern of mortality improvements, it is projected that life expectancy at birth will reach 75.8 years for males and 82.5 years for females in 2061.

Life expectancy at advanced ages is a key driver of the cost of retirement pensions. At age 60, life expectancy is 19.5 years for males and 23.1 years for females in 2011. It will reach 20.8 years for males and 26.2 years for females in 2061.

Migration

The 2011 census provides information on the total number of persons who emigrated during the period 2000-2011, with their age and gender distribution. The average number of net emigrants according to that source is 1,405 persons. For this valuation, net migration is assumed constant at the negative value of 1,500 persons per year.

In the previous actuarial review, net migration was assumed to be zero. In order to show the effect of this modification of the migration assumption on the result of the actuarial review, a sensitivity test is presented in Section 3.6.

Projected population

Chart 2.1 presents the projected population of Trinidad and Tobago from 2011 to 2061 separated into three age categories: children (0-15), persons who can potentially contribute to the NIS (16-59) and persons at pensionable age (60 and over). The evolution of the relative size of each age-group (notably the decrease of the population of children and the increase of the number of persons at pensionable age) illustrates the projected ageing of the population of Trinidad and Tobago.

Chart 2.1 Projected population of Trinidad and Tobago, by age groups (2013-2063)

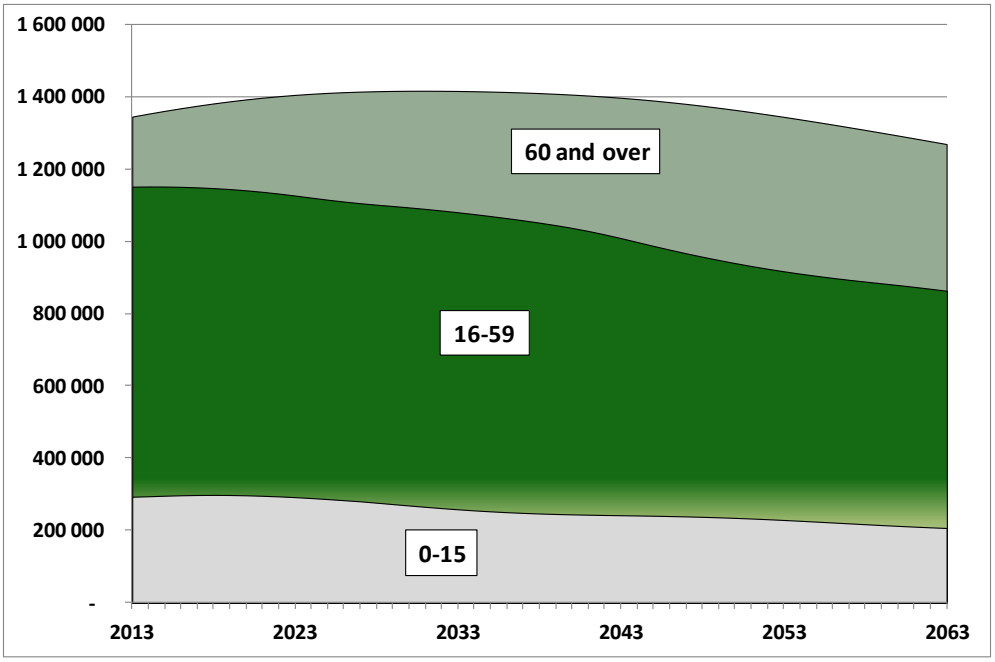


Table 2.2 presents detailed population projections. We may observe that the total population will increase from 1,345,095 in 2013 to 1,415,917 in 2033, and will then initiate a slow decrease to 1,269,073 in 2063. The number of persons at pensionable age (60 and over) will grow from 192,286 in 2013 to 404,723 in 2063, while the population aged 16 to 59 (the group who potentially supports the retirees though their contributions) will decrease by 24 percent over the same period. The number of working-age persons for each person aged 60 and over will fall dramatically from 4.5 to 1.6 over the projection period.

Table 2.2 Projected population of Trinidad and Tobago (2013-2063)

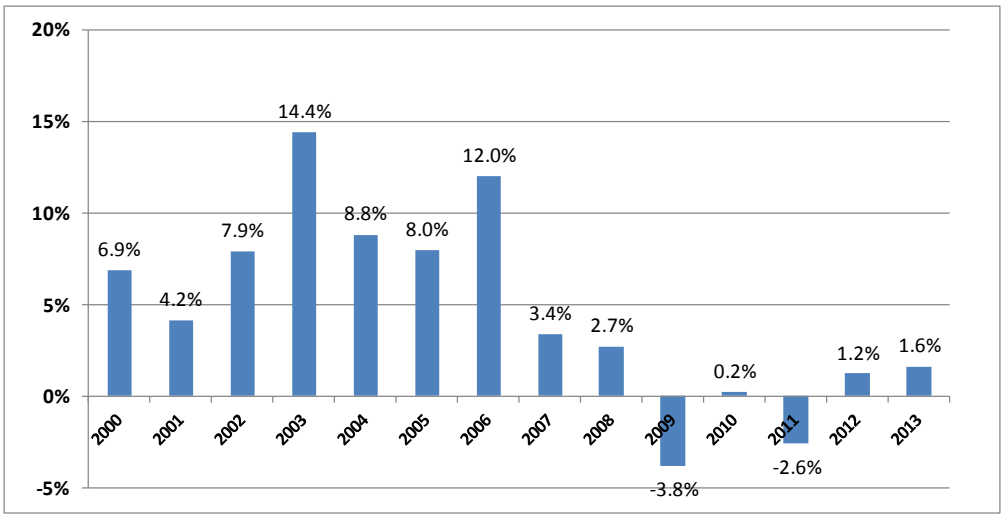
Year	Total	Age			Ratio of persons 16-59 to 60 & over
		0-15	16-59	60 & over	
2013	1,345,095	293,360	859,449	192,286	4.5
2023	1,405,033	292,207	835,973	276,853	3.0
2033	1,415,917	258,618	823,246	334,053	2.5
2043	1,397,164	242,274	767,941	386,949	2.0
2053	1,344,383	229,170	689,148	426,065	1.6
2063	1,269,073	206,991	657,358	404,723	1.6

2.2 Macroeconomic framework

Economic growth

Trinidad and Tobago's economy is driven by the energy sector. This explains the high historical economic growth of the country (see Chart 2.2), its volatility over recent years and its low level (in real terms) since 2009.

Chart 2.2 Real GDP growth of Trinidad and Tobago (2000-2013)



Source: Central Statistical Office of Trinidad and Tobago.

Trinidad and Tobago's economy will continue to be challenged by the weakness of the non-energy sector. In addition to the uncertainty about the energy-sector activity in the short-term, many have concerns about the performance of the construction sector, which is a major employer.

According to the International Monetary Fund, the Trinidad and Tobago's real rate of economic growth is projected at 2.2 percent in 2014 and 2015, 1.7 percent in 2016 and 1.6 percent from 2017 to 2019, on the assumption that the energy sector will return to growth and that a combination of fiscal and monetary stimulus will be beneficial to the non-energy sector. It is not anticipated that economic growth will revert to the high performance of the last decades. In addition, the future shrinking of the labour force (driven by the decrease of the population aged 16 to 59) will put additional constraints on economic growth. The long-term GDP growth assumption (below 1.0 percent) is the result of assumptions on the future evolution of the labour force, the wage share of GDP, assumed to remain constant at its level of 2010, and labour productivity (discussed below).

Productivity

Preliminary data indicate that the increase of the productivity of labour will be just below 2.0 percent in 2014 and 2015. For this valuation, it is assumed that the productivity of labour will fluctuate between 1.5 percent and 1.9 percent from 2014 to 2019 and will be constant at 1.5 percent from 2020 onwards. This long-term

assumption is in line with the average assumption used for the valuation of several social security systems around the world.[1]

Table 2.3 Projected GDP growth, productivity and total employment

Year	Real GDP growth (%)	Increase of the productivity per worker (%)	Increase of the number of workers (%)
2014	2.2	1.8	0.4
2015	2.2	1.9	0.3
2016	1.7	1.5	0.2
2017	1.6	1.5	0.1
2018	1.6	1.6	0.0
2023	1.2	1.5	- 0.3
2033	1.2	1.5	- 0.3
2043	0.7	1.5	- 0.8
2053	0.6	1.5	- 0.9
2063	0.9	1.5	- 0.6

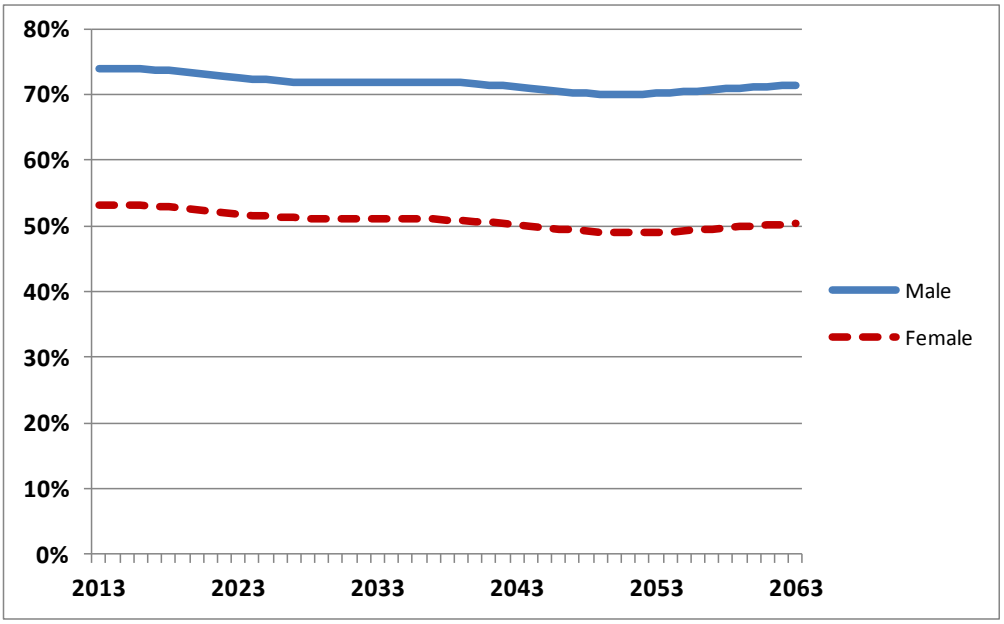
Labour force

After an increase of unemployment following the 2008-2009 economic crisis, the unemployment rate has returned to levels observed previously. It is estimated at 5.0 percent in 2013 (4.0 percent for males and 6.3 percent for females). Young people between the ages of 15 and 29 years account for more than half of the unemployed.

For the future, it is assumed that age-specific labour force participation rates will stay constant, at their level of 2013, for the entire projection period. Under this scenario, the total participation rate will slightly decrease in the future. For the male population, the total participation rate will go from 74 percent in 2013 to 71 percent in 2063. The total participation rate of females will go from 53 percent in 2013 to 50 percent in 2063.

[1] See: International Social Security Association, *Assumptions in the actuarial evaluation process – Comparison of demographic and economic assumptions in the actuarial analysis of 14 social security systems* (Geneva, 2009), p.18.

Chart 2.3 Projected total participation rate, by sex (2013-2060)



Under this scenario, the unemployment rate of 5.0 percent in 2013 will gradually decrease to 4.6 percent in 2040 and will stay at that level thereafter. Self-employed persons are representing 19 percent of male employment and 11 percent of female employment in 2013. It is assumed that those percentages will remain constant in the future.

Table 2.4 Labour market balance (2013-2060)
(in thousands)

	2013	2023	2033	2043	2053	2063
Total population	**1,345**	**1,405**	**1,416**	**1,397**	**1,344**	**1,269**
Male	674	700	701	687	658	618
Female	671	705	715	710	687	651
Population 15-69	**988**	**1006**	**993**	**959**	**890**	**812**
Male	498	505	498	482	447	411
Female	490	501	495	478	443	401
Labour force	**628**	**627**	**611**	**582**	**531**	**495**
Male	368	367	358	343	314	293
Female	261	260	253	240	217	202
Total participation rate	**64%**	**62%**	**61%**	**61%**	**60%**	**61%**
Male	74%	73%	72%	71%	70%	71%
Female	53%	52%	51%	50%	49%	50%
Total employed	**597**	**597**	**582**	**555**	**506**	**472**
Male	353	353	345	330	302	282
Female	244	245	237	226	204	190
Salaried	**505**	**502**	**488**	**465**	**423**	**395**
Male	286	283	276	263	240	225
Female	218	219	212	202	183	170
Self-employed	**93**	**97**	**97**	**93**	**86**	**79**
Male	67	70	69	67	62	57
Female	26	27	27	26	24	22
Unemployed	**31**	**29**	**29**	**27**	**24**	**23**
Male	15	14	14	13	12	11
Female	17	15	15	14	13	12
Unemployment rate	**5.0%**	**4.7%**	**4.7%**	**4.6%**	**4.6%**	**4.6%**
Male	4.0%	3.8%	3.8%	3.7%	3.7%	3.8%
Female	6.3%	5.9%	6.0%	5.9%	5.8%	5.9%

Inflation

Like many Caribbean countries, Trinidad and Tobago is exposed to supply-side inflationary pressures, owing to global commodity price volatility. Historically, inflation has been under control for most of the period from the mid-1990s to 2004. However, the inflation rate has increased significantly from 2005 onwards. The annual average rate of inflation (ratio of the average CPI for the 12 months of a calendar year to the average CPI of the 12 months of the preceding year) was 12.0 percent in 2008, 7.0 percent in 2009 and 10.6 percent in 2010 (see Table 2.5). In the

first half of 2011, inflation decreased on account of lower food price inflation. The inflation rate was 9.3 percent in 2012 and 5.2 percent in 2013.

Table 2.5 Historical inflation rates in Trinidad and Tobago (1994-2013)

Year	Inflation rate (%)	Year	Inflation rate (%)
1994	8.8%	2004	3.7%
1995	5.3%	2005	6.9%
1996	3.3%	2006	8.3%
1997	3.6%	2007	7.9%
1998	5.6%	2008	12.0%
1999	3.4%	2009	7.0%
2000	3.5%	2010	10.6%
2001	5.6%	2011	5.1%
2002	4.1%	2012	9.3%
2003	3.7%	2013	5.2%

Source: Central Statistical Office of Trinidad and Tobago

Food prices are anticipated to remain high and maintain upward inflationary pressures in the short run, but at single-digit levels. It is estimated that inflation will stand at 4.8 percent in 2014, will gradually converge to 3.0 percent in 2021 and will stay constant at that level thereafter.

The level of the assumed projected inflation rate has not much influence on the results of the valuation because it affects both the revenue and the expenditure of the scheme. The results of the valuation are more influenced by the level of the real wage increase, as discussed below.

Wage increases

Since pensions are assumed to be periodically adjusted in the future in line with inflation, while contribution income is directly influenced by the rate of growth of insured earnings, the financial evolution of the system is driven by the real wage increase (the difference between nominal wage increase and the inflation rate).

The real wage increase is assumed to gradually converge towards the productivity per worker, as it is expected that wages will adjust to efficiency levels over time. The long-term real wage increase is assumed to be 1.5 percent. Nominal wage increases will thus fluctuate slightly around 4.5 percent over the projection period.

Rate of return of the NIS fund

In a continuation of its accommodative policy, the Central Bank kept its policy rate at 2.75 percent. Given the lack of evidence suggesting a significant pick-up of the domestic economy, and with the US policy rate set to remain low, it is not anticipated that interest rates will increase in the short run.

To project the yield on investments of the National Insurance Fund, we have considered the target asset allocation of the NIBTT *Investment Policy Statement* and

a long-term real expected return for each asset class was determined, as shown in Table 2.6.

Table 2.6 Target asset allocation and projected long-term return

Asset class	Target asset allocation [1]	Expected nominal return [1]	Assumed real return [2]
Fixed Income (Local)	30%	3.00%	0.00%
Fixed Income (Overseas)	10%	4.00%	0.97%
Equities (Local)	35%	10.00%	6.80%
Equities (Overseas)	10%	9.00%	5.83%
Mutual Funds	2.5%	4.00%	0.97%
Real Estate	10%	9.00%	5.83%
Cash & Cash Equivalents	2.5%	1.00%	-1.94%
Total	**100%**	**6.73%**	**3.62%**

1. Source: Investment Policy Statement of the NIBTT (2014).
2. Assuming an implicit inflation rate of 3 per cent.

For the purpose of this actuarial review, it is assumed that the nominal rate of return of the National Insurance Fund will be equal to the real rates of return indicated in Table 2.6 to which the inflation rate (assumed in this valuation for each respective year) is added.

Table 2.7 Projected inflation rate, wage increase and rate of return of the Fund

Year	Inflation rate (%)	Annual nominal increase of average wage (%)	Rate of return of the Fund (%)
2014	4.8	4.2	8.6
2015	4.5	4.2	8.3
2016	4.3	4.3	8.1
2017	4.0	4.4	7.8
2018	3.8	4.4	7.5
2023	3.0	4.6	6.7
2033	3.0	4.5	6.7
2043	3.0	4.6	6.7
2053	3.0	4.5	6.7
2063	3.0	4.5	6.7

3. NIS demographic and financial projections

This valuation deals with the ability of the NIS 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 by the NIS indefinitely, thus paying contributions, accruing benefit entitlements and later receiving benefits in accordance with the legal provisions of the system. 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 assumptions appearing in Appendix 3.

The main purpose of the valuation is to find out whether the financing of the NIS is on course, and not to forecast numerical values exactly. Due to the long-term nature of the assumptions, absolute figures contain a high degree of uncertainty. Therefore, results should be interpreted carefully and future actuarial reviews undertaken on a regular basis will make possible a validation of the assumptions in the light the actual experience.

This review deals with the expenditure and revenue of all branches administered by the NIS: long-term benefits, short-term benefits and employment injury benefits. The key area of concern will be the long-term branch since it accounts for the largest proportion of future expenditure. It is certain that this proportion will grow significantly in the future due to its current immature state. Long-term benefits will attain a mature state only after the youngest of the first generation of contributors have become pensioners then died and all survivors' pensions paid on their behalf ceased. This requires that the situation of the system be analysed over the next 50 years. The general methodology of the actuarial review is presented in Appendix 2.

3.1 Defining the "base scenario"

NIBTT's policy objective is to maintain the link between contributions and benefits and the economic conditions. Given the design of the system, the technique used in the past in order to reach that objective was to increase the maximum insurable earnings and pensions in payment on an ad hoc basis following the recommendations of periodic actuarial reviews. However, given the intention of the NIBTT to modify its practice and to eventually adjust on an annual basis the different parameters of the scheme in line with the economic developments, the projections of the base scenario of this actuarial review have been performed on the following basis:

- Maximum insurable earnings are increased to TT$13,600 on 29 February 2016 in line with the increase of the national average wage during the period from 1 July 2010 to 30 June 2013. From March 2017, the maximum insurable earnings is indexed annually in line with the increase of the national average wage observed three years earlier (because of the delay in the publication of CSO data).

- Pensions in payment and fixed-parameters of the system (including the minimum retirement pension) are increased on 29 February 2016 by the same percentage of

13.5 percent. From March 2017, pensions in payment and fixed-parameters of the system are increased annually at a rate equal to the lesser of the increase of the CPI and the increase of national average wage observed three years earlier.

3.2 Demographic projections

As shown in Table 3.1, the total number of pensioners is projected to increase significantly in the future, from 135,049 in 2013-14 to 353,255 in 2062-63, while at the same time the number of contributors will be just below 500,000 for the next 10 years, but will then gradually decrease to 378,352 in 2062-63. The ratio of contributors to pensioners will decrease from 3.7 to 1.1 over the next 50 years.

Table 3.1 Projected number of contributors and pensioners - Long-term benefits, 2013-2063

Year	Number of contributors	Number of pensioners			Total number of pensioners	Ratio of contributors to pensioners
		Retirement	Invalidity	Survivors		
2013-14	499,516	92,534	4,168	38,347	135,049	3.7
2014-15	499,419	98,629	4,196	40,405	143,230	3.5
2015-16	498,990	104,286	4,329	41,965	150,580	3.3
2016-17	497,647	110,011	4,445	43,413	157,869	3.2
2017-18	495,739	115,116	4,557	44,982	164,656	3.0
2018-19	494,125	119,567	4,663	46,501	170,731	2.9
2019-20	492,199	124,069	4,752	48,076	176,897	2.8
2020-21	490,078	128,679	4,785	49,633	183,097	2.7
2021-22	487,821	133,490	4,804	51,118	189,412	2.6
2022-23	485,400	137,925	4,859	52,546	195,330	2.5
2027-28	474,305	159,157	5,210	58,704	223,071	2.1
2032-33	469,454	177,961	5,727	63,707	247,395	1.9
2037-38	463,022	198,043	6,092	68,391	272,526	1.7
2042-43	447,217	224,015	5,937	72,071	302,022	1.5
2052-53	400,796	270,438	4,732	76,461	351,631	1.1
2062-63	378,352	270,085	4,747	78,424	353,255	1.1

Demographic projections concerning Short-term benefits are presented in Table 3.2. As regards Sickness and Maternity benefits, the number of beneficiaries is relatively stable until 2020 and decreases thereafter following the decrease of the number of active insured persons. On the other hand, the number of Funeral grants increases significantly and continuously over the projection period, following the general ageing of the population.[2]

[2] On that account, the Funeral grant could be classified as a long-term benefit.

Table 3.2 Projected number of beneficiaries - Short-term benefits, 2013-2063

Year	Sickness benefit	Maternity benefit *	Special maternity grant	Funeral grant
2013-14	12,013	7,680	1,026	5,339
2014-15	12,050	7,678	1,026	5,437
2015-16	12,074	7,651	1,022	5,544
2016-17	12,081	7,600	1,015	5,657
2017-18	12,074	7,524	1,005	5,769
2018-19	12,059	7,426	992	5,892
2019-20	12,031	7,310	977	6,020
2020-21	11,992	7,179	959	6,154
2021-22	11,944	7,039	941	6,294
2022-23	11,888	6,893	922	6,448
2027-28	11,585	6,245	837	7,306
2032-33	11,369	5,945	796	8,235
2037-38	11,127	5,933	793	9,144
2042-43	10,725	5,902	789	9,982
2052-53	9,693	5,347	715	11,162
2062-63	9,111	4,859	650	12,245

* The number of "regular" maternity grants is assumed equal to the number of maternity benefit recipients.

Demographic projections concerning Employment injury benefits are presented in Tables 3.3. All benefits except the Disablement pension follow the general evolution of the number of active insured persons. Disablement pensions, on the other hand, are paid for long periods and this benefit will continue its maturing process until 2050.

Table 3.3 Projected number of beneficiaries – Employment injury benefits, 2013-2063

Year	Injury allowance	Disablement pension	Disablement grant	Death benefit	Medical expenses
2013-14	1,479	3,207	88	525	104
2014-15	1,480	3,315	88	532	104
2015-16	1,479	3,422	89	540	104
2016-17	1,476	3,527	89	544	104
2017-18	1,471	3,630	90	551	103
2018-19	1,467	3,732	90	562	103
2019-20	1,462	3,832	90	569	103
2020-21	1,457	3,929	90	578	102
2021-22	1,451	4,023	90	588	102
2022-23	1,444	4,113	90	590	102
2027-28	1,414	4,512	88	605	99
2032-33	1,399	4,826	88	585	98
2037-38	1,380	5,062	88	559	97
2042-43	1,337	5,215	85	528	94
2052-53	1,205	5,219	75	477	85
2062-63	1,130	5,025	72	440	80

3.3 Financial projections

Apart from being driven by the number of beneficiaries, the cost of NIS is also determined by the average amount of benefit paid to these persons. One indicator of the evolution of pension amounts is the evolution of pensions' replacement ratios (ratio of the average pension to the average wage of active contributors). Table 3.4 presents these replacement ratios for each type of pensions and by sex. Replacement ratios related to the retirement pension will stabilize rapidly because it may be considered that the system is reaching a state of maturity (the oldest active insured persons had the possibility to contribute to the system during the maximum potential period from age 16 to age 60 under stabilized conditions). However, it shows that the minimum retirement pension brings replacement ratios upward in the short term.

Table 3.4 Projected replacement ratios – Long-term benefits, 2013-2063

Year	Retirement		Invalidity		Survivors	
	Males	Females	Males	Females	Widows	Widowers
2013-14	0.58	0.67	0.23	0.24	0.11	0.15
2014-15	0.54	0.63	0.27	0.28	0.13	0.17
2015-16	0.49	0.58	0.29	0.30	0.13	0.18
2016-17	0.49	0.58	0.30	0.30	0.13	0.18
2017-18	0.51	0.60	0.32	0.32	0.14	0.19
2022-23	0.50	0.59	0.35	0.34	0.15	0.20
2032-33	0.48	0.55	0.35	0.34	0.17	0.20
2042-43	0.46	0.51	0.35	0.33	0.17	0.19
2052-53	0.44	0.47	0.34	0.32	0.18	0.18
2062-63	0.42	0.44	0.33	0.31	0.18	0.18

For accounting purposes, NIBTT presents the financial results under three branches: long-term benefits, short-term benefits and employment injury benefits. Provisions exist for transferring reserves between branches once certain ratios are met. In this section, it is considered more convenient to present the evolution of total assets irrespective of their allocation by branch.

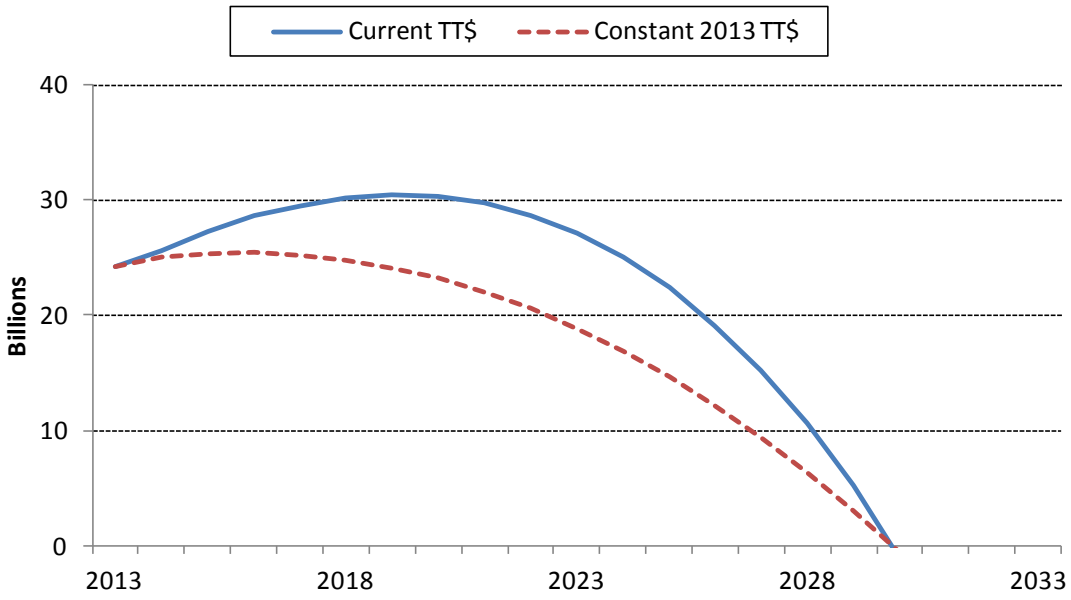
Table 3.5 presents the future evolution of NIS expenditures for each branch. It also presents the total expenditures in relation to total insurable earnings (the pay-as-you-go rate) and in relation to the GDP. The pay-as-you-go (PAYG) cost represents the contribution rate that would have to be paid to the system in the absence of reserve funds. It is projected to increase from its present level of 13.8 percent in 2013-14 to 35.7 percent in 2062-63.

Table 3.5 Projected NIS expenditure, 2013-2063 (thousand TT$)

Year	Benefit expenditure					Admin. expenses	Total expenditure	Expenditure as % of	
	Long-term			Short-term	Employment injury				
	Retirement	Invalidity	Survivors					Ins. earnings	GDP
2013-14	3,416,860	74,905	323,551	190,274	72,193	190,780	4,268,563	13.8	2.5
2014-15	3,666,320	86,445	365,633	203,576	84,355	199,245	4,605,574	13.6	2.6
2015-16	4,065,938	96,444	402,981	213,472	91,935	207,892	5,078,662	14.4	2.7
2016-17	4,668,481	112,335	468,046	229,667	103,715	216,713	5,798,956	15.5	3.0
2017-18	5,006,961	123,241	512,735	238,030	111,312	225,697	6,217,977	16.0	3.1
2018-19	5,427,116	134,976	564,077	247,983	119,218	234,836	6,728,205	16.6	3.2
2019-20	5,879,850	146,658	619,010	257,911	127,261	244,116	7,274,806	17.2	3.3
2020-21	6,378,767	156,916	676,111	267,715	135,543	253,525	7,868,578	17.9	3.4
2021-22	6,907,783	166,687	735,250	277,327	143,942	263,176	8,494,165	18.6	3.5
2022-23	7,398,218	177,398	796,031	286,867	152,188	273,194	9,083,897	19.1	3.6
2027-28	10,204,619	236,320	1,140,074	338,596	196,156	329,136	12,444,900	21.4	4.0
2032-33	13,806,912	318,286	1,595,134	411,169	248,785	396,139	16,776,425	23.5	4.4
2037-38	18,495,570	414,997	2,202,145	509,770	312,371	476,692	22,411,546	25.5	4.8
2042-43	25,546,908	493,908	2,977,294	626,878	386,873	573,981	30,605,842	28.8	5.4
2052-53	45,254,242	593,268	5,145,171	886,108	568,547	832,158	53,279,494	35.6	6.6
2062-63	65,747,830	929,829	8,333,431	1,260,118	826,346	1,204,128	78,301,683	35.7	6.7

Financial projections under the base scenario assume that the present contribution of 12.0 per cent is maintained for the whole projection period. Chart 3.1 presents the projection of assets (until the fund is depleted) in current and constant TT dollars.

Chart 3.1 Projected evolution of total NIS assets



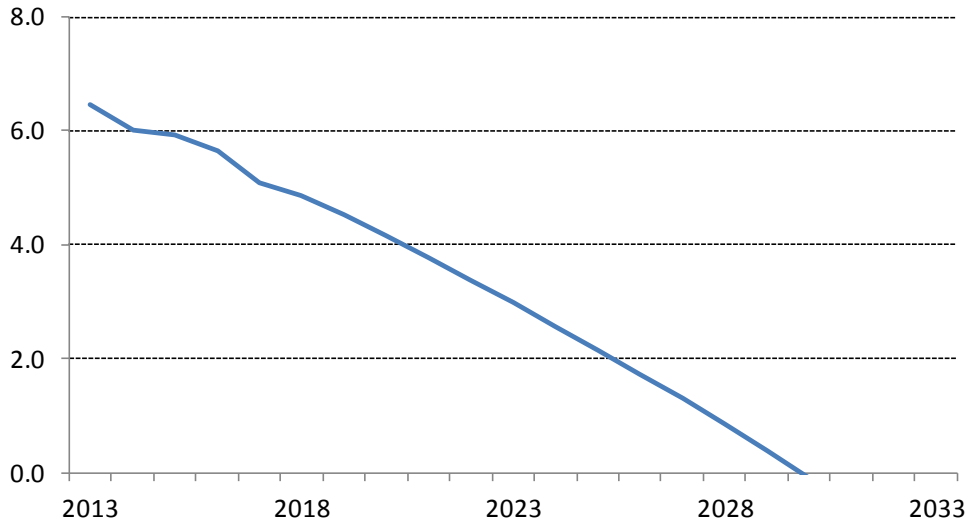
The NIS expenditures exceed contribution income in financial year 2013-14, as shown in Table 3.6. The total assets of the NIS will however continue to increase until 2018-19 because part of the investment income will be used, in addition to contributions, to support the expenditures of the system. From 2019-20, assets will rapidly decrease and the NIS funds will be completely depleted in 2029-30 if nothing is modified in terms of contributions or benefits.

Table 3.6 Key moments of the future evolution of NIS assets

	Year
System's expenditure first exceeds contributions	2013-14
System's expenditure first exceeds contributions plus investment income (assets start to decrease)	2019-20
Assets are exhausted	2029-30

The ratio of assets to total expenditure of the system is presently equal to 6.0. The ratio will decrease to a level below 2.0 from year 2025-26 and to zero in 2029-30.

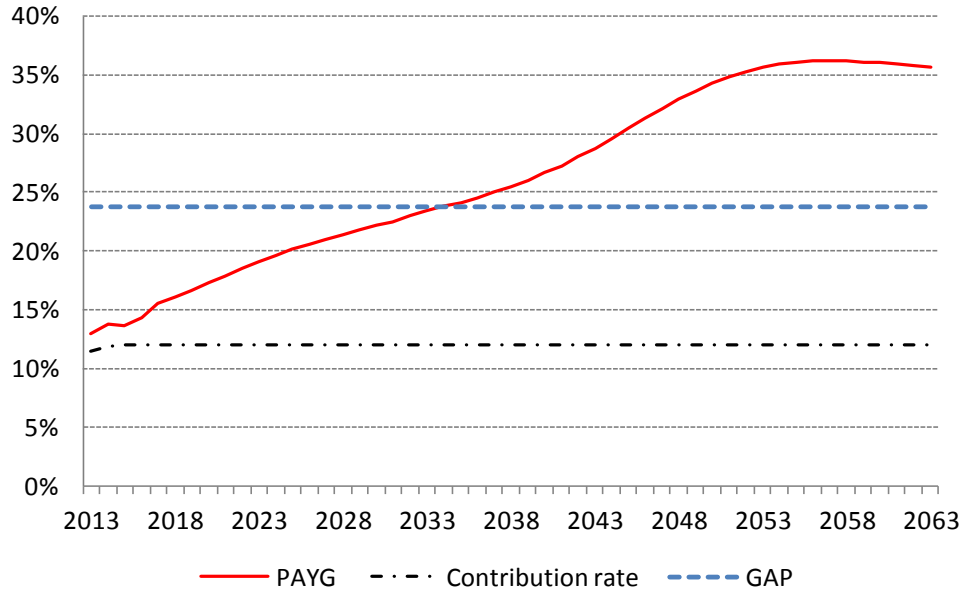
Chart 3.2 Ratio of assets to total expenditure (funding ratio)



The general average premium (GAP)[3] of the system (the constant contribution rate necessary to finance all NIS benefits over the next 50 years) is 23.8 percent. It may be compared to the present contribution rate of 12.0 percent (see Chart 3.3).

[3] There are two approaches for the calculation of the general average premium. A first approach uses the reserve at the valuation date (and the investment income thereon) so that the application of the GAP during the whole projection period would lead to a zero reserve at the end of 50 years. In that case, the value of the initial reserve, plus the present value of contribution (at the GAP rate) and investment income over the next 50 years is put equal the present value of benefit and administrative expenditures over the same period. Under the second approach, the initial reserve (and the investment income thereon) is not used in the calculation, so that the GAP represents the actual constant contribution rate that would preserve (over the projection period) the reserve observed at the valuation date. The second approach is used in this report.

Chart 3.3 Projected cost rates (as percentage of insurable earnings), 2013-2063



Projected PAYG rates show that, in the very long-term, contributors to the system (employers and workers) will eventually have to support contribution rates higher than 35 per cent for the financing of NIS benefits if nothing is changed in terms of benefits.

The present contribution rate of 12.0 is not sufficient to support the present level of benefits in the long run. It is not even sufficient to meet current benefit expenditures which represent 13.8 per cent of the payroll in 2013-14. Investment earnings have to be used presently to support the expenditures of the system. As shown in Chart 3.2, if nothing is modified, the reserve will be exhausted in 2029-30.

Measures will have to be taken. There is a need to plan for a combination of future contribution rate increases and measures to reduce the cost of the system. Section 3.7 presents a contribution rate schedule that would ensure financial sustainability under the present benefit conditions. Another possibility is to reduce the cost of certain benefits. Options to that regard are analysed in Section 4.3.

Detailed financial projections of the NIS under the present contribution and benefit conditions are presented in Table 3.7.

Table 3.7 Projected revenue, expenditure and assets, 2013-2063 (thousand TT$)

Year	Revenue			Expenditure			Assets	
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Year-end	Number of times current year's expenditure
2013-14	3,655,281	2,124,478	5,779,759	4,077,783	190,780	4,268,563	25,667,073	6.0
2014-15	4,051,407	2,148,247	6,199,654	4,406,329	199,245	4,605,574	27,261,153	5.9
2015-16	4,239,562	2,199,401	6,438,963	4,870,770	207,892	5,078,662	28,621,454	5.6
2016-17	4,490,574	2,216,965	6,707,538	5,582,243	216,713	5,798,956	29,530,036	5.1
2017-18	4,658,064	2,202,256	6,860,320	5,992,279	225,697	6,217,977	30,172,380	4.9
2018-19	4,858,768	2,161,540	7,020,309	6,493,369	234,836	6,728,205	30,464,483	4.5
2019-20	5,064,045	2,092,130	7,156,175	7,030,691	244,116	7,274,806	30,345,852	4.2
2020-21	5,275,510	1,992,493	7,268,003	7,615,053	253,525	7,868,578	29,745,276	3.8
2021-22	5,493,030	1,899,457	7,392,487	8,230,989	263,176	8,494,165	28,643,598	3.4
2022-23	5,715,772	1,813,029	7,528,801	8,810,703	273,194	9,083,897	27,088,503	3.0
2027-28	6,971,305	840,400	7,811,705	12,115,765	329,136	12,444,900	10,600,257	0.9
2032-33	8,586,868	-1,393,945	7,192,924	16,380,286	396,139	16,776,425	-26,216,525	-1.6
2037-38	10,561,390	-5,697,526	4,863,864	21,934,854	476,692	22,411,546	-96,344,185	-4.3
2042-43	12,770,379	-13,458,152	-687,773	30,031,861	573,981	30,605,842	-222,497,098	-7.3
2052-53	17,960,540	-49,166,032	-31,205,493	52,447,336	832,158	53,279,494	-797,918,926	-15.0
2062-63	26,345,908	-133,481,168	-107,135,260	77,097,554	1,204,128	78,301,683	-2,144,309,135	-27.4

3.4 Reconciliation with the results of the last actuarial review

According to the 8th Actuarial Review, NIS assets would increase until 2027-28 and would then start to decrease. It was projected that the fund would be depleted in financial year 2039-40.

The results of the 9th Actuarial Review reveal an important deterioration of the financial situation of the scheme, as shown in Table 3.8. The difference between the results of the two actuarial reviews may be reconciled by looking at three series of factors: (1) modifications to the scheme, (2) experience during the inter-valuation period and (3) modification of actuarial assumptions.

Modifications to the scheme

The legal provisions considered in the base scenario of the 8th Actuarial Review compare as follows with the actual legislative changes that took place in March 2013 and March 2014:

	Considered in the base scenario of the 8th Actuarial Review	Actual legislative changes
Pensions in payment	+ 52.3% in January 2013	+ 25% in March 2013 + 20% in March 2014
Minimum retirement pension	$3,000 from February 2012	$3,000 from February 2012
Fixed-rate benefits (funeral grant, minimum retirement grant, maternity grant, special maternity grant)	+ 52.3% in January 2013	+ 50% in March 2013
Minimum survivors' benefits	+ 52.3% in January 2013	+ 50% in March 2013
Maximum insurable earnings	$11,800 in January 2013 (adjusted with inflation thereafter)	$10,000 in March 2013 $12,000 in March 2014
Contribution rate	11.4% from January 2013 *	11.7% from March 2013 12.0% from March 2014

* This is the contribution rate used for the base scenario of the 8th Actuarial Review. The final recommendation was to increase the contribution rate to 12.0%.

The adopted legislative changes were rather aligned with the base scenario of the last review (and the recommendations that followed), despite certain differences in the timing of the modifications. The impact of the legislative changes is positive, mainly due to the higher contribution rate, the higher MIE and the slightly lower benefit increases than anticipated. As shown in Table 3.8, as a result of the modifications to

the system, the general average premium is 0.7 percentage points lower than projected and the reserve is projected to be exhausted 6 years later than projected in the last review.

Experience of the period 2010-2013

The following factors, related to the experience of the scheme between 1 July 2010 and 30 June 2013, have affected the cost of the scheme.

Investment return. Over the period 2010-2013, the rate of return of the fund has been 9.1 percent compared to a projected return of 9.3 percent. No noticeable deviation has resulted from this factor.

Pensions in payment on 30 June 2013. The number of retirement pensions in payment on 30 June 2013 is 2.4 per cent higher than the number projected in the last actuarial review. On the other hand, the number of invalidity pensioners is 5.5 per cent lower than projected. The number of widows is approximately the same, while the number of orphans and other survivors is almost double the number projected. This factor, added to the variation of the number of insured persons, has the global effect of increasing the GAP by 1.3 percentage points and anticipating the reserve exhaustion by 5 years.

Profile of insured persons. The review of the experience of the scheme has resulted in the adjustment of the number of inactive insured persons and the revision of insured's profiles regarding density, past service and family characteristics. An increase of 0.3 percentage points of the GAP results from these factors.

Insured earnings. Two factors have affected the general level of earnings in the inter-valuation period. First, the earnings of 2012-13 have been lower than projected (increase of 0.5 percentage points of the GAP). Second, a correction has been made in the data extraction program which has modified the distribution of earnings among the different earnings classes (increase of 0.8 percentage points of the GAP).

Methodological adjustment to mortality rates. A modification has been made in the actuarial model to eliminate a one-year-of-age difference in the mortality table used for simulating the survival of certain pensioners.

Modification of assumptions

A series of modifications have been made to the methods and assumptions in the 9th Actuarial Review.

Projected wage growth. The most important difference in the actuarial assumptions is related to the projected wage growth. The projected wage increases for the period 2014-2020 in the present valuation are on average 1.5 per cent per year lower that the corresponding wage increases of the previous valuation. This translates into a total insurable payroll approximately 10 per cent lower in 2020. Given the importance of the minimum pension of the NIS (which makes the scheme close to a flat-rate scheme), a lower assumption regarding the future evolution of wages has a quasi-proportional impact on the cost of the scheme. The lower wage increase

assumption has the effect of increasing the GAP by 2.6 percentage points and reducing the period before reserve exhaustion by 5 years.

Projected rate of return of the fund. The projected long-term nominal rate of return of the fund has been reduced from 6.9 to 6.725 percent, in line with the revision of the NIBTT *Investment Policy Statement*. This has not a major impact on the results of the valuation.

Global impact

All these factors had the effect of increasing the general average premium of the scheme from 17.6 per cent to 23.8 per cent and have reduced the period before reserve exhaustion by 10 years (see Table 3.8).

Table 3.8 Reconciliation of the 8th and 9th Actuarial Reviews

	Pay-as-you-go rate			General average premium		Year of reserve exhaustion
	2017-18	2037-38	2057-58	Period	GAP	
According to the 8th Actuarial Review	**12.4%**	**19.0%**	**30.2%**	**2011-2060**	**17.6%**	**2039-40**
Modifications to the scheme						
– Adjustment of benefits, MIE and contribution rate	11.6%	17.7%	30.3%	2011-2060	16.9%	2045-46
– Difference in period considered	11.6%	17.7%	30.3%	2014-2060	17.4%	2045-46
Experience of the period 2010-2013						
– Difference in cash flows between projections and results, pensions in payment on 30 June 2013 and evolution of number of insured persons	12.8%	19.5%	32.0%	2014-2060	18.7%	2040-41
– Insured earnings lower than projected in period 2010-2013	13.2%	20.1%	32.6%	2014-2060	19.2%	2038-39
– Change in profile of insured persons	13.4%	20.4%	32.6%	2014-2060	19.5%	2037-38
– Methodological adjustment to insured earnings	14.1%	21.5%	33.3%	2014-2060	20.3%	2035-36
– Methodological adjustment to mortality rates	14.2%	21.9%	34.1%	2014-2060	20.7%	2034-35
Modification of assumptions						
– Lower projected wage growth	16.0%	25.5%	36.2%	2014-2060	23.3%	2029-30
– Lower projected rate of return	16.0%	25.5%	36.2%	2014-2060	23.5%	2029-30
According to the 9th Actuarial Review	**16.0%**	**25.5%**	**36.2%**	2014-2060	23.5%	**2029-30**
– Difference in period considered				**2014-2063**	**23.8%**	

3.5 Actuarial liability

For the purpose of this valuation, "actuarial liability" refers to the present value, as of the valuation date, of future payments related to pensions-in-payment and to the accrued rights of the present participants.

Table 3.9 shows the actuarial liability related to pensions-in-payment at the valuation date. It also presents the relationship between the actuarial liability and the annual benefit expenditure (2012-2013). Results indicate that, for all three branches, the value of total funds held at the valuation date does not cover the actuarial liability related to pensions in payment.

Table 3.9 Actuarial liability related to pensions in payment on the valuation date (million TT$)

	Long-term benefits	Short-term benefits	Employment injury benefits
A. Actuarial liability related to pensions in payment	31,290	412	932
B. Annual benefit expenditure	3,329	171	57
Ratio (A / B)	9.4	2.4	16.4
Funds as at 30 June 2013	23,532	342	570

An additional actuarial liability is also determined in relation to the accrued rights of the present insured persons. For this purpose, the following approach is used:

- **Long-term benefits**. The actuarial liability refers to the value of pensions accrued at the valuation date. It takes into account the accumulated service of the present insured population, so that insured persons who have accumulated less than 15 years of contribution at the valuation date would eventually become eligible to a grant instead of a pension under the theoretical scenario of an NIS termination as at the valuation date. Moreover, it is supposed that the amount of pensions accrued at the valuation date will be indexed based on CPI after the valuation date. However, concerning the minimum retirement pension, it is assumed that the amount of TT$3,000 is not indexed after the valuation date.
- **Short-term benefits**. The actuarial liability refers to the value of sickness benefit payments, maternity benefit payments and funeral grants related to events that will occur after the valuation date, but for which the right was already vested on the valuation date.
- **Employment injury benefits**. The actuarial liability refers to the value of future benefit payments that relate to accidents that occurred before the valuation date.

This part of the actuarial liability is subject to uncertainty and unavoidable arbitrariness in the case of long-term benefits. In addition, given that this perspective of the actuarial review is considered secondary in relation to the financial projections presented, data collection and methodology are not as refined as for the rest of the valuation process. Consequently, certain approximations are involved and the estimation error is more significant. Nevertheless, it is considered that the results presented in Table 3.10 are valuable for the present exercise.

Table 3.10 Total actuarial liability on the valuation date (million TT$)

	Long-term benefits	Short-term benefits	Employment injury benefits
Actuarial liability	72,780	1,009	1,283
Ratio of accrued liabilities to annual benefit expenditure	21.9	5.9	22.6

It can be observed from Table 3.10 that, as at the valuation date, the actuarial liability of the Long-term branch represents 21.9 times the annual expenditure. In the case of Short-term and Employment injury benefits, the respective ratios are 5.9 and 22.6. These ratios may be compared to the present reserve objectives of 2.0 in the case of Short-term benefits and 10.0 in the case of Employment injury benefits.

Recommendation

Reserve objectives to be maintained for each fund should continue to be established as follows:

- Short-term: 2 times the annual benefit expenditure
- Employment injury: 10 times the annual benefit expenditure
- Long-term: the remaining excess of income over expenditure

Though the estimation of the actuarial liability is interesting for various purposes, they do not necessarily represent the target assets that should be maintained for each branch. Other considerations must also be taken into account. The determination of the contribution rate and the method of calculation of reserves must be established together.

3.6 Sensitivity analysis

Actuarial projections take into account an extensive set of demographic, economic and system-specific assumptions. Actual experience will inevitably differ from the projections. This section presents the effect on the valuation of alternative demographic and economic assumptions, plus a sensitivity test on the level of administrative expenses. The impact of alternative scenarios is presented on the GAP and on the year of reserve exhaustion.

Mortality

Two sensitivity tests have been performed concerning mortality rates. Under the first test, mortality rates of the base scenario have been increased by 15 per cent. Under the second test, mortality rates have been decreased by 15 per cent. With the scenario of higher mortality (lower life expectancy), the GAP decreases from 23.8 to 23.2 per cent. Under the scenario of lower mortality (higher life expectancy), the GAP increases from 23.8 to 24.0 per cent. Since different mortality rates have impacts mainly in the long term, the period before reserve exhaustion is not significantly affected by these tests.

Table 3.11 Sensitivity test on mortality

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Sensitivity test (mortality rates 15% higher)	23.2%	2030-31
Base scenario	**23.8%**	**2029-30**
Sensitivity test (mortality rates 15% lower)	24.0%	2029-30

Migration

The base scenario of the actuarial valuation projects a negative net migration of 1,500 per year. This assumption has a direct impact on the number of active insured persons. In this actuarial review, the total insured population is projected to decrease from its present level of 500,000 in 2013 to 485,000 in 2023 and 400,000 in 2053.

In this sensitivity test, it is assumed that net migration will be zero in the future, which is the assumption of the previous actuarial review. Under the sensitivity test, the total insured population still decreases, but at a slower rate: 493,330 in 2023 and 433,790 in 2053. The higher number of contributors (compared to the base scenario) would cause a decrease of the GAP from 23.8 percent to 23.1 percent and the year of reserve exhaustion would extend by one year.

Table 3.12 Sensitivity test on migration

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario (minus 1,500 migrants per year)	**23.8%**	**2029-30**
Sensitivity test (zero net migration)	23.1%	2030-31

Wage increase

The results of the valuation are very sensitive to the difference between the assumed future average wage increase and the inflation rate (the real wage increase). Under the base scenario, the real wage increase is 1.5 percent. The sensitivity test assumes a 1.0 percent real wage increase. Under the sensitivity test, the GAP increases from 23.8 percent to 25.2 percent and the reserve is depleted one year earlier.

Table 3.13 Sensitivity test on wage increase

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario (real wage increase of 1.5%)	**23.8%**	**2029-30**
Sensitivity test (real wage increase of 1.0%)	25.2%	2028-29

Inflation

It has been mentioned in Section 2.2 that the level of the assumed projected inflation rate has not much influence on the results of the valuation because it affects both the revenue and the expenditure of the scheme.

Under the base scenario of the valuation, the assumed long term inflation rate is 3 per cent. A sensitivity test has been performed with an inflation rate of 5 per cent. Results are presented in Table 3.14. Under the sensitivity test, the GAP is slightly lower, compared to the base scenario, and the year of reserve exhaustion is two years later. It must be noted here that these favourable results under the sensitivity test are mainly due to the fact that the real rate of return of the fund (3.6 per cent) has not been changed under the sensitivity test, so that the long term nominal rate of return would increase from 6.7 per cent under the base scenario (inflation of 3.0 per cent and real rate of return of 3.6 per cent) to 8.8 per cent under the sensitivity test (inflation of 5.0 per cent and real rate of return of 3.6 per cent).

Table 3.14 Sensitivity test on inflation

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario (inflation at 3%)	**23.8%**	**2029-30**
Sensitivity test (inflation at 5%)	23.0%	2031-32

Unemployment rate

The assumption on the future level of employment (and unemployment) has a direct impact on the number of persons insured under the system. Higher unemployment means fewer contributors to the scheme and lower system's revenue. It also means that fewer persons will be eligible to benefits in the longer run, but this will not fully compensate for the permanent negative impact on revenues. Under the base scenario, the current unemployment rate of 5.0 per cent decreases slightly to 4.6 percent in the long term. The sensitivity test uses an initial unemployment rate of 7.0 per cent decreasing to 6.7 per cent in the long term. Under the sensitivity test, the GAP increases from 23.8 per cent to 24.1 per cent.

Table 3.15 Sensitivity test on unemployment rate

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario (unemployment rate of 5.0% decreasing to 4.6% in long term)	**23.8%**	**2029-30**
Sensitivity test (unemployment rate of 7.0% decreasing to 6.6% in long term)	24.1%	2029-30

Rate of return of the fund

The base scenario assumes a long-term nominal investment yield of 6.725 percent. Sensitivity test have been performed by assuming a yield of 1.0 per cent higher and 1.0 per cent lower than the base scenario. Under the lower yield test, the GAP increases from 23.8 to 24.7 per cent and the reserve is exhausted one year earlier. Under the higher yield test, the GAP decreases to 22.9 per cent and the reserve is exhausted two years later.

An extreme scenario has also been tested with a rate of return of 4.0 per cent. Under that scenario, the GAP would significantly increase to 26.4 per cent.

Table 3.16 Sensitivity test on the rate of return of the fund

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Sensitivity test (yield of 5.725%)	24.7%	2028-29
Base scenario (yield of 6.725%)	**23.8%**	**2029-30**
Sensitivity test (yield of 7.725%)	22.9%	2031-32
Sensitivity test (yield of 4.0%)	26.4%	2028-29

Level of administrative expenses

Under the sensitivity test related to administrative expenses, it is supposed that total administrative expenditures of the NIS would increase during the next 5 years by twice the rate of growth assumed in the base scenario (the rate of growth of administrative expenses for the period 2013-2018 would be 8.4 per cent per year instead of 4.2 per cent). Under the sensitivity test, the GAP would increase by 0.1 percentage point at 23.9 per cent.

Table 3.17 Sensitivity test on the level of administrative expenses

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario	**23.8%**	**2029-30**
Sensitivity test (twice rate of growth for 5 years)	23.9%	2029-30

3.7 Financing policy

On the basis of this actuarial review and the observations of this section, it is recommended to gradually increase the contribution rate. The pace at which the contribution rate should increase depends on various factors.

A first consideration is the impact of a contribution rate increase on labour costs and consumption. Higher contribution rates will increase the cost of running businesses and will reduce the disposable income of workers available for buying goods and services. If this increases unemployment, the impact on the NIS could be negative.

A second consideration is the desire to avoid too important intergenerational transfers. The fact that the oldest generations of contributors have paid significantly lower contribution rates for the same level of benefits (in relative terms) represents intergenerational transfer. But should we try to avoid any such transfers by increasing the level of funding? Is a funded social security scheme more secure than a PAYG scheme? The following extracts from the paper[4] written by a prominent professor of actuarial science of the University of Waterloo (Canada) may be enlightening:

> *More heavily funded social security retirement systems (SSRS) are preferable when rates of return on investments exceed the rate of growth of the contributions base of the system (which is the reality in many advanced economies with aging populations today). Less funding (and hence more PAYGO financing) would be preferred when the growth of the contributions base exceeds the rate of return on investments*
>
> *... It is worthy of note, however, that a funded SSRS is inherently no more secure and no more predictable (i.e., less volatile) than a PAYGO scheme*
>
> *... SSRS are effectively means to allocate goods and services between workers and retirees. That is, 'they' decide how much of the Gross National Product SSRS beneficiaries can consume*
>
> *... both PAYGO SSRS and fully-funded SSRS are absolutely dependent on a next generation of workers to produce goods and services. Neither is demographically immune. If there is no production, there is no consumption*

[4] Brown, Robert L., *Criteria for the optimal design of a social security retirement system*, University of Waterloo, 2010.

... Does fuller funding increase national savings? Does the financing method create a more rapid rate of economic growth? Does the level of funding assist in creating a good banking system or a good stock market infrastructure? What impact does the design of the SSRS have on labor force participation rates or on the age of retirement? Does the design of the SSRS incent a cash economy? A careful reading of the literature says that there are no clear answers to most of these questions.

It would be necessary to implement a mechanism that would force the adjustment of the contribution rate at regular intervals. At present, measures are taken after each actuarial review to adjust the contribution rate, benefits and the different scheme's parameters following the recommendations of the actuarial review. However, the scheme's adjustments are conditional on the willingness of the government to pass the law to introduce those changes.

To avoid any uncertainty concerning the adjustment of the contribution rate in the future, an automatic mechanism (or rule) should be introduced in the law which would call for an adjustment of the system's contribution rates driven by the results of the most recent actuarial review. Given that the scheme is not yet stabilized in terms of maturity and financial development, we suggest that this mechanism be applied for the first time on the basis of the results of the 10th Actuarial Review (so that it would determine the contribution rate to be applied from year 2019-20). In the mean time, a realistic contribution rate schedule will be proposed until the rule applies.

One possible rule for establishing the contribution rate every three years would be that the contribution rate is equal to the general average premium (GAP)[5] calculated over the period of 50 years following the valuation date, on the condition that the contribution rate increase is not higher than 1.2 per cent (this number is divisible by 3 and can be easily split between employers and workers at a ratio of 2 to 1).

Such a rule would ensure the financial sustainability of the scheme and at the same time allow a gradual increase of the contribution rate towards its long-term level. The application of this rule in the context of expenditures and insurable earnings projected in the actuarial review would result in the application of the contribution rates appearing in Table 3.18. As can be seen, financial sustainability will require substantial increases of the contribution rate if the system’s provisions are not modified.

[5] The GAP utilized here is calculated by considering the initial reserve at time of determination.

Table 3.18 Illustration of an automatic mechanism for the adjustment of the contribution rate (all branches combined)

Year	Contribution rate
2016-17	13.2%
2017-18	14.4%
2018-19	15.6%
2019-20 to 2021-22	16.8%
2022-23 to 2024-25	18.0%
2025-26 to 2027-28	19.2%
2028-29 to 2030-31	20.4%
2031-32 to 2033-34	21.6%
2034-35 to 2036-37	22.8%
2037-38 to 2039-40	24.0%
2040-41 to 2042-43	25.2%
2043-44 to 2045-46	26.4%
2046-47 to 2048-49	27.6%
2049-50 to 2051-52	28.8%
2052-53 to 2054-55	30.0%

The legal provisions could also specify that the government has the possibility to alter the contribution rate schedule resulting from the application of the automatic mechanism by adopting measures affecting benefits that would reduce the cost of the scheme. This would constitute a formal financing policy for the NIS.

Until the next actuarial review, it is recommended to modify the contribution allocation by branch as follows: 90 per cent to the Long-term branch, 6 per cent to the Short-term branch and 4 per cent to the Employment injury branch.

Recommendations

The total contribution rate for salaried workers should be increased to 13.2 per cent of insurable earnings on 29 February 2016.

Contribution income should be allocated to the three benefit funds according to the following proportions:

- Long-term fund: 90 per cent
- Short-term fund: 6 per cent
- Employment injury fund: 4 per cent

It is recommended to adopt reforms, either by way of increasing contribution income or reducing benefit promises, for ensuring the long-term financial sustainability of the NIS. Particular consideration should be given to the development of a strategy for gradually increasing the contribution rate. An automatic mechanism should be introduced in the law for the determination of future contribution rates, based on fixed rules and on the results of the most recent actuarial review.

4. Analysis of modifications to the NIS

This section discusses possible modifications to the National Insurance System and presents the financial implications of these measures.

4.1 Adjustment of system's parameters

Different elements of the system need to be adjusted to keep their value over time: the maximum insurable earnings (MIE), minimum and maximum pension rates, grants and pensions in payment.

Relationship between MIE and earnings levels

Actuarial reviews were previously based on the assumption that the MIE would be adjusted at regular intervals so that the relationship between the MIE and the national average wage would be maintained over time. The practice has been to establish the MIE at two times the average national wage.

The MIE has been significantly increased in recent years: from TT$8,300 to TT$10,000 in March 2013 and TT$12,000 in March 2014. It now represents more than two times the estimated national average wage, according to CSO data. Realistic expectations as to the evolution of wages between now and the beginning of 2016 confirm that the MIE could stay at its present level of TT$12,000 until the beginning of 2016 and would still continue to represent more than two times the national average wage.

Table 4.1 compares, for 2012-13, the insurable and total earnings of NIS insured persons with the average national wage according to CSO (for salaried workers only and for all workers). It may be noted that:

- The average earnings of self-employed persons are lower than the earnings of salaried workers as revealed by a comparison of columns C and D of Table 4.1.
- The average wage of all salaried workers in the economy (column C) is lower than the average insurable earnings of NIS contributors (column B). One reason is the fact that the NIS was covering only workers earning more than TT$150 per week (or TT$650 per month) between March 2013 and February 2014. It must also be considered that the information on total earnings of NIS contributors represents an extrapolation of data on insurable earnings.

Table 4.1 Comparison of average monthly earnings under different basis (TT$)

	NIS insured persons (2012-13)		National CSO data (2012)	
	Insurable earnings	Total earnings *	Salaried workers aged 15 to 64	All workers aged 15 to 64
	(A)	(B)	(C)	(D)
Male	6,224	8,434	5,580	5,456
Female	5,212	6,541	4,817	4,701
Total	**5,720**	**7,491**	**5,248**	**5,157**

* Estimates based on a theoretical approach.

Source: NIBTT, CSO and authors' calculations

In 2012-13, 23 percent of NIS insured persons have contributed in earnings class XVI, meaning that part of their actual earnings are not covered by the scheme. Table 4.1 shows that the NIS (with its MIE of TT$10,000 from March 2013) was covering 76 percent of the total earnings of the average contributor (5,720 / 7,491).

Recommended adjustment of scheme's parameters on 29 February 2016

It is recommended that the MIE be increased by 13.5 percent (TT$13,600) on 29 February 2016. The proposed increase from TT$12,000 to TT$13,600 corresponds to the increase of the average national wage over the period from 1 July 2010 to 30 June 2013.

It is also recommended that the earnings classes limits be increased by the lesser of the average inflation rate and the average salary increase, which corresponds to the same percentage of 13.5 percent on 29 February 2016. Corresponding contributions and benefit schedules are presented in Appendix 5.

If the MIE is increased to TT$15,000 (instead of TT$13,600) on 29 February 2016, the GAP would be reduced from 23.8 to 23.4 per cent. The financial impact is not so important because this measure would affect only a small number of persons. Moreover, the higher MIE would generate more important short term contributions, but it would increase benefits in the longer term, thus cancelling part of the favourable impact on contributions.

Adjustment of scheme's parameters in subsequent years

There should be an annual adjustment of the MIE starting in March 2017. The MIE adjustment could take place in March of each year, two months following the presentation of the Finance Act which determines the MIE increase (normally tabled to Parliament at the beginning of the calendar year). The adjustment should be based on the evolution of the average earnings of all workers aged 15 to 64 in the Trinidad and Tobago's economy, according to CSO data.

To determine the annual adjustment in a given year, the MIE would be multiplied by the rate of increase of the national average wage three years before. For example, the MIE determined for March 2017 would be equal to the MIE of March 2016 multiplied by the following "wage index":

$$\text{Index W} = \frac{\text{Average national wage in 2014}}{\text{Average national wage in 2013}}$$

It appears that there would be a considerable delay between the calendar years considered in the calculation of the wage index (T-3, T-4) and the year of the MIE adjustment (T). But if the formula is consistent from one period to the next, the desired relationship between the MIE and the national average wage will be preserved over time. It would be advisable, however, that the government provides the necessary resources to the CSO in order to reduce that delay.

It is recommended that, starting in March 2017, benefits (minimum and maximum pension rates, grants and pensions in payment) be adjusted in line with the lesser of price inflation and national wage increase. For this, it will be necessary to establish a "benefit index" which would be equal to the lesser of the following two ratios:

$$\text{Index P} = \frac{\text{Average CPI in calendar year T-3}}{\text{Average CPI in calendar year T-4}}$$

$$\text{Index W} = \frac{\text{Average national wage in calendar year T-3}}{\text{Average national wage in calendar year T-4}}$$

The adjustment of benefits and the adjustment of career earnings would be done by using the lesser of Index P and Index W.

The introduction of an automatic adjustment of the system's parameters would have no material effect on the financial projections presented in this report since those projections were already performed assuming future regular indexing of these parameters.

Recommendations

The MIE and the earnings class limits should be increased by 13.5 percent on 29 February 2016.

From March 2017, the MIE should be subject to an automatic annual adjustment according to a wage index based on CSO data. Pensions in payment, fixed-rate benefits and the earnings class limits should be annually adjusted based on the lesser of a wage and a price index.

4.2 Level of the minimum retirement pension

A clear policy regarding the future evolution of the minimum retirement pension should be adopted so that the NIS pension formula of the scheme would effectively apply and the minimum pension would play its genuine role of taking care of persons with low earnings or interrupted careers.

The base scenario of the valuation assumes that the NIS minimum retirement pension will remain at $3,000 in 2015, that it will be indexed by 13.5 per cent in February 2016 (in line with the other benefits of the scheme) so that it reaches $3,404 in 2016, and that it will be indexed with inflation thereafter.

The Senior Citizens' Pension (SCP) has been increased to $3,500 on 1 October 2014 (with a new cap of $4,500 on the total income from SCP and other sources). This may create a political incentive to increase the NIS minimum pension. For the moment, there has been no commitment to increase the NIS minimum pension following the recent increase of the Senior Citizens' Pension (as this has been the case for previous increases of the SCP), but there may be pressure in that direction. The government should adopt a clear policy concerning the future evolution of these two pensions that affect, to a certain extent, the same clientele.[6]

Because of the high level of the NIS minimum pension, pension levels resulting from the pure application of the retirement pension formula cannot compete with the amount of the minimum pension. This is why such a large proportion of NIS pensioners receive the minimum pension. The present high level of the minimum pension results from a series of historical decisions that were not necessarily based on strong policy guidelines. A social security minimum pension between 40 and 80 per cent of the minimum wage is normally considered appropriate for taking care of persons with low earnings. Presently, the NIS minimum pension of $3,000 represents 115 per cent of the minimum wage (established at $2,600 per month).

In order to reinstate the minimum pension to a level consistent with international practice, it is recommended to index it more slowly than the other benefits of the scheme for the period that will be necessary.

Four scenarios of modification of the minimum pension have been analysed:

1. Increase the minimum pension at $3,500 on 1 April 2015. The minimum pension would be indexed annually thereafter at the rate applied to other benefits (the lesser of price and wage inflation).
2. Increase the minimum pension at $3,500 on 1 April 2015, but the amount of the minimum pension would depend on the age at which the retirement pension becomes payable, for encouraging people to delay retirement. Once determined, the minimum pension amount would remain at the same level for life (except for future periodic indexation at full rate). The amount of the minimum pension would vary as follows, depending on the age at the start of the pension:
    - Retirement at 61: $3,100
    - Retirement at 62: $3,200
    - Retirement at 63: $3,300
    - Retirement at 64: $3,400
    - Retirement at 65 or above: $3,500

[6] If, for example, the Senior Citizens Pension was transformed into a universal pension (as recommended by the World Bank), the NIS minimum pension could be reduced or even eliminated.

3. Freeze the minimum pension in 2015 and 2016, followed by a partial indexation of the minimum pension of $3,000 from March 2017 at 50 per cent of the indexation rate applied to other benefits, in order to reduce its importance over time.

4. Freeze the minimum pension at $3,000 forever.

The cost implications of these measures are presented in Table 4.2. The first measure slightly increases the cost of the scheme. The second measure reduces the GAP from 23.8 to 22.9 per cent. The third measure (partial indexing of the current minimum pension of $3,000) has a significant financial impact by reducing the GAP from 23.8 to 21.2 per cent and extending the period before reserve exhaustion by 5 years.

The fourth measure (minimum pension at $3,000 forever) would reduce the GAP to 20.5 per cent. This is a drastic scenario that would represent de facto an elimination of the minimum pension in the long term. This option is not recommended because it would put discredit on the scheme. It does not appear appropriate to eliminate the minimum pension which has a role to play for ensuring a minimum level of income to NIS contributors, even if there exists a need to reduce its importance over time.

Table 4.2 Financial implications of different levels of minimum pension

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion	PAYG rate (2062-63)
Base scenario	**23.8%**	**2029-30**	**35.7%**
1. Increase of minimum pension at $3,500 in April 2015 (fully indexed thereafter)	24.0%	2029-30	35.8%
2. Increase of minimum pension at $3,500 in April 2015, varying according to pension starting age between 60 and 65 (fully indexed thereafter)	22.9%	2031-32	34.8%
3. Minimum pension at $3,000 indexed at 50% of the lesser of price and wage inflation	21.2%	2034-35	32.4%
4. Minimum pension at $3,000 not indexed	20.5%	2037-38	32.3%

Recommendation

The minimum retirement pension should be maintained at its present level of $3,000 until the beginning of 2017. Starting in March 2017, it should be partially indexed each year at 50 per cent of the indexation rate applied to other benefits. Full indexation could be applied only once the partial indexation will have taken back the level of minimum pension at an appropriate percentage of the minimum wage.

4.3 Gradual increase of the retirement age

An increase of the NIS retirement age could be justified considering the projected increase of the life expectancy in Trinidad and Tobago. With retirement presently possible at age 60 without any penalty, the average worker spends 35 years in the labour force (from age 25 to age 60) and may expect to receive a pension for approximately 20 years (from age 60 to age 80). This represents a relatively short period of work for financing a long period of retirement. In addition, with the projected increase of life expectancy, which could add 2 to 3 years of retirement duration over the next 50 years [7], the pressure will become important on the shoulders of employers and workers for financing the system.

The increase of the retirement age may also be justified by the labour force shortage that is anticipated for Trinidad and Tobago in the future, namely on account of the shrinking of the population aged 16 to 59.

Any increase of the retirement age does not have to be implemented suddenly. In most countries where such a measure has been adopted, a transition period before the commencement of the retirement age increase has been provided in order to allow people to adjust their retirement planning to the new rules. In addition, the increase of the retirement age may be spread over an extended period of time.

With the increase of the "normal" retirement age, it would nevertheless be possible to continue to allow people to claim their retirement pension from age 60 with a lifetime actuarial reduction of their pension. It would also be possible to envisage postponed retirement (after normal retirement age) with actuarial increase. Hence, the NIS financial position would not be affected by individual decisions to retire early or late, and people could use this flexible retirement approach to fit their personal needs.

We recommend that the retirement age for an unreduced pension be gradually increased from age 60 to age 65 over a 36-year period. The increase of the retirement age would start in 2025 and the retirement age of 65 would be reached in 2060. This measure would reduce the GAP of the system from 23.8 per cent to 21.8 per cent. The cost reduction does not appear very important because the GAP is measured over the next 50 years. Since the increase of the retirement age is spread over a long period of time, it will have most of its financial impact after 50 years. The increase of the retirement age must be seen as a sound measure from a demographic, social and economic point of view.

This measure should be adopted following a national dialogue on the future of the retirement system which would address all components of the retirement system.

[7] The projected increase of life expectancy at age 60 over the period from 2011 to 2061 is 1.3 years for males and 3.1 years for females (as seen in Section 2.1).

Recommendation

The retirement age for an unreduced pension should be gradually increased from age 60 to age 65 over the period from 2025 to 2060. Actuarially reduced pensions would be available from age 60.

4.4 Global impact of the proposed measures

This section presents the financial projections of the NIS if the following measures are adopted:

1. Partial indexation of the minimum pension of $3,000 from March 2017, at 50 per cent of the indexation rate applied to other benefits;
2. Increase of the retirement age from 60 to 65 over the period from 2025 to 2060.

With the adoption of these measures, the long-term PAYG cost of the system would be reduced from 35.7 per cent to 28.1 per cent. The GAP would be reduced from 23.8 per cent to 19.4 per cent. In addition, the contribution rate would not have to increase to levels as high as shown in Table 3.18. A very gradual increase of the contribution rate (that would reach 22.8 per cent in 2061-62) would be sufficient to maintain reserve ratios around 6.0 until the end of the projection period. Here is a possible contribution rate schedule under reform:

Year	Contribution rate
2016-17	13.2%
2017-18	14.4%
2018-19	15.6%
2019-20 to 2021-22	16.8%
2022-23 to 2027-28	18.0%
2028-29 to2038-39	19.2%
2039-40 to 2051-52	20.4%
2052-53 to 2060-61	21.6%
2061-62 +	22.8%

Table 4.3 presents the financial projections of the scheme when taking into account the proposed reform measures.

Table 4.3 Projected revenue, expenditure and assets with reform measures, 2013-2063 (thousand TT$)

Year	Revenue			Expenditure			Assets	
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Year-end	Number of times current year's expenditure
2013-14	3,658,287	2,124,658	5,782,945	4,076,696	190,780	4,267,476	25,671,346	6.0
2014-15	4,051,426	2,148,656	6,200,082	4,405,225	199,245	4,604,470	27,266,957	5.9
2015-16	4,239,291	2,206,456	6,445,747	4,709,896	207,892	4,917,788	28,794,916	5.9
2016-17	4,938,457	2,268,371	7,206,828	5,080,069	216,713	5,296,782	30,704,962	5.8
2017-18	5,587,289	2,349,299	7,936,588	5,432,116	225,697	5,657,813	32,983,737	5.8
2018-19	6,313,641	2,447,857	8,761,498	5,825,335	234,836	6,060,170	35,685,065	5.9
2019-20	7,086,486	2,564,007	9,650,493	6,250,471	244,116	6,494,587	38,840,970	6.0
2020-21	7,382,314	2,678,121	10,060,435	6,720,029	253,525	6,973,554	41,927,851	6.0
2021-22	7,686,611	2,826,472	10,513,083	7,220,499	263,176	7,483,675	44,957,259	6.0
2022-23	8,569,500	3,043,838	11,613,338	7,687,760	273,194	7,960,954	48,609,644	6.1
2027-28	10,551,292	4,381,138	14,932,430	10,139,063	329,136	10,468,199	69,569,716	6.6
2032-33	13,948,956	6,252,411	20,201,367	13,148,877	396,139	13,545,016	99,427,036	7.3
2037-38	17,345,422	8,595,659	25,941,081	17,928,370	476,692	18,405,062	135,882,324	7.4
2042-43	22,761,042	11,699,830	34,460,872	23,511,705	573,981	24,085,686	185,012,678	7.7
2052-53	34,362,019	18,071,458	52,433,478	40,447,405	832,158	41,279,562	283,333,257	6.9
2062-63	53,487,908	24,503,993	77,991,901	64,777,675	1 204,128	65,981,804	382,628,681	5.8

5. Investment policy and administrative expenses

This section discusses the NIBTT investment policy. It also presents an analysis of the level of administrative expenses of the institution, a comparison with other social security schemes and recommendations for the future monitoring of these expenses.

5.1 Investment policy

General considerations

The asset allocation of a social security system should be established with reference to the time horizon of the system and the size of the fund. A long horizon offers the possibility to access investments that deliver value over a longer time frame that what is possible for other investors. The large size of a social security fund also allows to invest in private (direct) investments and not only in public markets. The social security fund can thus expect a greater return over time than smaller investors.

The evolution of future revenues and expenditures of the system should normally be presented as background to the *Investment Policy Statement* for the purpose of showing that a social security pension system has a long-term investment horizon. This information comes from the actuarial review. In the context of Trinidad and Tobago, various constraints like the structure of the economy and the limits imposed on overseas investments make it difficult for the NIBTT to adopt an investment policy that exactly fits these long-term objectives, but the NIBTT should keep that objective in mind and move as much as possible in that direction. The asset allocation should be established by taking into account these objectives and constraints. Actuaries are often involved in this exercise by making sensitivity analysis based on various scenarios of asset allocation. This helps establishing the risk tolerance of the social security fund and the projected return.

It is likely that the expected long-term rate of return used by actuaries for the projection of the National Insurance Fund will differ from the expected rate of return appearing in the *Investment Policy Statement*. The actuary must ensure the likelihood of long-term assumptions taking into account the investment policy, historical returns and governance practices. The actuary also takes into account short-term trends to ensure consistency with the other parameters of the macroeconomic framework at the basis of the valuation. Consequently, these factors may cause a difference in the projected rate of return used in the actuarial review compared with the forecasts made by the persons responsible for the establishment of the investment policy.

Recent evolution of the investment portfolio

The composition of the investment portfolio of the NIBTT has evolved over recent years as shown in Table 5.1. The asset mix has been relatively stable during the last six years. As of 30 June 2013, 45 per cent of the portfolio is invested in fixed-income securities (government securities, corporate bonds, debentures, mortgages, fixed-deposits and money market instruments) and 55 per cent in equities. Because of the limited equity market in Trinidad and Tobago, local equities are concentrated

in a small number of enterprises, hence diversification may be achieved only by investing overseas. The proportion of overseas investments in the NIBTT portfolio has increased from 11 to 14 percent of the total portfolio over the period 2009-2013. It is hoped that the legislative constraints applied to overseas investments will be relaxed, so that the NIBTT will have more flexibility to diversify its portfolio. According to the National Insurance Act, overseas investments are limited to 20 per cent of the total investment portfolio.

Table 5.1 Evolution of the NIBTT investment portfolio from 2009 to 2013

	Year					Fixed-income (F-I) vs equity (E)
Type of investment	**2009**	**2010**	**2011**	**2012**	**2013**	
Local investments						
Fixed Deposit/Demand Deposit	3%	9%	0%	5%	7%	F-I
TT Government Securities	24%	22%	22%	21%	22%	F-I
TT Debentures / Bonds	20%	15%	15%	13%	9%	F-I
Subsidary Company Bonds	9%	9%	9%	8%	5%	F-I
Subsidary Company Equities	1%	1%	1%	1%	5%	E
Subsidary Company Debentures	1%	1%	1%	1%	0%	F-I
Mortgages	0%	0%	0%	0%	0%	F-I
Local Equities	26%	26%	31%	32%	33%	E
Investment properties	1%	1%	1%	1%	1%	E
Other Equity Mutual Funds	3%	4%	4%	4%	4%	E
Sub-Total - Local	**89%**	**87%**	**84%**	**86%**	**86%**	
Overseas investments						
Regional Equity	0%	0%	0%	0%	0%	E
US$ Equity	2%	2%	3%	2%	2%	E
US$ Debentures/ Bonds	1%	1%	1%	1%	1%	F-I
US$ Cash	0%	0%	0%	0%	0%	F-I
US$ RBC Shares	8%	9%	12%	10%	10%	E
Sub-Total - Overseas	**11%**	**13%**	**16%**	**14%**	**14%**	
Total	**100%**	**100%**	**100%**	**100%**	**100%**	

Source: NIBTT

Target asset allocation and return

The actuaries have received a copy of the *Investment Policy Statement* 2014-2015 of the NIBTT. The document presents the strategic asset allocation and expected returns as they appear in Table 5.2.

Table 5.2 NIBTT target asset allocation and expected return

Asset class	Target asset allocation	Allowable range	Expected returns
Fixed Income (Local)	30.0%	25% - 35%	3%
Fixed Income (Overseas)	10.0%	5% - 15%	4%
Equities (Local)	35.0%	30% - 40%	10%
Equities (Overseas)	10.0%	5% - 15%	9%
Mutual Funds	2.5%	0% - 10%	4%
Real Estate	10.0%	5% - 15%	9%
Cash & Cash Equivalents	2.5%	2.5% - 5%	1%
Total	**100.0%**		**6.5% ***

Source: NIBTT *Investment Policy Statement* 2014-2015
* Note: The exact weighted average return is 6.725% but the figure is rounded down to the nearest 0.5%.

According to the geographic exposure for the investment portfolio presented on page 20 of the investment policy, the target exposure to overseas investments is 18 per cent, while figures coming from the target asset allocation (appearing in Table 5.2 above) sum up to 20 per cent. These two objectives (which should be aligned) are higher than the limit indicated in the law. We understand that the NIBTT is expecting a modification of the legislation that would better fit the objectives of the NIS fund in terms of return and diversification.

Appropriateness of the NIBTT *Investment Policy Statement*

The appropriateness of the NIBTT investment policy is analysed here with reference to the ISSA *Guidelines on Investment of Social Security Funds*.[8]

It is understood that other documents have been produced by the NIBTT (in addition to the *Investment Policy Statement*) to provide guidance in certain specific aspects of the investment management. They include:

- *Risk management policies and procedures*
- *Investment management procedures*
- *Active trading guidelines and procedures*
- *Delegated authority limits*

It may be said that, in general, the principles that should govern the investments of assets are well enunciated in the NIBTT investment policy. However, how these principles will be applied in practice is not always fully described.

Maximization of long-term return and diversification. The portfolio must be constructed with appropriate efficiency and diversification. The target asset allocation of the investment policy meets those objectives. With 57.5 percent of investments in equities (including mutual funds and real estate), the target asset mix

[8] See http://www.issa.int/excellence/guidelines/investment.

is well designed for maximizing the long-term return. The long horizon of the NIS and the large size of its fund allows a relative high proportion of equity investments. At the same time, it may be noted that many social security schemes in the world have a proportion of investments in equity higher than 60 per cent. The portfolio appears to be well balanced among the different asset categories.

Geographical diversification may be achieved with the 20 per cent objective in overseas investments. The intention to go above the statutory limit on overseas investments aims at meeting the higher return and diversification objectives. However, the specific criteria for the choice of overseas investments are not mentioned. On the other hand, investments in real estate provides inflation protection over the long-term and its target allocation of 10 per cent seems appropriate in that regard.

Taking into account the nature of liabilities and the financing policy. The new investment policy has greatly improved compared to the preceding one by making the link between the investment policy and the results of the actuarial review. It now presents cash flow projections of the NIS in annex and indicates the gap between contribution income and total expenditures that will have to be supported by investment income. The NIS is maturing with greater cash flow demands.

However, there would be a need to establish a closer link between the investment policy and the target reserve levels that would result from the application of an automatic mechanism for adjusting the contribution rate of the NIS that might be introduced in the law. Even if the actuarial projections under the base scenario show an increasing reserve only during the next 5 to 6 years in nominal value, it is expected that actions will be undertaken to ensure a continuous growth of assets over the long run. The way the present liability mapping is illustrated in Appendix III of the investment policy may induce the need to adopt a short-term view concerning the investments of the scheme and could guide in the choice of inappropriate investments in terms of maturity and risk. The reduction of the reserve in 2016-17 shown in Appendix III may not be representative of the actual situation that will prevail if appropriate actions are taken to ensure the long-term sustainability of the scheme. These considerations require close communication between the NIBTT Investment Department and the Actuarial Services.

Section 3.7 proposes the adoption of a legal mechanism that would determine the level of the future contribution rates necessary to maintain sufficient reserves for ensuring the sustainability of the scheme. If such a financing mechanism is implemented, the NIS assets will be increasing for several decades. Financial projections on that basis would provide a better information for assessing the real liquidity needs of the NIS fund.

Criteria for choice between internal and external investment management. It is necessary to assess the resources within the organization that are able to manage appropriately part or all of the assets of the reserve fund and consequently decide if part of the asset management must be done externally. We understand that separate guidelines would deal with the selection process for external managers and the way their missions and goals are defined. However, a mention should be made in the *Investment Policy Statement* about the general approach and criteria that drive internal versus external asset management.

Measurement of investment risks. The document outlines the statutory limits included in the National Insurance Act. It also describes the risk limits according to the different types of risks identified. These risk limits are more precise than the statutory limits and well focused on the objectives of security and diversification. The investment policy should however present the level of risk (e.g. standard deviation) associated with each asset class. It should also discuss the question of risk tolerance of the social security fund (taking into account its long horizon). Financial projections based on certain extreme scenarios may help evaluate the risk tolerance of the system.

Selection of appropriate benchmarks. The rate of return benchmarks chosen for each asset class appear appropriate.

Active and passive management. The document clearly states that the Board will adopt an active management strategy because of its responsibility to assist in the development of the local capital market. It also mentions that a comprehensive active management plan has been developed for identifying the strategies and activities to support that objective. In the context of Trinidad and Tobago, and with the legitimate objective of social and economic utility of social security investments, this approach is considered appropriate.

Performance and risk analysis, reporting and disclosure. It is necessary to provide quality information to stakeholders. At the same time, it is necessary to produce appropriate and meaningful indicators. The investment policy correctly outlines the different types of reports that are prepared on a bi-weekly, monthly and quarterly basis, with the intended audience.

Managers monitoring and evaluation. The investment policy does not mention these activities. It is understood that the *Investment management procedures* deal with these matters.

5.2 Level of administrative expenditures

Section 22 of the National Insurance Act stipulates that administrative expenditure should not exceed the actuary's recommendations included in the periodic actuarial review. It states that:

> *"22. (1) The revenue of the Board for any financial year shall be applied in defraying the following commitments, that is to say:*
>
> *(a) the payment of benefits;*
>
> *(b) the salaries, fees, remuneration and gratuities of the officers, and employees, and technical and other advisers, of the Board;*
>
> *(c) the remuneration, fees and allowances of the Directors or of any committee of the Board;*
>
> *(d) any other expenditure or losses or write-off identified by the Board and subject to the approval of the Minister of Finance which are properly chargeable to the Board's Revenue Account,*
>
> *but the commitments described at (b), (c) and (d) shall not exceed the amount fixed by the Minister not exceeding the recommendations of the actuary arising out of the periodic review of the National Insurance System."*

Assessment of the appropriate level of administrative expenditure for any social security systems must be based on several criteria that are necessarily based, at least in part, on judgment. Sufficient resources are necessary to provide the appropriate level of service while maintaining a reasonable cost. The type of benefits, the state of maturity of the system, the level of contributions in relation to benefits must all be considered when establishing indicators for the analysis of administrative expenditures. There is no reliable unique benchmark appropriate in all circumstances. Guidelines can be inspired by comparison with other systems and genuine consideration of the differences between them.

Observed NIBTT administrative expenditure ratios

Table 5.3 shows NIBTT administrative expenditures, their year-to-year variations and various ratios established for the past three financial years.

Table 5.3 NIBTT administrative expenditure ratios

	2010-11	2011-12	2012-13
Administrative expenditures (million TT$)	128	141 *	185
Variation with previous year	- 0.3%	9.7%	31.2%
Financial data (million TT$)			
Contribution income	2,723	2,822	3,304
Benefit expenditure	2,295	2,754	3,556
Ratio of administrative expenditures to:			
Contribution income	4.7%	5.0% *	5.6%
Benefit expenditure	5.6%	5.1%	5.2%
Ratio projected in 8th Actuarial Review (% of contribution income)	4.7%	4.4%	4.2%

* Does not take into account the unrealised losses on property development of 45 million$.

Source: NIBTT

During the three-year period from 2010-11 to 2012-13, administrative expenditures have represented, on average, 5.1 percent of contribution income and 5.3 percent of benefit expenditure. The experiences ratios in the present valuation are higher than those assumed in the 8th Actuarial Review (last line of Table 5.3).

Analysis of the correlation between the evolution of economic variables and the NIBTT administrative expenditures does not enable the identification of a reliable indicator, even if an observation period longer than the last three years is used.

Comparison with other schemes

Table 5.4 presents a comparison of administrative expenses of different social security systems. It shows that Trinidad and Tobago stands in the group with the lowest administrative expenditure ratios among Caribbean countries. It must be

recognized here that and Trinidad and Tobago is the largest of the Caribbean countries presented in the table and this explains, at least in part, its better ranking. Canada is also presented to show the level of administrative expenses of a larger country. Canada Pension Plan's administrative expenditures have represented 2.6 per cent of contribution income in 2013. However, the size of the Trinidad and Tobago's scheme may preclude the attainment of the same economies of scale as those possible in a country like Canada. It must also be mentioned that NIBTT is responsible for the administration of Short-term and Employment injury benefits which normally generate higher administrative costs than Long-term benefits. In North American and Western European countries, Short-term and Employment injury benefits are generally administered separately from Long-term (pension) benefits.

Table 5.4 Comparison of administrative expenses of social security systems in different countries

Country	Year	Administrative expenses as % of	
		Contribution income	Benefit expenditure
Bahamas	2013	19.6%	20.2%
Barbados	2009	4.7%	6.3%
Belize	2011	30.9%	32.0%
Canada	2013	2.6%	3.0%
Dominica	2012	11.6%	11.4%
Guyana	2011	13.8%	14.0%
Saint Kitts and Nevis	2010	18.1%	31.7%
Saint Lucia	2009	16.4%	30.2%
Trinidad and Tobago	2013	5.6%	5.2%

Source: Annual reports of the different administrations.

Projected NIBTT administrative expenditures

Table 5.5 presents projected administrative expenditures in terms of contribution income for the next five years if the contribution rate remains at 12.0 percent. For this actuarial review, it is assumed that administrative expenditures would increase according to wage increases and price inflation in equal proportions. The most important component of administrative expenditures is wages. The other expenses are subject to various inflationary pressures. Price inflation was thus considered appropriate for these other expenses.

Table 5.5 Projected NIBTT administrative expenditures as a percentage of contribution income (2013-2014 to 2017-2018)

	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Ratio	5.2%	4.9%	4.9%	4.8%	4.8%

One can expect that administrative costs may also be subject to additional upward pressures if the workload increases. Such workload might increase during the maturing phase of the system because the number of beneficiaries will grow steadily. An upgrade of IT systems of the NIBTT might also push administrative costs upward. It has been assumed that productivity gains would offset these factors.

Recommendations

Actuaries can provide significant advice in all aspects of social security schemes. However, in the matter of administrative expenditures, especially when the administering entity has reached a certain stage of maturity, it is questionable whether the actuary's opinion should be given precedence over the combined efforts of budget people and the governing body of a social security institution. Thus, it is recommended that Section 22 of the National Insurance Act be reviewed so that the target administrative expenditure level be established with consideration of a more comprehensive analysis of the NIBTT administration components and not only on the actuaries' opinion.

The Board of Directors of the NIBTT has established a limit on administrative expenditures at 7.5 percent of contribution income. In 2012-13, administrative expenditures have represented 5.6 percent of contribution income. Before the National Insurance Act is modified in line with the recommendation of the preceding paragraph, the ratios appearing in Table 5.5 may be considered as a reasonable benchmark for administrative expenditure targets (allowing for a margin given that fluctuations can be expected). Hence the present limit established at 7.5 percent of contribution income could remain the same in the context of the present contribution rate of 12.0 per cent. However if the contribution rate is increased, as recommended in this report, then the limit of 7.5 per cent should be lowered (adjusted proportionately). It is recommended that an administrative review of the NIBTT be undertaken before the next actuarial review in order to specify a more precise and reliable indicator.

In the NIS financial statements, administrative expenditures are allocated by branch of benefits in proportion to contributions. This may not properly reflect the workload that each branch generates. In particular, it seems that the Short-term fund may not support its appropriate share of administrative expenditures. Short-term benefits do not generate a significant need for reserving, but are very demanding in terms of benefits follow-up. It is suggested to use contribution income and benefit expenditures in equal proportion to allocate administrative expenditures between branches. The basis for allocation by branch could be improved in the future if the NIBTT introduces mechanisms to precisely measure administrative expenditures for each branch.

6. Extension of coverage to self-employed persons

6.1 Background

Although the coverage of self-employed workers is part of the National Insurance Act No. 35 of 1971, the relevant social security provisions regulating contributions and benefits under the Act have not yet been implemented. It is assumed in this section that the application of specific provisions concerning self-employed persons (SEP) would be introduced on 1 July 2015.

The International Labour Office (ILO) has produced, in 2010, an actuarial review regarding the extension of coverage to the self-employed persons. The analysis presented hereunder is consistent with the findings of the 2010 ILO report, but adapted to the context of the 9th Actuarial Review.

6.2 Conditions for success

In general, the coverage of self-employed workers presents considerable inherent difficulties: irregular nature of self-employment, heterogeneous types of work and social security needs, non-compliance, management of small cash flows, limited scope and level of coverage, and mistrust due to governance failures in certain social security systems. The extension of coverage to SEP in Trinidad and Tobago thus requires appropriate design and administrative measures in order to guarantee the success of this extension.

The following elements need to be addressed for a successful application of the NIS to self-employed persons.

- **Earnings basis for the calculation of contributions and benefits**. The definition of covered earnings represents a difficulty for self-employed persons. Many SEP have irregular earnings during the year and many self-employed jobs are seasonal. There is also an issue concerning the equalization of earnings over the year for many SEP. Frequency of contribution payment should also be adapted to the reality of each industry.

- **Definition of the self-employed status**. The employment status may be difficult to establish in some industries. Precise criteria must be established to clearly determine the status of all members of the labour force as self-employed or as salaried workers.

- **Definition of retirement**. Retirement is not a clear-cut event for most self-employed persons. Some flexibility is necessary to allow SEP to have access to the benefits they paid for, in respect of their particular work history and status.

- **Stimulus required for persons near the retirement age**. For attracting older SEP into the NIBTT, it will be necessary to offer additional contribution credits to these persons so that they have a possibility to reach the minimum of 15 years of participation before the retirement age. In addition, some salaried workers may

have moved to self-employment a few years before retirement without having attained the 750 minimum contribution period. There is thus a need, at the implementation of the SEP system, to provide age credits for these persons.

- **Stimulus required for low-income SEP**. A subsidization of contributions for low-income SEP would help them acquire right to the minimum pension and encourage their participation.

- **Necessary links with SEP associations and Government agencies**. SEP associations offer services to their members, so they may help in the collection of NIS contributions. Self-employed persons in many industries need a license to operate; this allows SEP associations to maintain records of their members and may represent a useful tool to ensure NIS coverage. In addition, SEP must interact with several Government agencies for conducting their business. Exchange of information between NIBTT and those agencies will help improving compliance.

- **Information campaigns**. There is a need to sell correctly the benefits of NIS in order to be able to attract SEP into the National Insurance System, otherwise they would resist contribution payment. Hence, information and communication is a crucial aspect of the implementation of the SEP system.

6.3 Profile of self-employed persons

The number of self-employed persons is estimated at 92,786 in 2013 (see Table 6.1).[9] They represent 16 per cent of the total labour force. Among SEP, 30,902 are aged 50 and over. The averaged earnings of SEP are estimated at TT$6,672 per month for males and TT$4,625 for females.

[9] This number of SEP is significantly lower than the number presented in the report of the 8th Actuarial Review. The reason is that numbers presented here are based on more precise data coming from the last national census, while previous CSO data were based on crude labour force estimates.

Table 6.1 Number and average earnings of self-employed persons, by age and sex (2013*)

Age	Male		Female		Total	
	Number	Average monthly earnings (TT$)	Number	Average monthly earnings (TT$)	Number	Average monthly earnings (TT$)
15-19	663	2,731	148	1,901	812	2,579
20-24	3,040	4,013	1,207	2,611	4,248	3,615
25-29	5,699	5,107	2,441	3,605	8,139	4,657
30-34	7,424	5,580	3,056	4,826	10,480	5,360
35-39	8,516	6,583	3,094	5,969	11,610	6,419
40-44	9,517	7,209	3,291	5,511	12,808	6,772
45-49	9,955	7,324	3,832	4,428	13,787	6,519
50-54	8,891	7,389	3,815	4,024	12,705	6,378
55-59	6,456	7,431	2,744	4,505	9,200	6,558
60-64	4,079	7,455	1,479	4,808	5,558	6,751
65 +	2,382	7,681	1,057	5,324	3,439	6,956
Total	66,622	6,672	26,164	4,625	92,786	6,095

* Based on 2012 CSO data projected in 2013.

Self-employed persons may be divided into two groups: ***Employers*** (sole proprietors who may have staff) and ***Own account workers*** (who operate on their own). *Employers*, who represent 23 per cent of all SEP, are considered more likely to be operating formally and are relatively easy to identify. *Own account workers*, on the other hand, can be divided in two subgroups, assumed to be roughly of equal size, according to the degree of informality of their work activities. One subgroup is formally engaged in economic activities and the other is not. It should be possible to eventually register a large proportion of the *Employers*, but there is high uncertainty about the capacity to register a significant proportion of the *Own account workers*, even in the long-term.

The determination of earnings for contribution purposes will be a major administrative challenge for NIBTT. In cases where a person produces enough valid evidence for a particular level of annual earnings, such earnings shall be used for determining contributions. However, it is anticipated that assessment problems and/or unreliability of declared income will impede this process. In such cases, each SEP shall be assigned a minimum level of earnings based on his or her occupation. NIBTT would then have to generate and regularly review the minimum earnings' categories so that they correctly reflect the reality of each occupation.

6.4 Specific provisions applicable to self-employed persons

Benefits offered to self-employed persons would include long-term and short-term benefits. The contemplated long-term benefits are similar to those applicable to salaried workers. For short-term benefits, there exist certain differences aimed at reducing anti-selection.

A. Long-term benefits:

- **Retirement**. They would have access to a retirement pension from age 60 (as for salaried employees) with mandatory retirement at age 65. The contribution requirements and pension formula would be the same as for salaried workers. A retirement grant would be paid if contributions are not sufficient.

- **Invalidity**. The definition of invalidity, contribution requirements and pension formula would be the same as for salaried workers.

- **Survivorship**. Benefits would include survivors' pensions and a Remarriage grant. Contribution requirements, pension formula and conditions of payment to survivors would be the same as for salaried workers.

B. Short-term benefits

- **Incapacity**. The benefit would be paid in case of incapacity (illnesses/injuries included in a prescribed list) lasting 7 days or more, if the person has paid contributions for at least 20 weeks during the last 26 weeks. The benefit would represent 60 per cent of the earnings of the best 20 of the last 26 weeks and it would be paid retroactively from the first day of incapacity.

- **Maternity**. The benefit would include a Maternity grant of TT$3,750 plus 60 per cent of earnings for 14 weeks. For eligibility, they would need 39 weekly contributions in the year preceding the 6th week before the expected date of confinement.

- **Funeral grant**. The amount would be the same as for salaried workers (TT$7,500).

The 2015 Budget Statement includes two measures specifically applicable to SEP. They are as follows.

Age credits. Self-employed persons aged 57 and over at the commencement of coverage in 2015 will receive a one-off payment equal to three times their contributions. Persons aged 50 to 56 at the commencement of coverage who contributed fully in each year prior to retirement will be credited with additional contributions to allow them to receive the minimum pension. Age credits (for eligibility purposes) will be granted at a rate of 50 contribution weeks for each complete year elapsed between the age of 50 and the attained age of the person at the introduction of these measures (up to a maximum of 6 years of credit). However, to

receive the age credits, the persons will have to register within twelve months of the appointed day.

Co-payment of contributions for low-income SEP. The NIBTT contributions of low-income self-employed persons (defined as persons who earn less than TT$3,000 per month) will be subsidized in an amount equivalent to two-thirds of the contributions due. The subsidy will cover 100 per cent of contributions during the first year of application.

6.5 Projected evolution of SEP coverage

The pre-registration of SEP contributors has started early in 2015, but it is anticipated that the first contributions will be paid from 1 July 2015.

Despite intensive efforts of implementation, the registration of SEP will be gradual. It should increase significantly over the first five years of implementation and will slowly reach maturity over time. It may be expected that the incentives announced by the Government in the 2015 Budget Statement will encourage SEP participation. In particular, it is expected that the full subsidization (instead of two-thirds) of contributions for low-income SEP during the first year of application will encourage SEP to become NIS contributors. However, given the experience in other countries, it is not expected that the coverage rate for this first year of application will exceed 15 per cent. The coverage of the self-employed population is also dependent on the administrative capacities of the NIBTT to absorb this new group of contributors. The assumed future evolution of SEP coverage rates is presented in Table 6.2.

Table 6.2 Assumed self-employed coverage rates

Year	Coverage rate
2015-16	15%
2016-17	20%
2017-18	30%
2018-19	35%
2019-20	40%
- - -	Linear increase
From 2059-60	60%

6.6 Administrative expenditures

The administrative expenditures will be higher during the implementation phase. From the fourth year, it is assumed that these expenditures will represent 0.5 percent of total insurable earnings (see Table 6.3).

Table 6.3 Projected administrative expenditures for SEP as a percentage of total insurable earnings (2015-16 to 2019-20)

Year	2015-16	2016-17	2017-18	2018-19	2019-20
Admin. ratio	2.3%	1.0%	0.7%	0.5%	0.5%

6.7 Demographic projections

The number of SEP pensioners will slowly increase through the projection period. By the end of the projection period, the ratio of contributors to pensioners will reach a level of 1.3 (see Table 6.4), which is comparable to the ratio observed 20 years earlier in the case of salaried employees. These projections take into account the granting of age credits to SEP aged 50 and over at the inception date.

Table 6.4 Projected number of self-employed contributors and pensioners - Long-term benefits (2013-2063)

Year	Number of contributors	Number of pensioners				Ratio of contributors to pensioners
		Retirement	Invalidity	Survivors	Total	
Until 2014-15	0	0	0	0	0	-
2015-16	12,741	0	0	0	0	-
2016-17	17,168	0	0	28	28	611.0
2017-18	25,875	0	0	94	94	276.2
2018-19	30,379	1	7	187	196	155.4
2019-20	34,865	5	25	308	339	102.9
2020-21	35,487	13	53	448	514	69.1
2021-22	36,022	27	88	597	712	50.6
2022-23	36,512	47	126	747	920	39.7
2027-28	38,636	560	286	1,457	2,303	16.8
2032-33	40,475	1,360	416	2,023	3,798	10.7
2037-38	41,609	4,678	506	2,514	7,697	5.4
2042-43	41,770	9,711	535	3,096	13,343	3.1
2052-53	41,500	19,592	474	4,850	24,915	1.7
2062-63	41,971	24,010	525	7,297	31,832	1.3

Table 6.5 presents the projected number of benefit recipients for short-term benefits. The number of beneficiaries of Incapacity and Maternity benefits is relatively stable after the period of implementation. The number of Funeral grants is affected by population ageing and thus continuously increases over time.

Table 6.5 Projected number of self-employed benefit recipients - Short-term benefits (2013-2063)

Year	Incapacity benefit	Maternity benefit *	Funeral grant
Until 2014-15	0	0	0
2015-16	309	78	0
2016-17	417	104	54
2017-18	628	155	72
2018-19	738	180	108
2019-20	848	204	127
2020-21	862	204	146
2021-22	875	203	150
2022-23	887	201	154
2027-28	941	191	172
2032-33	984	187	199
2037-38	1,007	195	254
2042-43	1,007	206	345
2052-53	1,002	209	637
2062-63	1,014	198	1,023

* The number of Maternity grants is assumed equal to the number of Maternity benefit recipients.

6.8 Proposed contribution rate

In the establishment of a contribution rate specific to SEP, it is necessary to ensure that it will be sufficient to cover the financial needs of the system. If the rates are expected to evolve significantly in the future, it would be advisable to develop a plan of subsequent increases and to communicate the long-term perspectives to stakeholders. Equity among the various stakeholders must be preserved.

As the protection offered in the Long-term branch is the same as the one that is available to salaried workers, equity suggests using the same contribution rate for both salaried workers and SEP. However, the long-term financial sustainability of the fund does not necessarily require a rate as high as the rate for salaried workers at the onset. Indeed, the benefits-to-earnings ratio increases very slowly in the first two decades. On the one hand, SEP had the opportunity to register in the past and to accrue rights when contribution rates were lower, but most of them did not. On the other hand, SEP may switch during their career from one status to another. Fairness suggests that these workers should pay the same amount of contributions for the same benefits, irrespective of their status.

Concerning Short-term benefits, the cost is stable throughout the projection period. Hence, the contribution rate determined at the onset is not subject to structural changes. Consequently, the rate for Short-term benefits should be in line with the expected cost.

Based on these considerations, it is recommended that:

- the contribution rate for Long-term benefits should be identical to that for salaried workers;
- the contribution rate for Short-term benefits should adequately cover the benefit and administrative expenditures of the branch.

On that basis, the SEP contribution rate for Long-term benefits would be 10.8 per cent (90 percent of the total contribution rate of 12.0 per cent). The expected cost of Short-term benefits is 0.4 per cent. The total SEP contribution rate would thus be 11.2 percent. It is recommended that this contribution rate be adjusted in the future to take into account any adjustment of the contribution rate for Long-term benefits applicable to salaried workers. For example, the SEP contribution rate would be increased to 12.4 per cent (12.0 per cent for Long-term benefits and 0.4 per cent for Short-term benefits) on 29 February 2016 for consistency with the increase recommended for salaried workers.

6.9 Financial projections

Benefit expenditures relative to SEP are presented in Table 6.6. The benefits-to-earnings ratio increases very slowly but reaches a level that is significant at the end of the projection period. The ratio of benefits to expenditures for Long-term benefits increases steadily over the projection period while the ratio for Short-term benefits is fairly stable from 2017-18. After the first year of implementation, during which administrative costs would be higher, the total PAYG rate would slowly increase from 0.6 percent in 2015-16 to 4.0 percent in 2022-23, and will reach 26.1 percent in 2062-63.

Total GAP of the SEP system is 11.9 percent (11.5 percent for Long-term benefits and 0.4 percent for Short-term benefits).

Table 6.6 Projected benefit expenditures, Self-employed persons (2013-2063)

Year	Benefit expenditure (million TT$)					Benefits as a % of	
	Retirement	Invalidity	Survivors	Short-term	Total	Insurable earnings	GDP
Until 2014-15	0	0	0	0	0	-	-
2015-16	0	0	0	3	3	0.6	0.00
2016-17	3	0	0	5	8	0.7	0.00
2017-18	10	0	1	7	18	1.0	0.01
2018-19	20	0	2	9	31	1.3	0.01
2019-20	34	1	4	10	49	1.7	0.02
2020-21	52	2	6	11	71	2.2	0.03
2021-22	83	3	9	11	105	3.1	0.04
2022-23	114	4	11	12	141	3.9	0.06
2027-28	262	11	26	15	314	6.6	0.10
2032-33	409	20	45	19	492	8.0	0.13
2037-38	504	30	70	25	629	8.0	0.13
2042-43	1,105	39	110	33	1,288	13.2	0.23
2052-53	3,023	55	282	57	3,417	22.7	0.42
2062-63	5,369	95	668	97	6,228	26.1	0.53

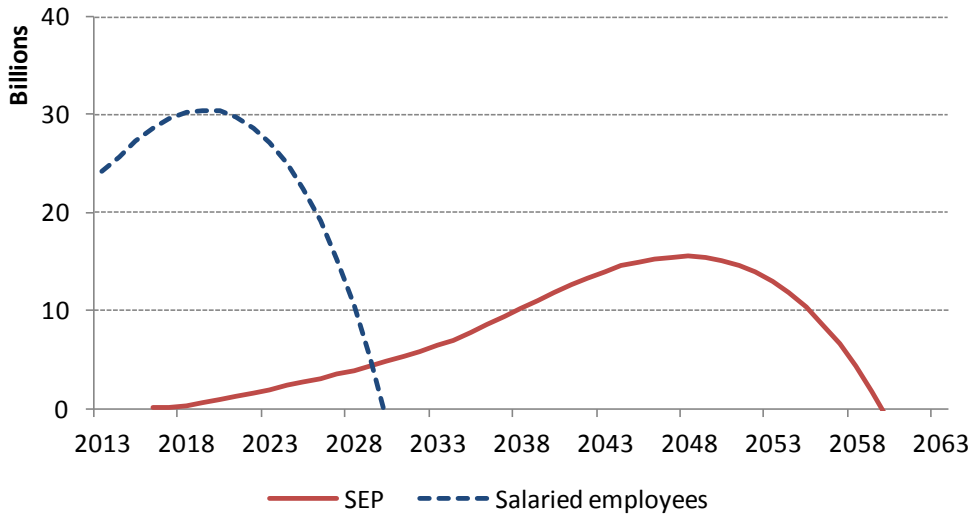
Financial projections concerning SEP are presented in this section using a constant contribution rate of 11.2 percent. Under that basis, Table 6.7 reveals that the fund would increase continuously until 2048-49 (before that, the total of contributions and investment income is sufficient to support scheme's expenditure). The fund would become negative only at the very end of the projection period (2059-60). It is understood here that any increase of the contribution rate of Long-term benefits applicable to salaried workers (that could follow the recommendations of this actuarial valuation) would bring a similar increase of the SEP contribution rate and would improve the financial condition of this system.

Table 6.7 Key moments of the future evolution of SEP assets

	Year
System's expenditure first exceeds contributions	2040-41
System's expenditure first exceeds contributions plus investment income (assets start to decrease)	2048-49
Assets are exhausted	2059-60

It is interesting to compare the size of the projected fund for SEP to the projected fund for salaried workers. Chart 6.1 shows that the SEP fund will reach the peak of its fund level 30 years later than the fund of salaried workers.

Chart 6.1 Comparison of fund projections (SEP versus Salaried employees)



Detailed financial projections regarding the SEP system are presented in Table 6.8. The application of a contribution rate of 11.2 per cent would generate sufficient income to maintain a positive fund until 2058-59.

Table 6.8 Projected revenue, expenditure and assets, Self-employed persons, 2013-2063 (thousand TT$)

Year	Revenue			Expenditure			Assets	
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Year-end	Number of times current year's expenditure
2013-14	0	0	0	0	0	0	0	-
2014-15	0	0	0	0	0	0	0	-
2015-16	55,465	1,675	57,139	2,970	11,600	14,570	42,569	2.9
2016-17	128,150	7,663	135,813	8,425	11,600	20,025	158,357	7.9
2017-18	192,034	18,355	210,389	17,913	11,600	29,513	339,233	11.5
2018-19	261,495	33,129	294,624	30,726	12,639	43,364	590,492	13.6
2019-20	316,722	51,101	367,823	49,029	15,268	64,296	894,019	13.9
2020-21	356,992	70,541	427,532	71,036	17,415	88,451	1,233,100	13.9
2021-22	379,134	91,579	470,713	105,359	18,446	123,805	1,580,009	12.8
2022-23	401,973	114,467	516,440	140,850	19,456	160,306	1,936,143	12.1
2027-28	529,111	241,402	770,514	314,125	25,091	339,215	3,923,311	11.6
2032-33	686,082	397,111	1,083,193	492,408	31,691	524,099	6,378,707	12.2
2037-38	875,161	634,497	1,509,658	628,581	39,571	668,152	10,165,888	15.2
2042-43	1,092,214	888,635	1,980,849	1,287,756	48,810	1,336,565	13,970,544	10.4
2052-53	1,686,275	874,751	2,561,026	3,416,979	77,088	3,494,066	12,968,643	3.7
2062-63	2,670,468	-707,026	1,963,442	6,228,317	120,297	6,348,613	-13,051,686	-2.1

6.10 Cost of specific SEP provisions

Two measures specific to SEP (age credits and co-payment of contributions for low-income SEP) will be introduced. The Government has already committed to inject funds to support the financing of these additional provisions. The Government will inject TT$12.9 million to cover the cost of age credits. In addition, TT$41.0 million will be paid by the Government to meet the co-payment of contributions for low-income SEP over the next 5 years (with an injection of TT$4.0 million for fiscal 2015) and an additional TT$2.0 million will be injected in 2015 to meet the additional cost of the full-subsidy during the first year of application.

New cost estimates of these two measures have been performed based on the most recent SEP profile and taking into account the actuarial bases and assumptions of this valuation. The new cost estimates are as follows:

- **Age credits**. It is estimated that the cost of the age credits is TT$108 million. When expressed in terms of general average premium, the age credits increase the GAP of the SEP system for Long-term benefits (excluding administrative costs) from 10.87 to 11.04 per cent.

- **Co-payment of contributions for low-income SEP**. It is estimated that the cost of the subsidy to low-income SEP (earning less that TT$3,000 per month) is TT$3 million in the first year of application and TT$44 million in total for the first 5 years. This includes the cost of the full subsidy during the first year.

Consequently, part of the cost of age credits will have to be absorbed by the group of SEP contributors themselves. It must however be mentioned that these cost estimates are based on a series of assumptions on the actual earnings profile of low-income SEP and their behaviour regarding coverage under the NIS. Hence the actual costs could significantly vary from these estimates.

6.11 Comments on the NIBTT orientation document

The NIBTT has produced in August 2013 a document entitled "*Design of the System for Incorporation of Self-Employed Persons into the National Insurance System of Trinidad and Tobago*". Following are some comments on that document.

- **Determination of the earnings class**. The document mentions that each SEP will be assigned an earnings class according to the occupational grouping to which he/she belongs. If the SEP has actual earnings different from this predetermined occupation grouping and wants to contribute on the basis of a different earnings class, the burden of the proof will be on the SEP shoulders to demonstrate that his/her earnings are different from the assigned one. This could represent a deterrent to the participation of SEP in the NIBTT.

  It is also mentioned that SEP earnings by occupational groupings will be based on CSO data. It might be difficult to establish up-to-date SEP earnings by occupational groupings based on CSO data since, as observed presently, there is a

considerable delay before CSO publishes data on earnings (at least two years at the moment). If based on CSO information, there is thus a risk that the determination of SEP earnings presents outdated information.

Still concerning the earnings class system, it will be necessary to record information on SEP that will allow an easy transition to an eventual new system based on percentage of earnings instead of earnings classes. For that purpose, the NIBTT administrative systems should record the exact earnings on which SEP have contributed, in addition to the earnings class, until the new system based on percentage of earnings is implemented.

- **Frequency of contribution payment**. It is planned that SEP contributions will be paid monthly. In that case, it will be important to specify how these monthly contributions will be translated into weekly contributions for (1) the application of the minimum weekly earnings of TT$180 and (2) the application of the weekly contribution requirements for eligibility and benefit calculation. In addition, some spreading of earnings should be possible in case a SEP does not contribute during a month of leave, for example. Finally, for persons with irregular earnings, there should be a possibility to establish insured earnings at a higher level for certain weeks within a month, instead of systematically imposing a uniform weekly average of the registered monthly earnings. The general idea here is to treat SEP in a manner similar to treatment offered to salaried workers.

- **Dual status**. In cases where a person has contributed both as salaried and as self-employed, the document mentions that benefits shall be paid according to the system (salaried or self-employed) to which the person has contributed at the time of qualifications for the benefit. However, it would be important that a SEP do not loose eligibility to certain benefits just because of a change in insured status.

- **Independent financing objectives for the SEP system**. The document suggests a financing of SEP benefits independent of the financing of the system for salaried workers and the monitoring of a funding objective for the SEP system. It is understood here that the follow-up of reserve ratios for the SEP system will be made in a manner similar to the methods applied to the system for salaried workers.

- **Effect of the contribution subsidy on cost of the Senior Citizens Pension**. While in theory the participation of SEP to the NIBTT would bring a reduction of the cost of the Senior Citizens Pension (SCP), it must be acknowledged that the existence of the SCP itself (and its coordination with the NIBTT pension) is a deterrent to the participation of self-employed persons to the NIS. Hence the expected cost savings on the SCP may not materialize.

- **Establishment of a sinking fund for managing Government transfers for the co-payment of SEP contributions**. The concept is interesting, but the precise objectives and operations of that fund need to be specified before deciding on its utility.

- **Representation at the NIBTT Board**. The document suggests that SEP would be adequately represented on the Board either through Labour representatives (for own account workers) or through Business representatives (for employers). This

does not appear sufficient because there is no assurance that either of these groups will adequately represent SEP. There should be at least one member of the NIBTT Board having the SEP status.

- **Late claims**. The document suggests a delay for submitting a claim for the different benefits. While such a delay is justified for most benefits, in case of death, it appears difficult to justify precluding access to survivors' benefits just because of late claim, in a situation where the effect of the contingency (the death of the person) is easy to confirm and is not debatable.

7. Conversion from an earnings class system to a system based on percentage of earnings

It is the intention to move from the present earnings class system to a career average re-valued earnings formula for the calculation of pensions based on percentage of earnings. The change would affect the calculation of both contributions and benefits, and would apply to the three benefit branches.

This section presents different formulas for the calculation of benefits (based on the career average re-valued earnings formulas), with the financial implications of each formula. It comments on advantages and disadvantages of each one and outlines factors to be considered in the choice of an appropriate formula, taking into account the existence of the minimum pension. Advice is also provided on possible approaches to recognize the accrued rights (before the reform) of the present insured population, with a view to operate a smooth transition between the old and the new system. Conversion tables are recommended for rights accrued before the reform of the pension formula, as well as precise methods for the calculation of the different benefits. Finally, guidance is provided regarding the necessary legislative changes.

7.1 Objectives of a new pension formula

In reviewing the NIS pension formula, the following objectives should be pursued:

1. The reform should simplify the administration.
2. It should be cost neutral. The adoption of a new formula should not result in significant additional costs to the contributors to the scheme.
3. There should be some form of equivalence between the old and the new formulas that would continue to exist in the long term. However, it is not necessary that the new formula exactly reproduces the replacement rates of the present system. The adopted formula should ensure that the NIS pension is pertinent and equitable.
4. The formula should encourage participation to the NIS by providing higher benefits to persons with longer contribution histories.
5. One objective may be to perform a redistribution in favour of persons with lower earnings and to reduce the importance of the minimum pension.

The choice of a new pension formula should also consider the following:

- Attention should be focused on earnings classes V and above because the minimum pension will not be suddenly abolished and will continue to take care of persons in the lowest earnings classes. It may however represent an opportunity to question the payment of the minimum pension to retirees between the ages of 60 and 65.
- Even if the present eligibility condition for the retirement pension is to have contributed for a minimum of 15 years, the formula should allow the possibility to pay pensions to persons with less than 15 years of contribution (without paying them the full minimum pension).

7.2 Description of three possible formulas, with pros and cons

The pension rate selected will depend on (1) the replacement rate desirable for those with a full career, (2) the weight to be placed on the earlier years of the career versus later years and (3) the weight to be placed on low versus high earnings. Three formulas are considered.

Formula 1 – Reproduction of the present pension formula

Example: 2% for the first 15 years of contribution, plus 1.1% for each year over 15

- This formula reproduces precisely the present formula for the earnings classes V and above.
- It puts more weight on the first 15 years of contribution and may thus discourage workers to continue contributing after 15 years.
- It represents the formula that meets directly the objective of reducing the administration burden inherent in the present earnings class system without trying to reach any objective of redistribution of income or further simplification of the formula itself.
- With this formula, there is a need to maintain the minimum pension for the lowest earnings classes. However, with a partial indexing of the minimum pension (lower than CPI), the relative importance of the minimum pension (compared to emerging new pensions) would decrease over time.

Formula 2 – Fixed-rate per year of contribution

Example: 1.6% per year

- This represents a formula aiming directly at simplifying the pension formula. The single accrual rate applicable to all years of contribution is easy to understand and to communicate.
- It is more advantageous than the present formula for persons with long contribution histories, but less advantageous for shorter careers. Such a formula would encourage participation to the NIS.
- With this formula, there is a need to maintain the minimum pension for the lowest earnings classes. However, with a partial indexing of the minimum pension (lower than CPI), the relative importance of the minimum pension (compared to emerging new pensions) would decrease over time.

Formula 3 – Redistributive formula putting more weight on low earnings

Example: 1.8% per year for earnings below 50% of the MIE, plus 1.2% per year for earnings above 50% of the MIE

- This formula provides approximately the same replacement rate as Formula 2 for persons with earnings of 75 percent of the MIE and above, but is more generous for persons with low earnings.
- The formula would accomplish income redistribution by weighting the pension in favour of persons with low earnings. Among the three formulas, it is the most generous for persons with low earnings and a long period of

contribution. Furthermore, it is the one that is closer to the present formula for persons with low earnings.

- This is the most appropriate formula in the context of an eventual elimination of the minimum pension.

Appendix 7 presents a comparison of pension amounts (for different earnings classes and for periods of contribution of 15, 25 and 35 years) resulting from the application of the three contemplated formulas.

Illustration

Under all three formulas, contributions made each year would be taken into account and equal weight would be given to the earnings of each year, with older earnings re-valued (or indexed) to bring them to a current value. The proposed method would be applied as follows:

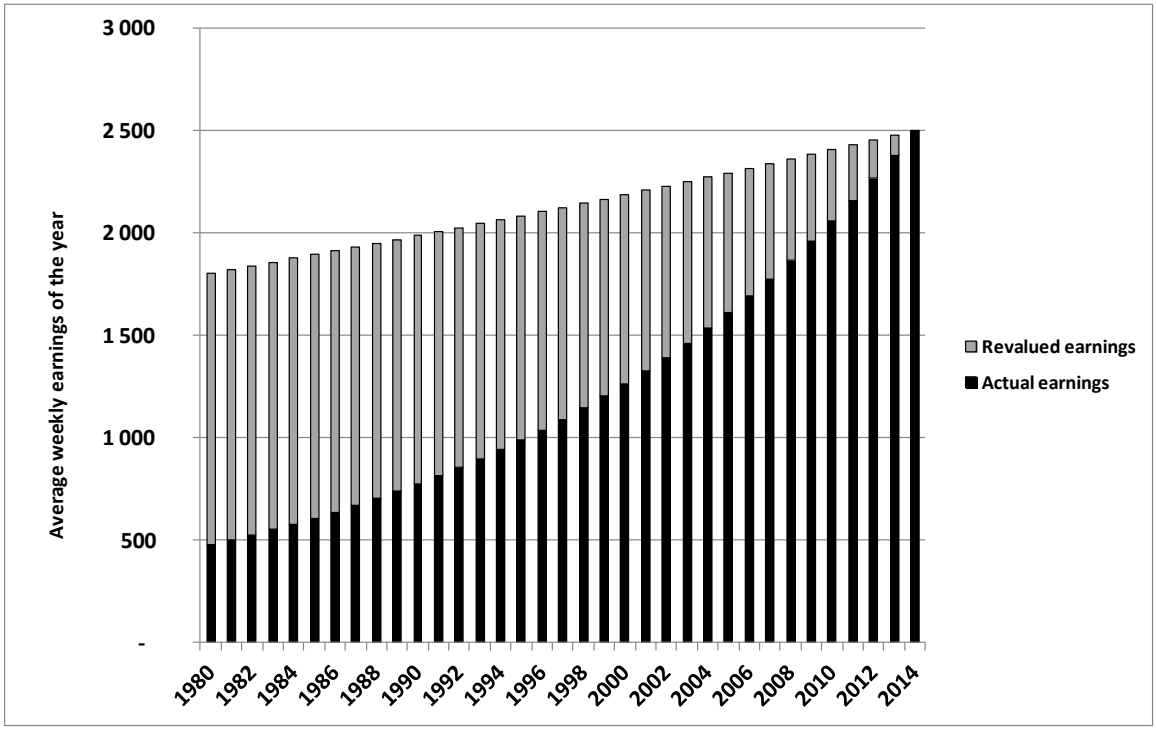
1. obtain the amount of insured earnings for each contribution week and the number of weeks of contribution;
2. using a cumulative index, adjust each insured earnings so that it is revalued to current dollars;
3. calculate the average weekly revalued earnings by dividing the total revalued earnings by the number of weeks of contribution;
4. apply the pension rate (according to the chosen formula) to the average revalued earnings and the period of contribution.

An example is presented hereunder for the application of the career average re-valued earnings to the three formulas described above.

Suppose that the person has contributed to the NIS for 35 years (from 1980 to 2014) and had average insurable earnings of TT$2,500 per week in 2014. During the career, it is supposed that the earnings of the insured person have increased at a rate of 5 percent per year, while the inflation rate was 4 percent per year.

The first step consists in adjusting past insurable earnings of the person. Chart 7.1 illustrates how past earnings would be adjusted in order to give them a 2014 value. To operate this revaluation, all weekly earnings of the career of the individual are multiplied by a cumulative price index for the period between the year these earnings were recorded and the year the pension becomes payable.

Chart 7.1 New pension formula – Revaluation of past earnings



The second step is the calculation of career average re-valued earnings. The sum of weekly re-valued earnings of the whole career is divided by the total number of weeks of contribution. In our example, the average career weekly earnings is equal to TT$2,135.

The third step is the application of the pension rate to the average re-valued earnings and the period of contribution, in accordance with the chosen formula.

- Under Formula #1, the weekly pension is equal to 2.0% of average career weekly earnings for the first 15 years and 1.1% for years over 15:

  [(780 weeks of contribution X 2.0%) + (1,040 weeks of contribution X 1.1%)] X $2,135 / 52 = **$1,110**

- Under Formula #2, the weekly pension is equal to 1.6% of average career weekly earnings per year of contribution:

  1,820 weeks of contribution X 1.6% X $2,135 / 52 = **$1,195**

- Under Formula #3, the weekly pension is equal to 1.8% of average career weekly earnings below $1,385 plus 1.2% of earnings above $1,385, multiplied by the number of weeks of contribution, divided by 52:

  (1,820 weeks of contribution) X [(1.8% X $1,385) + (1.2% X $750)] / 52 = **$1,187**

Application to all benefits

The preceding example focused on the retirement pension, but the new formula would also apply to invalidity and survivors' pensions with the same general approach.

It must be recalled that the present formula includes a basic pension amount corresponding to the first 750 contribution weeks and increments for contribution weeks above 750. Hence the calculation of all pensions under the new formula should use, as a minimum, a contribution period of 750 weeks to ensure that no one is penalized with the application of the new formula.

For Short-term and Employment injury benefits, since benefits are determined with reference to earnings registered over a recent period, the change from the earnings class system to benefits determined as a percentage of earnings can be effected easily.

Impact of new pension formulas on individuals

Appendix 8 presents detailed information on the difference between retirement pensions calculated under the present formula and under the three alternative formulas. The comparison is expressed as the replacement rate under the new formula minus the replacement rate under the present formula. It is presented for different earnings classes and for different periods of contribution, with and without the application of the minimum pension.

It shows that if we consider the minimum pension, very few cases would be affected negatively by any of the three alternative formulas, especially if the number of years of contribution is high.

If the minimum pension is not considered, figures shown in Appendix 8 can be interpreted as the impact that the different pension formulas will have in the long term. In that case:

- Formula 1 is quite neutral for earnings classes V and above when the person has more than 15 years of contribution.
- Formula 2 is generally less generous than the present formula when the minimum pension is not considered. It becomes advantageous only if the number of years of contribution is higher than 27 years.
- Formula 3 is less generous than the present formula if the number of years of service is less than 20 and generally more generous for earnings classes V to XII after 20 years of contribution.

It can thus be said that Formula 1 would be quite neutral for most NIBTT insured persons, but that Formulas 2 and 3 would be slightly less generous than the present formula if the minimum pension is not considered (long-term effect).

7.3 Recognition of accrued rights and transition to the new system

This section presents a practical approach for the treatment of rights accrued prior to the application of the new pension formula, the way prior rights would be recognized under the new formula and the transition between the present and the new system. The following method is recommended because it would operate a smooth transition between the old and the new system, it is simple to apply and it ensures equity between different cohorts of NIS contributors. It appears as a valuable approach for treating past accrued rights, but the NIBTT should test its feasibility and applicability to its systems and databases, and proceed with adjustments if necessary.

The method takes into account the following operational changes that will take place from the implementation date:

- Employers will report amounts of earnings instead of earnings classes;

- The adjustment of earnings will be done through an index (e.g. CPI) instead of being done through the application of earnings class conversion tables.

In addition, the following principles would be applied to the treatment of earnings recorded before the implementation date:

- Since the tables used for conversion of the earnings classes before 3 May 1999 did not follow the evolution of general economic variables (inflation, general wage increase), the conversion tables applied before 3 May 1999 should continue to be used for insured persons who have most of their insurance period before that date;

- Since earnings classes conversion tables have been updated on a basis close to inflation since 3 May 1999, the new formula (i.e. without reference to the earnings class system) should be applied on the earnings of the whole career for persons who have most of their insurance period after that date.

Accordingly, the recognition of accrued rights before the implementation of the new system would be done under different methods for different cohorts of insured, as follows:

- **Group 1: Persons aged less than 18 on 3 May 1999 (aged less than 35 in May 2016)**. The annual accrual rate of the new formula is applied to the entire contribution period (pre and post reform). All career earnings are indexed to the date of calculation of the pension and the new pension formula is applied directly to the adjusted career earnings. This requires to calculate and record, for each individual of this cohort, the amount of earnings (instead of the earnings class) for each contribution period before the implementation date.

- **Group 2: Persons aged 18 to 33 on 3 May 1999 (aged 35 to 50 in May 2016)**. For the period before the implementation date, "average earnings before implementation" are calculated by using the earnings classes conversion tables in use for the appropriate past periods. From the implementation date, these past average earnings are indexed to the date of

calculation of the pension and added to the indexed earnings registered after the implementation date. The new pension formula is then applied directly to the total indexed career earnings. The NIBTT could proceed with an ad hoc operation, soon after the implementation date, to establish the period of contribution and the average earnings of all insured persons in this category so that conversion tables do not have to be used thereafter.

- **Group 3: Persons aged more than 33 on 3 May 1999 (aged more than 50 in May 2016)**. These persons are close to retirement and have less time to adapt to the change of the pension calculation method. Hence the method should aim at calculating a pension which is as close as possible to the one these people are expecting from the present law. For this group, the method would consist in freezing the dollar amount of the accrued pension at the date of introduction of the reform and to index that amount annually with reference to the specified index. The pension amount at date of implementation would be calculated on the basis of the historical earnings classes conversion tables. This pension amount would be indexed until the date a pension become payable. Thus the new formula would apply only to service accomplished after the reform date.

  The preservation of the exact accrued pension (in dollars) ensures that the new rules will apply only to the part of the pension associated with contributions paid after the reform date. This would limit the impact on persons who will claim their retirement pension shortly after the reform date.

  It will also be necessary to define rules applicable to persons who do not meet the criteria of 15 years of contribution at the reform date. Their rights could be treated, for example, as it is suggested for Group 2.

If the computation of "average earnings before implementation" using the earnings classes conversion tables can be accomplished easily by NIBTT, then it could be possible to consider combining Group 1 and Group 2 (all persons aged 50 or less on 1 January 2017) and apply to them the method described for Group 2.

We must also take into account the existence of a generous minimum pension that cannot simply be abolished by reason of the introduction of a new pension formula. Our simulations have shown that because of the presence of this minimum pension, very few persons would be affected negatively by the application of the new pension formula, for any of the three formulas presented. However, some cases would be negatively affected with Formulas 2 and 3. In that context, it would be possible, at least for a certain period, to undertake two calculations of the pension amount of new pensioners (one based on the old formula and one based on the new formula) and to grant to the person the highest of the two pensions.

7.4 Financial implications

Table 7.1 presents cost implications for the three options presented above. It must be noted that Formula 1 has a cost which is equivalent to the present system and very few people would be affected by the new formula applied to the total service of the individuals. Therefore, in the case of Formula 1, there would be no need to compare,

for new pensioners, the pension amount calculated under the old and the new formula and to grant the higher of the two. We expect no losers under Formula 1.

The case is different under Formulas 2 and 3, as demonstrated by the fact that the cost of these options, when comparing the situation with and without the floor benefit (benefit calculated under old rules), is significantly different. Formulas 2 and 3 would make it more difficult to reach the objective of a cost neutral conversion to the new pension formula.

Table 7.1 New pension formula – Comparison of costs (salaried workers)

	GAP related to pension benefits
Base scenario (status quo)	22.32%
Formula 1	
– Without floor benefit	22.26%
– With floor benefit equal to present provisions	22.32%
Formula 2	
– Without floor benefit	22.23%
– With floor benefit equal to present provisions	22.46%
Formula 3	
– Without floor benefit	22.66%
– With floor benefit equal to present provisions	22.96%
– New formula for future only (Formula 1 for past service)	23.27%

Another useful information is the comparison of the cost of the different options when the minimum pension is not considered. This gives a better idea of the real equivalence of formulas in the long-term. If the minimum pension is not considered, the GAP related to long-term benefits is 18.0% under the present provisions. This may be compared to:

– 17.7 percent under Formula 1;
– 17.6 percent under Formula 2;
– 18.5 percent under Formula 3.

This shows that Formulas 1 and 2 are almost equivalent to the present provisions, while the application of Formula 3 would slightly increase the cost.

Table 7.2 presents the cost implications of applying the new pension formulas to self-employed persons. Since coverage of this group is only for future service (with no need to recognize past service), there are no cost implications when comparing the present to the new formula. Hence, for the SEP, no formula would lead to a cost higher than the base scenario.

Table 7.2 New pension formula – Comparison of costs (self-employed persons)

	GAP related to pension benefits
Base scenario	11.04%
Option 1 (2% for first 15 years and 1.1% after 15 years)	11.01%
Option 2 (1.6% per year)	10.55%
Option 3 (1.8% below TT$4,150 and 1.2% above TT$4,150)	10.72%

7.5 Criteria for selection

Table 7.3 presents a comparison of the three options on the basis of the most significant criteria for the selection of an appropriate formula.

Table 7.3 New pension formula – Criteria for selection

	Formula 1	Formula 2	Formula 3
Simplified administration	√	√	√ [1]
Cost neutrality	√	√ [2]	√ [2]
Maintenance of the equivalence of the old and new formulas in the long-term	√		
Encouragement to participate to the NIS (rewarding long contribution histories)		√	√
Redistribution in favour of persons with low earnings (reduction of the importance of the minimum pension)			√

[1] Formula 3 considers two wage bands. This may require more administrative treatment than Formulas 1 and 2.

[2] Given that Formulas 2 and 3 may affect negatively certain persons (and thus require a measure to guarantee a floor of benefit), a small cost could be associated with the conversion.

Recommendation

Among the three alternative pension formulas presented in the report, it is recommended to adopt Formula 3 which would effect a certain redistribution in favour of persons with low earnings (thus reducing the importance of the minimum pension in the longer term) and would encourage participation to the NIS by rewarding long contribution histories.

7.6 Steps for implementation

The implementation of a new pension formula will require different actions:

- **Agreement of the different stakeholders**. There will be a need to consult the different stakeholders (workers and employers associations) on the proposed modification, to obtain a decision of the Board of Directors of the NIBTT on the final direction and timetable for the change and to obtain an agreement in principle at the government level.

- **Institutional adjustments**. The database recording monthly earnings for each insured persons will have to be modified in order to include the information required for the application of the new formula. Personnel will have to be trained on the calculation of new pensions.

  In addition, as mentioned previously concerning the recognition of past accrued rights, the NIBTT should proceed with an ad hoc operation, soon after the implementation date, to establish the period of contribution and the average past earnings for the group of insured persons aged less than 50 (using earnings class conversion tables). Also, pension amounts as of the implementation date will have to be calculated for persons aged 50 and over (so that they can be easily indexed thereafter).

- **Establishment of the legal and regulatory framework**. The new pension formula will have to be codified in a new law. In particular, the law will need to specify the treatment of old and new pensioners and the recognition of accrued rights under the previous system.

- **Communications**. The communication plan will be very important. For workers, there will be a need to announce the modifications a certain period in advance, especially for those who will retire shortly after the modification, and to reassure them about the protection of their past accrued rights. For employers, communication will focus on the advantages of simplifying procedures for the calculation of contributions.

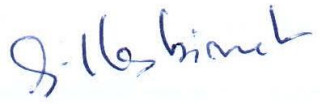
8. Actuarial opinion

In our opinion,

- the data upon which the report is based are sufficient and reliable;
- the assumptions used for the report are reasonable and appropriate both in the aggregate and individually; and
- the methodology employed is appropriate and consistent with accepted actuarial practice.

This report and the opinions given have been prepared in accordance with the internationally accepted actuarial practice as provided by the International Standard of Actuarial Practice 2 – Financial Analysis of Social Security Programs of the International Actuarial Association.

Pierre Plamondon, FCIA, FSA



Gilles Binet, FCIA, FSA

Doan-Trang Phan, ACIA, ASA

Conclusion

The actuarial review has shown that the financial situation of the NIS has significantly deteriorated over the three-year period from 1 July 2010 to 30 June 2013. The general average premium of the scheme has increased from 17.6 to 23.8 per cent between the two valuations. On that account, major actions must be undertaken in order to restore the financial health of the system. Three series of measures are recommended in the report to reach that goal:

Minimum pension. The NIS minimum pension is too generous. It is recommended to freeze the minimum pension for 2015 and 2016 and, starting in 2017, to index the minimum pension at 50 per cent of the inflation rate, in order to gradually reduce its importance over time. Full indexation could be applied only once the partial indexation will have taken back the level of minimum pension at an appropriate percentage of the minimum wage.

Retirement age. There is a demographic pressure on the NIS because of the increase of life expectancy. It is recommended to gradually increase the retirement age for an unreduced pension, starting in 2025, so that it reaches age 65 in 2060.

Contribution rate. The present contribution rate is clearly insufficient to finance the NIS in the long term. It is recommended to increase the contribution rate and to introduce in the National Insurance Act an automatic mechanism for periodically adjusting the contribution rate on the basis of periodic actuarial reviews.

It will be necessary to engage all stakeholders into a national dialogue on the future of the retirement system. In particular, the role of the Senior Citizens Pension must be reassessed and its parameters must be established in a manner that ensures harmonization with the other components of the Trinidad and Tobago's pension system, namely the NIS minimum pension. It is also necessary to discuss the relevance of increasing the retirement age for the NIS and for the civil service pension scheme.

Appendix 1 Overview of the legal provisions of the National Insurance System

This appendix provides a general overview of the key coverage, contribution and benefit provisions of the National Insurance System (NIS) as of 30 June 2013.

A1.1 Contingencies covered

These funds provide for the following benefits:

- *Long-term benefits:* Retirement pension, Invalidity pension and Survivors' pension
- *Short-term benefits:* Sickness benefit, Maternity benefit, Maternity grant and Funeral grant
- *Employment injury benefits:* Injury allowance, Disablement pension, Disablement grant, Death benefit and Medical expenses

Section 43 of the National Insurance Act establishes three funds:

- Long-term fund
- Short-term fund
- Employment injury fund

These funds are operated and managed by the National Insurance Board of Trinidad and Tobago for the purpose of providing monies required for the payment of benefits. The funds are credited with contributions paid by employers, employed people and voluntary contributors.

A1.2 Coverage

The NIS covers all employed people aged 16 to 64 who are in insurable employment. Insurable employment means any employment that is not explicitly excluded according to Section 29(2) of the National Insurance Act. Insurable employment excludes:

- People who earn less than TT$150 per week (TT$180 from 3 March 2014). However, a person who was employed on 29 February 2004 and continues in such employment on and after 1 March 2004 and earns less than TT$120 per week is regarded as an employed person or insured person for the purposes of the Act and such employed person pays contributions as specified in Class I.
- People employed by international organizations that are granted specific exemptions.

Employed people under the age of 16 or over the retirement age (i.e. age 65 or 60-64 if the person ceases to be engaged in insurable employment), and unpaid apprentices are covered only for employment injury benefits.

People under the age 60 who cease to be in insurable employment may elect to become voluntary contributors. Voluntary contributors may qualify only for retirement benefits, survivors' benefits and funeral grants.

A1.3 Maximum insurable earnings

On 30 June 2013, earnings covered for the purpose of determining contributions and benefits are limited to TT$2,308 per week or TT$10,000 per month (increased to TT$2,770 per week or TT$12,000 per month on 3 March 2014).

A1.4 Financing

Contributions payable by employers and employed people are based on the earnings class of the insured person. Total contributions on behalf of an employed person represent 11.7 percent of average weekly insurable earnings (the contribution rate was increased to 12.0 percent from 3 March 2014). Contributions are shared between employer and employee in a proportion of 2 to 1. For voluntary contributions, the earnings class is determined with reference to the average weekly insurable earnings of the person over the two-year period preceding the application for voluntary contribution. The earnings classes and respective contribution rates in application on 30 June 2013 are set out in Table A1.1.

Income from contributions is allocated to the three benefit funds according to the following proportions:

- Long-term fund: 89 per cent
- Short-term fund: 6 per cent
- Employment injury fund: 5 per cent

Reserves held for each fund are established as follows:

- The Short-term fund is maintained at 2 times the annual benefit expenditure;
- The Employment injury fund is maintained at 10 times the annual benefit expenditure;
- The remaining excess of income over expenditure is allocated to the Long-term fund.

Table A1.1 Earnings classes and contributions in application on 30 June 2013 (based on a contribution rate of 11.7%)

Earnings classes	Weekly earnings	Monthly earnings	Assumed weekly earnings	Weekly contribution		Total weekly contributions	Class Z weekly contribution
				Employee	Employer		
I	150.00 – 249.99	650.00 – 1,082.99	200.00	7.80	15.60	23.40	1.17
II	250.00 – 329.99	1,083.00 – 1,429.99	290.00	11.31	22.62	33.93	1.70
III	330.00 – 449.99	1,430.00 – 1,949.99	390.00	15.21	30.42	45.63	2.28
IV	450.00 – 559.99	1,950.00 – 2,426.99	505.00	19.70	39.39	59.09	2.95
V	560.00 – 679.99	2,427.00 – 2,946.99	620.00	24.18	48.36	72.54	3.63
VI	680.00 – 819.99	2,947.00 – 3,552.99	750.00	29.25	58.50	87.75	4.39
VII	820.00 – 959.99	3,553.00 – 4,159.99	890.00	34.71	69.42	104.13	5.21
VIII	960.00 – 1,099.99	4,160.00 – 4,766.99	1,030.00	40.17	80.34	120.51	6.03
IX	1,100.00 – 1,259.99	4,767.00 – 5,459.99	1,180.00	46.02	92.04	138.06	6.90
X	1,260.00 – 1,409.99	5,460.00 – 6,109.99	1,335.00	52.07	104.13	156.20	7.81
XI	1,410.00 – 1,569.99	6,110.00 – 6,802.99	1,490.00	58.11	116.22	174.33	8.72
XII	1,570.00 – 1,749.99	6,803.00 – 7,582.99	1,660.00	64.74	129.48	194.22	9.71
XIII	1,750.00 – 1,929.99	7,583.00 – 8,362.99	1,840.00	71.76	143.52	215.28	10.76
XIV	1,930.00 – 2,149.99	8,363.00 – 9,316.99	2,040.00	79.56	159.12	238.68	11.93
XV	2,150.00 – 2,307.99	9,317.00 – 9,999.99	2,229.00	86.93	173.85	260.78	13.04
XVI	2,308.00 and over	10,000.00 and over	2,308.00	90.01	180.02	270.03	13.50

Contributions payable by an employer in respect of employment injury coverage for an employed person who has not yet attained the age of 16 years, who is in receipt of a retirement pension or who has attained the age of 65 are as set out in Class Z of the above table. For unpaid apprentices, the contribution is TT$1.00 per week.

A1.5 Benefit provisions

A1.5.1 Long-term benefits

Retirement pension

Contribution requirement: 750 weeks of contributions paid or credited.

Age requirement: Age 60 or over and retired from the workforce, or age 65 and over regardless of whether or not the person is retired.

Amount of benefit: 30% to 48% of average weekly earnings over the whole period for which contributions are paid or credited, based on the 16 earnings classes, plus 0.56% to 0.71% of average weekly earnings for each 25-week period of contributions (not including age credits) exceeding 750.

Minimum basic pension: TT$3,000 per month.

Retirement grant

Contribution requirement: Less than 750 weeks of contributions paid or credited.

Eligibility: The person is ineligible for the retirement pension.

Age requirement: Same as retirement pension.

Amount of benefit: Three times total employee and employer contributions. Min.: TT$3000

Invalidity pension

Eligibility: The insured people must have met certain contribution requirements, be aged less than 60, suffers from an incapacity not caused by employment and have medical certification that the person is likely to remain incapable of work for a period of at least 12 months.

Amount of benefit: Same as retirement pension, but not subject to the minimum pension.

Duration of pension: Payable until age of 60 (or until recovery from invalidity) and then converted to a retirement pension of the same amount whether or not 750 weeks of contributions have been paid or credited.

Survivors' pension

Eligibility: Deceased insured less than age 60, or receiving a retirement pension, or aged 60 or over entitled to receive a retirement pension as at date of death. Benefit not paid where the deceased insured would have been entitled to a Retirement grant. Death not caused by employment. A minimum of 50 weeks of contributions paid.

- Widow or widower: legal or common law spouse.
- Child: less than age 19, including an unborn child. In the case of an orphan, when only one of the deceased parents was an insured, this orphan is considered as a child.
- Orphan: less than age 19.
- Parent: wholly or mainly maintained by deceased insured.

Amount of benefit: Proportion of retirement or invalidity pension, to which the spouse/child/orphan/parent was entitled, as follows:

- Widow/widower: 60 per cent (min.: TT$600 per month)
- Child: 30 per cent (min.: TT$600 per month)
- Orphan: 60 per cent (min.: TT$1,200 per month)
- Parents: 30 per cent (min.: TT$600 per month to be shared between the two parents if both alive). If one parent dies, the surviving parent receives the total amount of dependent parents benefit.

Maximum family benefit: 100 per cent

Duration of benefit:

- Widow or widower: the pension is paid for life or until remarriage.
- Child/orphan: Payable up to age 19. If the child/orphan was mentally or physically disabled before age 19, the benefit is paid until the incapacity ceases.
- Parents: the pension is paid for life or until remarriage.

Remarriage grant

Eligibility: Payable at remarriage of widow or widower.

Amount of benefit: Lump-sum equal to 52 weeks of widow/widower pension.

A1.5.2 Short-term benefits

Sickness benefit

Contribution requirement: A minimum of 10 weekly contributions in the 13 weeks immediately preceding the week in which illness began.

Eligibility: The insured person must have been in insurable employment at the time of illness and is losing earnings. Illness not caused by employment.

Amount of benefit: 60 per cent of the insured average weekly earnings over the best 10 out of the 13 weeks immediately preceding the illness, based on the 12 earnings classes.
Min.: TT$144.00 per week.
Max.: TT$1,661.40 per week.

Waiting period: Three days.

Duration of benefit: Payable for a maximum of 52 weeks.

Maternity benefit

Contribution requirement: A minimum of 10 weekly contributions in the 13 weeks immediately preceding the sixth week before the expected week of confinement.

Eligibility: The insured woman is not in insurable employment during the period of leave and pregnant for a minimum of 26 weeks or delivered a live child as certified by a medical practitioner. The benefit is not dependent upon loss of earnings.

Amount of Benefit: 60% of the insured average weekly earnings over the best 10 out of the 13 weeks immediately preceding the illness, based on the 12 earnings classes.
Min.: TT$ 120.00 per week (increased to TT$144.00 in March 2014).
Max.: TT$1,384.80 per week (increased to TT$1,662.00 in March 2014).

Duration of benefit: Payable for a maximum of 13 weeks.

Maternity grant

Eligibility: A woman who satisfies the contribution requirement for maternity benefit. Where the mother does not qualify in her own right, based on father's contributions (then named Special maternity grant). Payable for each birth in case of multiple births. Paid in addition to maternity benefit.

Amount of benefit: TT$3,750.

Funeral grant

Eligibility: Death of an insured person. The deceased insured must have made a minimum of 25 contributions or was in receipt of employment injury benefit at the time of death or would have been entitled to receive employment injury benefit but for death.

Amount of benefit: TT$7,500.

A1.5.3 Employment injury benefits

Injury allowance

Eligibility: At least one contribution paid. Incapable of work as a result of an accident arising out of insured employment, or as a result of a prescribed disease. This includes employed insured persons who are under 16 or over 65 years. The benefit is not dependent upon loss of earnings.

Amount of benefit: 66⅔% of weekly earnings related to the contributions paid for the week during which the accident occurred or the disease was diagnosed.
Min.: TT$133.33 per week (increased to TT$160.26 in March 2014).
Max.: TT$1,538.67 per week (increased to TT$1,846.00 in March 2014.

Duration of benefit: Payable for a maximum of 52 weeks.

Disablement pension

Eligibility: At least one contribution paid. Disablement resulting from an accident at work or a prescribed disease and the insured person is certified to be at least 20 per cent disabled.

Amount of benefit: Percentage of the amount of employment injury allowance, proportional to the degree of disability.

Duration of benefit: After injury allowance has ceased, payable for life or until disablement ceases.

Disablement grant

Eligibility: At least one contribution paid. The insured person must be ineligible for disablement pension i.e. the insured person is certified to be less than 20 per cent disabled.

Amount of Benefit: A lump sum equal to the product of the degree of disablement (minimum of 3 per cent) times the number of weeks it is expected that the disablement will last (maximum of 365) times 50 per cent of the average weekly earnings that would be used for injury allowance.

Death benefit

Eligibility: At least one contribution paid. The death of an insured person in the course of insurable employment as a result of an accident or a prescribed disease.

Amount of Benefit: Pension payable to widow, a dependent widower, a child, an orphan and dependent parents subject to similar conditions as survivors' benefits. Death benefits are the same percentages of injury allowance as survivors' benefits are of the retirement pension.

Medical expenses

Eligibility: An insured person who incurs the cost of medical treatment for the personal injury or prescribed industrial disease arising out of insured employment.

Expenses covered: Doctor's fees, drugs, private hospital, operations, attendance allowances.

Amount of benefit: Maximum of TT$28,125 per injury (increased to TT$33,750 on 3 March 2014).

A1.6 Benefit indexing

There is no automatic indexing of pensions in payment and benefit amounts. In practice, pensions in payment and benefit amounts are adjusted every three years, following the recommendations of the periodic actuarial review.

Appendix 2 Methodology of the actuarial valuation

This actuarial review makes use of the 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 systems. These modelling tools include a population model, an economic model, a labour force model, a wage model, a long-term benefits model, a short-term benefits model and an employment injury model. The review has been undertaken using the version of the ILO models that were delivered to the NIBTT following the Eighth Actuarial Review of the NIS, and that the actuaries of the ENAP have adjusted to reflect the situation of the system as at 30 June 2013.

The actuarial valuation starts with a projection of the future demographic and economic environment of Trinidad and Tobago. Next, projection factors specifically related to the NIS are determined and used in combination with the demographic/economic framework.

A2.1 Modelling the demographic and economic environment

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 relate to the future rate of return on investments, the indexation of benefits and the adjustment of parameters like the maximum insurable earnings and the future level of flat-rate benefits.

The selection of projection assumptions takes into account the recent experience of the NIS to the extent this information was available. The assumptions are selected to reflect long-term trends rather than giving undue weight to recent experience.

General population

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

Economic growth

Increase of the productivity of labour, wage share of GDP and inflation rates are exogenous inputs to the economic model. The long-term GDP growth assumption is the result of assumptions on the future evolution of the labour force, wage share of GDP and labour productivity.

Labour force, employment and insured population

The projection of the labour force, i.e. the number of persons available for work, is obtained by applying assumed labour force participation rates to the projected number of persons in the general population. Employment rates are assumed for the

future and unemployment is calculated as the difference between labour force and employment. This exercise is performed separately for salaried and self-employed persons.

The model assumes movement of participants between the groups of active and inactive insured persons.

Wages

Based on an allocation of total GDP to capital income and to labour income, a starting average wage is calculated by dividing the wage share of GDP by the total number of employed persons.

In the medium term, real wage development is checked against the labour productivity growth. In specific labour market situations, wages might grow at a pace faster or slower than productivity. However, due to the long-term perspective of the present review, 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.

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. Assumptions on the differentiation of wages by age and sex are established, as well as assumptions on the dispersion of wages between income groups.

A2.2 Modelling the financial development of the NIS

The present actuarial review addresses all revenue and expenditure items of the NIS. The most important components of this budget concern long-term (pension) benefits. This section focuses on them.

For Short-term benefits, income and expenditures are projected using simple projection methods based on recent experience. For Employment injury benefits, income and expenditures are projected using a model specifically developed by the ILO for that branch.

Projections for pensions are done for each sex separately. Groups of insured are separated between salaried and self-employed persons.

Purpose of pension projections

The purpose of the pension model is twofold. First, it is used to assess the financial viability of the Long-term benefits branch. This refers to the measure of the long-term balance between income and expenditure of the system. In case of 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 pension model is used to develop long-term projections of expenditures and insurable earnings under the system, for the purpose of:

- assessing the options to build up a contingency or a technical reserve;
- proposing schedules of contribution rates consistent with the funding objective;
- testing how the system reacts to changing economic and demographic conditions.

Pension data and assumptions

Pension projections require the demographic and macro-economic frame already described and, in addition, a set of assumptions specific to the NIS.

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

System-specific assumptions such as the disability incidence rates and the distribution of retirement by age are determined with reference to the system provisions and the historical experience under the system.

The projection of the annual investment income requires information on the existing assets on the valuation date. A rate of return assumption is formulated on the basis of the nature of the system's assets, the past performance of the Fund, the system's investment policy and assumptions on future economic growth and wage development.

Pension projection approach

Pension projections are performed following a year-by-year cohort methodology. The existing population is aged and gradually replaced by the successive cohorts of participants on an annual basis according to the demographic and coverage assumptions. The projection of insurable earnings and benefit expenditures are then performed according to the economic assumptions and the system'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 system extends over the whole adult life, either as contributor or beneficiary, i.e. up to 70 years for someone entering the system at the age of 16, retiring at the age of 65 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. The objective of pension projections is not to forecast the exact development of income and expenditures of the system, but to check its financial viability. This entails evaluating the system with regard to the relative balance between future revenue and expenditure.

Appendix 3 NIS specific data and assumptions

In addition to the demographic and economic assumptions presented in Section 2, the projection of the future financial development of the National Insurance System requires a database specific to the system (characteristics of insured persons and pensions in payment) and some particular actuarial assumptions.

A3.1 Data and assumption on the insured population

Number of insured persons

Data on the insured population were obtained from the NIBTT. The database includes a population of 499,563 insured persons who have contributed in 2012-13. In addition, to simulate the impact on the system of workers who have ceased participation but who have accumulated in the past a certain number of contribution credits, it has been assumed that the system counts 146,302 inactive insured persons. The number of inactive insured persons has been estimated from NIBTT data on persons who have already contributed to the NIS in the past, have not contributed to the system for a certain period and have not yet reached the retirement age. Those data were confronted with different simulations on the number of emerging retirement pensions which would result from the recognition of different numbers of inactive insured persons and a comparison with the retirement experience of recent years. The distribution of these insured populations, by age and sex, is shown in Table A3.1.

Table A3.1 Insured persons, by age and sex, in 2012-2013

Age	Active			Inactive		
	Male	Female	Total	Male	Female	Total
15-19	5,139	5,022	10,161	-	-	-
20-24	27,459	28,700	56,160	-	-	-
25-29	38,225	41,773	79,998	443	416	858
30-34	37,636	40,041	77,678	1,183	2,461	3,644
35-39	30,283	31,664	61,947	3,887	5,191	9,078
40-44	27,081	26,150	53,232	6,959	6,930	13,889
45-49	26,116	25,501	51,617	7,007	6,427	13,434
50-54	27,009	24,302	51,311	6,745	6,633	13,378
55-59	23,363	18,853	42,216	11,057	9,439	20,496
60-64	8,477	6,767	15,244	-	-	-
Total	**250,789**	**248,774**	**499,563**	**37,279**	**37,497**	**74,777**

The projection of the insured population is calculated by applying constant coverage rates (by age and sex) to the employed population as determined under the economic framework. Age-specific coverage rates are assumed constant for the whole

projection period. Coverage rates appearing in Table A3.2 are calculated as the ratio of insured persons to the labour force at the corresponding age. Certain coverage rates higher than 100% result from differences in methodologies used in the determination of NIS coverage rates and in the Labour Force Survey.

Table A3.2 NIS coverage rates, by age and sex (2013 and 2063)

Age	2013		2063	
	Male (%)	Female (%)	Male (%)	Female (%)
17	39	42	24	29
22	77	114	71	106
27	74	97	74	103
32	62	90	75	109
37	64	83	69	97
42	66	87	74	98
47	68	88	65	95
52	64	75	70	88
57	65	76	69	84
62	48	69	44	56
Total	**66**	**89**	**67**	**93**

Insurable earnings

Table A3.3 shows the average insurable earnings of active contributors in 2012-13 on a monthly basis, by age and sex. Average earnings of the insured population have been separated into three subgroups of earnings: the lowest 30 per cent, a medium range of 40 per cent and the highest 30 per cent, in order to capture the effect of the minimum pension.

Table A3.3 Average monthly insurable earnings of active contributors in 2012-13, by age and sex (TT$)

Age	Male	Female
15-19	2,647	2,395
20-24	4,234	3,563
25-29	5,901	5,168
30-34	6,517	5,680
35-39	6,776	5,827
40-44	6,873	5,691
45-49	6,756	5,404
50-54	6,760	5,410
55-59	6,668	5,480
60-64	6,363	4,946
Total	**6,224**	**5,212**

Density of contributions

Density of contribution represents the proportion of the year during which the average contributor pays contributions. Density factor by age and sex were obtained from the NIBTT. Sample density factors appear in Table A3.4.

Table A3.4 Density factors, by age and sex

Age	Male	Female
17	0.28	0.26
22	0.64	0.65
27	0.80	0.84
32	0.85	0.88
37	0.87	0.90
42	0.87	0.90
47	0.88	0.90
52	0.89	0.91
57	0.89	0.91
62	0.73	0.75
Total	**0.82**	**0.85**

Accrued past credits

A complete distribution of accrued past credits for the active and inactive insured populations was obtained from the administrative records of the NIBTT. Average data are shown in Table A3.5.

Table A3.5 Average past contribution years of insured persons, as of 30 June 2013, by age and sex

Age	Active insured persons		Inactive insured persons	
	Male	Female	Male	Female
17	1.2	1.2	1.2	1.2
22	2.6	2.6	2.6	2.6
27	5.4	5.4	5.4	5.4
32	8.2	8.1	8.2	8.1
37	10.4	10.0	10.4	10.0
42	12.6	11.4	12.6	11.4
47	15.3	13.2	15.3	13.2
52	19.6	16.4	19.6	16.4
57	23.6	19.5	23.6	19.5
62	25.5	21.5	25.5	21.5

A3.2 Demographic assumptions related to the system

Mortality of insured persons

Mortality rates for the insured population have been assumed to be equal to the mortality rates of the general population (sample mortality rates are presented in Table A3.6). Mortality rates are assumed to decline continuously during the projection period in line with the assumed increase of the average life expectancy. This mortality pattern is also used to project survivors' benefits payable on the death of insured persons or pensioners. For invalidity pensioners, it is assumed that mortality rates are equal to five times those of the general population at age 20 years, decreasing gradually to two times at age 60 years.

Table A3.6 Sample mortality rates (per 100), by age and sex

Age	Male		Female	
	2013	2063	2013	2063
0	1.463	1.352	0.209	0.692
5	0.030	0.031	0.010	0.018
10	0.033	0.023	0.003	0.007
15	0.070	0.018	0.045	0.011
20	0.190	0.076	0.121	0.050
25	0.307	0.092	0.197	0.069
30	0.302	0.116	0.196	0.085
35	0.317	0.166	0.200	0.109
40	0.357	0.207	0.247	0.143
45	0.455	0.296	0.326	0.195
50	0.631	0.392	0.471	0.271
55	0.903	0.574	0.693	0.381
60	1.356	0.820	1.071	0.536
65	2.089	1.310	1.673	0.819
70	3.060	1.980	2.459	1.195
75	4.805	3.038	4.147	2.007
80	7.501	4.884	6.694	3.181
85	11.319	8.397	10.432	6.504
90	18.291	12.928	17.377	10.622
95	26.386	19.404	25.745	16.812
100	100.000	100.000	100.000	100.000

Invalidity incidence

Invalidity incidence rates are based on the experience of the NIS. They are assumed constant for the whole projection period. The rates are shown in Table A3.7.

Table A3.7 Rates of entry into invalidity, by age and sex

Age	Male	Female
27	0.00012	0.00012
32	0.00024	0.00022
37	0.00049	0.00041
42	0.00098	0.00078
47	0.00196	0.00146
52	0.00393	0.00275
57	0.00787	0.00518

Retirement behaviour

The first possible age of retirement under the NIS system is 60 years. The actuarial model used for the present actuarial review considers retirement as the residual element of a series of factors. The macro-economic frame described in the previous chapter provides the number of people employed each year. For a given age (at which retirement is possible under the NIS), the difference between the number of insured in two consecutive years (for two consecutive years of age) is considered to be new retirees. Resulting retirement rates appear in Table A3.8. Consistency checks are performed to reproduce the retirement pattern observed under the system.

Table A3.8 Retirement rates, by age and sex

Age	Male	Female
60	0.50	0.43
61	0.34	0.40
62	0.20	0.23
63	0.25	0.28
64	0.23	0.23
65	1.00	1.00

Family structure

Information on the family structure of the insured 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 the spouses, the average number or children possibly eligible to an orphan's benefit and the average age of the orphans. Sample assumptions are shown in Table A3.9.

Table A3.9 Family statistics

Age	Male				Female			
	Probability of having an eligible spouse (%)	Average age of spouse	Average number of eligible children	Average age of children	Probability of having an eligible spouse (%)	Average age of spouse	Average number of eligible children	Average age of children
17	0%	17	-	-	5%	21	-	-
22	3%	21	0.16	2	13%	26	0.29	2
27	15%	25	0.57	4	20%	30	0.72	4
32	28%	29	0.90	6	28%	35	1.01	6
37	40%	34	1.05	8	34%	40	1.05	8
42	48%	38	0.99	9	38%	45	0.90	9
47	54%	42	0.79	11	39%	49	0.62	11
52	57%	46	0.53	13	37%	54	0.32	13
57	57%	51	0.27	15	32%	59	0.08	15
62	55%	55	0.12	15	26%	64	-	-
67	52%	59	0.05	15	19%	68	-	-
72	49%	63	0.02	15	13%	73	-	-
77	45%	68	-	-	8%	78	-	-
82	40%	72	-	-	5%	83	-	-
87	34%	76	-	-	4%	87	-	-

A3.3 Other assumptions

Indexing of system's parameters and pensions in payment

Maximum insurable earnings are increased to TT$13,600 on 29 February 2016 in line with the increase of the national average wage during the period from 1 July 2010 to 30 June 2013. From March 2017, the maximum insurable earnings is indexed annually in line with the increase of the national average wage observed three years earlier (because of the delay in the publication of CSO data).

Pensions in payment and fixed-parameters of the system (including the minimum retirement pension) are increased on 29 February 2016 by the same percentage of 13.5 percent. From March 2017, pensions in payment and fixed-parameters of the system are increased annually at a rate equal to the lesser of the increase of the CPI and the increase of national average wage observed three years earlier.

Administrative expenses

Administrative expenses are determined as the amount paid in 2012-13 increasing annually in line with the average of the wage increase and the inflation rate.

A3.4 Pensions in payment in June 2013

Table A3.10 Retirement pensions

Age	Male		Female		Total	
	Number	Average monthly pension	Number	Average monthly pension	Number	Average monthly pension
60-64	16,840	2,990	9,927	2,986	26,767	2,989
65-69	15,745	2,997	8,180	2,995	23,925	2,996
70-74	9,784	3,000	4,974	3,000	14,758	3,000
75-79	6,588	3,000	3,189	3,000	9,777	3,000
80-84	3,894	3,000	1,990	3,000	5,884	3,000
85-89	2,042	3,000	1,019	3,000	3,061	3,000
90-94	894	3,000	491	3,000	1,385	3,000
95 +	279	3,000	169	3,000	448	3,000
Total	**56,066**	**2,996**	**29,939**	**2,994**	**86,005**	**2,995**

Table A3.11 Widows and widowers' pensions (according to sex of dead spouse)

Age	Male		Female		Total	
	Number	Average monthly pension	Number	Average monthly pension	Number	Average monthly pension
20-24	-	-	1	0	1	0
25-29	145	938	7	914	152	937
30-34	239	955	31	731	270	930
35-39	419	889	61	937	480	895
40-44	667	834	80	827	747	833
45-49	1,257	802	113	796	1,370	802
50-54	2,017	811	190	848	2,207	814
55-59	2,758	803	237	858	2,995	807
60-64	2,797	757	205	875	3,002	765
65-69	3,746	698	202	806	3,948	703
70-74	3,597	644	141	759	3,738	649
75-79	3,637	617	103	703	3,740	619
80-84	2,789	602	80	656	2,869	604
85-89	1,782	596	54	615	1,836	596
90-94	774	592	18	607	792	592
95-99	243	584	7	660	250	586
Total	**26,867**	**699**	**1 530**	**804**	**28,397**	**705**

Table A3.12 Invalidity pensions

Age	Male		Female		Total	
	Number	Average monthly pension	Number	Average monthly pension	Number	Average monthly pension
20-24	-	-	1	967	1	967
25-29	16	1,583	10	1,093	26	1,395
30-34	48	1,450	39	1,282	87	1,375
35-39	81	1,285	60	1,168	141	1,235
40-44	135	1,293	89	1,105	224	1,218
45-49	326	1,216	192	1,057	518	1,157
50-54	670	1,213	418	1,078	1,088	1,161
55-59	1,249	1,182	617	1,075	1,866	1,147
60-64 *	270	901	117	799	387	870
Total	**2,795**	**1,181**	**1,543**	**1,063**	**4,338**	**1,139**

* Invalidity pensioners aged 60 and over (appearing in the database) are automatically transferred to the retirement pensioners' population for projection purposes.

Table A3.13 Children, orphans and parents pensions

Age	Number	Average monthly pension
0-4	392	516
5-9	1,476	507
10-14	2,425	505
15-19	3,584	499
20-24	56	491
25-29	48	512
30-34	35	500
35-39	34	561
40-44	28	547
45-49	42	523
50-54	88	497
55-59	91	464
60-64	71	417
65-69	132	350
70-74	141	347
75-79	139	339
80-84	71	351
85-89	36	337
90-94	15	325
95-99	5	280
Total	**8,909**	**493**

Appendix 4 Detailed NIS results (1 July 2010 to 30 June 2013)

This appendix presents a detailed reconciliation of financial and demographic data of the NIS over the period 1 July 2010 to 30 June 2013.

A4.1 Reconciliation of financial results

Internal accounting procedures allow for proper monitoring of experience and of the different financing methods, consistent with the fact that each type of benefits has its specific characteristics and funding objectives. Each branch is also expected to meet its expenditures from its own income and accumulated reserves.

Table A4.1 Long-term benefits fund (million TT$)

	2010-11	2011-12	2012-13
Fund at start of year	**17,668**	**20,622**	**21,666**
Contribution income	2,424	2,511	2,941
Investment income *	2,006	1,022	2,380
Miscellaneous income	21	55	-9
Transfer from Short-term and EI funds	153	142	47
Total revenue	**4,603**	**3,730**	**5,360**
Retirement pension	1,797	2,268	2,955
Retirement grant	71	56	90
Invalidity pension	47	45	51
Survivors' pension	184	191	233
Administration expenses	114	125	164
Total expenditure	**2,213**	**2,686**	**3,494**
Revenue - Expenditure	**2,390**	**1,044**	**1,866**
Fund at year-end	**20,057**	**21,666**	**23,532**

* Includes realized and unrealized gains and losses.

Table A4.2 Short-term benefits fund (million TT$)

	2010-11	2011-12	2012-13
Fund at start of year	**289**	**290**	**285**
Contribution income	163	169	198
Investment income *	18	9	16
Miscellaneous income	0	0	0
Transfer from Long-term fund	0	0	26
Total revenue	**182**	**179**	**239**
Sickness benefit	38	36	39
Maternity benefit	76	76	93
Special Maternity grant	2	2	2
Funeral grant	29	29	36
Administration expenses	8	8	11
Transfer to Long-term fund	29	32	0
Total expenditure	**181**	**184**	**182**
Revenue - Expenditure	**0**	**-5**	**58**
Fund at year-end	**290**	**285**	**342**

* Includes realized and unrealized gains and losses.

Table A4.3 Employment injury benefits fund (million TT$)

	2010-11	2011-12	2012-13
Fund at start of year	**517**	**513**	**509**
Contribution income	136	141	165
Investment income *	42	20	36
Miscellaneous income	0	1	0
Transfer from Long-term fund	0	0	0
Total revenue	**178**	**162**	**201**
Disablement benefit	32	32	34
Disablement grant	0	0	1
Injury allowance	13	12	14
Medical expenses	0	0	0
Survivors' benefits	7	7	8
Administration expenses	6	7	9
Transfer to Long-term fund	124	109	73
Total expenditure	**182**	**167**	**139**
Revenue - Expenditure	**-3**	**-5**	**62**
Fund at year-end	**513**	**509**	**570**

* Includes realized and unrealized gains and losses.

A4.2 Comparison of demographic data

Table A4.4 Comparison of expected and observed number of contributors and beneficiaries

	2010-11	2011-12	2012-13
	Expected		
Contributors	**491,278**	**494,956**	**497,958**
Retirement pensioners	77,575	80,917	84,061
Retirement grants	3,521	3,478	3,685
Survivor pensioners	31,659	32,361	33,128
Invalidity	4,236	4,431	4,619
Total Long-term	**116,990**	**116,990**	**121,187**
Sickness	12,009	12,158	12,294
Maternity benefits	6,738	6,814	6,869
Special maternity grants	781	790	796
Funeral grants	5,115	5,179	5,251
Total Short-term	**24,643**	**24,941**	**25,211**
Injury allowances	2,129	2,159	2,203
Medical expense payments	158	160	163
Disablement pensioners	3,226	3,391	3,556
Disablement grants	115	116	118
Death benefits	420	426	432
Total Employment injury	**6,047**	**6,252**	**6,472**
	Observed		
Contributors	**484,979**	**489,553**	**506,242**
Retirement pensioners	77,693	81,249	86,097
Retirement grants	4,353	2,872	4,100
Survivor pensioners	36,148	36,758	37,692
Invalidity	4,462	4,306	4,364
Total Long-term	**122,656**	**125,185**	**132,253**
Sickness	12,009	11,270	11,975
Maternity benefits	6,738	6,663	7,659
Special maternity grants	749	942	1,023
Funeral grants	5,865	5,811	6,243
Total Short-term	**25,361**	**24,686**	**26,900**
Injury allowances	1,729	1,604	1,751
Medical expenses payments	91	67	79
Disablement pensioners	3,185	3,140	3,092
Disablement grants	*	*	65
Death benefits	516	519	510
Total Employment injury	**5,521**	**5,330**	**5,497**
	Ratio observed / expected		
Contributors	**0.987**	**0.989**	**1.017**
Retirement pensioners	1.002	1.004	1.024
Retirement grants	1.236	0.826	1.113
Survivor pensioners	1.142	1.136	1.138
Invalidity	1.053	0.972	0.945
Total Long-term	**1.048**	**1.070**	**1.091**
Sickness	1.000	0.927	0.974
Maternity benefits	1.000	0.978	1.115
Special maternity grants	1.000	0.978	1.115
Funeral grants	1.147	1.122	1.189
Total Short-term	**1.029**	**0.990**	**1.067**
Injury allowances	0.812	0.743	0.795
Medical expenses payments	0.576	0.418	0.483
Disablement pensioners	0.953	0.895	0.859
Disablement grants	–	–	0.552
Death benefits	1.230	1.218	1.180
Total Employment injury	**0.913**	**0.853**	**0.849**

* Included in disablement pensioners.

Appendix 5 Recommended contribution and benefit schedules from 29 February 2016

Table A5.1 Earnings classes and contributions
(based on a contribution rate of 13.2 percent)

Earnings class	Weekly earnings	Monthly earnings	Assumed average weekly earnings	Employee weekly contribution	Employer weekly contribution	Class Z weekly contribution
I	200 - 340	867 - 1,473	270	11.90	23.80	1.79
II	340 - 450	1,473 - 1,950	395	17.40	34.80	2.61
III	450 - 610	1,950 - 2,643	530	23.30	46.60	3.50
IV	610 - 760	2,643 - 3,293	685	30.10	60.30	4.52
V	760 - 930	3,293 - 4,030	845	37.20	74.40	5.58
VI	930 - 1,120	4,030 - 4,853	1025	45.10	90.20	6.77
VII	1,120 - 1,300	4,853 - 5,633	1,210	53.20	106.50	7.98
VIII	1,300 - 1,490	5,633 - 6,457	1,395	61.40	122.80	9.21
IX	1,490 - 1,710	6,457 - 7,410	1,600	70.40	140.80	10.56
X	1,710 - 1,910	7,410 - 8,277	1,810	79.60	159.30	11.94
XI	1,910 - 2,140	8,277 - 9,273	2,025	89.10	178.20	13.37
XII	2,140 - 2,380	9,273 - 10,313	2,260	99.40	198.90	14.91
XIII	2,380 - 2,630	10,313 - 11,397	2,505	110.20	220.40	16.53
XIV	2,630 - 2,920	11,397 - 12,653	2,775	122.10	244.20	18.32
XV	2,920 - 3,138	12,653 - 13,600	3,029	133.30	266.60	20.00
XVI	3,138 and over	13,600 and over	3,138	138.10	276.10	20.72

Table A5.2 Basic retirement and invalidity pension rates

Earnings class	Basic pension (weekly)	Basic pension (monthly)
I	130.78	566.72
II	169.35	733.83
III	200.81	870.18
IV	233.32	1,011.07
V	261.95	1,135.12
VI	307.50	1,332.50
VII	363.00	1,573.00
VIII	418.50	1,813.50
IX	480.00	2,080.00
X	543.00	2,353.00
XI	607.50	2,632.50
XII	678.00	2,938.00
XIII	751.50	3,256.50
XIV	832.50	3,607.50
XV	908.77	3,938.00
XVI	941.40	4,079.40

Table A5.3 Increments for retirement and invalidity pensions

Earnings class	Increment (weekly)	Increment (monthly)
I	1.91	8.28
II	2.65	11.48
III	3.36	14.56
IV	4.10	17.77
V	4.82	20.89
VI	5.74	24.87
VII	6.78	29.38
VIII	7.81	33.84
IX	8.96	38.83
X	10.14	43.94
XI	11.34	49.14
XII	12.66	54.86
XIII	14.03	60.80
XIV	15.54	67.34
XV	16.96	73.49
XVI	17.57	76.14

Table A5.4 Basic survivors' pension rates

Earnings class	Weekly				Monthly			
	Widow / widower	Dependent child	Dependent parents	Dependent orphan	Widow / widower	Dependent child	Dependent parents	Dependent orphan
I	78.47	39.23	39.23	78.47	340.04	170.00	170.00	340.04
II	101.61	50.80	50.80	101.61	440.31	220.13	220.13	440.31
III	120.49	60.24	60.24	120.49	522.12	261.04	261.04	522.12
IV	139.99	70.00	70.00	139.99	606.62	303.33	303.33	606.62
V	157.17	78.59	78.59	157.17	681.07	340.56	340.56	681.07
VI	184.50	92.25	92.25	184.50	799.50	399.75	399.75	799.50
VII	217.80	108.90	108.90	217.80	943.80	471.90	471.90	943.80
VIII	251.10	125.55	125.55	251.10	1,088.10	544.05	544.05	1,088.10
IX	288.00	144.00	144.00	288.00	1,248.00	624.00	624.00	1,248.00
X	325.80	162.90	162.90	325.80	1,411.80	705.90	705.90	1,411.80
XI	364.50	182.25	182.25	364.50	1,579.50	789.75	789.75	1,579.50
XII	406.80	203.40	203.40	406.80	1,762.80	881.40	881.40	1,762.80
XIII	450.90	225.45	225.45	450.90	1,953.90	976.95	976.95	1,953.90
XIV	499.50	249.75	249.75	499.50	2,164.50	1,082.25	1,082.25	2,164.50
XV	545.26	272.63	272.63	545.26	2,362.79	1,181.40	1,181.40	2,362.79
XVI	564.84	282.42	282.42	564.84	2,447.64	1,223.82	1,223.82	2,447.64

Table A5.5 Increments for survivors' pensions

Earnings class	Weekly				Monthly			
	Widow/ widower	Dependent child	Dependent parents	Dependent orphan	Widow/ widower	Dependent child	Dependent parents	Dependent orphan
I	1.15	0.57	0.57	1.15	4.98	2.47	2.47	4.98
II	1.59	0.80	0.80	1.59	6.89	3.47	3.47	6.89
III	2.02	1.01	1.01	2.02	8.75	4.38	4.38	8.75
IV	2.46	1.23	1.23	2.46	10.66	5.33	5.33	10.66
V	2.89	1.45	1.45	2.89	12.52	6.28	6.28	12.52
VI	3.44	1.72	1.72	3.44	14.91	7.45	7.45	14.91
VII	4.07	2.03	2.03	4.07	17.64	8.80	8.80	17.64
VIII	4.69	2.34	2.34	4.69	20.32	10.14	10.14	20.32
IX	5.38	2.69	2.69	5.38	23.31	11.66	11.66	23.31
X	6.08	3.04	3.04	6.08	26.35	13.17	13.17	26.35
XI	6.80	3.40	3.40	6.80	29.47	14.73	14.73	29.47
XII	7.59	3.80	3.80	7.59	32.89	16.47	16.47	32.89
XIII	8.42	4.21	4.21	8.42	36.49	18.24	18.24	36.49
XIV	9.32	4.66	4.66	9.32	40.39	20.19	20.19	40.39
XV	10.18	5.09	5.09	10.18	44.11	22.06	22.06	44.11
XVI	10.54	5.27	5.27	10.54	45.67	22.84	22.84	45.67

Table A5.6 Employment injury benefit rates

Earnings class	Weekly	Monthly
I	180.00	780.00
II	263.33	1,141.10
III	353.33	1,531.10
IV	456.67	1,978.90
V	563.33	2,441.10
VI	683.33	2,961.10
VII	806.67	3,495.57
VIII	930.00	4,030.00
IX	1,066.67	4,622.24
X	1,206.67	5,228.90
XI	1,350.00	5,850.00
XII	1,506.67	6,528.90
XIII	1,670.00	7,236.67
XIV	1,850.00	8,016.67
XV	2,019.49	8,751.12
XVI	2,092.00	9,065.33

Table A5.7 Employment injury death benefit rates

Earnings class	Widow		Dependent child		Dependant parent	
	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly
I	108	468	54	234	54	234
II	158	685	79	342	79	342
III	212	919	106	459	106	459
IV	274	1,187	137	594	137	594
V	338	1,465	169	732	169	732
VI	410	1,777	205	888	205	888
VII	484	2,097	242	1,049	242	1,049
VIII	558	2,418	279	1,209	279	1,209
IX	640	2,773	320	1,387	320	1,387
X	724	3,137	362	1,569	362	1,569
XI	810	3,510	405	1,755	405	1,755
XII	904	3,917	452	1,959	452	1,959
XIII	1,002	4,342	501	2,171	501	2,171
XIV	1,110	4,810	555	2,405	555	2,405
XV	1,212	5,251	606	2,625	606	2,625
XVI	1,255	5,439	628	2,720	628	2,720

Table A5.8 Constant attendance and care allowance rates

Earnings class	Weekly	Monthly
I	26.72	115.79
II	43.82	189.89
III	58.12	251.85
IV	76.64	332.11
V	97.44	422.24
VI	119.31	517.01
VII	140.21	607.58
VIII	164.98	714.91
IX	191.02	827.75
X	218.33	946.10
XI	248.17	1,075.40
XII	294.54	1,276.34
XIII	326.47	1,414.70
XIV	361.64	1,567.11
XV	394.80	1,710.80
XVI	408.82	1,771.55

Table A5.9 Sickness and maternity benefit rates

Earnings class	Weekly	Monthly
I	162.00	702.00
II	237.00	1,027.00
III	318.00	1,378.00
IV	411.00	1,781.00
V	507.00	2,197.00
VI	615.00	2,665.00
VII	726.00	3,146.00
VIII	837.00	3,627.00
IX	960.00	4,160.00
X	1,086.00	4,706.00
XI	1,215.00	5,265.00
XII	1,356.00	5,876.00
XIII	1,503.00	6,513.00
XIV	1,665.00	7,215.00
XV	1,817.54	7,876.01
XVI	1,882.80	8,158.80

Table A5.10 Rates for medical expenses

Expense	From 3 March 2014	From 29 February 2016
a) Doctor's visit		
General Practitioner		
Office visit	TT$70.32 per visit	TT$79.81 per visit
Visit by doctor to site	TT$139.70 per visit	TT$158.56 per visit
Specialist		
Office visit	TT$174.38 per visit	TT$197.92 per visit
Visit by doctor to site	TT$232.50 per visit	TT$263.89 per visit
Psychiatrist		
Initial consultation	TT$210.00 per hour	TT$238.35 per hour
Follow up	TT$174.38 per visit	TT$197.92 per visit
b) Drugs and dressing	Up to TT$1,162.50 per injury	Up to TT$1,319.44 per injury
c) Hospital expenses	TT$348.75 per day	TT$395.83 per day
d) Operations		
Minor	Up to TT$930	Up to TT$1,056
Intermediate	Up to TT$1,860	Up to TT$2,111
Major	Up to TT$3,720	Up to TT$4,222
Maximum total medical expenses per injury	TT$33,750	TT$38,300

Appendix 6 Detailed observed and expected mortality from 1 July 2010 to 30 June 2013

The following tables present the detailed information used for determining the observed and expected mortality rates by age and gender. It must be noted that the exposure has been calculated with approximate methods and would need refinements in case the results would be published. In addition, no graduation of the calculated ratios has been performed.

MALES

	Exposure				Deaths				Observed QX			Expected QX according to 2010 Valuation			Expected deaths	Ratio
Age	2011	2012	2013	2011-2013	2011	2012	2013	2011-2013	2011	2012	2013	2011	2012	2013	2011-2013	Obs/Exp
60	4 403	3 088	3 218	10 709	15	14	14	43	0.003407	0.004534	0.004350	0.014573	0.014419	0.014267	154.6	28%
61	3 339	3 349	3 477	10 165	57	52	41	150	0.017069	0.015527	0.011793	0.015918	0.015754	0.015592	160.1	94%
62	3 421	3 349	3 462	10 232	53	63	46	162	0.015490	0.018812	0.013288	0.017390	0.017217	0.017046	176.2	92%
63	3 196	3 410	3 419	10 025	69	70	59	198	0.021593	0.020526	0.017254	0.018994	0.018809	0.018626	188.5	105%
64	2 981	3 231	3 505	9 717	55	81	63	199	0.018450	0.025071	0.017975	0.020741	0.020546	0.020352	199.5	100%
65	3 265	3 155	3 351	9 771	67	61	73	201	0.020522	0.019336	0.021784	0.022654	0.022448	0.022243	219.3	92%
66	2 961	3 118	3 136	9 214	45	82	68	195	0.015199	0.026301	0.021686	0.024740	0.024522	0.024305	225.9	86%
67	2 675	2 915	3 060	8 649	62	71	72	205	0.023178	0.024359	0.023532	0.027009	0.026777	0.026548	231.5	89%
68	2 296	2 618	2 856	7 770	67	62	72	201	0.029178	0.023685	0.025206	0.029485	0.029241	0.029000	227.1	89%
69	2 073	2 229	2 558	6 860	64	62	77	203	0.030871	0.027812	0.030107	0.032181	0.031924	0.031669	218.9	93%
70	2 019	2 020	2 174	6 213	56	63	61	180	0.027738	0.031183	0.028057	0.035118	0.034847	0.034578	216.5	83%
71	1 783	1 960	1 951	5 694	69	76	62	207	0.038701	0.038766	0.031785	0.038313	0.038028	0.037745	216.5	96%
72	1 765	1 716	1 892	5 373	55	62	81	198	0.031160	0.036140	0.042810	0.041788	0.041488	0.041190	222.9	89%
73	1 612	1 712	1 645	4 969	51	67	74	192	0.031642	0.039136	0.044988	0.045559	0.045246	0.044934	224.8	85%
74	1 516	1 553	1 634	4 704	72	85	72	229	0.047478	0.054734	0.044062	0.049656	0.049329	0.049003	232.0	99%
75	1 383	1 435	1 473	4 291	77	70	74	221	0.055660	0.048779	0.050252	0.054102	0.053759	0.053418	230.7	96%
76	1 261	1 316	1 368	3 945	62	65	77	204	0.049164	0.049401	0.056300	0.058929	0.058572	0.058217	231.0	88%
77	1 166	1 182	1 250	3 599	82	65	57	204	0.070303	0.054988	0.045590	0.064147	0.063778	0.063410	229.5	89%
78	1 020	1 089	1 115	3 224	72	57	73	202	0.070561	0.052359	0.065495	0.069803	0.069418	0.069035	223.7	90%
79	902	952	1 029	2 883	61	59	74	194	0.067648	0.061948	0.071895	0.075910	0.075515	0.075122	217.7	89%
80	886	837	894	2 617	63	53	59	175	0.071135	0.063308	0.065974	0.082507	0.082099	0.081694	214.9	81%
81	802	823	781	2 406	61	59	75	195	0.076028	0.071709	0.096091	0.089624	0.089206	0.088790	214.6	91%
82	658	737	745	2 139	64	71	73	208	0.097318	0.096373	0.097996	0.097289	0.096861	0.096435	207.2	100%
83	604	590	677	1 872	57	52	72	181	0.094314	0.088062	0.106338	0.105535	0.105100	0.104668	196.7	92%
84	570	540	535	1 645	58	54	52	164	0.101724	0.099997	0.097197	0.114388	0.113948	0.113509	187.5	87%
85	490	509	479	1 478	63	66	59	188	0.128616	0.129580	0.123102	0.123888	0.123444	0.123002	182.5	103%
86	433	426	453	1 313	55	51	61	167	0.126959	0.119676	0.134561	0.134052	0.133609	0.133168	175.4	95%
87	403	379	369	1 152	51	49	50	150	0.126419	0.129278	0.135474	0.144914	0.144472	0.144033	166.4	90%
88	334	356	328	1 017	49	44	49	142	0.146699	0.123751	0.149542	0.156495	0.156060	0.155627	158.8	89%
89	269	276	314	858	47	33	50	130	0.175041	0.119625	0.159296	0.168822	0.168398	0.167974	144.5	90%
90	227	221	237	686	46	45	43	134	0.202213	0.203184	0.181572	0.181910	0.181499	0.181088	124.5	108%
91	179	191	182	553	35	33	35	103	0.194990	0.172803	0.192175	0.195774	0.195380	0.194986	108.0	95%
92	152	144	160	456	34	31	25	90	0.223493	0.214704	0.156516	0.210419	0.210048	0.209676	95.8	94%
93	119	121	117	357	21	17	26	64	0.176948	0.140495	0.221562	0.225859	0.225513	0.225167	80.5	79%
94	88	92	94	274	29	28	22	79	0.329838	0.305502	0.233980	0.242082	0.241767	0.241453	66.1	119%
95	57	62	73	191	16	13	13	42	0.282339	0.209826	0.178613	0.259080	0.258802	0.258524	49.5	85%
96	49	47	50	146	5	9	12	26	0.101291	0.192195	0.240596	0.276834	0.276597	0.276360	40.4	64%
97	27	42	41	110	9	6	14	29	0.333088	0.141987	0.344750	0.295320	0.295128	0.294937	32.4	89%
98	15	21	35	71	6	11	9	26	0.393836	0.515658	0.259980	0.314510	0.314367	0.314224	22.4	116%
99	10	10	13	34	5	0	3	8	0.476454	0.000000	0.225509	1.000000	1.000000	1.000000	34.1	23%
100	9	7	8	24	1	3	5	9	0.117500	0.411048	0.599262	1.000000	1.000000	1.000000	24.2	37%
Total	**51 420**	**51 829**	**54 156**	**157 405**	**1 986**	**2 015**	**2 097**	**6 098**	**0.038623**	**0.038878**	**0.038721**				**6 773**	**90%**

FEMALES

	Exposure				Deaths				Observed QX			Expected QX according to 2010 Valuation			Expected deaths	Ratio
Age	2011	2012	2013	2011-2013	2011	2012	2013	2011-2013	2011	2012	2013	2011	2012	2013	2011-2013	Obs/Exp
60	2 545	1 831	1 998	6 373	7	6	4	17	0.002750	0.003277	0.002002	0.010043	0.009913	0.009785	63.3	27%
61	1 767	1 908	2 088	5 763	15	12	11	38	0.008488	0.006290	0.005268	0.011033	0.010894	0.010757	62.7	61%
62	1 780	1 789	2 004	5 572	11	15	20	46	0.006179	0.008386	0.009982	0.012128	0.011978	0.011829	66.7	69%
63	1 673	1 799	1 865	5 336	19	8	18	45	0.011358	0.004448	0.009653	0.013332	0.013169	0.013009	70.2	64%
64	1 540	1 703	1 882	5 124	15	11	16	42	0.009741	0.006460	0.008502	0.014655	0.014481	0.014309	74.2	57%
65	1 613	1 621	1 797	5 031	17	16	19	52	0.010538	0.009873	0.010573	0.016109	0.015923	0.015738	80.1	65%
66	1 463	1 561	1 637	4 661	12	21	17	50	0.008200	0.013456	0.010385	0.017711	0.017511	0.017313	81.6	61%
67	1 344	1 454	1 547	4 346	13	22	23	58	0.009669	0.015131	0.014867	0.019469	0.019252	0.019038	83.6	69%
68	1 133	1 331	1 437	3 900	17	14	7	38	0.015010	0.010521	0.004872	0.021396	0.021164	0.020935	82.5	46%
69	1 007	1 116	1 321	3 443	15	14	18	47	0.014899	0.012548	0.013628	0.023517	0.023268	0.023022	80.0	59%
70	970	997	1 104	3 072	8	26	23	57	0.008246	0.026071	0.020826	0.025838	0.025571	0.025307	78.5	73%
71	862	956	975	2 793	15	18	19	52	0.017395	0.018834	0.019490	0.028388	0.028103	0.027821	78.5	66%
72	793	850	936	2 579	15	15	16	46	0.018919	0.017651	0.017093	0.031183	0.030877	0.030573	79.6	58%
73	728	776	837	2 341	15	15	26	56	0.020603	0.019322	0.031065	0.034242	0.033915	0.033591	79.4	71%
74	714	707	757	2 178	19	20	18	57	0.026615	0.028291	0.023765	0.037590	0.037240	0.036893	81.1	70%
75	658	699	693	2 050	13	15	15	43	0.019766	0.021446	0.021655	0.041253	0.040880	0.040510	83.8	51%
76	583	642	681	1 906	22	11	15	48	0.037743	0.017143	0.022011	0.045261	0.044864	0.044470	85.5	56%
77	535	563	626	1 724	16	12	18	46	0.029884	0.021316	0.028774	0.049638	0.049216	0.048797	84.8	54%
78	465	515	545	1 525	18	16	20	54	0.038742	0.031059	0.036708	0.054415	0.053965	0.053519	82.2	66%
79	459	449	499	1 407	17	19	21	57	0.037075	0.042299	0.042081	0.059620	0.059143	0.058669	83.2	69%
80	451	439	433	1 323	19	14	17	50	0.042132	0.031920	0.039245	0.065291	0.064785	0.064284	85.7	58%
81	392	436	419	1 248	17	17	14	48	0.043350	0.038999	0.033376	0.071461	0.070926	0.070396	88.5	54%
82	303	370	413	1 086	26	18	18	62	0.085877	0.048663	0.043546	0.078166	0.077603	0.077043	84.2	74%
83	280	279	347	905	20	18	19	57	0.071505	0.064624	0.054755	0.085446	0.084852	0.084263	76.8	74%
84	244	262	259	764	17	18	11	46	0.069631	0.068809	0.042547	0.093336	0.092712	0.092093	70.8	65%
85	241	222	246	709	19	10	15	44	0.078923	0.044995	0.060940	0.101870	0.101217	0.100568	71.8	61%
86	200	222	209	630	18	13	21	52	0.090214	0.058472	0.100649	0.111091	0.110409	0.109730	69.6	75%
87	198	183	202	584	18	18	13	49	0.090812	0.098187	0.064241	0.121036	0.120325	0.119618	70.3	70%
88	167	175	162	504	17	16	23	56	0.101614	0.091658	0.141801	0.131738	0.131000	0.130266	66.0	85%
89	132	148	158	438	15	12	10	37	0.113286	0.081134	0.063347	0.143230	0.142466	0.141706	62.4	59%
90	111	117	137	364	16	11	20	47	0.144456	0.094327	0.146281	0.155552	0.154765	0.153981	56.3	83%
91	78	94	105	277	12	12	17	41	0.153916	0.127648	0.162542	0.168717	0.167909	0.167104	46.4	88%
92	66	71	82	220	7	8	9	24	0.106157	0.111972	0.109426	0.182763	0.181936	0.181112	39.9	60%
93	57	59	60	176	9	10	15	34	0.158445	0.168446	0.251221	0.197700	0.196858	0.196020	34.6	98%
94	53	49	51	153	6	5	8	19	0.112769	0.101339	0.158368	0.213536	0.212683	0.211833	32.6	58%
95	44	43	40	127	10	11	4	25	0.227386	0.253806	0.101128	0.230277	0.229418	0.228561	29.1	86%
96	29	37	37	102	7	5	5	17	0.242656	0.136318	0.136404	0.247916	0.247054	0.246194	25.2	67%
97	20	22	26	68	4	8	5	17	0.203241	0.358638	0.190582	0.266439	0.265581	0.264725	18.1	94%
98	11	15	17	44	5	5	2	12	0.458195	0.330468	0.114472	0.285823	0.284973	0.284126	12.4	97%
99	4	8	12	24	1	3	4	8	0.264291	0.364158	0.320711	1.000000	1.000000	1.000000	24.5	33%
100	5	4	5	14	0	1	3	4	0.000000	0.273135	0.597954	1.000000	1.000000	1.000000	13.7	29%
Total	**25 717**	**26 520**	**28 648**	**80 884**	**562**	**539**	**597**	**1 698**	**0.021854**	**0.020325**	**0.020839**				**2 640**	**64%**

Appendix 7 Pension amounts (and replacement rates) generated by different formulas

This appendix presents an illustration of retirement pensions resulting from the application of the different formulas considered in the report regarding the conversion of the present earnings class system into a system based on a percentage of earnings. Pension amounts and replacement rates are presented for 15, 25 and 35 years of contribution to the NIS.

Table A7.1 Comparison of pension amounts under different pension formulas – 15 years of contribution (TT$)

Earnings class	Distribution of insured population	Present provisions (March 2014)			Formula 1		Formula 2		Formula 3	
					2% first 15 years 1.1% over 15 years		1.6% per year		1.8% on earnings below $6,000 1.2% on earnings above $6,000	
		Pension amount	Replacement rate	Pension taking into account minimum pension	Pension amount	Replacement rate	Pension amount	Replacement rate	Pension amount	Replacement rate
I	2%	504	48.4%	3000	312	30%	250	24%	281	27%
II	3%	650	42.9%	3000	455	30%	364	24%	409	27%
III	7%	772	37.9%	3000	611	30%	489	24%	550	27%
IV	5%	893	34.1%	3000	786	30%	629	24%	708	27%
V	6%	1001	31.0%	3000	968	30%	775	24%	872	27%
VI	8%	1191	30.4%	3000	1176	30%	941	24%	1059	27%
VII	7%	1402	30.2%	3000	1391	30%	1113	24%	1252	27%
VIII	8%	1614	30.2%	3000	1605	30%	1284	24%	1445	27%
IX	9%	1840	30.0%	3000	1839	30%	1472	24%	1644	27%
X	5%	2079	30.0%	3000	2080	30%	1664	24%	1788	26%
XI	4%	2324	30.0%	3000	2327	30%	1862	24%	1936	25%
XII	4%	2579	29.8%	3000	2594	30%	2075	24%	2096	24%
XIII	3%	2857	29.8%	3000	2873	30%	2298	24%	2264	24%
XIV	4%	3167	29.8%	3167	3185	30%	2548	24%	2451	23%
XV	2%	3458	29.8%	3458	3477	30%	2782	24%	2626	23%
XVI	23%	3581	29.8%	3581	3600	30%	2880	24%	2700	23%
Average										
All earnings class		**2084**			**2060**		**1648**		**1673**	
Earnings classes V and above		**2359**			**2362**		**1889**		**1907**	

Table A7.2 Comparison of pension amounts under different pension formulas – 25 years of contribution (TT$)

Earnings class	Distribution of insured population	Pension amount	Replacement rate	Pension taking into account minimum pension	2% first 15 years 1.1% over 15 years: Pension amount	2% first 15 years 1.1% over 15 years: Replacement rate	1.6% per year: Pension amount	1.6% per year: Replacement rate	1.8% on earnings below $6,000 1.2% on earnings above $6,000: Pension amount	1.8% on earnings below $6,000 1.2% on earnings above $6,000: Replacement rate
I	2%	651	62.6%	3000	426	41%	416	40%	468	45%
II	3%	854	56.3%	3000	622	41%	607	40%	682	45%
III	7%	1030	50.6%	3000	835	41%	815	40%	916	45%
IV	5%	1207	46.0%	3000	1075	41%	1049	40%	1180	45%
V	6%	1369	42.4%	3000	1323	41%	1291	40%	1453	45%
VI	8%	1640	41.8%	3000	1608	41%	1569	40%	1765	45%
VII	7%	1927	41.6%	3000	1901	41%	1855	40%	2086	45%
VIII	8%	2221	41.5%	3000	2194	41%	2141	40%	2408	45%
IX	9%	2531	41.3%	3000	2514	41%	2453	40%	2739	45%
X	5%	2863	41.3%	3000	2843	41%	2773	40%	2980	43%
XI	4%	3198	41.2%	3198	3180	41%	3103	40%	3227	42%
XII	4%	3553	41.1%	3553	3544	41%	3458	40%	3494	40%
XIII	3%	3936	41.1%	3936	3926	41%	3831	40%	3773	39%
XIV	4%	4363	41.1%	4363	4353	41%	4247	40%	4085	38%
XV	2%	4764	41.1%	4764	4752	41%	4636	40%	4377	38%
XVI	23%	4934	41.1%	4934	4920	41%	4800	40%	4500	38%
Average										
All earnings class		**2864**			**2816**		**2747**		**2788**	
Earnings classes V and above		**3248**			**3228**		**3149**		**3178**	

Table A7.3 Comparison of pension amounts under different pension formulas – 35 years of contribution (TT$)

Earnings class	Distribution of insured population	Present provisions (March 2014)			Formula 1		Formula 2		Formula 3	
					2% first 15 years 1.1% over 15 years		1.6% per year		1.8% on earnings below $6,000 1.2% on earnings above $6,000	
		Pension amount	Replacement rate	Pension taking into account minimum pension	Pension amount	Replacement rate	Pension amount	Replacement rate	Pension amount	Replacement rate
I	2%	799	76.8%	3000	541	52%	582	56%	655	63%
II	3%	1057	69.7%	3000	789	52%	849	56%	955	63%
III	7%	1288	63.2%	3000	1059	52%	1140	56%	1283	63%
IV	5%	1521	58.0%	3000	1363	52%	1468	56%	1652	63%
V	6%	1738	53.8%	3000	1679	52%	1808	56%	2034	63%
VI	8%	2089	53.3%	3000	2039	52%	2196	56%	2471	63%
VII	7%	2453	52.9%	3000	2411	52%	2596	56%	2921	63%
VIII	8%	2829	52.9%	3000	2783	52%	2997	56%	3371	63%
IX	9%	3222	52.5%	3222	3188	52%	3434	56%	3835	63%
X	5%	3648	52.6%	3648	3605	52%	3882	56%	4172	60%
XI	4%	4071	52.5%	4071	4033	52%	4344	56%	4518	58%
XII	4%	4527	52.4%	4527	4495	52%	4841	56%	4891	57%
XIII	3%	5015	52.4%	5015	4980	52%	5363	56%	5282	55%
XIV	4%	5559	52.4%	5559	5521	52%	5945	56%	5719	54%
XV	2%	6070	52.4%	6070	6027	52%	6490	56%	6128	53%
XVI	23%	6287	52.4%	6287	6240	52%	6720	56%	6300	53%
Average										
All earnings class		**3644**			**3571**		**3846**		**3903**	
Earnings classes V and above		**4137**			**4094**		**4409**		**4449**	

Appendix 8 Impact on individuals of alternative pension formulas

This Appendix presents detailed information on the difference between retirement pensions calculated under the present formula and under the three proposed alternative formulas. The comparison is expressed as the replacement rate under the new formula minus the replacement rate under the present formula (negative numbers mean that the new formula is less generous). It is presented for different earnings classes and for different periods of contribution, with and without the application of the minimum pension.

Table A8.1 Difference between replacement rates (alternative formula minus present formula) - Formula 1 (2% for first 15 years, plus 1.1% for years over 15)

	NO MIN PENSION																						
Class	Monthly average insurable earnings	Min Penion as % Ins. Earnings	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
I	1 040	288%	-18%	-19%	-19%	-19%	-20%	-20%	-20%	-21%	-21%	-21%	-22%	-22%	-22%	-23%	-23%	-23%	-24%	-24%	-24%	-24%	-25%
II	1 517	198%	-13%	-13%	-13%	-14%	-14%	-14%	-14%	-15%	-15%	-15%	-15%	-16%	-16%	-16%	-16%	-17%	-17%	-17%	-17%	-17%	-18%
III	2 037	147%	-8%	-8%	-8%	-8%	-9%	-9%	-9%	-9%	-9%	-9%	-10%	-10%	-10%	-10%	-10%	-10%	-11%	-11%	-11%	-11%	-11%
IV	2 622	114%	-4%	-4%	-4%	-4%	-4%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-6%	-6%	-6%	-6%	-6%	-6%
V	3 228	93%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%
VI	3 922	77%	0%	0%	0%	0%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%
VII	4 637	65%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%
VIII	5 352	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%
IX	6 132	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%
X	6 933	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%	-1%
XI	7 757	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XII	8 645	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XIII	9 577	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XIV	10 617	28%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XV	11 590	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XVI	12 000	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	WITH MIN PENSION (PRORATED IF LESS THAN 15 CONTRIBUTION YEARS)																						
Class	Monthly average insurable earnings	Min Penion as % Ins. Earnings	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
I	1 040	288%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
II	1 517	198%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
III	2 037	147%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
IV	2 622	114%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
V	3 228	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VI	3 922	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VII	4 637	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VIII	5 352	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
IX	6 132	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%
X	6 933	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%	-1%
XI	7 757	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XII	8 645	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XIII	9 577	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XIV	10 617	28%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XV	11 590	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
XVI	12 000	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table A8.2 Difference between replacement rates (alternative formula minus present formula) - Formula 2 (1.6% per year)

	NO MIN PENSION																						
Class	Monthly average insurable earnings	Min Penion as % Ins. Earnings	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
I	1 040	288%	-24%	-24%	-24%	-24%	-24%	-24%	-23%	-23%	-23%	-23%	-23%	-22%	-22%	-22%	-22%	-22%	-22%	-21%	-21%	-21%	-21%
II	1 517	198%	-19%	-19%	-18%	-18%	-18%	-18%	-17%	-17%	-17%	-17%	-16%	-16%	-16%	-16%	-15%	-15%	-15%	-14%	-14%	-14%	-14%
III	2 037	147%	-14%	-14%	-13%	-13%	-13%	-12%	-12%	-12%	-11%	-11%	-11%	-10%	-10%	-10%	-9%	-9%	-9%	-8%	-8%	-8%	-7%
IV	2 622	114%	-10%	-10%	-9%	-9%	-8%	-8%	-8%	-7%	-7%	-6%	-6%	-6%	-5%	-5%	-4%	-4%	-4%	-3%	-3%	-2%	-2%
V	3 228	93%	-7%	-7%	-6%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-2%	-2%	-1%	-1%	-1%	0%	0%	1%	1%	2%	2%
VI	3 922	77%	-6%	-6%	-5%	-5%	-5%	-4%	-4%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	0%	1%	1%	2%	2%	3%
VII	4 637	65%	-6%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%
VIII	5 352	56%	-6%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-2%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%
IX	6 132	49%	-6%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	3%
X	6 933	43%	-6%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	2%	3%	3%
XI	7 757	39%	-6%	-5%	-5%	-5%	-4%	-4%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XII	8 645	35%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XIII	9 577	31%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XIV	10 617	28%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XV	11 590	26%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XVI	12 000	25%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
	WITH MIN PENSION (PRORATED IF LESS THAN 15 CONTRIBUTION YEARS)																						
Class	Monthly average insurable earnings	Min Penion as % Ins. Earnings	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
I	1 040	288%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
II	1 517	198%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
III	2 037	147%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
IV	2 622	114%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
V	3 228	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VI	3 922	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VII	4 637	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VIII	5 352	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
IX	6 132	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	3%	3%	3%
X	6 933	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	2%	3%	3%
XI	7 757	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XII	8 645	35%	0%	0%	0%	0%	0%	-1%	-2%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XIII	9 577	31%	0%	0%	-1%	-2%	-3%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XIV	10 617	28%	-2%	-3%	-4%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XV	11 590	26%	-4%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%
XVI	12 000	25%	-5%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%

Table A8.3 Difference between replacement rates (alternative formula minus present formula) - Formula 3 (1.8% for monthly earnings below $6,000, plus 1.2% for monthly earnings above $6,000)

	NO MIN PENSION																					
Class	Monthly average insurable earnings	Min Penion as % Ins. Earnings	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
I	1 040	288%	-21%	-21%	-21%	-20%	-20%	-20%	-19%	-19%	-18%	-18%	-18%	-17%	-17%	-16%	-16%	-16%	-15%	-15%	-15%	-14%	-14%
II	1 517	198%	-16%	-15%	-15%	-15%	-14%	-14%	-13%	-13%	-12%	-12%	-11%	-11%	-10%	-10%	-9%	-9%	-9%	-8%	-8%	-7%	-7%
III	2 037	147%	-11%	-10%	-10%	-9%	-9%	-8%	-8%	-7%	-7%	-6%	-6%	-5%	-5%	-4%	-3%	-3%	-2%	-2%	-1%	-1%	0%
IV	2 622	114%	-7%	-6%	-6%	-5%	-5%	-4%	-3%	-3%	-2%	-2%	-1%	0%	0%	1%	1%	2%	3%	3%	4%	4%	5%
V	3 228	93%	-4%	-3%	-3%	-2%	-1%	-1%	0%	1%	1%	2%	3%	3%	4%	5%	5%	6%	7%	7%	8%	9%	9%
VI	3 922	77%	-3%	-3%	-2%	-1%	-1%	0%	1%	1%	2%	3%	3%	4%	4%	5%	6%	6%	7%	8%	8%	9%	10%
VII	4 637	65%	-3%	-3%	-2%	-1%	-1%	0%	1%	1%	2%	3%	3%	4%	5%	5%	6%	7%	7%	8%	9%	9%	10%
VIII	5 352	56%	-3%	-2%	-2%	-1%	0%	0%	1%	1%	2%	3%	3%	4%	5%	5%	6%	7%	7%	8%	9%	9%	10%
IX	6 132	49%	-3%	-3%	-2%	-1%	-1%	0%	1%	1%	2%	3%	3%	4%	5%	5%	6%	7%	7%	8%	9%	9%	10%
X	6 933	43%	-4%	-4%	-3%	-2%	-2%	-1%	-1%	0%	1%	1%	2%	2%	3%	3%	4%	5%	5%	6%	6%	7%	8%
XI	7 757	39%	-5%	-4%	-4%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	3%	3%	4%	4%	5%	5%	6%
XII	8 645	35%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%	4%
XIII	9 577	31%	-6%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	1%	2%	2%	3%
XIV	10 617	28%	-7%	-6%	-6%	-6%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	-1%	0%	0%	1%	1%	2%
XV	11 590	26%	-7%	-7%	-6%	-6%	-6%	-5%	-5%	-4%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	-1%	0%	0%	0%
XVI	12 000	25%	-7%	-7%	-7%	-6%	-6%	-5%	-5%	-5%	-4%	-4%	-4%	-3%	-3%	-2%	-2%	-2%	-1%	-1%	-1%	0%	0%
	WITH MIN PENSION (PRORATED IF LESS THAN 15 CONTRIBUTION YEARS)																						
Class	Monthly average insurable earnings	Min Penion as % Ins. Earnings	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
I	1 040	288%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
II	1 517	198%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
III	2 037	147%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
IV	2 622	114%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
V	3 228	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VI	3 922	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VII	4 637	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VIII	5 352	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	3%	5%	7%
IX	6 132	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	5%	6%	8%	9%	9%	10%
X	6 933	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	3%	4%	5%	5%	6%	6%	7%	8%
XI	7 757	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	3%	3%	4%	4%	5%	5%	6%
XII	8 645	35%	0%	0%	0%	0%	0%	-1%	-2%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	2%	2%	3%	3%	4%	4%
XIII	9 577	31%	0%	0%	-1%	-2%	-3%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	0%	0%	1%	1%	1%	2%	2%	3%
XIV	10 617	28%	-2%	-3%	-4%	-5%	-5%	-5%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	-1%	0%	0%	1%	1%	2%
XV	11 590	26%	-4%	-5%	-6%	-6%	-6%	-5%	-5%	-4%	-4%	-4%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	-1%	0%	0%	0%
XVI	12 000	25%	-5%	-6%	-7%	-6%	-6%	-5%	-5%	-5%	-4%	-4%	-4%	-3%	-3%	-2%	-2%	-2%	-1%	-1%	-1%	0%	0%

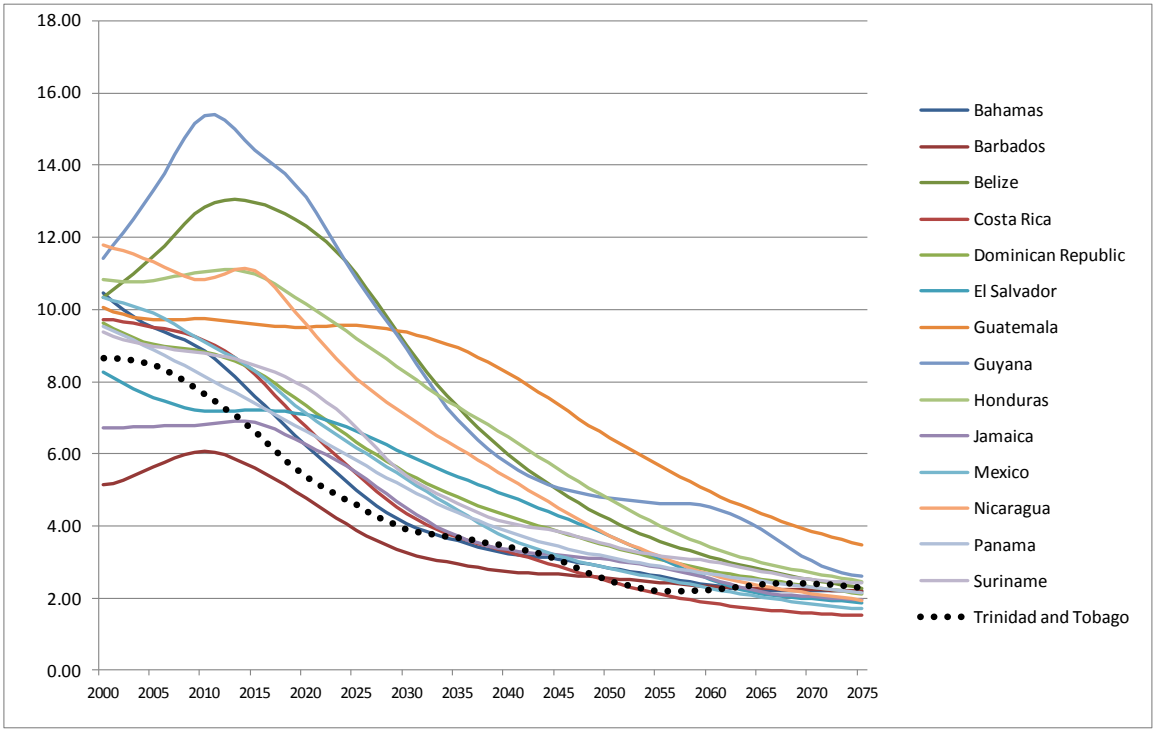
Appendix 9 International comparison of pension adequacy and sustainability

This Appendix presents an international comparison of indicators on the adequacy of benefits and pension sustainability, aimed at positioning Trinidad and Tobago's pension system with regard to the systems of other countries. All the information presented in the Appendix has been extracted from the OECD publications *Pensions at a Glance: Latin America and the Caribbean (2014)* and *Pensions at a Glance (2013)*. Certain indicators have however been adjusted in the case of Trinidad and Tobago to take into account more precise information available as part of the present actuarial review. The demographic data used as a basis for OECD calculations originates from *United Nations Population Prospects - 2012 Revision*.

A9.1 Demographic pressure

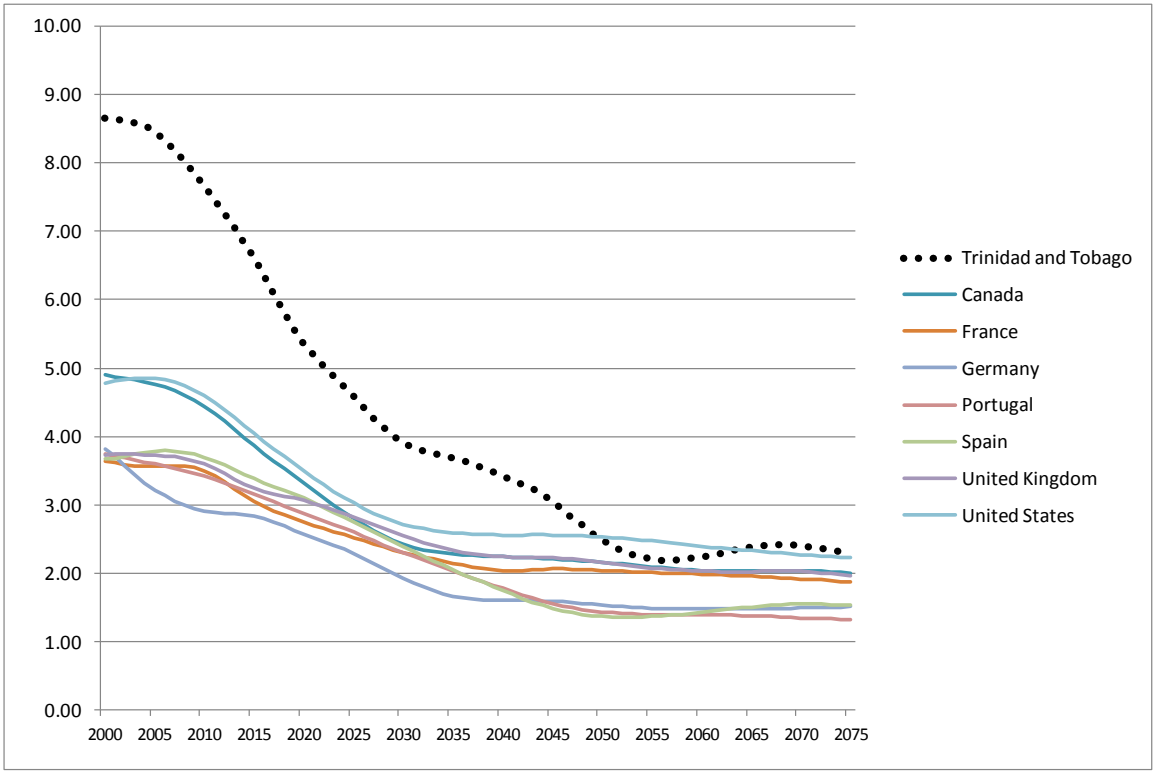
Charts A9.1 and A9.2 present the ratio of the population at working age for each person aged 65 and over (old-age support ratio). When compared to neighbouring countries in Central America and the Caribbean, it is observed that Trinidad and Tobago has a population relatively older than most other countries (7 workers per elderly in Trinidad and Tobago in 2015, compared to ratios above that level in most other countries), but all countries will eventually move towards an old-age support ratio between 1.8 and 3.0 in 2075.

Chart A9.1 Old-age support ratio - Ratio of population aged 20 to 64 to population aged 65 and over (comparison with Central America and Caribbean countries)



When compared to countries in Western Europe and North America (Chart A9.2), Trinidad and Tobago appears to have a significantly younger population presently (ratio of 7.0, compared to ratios between 3.0 and 4.0 for the other countries). But the trend is the same in the long term.

Chart A9.2 Old-age support ratio - Ratio of population aged 20 to 64 to population aged 65 and over (comparison with Western Europe and North America)



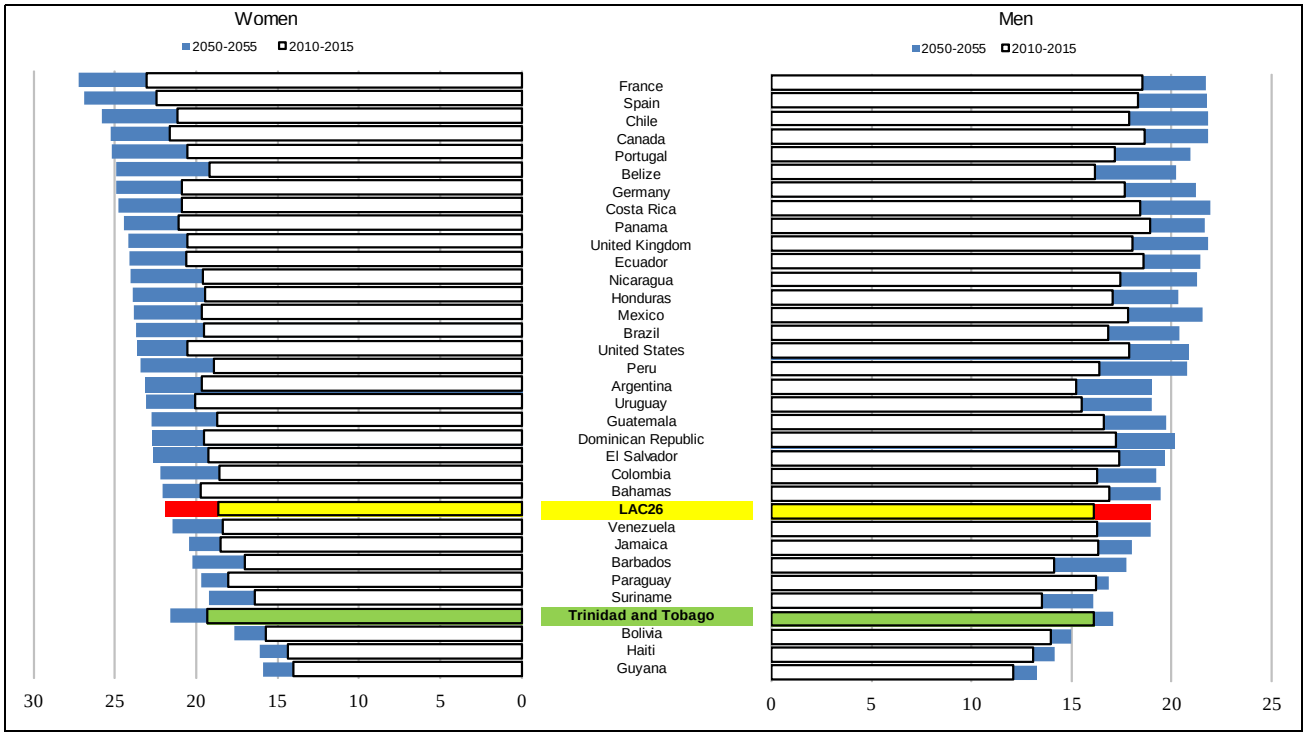
These trends are driven by two main factors, the fertility rate and the increase of life expectancy. Fertility has dropped dramatically over recent decades in most OECD countries and Trinidad and Tobago has followed the same trend. The total fertility rate of 1.8 in Trinidad and Tobago (2010) is similar to levels observed in most OECD countries (1.7 on average) and lower than the average fertility rate of 2.6 observed for the twenty-six Latin American and Caribbean countries.

Concerning life expectancy, Chart A9.3 compares life expectancy at age 65 for different countries. [10] Life expectancy at 65 presently stands at 16.1 for males and 19.3 for females in Trinidad and Tobago. It is projected to increase to 17.1 and 21.7 respectively for males and females in 2050-55. The chart also shows that life expectancy in Trinidad and Tobago compares to levels observed in most developed countries.

[10] In this chart, Trinidad and Tobago data have been adjusted to reflect the mortality basis used for this actuarial review. It appears that mortality data contained in the 2011 Trinidad census differ significantly from the data used by OECD in its comparative study.

It must be realized that the effective retirement age under the National Insurance System of Trinidad and Tobago is 60 (and not 65 as appearing in the comparison) and that this low retirement age puts high pressure on the pension scheme. As mentioned in Section 2.1, life expectancy at age 60 is 19.5 years for males and 23.1 years for females in 2011 and it will reach 20.8 years for males and 26.2 years for females in 2061. If the support ratio is defined with reference to age 60, instead of 65, it reduces to 4.5 in 2013 and is projected at only 1.6 in 2053.

Chart A9.3 Life expectancy at age 65, in 2010-15 and 2050-55



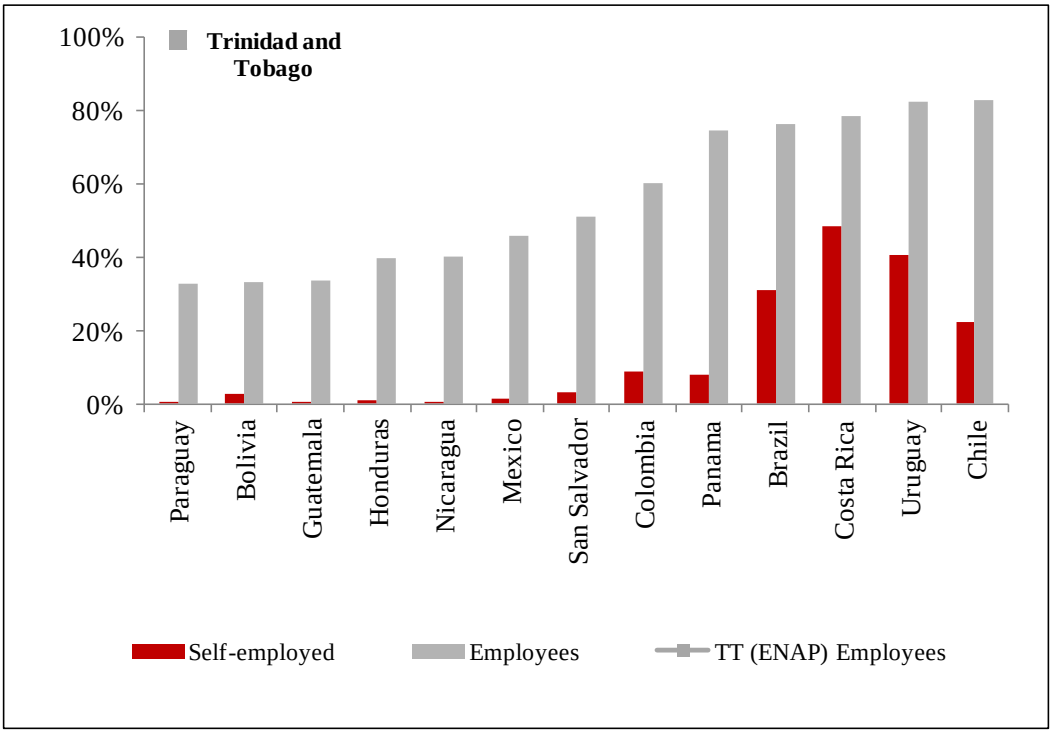
A9.2 Social security coverage

Almost all salaried workers are covered by the National Insurance System in Trinidad and Tobago. As shown in Chart A9.4, social security coverage is between 75 and 80 per cent in Chile, Uruguay, Costa Rica and Brazil. Coverage is significantly lower in other Central and South American countries.[11]

It must be mentioned that some countries already cover self-employed persons, as shown in red on the chart. Self-employed persons represent 16 per cent of total employment in Trinidad and Tobago.

[11] The assessment of social security coverage may be affected by the design of a country's pension system. This could explain why Trinidad and Tobago stands at such a high level compared to other countries.

Chart A9.4 Social security contributors as percentage of total workers, by type of employment



A9.3 Replacement rate of pensions

Chart A9.5 compares the replacement rate of pensions in Latin American, Caribbean and some OECD countries. It shows that for persons who earn 50 per cent of the average national wage, the replacement rate is 68.3 per cent in Trinidad and Tobago, a level slightly lower than the average of Latin American and Caribbean countries, but much lower than the replacement rate offered by OECD countries in Western Europe and North America. For workers at the average wage or above, the Trinidad and Tobago's pension system offers a replacement rate lower that what is offered in many other Latin American and Caribbean countries.

It must be mentioned that in certain OECD countries (e.g. Canada, United States and United Kingdom), the replacement rate offered by mandatory pension schemes to persons at two times the average wage or more is very low because these countries have left the pension coverage of this part of earnings to voluntary mechanisms.

Chart A9.5 Replacement rate offered by mandatory schemes, by earnings level

	Individual earnings, multiple of mean for men (women where different)								
	0.5	1.0	2.0	3.0		0.5	1.0	2.0	3.0
Argentina	104.6 (96.1)	90.6 (82.1)	89.6 (81.4)	83.3 (76.1)	Nicaragua	94.2	96.6	76.7	77.8
Bahamas	58.8	58.8	34.5	22.8	Panama	79.1 *(73.4)*	78.8 *(73.2)*	84.1 *(78.1)*	89.1 *(82.7)*
Barbados	66.2	66.5	60.5	42.5	Paraguay	104.1	103.8	105.6	105.8
Belize	76.3	72.5	59.4	41.6	Peru	88.3	81.1	40.6	28.5
Bolivia	36.4	41.7	36.0	33.9	Suriname	62.6	32.8	18.6	13.3
Brazil	61.1 (55.7)	64.1 (58.4)	72.8 (66.4)	64.3 (58.7)	Trinidad and Tobago	68.3	54.0 *(63)*	43.8	42.5
Chile	69.2 (58.3)	50.5 (39.6)	46.3 (31)	47.3 (31)	Uruguay	67.7	65.9	75.2	86.2
Colombia	102.7	73.8 (66.8)	75.3 (68.2)	75.8 (68.6)	Venezuela	143.7 *(138.8)*	98.5 *(93.6)*	75.4 *(70.5)*	67.8 *(63.1)*
Costa Rica	90.3	84.5	86.0	87.4	**LAC26**	**76.4** ***(74.9)***	**66.8** ***(65.3)***	**60.9** ***(58.6)***	**57.3** ***(55)***
Dominican Republi	23.2	23.7	24.2	25.6					
Ecuador	102.8	103.3	103.6	105.3	**OECD countries**				
El Salvador	85.4	45.2	30.1 (23.9)	30.6 (23.4)	Canada	94.8	56.5	31.4	22.6
Guatemala	69.9	70.1	72.2	75.7	France	64.6	60.7	48.9	44.2
Guyana	72.0	75.7	74.4	59.4	Germany	56.3	58.5	45.3	30.6
Haiti	31.8	32.5	33.8	33.7	Portugal	71.0	69.8	71.8	69.4
Honduras	67.0 (62.8)	67.1 (62.9)	66.0 (61.9)	65.6 (61.5)	Spain	79.3	80.1	63.9	45.3
Jamaica	103.9	74.1	67.1	52.6	United Kingdom	70.2	41.6	23.7	16.6
Mexico	58.0	31.2 (30.3)	32.1 (29.2)	32.4 (29.4)	United States	59.7	48.5	38.9	28.9

A9.4 Public spending on pensions

Public expenditures on pensions in Trinidad and Tobago represent 4.4 per cent of GDP, compared to an average of 3.1 per cent for the twenty-six Latin American and Caribbean countries, and an average of 7.8 per cent for OECD countries.

Mexico and Chile have levels of public spending on pensions lower than Trinidad and Tobago because they have chosen the defined-contribution (individual accounts) approach. Countries of Anglo-Saxon tradition (United Kingdom, United States and Canada) have opted for generous basic public systems for low-income people, complemented by private pension mechanisms for persons at higher earnings levels, explaining their relatively low spending on public pensions.

Chart A9.6 Public spending on pensions, as percentage of GDP (2009)