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National Insurance Scheme Reforms in the CaribbeanPrepared by Koffie Nassar, Joel Okwuokei, Mike Li, Timothy Robinson and Saji Thomas¹

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Abstract

Weighed down by population aging, slow economic growth, and high unemployment, National Insurance Schemes in the Caribbean are projected to run substantial deficits and deplete their assets in the next decades, raising the prospects of government intervention. With the region highly indebted, this paper quantifies the impact of three parametric reforms—freezing pension benefits for two years, raising the retirement age and increasing the contribution rate by one percentage point—that, if implemented, would put the pension schemes on a stronger financial footing. While the appropriate combination of reforms necessary to eliminate the actuarial deficits varies depending on each country's circumstances, most countries need to undertake reforms now or risk even higher taxes, lower growth and unsustainable debt dynamics.

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I. INTRODUCTION

Population aging, slow economic growth and high unemployment are weighing on National Insurance Schemes (NIS) in the Caribbean. Recent demographic trends—declining fertility rates and rising life expectancy—have reduced the number of the economically active population and pushed up the share of the elderly. Long-term projections point to continuing unfavorable demographic trends and large increases in pension spending. In addition to demographic pressures, the region has been saddled with tepid economic growth, rising unemployment, widening fiscal deficits and elevated public debt levels since the onset of the 2008 global financial crisis. Against this background, reforms to contain the growth of pension spending should figure prominently in fiscal consolidation strategies over the next several years.

The NIS in the Caribbean are pay-as-you-go (i.e., they use employer and employee contributions to pay for retirees' current benefits) and defined-benefit arrangements. Since their establishment in the 1960s, 1970s and 1980s, contribution incomes have exceeded benefit payments and administrative expenses for most countries and the systems have accumulated a large fund. The schemes appear relatively sound until about 2017. Thereafter, they are projected to incur substantial deficits and eventually run down their assets, raising the prospects that the government would have to bear a share of the promised pension benefits.² These developments will take place as the authorities aim to scale up infrastructure spending, while at the same time, pursuing debt sustainability. To avoid crowding out other priority expenditures, the authorities could, in the short term, implement parametric reforms that would help offset the impact of demographic pressures. Phasing in these reforms now will prevent a significant buildup of pressures and avoid the need for drastic measures in the future.

This paper proposes reform options to address these challenges, with a focus on old-age pensions. It does so by analyzing the outlook for NIS' pension income and expenditure over the next decades, and computing their actuarial balances.³ The actuarial deficits calculated as the Present Discount Values (PDVs) of future benefit expenditure minus income over the period 2016-60 at a discount rate of 5 percent, range from 0.7 percent of GDP in Barbados to 92 percent of GDP in Jamaica.⁴ Thus, absent reforms, contingent liabilities of several percentage points of GDP could materialize in few countries, putting substantial pressure on public finances. It is, therefore, imperative that these risks be mitigated by taking timely reform measures. To this end, this paper quantifies the impact of three parametric reform measures: raising the retirement age, freezing old-age pension benefits and increasing the

² By law, National Insurance Schemes' pensions are public sector contingent liabilities and participation is mandatory, including for the self-employed (except for Trinidad and Tobago).

³ Under the baseline projections, the Present Discounted Value (PDV) of future benefits (or expenditures) is much greater than the sum of the assets on hand plus the PDV of contributions and investment income for most of the countries in the Caribbean.

⁴ Barbados is the only country in the Caribbean that has substantially reformed its traditional PAYGO system during the last decades.

contribution rate. Our results suggest that these measures, taken together, would not be sufficient to effectively contain actuarial deficits for a few countries. For these countries, we recommend that they also take measures to improve coverage of the scheme, with a view to reducing the old age dependency ratio. This paper contributes to the existing literature on pension reforms in the Caribbean by quantifying the impact of parametric reforms, providing a cross-country perspective and discussing the pros and cons of each reform.⁵

The remainder of the paper is structured as follows. Section II discusses the impact of recent macroeconomic developments in the region on the NIS. Section III presents an overview of the pension schemes and recent trends in their finances. Section IV discusses NIS viability and the need for fiscal transparency in the management of pension schemes. Section V presents the results of three parametric reforms that could potentially contain the projected rise in pension costs. Section VI concludes.

II. IMPACT OF RECENT MACROECONOMIC DEVELOPMENTS ON PENSION SCHEMES

Caribbean countries were hit hard by the 2008 global financial crisis (Annex I). Declines in remittances, tourism arrivals and offshore finances affected growth, employment and the fiscal position. However, the magnitude and the duration of the output loss differed markedly across countries: the average decline was much higher in tourism-dependent countries than in resource-based ones. In tourism-dependent countries, output started to recover much later, but at an accelerated pace, reaching growth rates significantly above 4 percent in some cases (St. Kitts and Nevis and Grenada). Nonetheless, fiscal positions deteriorated, except for countries with an IMF program (Antigua and Barbuda, Grenada, Jamaica, and St. Kitts and Nevis) and Guyana.⁶ Consequently, debt-to-GDP ratios increased sharply.

The economic downturn has negatively impacted pension schemes in the region. Decline in real wage growth and almost a doubling of unemployment rates contributed to lower pension contributions. At the same time, pension spending increased as more individuals retired from the labor force and sought pension benefits. Invalidity and short-term disability claims also increased as a result of higher unemployment. Furthermore, NIS' investments have been adversely affected by declines in asset value, following the collapse of two large regional financial groups (the Stanford Financial Group and the Trinidad-based conglomerate CL Financial) and debt restructuring (e.g., in Jamaica). These developments reinforce the need for pension schemes reform.

⁵ See Alleyne (2001), Plamondon (2001), Brough (2004), Osborne (2004), Paddison (2006), Williams et al., (2005), ECLAC (2005a), ECLAC (2005b), Herbert (2005), Pattinato et al., (2005), ECLAC (2006), and Monroe (2009). In addition, several assessments have been undertaken at the country level.

⁶ The situation in Antigua and Barbuda deteriorated significantly after the end of the IMF program in 2012.

III. OVERVIEW OF THE PENSION SYSTEMS AND RECENT TRENDS

A. Characteristics of the Pension Systems

All Caribbean countries have comprehensive social security schemes which are broadly similar in design.⁷ Initially focusing on old-age pensions, the schemes have gradually expanded and now offer a wide range of benefits, typically including invalidity and survivor's pensions, as well as benefits for sickness, maternity, and employment injury. In addition, a few countries have added unemployment benefits (Barbados and The Bahamas), and partial health benefits (Belize, Jamaica, and The Bahamas). Coverage is mandatory for employees and the self-employed (except for Trinidad and Tobago), although the enforcement of contribution provisions is much looser for the latter than for salaried workers. In spite of the gradual expansion of the scope, the basic structure remains that of a traditional defined-benefit scheme. In addition, a number of design parameters are common to most schemes, including higher accrual rates for the initial 10–15 years, generally similar vesting periods and caps on pensionable wage, and benefit adjustments subject to parliamentary approval.⁸ There are also notable differences among the schemes in the region. For example, Barbados has three separate NIS funds (old age, unemployment and severance) and Jamaica has a scheme that offers both flat-rate and wage-related pension benefits.⁹

The schemes are the main component of public social security and are financed by payroll taxes paid by both employees and employers. Contribution rates vary significantly across countries, with the employer paying a larger share in most cases (Table 1). According to the latest available data, total pension contributions for old age pension, survivor and disability, as a share of pensionable wage average 10 percent in the Caribbean, which is lower than comparators in Latin America, Europe, and Asia and the Pacific. Contribution rates are very low in Jamaica, but are above the regional average in Barbados, Dominica, Guyana and Trinidad and Tobago. These rates apply to wages up to a statutory limit (wage ceiling), which are increased by legislation from time to time. Thus, a portion of wages of high income earners is excluded from the computation of contributions and does not also count towards benefits.

The most significant benefit provided by the NIS is old age pension, which accounts for about two-thirds of total benefits. In addition to NIS benefits, public sector employees in some countries receive government pensions, which are non-contributory. In all countries, private pension funds exist and are organized along occupational lines. Some countries also

⁷ The schemes were designed along the lines of 'scaled-premium', partially funded benefits models. Such models assume that contributors will generate the resources required to pay benefits to the current generation of pensioners.

⁸ World Bank, (2010), *Strengthening Caribbean Pensions: Improving Equity and Sustainability*, Report No. 47673-LAC, pp. iv-v.

⁹ The flat rate portion, which depends on the average number of contributions made by the insured, provides a base income level for the low income earners, while the wage-related portion depends on the actual amount of contributions.

have private annuities, and a variety of retirement savings vehicles, such as individual retirement accounts.

Table 1. Contribution Rates for Social Security Systems, 2014						
(Percent of Covered Wage)						
	Old Age, disability and survivors			All Social Security Programs		
	Employee	Employer	Total	Employee	Employer	Total
Antigua and Barbuda	2.7	5.0	7.7	7.5	9.5	17.0
Bahamas	3.9	5.9	9.8	4.4	6.4	10.8
Barbados	8.6	9.4	18.0	9.2	10.4	19.6
Belize	2.9	5.1	8.0	2.9	5.1	8.0
Dominica	3.8	7.0	10.8	4.5	7.3	11.8
Grenada	4.0	5.0	9.0	4.0	5.0	9.0
Guyana	5.6	8.4	14.0	5.6	8.4	14.0
Jamaica	2.5	2.5	5.0	2.5	2.5	5.0
St Kitts and Nevis	5.0	5.0	10.0	5.0	6.0	11.0
St Lucia	5.0	5.0	10.0	5.0	5.0	10.0
St Vincent and the Grenadines	3.5	4.5	8.0	3.5	5.0	8.5
Trinidad and Tobago	4.0	8.0	12.0	4.0	8.0	12.0
Caribbean Average	4.3	5.9	10.2	4.8	6.5	11.4
LAC Average	5.7	6.4	12.1	7.1	12.0	19.1
Europe Average	8.2	16.0	24.2	11.4	22.8	34.2
Asia & Pacific Average	6.0	10.1	16.1	6.7	12.7	19.3

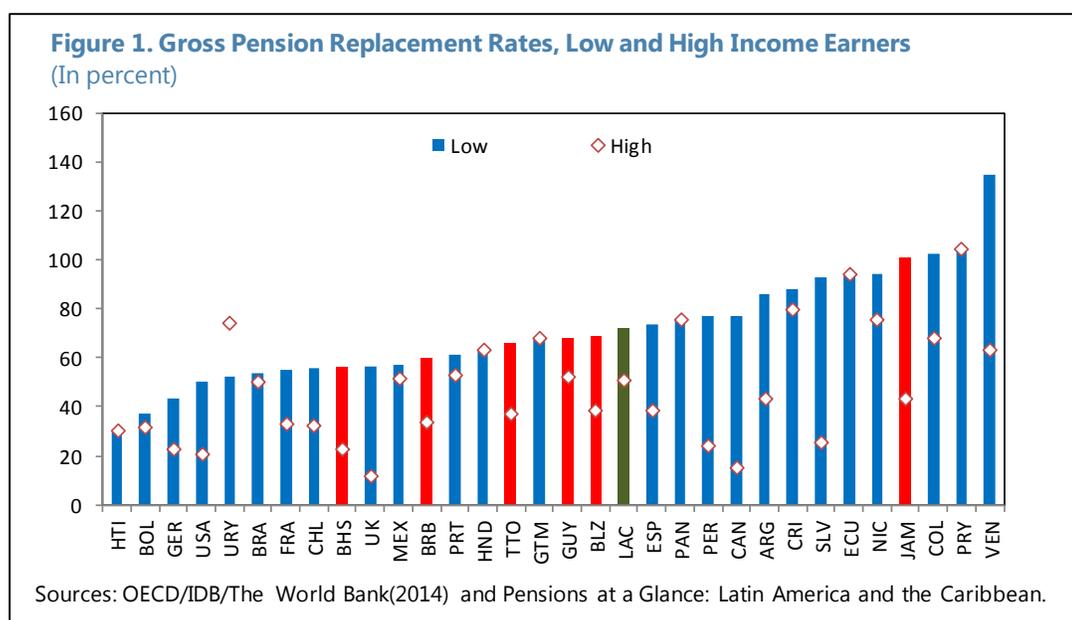
Source: National Authorities; Social Security Programs Throughout the World; and IMF staff calculations.

To receive benefits under the NIS, certain conditions have to be met. For old-age pension, the insured must attain a statutory pensionable age, and complete a specified period of covered employment. Typically, it requires ten years of contributions to qualify for a minimum pension, representing some 30 percent of the pensionable wage.¹⁰ The statutory retirement age for receiving full benefits is around 60–65 years for men and women. On average, the retirement age in the Caribbean is comparable to standards in Latin America but lower than the standards in Europe (Table 2). Following recent reforms (Annex II), the pensionable age in Barbados will rise to 67 years in 2018. Delayed retirement is permitted at increased benefits in some countries (for example, until age 65 and 70 in The Bahamas and Barbados, respectively). Optional early retirement at reduced benefits is available at ages ranging from 60 to 62 in Barbados, Belize, The Bahamas, and St. Lucia.

¹⁰ The pensionable wage is generally calculated as the average highest wage during the last 3-5 year period or during the last 10-15 years of employment. The rate of benefit accumulation is, in all cases, diminishing over time. The maximum pension, usually attained after 40 years of contributions, ranges from 50 to 70 percent of the pensionable wage.

	Statutory Pensionable Age		Early Pensionable Age /1		Life Expectancy at Birth (years)		Life Expectancy at 60 (years)	
	Men	Women	Men	Women	Men	Women	Men	Women
	Antigua and Barbuda	60	60	73	77	21	23
Bahamas	65	65	60	60	73	78	19	23
Barbados	66.5	66.5	62	62	75	81	21	25
Belize	65	65	60	60	72	78	19	23
Dominica	60	60	...	...	72	77	21	22
Grenada	60	60	...	...	73	77	16	23
Guyana	60	60	...	...	60	67	13	17
Jamaica	65	62	...	...	72	77	20	23
St Kitts and Nevis	62	62	...	...	72	79	17	21
St Lucia	65	65	60	60	72	76	19	23
St Vincent and the Grenadines	60	60	...	...	72	75	20	22
Trinidad and Tobago	60	60	...	...	66	74	16	20
Caribbean Average	62	62	...	...	71	76	19	22
LAC Average	62	61	...	...	72	78	20	23
Europe Average	64	63	...	...	76	82	20	24
Asia & Pacific Average	60	57	...	...	70	75	18	20

Sources: National Authorities; Social Security Programs Throughout the World; World Health Organization; and IMF staff calculations.
1/ Some countries have no early pensionable age, some have only for specific groups and others have no information.



Usually, low-income earners are protected from old-age poverty by providing this segment a relatively high replacement rates than the average and high income earners.¹¹ Based on available data, Jamaica provides low earners with pensions equal to their earnings—higher than the Latin America Average of 72 percent. The Bahamas, Barbados, Belize, Guyana, and Trinidad and Tobago offer replacement rates lower than the Latin America average (Figure 1).

¹¹ The replacement rate is defined as gross pension entitlement divided by gross pre-retirement earnings.

B. Trends in NIS Finances

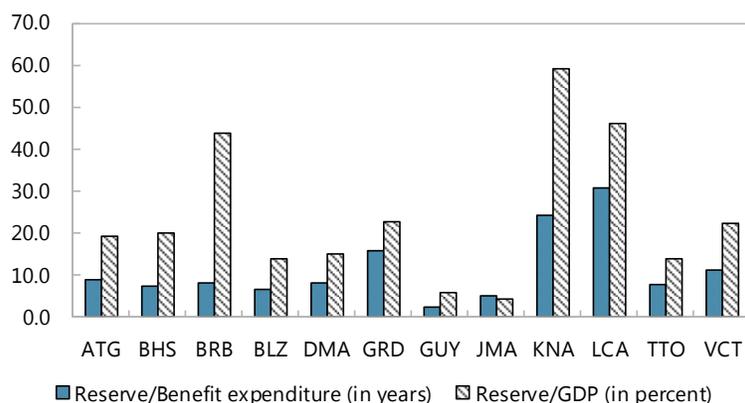
Most social security schemes in the Caribbean have been in existence for over four decades. As expected, they have generated large surpluses, due to minimal expenditure in the early years. At present, total income (contribution and interest income) still exceeds total expenditure in all the countries except in Antigua and Barbuda, and Guyana (Table 3). However, contribution income has already fallen short of total expenditure in some countries, and will do so in the next three years for the others, reflecting ongoing growth and fiscal challenges. The schemes are projected to exhaust their reserves starting in 2017 and half would do so by 2030. Besides anemic economic growth and high unemployment, in some countries, low contribution income is also due to inadequate coverage and weak compliance. These concerns are more acute in Jamaica, where high levels of informality mean that only about one-quarter of the employed labor force contributes to the NIS and pensioners receiving benefits are less than half of the pensionable population (i.e., population older than the retirement age). In Guyana, about 60 percent of the employed were reported to contribute to the system, but only 35–40 percent of the pensionable population receives benefits. Coverage is relatively high in Barbados, The Bahamas and Trinidad and Tobago. In Barbados, about 90 percent of the employed contributes to the scheme, 70 percent of the elderly population receives pensions, and 78 percent of workers have their wages fully covered. There is room for improvement in coverage in Antigua and Barbuda, Belize, Jamaica and St Vincent and the Grenadines, particularly for the self-employed.

Table 3. Key Dates in the Projections of Social Security Finances

	NIS establishment date	Year when expenditure first exceeds		Year when reserves are exhausted	PAYG Rate
		Contribution income	Total income		
Antigua and Barbuda	1972	2009	2010	2026	15.7
Bahamas	1972	1996, or earlier	2018	2029	21.8
Barbados	1966	2017	2024	2037	33.1
Belize	1979	1996, or earlier	2022	2030	16.2
Dominica	1975	2015	2030	2045	20.6
Grenada	1983	2016	2026	2038	15.0
Guyana	1969	2011, or earlier	2011	2017	24.0
Jamaica	1965	2007	2019	2025	9.5
St. Kitts and Nevis	1977	2015	2027	2043	20.5
St. Lucia	1979	2018	2028	2042	28.3
St. Vincent and the Grenadines	1986	2011	2019	2026	24.9
Trinidad and Tobago	1972	2013	2025	2035	16.8

Sources: Most recent actuarial reviews; IMF staff estimates; Social Security Programs Throughout the World: The Americas, 2013.

Surpluses generated by the schemes over time have led to the accumulation of substantial reserves. The latest available data indicate that total reserves averaged about 24 percent of GDP in all countries and were highest in St Kitts and Nevis and St. Lucia, 59 percent and 46 percent of GDP, respectively (Figure 2). Jamaica and Guyana NIS have accumulated the lowest amount of reserves—4 percent and 6 percent of GDP, respectively. Jamaica NIS lost J\$0.7 billion and J\$8 billion, (0.1 percent and 0.5 percent of GDP) in 2009 and 2013, respectively, due to debt restructuring. The reserve-to-annual benefit expenditure ratio ranges from 2.5 to 30. St. Lucia has the highest ratio, which could cover about 30 years of benefit payments without additional revenue. In Guyana, on the other hand, reserves are only enough to cover 2½ years of benefits.

Figure 2. NIS Reserves 1/

Source: National Authorities and IMF staff calculations
 1/ Available data for 2011-2014

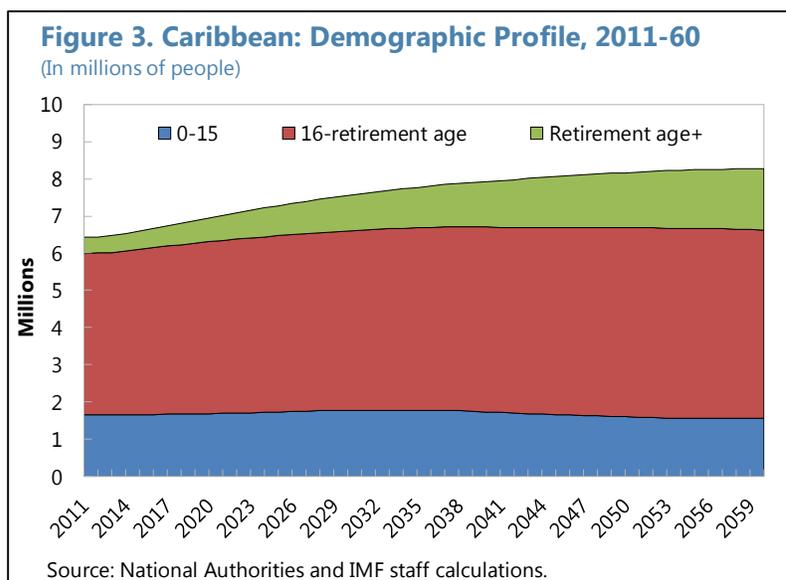
Table 4. Demographic Statistics, 2013

	Population (millions)	Percentage 65 or Older	Old-Age Dependency Ratio 1/
Antigua and Barbuda	0.09	7.1	0.11
Bahamas	0.36	7.0	0.10
Barbados	0.28	10.4	0.23
Belize	0.31	3.9	0.03
Dominica	0.07	10.4	0.18
Grenada	0.11	7.2	0.15
Guyana	0.79	3.3	0.08
Jamaica	2.70	7.8	0.10
St Kitts and Nevis	0.05	7.8	0.17
St Lucia	0.18	8.5	0.10
St. Vincent and the Grenadines	0.11	6.7	0.10
Trinidad and Tobago	1.30	8.3	0.10
Caribbean average	0.5	7.4	0.12
LAC average	26.8	7.7	...
Europe Average	20.0	16.1	...
Asia & Pacific Average	86.3	5.8	...

Sources: National Authorities; Social Security Programs Throughout the World; IMF Staff calculations.

1/ Population aged 65 or older divided by population aged 15-64.

Going forward, changing population dynamics are expected to negatively impact future income and expenditure flows and the long-run sustainability of the pension schemes (Figure 3; see Annex III for detail breakdown by country).¹² Life expectancy at birth is relatively high in the region—71 years for men and 76 years for women, on average (Table 2). Moreover, at age 60, a retiree is expected to live for 13–25 years. Increasing life expectancy rates and declining fertility rates are thus expected to triple old-age dependency ratios in the Caribbean (Table 4, Figure 3).



Administrative costs for pension schemes appear relatively high, reflecting limited room to exploit economies of scale in small islands (Table 5). Other inefficiencies, including staffing costs, are also non-negligible. Despite their centralized structure, pension systems in the Caribbean entail very high administrative costs, ranging from 0.1 to 0.7 percent of GDP. As a share of contribution income, administrative expenses range from as low as 5 percent in Barbados and Trinidad and Tobago to as high as 26 percent in Belize.¹³ In The Bahamas, for example, one-quarter of contributions is used to run the NIS, and staffing costs constitute around 70 percent of administration expenses, mostly reflecting the scheme's relatively large role, staff size, and the difficulties of rendering social services on all the islands¹⁴.

Administration costs in the Caribbean average 15 percent of contributions compared with around 0.8 percent and 3.0 percent, in the US and Canada, respectively, highlighting the need to correct major inefficiencies in the pension schemes. Another administrative challenge is low compliance.

¹² See Annex IV for the macroeconomic assumptions. Projections are based on the most recent real GDP growth data, which are lower than the historical average in some cases.

¹³ For Belize, NIS' administrative expenses reflect the cost of administering other social programs.

¹⁴ The Bahamas NIS has 579 employees in up to 20 locations across the country, and performs numerous functions, including registration, collection of contributions, and the administration of various benefits. It will begin registration of beneficiaries under the soon-to-be launched government's National Health Insurance.

Table 5. Caribbean: Social Security Administrative Costs 1/				
	Costs as a percent of			
	Benefit Expenditures	Contribution Income	Reserve Assets	GDP
Antigua and Barbuda	18.8	16.3	2.1	0.4
Bahamas	50.7	24.6	3.3	0.7
Barbados	6.0	5.2	0.7	0.3
Belize	26.1	26.9	4.1	0.6
Dominica	12.3	11.3	1.5	0.2
Grenada	15.3	14.3	1.0	0.2
Guyana	12.3	13.9	4.9	0.3
Jamaica	6.2	8.1	1.2	0.1
St. Kitts and Nevis	22.7	17.5	0.9	0.6
St. Lucia	17.6	11.4	0.6	0.3
St. Vincent and the Grenadines	24.7	22.1	2.2	0.5
Trinidad and Tobago	5.1	5.0	0.6	0.1
Caribbean average	18.2	14.7	1.9	0.3
US	0.7	0.8	0.2	0.0
Canada 2/	3.5	3.0	0.7	0.1

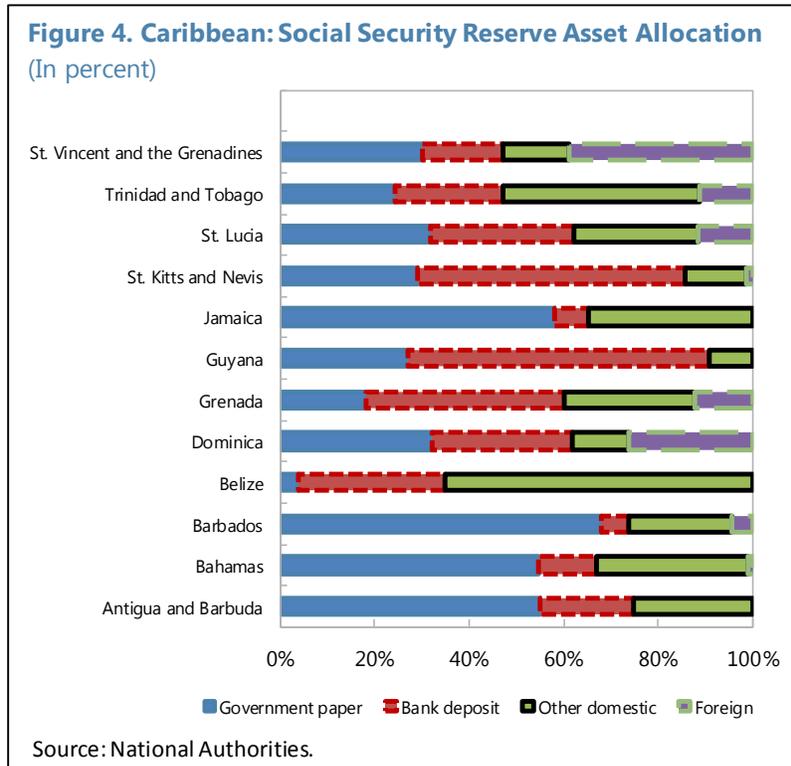
Sources: National authorities; Osborne (2004); and IMF staff estimates.
1/ Latest data available.
2/ Canadian Pension Plan only.

C. Investments of Pension Funds

Sound management of NIS' assets is important not only to preserve contribution income but also to generate additional value that would help meet pension obligations. NIS' assets amount to about 24 percent of GDP. Typically, all the schemes have asset allocation guidelines. However, given that capital markets are not well developed in the region, NIS' reserves are invested in domestic assets, mainly government paper and short term deposits. This also means that pension schemes have significant impact on the domestic financial system and the broader economy.

Government paper, including those issued by State-owned enterprises (SOEs), constitutes the largest share of NIS' investment portfolio (36 percent on average; Figure 4). While the NIS in Belize holds 4 percent, that in Barbados holds 68 percent of government securities.¹⁵ Short-term deposits at banks and other financial institutions is the second largest component (28 percent of total assets). They range from 6 percent in Barbados to 57 percent in St. Kitts and Nevis. The share of other domestic investments is 27 percent on average. The NIS in Belize holds the highest other domestic investment, reflecting private sector loans and equity investment in two large public utilities. In Jamaica, NIS' real estate investments account for 15 percent of total investment. In addition, two-thirds of the pension schemes have foreign investment, which includes assets held within the region. The NIS in St. Vincent and Grenadine has close to 40 percent of its assets invested within the region.

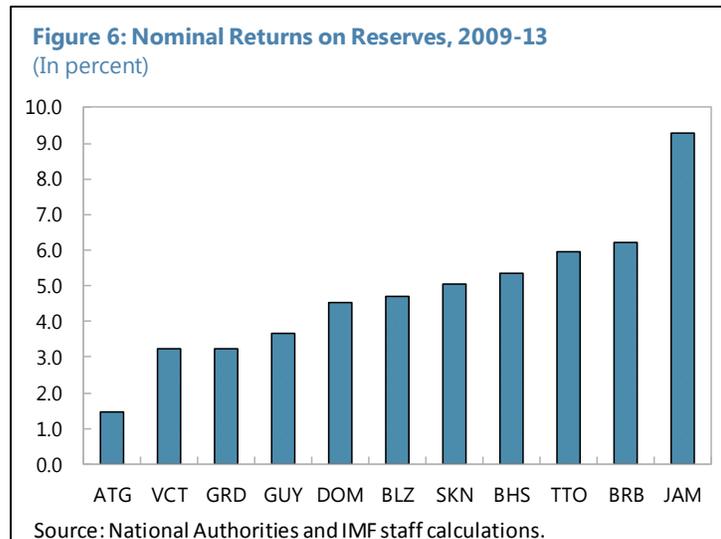
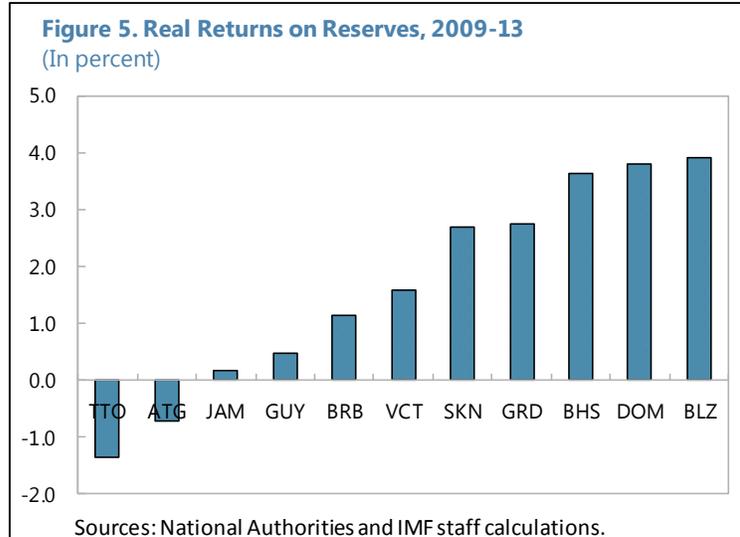
¹⁵ According to Barbados' NIS officials, the suggested prudential limit for government securities is 54 percent, but the agency's own target is 60 percent.



The share of total assets held in bank deposits raises concerns about potential systemic financial stability. In the ECCU countries, these deposits are held almost exclusively in locally incorporated banks, which are heavily exposed to the government on the asset side of the balance sheet—implying that NIS’ overall exposure to government could be higher than reported. There is also a concern about what would happen to the banking system, should social security surpluses dry up and reserve assets withdrawn to fund cash flow deficits. A more developed interbank market would help to reduce these liquidity pressures, but this market has remained fairly inactive.¹⁶

In some countries, the schemes are mandated to pursue developmental objectives in the areas of housing, health, tourism and education. To this end, they have advanced loans to government entities, including development banks, in some cases, at below market interest rates. The NIS are thus subsidizing social programs, when in fact, they may perhaps be able to command higher rates in the market where there is no excess liquidity. The average yield was 1.6 percent, in real terms, during 2009–13, reflecting mainly investment in low risk assets (Figures 5 and 6).

¹⁶ This will depend on how much advance notice the banks have relative to their maturity structure.

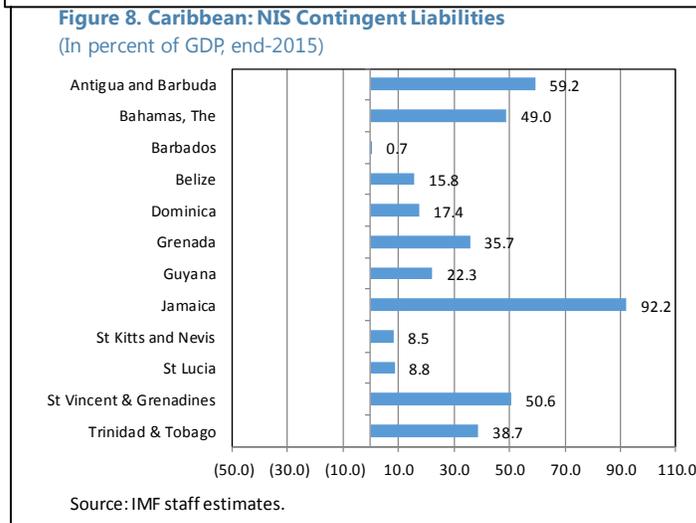
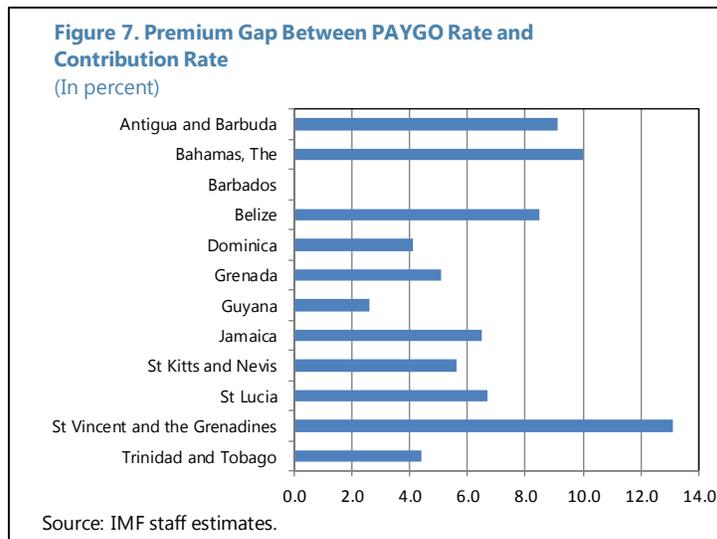


IV. VIABILITY OF THE PENSION SYSTEMS AND NEED FOR FISCAL TRANSPARENCY

The viability of a pension systems is assessed in two ways. The first approach is to estimate the pay-as-you-go (PAYGO) contribution rate, which is the rate at which current outlays on pension benefits equals current revenues. The premium gap for the pension system, defined as the difference between the PAYGO rate and the current contribution rate, are shown in Figure 7. All pension schemes in the region have a premium gap, except Barbados. This means that the contribution rate would have to be increased from 10.8 percent to 14.9 percent in Dominica and from 10 percent to 23 percent in St. Vincent and Grenadines (more than twice the current rate) in order for the NIS to break even.

A second approach is to impute the “actuarial balance” or contingent liabilities of the social security scheme. The net implicit debt is the present value of future expenditures minus the present value of future contributions plus current reserves over a 45-year horizon (Figure 8). In the Caribbean, estimates of net implicit debt range from a surplus of 0.7 percent of GDP in

Barbados to a deficit of 92 percent of GDP in Jamaica—reflecting the large cash flow deficits that would emerge in the coming decades. In the event that the scheme is unable to meet its obligations, the government is expected to step in to compensate pensioners. However, since fiscal positions are already over-stretched and public debt-to-GDP ratios are very high in the region, these contingent liabilities are major sources of fiscal risk. Cebotari (2008) and IMF (2012) have shown that, in several cases, failure to disclose and prepare for contingent liabilities has led to large increases in public debt and triggered fiscal crisis. In other words, countries with both large debt-to-GDP ratios and unfunded pension schemes need to implement far-reaching pension reforms now or risk even higher taxes, lower growth and unsustainable public debt dynamics.



A first step in addressing the potential fiscal risk associated with the pension schemes is disclosure of information. At a minimum, the actuarial deficits should be systematically monitored, and reported to the public with frequency and a degree of detail that allows a proper evaluation of the fiscal risk. For this reason, the *2001 Government Financial Statistics Manual (GFSM 2001)* recommends extending the coverage of government to include statistics on the nonfinancial public sector as well as general government—for example, to encompass the NIS. In the same vein, the IMF's *Code of Good Practices on Fiscal*

Transparency requires that public sector balances should be reported. The Code also calls for separate reporting of the nature and fiscal significance of quasi-fiscal activity. Therefore, given the large fiscal risk associated with pension schemes in the Caribbean, it is good practice that governments adhere to these codes of international best practice.

V. IMPACT ANALYSIS OF PARAMETRIC REFORMS

This section presents the impact analysis of reforms that could be adopted, focusing on old-age pension, with a view to maintaining sustainability as the pension systems mature and the population ages (see Annex IV for the baseline projections).¹⁷ The magnitude of the unfunded pension deficits suggests that relatively deeper reforms are required to stabilize the schemes over the next 45 years. These could include raising the retirement age and contribution rate, especially in countries where they are low, and cutting benefits in countries where the replacement rate is high. In this paper, we consider three reforms aimed at strengthening the existing PAYGO system. All countries in the Caribbean, except Barbados, could follow this route, at least as an initial step, toward more comprehensive reforms, including: (i) raising the statutory retirement age from 60 to 65 years; (ii) freezing pension spending for two years; and (iii) increasing the contribution rate on a one-time basis by one percentage point in 2016.^{18,19}

	Increase Pension Eligibility Age		Freeze Pensions (2 yrs.)		Increase Contribution Rate (1%)	
	2016	2021	2016	2021	2016	2021
Antigua and Barbuda 1/	0.3	1.8	0.1	1.7	0.6	2.0
The Bahamas 2/	0.8	5.3	0.4	3.2	0.3	1.6
Barbados 3/	n.a.	n.a.	0.4	4.2	0.4	2.2
Belize 2/	0.3	1.5	0.1	1.0	0.7	2.3
Dominica 1/	2.2	6.0	0.2	1.9	0.9	3.1
Grenada 1/	1.2	4.2	0.3	3.0	0.8	2.9
Guyana 1/	1.3	7.3	0.9	5.1	0.2	1.0
Jamaica 2/	0.3	1.4	0.4	1.2	0.0	0.6
St Kitts and Nevis 1/	1.0	3.6	0.1	1.5	0.9	3.0
St Lucia 1/	1.1	4.9	0.2	2.9	0.6	2.3
St Vincent and the Grenadines 1/	0.1	2.1	0.0	1.3	0.3	1.8
Trinidad and Tobago 2/	2.1	7.5	0.2	2.2	0.4	1.5

Source: IMF Staff estimates.
 1/ Increase statutory retirement age from 60 to 65.
 2/ Increase statutory retirement age from 65 to 67
 3/ For Barbados, an increase in the pensionable age to 67 is already planned for 2018.

A. Raising the Statutory Retirement Age

The gap between life expectancy and the pension eligibility age is relatively large for most countries in the Caribbean. Moreover, the elders are expected to remain healthy and less likely to be disabled, which would allow them to make the choice to work longer. In this

¹⁷ See Annex V for a description of the model.

¹⁸ This includes an increase in the retirement age from 65 to 67 for The Bahamas, Belize and Jamaica. For Barbados, the retirement age is already scheduled to increase to 67 by 2018. The pace of the reforms could be calibrated depending on each country's economic and political circumstances.

¹⁹ These are consistent with the main recommendations in recent actuarial reports of the countries covered.

context, raising the retirement age would help pension finances by increasing the years of contributions and reducing the number of years of benefits. For Dominica, for example, simulations show that increasing the statutory retirement age would generate cumulative savings of 6.0 percent of GDP by 2021 relative to 2015 (Table 6).

Containing eligibility through increasing the retirement age would have other advantages. First, it is expected to bolster long-run economic growth by promoting continued labor force participation of old-aged workers and raising consumption through improved lifetime earnings. Second, it is fairer from intergenerational equity perspective—thus, the burden would be more equally shared between younger and older generations (Tokuoka, 2012). Third, in some cases, it could allow for a reduction in the contribution rate, thereby lowering labor costs and increasing household disposable income. The disadvantages include: possible deterioration in the quality of life and a higher level of anxiety for older workers.²⁰

B. Freezing Old-Age Benefits

While freezing pension spending for two years reduces the schemes' actuarial deficit, doing so could marginally worsen old-age poverty depending on each country's specific circumstances.²¹ An across-the-board freeze in pension spending for two years would generate 0.9 percent of GDP in savings in 2016 and postpone the depletion of NIS assets from 2021 to 2027 in Guyana. However, this measure could dampen economic growth and could on the margin undermine the pension system's ability to contain old-age poverty, especially in a high inflation environment.

C. Increasing the Contribution Rate

The average pension contribution rate in the Caribbean is lower than the average in Europe, Asia and Latin America (Table 1). Raising the rate by 1 percentage point, on a one-time basis, for example, would increase contribution income by 0.9 percent of GDP in 2016 in St Kitts and Nevis. While empirical evidence suggests that strengthening the link between pension contributions and benefits improves labor market outcomes (Disney 2004), it tends to aggravate intergenerational imbalances—pension contributions are paid by the working-age population.²² Moreover, increasing labor market friction in a fixed exchange rate regime (which is the case for all countries, except for Guyana and Jamaica) could be costly in terms of economic growth and employment.

²⁰ Evidence shows that increases in the statutory retirement age do not, by themselves, necessarily lead to increase in labor force participation for older workers. Complementary reforms could include tightening rules for early retirement, benefit rationalization, and other financial incentives, together with policies that boost labor demand for those that postpone retirement (IMF; 2012).

²¹ For example, it depends on how much old age pensioners rely on the pension, as opposed to other sources of income, such as other pension fund, remittances or their own savings.

²² R. Disney, (2004), "Are Contributions to Public Pension Programmes a Tax on Employment?", in *Pensions and Employment*, Economic Policy, July 2004, pp. 267-311, Printed in Great Britain.

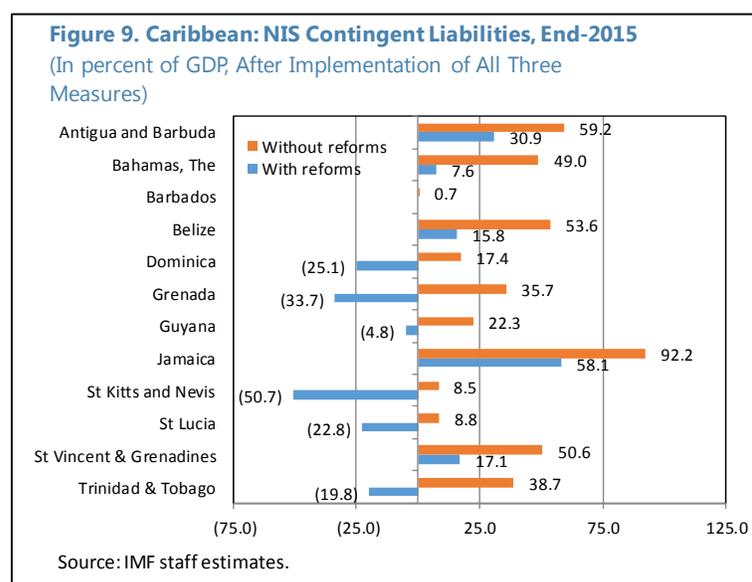
D. Impact of All Three Reforms Combined

All three measures, if implemented together, will on average eliminate the actuarial deficit for the region as a whole in 2016. However, for countries with relatively large unfunded pension liabilities (e.g., Antigua and Barbuda, The Bahamas, Belize, Jamaica, and St Vincent and the Grenadines), these measures will not be sufficient to address the actuarial deficits (Figure 9)²³, despite having quite a large benefit in reducing pension costs. However, the population aging dynamics are such that the reforms have fairly limited impact on raising contributions, indicating that policymakers also need to focus on broadening the coverage of the scheme. Furthermore, these countries would have to implement far-reaching structural reforms or risk even higher taxes, lower growth and unsustainable debt dynamics. For example, the above mentioned countries should consider increasing contribution rates further (by as much as 5.5 percent in the case of Antigua and Barbuda) in order to close the premium gap (Table 7).

Table 7. Premium Gap After Implementation of All Three Measures

	Contribution Rate	Average Pay-As-You-Go Rate	Premium Gap
Antigua and Barbuda	8.7	14.2	5.5
Bahamas	10.8	16.2	5.4
Belize	9.0	13.0	4.0
Jamaica	6.0	11.4	5.4
St Vincent and the Grenadines	11.0	18.6	7.6

Source: IMF staff calculations.



²³ It appears that Jamaica would, first of all, need to expand coverage of its pension scheme in order to maximize the impact of the reforms discussed in this paper.

VI. CONCLUDING REMARKS

Population aging is putting increasing pressure on public finances in the Caribbean. Long-term projections point to continuing unfavorable demographic trends. Thus, pension schemes have become unsustainable. In addition, there is a concern that investment of pension funds may lead to high exposures to government securities. These developments, together with anemic economic growth, rising unemployment, and limited room for macroeconomic policy intervention, suggests that pension reforms are unavoidable. A range of reform measures, with varying socio-economic impact could be implemented to contain the projected increase in pension spending.

This paper quantifies the impact of three parametric reforms, highlighting their implications for economic growth, intergenerational equity, and fiscal savings. In addition to containing demographic pressures, raising the retirement age would not only be inter-generationally fair, but could also have a positive effect on economic growth in the long run by increasing participation in the labor force. At the same time, it will reduce the welfare of older workers and the unemployment of the young. An across-the-board freeze in old-age benefits for two years is shown to improve the financial position of the pension systems but it could somewhat dampen economic growth and, at the margin, could increase old-age poverty. Finally, a one percentage point increase in the pension contribution rate would bring the contribution rate closer to global averages and improve the sustainability of the pension systems, but it could also discourage labor market participation and aggravate intergenerational imbalances. For most countries, implementing these three reform measures concurrently would suffice to put the pension scheme on a sustainable path. For other countries (such as Antigua and Barbuda, Belize, Jamaica, and St Vincent and the Grenadines) these measures would need to be complemented by improvement in the coverage of the pension schemes. While the appropriate combination of the measures necessary to eliminate the actuarial deficits varies depending on each country's circumstances, most countries need to undertake these reforms now or risk even higher taxes, lower growth and unsustainable debt dynamics.

Finally, it is imperative that the authorities begin to build national awareness of the fiscal risk associated with the pension schemes and the need for reforms. At a minimum, the actuarial deficits should be systematically monitored and reported to the public with more frequency and a degree of detail to allow proper evaluation of the fiscal risk.

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Annex I. Macroeconomic Trends, 2006-14											
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2006-08 Average	2009-14 Average
GDP growth											
Antigua and Barbuda	12.7	7.1	1.5	-10.7	-8.5	-1.9	3.6	1.5	4.2	7.1	-2.0
The Bahamas	2.5	1.4	-2.3	-4.2	1.5	0.6	2.2	0.0	1.0	0.5	0.2
Barbados	5.7	1.8	0.4	-4.0	0.3	0.8	0.3	0.0	0.2	2.6	-0.4
Belize	4.6	1.1	3.2	0.7	3.3	2.1	3.8	1.5	3.6	3.0	2.5
Dominica	4.7	6.4	7.1	-1.2	0.7	-0.1	-1.3	0.6	3.9	6.0	0.4
Grenada	-4.0	6.1	0.9	-6.6	-0.5	0.8	-1.2	2.3	5.7	1.0	0.1
Guyana	5.1	7.0	2.0	3.3	4.4	5.4	4.8	5.2	3.8	4.7	4.5
Jamaica	2.9	1.4	-0.8	-3.4	-1.5	1.4	-0.5	0.2	0.4	1.2	-0.6
St Kitts and Nevis	4.6	4.8	3.4	-3.8	-3.8	-1.9	-0.9	6.2	6.1	4.3	0.3
St Lucia	8.2	0.6	2.8	-0.5	-1.7	0.7	-1.1	0.1	0.5	3.9	-0.3
St Vincent and the Grenadines	6.0	3.0	-0.5	-2.0	-2.3	0.2	1.3	2.3	-0.2	2.9	-0.1
Trinidad and Tobago	13.2	4.8	3.4	-4.4	-0.1	0.0	1.4	1.7	0.8	7.1	-0.1
Unemployment rate											
Antigua and Barbuda		3.5				16.2				3.5	16.2
The Bahamas	7.6	7.9	8.7	14.2	15.1	15.9	14.4	15.8	14.6	8.1	15.0
Barbados	8.7	7.4	8.1	10.0	10.3	11.2	11.5	11.6	12.7	8.1	11.2
Belize	9.4	8.5	8.2	13.1	13.5	14.0	14.4	14.1	11.1	8.7	13.4
Dominica	.	.	.	9.8	.	.	.	.	.	.	.
Grenada			24.9		29.0			32.5	28.9	24.9	30.1
Guyana	.	.	.	.	.	.	.	.	.	.	.
Jamaica	10.3	9.9	10.6	11.4	12.4	13.0	13.9	15.3	15.3	10.3	13.5
St Kitts and Nevis	.	.	5.1	.	.	.	.	.	.	.	.
St Lucia	16.7	14.0	15.7	18.1	20.6	21.2	21.4	23.3	24.4	15.5	21.5
St Vincent and the Grenadines			18.8								
Trinidad and Tobago	6.2	5.5	4.6	5.3	5.9	5.1	4.9	3.7	3.3	5.5	4.7
General government balance 1/											
Antigua and Barbuda	-8.8	-5.0	-5.7	-18.2	-0.3	-3.6	-1.2	-4.3	-2.9	-6.5	-5.1
The Bahamas 2/	-0.7	-1.4	-1.2	-3.0	-3.2	-3.8	-4.3	-5.4	-3.3	-1.1	-3.8
Barbados 2/	-2.4	-4.4	-4.8	-7.3	-8.8	-4.4	-8.6	-11.2	-6.6	-3.9	-7.8
Belize 2/	-3.9	-0.7	0.4	-1.2	-1.7	-1.1	-0.5	-3.5	-3.9	-1.4	-2.0
Dominica	2.9	1.8	0.7	-0.3	-3.4	-4.4	-5.4	-2.8	-3.4	1.8	-3.3
Grenada	-5.6	-6.4	-4.1	-5.2	-3.6	-5.2	-5.9	-7.3	-4.7	-5.4	-5.3
Guyana	-8.0	-4.3	-3.9	-3.7	-2.8	-3.1	-4.8	-4.3	-5.1	-5.4	-4.0
Jamaica	-4.9	-3.8	-7.5	-11.1	-6.3	-6.4	-4.1	0.1	-0.5	-5.4	-4.7
St Kitts and Nevis	-1.8	-3.6	-3.9	-2.8	-7.5	1.9	4.9	12.1	9.5	-3.1	3.0
St Lucia	-5.8	-1.8	-0.9	-3.1	-4.9	-6.5	-9.2	-5.9	-3.6	-2.8	-5.6
St Vincent and the Grenadines 2/	-3.3	-3.4	-1.4	-3.0	-3.9	-7.2	-2.1	-6.2	-3.0	-2.7	-4.2
Trinidad and Tobago	6.1	3.6	8.0	-9.1	-3.8	-0.1	-0.3	-2.0	-4.0	5.9	-3.2
Public Debt 1/											
Antigua and Barbuda	90.9	79.2	77.3	102.5	90.8	92.4	87.1	95.5	98.2	82.4	94.4
The Bahamas	29.6	30.0	32.3	38.4	43.2	45.0	48.4	56.3	60.9	30.6	48.7
Barbados	48.4	51.4	53.9	63.1	70.2	76.2	84.6	95.9	100.7	51.2	81.8
Belize	90.6	86.0	79.8	83.7	83.2	79.4	75.0	75.2	75.3	85.5	78.6
Dominica	77.4	71.8	64.4	62.5	66.8	69.7	72.6	74.7	76.4	71.2	70.5
Grenada	92.9	89.1	83.9	91.1	96.9	100.7	103.3	106.7	100.5	88.6	99.9
Guyana	94.2	59.9	61.6	64.8	65.2	65.2	62.5	57.3	65.8	71.9	63.5
Jamaica	117.1	114.5	127.0	141.9	142.0	140.5	145.3	139.7	135.7	119.5	140.9
St Kitts and Nevis	143.8	135.0	131.9	144.3	159.3	151.6	137.3	102.9	79.9	136.9	129.2
St Lucia	56.1	55.4	55.8	59.3	62.4	66.9	73.7	78.6	79.4	55.8	70.0
St Vincent and the Grenadines	64.1	55.5	56.7	63.5	66.3	68.3	72.0	74.3	76.7	58.8	70.2
Trinidad and Tobago	32.6	26.1	21.5	30.6	35.2	32.3	40.7	39.1	39.3	26.7	36.2
Sources: Country authorities and IMF staff estimates.											
1/ In percent of GDP.											
2/ Central government.											

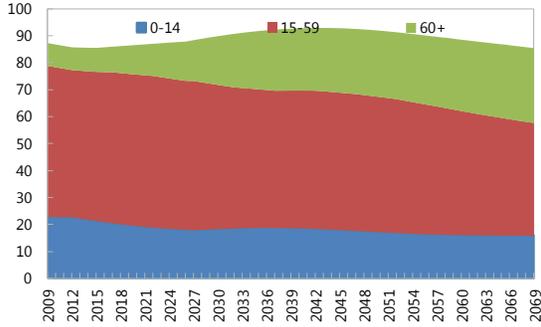
Annex II. Recent Parametric Reforms in Selected Countries

Barbados	<ul style="list-style-type: none"> Increasing contributions from 14 percent to 18 percent of insurable earnings over four years. Raising retirement age by six months every four years beginning in 2006, up to the revised retirement age of 67 years by the year 2018. Subjecting early retirement to an actuarial reduction of ½ percent per month early. Voluntary deferral in NIS pensions until age 70 with increase of ½ percent for each month after the standard pensionable age. Target reserve-to-expenditure ratio of five.
Bahamas	<ul style="list-style-type: none"> Unemployment benefit was introduced in 2009 providing income protection for workers from involuntary loss of wages. As a result, the contribution rate was raised by 1 percent to 9.8 percent in June 2010. The National Prescription Drug Plan was introduced in 2010, providing free prescription drugs for 14 chronic diseases for selected active beneficiaries. Eligibility rules were modified in 2010, and 2012, with likely positive impact on long term sustainability The wage ceiling was raised by 50 percent, while automatic biannual adjustments to both pensions in payment and the wage ceiling were introduced.
Belize	<p>As of July 1, 2003:</p> <ul style="list-style-type: none"> Contributions increased from 7 percent to 8 percent; employers 6½ percent and employees 1½ percent up to B\$130 of weekly insurable earnings. Vesting – minimum of 50 contributions to qualify for retirement grant, up from 26 contributions. Insurable earnings ceiling rose from B\$320 per week to B\$640. Retirement pension earmarked for a 100 percent increase to B\$384 per week. New basis for calculating pensions will be 2 percent of final average earnings for the first 20 years, thereafter, 1.25 percent up to a maximum of 60 percent of final average earnings. Final average earnings (the basis for calculating pensions) raised from the average the best three years to the best five years earnings to provide a more representative pension. Voluntary retirement age to be raised from 60 to 63 years. Mandatory retirement to move up from 65 to 67 years. Institutional reforms: prudential regulation and streamlining of its operations; system is being put in place to monitor financial and actuarial developments so that timely parametric adjustments can be made where needed. The Scheme is set to design key performance indicators to benchmark performance. Plans are afoot to revise the government pension scheme and the self-employed scheme to capture a wider pool of households.
Dominica	<p>The government approved a reform plan in 2006. The main changes were:</p> <ul style="list-style-type: none"> The total contribution rates will eventually be increased from the current 10.75 percent (2009) to 15 percent. The contribution ceiling will be increased from EC\$1,000 to EC\$6,000 per month, starting in 2008. The annual accrual rate for the contribution period between 10 and 20 years will be reduced from 2 to 1 percent and the maximum replacement rate will be reduced from 70 to 60 percent, starting in 2008. The pensionable wages will be increased from 3 to 10 years, starting in 2008. The minimum pension age will be increased by 1 year every 3 years up to 65, starting in 2009.
Jamaica	<p>From April 2006:</p> <ul style="list-style-type: none"> Weekly rate for full rate for Old Age, Invalidity and Widow's Pension has been raised from J\$900 to J\$1,500. Dependent Spouse's Allowance raised from J\$300 to J\$500. Insurable wage ceiling doubled from J\$250,000 to J\$500,000, from October 2003. Contribution rate unchanged at 2.5 percent each by employer and employee. 20 percent of the contributions are transferred to the National Health Fund and a National Health Plan for pensioners is being implemented since October 2003.
St Lucia	<ul style="list-style-type: none"> The normal retirement pensionable age is gradually being increased from 60 to 65. Years of contribution required to access the pension are being increased from 10 to 15. Progress began in 2000 and will be completed by 2013. The required age for a survival spouse to get a permanent pension was raised from 55 to the normal pension age.
St Vincent and the Grenadines	<ul style="list-style-type: none"> The contribution rate was increased as of January 1, 2008 to 8 percent of covered wages, 4.5 percent employer and 3.5 percent employee. Reforms enacted in 2013 that took effect on January 1, 2014 include: (i) increase in the contribution rate to 10 percent; (ii) the number of years of insurable wages averaged when calculating Age pension was increase from best 3 in 15 years prior to age 60 to the best 5 years over all contribution years; and (iii) the contribution rate of the self-employed persons was increased from 7.5 percent to 9.5 percent.
Trinidad and Tobago	<ul style="list-style-type: none"> 16 classes of contributions (Jan 2008). From 5 January 2004, earnings limits of each class of contributors will be indexed to earnings inflation to retain their real value. To capture a wider contribution pool, the effective income ceiling raised to TT\$8,300 per month (Jan. 2008) and the minimum contributory earnings will rise to TT\$433 per month (2004). Contribution will increase from 10.5 to 11.4 percent phased in from 2008 to 2012. Basic pensions will be indexed to earnings inflation to maintain their real values. This will be achieved by increasing basic pension rates by 24 percent. Increment rates will also be increased to lead to roughly a halving of the difference in accrual rates between basic and increment pensions. This would result in a further increase in increments of 71.6 percent and an overall increase of 112.8 percent when indexation is included. Introduction of a minimum pension of TT\$2,000 per month (Jan. 2008). Pensions payable for persons who retire at age 60. Pensioners who return to work will still be entitled to their pension and will be eligible for employment injury coverage by paying class Z contributions.

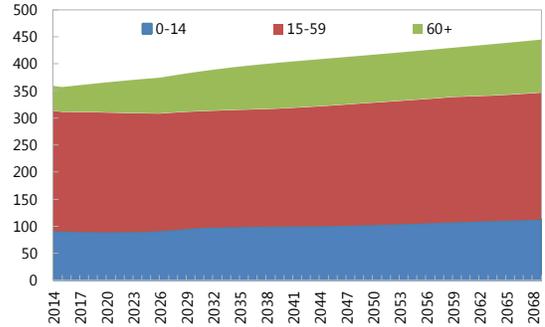
Sources: World Bank (2010); and IMF staff.

Annex III. Demographic Projections

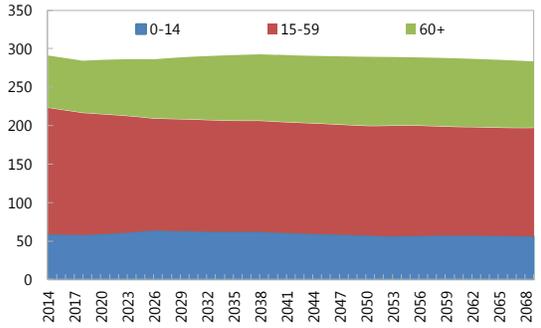
Antigua & Barbuda: Population Profile, by age groups
(Thousands of Persons)



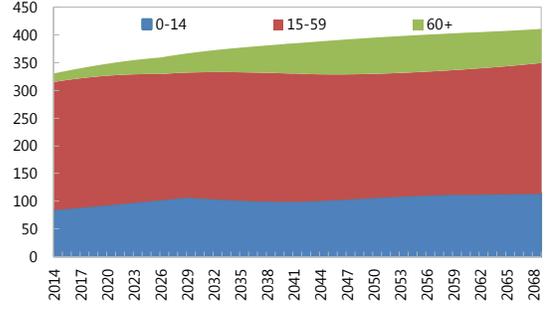
Bahamas: Population Profile, by age groups
(Thousands of Persons)



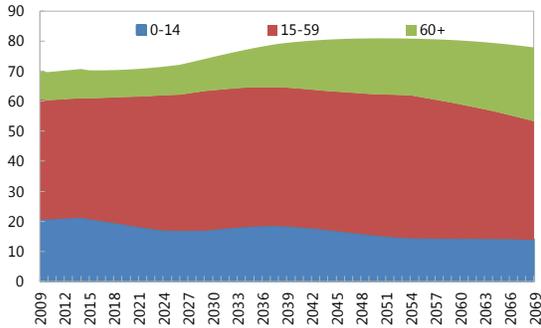
Barbados: Population Profile, by age groups
(Thousands of Persons)



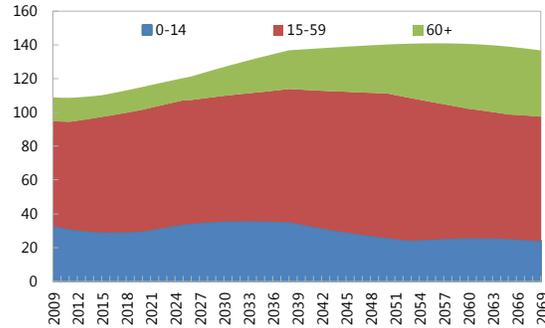
Belize: Population Profile, by age groups
(Thousands of Persons)



Dominica: Population Profile, by age groups
(Thousands of Persons)

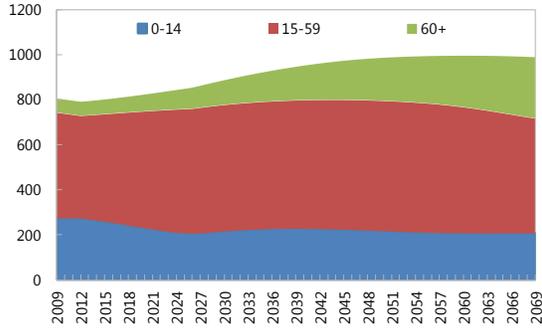


Grenada: Population Profile, by age groups
(Thousands of Persons)

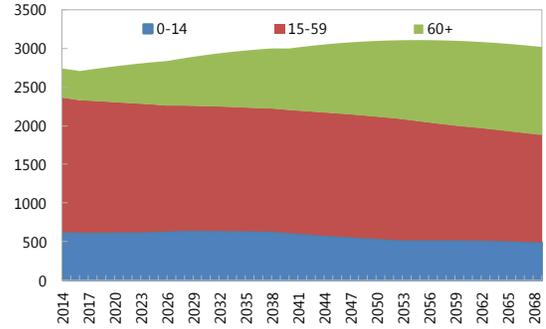


Annex III. Demographic Projections (Concluded)

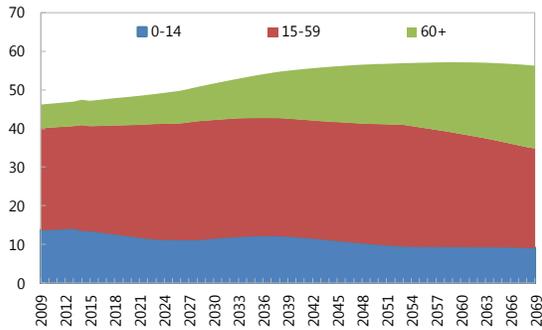
Guyana: Population Profile, by age groups
(Thousands of Persons)



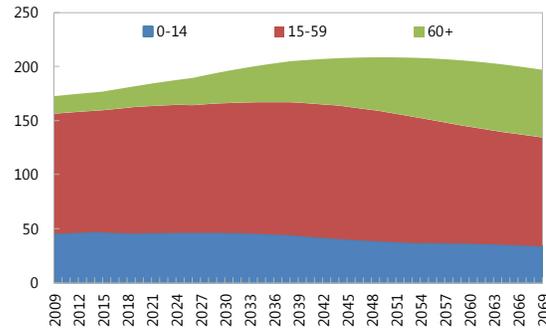
Jamaica: Population Profile, by age groups
(Thousands of Persons)



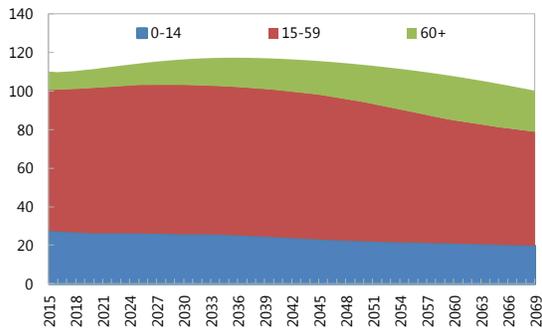
St. Kitts & Nevis: Population Profile, by age groups
(Thousands of Persons)



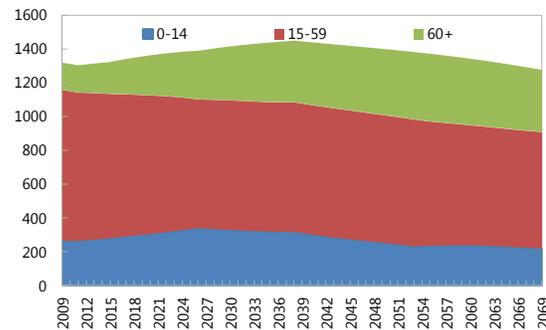
St. Lucia: Population Profile, by age groups
(Thousands of Persons)



St. Vincent and Grenadines: Population Profile, by age groups
(Thousands of Persons)



Trinidad: Population Profile, by age groups
(Thousands of Persons)



Source: National authorities.

Annex IV: Baseline Projections

(In millions of national currency)

Countries	2014			2030			2050		
	Income	Expenditure	Reserves	Income	Expenditure	Reserves	Income	Expenditure	Reserves
Antigua and Barbuda	98	117	605	151	333	0	331	788	0
Bahamas	274	454	1713	322	1466	0	608	3436	0
Barbados	796	1147	4481	1052	2815	3846	1491	5545	0
Belize	98256	75210	501836	177856	336021	0	284852	840180	0
Dominica	62	50	364	110	111	567	186	396	0
Grenada	94	67	842	220	273	773	567	1296	0
Guyana	15343	16093	28252	41889	76217	0	117355	286953	0
Jamaica	18751	16425	65829	54182	117103	0	319070	1121669	0
St. Kitts and Nevis	138	71	1411	235	277	1633	475	949	0
St. Lucia	204	147	1921	430	577	4093	581	3124	0
St. Vincent and the Grenadines	73	56	463	130	192	367	251	755	0
Trinidad and Tobago	4558	4109	25796	9766	12131	27900	15909	42731	0

Sources: Country authorities and IMF staff estimates.

Annex V. The Model

The model used in the simulations adopts the historic costs and benefits and projects them in line with a cohort-level demographic simulation. The demographic simulation forecasts the births, deaths, and migrations for each year and for each cohort. This then gives an estimated retiree population and workforce population over time, based on the original parameters set. The cost and benefit factors are then grown by a function of the macroeconomic and demographic estimates to provide a cost estimate of the scheme over time. The initial baseline estimates model parameters are set to mirror the conditions in the baseline of the last actuarial report for each country, where available.

Calculations of the actuarial balance are made for each country as a comparative measure of the solvency of the system. The balance is calculated as the difference between the present value of the contributions (and returns or losses on investment) minus the present value of the payments obligated to beneficiaries (and administrative expenditure). The discount rate used in the calculation is 5 percent for all countries.

The projections of contribution income, pensions spending and reserves for the period 2016-2050 are done as follows:

Contribution income grows in line with the number of contributors, real income (IMF estimates), inflation, and contribution rate. The number of contributors is based on the population size and the labor force as indicated in the most recent Actuarial Report.

The number of pensioners is projected by adjusting the previous year's figure by the projected number of current year's newcomers and exits, taken from demographic simulations within the model.

Fertility Rate: The fertility rate represents the number of children per adult, per year in a given cohort. It is multiplied by the number of people at that age in the cohort. This allows us to make adjustment by age group—setting the fertility rate differently across age groups.

The projected number of new beneficiaries is based on the assumption that the shares of cohorts of the covered pensioners in the population will remain at the same level during the forecast period, and injuries are forecast in line with assumed disability rates.

The projection of exits is based on the most recent data on shares of exits in the population, by cohorts. The projection is adjusted for changes in life expectancy.

- **Mortality:** The model is built with some pre-set mortality assumptions (set out in a life table—based on the most recent country actuarial report's demographic assessments. Mortality figures are used to create a “proportion of persons left alive” within an age cohort as it moves to the next cohort. Death rates within cohorts are adjusted to follow the pattern of population growth in the most recent actuarial report.

- **Migration:** The overall net migration rate for the model is based on the country actuarial report. This is then distributed across the groups, typically with the younger working-age groups affected the most. The migration numbers are then deducted from the population of their respective age groupings.

Disability: Disability rates are given per 10,000 of the population, and based on information in previous actuarial reports. They can change across gender and cohort, but assumed not to change over time. The population at that age is then multiplied by the disability rate.

Benefits: Starting from the base year, age benefits grow in line with the number of beneficiaries, real income, and inflation. For invalidity benefits, the base year is adjusted for inflation and changes in the historic coverage. The number of persons injured is calculated as a function of the disability rates at different cohort groups. Survivor benefits growth by the historical average and are adjusted for inflation.

The indexation of pensions follows the current CPI (plus real GDP growth) rule up to the point where the net replacement rate of a standard pensioner falls to the level of 50 percent replacement rate that is considered socially acceptable.

Other assumptions. The non-contributory scheme is held constant in real terms. Employment injury grows in line with growth in the age or disability funds. Administrative costs grow in line with inflation and historical average. Investment Income grows in line with growth in the reserves, and an assumed nominal rate of return, which is based on historical.

The reliability of projections would be affected by the shortcomings of the data as projected in the most recent Actuarial Review. These include: (i) data on formal employment by age cohorts; (ii) demographic projections, including migrations, birth and death rates; (iii) projections of life expectancy after retirement; (iv) detailed data on survivors; and (v) information on the likely performance of the investments in the fund. However, data on pensioners with accelerated years of service are not available, and we have had to utilize summary data for much of the costing information

Annex VI. Assumptions in Baseline Projections

Country	Real Earnings Growth (%)			Inflation (%)			Real Investment Return (%)			Contribution Rate (%)			Mortality rate at 75
	2015	2040	2060	2015	2040	2060	2015	2040	2060	2015	2040	2060	
Antigua and Barbuda	2.0%	2.2%	2.2%	1.2%	2.5%	2.5%	2.0%	2.0%	2.0%	7.7%	7.7%	7.7%	35.0%
Dominica	1.3%	2.0%	2.0%	0.5%	2.0%	2.0%	1.0%	1.0%	1.0%	10.8%	10.8%	10.8%	35.0%
Grenada	2.5%	2.5%	2.5%	1.7%	2.5%	2.5%	1.0%	1.0%	1.0%	9.0%	9.0%	9.0%	35.0%
St. Kitts and Nevis	2.0%	1.5%	1.5%	3.0%	3.0%	3.0%	1.0%	1.0%	1.0%	11.0%	11.0%	11.0%	25.4%
St. Lucia	1.2%	2.5%	2.5%	1.7%	2.5%	2.5%	1.0%	1.0%	1.0%	10.0%	10.0%	10.0%	35.0%
St. Vincent and the Grenadines	1.8%	3.1%	3.1%	0.9%	2.3%	2.3%	2.0%	2.0%	2.0%	10.0%	10.0%	10.0%	35.0%
Barbados	0.5%	0.5%	0.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	18.0%	18.0%	18.0%	26.8%
Bahamas	0.8%	0.8%	0.8%	2.5%	2.5%	2.5%	2.0%	2.0%	2.0%	9.8%	9.8%	9.8%	29.1%
Belize	0.8%	0.8%	0.8%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	8.0%	8.0%	8.0%	69.7%
Guyana	2.0%	2.0%	2.0%	2.5%	2.5%	2.5%	1.0%	1.0%	1.0%	14.0%	14.0%	14.0%	30.9%
Jamaica	1.0%	1.0%	1.0%	8.0%	8.0%	8.0%	0.5%	0.5%	0.5%	5.0%	5.0%	5.0%	28.3%
Trinidad and Tobago	1.5%	0.7%	1.0%	4.6%	3.0%	3.0%	2.3%	3.9%	3.9%	12.0%	12.0%	12.0%	35.0%

Sources: IMF Staff estimates and projections.