

# **Long-Term Social Insurance in the Caribbean: Beyond Parametric Reforms**

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**LONG-TERM SOCIAL INSURANCE IN THE CARIBBEAN:  
GOVERNANCE, OPERATIONS, AND ASSET-LIABILITY MANAGEMENT FOR RESILIENT  
PENSION FINANCE**

**Manuel García Huitrón  
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## **Abstract**

This report analyzes the long-term pension branches of Caribbean National Insurance Schemes, focusing on old-age and survivors' benefits. These systems, which are defined-benefit and therefore depend largely on demographic patterns, are under growing financial strain from population ageing, limited local investment opportunities, emigration of working-age people, and exposure to climate and economic shocks. Using actuarial reviews, financial data, and a survey across eight countries, the study assesses financial performance and closely examines administration—from registration, contribution collection and finance management through benefit payments—as well as investment management and governance.

It identifies operational and governance weaknesses that speed up financial problems and proposes concrete administrative reforms to address them. It also introduces clear indicators to track solvency and investment performance, including how long reserves will last and whether returns keep up with inflation and liabilities. Moreover, it presents practical innovations to strengthen funding and share risks, such as a “Unitized Longevity Account” and a “CaRIBond,” along with principles for regional pooling to improve scale and oversight.

Ultimately, parametric reforms alone are not enough if operational issues persist. By strengthening administration, governance, and investment, the recommendations in this report can improve system performance and, importantly, build the credibility and legitimacy needed to make parametric reforms politically feasible.

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## Note on terminology and conventions

Readers who encounter unfamiliar technical concepts can refer to the *Glossary of Technical Terms* at the end of the report (Appendix 2). The glossary explains the main terms used here and in Caribbean social insurance practice more broadly. It also includes practical reference points, such as the CPI + dr benchmark, warning and intervention thresholds (for example, R/E levels), and clarifications of commonly confused concepts, such as statutory limits versus IPS ranges, and reserves versus assets.

### *Indexation conventions.*

Throughout the report, “real” protection is defined using the consumer price index (CPI). The CPI is observable, widely understood, and can be applied consistently in both actuarial valuations (CPI + dr) and policy benchmarks. In principle, however, a standard-of-living index—often approximated by per capita consumption—better reflects welfare, as it captures both inflation and long-term improvements in living standards. In the retirement income bond design, indexing can be set to per-capita consumption before payouts begin and switch to inflation thereafter. Finally, VAT linkage is treated as an issuer-side design feature: for governments with a value-added tax, VAT revenues can provide a natural hedge for consumption-linked payments, improving fiscal coherence of issuance. For feasibility and comparability, the baseline instruments and benchmarks in this report use CPI indexation; while standard-of-living and VAT-linked options are presented as extensions when data, legal frameworks, and market conditions allow.<sup>1</sup>

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<sup>1</sup> Robert C. Merton (1983) formalizes the rationale for consumption (standard-of-living) indexation in public pension design and shows why it is closer to the welfare objective than price-only indexation. Merton and Muralidhar’s SeLFIES design specifies indexation to aggregate per-capita consumption (and motivates governments with VAT as natural issuers because VAT is a tax on consumption); see also Merton, R. C. (2019).

## 1. Introduction

Social insurance systems in the Caribbean form a central pillar of social protection, providing coverage for risks like sickness, parental leave, disability, survivorship, and old age. Established in the 1960s and 1970s, they reflect British and Dutch institutional legacies and the statutory template of National Insurance Acts (NIAs), which created public agencies responsible for administering contributions, adjudicating pecuniary benefits, and managing reserves (Jenkins, 1981).

Unlike several Spanish-speaking Latin American countries that shifted toward mandatory defined-contribution designs in the 1990s, Caribbean countries have maintained defined-benefit structures with standardized weekly contributions and similar pension ages across sexes (Schwartz & Zegarra, 2021; Economic Commission for Latin America and the Caribbean [ECLAC], 2022). These structures combine short-term benefits addressing immediate contingencies, such as sickness or employment injury, with long-term provisions that insure against life-cycle risks, including old age, disability, and survivorship.

This report focuses on long-term benefits in Caribbean social security systems. Notably, these benefits are increasingly strained by demographic shifts, which are undermining actuarial balance and threatening financial sustainability. In general, actuarial reviews forecast reserve depletion within one to two decades under unchanged parameters.

Demographic pressures are compounded by three additional elements. First, Caribbean countries face heightened exposure to shocks from economic specialization and climate vulnerability. Most of these nations are characterized by small, open economies dependent on agriculture, tourism, and natural resources, making them susceptible to external volatility. Environmental risks further intensify this vulnerability: Caribbean nations rank among the top 25 most disaster-prone countries globally (Bailey et al., 2023). Such shocks can depress contributions and raise benefit needs, increasing social insurance costs. Limited diversification and high risk constrain investment opportunities for fund managers.

Second, beyond declining fertility and rising life expectancy, the Caribbean faces pressure from sustained emigration. The share of older adults is projected to double over the next 45 years (Bassarsky et al., 2024), increasing old-age support needs, while outflows of working-age

individuals will simultaneously shrink the contributory base. In 2020, the shares of migrants from Jamaica, Guyana, and Trinidad and Tobago living abroad were respectively 36%, 49%, and 21% of their resident populations, raising the financial burden on those remaining.<sup>2</sup>

Third, the small size of Caribbean countries makes it harder to achieve economies of scale in revenue mobilization and public services, and to maintain the specialized governance, systems, and expertise needed for modern reserve-fund investment (e.g., risk management, performance measurement, custody oversight, and foreign-exchange operations). With a smaller contributory base, fixed administrative costs are spread more thinly, leading to higher per capita costs and limited capacity for digitalization, compliance, contribution collection, and the development of local investment opportunities.

Policy discussions in the Caribbean often focus on parametric reforms, such as adjusting contribution rates or retirement ages. While these measures remain essential in many countries, equal attention should be given to strengthening social insurance administration—through better compliance mechanisms and clearer governance—and to improving investment management, with stronger risk assessment and closer alignment between portfolios and long-term liabilities. These changes can improve system performance and financial sustainability by reducing leakage, increasing contribution revenues, and better matching investment returns to pension obligations, while also reinforcing public trust and institutional legitimacy—both essential for building support for deeper parametric or structural reforms.

In light of these considerations, this report provides a comprehensive diagnostic of Caribbean National Insurance Schemes (NISs), with a focus on long-term pensions. It assesses system performance—including coverage, adequacy, and sustainability—highlighting administrative and investment practices that determine statutory promise viability, and developing actionable recommendations on the reform of financing, administration, and investment policies as well as guidelines for structural reforms. It consolidates country information into a comparative picture of Caribbean National Insurance Schemes, Drawing on actuarial reviews, financial statements, and a new questionnaire applied to eight social insurance administrations, it comparatively maps

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<sup>2</sup> Net migration assumptions differ across demographic projections and actuarial valuations. Policy changes in destination countries could reduce outflows or increase return migration. Meanwhile, net fiscal effects depend on the age/skills composition of flows and the extent to which additional residents contribute to covered employment.

scheme performance along the value chain, from registration to benefit payment. The report also develops solvency and investment indicators that make reserve runways and funding pressures transparent across countries, responding to earlier calls for financial-stability measures and governance diagnostics for pension funds (Davis, 2016; International Monetary Fund [IMF], 2024a; ISSA, 2019b, 2019c).

Building on this assessment, the report develops actionable recommendations for administration, financing, and investment policies as well as proposes guiding principles to inform operational and structural reforms. Rather than a one-size-fits-all blueprint, countries can implement these according to their legal, institutional, and fiscal contexts. The principles focus first on management practices under existing laws and involve modernizing administration through digital registration and contribution processes, risk-based compliance, and clear procedures for self-employed and platform workers. They also include adopting a rules-based funding approach maintaining reserves within a defined range relative to expenditures, with alerts to trigger timely corrective actions.

Strengthening investment management is key, with total-fund performance assessed against a benchmark tied to long-term obligations, clear risk limits, and rebalancing rules, where investment policy statements (IPSs), asset allocation, and risk budgets are aligned with long-term, inflation-linked obligations under a liability-aware, liability-driven investment (LDI) framework.<sup>3</sup> In partially funded social-insurance schemes, LDI does not imply full immunization of the entire liability stream. Rather, it is a discipline for managing the investable reserve portfolio so that the scheme (i) maintains explicit cash-flow and liquidity coverage targets over the expected reserve runway, (ii) tracks a liability-consistent performance yardstick that ensures stable contributions over the long term, (iii) operates within an explicit total-fund risk budget (with breach and rebalancing protocols), and (iv) reduces uncompensated concentration, currency, and liquidity risks that amplify funding volatility. This framing is designed to improve solvency discipline and reduce variance in funding outcomes, not to “match liabilities to infinity” in schemes whose actuarial baseline projects reserve depletion. Broadly, these measures aim to

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<sup>3</sup> Throughout this report, “LDI” refers to the liability-relative, four-part operational discipline defined in §4.3 (benchmarking to CPI + dr, runway cash-flow/liquidity alignment, explicit total-fund risk budgets with breach/rebalancing protocols, and reduction of uncompensated concentration/currency/liquidity risks).

expand coverage, reduce costs, align investments with long-term commitments, and rebuild credibility—creating space for more equitable parametric reforms.

The report also outlines options for deeper structural reforms that countries may adopt over time. These include moving to a system combining a budget-financed basic social pension, a contributory pay-as-you-go pillar governed by solvency rules, and—where conditions allow—a funded tier supported by Caribbean collective investment mechanisms to share risks across countries.

Prior work has examined the pressures these systems face, including high public debt, exposure to natural disasters and climate shocks, and limited economic diversification. Studies such as *Unleashing Growth and Strengthening Resilience in the Caribbean* (Alleyne et al., 2017) and *Economic Institutions for a Resilient Caribbean* (Beuermann & Schwartz, 2021) underline that social spending operates within tight fiscal constraints and that pension schemes matter because their promises translate into long-term government obligations. At the same time, well-governed reserve funds can help finance priority investment, including climate-resilient infrastructure (Alleyne et al., 2017; Beuermann & Schwartz, 2021; Schwartz & Zegarra, 2021). Looney (2021) makes a similar point, arguing that structural reforms that reduce fiscal risk and support private investment are central to improving growth and resilience.

A second, related, strand of literature examines Caribbean social insurance and its history. Early work describes National Insurance Acts and social insurance institutions in the English-speaking Caribbean, and the shift to Bismarckian, earnings-related, defined-benefit schemes financed on a pay-as-you-go basis with partial reserves (Jenkins, 1981; Plamondon & Osborne, 2001). Later studies document generous benefit formulas, short contribution careers, parallel public-sector schemes, limited coverage of self-employed and informal workers, with emerging cash-flow pressures and growing implicit subsidies (Brunton & Masci, 2005; World Bank, 2010). This work recommends parametric reform of contribution rates, retirement ages and benefit formulas, clearer rules for indexation and ceilings, and stronger governance and investment policies (Brunton & Masci, 2005; World Bank, 2010). Recent research, including Nassar et al. (2016), Schwartz and Zegarra (2021), and Rosenblatt et al. (2024), further emphasizes that without timely reforms, reserves will be exhausted and pension fiscal burden will increase.

This report also intersects with studies that consider the Caribbean experience within the broader Latin American and global context. Regional analyses examine replacement rates, coverage, implicit subsidies, and non-contributory pensions across Latin America and the Caribbean, showing how design choices shape protection and costs (e.g., Altamirano Montoya et al., 2023; Aranco et al., 2022; Arenas de Mesa & Robles, 2024; Bosch et al., 2018; Economic Commission for Latin America and the Caribbean [ECLAC], 2024). Comparative work on pension finance, funding, and investment governance explores defined-benefit financing, long-term sustainability assessment, and the ways regulation can align investment policy with pension obligations while maintaining fiscal anchors (Davis, 2001, 2005, 2016; Davis & Lastra, 2017; Davis & Li, 2003; Davis, Grob, & de Haan, 2007; Diamond & Geanakoplos, 2003; International Labor Organization [ILO], 2014; International Social Security Association [ISSA], 2019b, 2019c; OECD, 2022, 2023; Waring, 2011). Literature on social-security institutions and small developing countries highlights scale constraints, informality, administrative costs and adapting systems to limited capacity (AIOS, 2000; CONSAR, 2020; Glaessner & Valdés-Prieto, 1998; ILO, 2015, 2018a; ISSA, 2013, 2022a, 2022b; Peters, 2017; Superintendencia de Pensiones de Chile, 2021; Dominican Republic, 2001; United States Department of Labor, 2008, 2024; Uruguay, 1995), while research on Small Island Developing States (SIDS) shows how rapid population ageing and high disaster exposure compound these pressures (Bassarsky et al., 2024; Sealey-Huggins, 2017).

The study offers a fundamental contribution to these various strands of the literature through its focus on the operational and implementation aspects of pension systems. Its scope is pragmatic, emphasizing financing and management mechanics that determine whether statutory pension promises can be met reliably. As such, it does not engage in the debate over whether a given pension system should be structured as defined contribution (DC) or defined benefit (DB), but rather recognizes that each has advantages and trade-offs, neither being inherently superior.<sup>4</sup> The report also recognizes the complementary role of non-contributory floors in protecting against old-age poverty and clear interaction rules between contributory and budget-financed benefits (e.g., ECLAC, 2024).

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<sup>4</sup> If anything, they complement each other as DB can offer basic income support for life and DC can help individuals customize their target retirement income to desired lifestyle.

The remainder of this report is organized as follows. Section 2 reviews Caribbean social insurance laws and describes performance in coverage, adequacy, and sustainability challenges. Section 3 examines administration and management, including registration, collection, compliance, and digitalization. Section 4 covers investment governance and strategy, focusing on aligning investment policy statements, asset allocation, and risk budgets with long-term, inflation-linked liabilities under a LD) framework. Section 5 quantifies the impact of operational improvements—such as administrative modernization, stronger compliance, and better investment management—on reserve sustainability through simulations. Section 6 presents policy recommendations, beginning with measures implementable under existing laws—such as administrative reforms, funding rules, and LDI-based investment strategies—and guidelines for structural reforms where fiscal and demographic conditions allow. These reforms combine a budget-financed basic pension, a contributory pay-as-you-go pillar with clear solvency rules, and a funded tier converting savings into predictable, inflation-linked income. The section outlines financing and risk-sharing arrangements, including Caribbean collective investment vehicles to pool longevity and market risks across countries and regional oversight structures. Finally, Section 7 concludes with some final reflections on achieving higher standards of resilience by optimizing processes and adopting a liability-driven asset management.

## **2. Long-Term Social Insurance in the Caribbean: General Characteristics**

### **2.1. Origins and Main Institutional Features**

In contrast to many Latin American countries where basic social security principles are set out in the Constitution, in the English- and Dutch-speaking Caribbean, social insurance scope is defined by ordinary legislation. This statutory approach means detailed laws determine who is covered, which risks are insured, and how schemes are administered. Caribbean systems thus primarily operate as insurers: paying cash benefits when qualifying conditions are met. As the Caribbean norm is a single public social insurance provider, it differs from the Spanish-speaking Latin America model, where social security institutes combine cash benefits with direct health services (ISSA, 2019a), or the more fragmented arrangements found in several other Latin American countries. These legal and institutional features matter for reform: operational

responsibility is concentrated in one single agency and legislative change is required to adjust parameters.

National Insurance Schemes (NIS) comprise two main components: long-term and short-term insurance, each serving different social protection functions. Long-term insurance focuses on income security over the life cycle, particularly for old age, disability, or death. Short-term insurance provides temporary income replacement and protection against short-duration risks, such as illness, maternity, or employment-related injuries. As seen in Table 1, all Caribbean countries provide both types.

The table also compares social insurance rules in their original form, as codified in their National Insurance Acts (NIAs). Modelled on the United Kingdom's NIA of 1911, these acts establish a framework for social insurance services, detailing covered risks and benefits delivered upon qualifying conditions. They define administrative arrangements through national insurance/security schemes, services, or boards, and set out key design and governance features, including organizational architecture, funding sources, parameters, and investment policies. NIAs also detail contribution schedules, registration processes, and paper-based forms. Structural reforms therefore require amendments to the NIA, a process usually involving multiple political stakeholders (Walcott, 2009). The table reports the inception year of each NIA, board composition, and NIA-determined implementation features. It also compares design parameters including types of insured workers and covered risks.

Most social insurance systems in the Caribbean were established between the 1960s and 1980s. Barbados and Jamaica created their systems in 1966, whereas Suriname implemented its mandatory and private pension fund more recently, in 2014. NIAs determine a range of corporate and organizational features for national insurance agencies. Except for Belize, Suriname, and Jamaica, boards have a tripartite composition, representing government, employers, and employees. In Suriname, the board is appointed by the government. Self-employed workers, despite being significant potential contributors, lack formal representation. In Barbados, Suriname, St. Vincent, and Trinidad and Tobago, NIAs define profiles of main positions, such as directors. In Trinidad and Tobago, Belize, and Guyana, NIAs determine specified structures.

While each country's NIA delineates a unique NIS design, and administrative structures and autonomy levels vary significantly, some commonalities emerge:

- A corporate mandate for social insurance systems is the core focus. In the Bahamas, Barbados, Guyana, and Suriname, for example, the system's primary objective is to establish a national insurance organization providing cash benefits, positioning it as a direct service provider. In contrast, the NIA in St. Vincent and the Grenadines adopts a broader approach by establishing a national insurance service without defining a specific role.
- The national insurance organization's role in the NIA is to manage covered risks and deliver cash benefits when qualifying conditions are met after claims. A "provider" mandate encourages broad benefits, while a "risk manager" mandate focuses on eligibility conditions and enforcement. This distinction shapes how qualifying conditions are framed, the strictness of eligibility criteria, and the allocation of resources across contingencies, with implications for operational efficiency and long-term sustainability. The NIA in The Bahamas specifies coverage for various risks, including retirement and medical benefits, with an embedded non-contributory pension introduced in 1998. In Barbados, the NIA covers comprehensive risks and includes contributory and non-contributory pensions. That of Trinidad and Tobago is perhaps the most detailed, distinguishing short- and long-term covered risks. Unlike more provider-centric systems, the NIA in St. Vincent and the Grenadines emphasizes risk management over direct service provision.
- Administrative structures and autonomy levels vary significantly across Caribbean social insurance systems. In some cases, NIAs provide detailed frameworks for governing board operations, including meeting schedules, board member responsibilities, and enforcement mechanisms. In contrast, other NIAs offer more flexibility, granting higher authority to specific ministries, such as Labor (e.g. Barbados and Jamaica) or Finance (e.g. Belize and Trinidad and Tobago), to oversee aspects of the social insurance system, particularly financial control.
- A tripartite board composition, representing employers, employees, and the government, typically has significant regulatory powers within national insurance systems. While NIAs specify initial parameters and contribution tariffs, the board can adjust these elements over time. It can also establish and modify contribution rates based on the system's financial

health, assessed through periodic actuarial valuations. Trinidad and Tobago has, for instance, a large board structure comprised of employer, employee, and government representatives, along with a chairperson and executive director. It details the governance structure by determining board meeting schedules and position profiles.

- Boards have significant enforcement design powers in financing aspects. They can impose penalties on employers who fail to register workers or remit contributions, or on individuals who fail to comply with contribution obligations. These powers mean that boards play a central role in shaping compliance, arrears management, and contribution schedule credibility.
- Boards also exercise substantial influence over investment policy and funding strategies, critical for managing reserve funds. By defining the asset allocation within the admissible instruments (government bonds, equities, real estate, or loans) and setting quantitative limits, they directly affect the system's ability to meet future liabilities. In countries such as Barbados and Trinidad and Tobago, statutory provisions spell out investment policies, limits, and allowable instruments, reflecting a rule-based approach to financial management. Comparative actuarial reviews document that these systems share common financing templates and valuation standards across Caribbean social insurance schemes (International Labor Organization, 2016).

These common features of National Insurance Acts—single public providers, tripartite boards with broad powers, and statutory investment limits—frame Caribbean social insurance operations. They influence parameter changes, reserve management, and risk sharing across workers and retirees. The following sections delineate how this institutional framework shapes eligibility, contribution patterns, and solvency trajectories, setting the stage for the subsequent discussion of administrative and investment reform.

## **2.2. Eligibility and Contribution Rates**

Eligibility rules and contribution structures in the long-term branch determine pension rights accrual. They focus on income security over the life cycle, particularly for old age, disability, or death. Benefits are pension-based and structured as defined benefit schemes, with amounts determined by factors like contribution years and average earnings. Following a Bismarckian

logic, entitlement and benefits are tied to formal employment and financed through mandatory contributions from workers and employers. To preserve workers' living standards and provide income replacement for insured workers and dependents, benefits link to prior earnings. Though self-employed workers are eligible in most schemes, there are exceptions, such as the National Insurance Scheme of Trinidad and Tobago, which does not provide a functional self-employed contribution channel (Table 2).

As summarized in Table 2A (companion to Table 2), original minimum qualifying service for a contributory old-age pension is typically 500–750 weeks ( $\approx$ 10–15 years) across the NISs at the system's inception: Suriname's earnings-related APF uses a five-year vesting period, while Trinidad and Tobago and Guyana require 750 weeks. These qualifying conditions in contributory schemes are relatively lenient by Latin American standards, where requirements of 1,000 weeks or more are common (Altamirano et al., 2023).

For employed workers, statutory employee rates range from about 2% (low-wage Bahamas) to about 11–11.25% (Barbados), while combined employed rates range from 6% (Jamaica) to 23.75–24.25% (Barbados), reflecting differences in bundled contingencies and ceilings (Table 2). In most schemes, employee rates are flat within the insurable earnings band,<sup>5</sup> which raises the payroll wedge at low wages and can be burdensome for liquidity-constrained workers—even where benefit formulas include minimum pensions, caps, or other progressive features for those who ultimately qualify. Because they typically pay the full combined rate, self-employed workers face higher statutory rates—up to 17.1% in Barbados and projected to reach 28% in Suriname's APF (separate from the semi-contributory AOV levy). Combined with irregular earnings, administrative frictions, and uncertainty about qualifying and receiving benefits, this often depresses regular contributions and makes the obligation feel tax-like rather than insurance-like for this group.<sup>6</sup> As examined further in Sections 2.3 and 2.4, the calibration of eligibility thresholds and contribution rates, especially for self-employed workers, shapes pension qualification, generosity, and scheme sustainability.

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<sup>5</sup> Important exceptions include Bahamas' low-wage tier and systems that operationalize contributions through earnings classes (e.g., Trinidad and Tobago) (Table 2).

<sup>6</sup> Distributional incidence depends on both the contribution schedule and the benefit formula (including minimums/caps) and on contribution density/vesting. Where low-income or self-employed workers have incomplete contribution histories and fail to qualify, proportional contribution rates can operate as a tax wedge with limited expected benefit.

Note that because contribution rates finance different bundles of contingencies and only apply up to country-specific ceilings, Table 2 is not a direct proxy for old-age pension generosity. Table 2A accordingly summarizes the statutory contributory old-age DB promise (reference wage, accrual/cap, eligibility, and indexation).

Table 1. Institutional features of social insurance as originally defined by NIAs.

<b>Dimension / Country</b>	<b>Bahamas</b>	<b>Barbados</b>	<b>Belize</b>	<b>Guyana</b>	<b>Jamaica</b>	<b>St. Vincent and The Grenadines</b>	<b>Suriname</b>	<b>Trinidad and Tobago</b>
<b>Name of the agency</b>	National Insurance Board	National Insurance Scheme	Social Security Board	National Insurance Scheme	National Insurance Scheme	National Insurance Services	APF	National Insurance Board
<b>Year established</b>	1972	1966	1981	1969	1966	1986	2014	1971
<b>Objective of the NIA</b>	Establish a system of national insurance providing pecuniary payments in respect of covered risks.	Establish a system of national insurance and social security providing payments by way of the covered risks.	Not specified	Establish a system providing pecuniary payments by way of the covered risks.	Not specified	Establish a National Insurance Services, and for purposes connected therewith.	Establish rules concerning the introduction of a general pension as part of a national social security system.	Not specified
<b>Board members</b>	3 for employers 3 for employees 5 for Government	2 for employers 2 for employees 3 for Government	Defined in law (Second Schedule): 5 appointed by the Minister; 2 nominated by the National Trade Union Congress; 2 nominated by employers' organizations; CEO ex officio (as applicable per Schedule).	7 members appointed by the Minister  1 Chairperson  1 Deputy Chairperson	Not defined by law	2 for Government 2 for Employers 2 for Employees 2 for independent 1 Director	7 members appointed by the Council of Ministers	3 for Employers 3 for Employees 3 for Government 1 Chairperson 1 Executive Director

<b>Dimension / Country</b>	<b>Bahamas</b>	<b>Barbados</b>	<b>Belize</b>	<b>Guyana</b>	<b>Jamaica</b>	<b>St. Vincent and The Grenadines</b>	<b>Suriname</b>	<b>Trinidad and Tobago</b>
<b>Main position profiles are specified in NIA</b>	No	Yes	No	No	No	Yes	Yes	Yes
<b>Organizational architecture is specified in NIA</b>	No	No	Yes	Yes	No	No	No	Yes
<b>Type of insured workers</b>	Employees, self-employed, voluntary	Employees and self-employed	Employees and self-employed, voluntary	Employees and self-employed, voluntary	Employees, self-employed and voluntary	Employees, public servants, armed forces, self-employed, unpaid interns, voluntary.	Employees and self-employed	Employees and voluntary (self-employed defined in the Act but excluded from commencement; not implemented)
<b>Covered risks</b>	(i) Retirement benefit, (ii) invalidity benefit, (iii) survivor's benefit, (iv) sickness benefit, (v) maternity benefit, (vi) funeral benefit, (vii) medical benefit, (viii) unemployment benefit, (ix) injury	(i) Sickness leave, (ii) maternity grant, (iii) employment injury, (iv) funeral grant, (v) survivor's pension, (vi) invalidity pension, (vii) Old-age contributory pension, (viii) old age non-contributory pension.	(i) Sickness benefit, (ii) Maternity benefit, (iii) invalidity benefit (includes old age retirement), (iv) Employment injury benefit, (v) Non-contributory pension.	(i) Old age benefit, (ii) Invalidity benefit, (iii) Survivor benefit, (iv e) Sickness benefit, (v) Maternity benefit, (vi) Funeral Benefit, (vii) Childcare benefit, (viii) constant attendance benefit.	(i) Sickness leave, (ii) maternity, (iii) child benefit, (iv) survivor's pension, (v) employment injury, (vi) old age, (vii) funeral grant.	(i) Sickness leave, (ii) Maternity, (iii) Invalidity, (iv) Survivors, (v) funeral (vi) grant, (vii) retirement.	(i) Old age pension, (ii) Survivor's pension, (iii) Early retirement, (iv) Disability.	(i) Sickness leave, (ii) maternity, (iii) invalidity, (iv) funeral grant, (v) retirement, (vi) employment injury, (vii) survivor's pension.

<b>Dimension / Country</b>	<b>Bahamas</b>	<b>Barbados</b>	<b>Belize</b>	<b>Guyana</b>	<b>Jamaica</b>	<b>St. Vincent and The Grenadines</b>	<b>Suriname</b>	<b>Trinidad and Tobago</b>
	benefit, (ix) disablement benefit, (x) death benefit.							
<b>Embedded non-contributory pension stipulated in NIA</b>	Yes	Yes	Yes	No	No	No	No	No
<b>Funding sources</b>	Yes	Yes	Yes	Yes	Yes	Yes		Yes
<b>Minimum weeks for old age pension</b>	500	500	500	Not specified on NIA	520	Not defined by law	250	750
<b>Investment policies, limits and instruments specified in NIA</b>	No	Yes	No	No	No	No	No	Yes
<b>Enforcement mandate with penalties</b>	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' compilation based on local laws: Bahamas – National Insurance Act, Chapter 350, Rev. 2006; Barbados – National Insurance and Social Security; Belize – Social Security Act, Chapter 44 (Substantive Laws of Belize, Revised Edition 2020), Second Schedule (as amended by Social Security (Amendment) Act, 2024 (No. 1 of 2025)); Guyana – National Insurance and Social Security Act, Chapter 36:01, L.R.O. 2012; Jamaica – The National Insurance Act, L.N. 128/2016; St. Vincent and the Grenadines – National Insurance Act, Chapter 296; Suriname – General Pension Act, 2015 (Algemene Pensioenwet 2014); Trinidad and Tobago – National Insurance Act, Chapter 32:01, Rev. 201

*Table 2. Statutory payroll collection schedules and contribution bases (2024–2025): employed and self-employed rates, with insurable-earnings ceilings (all-in collections where levies are co-collected)*

<b>Country / Category</b>	<b>Bahamas</b>	<b>Barbados</b>	<b>Belize</b>	<b>Guyana</b>	<b>Jamaica</b>	<b>St. Vincent and the Grenadines</b>	<b>Suriname</b>	<b>Trinidad and Tobago</b>
<b>Employer</b>	6.65%	12.75% (→ 13.00% from 1 Apr 2025, incl. R&R)	7.0%	8.4%	3.0%	6.5% (Jun–Dec 2024); 7.0% (2025)	3.75% (APF) + 4.0% (AOV)	8.8%
<b>Employee</b>	4.65% (low-wage tier: 2% for earnings < 50% of the contribution ceiling)	11.00% (→ 11.25% from 1 Apr 2025, incl. R&R) (flat, for all workers, regardless of income levels)	3.0% (flat, for all workers, regardless of income levels)	5.6% (flat, for all workers, regardless of income levels)	3.0% (flat, for all workers, regardless of income levels)	5.5% (Jun–Dec 2024); 6.0% (2025) (flat, for all workers, regardless of income levels)	3.75% (APF)	4.4% (earnings-class system; effective split at ceiling)
<b>Employer + employee</b>	11.3%	23.75% all-in collection (→ 24.25% from 1 Apr 2025, incl. R&R) core social-security funds = 20.25%*	10.0%	14.0%	6.0%	12.0% (Jun–Dec 2024); 13.0% (2025)	7.5% (APF) + 4.0% (AOV, employer-only)	13.2%
<b>Self-employed</b>	10.3%	17.10% (→ 17.25% from 1 Apr 2025, incl. R&R, as applicable)	10.0%	12.5%	6.0%	11.5% (Jun–Dec 2024); 12.5% (2025)	7.5% (APF) + 4.0% (AOV)	Not operational (legal basis exists / not implemented)
<b>Insurable earnings ceiling (2024–25)</b>	B\$810/week (B\$3,510/month) (from Jul 1, 2024)	B\$5,200/month (2024); B\$5,280/month (2025)	BZ\$520/week (≈BZ\$2,253/month)	GY\$280,000/month	J\$5,000,000/year (≈J\$416,667/month)	EC\$1,200/week (≈EC\$5,200/month) (from Jun 1, 2024)	APF: SRD 5,000/month ceiling; AOV: no ceiling	TT\$13,600/month (Class XVI ceiling; earnings-class system)

Source: Authors' compilation from official scheme publications and official statutory instruments/administrative summaries (in force 2024–2025). In Barbados, “Core social-security funds” for private-sector employees = 20.25% (excluding the Training Levy and Health Service Contribution). A Training Levy (1.0%) and a Health Service Contribution (2.5%) are collected alongside but are not part of the NIS fund; including these yields 23.75% all-in collection. From 1 April 2025, the Resilience & Regeneration Fund adds 0.50 percentage points for employed persons, raising all-in collection to 24.25% (Self-employed treatment differs by covered contingencies; see the statutory schedule for that category reflected in the rate shown). *Scope / that which the rate finances.* In most jurisdictions, the statutory contribution rate finances a bundle of contingencies (long-term and short-term). Barbados'

headline “all-in” rate is structurally different because it embeds multiple earmarked levies (e.g., unemployment, training, health service contribution, severance, and, from April 2025, the Resilience & Regeneration Fund). In Jamaica, 1 percentage point of the statutory contribution is earmarked to the National Health Fund (NHF). Suriname is not a single-rate NIS: it combines a universal AOV levy (employer/self-employed) with a separate earnings-related APF contribution (split employer/employee). The National Insurance Act defines “employed person” to include “a self-employed person” (National Insurance Act, Chap. 32:01, s. 2 [Interpretation], definition of “employed person”, p. 9). However, the commencement proclamation bringing the Act into operation excluded its application to self-employed persons (“save in their application to self-employed persons”) (Proclamation, Gazette Notice No. 223 of 1971, effective 15 Nov 1971, p. 2). Consistent with this, the National Insurance Board of Trinidad and Tobago reports that the system “still does not yet cover the self-employed” (Eleventh Actuarial Review of the NIS as of 30 June 2020, p. 84).

*Contribution base/ceiling.* Rates apply to “insurable earnings” up to a statutory ceiling (weekly/monthly/annual) and, in some cases, to earnings classes. Ceilings differ materially across countries and are updated under different rules (automatic/biennial in some, ad hoc or infrequent in others). Consequently, a “10%” contribution rate on a low ceiling is not comparable to “10%” on a high ceiling; ceilings also bound the benefit base in defined-benefit schemes (explicitly or implicitly), so ceiling policy is a first-order driver of both effective contribution burden and realized replacement outcomes.

Table 2A (companion to Table 2). Statutory contributory old-age defined-benefit promise (2024–2025): reference wage, accrual/caps, eligibility, and indexation rule

	Bahamas	Barbados	Belize	Guyana	Jamaica	St. Vincent and the Grenadines	Suriname	Trinidad and Tobago
<b>Reference wage definition</b>	Avg insurable earnings over highest-paid 3 years (if <10 years, avg of all years)	Avg insurable earnings over best 5 years	Avg earnings over best 3 years within last 15	Avg weekly earnings over best 3 of last 5 years pre-age 60	No “ref wage” RR formula; benefit is flat basic + contribution-linked supplement	Avg insurable earnings over best 7 years (change effective 2024)	APF: avg wage over last 60 months; AOV: flat universal amount	Earnings-class based (benefit tied to class schedule rather than continuous wage)
<b>Accrual structure / statutory cap</b>	30% + 1% per 50 weeks beyond first 500; cap 60%; minimum pension exists	Transitional: “new basis” 2%/yr (first 20 yrs), 1.25%/yr thereafter, plus legacy/transit ion rules; cap 60%; minimum pension exists	40% for first 500 weeks + 2% per 50 weeks beyond; cap 60%	40% at 750 weeks + 1% per 50 weeks beyond; cap 60%	Basic flat pension + supplement linked to total contributions credited (no explicit RR cap beyond ceiling mechanics)	30% at the “full pension” threshold + 1% per 50 weeks beyond; cap 60%	APF: 2% per year of contributions; statutory cap cited as 70%; AOV is separate flat benefit	Base pension by earnings class at 750 weeks + increments per 25-week blocks beyond; minimum pension floor exists; no automatic cost-of-living adjustment (COLA)
<b>Eligibility (min qualifying) / pension age</b>	500 weeks; pension age 65; deferral to 70 with actuarial uplift	Pension age 67; early 60 with actuarial reduction; qualifying includes 500 paid + 750 paid/credited	Pension age 65; early 60 with reduction; qualifying 500 weeks	Pension age 60; qualifying 750 weeks	Pension age 65; qualifying 520 weeks	Pensionable age rising to 65 (63 in 2024); early 60 with tighter conditions; qualifying 500 weeks minimum; “full pension” qualifying weeks rising (650 in 2024 → 750 by 2028)	Pension age 60; APF vesting 5 years; AOV has residency test	Pension age 60 (deferral up to 65); qualifying 750 weeks (otherwise lump-sum grant)

	<b>Bahamas</b>	<b>Barbados</b>	<b>Belize</b>	<b>Guyana</b>	<b>Jamaica</b>	<b>St. Vincent and the Grenadines</b>	<b>Suriname</b>	<b>Trinidad and Tobago</b>
<b>Indexation rule</b>	Automatic biennial CPI-linked adjustment	Discretionary (practice guided by reviews; not automatic COLA)	Discretionary (no binding automatic indexation rule identified)	Discretionary (ad hoc increases)	Review-cycle driven (actuarial review cadence; adjustments subject to approval; not automatic COLA)	Discretionary (no binding automatic indexation rule identified)	APF: statutory $\geq$ every 3 years tied to national average wage; AOV: discretionary decree / budget	Discretionary (no automatic COLA; changes via reform / decisions)

Source: Authors' compilation from binding pension legislation and official scheme publications (benefit guides/handbooks), cross-checked against the latest officially published actuarial reviews and official statutory/administrative summaries (in force 2024–2025; post-2025 changes flagged separately).

*Statutory vs modeled outcomes.* Table 2A reports statutory design metadata (reference wage, accrual/cap, eligibility, and indexation rule). It does not report a single “target replacement rate,” because realized replacement depends on contribution density, earnings path relative to the ceiling, and interaction with minimum pensions and social pensions.

*Indexation classification.* “Discretionary” means no binding automatic indexation rule was identified in the governing instruments/official scheme publications used for this table; benefit increases may occur through ministerial/board decisions, budget measures, or periodic review processes.

*Stylized replacement rates.* For harmonized “stylized full-career” replacement rates under common assumptions (continuous contributions from age 20 to minimum retirement age), see Figure 1 / Altamirano et al. (2023, Table A2). This is a modeled outcome, not a statutory promise.

*Cap attainment.* Where the law specifies an RR cap, the table reports the cap but does not infer the years/weeks required to reach it unless explicitly stated in the governing instruments.

### **2.3. Performance: Adequacy, Coverage, and Equity**

This subsection assesses the performance of Caribbean pension arrangements across three dimensions: benefit adequacy, elderly population coverage, and structural equity.

In the Caribbean, parallel schemes separating private- and public-sector workers provide pensions. Social insurance systems under the NIA generally cover private-sector workers, while public employees have special, distinct regimes (with the exception of Barbados where both public and private workers are covered under a single system).

Countries also operate non-contributory, social assistance pensions—such as the Old Age Pension (OAP) in Guyana, the Senior Citizens' Pension (SCP) in Trinidad and Tobago, and the Algemene Oudedagsvoorziening (AOV) in Suriname — serving as income floors for older persons lacking sufficient contribution records (often due to informal employment or unemployment) and at risk of poverty. As shown in Table 3, program parameters and eligibility conditions differ markedly. Guyana and Suriname offer generous terms with universal age-based benefits, while Jamaica's program targets only those without contributory pensions, and Belize restricts access to the needy. Design choices (universal versus targeted benefits, floor level, and taper rules) affect take-up, equity, and fiscal sustainability (Arenas de Mesa & Robles, 2024).

Table 3. Retirement-income system architecture by country: contributory NIS old-age design in context (social pensions and separate public-sector schemes)

Country	Retirement benefits / organizations	Level of benefits (old-age; contributory scheme)
<b>Bahamas</b>	National Insurance Board (NIB): contributory social insurance for employed and self-employed. Non-contributory old-age pension: for citizens 65+ who do not qualify for contributory pension (income-tested). Public service pension plan (separate).	<ul style="list-style-type: none"> <li>• <b>Pension age:</b> 65 (deferral to 70 permitted).</li> <li>• <b>Qualifying:</b> 500 weeks for pension (otherwise grant).</li> <li>• <b>Reference wage:</b> Average insurable earnings over the highest-paid 3 contribution years (if &lt;10 years, average of all years).</li> <li>• <b>Accrual / cap:</b> 30% + 1% per 50 weeks beyond the first 500; cap 60% (minimum pension exists).</li> <li>• <b>Indexation:</b> Automatic biennial CPI-linked adjustment.</li> </ul>
<b>Barbados</b>	National Insurance Scheme (NIS): pensions for private and public sector employees. Non-contributory old-age pension: for eligible persons 65+ who do not qualify for contributory pensions.	<ul style="list-style-type: none"> <li>• <b>Pension age:</b> 67 (early 60 with actuarial reduction).</li> <li>• <b>Qualifying:</b> 500 weeks paid contributions plus 750 paid or credited.</li> <li>• <b>Reference wage:</b> Average insurable earnings over best 5 years.</li> <li>• <b>Accrual / cap:</b> Transitional formula: “new basis” 2% per year (first 20 years), 1.25% per year thereafter, plus legacy/transition rules; cap 60% (minimum pension exists).</li> <li>• <b>Indexation:</b> Discretionary (not automatic COLA).</li> </ul>
<b>Belize</b>	Social Security Board (SSB): contributory pensions for eligible workers. Non-Contributory Pension Program (NCP): means-tested old-age assistance. Pension Plan for Public Officials (PPPO): separate DB for public servants.	<ul style="list-style-type: none"> <li>• <b>Pension age:</b> 65 (early 60 with reduction).</li> <li>• <b>Qualifying:</b> 500 weeks.</li> <li>• <b>Reference wage:</b> Average earnings over best 3 years within last 15.</li> <li>• <b>Accrual / cap:</b> 40% for first 500 weeks + 2% per 50 weeks beyond; cap 60%.</li> <li>• <b>Indexation:</b> Discretionary (no binding automatic indexation rule identified).</li> </ul>
<b>Guyana</b>	National Insurance Scheme (NIS): contributory pension for employed and self-employed. Old Age Pension (OAP): non-contributory social pension for citizens 65+. Public Service Pension Plan (separate).	<ul style="list-style-type: none"> <li>• <b>Pension age:</b> 60.</li> <li>• <b>Qualifying:</b> 750 weeks for pension (otherwise grant).</li> <li>• <b>Reference wage:</b> Average weekly earnings over best 3 of last 5 years before age 60.</li> <li>• <b>Accrual / cap:</b> 40% at 750 weeks + 1% per 50 weeks beyond; cap 60%.</li> <li>• <b>Indexation:</b> Discretionary (ad hoc increases).</li> </ul>
<b>Jamaica</b>	National Insurance Scheme (NIS): contributory pensions for employed and self-employed.	<ul style="list-style-type: none"> <li>• <b>Pension age:</b> 65.</li> <li>• <b>Qualifying:</b> 520 weeks.</li> </ul>

	<p>Social Pension Program: non-contributory support for eligible older persons (separate).</p> <p>Public Service Pension Plan (separate).</p> <p>Individual Pension Arrangement (IPA) / occupational plans (separate).</p>	<ul style="list-style-type: none"> <li>• <b>Benefit structure:</b> Basic flat pension + contribution-linked supplement (linked to total contributions credited; no explicit RR cap beyond ceiling mechanics).</li> <li>• <b>Indexation:</b> Review-cycle driven (actuarial review cadence; adjustments subject to approval; not automatic COLA).</li> </ul>
<b>St. Vincent and the Grenadines</b>	<p>National Insurance Services (NIS): contributory old-age, disability, survivors.</p> <p>Non-contributory elderly assistance programs (separate).</p>	<ul style="list-style-type: none"> <li>• <b>Pension age:</b> Rising to 65 (63 in 2024; reaches 65 by 2028).</li> <li>• <b>Qualifying:</b> 500 weeks minimum; “full pension” qualifying weeks rising (650 in 2024 → 750 by 2028).</li> <li>• <b>Reference wage:</b> Average insurable earnings over best 7 years.</li> <li>• <b>Accrual / cap:</b> 30% at the “full pension” threshold + 1% per 50 weeks beyond; cap 60%.</li> <li>• <b>Indexation:</b> Discretionary (no binding automatic indexation rule identified).</li> </ul>
<b>Suriname</b>	<p>Algemene Oudedagsvoorziening (AOV): universal flat pension (residency-based).</p> <p>Algemeen Pensioenfonds (APF): contributory earnings-related pension.</p> <p>Civil service pension scheme (separate).</p> <p>Corporate pension funds (separate).</p>	<ul style="list-style-type: none"> <li>• <b>AOV (universal)</b> <ul style="list-style-type: none"> <li>• <b>Pension age:</b> 60 (subject to residency test).</li> <li>• <b>Benefit type:</b> Flat universal benefit.</li> <li>• <b>Indexation:</b> Discretionary (decree/budget).</li> </ul> </li> <li>• <b>APF (contributory)</b> <ul style="list-style-type: none"> <li>• <b>Pension age:</b> 60; vesting 5 years.</li> <li>• <b>Reference wage:</b> Average wage over last 60 months.</li> <li>• <b>Accrual / cap:</b> 2% per year of contributions; statutory cap cited as 70% (AOV separate flat benefit).</li> <li>• <b>Indexation:</b> Statutory ≥ every 3 years tied to national average wage.</li> </ul> </li> </ul>
<b>Trinidad and Tobago</b>	<p>Senior Citizens’ Pension (SCP): non-contributory, means-tested social pension (separate).</p> <p>National Insurance Scheme (NIS): contributory pension for employed and voluntary contributors.</p> <p>Public service pension schemes (separate).</p> <p>Occupational pension plans (separate).</p>	<ul style="list-style-type: none"> <li>• <b>Coverage note:</b> Self-employed not covered under NIS.</li> <li>• <b>Pension age:</b> 60 (deferral up to 65).</li> <li>• <b>Qualifying:</b> 750 weeks for pension (otherwise lump-sum grant).</li> <li>• <b>Benefit structure:</b> Earnings-class based—base pension by earnings class at 750 weeks + increments per 25-week blocks beyond; minimum pension floor exists.</li> <li>• <b>Indexation:</b> Discretionary (no automatic COLA; changes via reform/decisions).</li> </ul>

Source: Authors’ compilation from binding pension legislation (National Insurance Acts and subsidiary regulations) and official scheme publications (benefit guides/handbooks and official websites), with contributory old-age parameters aligned to Table 2A and cross-checked against the latest officially published actuarial reviews and official statutory/administrative summaries in force during 2024–2025 (post-2025 changes flagged separately).

Scope. Table 3 lists retirement arrangements for institutional context (including non-contributory schemes and separate public-sector plans where relevant). The “Level of benefits” column summarizes solely the contributory old-age design.

*Consistency with Table 2A.* The contributory old-age parameters in Table 3 are intentionally harmonized with Table 2A (reference wage, accrual/cap, eligibility/age, indexation rule).

*Statutory vs modeled outcomes.* Table 3 reports statutory design features, not a single “target replacement rate”; realized outcomes depend on contribution density, earnings paths relative to ceilings, and interaction with minimum pensions/social pensions. For harmonized stylized full-career replacement rates, see Figure 1 / Altamirano et al. (2023, Table A2).

*Indexation classification.* “Discretionary” means no binding automatic indexation rule was identified in the governing instruments/official scheme publications used for the table; increases may occur via ministerial/board decisions, budget measures, or periodic review processes. *Coverage-in-practice caveats.* Where legal coverage differs from operational practice, this is flagged (e.g., Trinidad and Tobago: no operational self-employed channel). Where the system is structurally dual, this is stated (e.g., Suriname: AOV + APF).

Ultimately, the region’s long-term social insurance challenge is not only to adjust parameters, but to build institutions that can execute promises—consistently, transparently, and at a scale resilient to demographic change and shocks.

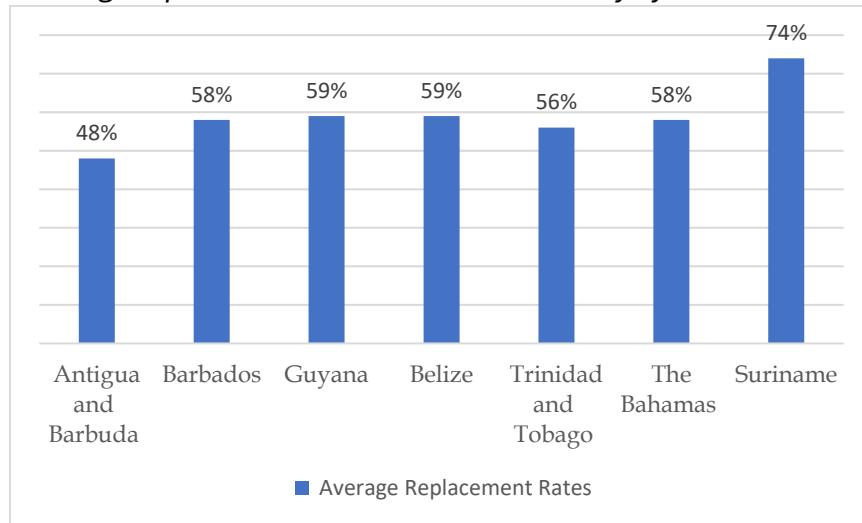
**Adequacy.** Pension adequacy refers to how well pension systems maintain a decent standard of living after labor force departure. In practical terms, whether pensions prevent poverty in old age and allow individuals to sustain a reasonable share of their pre-retirement income. Replacement rates show just how much of a worker’s pre-retirement income is replaced by the pension. Because a high replacement rate can still correspond to a very low absolute benefit when pre-retirement earnings are low, adequacy must also be interpreted against an absolute anchor, such as the minimum wage or a poverty/basic-needs threshold. This is especially true in settings with low wages and incomplete contributory careers.

Estimates from an IDB study, based on a worker contributing continuously from age 20 until minimum retirement age, show that average replacement rates vary widely across the Caribbean (Altamirano et al., 2023), from 74% in Suriname, the most generous system, down to 48% in Antigua and Barbuda (Figure 1). For the stylized full-career worker in this simulation, replacement rates in most Caribbean defined-benefit systems exceed the International Labor Organization’s 40% benchmark.<sup>7</sup>

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<sup>7</sup> Altamirano et al. (2023, Table A2) report replacement rates for a stylized, fully compliant worker (contributing continuously from age 20 to the minimum retirement age), evaluated at earnings levels expressed as multiples of each country’s average formal wage (0.75×, 1×, 1.5×, 2×, 3×). At 1× average formal wage, replacement rates for Caribbean defined-benefit systems are: Antigua & Barbuda 48.1%, Bahamas 57.7%, Barbados 57.7%, Belize 58.8%, Guyana 58.8%, Jamaica 34.1%, Suriname 73.9%, and Trinidad & Tobago 55.7%. The same table shows how replacement rates vary at lower earnings and higher earnings: for example, Jamaica declines from 44.8% (0.75×) to 12.4% (3×) and Trinidad & Tobago declines from 74.3% (0.75×) to 29.8% (3×), while Bahamas (57.7%) and Suriname (73.9%) are flat across these multiples, illustrating that “above 40%” depends on both country design and where, under the common methodology, a worker sits in the earnings distribution.

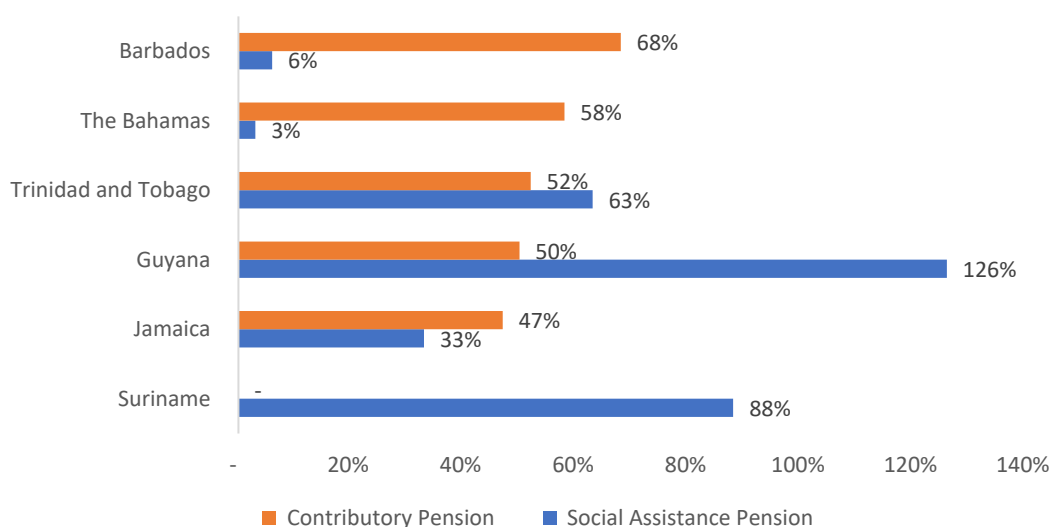
Figure 1. Average replacement rates of social security systems in the Caribbean



Source: Altamirano Montoya et al. (2023)

**Coverage.** Replacement rates reflect pension benefit generosity for those who qualify, while coverage rates indicate system reach. An IDB study using administrative data estimates coverage as the share of age-eligible population receiving benefits, excluding survivorship pensions and including non-residents. As shown in Figure 2, both contributory and non-contributory pension coverage vary across Caribbean countries. Among non-contributory schemes, Guyana has over 73,000 beneficiaries, exceeding the estimated population aged 65 and older. Barbados shows the highest coverage under contributory schemes (Aranco et al., 2022). In Suriname, data on contributory pension systems are unavailable, but an ILO study suggests low coverage: estimates of retirees receiving benefits under civil servant and private sector schemes (PFS and APF) indicate that nearly two-thirds of the elderly population lack coverage from these main formal-sector pension programs (ILO, 2024).

Figure 2. Percentage of eligible residents receiving a pension<sup>8</sup>



Source: Aranco et al. (2022)

Contributory systems currently cover between half and two-thirds of the age-eligible population, with Jamaica exhibiting the lowest coverage and Barbados the highest. In many places, these are complemented by non-contributory social assistance pensions. In Suriname, Guyana, and Trinidad and Tobago, social pensions supplement the income of contributory pensioners whose benefit falls below a specified threshold. Regionally, in LAC, coverage among persons aged 65+ has risen to 75.5%, with non-contributory recipients reaching 31.5%, and elderly poverty declining faster than total poverty (Economic Commission for Latin America and the Caribbean [ECLAC], 2024, pp. 104–105).

Two factors limit contributory coverage in the Caribbean. First, social insurance systems are designed around salaried employment, limiting the participation of the self-employed, who must not only pay higher contribution rates than salaried employees (whose costs are shared by their

<sup>8</sup> Data from IDB using National Insurance Board of The Bahamas (Annual Report 2021); National Insurance Board of Barbados (17th Actuarial Review); Guyana National Insurance Scheme (2021 Annual Report); Ministry of Labor and Social Security of Jamaica (MLSS Sectoral Presentation 2024; MLSS Annual Report 2022/23); National Statistics Institute of Suriname (Statistical Yearbook, Dec 2023); National Insurance Office of Trinidad and Tobago (Annual Report 2022/23). For Barbados, non-contributory coverage reflects contributions by National Insurance and Social Security Service and excludes recipients below 75 years. Guyana's statutory retirement age is 60, but social assistance pension is for those above 65. To account for early retirees, pensioners below statutory pension age was assumed at 14.5% for The Bahamas (ILO 2022) and 31% for Trinidad and Tobago (ILO 2018). For Suriname, data on contributory pillar coverage was unavailable.

employers) but also navigate complex procedures amid weak enforcement. In Trinidad and Tobago, the National Insurance Act's definitions include self-employed persons within the category "employed person" (National Insurance Act, Chap. 32:01, s.2 (Interpretation), definition of "employed person"), yet the proclamation bringing the Act into force excludes this group ("save in their application to self-employed persons")—meaning that there is no self-employed contribution channel in force. Official National Insurance Board of Trinidad and Tobago (NIBTT) material likewise confirms that the NIS "still does not yet cover the self-employed." This represents a significant limitation, given that a large portion of the Caribbean workforce consists of this category of workers. According to household surveys, the share of self-employed workers in Guyana, Jamaica, and Suriname is 29% (2021), 31% (2020), and 13% (2022), respectively<sup>9</sup>.

Second, contributory coverage can be weakened by disincentives when non-contributory pensions provide comparable benefits to contributory schemes, reducing participation incentives. In Guyana, this dynamic is especially evident. The value of the contributory pension provided by the National Insurance Scheme (NIS) is nearly identical to the non-contributory Old Age Pension (OAP), with average monthly benefits of approximately USD 12.5 and USD 12.4 per day in purchasing power parity (PPP) terms, respectively (IDB, 2024). This minimal differential weakens the incentive to contribute to the NIS, particularly among informal or low-income workers, and may encourage non-compliance and informality in the labor market.

**Equity.** Equity refers to fairness in benefit and contribution distribution. It is attained when individuals with similar contribution records are treated equally, reducing horizontal inequities, and subsidies are directed to those most in need, reducing vertical inequities. In Caribbean countries, the presence of multiple pension schemes (Table 1), introduces inequities, especially where generous public servant plans coexist with lower benefits for private sector workers.<sup>10</sup> With regard to vertical inequities, defined benefit systems employ three progressive features for redistribution. First, they include minimum pensions to protect low-income workers. Second, their benefit formulas are progressive, offering higher replacement rates at lower income levels. However, these design features do not guarantee progressive outcomes: net incidence also

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<sup>9</sup> These statistics are taken from the Labor Market Observatory of the IDB available at <https://observatoriolaboral.iadb.org/en/>

<sup>10</sup> Broader equity comparisons should be made on a total-compensation basis (wages + employer contributions + pension wealth) and on net tax-benefit incidence (benefits relative to contributions and general-revenue transfers).

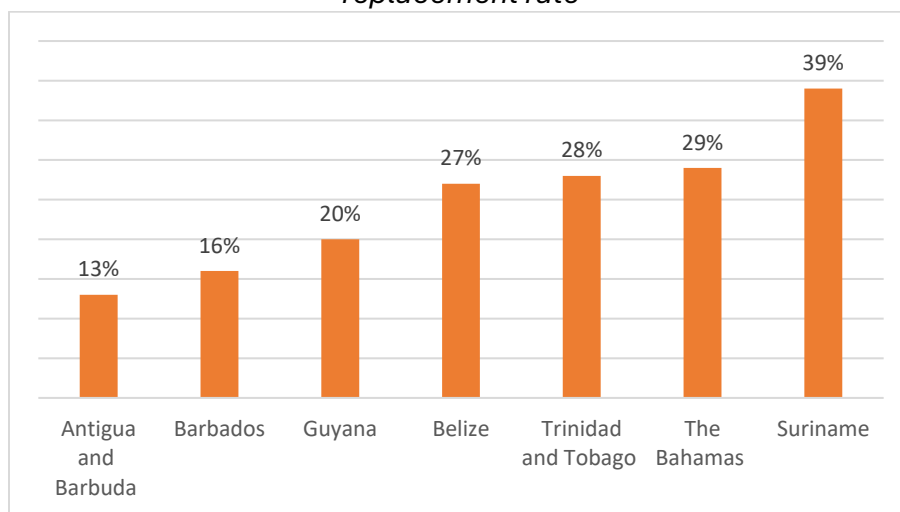
depends on the contribution schedule and, especially in the Caribbean, coverage and qualification (contribution density/qualifying weeks). Third, they impose benefit caps to limit pensions for high earners (Altamirano et. al, 2023). As seen in Table 1, many Caribbean countries incorporate these features.

Other design features also have important equity implications. Implicit subsidies arise when benefits exceed the actuarially fair value of contributions—when pension levels surpass the capitalized value of contributions plus interest. Here, the system subsidizes benefits beyond individual funding.

Defined benefit systems often include these implicit subsidies, as pensions are linked to final salaries and eligibility depends on minimum contribution periods. This creates a gap between the pension received and the value of lifetime contributions, constituting an implicit subsidy financed by the system. A recent IDB study estimates these subsidies using hypothetical workers who contribute from age 20 until the minimum retirement age, comparing benefits under the existing system with those under an actuarially fair system. As shown in Figure 3, Suriname exhibits the largest implicit subsidy: an average worker would receive a pension equivalent to 35% of final salary under an actuarially fair system with a full labor density of contributions, whereas the actual replacement rate is 74% (Figure 1), creating an implicit subsidy of 39 percentage points (Bosch et al., 2018). These subsidies have clear redistributive implications, as generous replacement rates often coexist with the exclusion of self-employed and informal workers from system coverage.

Broadly, adequacy, coverage, and equity patterns show that Caribbean pension systems provide protection for those who qualify but leave gaps among self-employed and informal workers and embed significant subsidies. These tensions shape both sustainability (addressed in the next section) and the reform trade-offs explored later in this report.

Figure 3. Implicit subsidies of pension systems in the Caribbean in percentage points of the replacement rate



Source: Altamirano et al., 2023

#### 2.4. Sustainability: Premium Gaps and Solvency Pressures

Adequacy, coverage, and equity patterns rest on financing structures that face increasing strain. The long-term branches of NISs are funded through mandatory contributions, with reserves invested via National Insurance Funds (NIFs). According to disclosed financial statements, as of 31 December 2023 NIFs held US\$ 915 million in The Bahamas, US\$ 1.8 billion in Barbados, US\$ 1.1 billion in Jamaica, US\$ 3.5 billion in Trinidad and Tobago, US\$ 275 million in Belize, US\$ 500 million in Guyana, US\$ 210 million in St Vincent and the Grenadines, and US\$ 1.2 billion in Suriname. Actuarial reviews highlight considerable sustainability challenges for these social insurance systems, which are unlikely to meet obligations without significant disruptions, such as sharp increases in contribution rates or substantial reductions in benefits (Table 4).

A fundamental problem underlying this pattern is the fact that many Caribbean NISs branches operate in cash deficit due to imbalanced contributions and benefits. In actuarial “pay-as-you-go” (PAYGO) accounting, the key comparison is between the actual combined contribution rate and the PAYGO rate that would exactly finance current pension expenditures. As seen in Figure 4, the premium gap (PAYGO minus actual rate) is positive in all countries except Jamaica. In Saint

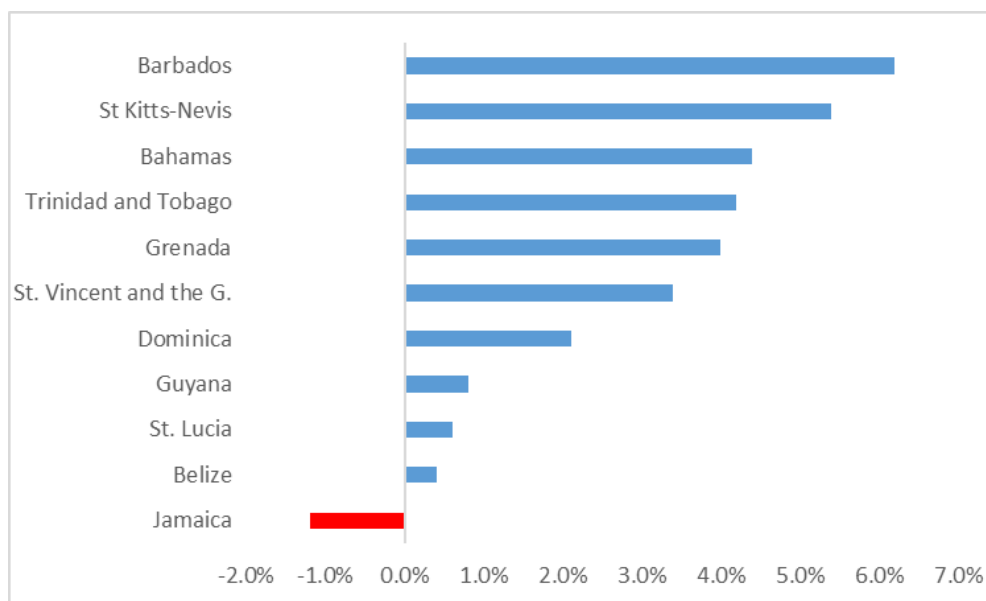
Kitts and Barbados, the gap exceeds five percentage points, indicating the combined rate would need to rise by at least that amount to break even.

*Table 4. Sustainability challenges<sup>11</sup>*

<b>Bahamas</b>	The pension system is projected to run out of funds within 10-15 years unless urgent reforms are implemented. The government's pension liabilities for public service employees will reach US\$3.5 billion by 2030, accounting for a significant portion of recurrent expenditure (Rosenblatt et al., 2024).
<b>Belize</b>	PPPO's deficit totaled 1.1% of GDP in 2022 and will reach 4.1% by 2072, with cumulative deficits' present value at 77.1% of GDP (World Bank, 2024).
<b>Guyana</b>	IMF projections starting from 2017 indicate substantial deficits and an eventual depletion of assets over a 13-year period (Beuermann et al., 2021).
<b>Jamaica</b>	The pension system in Jamaica is projected to run out of funds within the next 10 to 15 years (Rosenblatt et al., 2024).
<b>St. Vincent and the G.</b>	The NIS is in the process of a gradual increase in the contribution rate until 2027 to prevent the National Insurance Fund from exhausting (IMF, 2024c).
<b>Suriname</b>	The Earnings-Related Pension contributions aim to reach 28% by 2065 for enhanced sustainability. However, according to APF's 2019 annual report projection, the fund will run into deficit after 2037.
<b>Trinidad and Tobago</b>	The National Insurance Fund is projected to exhaust its reserves by early-to-mid 2030s under baseline (11th actuarial review).

Source: Authors' compilation.

*Figure 4. Premium gap between PAYGO and contribution rates, 2022*



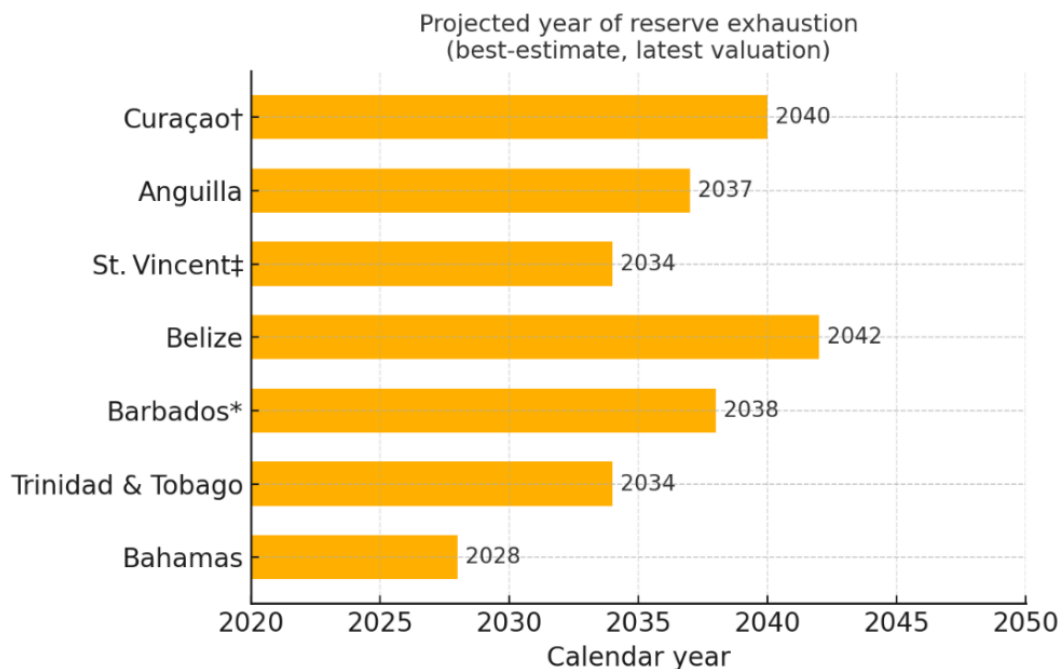
Source: Authors' calculations based on actuarial projections

<sup>11</sup> In Barbados, recent projections show contribution rates may rise from 8.9% in 2015 to 17.2% by 2030 for solvency, according to Greenidge, 2024 (unpublished manuscript, figures subject to revision).

Note that in Caribbean policy discourse, “PAYGO” is often used more narrowly to describe schemes with minimal marketable reserves (e.g., where the reserve-to-expenditure ratio is around 1 or below). Here, to avoid confusion, “PAYGO rate” is used in its actuarial sense: the contribution rate that would finance current-year pension expenditures, regardless of whether the scheme is partially funded.

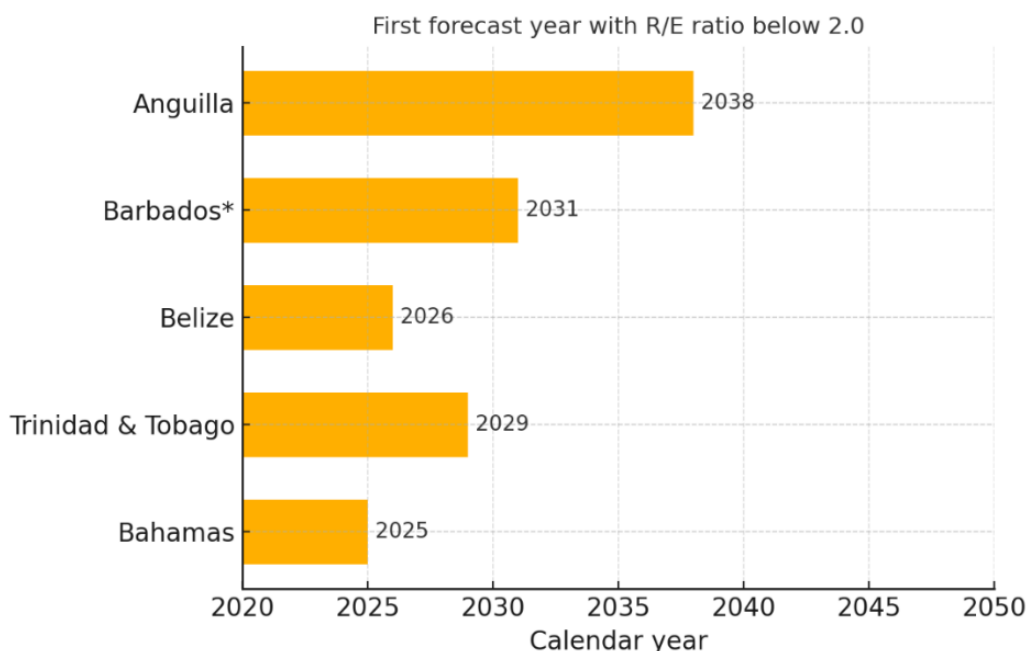
The compilation of recent external actuarial valuations (cut-offs between 2018 and 2025) for eight national insurance schemes—reporting two indicators: (i) the first year in which the reserve-to-expenditure ratio (R/E) falls below 2.0, a common prudential alarm, and (ii) the projected year when reserves become fully depleted under the central scenario—complements the sustainability evidence in Table 4. First, we see in Figures 5a and 5b that for every scheme with a valuation less than four years old, the R/E ratio is projected to fall below 2.0 before 2035. Second, once that prudential threshold is crossed, there is little time between early warning and full reserve exhaustion. In all valuations, this interval never exceeds nine years, leaving small scope for gradual parameter changes to stabilize the system.

Figure 5a. Projected year of reserve depletion — baseline (no-reform), latest valuation



Note: Horizontal bars end at calendar years when scheme reserves deplete under baseline scenarios of latest valuations (or proxy where noted). Bar length shows remaining years of solvency with unchanged parameters. Sources: Bahamas (NIB & ILO, Eleventh Valuation, 2018 cut-off, p. 57); Trinidad and Tobago (NIB & ILO, Eleventh Valuation, 2020, pp. 47–48); Barbados\* (NIS & ILO, Seventeenth Review, 2020, pp. 25–28; 2034–41 range midpoint); Belize (SSB, Performance Analysis, 2022, pp. 46, 52–53; 2040–45 range midpoint); Saint Vincent‡ (NIS, Eleventh Review, 2019 projection of 2034); Anguilla (SSB, Twelfth Review, 2020, pp. 3, 22, 24); Curaçao† (World Bank, Public Expenditure Review of Sint Maarten, 2020, p. 64; proxy for Curaçao AOV). Data notes: Bahamas, Trinidad and Tobago, Belize, and Anguilla report single-year estimates. Barbados review provides the 2034–41 range across three scenarios; midpoint (2038) shown. Saint Vincent's twelfth review pending; chart shows 2034 from eleventh review. Antigua and Barbuda omitted as the fund has no liquid assets and operates in an effectively cash-flow financed state (often described locally as 'PAYGO'). Curaçao 2040 marker derived from World Bank analysis of Sint Maarten's system (†).

Figure 5b. First forecast year with reserve-to-expenditure ratio below 2.0



Note: Bars end when reserve-to-expenditure ratio falls below 2.0—a threshold used by Caribbean supervisors indicating liquid assets cover less than two years of benefits.

Sources: Same as Figure 5a. Bahamas, Trinidad and Tobago, Belize, Anguilla: first year below 2.0 read from R/E time-series. Barbados: with 2030 ratio at 2.1 and subsequent depletion, linear interpolation suggests ratio falls below two in 2031 (marked with asterisk). Saint Vincent, Antigua and Curaçao: excluded due to lack of R/E threshold data.

Depletion dates and R/E ratios only matter while a fund has marketable reserves. This is an important distinction for investment governance: ALM/LDI in these schemes is primarily about managing liquidity and risk while reserves exist and reducing the variance of the funding path, not about hedging the full liability stream beyond projected depletion.

Once reserves reach zero (i.e., the scheme becomes effectively cash-flow financed, often described locally as “PAYGO”), solvency depends on monthly cash coverage. That is, whether contributions plus enforceable Treasury transfers can pay benefits. In Antigua and Barbuda, for example, by 2013, the Social Security Fund had cash deficits of EC\$1.5 million monthly with no saleable assets; cheques bounced and the Treasury advanced cash. Actuaries now frame

sustainability solely by the PAYGO rate, currently near 16% and projected to reach 30% by the early 2060s without reform. Neighboring schemes show similar patterns; even better-funded systems like The Bahamas and Trinidad and Tobago will exhaust buffers within a decade without decisive action.

Once a fund crosses the prudential threshold, analyses necessarily shift from counting reserve years to three questions: (i) the annual financing gap (benefits minus contributions, net of enforceable transfers); (ii) erosion of the contributor-to-pensioner ratio, and (iii) the elasticity of contribution income to rate increases. A practical insolvency test is the first-year projected contributions plus legally committed Treasury transfers' failure to cover benefits.<sup>12</sup>

Another structural factor driving financial deterioration is longevity, operating at two levels. At the individual level ("micro longevity"), decumulation products like guaranteed or non-guaranteed life annuities protect people from outliving assets by pooling mortality risk across retirees. Though, inflation-protected lifetime income is often limited and costly in markets lacking long-duration, CPI-linked hedging instruments (see Section 6.4.6). At the population level ("macro longevity"), systematic increases in life expectancy raise the cost of lifetime benefits for entire cohorts. While longevity-linked securities can, in principle, transfer part of this systematic risk, such markets are limited. The focus here is therefore on actuarially neutral regional risk-sharing mechanisms. In small, open economies with emigration, these society-level shocks cannot be diversified within a single scheme. Without formal risk-sharing, the extra cost of macro-longevity risk falls on current contributors and the government budget, a point we return to in Section 6. Before doing so, the following sections address implementation across the value chain, where these solvency pressures are either amplified by leakage and weak controls or mitigated by disciplined administration and investment governance. Given short runways, the binding margin becomes (a) effective contribution income net of leakage and arrears, (b) administrative drag, and (c) liability-consistent net returns. Sections 3 and 4 thus treat administration and investment as solvency instruments, not "nice-to-haves."

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<sup>12</sup> The investment-governance implications—i.e., which instruments translate actuarial alarms into routine management discipline (dashboards, funding rules, published IPSs, attribution, stress testing)—are developed in Section 4 (see Table 7) and operationalized in Section 6.

### **3. Social Insurance Implementation: Administration and Management**

The preceding section showed that adequacy, coverage, and equity rest on an increasingly fragile financing base. Under unchanged parameters, actuarial reviews indicate short solvency runways, with reserves in many countries projected to fall below prudential thresholds within a decade. This section turns to the present, examining the daily administrative and operational management practices of these systems, before addressing investment governance in the following section.

In practice, contribution rates generate varying revenues, and benefit formulas can yield different service levels, depending on how registration, contribution collection, record-keeping, entitlement determination, governance, and compliance are organized. Administrative costs remain high in many countries, absorbing a significant share of contribution income, while operational frictions (e.g., paper-based processes, slow posting, weak enforcement) erode the resources available to finance benefits (ILO, 2018a; Peters, 2017).

Effective administration is a first-order reform lever. Lower administrative costs and stronger compliance improve financial sustainability by reducing leakage and raising net contribution income. Improved service delivery and greater transparency can also rebuild confidence in national insurance institutions, making it easier to secure political support for the parametric and structural reforms examined in this section.

#### **3.1. Administration Costs**

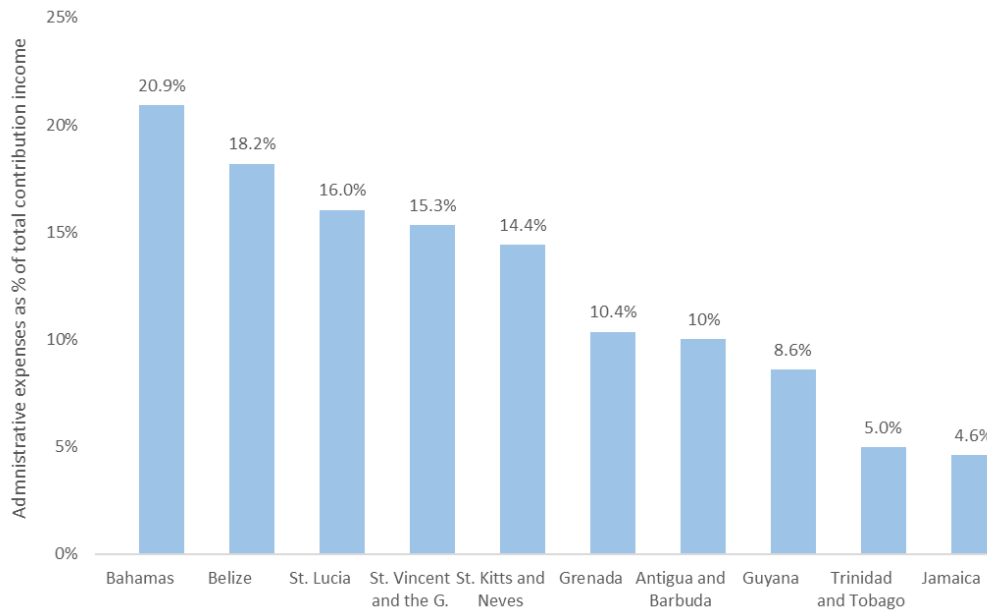
The importance of effectual administration extends beyond service quality, governance, and public trust. It is crucial for financial sustainability. Under plausible assumptions, a 1% annual administrative charge on pension accumulation can reduce the final balance by around 20% over a working life (Barr & Diamond, 2006). In social insurance, high operating expenses reduce net contribution income, leaving fewer resources to finance benefits and build reserves.

Administrative costs (as a percentage of total contribution income) are thus a key indicator of National Insurance Scheme (NIS) management efficiency, revealing where sustainability can be strengthened. As shown in Figure 6, differences across countries are substantial. Jamaica reports the lowest administrative burden at 4.6% of contribution income, followed by Trinidad and Tobago

at 5.0% and Guyana at 8.6%. St. Vincent and the Grenadines and Belize record higher ratios of 15.3 and 15.9%, respectively.

Each percentage point spent on administration reduces the contribution income available for pensions and benefits. In systems facing premium gaps and short solvency runways, high administrative costs constrain the ability to meet obligations, rebuild reserves, and adapt to demographic and economic shocks without forceful parametric or fiscal measures.

Figure 6. Administrative expenditure as a proportion of contribution income (circa 2022)



Source: Financial statements reported by each country (not available for Barbados and Suriname).

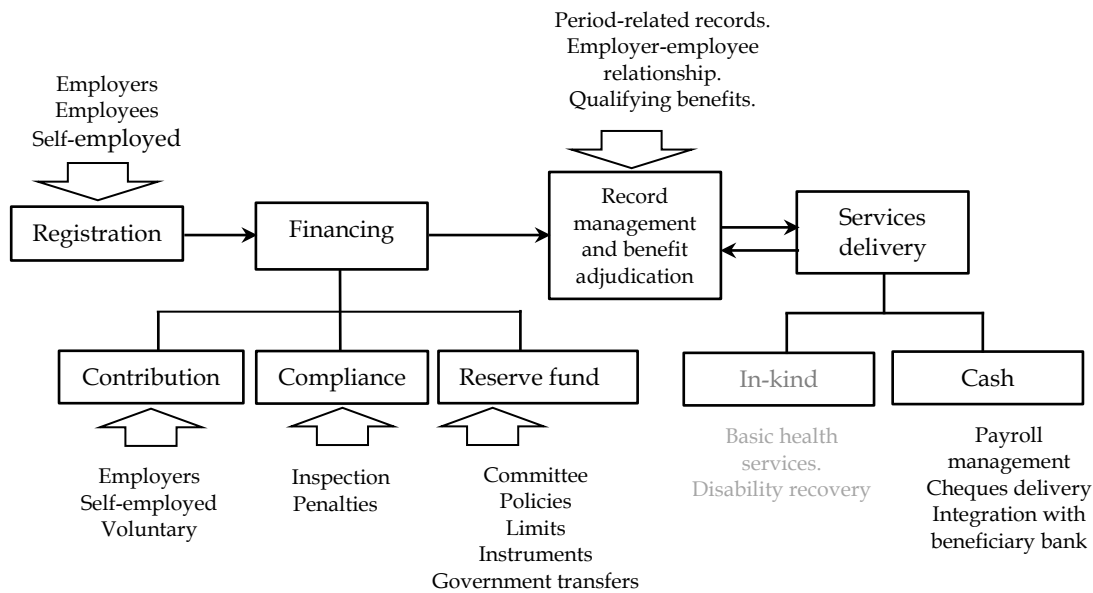
### 3.2. Collection of Information along the Value Chain

Understanding how social insurance systems operate along the value chain allows to identify avenues for administrative modernization. To this end, a questionnaire was conducted in early 2024, gathering responses from the national insurance agencies of seven Caribbean Community (CARICOM) countries (St. Vincent and the Grenadines, Trinidad and Tobago, The Bahamas, Barbados, Belize, Antigua and Barbuda, and Anguilla) and Curaçao. Annual reports, actuarial reviews, and bilateral interviews with administrators of selected NISs complement the questionnaire.

The information gathered sheds light on the practical challenges posed at each operational stage: registration and contribution collection, compliance and enforcement, record management, benefit adjudication, and service delivery, including digitalization efforts. Institutional practices reflect specific historical, geographical, and regulatory contexts such that the questionnaire captures both common patterns and country-specific variations in social insurance implementation.

In a Caribbean NIS, the social insurance process begins with the registration of employers, employees, and self-employed workers. Once complete, financing activities channel resources through three mechanisms: (i) contributions from employers, self-employed persons, and voluntary participants; (ii) compliance processes for timely payment, including inspections and penalties; and (iii) reserve fund management, guided by committees, policies, permissible investments, and government transfers for non-contributory pensions. These resources support record management and benefit adjudication, where contribution records, employer–employee relationships, and qualifying conditions are verified. Service delivery occurs primarily through payroll management, cheque issuance, or integration with beneficiary bank accounts. Inefficiencies at any step—such as slow registration, weak compliance, manual records, or limited payment options—can weaken coverage, increase costs, and delay benefits. Figure 7 summarizes this value chain, from registration through financing, records and adjudication, to service delivery.

Figure 7. Illustration of a traditional value chain in the management of typical social insurance services



In light of this structuring, the questionnaire is divided into the following sections, each corresponding to a step in the value chain and its supporting functions:

- *Customer service*: This section examines customer service structure and functionality, including specialized units, customer-relationship management (CRM) software, and multiple service channels (walk-in offices, phone centers, digital platforms, mobile apps, WhatsApp Business, mailboxes, and email). It also asks whether other entities contact customers for the NIS, typical response times for pension claims, the availability of live tracking, and the average time to complete a claim.
- *Registration practices and interoperability*: This section explores requirements for employer and employee registration to pay contributions, including required documents. It looks at eligibility rules for worker categories, electronic registration linked to official identification, and registration response times. It investigates whether employees can register with multiple employers, the use of electronic payroll databases, rejection of unregistered employee contributions, employers' obligations to notify employment

relationship endings and liabilities, and treatment of retired employee contributions and affiliations. Interoperability with other public databases (national identification, public health, business registries, and civil registries) is also considered.

- *Contribution collection practices and enforcement:* This section identifies who defines contribution rates (the NIS/SSB or external authority) and collection channels like banking services, in-office collection, and online platforms. It asks whether: third parties match cash inflows, payments process automatically, and cash management is in-house or outsourced. It also covers the time needed to apply contributions to records, define arrears, and initiate coercive collection of unpaid contributions, and whether enforcement is conducted by the NIS/SSB or third party.
- *Investment policies and practices:* This section examines whether funds are divided by covered risks, whether pension funds are separate from other branches, and whether social security funds are managed in-house or externally. It asks if investments are regulated by external authority, whether there is second-level risk assessment, and if a high-level investment committee exists within the board. It also identifies whether investment policies are defined by law or internal authority, are public, and set minimum returns. It determines whether policies allow foreign investments, define exit and liquidity rules, permit direct lending, and specify minimum returns. This section also collects information on real-sector investments, portfolio disclosure restrictions, portfolio value and composition, whether the fund is indexed to actuarial liabilities, financial management covers mission-related and administrative activities, and actuarial calculations are done internally or externally. Finally, it asks if financial statements are public and discerns the ratio of administrative costs to contribution income in the last fiscal year.
- *Contribution records, benefit adjudication, and payment mechanics:* This section covers time to receive first payment after pension grant, availability of digital claim platforms, paper-free processes, and whether payments occur through banking systems with direct digital links. It asks whether the financial instance manages bank relationships, pensioners can choose and switch banks, if they access digital platforms for pension statements, and what transaction costs apply. It examines how payroll information

reaches banks and whether the payroll database connects to identification and death-certification services. Questions cover life certificates for local pensioners, pension transfers to foreign banks, and, for disability and survivorship branches, whether deceased affiliates are updated automatically, survivorship pensions are granted automatically, claims use digital platforms, and cohabitation certification. This section also examines time for survivorship pension issuance, multiple pension grants to beneficiaries, disability cause determination methods, disability checklists, controversy resolution mechanisms, frequency of medical reviews, and time required for disability pension grants.

- *Risk management*: This final section identifies whether the organization has a unit for risk management (operational, financial, and fraud risks), and its name, location, and relation to internal audit. It asks about formal information security practices (e.g., ISO 27001), the presence of a security operations center, and data center location (in-house or third party). It also inquires whether the organization has experienced a cyberattack and how losses are compensated—through insurance, self-insurance funds, or budget allocations.

The subsections that follow use the information gathered from the questionnaire to delve more deeply into how registration, contribution collection, reserve management, record-keeping, benefit payment, digitalization, and compliance operate in practice, and in doing so, identify opportunities for administrative modernization.

### **3.3. Registration Practices and Interoperability**

Questionnaire responses reveal diverse registration practices with varying levels of formality. In most schemes, including Trinidad and Tobago, The Bahamas, and Barbados, registration is compulsory for employees. Employers must submit business registration documents, manager identification, and sometimes employment contracts to register workers with the National Insurance Scheme (NIS) or Social Security Board (SSB).

While robust documentation facilitates accurate records and compliance, it can also increase registration transaction costs. For small firms and self-employed and informal-sector workers, extensive paperwork and in-person procedures can discourage registration and reduce contributory coverage.

Among surveyed national insurance services, interoperability with other public databases, such as national identification agencies, health systems, business registries, and civil registries, is effectively absent. Each institution maintains separate registration records, with limited or no automated data exchange. This lack of interoperability increases administrative workload, makes identity verification and status updates slower and more error-prone, and weakens the informational base for contribution assessment and benefit adjudication.

### **3.4. Contribution Collection Practices and Enforcement**

This subsection examines how contributions are collected, monitored, and enforced in the financing segment. Responses reveal that contribution collection processes vary significantly across countries. For example, in Trinidad and Tobago and Barbados, contribution rates are defined by the NIS/SSB under governing legislation, while in Curaçao and Anguilla, rates are set directly by law outside the social insurance agency.

There is furthermore a continued reliance on in-office cash receipts. Several schemes, including St. Vincent and the Grenadines, Trinidad and Tobago, and Barbados, still accept cash payments at NIS offices. In contrast, international practice increasingly relies on digital payment channels, such as bank transfers and online platforms, which facilitate traceability, lower handling risks, and reduce fraud opportunities.

Though only Belize reports having fully automated systems that attribute payments to individual contributor accounts, such automation is crucial for real-time compliance tracking, timely contribution record updates, and reconciliation between bank receipts and individual ledgers. Delays in recognizing payments in other Caribbean countries, ranging from 1 to 30 days, pose challenges. It takes five days to recognize payments in St. Vincent and the Grenadines, and can take up to 30 days in Barbados. Longer posting times increase error risks, complicate arrears monitoring, and delay corrective action.

Enforcement practices differ markedly. For coercive collection of unpaid contributions, reported lags range from 30 days after non-payment to 90 days in Trinidad and Tobago. Long waiting periods before launching coercive measures weaken deterrence, allow arrears to accumulate, and reduce statutory penalties' effectiveness. Cash-based collection, slow posting, and delayed

enforcement reduce contribution income and increase cash-flow volatility, compounding the sustainability pressures documented in Section 2.

### 3.5. Reserve Funds and Investments

Questionnaire responses show that NISs manage reserves through investment committees and typically handle investments internally and in-sourced. Many organize portfolios by risk type or benefit branch, but none of the eight surveyed entities links its strategic asset allocation (SAA) to future benefit payments through formal asset–liability management (ALM). Neither do they map their asset mix to projected benefit cash flows.

With respect to governance, publication of an investment policy statement (IPS)—a board-approved document that defines investment objectives, SAA, benchmarks, rebalancing rules, and risk budgets—are rare. While Anguilla reports having an IPS that can be accessed on demand, a current, publicly available version could not be independently confirmed.<sup>13</sup> Other schemes rely on statutory investment limits or maintain internal IPS documents, which are not disclosed (see Appendix 1, Table A1, "Investment policies are public").

These findings align with the governance assessment in Table 7 and support the framework set forth in Section 4.3, which recommends pairing a statutory Funding Policy with a published IPS and adopting ALM-based investment objectives. Indeed, without a public IPS and SAA linked to liabilities, boards lack a transparent way to show that investment portfolios align with future benefit obligations and total-fund returns are managed against the actuarial yardstick rate.

### 3.6. Contribution Records, Benefit Adjudication, and Payment Mechanics

Efficient contribution record management and benefit adjudication are essential to maintain accurate beneficiary data and ensure timely payments. Record management involves tracking contributions, employer–employee relationships, and eligibility for benefits. While some

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<sup>13</sup> Verification note: Anguilla’s response to the 2024 questionnaire indicates the existence of an IPS but as of the report cut-off (December 2025), public posting of a current IPS could not be independently confirmed. The statement is therefore treated as self-reported and should be updated only when an official publicly accessible IPS is provided.

Caribbean countries, like The Bahamas, have adopted digital claims processes, others, like St. Vincent and the Grenadines, still rely on manual documentation.

In addition, few schemes verify cohabitation or review disability status, increasing the risk of payment errors, including transfers to ineligible beneficiaries. Trinidad and Tobago and Anguilla handle disability benefit examinations internally, whereas Barbados uses both internal and external assessments. This mix can provide checks and balances but requires clear protocols to avoid inconsistent decisions.

Digital integration with other public databases, such as death registries, is limited. In all schemes except that of Belize, death certificates remain paper-based, without automated links between civil-registration systems and pension records. This hinders prompt payment stoppage after a beneficiary's death, increasing overpayment risks and "ghost" pensions. Quantifying this exposure is critical: international evidence suggests that in jurisdictions with similar proof-of-life lags, administrative friction accounts for a fiscal leakage of 2–5% of total pension expenditure, rising to over 15% in fully manual environments (Holzmann et al., 2009).<sup>14</sup>

Across the countries examined, cash payments through banking systems are standard, providing basic traceability and security. However, digital integration with banks is often partial. Few schemes offer digital pension statements or paper-free claims processes, limiting accessibility and straight-through processing. Curaçao provides paper-free claims, but other countries, including Trinidad and Tobago and Barbados, lack digital channels that could simplify procedures and reduce costs.

Finally, all schemes require "life certificates" or proof-of-life procedures to verify pensioners' eligibility. While these checks prevent fraud, they also burden older people, particularly in terms

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<sup>14</sup> For example, the U.S. Social Security Administration's Office of Inspector General reported fraud-unit savings of approximately US\$416 million through death-data matching activities (Carlson et al., 2013). Similarly, South Africa's SASSA realized annual savings of approximately US\$194 million (R2 billion) following biometric and registry cleanups (Habtemichael, 2009). Beyond direct fraud, actuarial analysis confirms that such "phantom" populations—beneficiaries who remain on rolls due to data errors—can distort annuity valuations by up to 4% for specific cohorts, compounding long-term solvency risks (Cairns et al., 2016). Without automated "proof of death" integration via civil registries, standard bi-annual "proof of life" cycles create structural leakage windows of up to six months (Khan et al., 2015).

of in-person visits, highlighting the value of interoperable digital solutions with civil registries (see also Section 6.1).

### **3.7. Digitalization: Platforms, Interoperability, and Gaps**

Questionnaire evidence indicates low digital maturity across the administrative chain. Most schemes lack end-to-end transactional portals and use paper-based or email workflows for registration, contribution reporting, and claims submission. Integration with bank payment rails is partial, and machine-to-machine interoperability with national identification systems, tax and business registries, health databases, and vital-events registries is either absent or limited to pilots (see Appendix 1, Table A1). For example, Barbados lacks a fully online registration portal, Trinidad and Tobago's Empower initiative is not yet fully transactional, and several smaller schemes process employer returns and benefit claims mostly offline.

These limitations have operational impacts. Manual workflows extend adjudication times, require repeated identity checks (through physical life certificates), and restrict use of risk-based compliance tools that need timely data. Fragmented records and poor interoperability increase error and fraud risks and impede monitoring contribution posting and arrears in real time. In systems facing short solvency runways, this digital gap reduces effective contribution income and undermines service quality.

The evidence presented here complements that on collection timeliness and electronic channels discussed next, and the analysis of capital-market plumbing in Section 4.2. We return to these issues again in Section 6.2, where performance targets and implementation milestones are proposed for building an integrated digital backbone linking registration, collections, compliance, and benefit payments across the region.

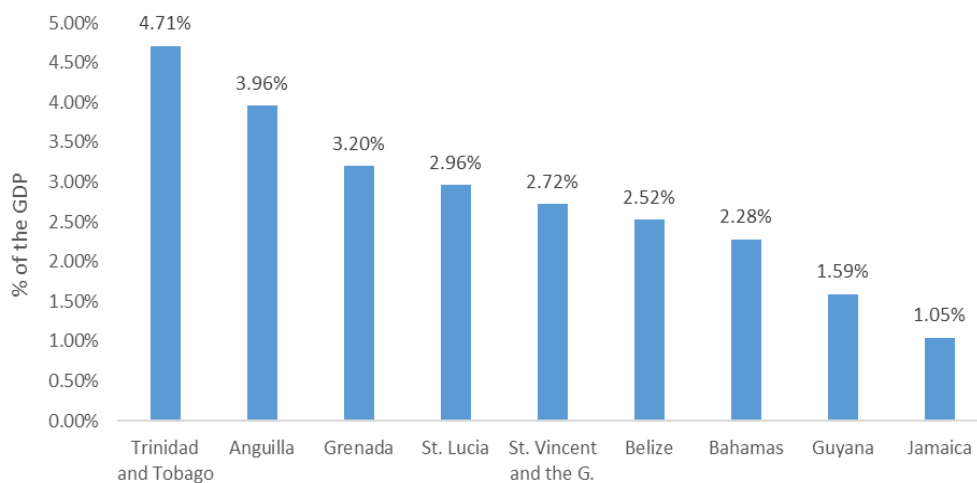
### **3.8. Contribution Collection and Compliance**

This section examines how contribution revenue is collected and enforced and identifies the compliance shortfalls that constrain contribution income and, by extension, the financing of NIFs.

### 3.8.1 Collection Channels and Processing Times

Social insurance contribution income as a percentage of GDP varies across Caribbean territories (Figure 8), reflecting differences in economic structure, labor-market formality, coverage, contribution rates, and enforcement. Jurisdictions with higher contribution-to-GDP ratios typically have broader formal worker coverage, stronger compliance mechanisms, and higher contribution rates, while those with lower ratios often face gaps in terms of registration, enforcement, or inclusion of self-employed and informal workers.

*Figure 8. Contribution collection as percentage of GDP (circa 2021)*



Source: Authors' calculations based on financial statements

Trinidad and Tobago leads with contribution revenues of 4.71% of GDP, indicating strong payroll tax compliance in its formal labor market. Anguilla follows at 3.96%, reflecting a robust contribution base. Grenada's social insurance contributions account for 3.20% of GDP, in line with regional norms, followed closely by St. Lucia and St. Vincent and the Grenadines at 2.96% and 2.72%, respectively. Belize and The Bahamas, at 2.52% and 2.28%, show lower revenues, implying structural labor-market differences, weaker compliance, or design features that narrow the contributory base. Finally, challenges in expanding coverage and enforcement are most evident in Guyana and Jamaica, where this ratio is 1.59% and 1.05%, respectively.

For workers outside traditional employment, voluntary contributions are available in some schemes. In The Bahamas and Barbados, however, voluntary contributors face reduced covered

risks, as contingencies tied to employment—such as work injury—are excluded. Moreover, financial statements show that voluntary contributions are insignificant, accounting for under 1% of total contributions, meaning that this channel does little to offset coverage gaps from informality and self-employment.

### **3.8.2 Enforcement, Penalties, and Recovery Rates**

A cross-sectional analysis, complemented by desk research, of the eight NIS/SSB entities (or “reference schemes”) covered by the questionnaire, reveals uneven progress in digital capability and enforcement across the region.<sup>15</sup> The most advanced configuration—an integrated tax-portal model with mandatory electronic filing, bank-only payments, and automatic penalties—remains the exception. In most schemes, electronic submission coexists with paper steps, gaps in account posting, and limited publication of metrics. This heterogeneity explains the low revenue from penalties and surcharges and weak enforcement discipline across Caribbean administrations.

Against this backdrop, the ISSA Guidelines on Contribution Collection and Compliance stress aligning legislated obligations with operational mechanisms, recognizing contributions as the backbone of NIF financing (ISSA, 2022b). Traditional NISs operate in the shadow of sizeable informal economies that erode detectability *ex ante* and increase *ex post* enforcement costs. Indicative estimates put the shadow economy at roughly 20–30% of GDP in The Bahamas, 29–33% in Barbados, and 35–45% in Jamaica (Peters, 2017).<sup>16</sup>

Statutory frameworks are not the primary constraint. NIAs empower administrators to register contributors, maintain records, collect contributions, inspect employers, and enforce compliance. Inspectors may enter premises at reasonable times, review records, and interview relevant individuals, with obstruction treated as an offence. In Jamaica, obstruction can result in penalties or imprisonment. In Trinidad and Tobago, summary-conviction fines apply for non-

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<sup>15</sup> Namely, The Bahamas, Barbados, Belize, Curaçao, St Vincent and the Grenadines, Trinidad and Tobago, Antigua and Barbuda, and Anguilla; see Sections 3.2. and 3.3 and Appendix 1, Table A1.

<sup>16</sup> These figures are presented for indicative purposes and order-of-magnitude diagnostics rather than point estimates.

payment—TT\$4,000 plus TT\$100 per day per employee for continuing offences—with prosecution permitted after missed payments, though remediation is pursued first. In The Bahamas, retaliatory dismissal or threats against employees who cooperate with inspectors are offences subject to fines and imprisonment in defined circumstances. Belize and Guyana enumerate similar offences and penalties. In Suriname, the APF framework provides sanctions in law, though public documentation on their application is limited. These provisions indicate a robust statutory basis for enforcement across the region; gaps are predominantly operational rather than legislative.

All eight reference schemes have introduced employer e-portals and accept electronic submission of contribution schedules. However, the mandatory use of portals, requirements for bank-transfer payments, and automatic calculation of penalties vary across jurisdictions.<sup>17</sup> Where portal–bank–ledger integration is complete, posting and penalty assessment are triggered automatically by rule-based processes. Elsewhere, manual reconciliation and discretionary enforcement persist, producing latency and inconsistency in compliance. This latency is compounded by the lack of published service standards for posting times, defined as days between (i) verified receipt of payment and schedule, (ii) bank reconciliation and payroll matching, and (iii) credit visibility in contributors' records. Field observations suggest prompt reconciliation when payments and schedules match, but no public data exists on median or 95th-percentile posting times. To strengthen traceability and deterrence, two benchmarks should be established and disclosed, with monthly tracking and root-cause diagnostics: (a) reconciliation completion within T+2 days and (b) individual posting within T+7 days.<sup>18</sup>

A parallel weakness concerns the dunning cadence: the schedule of reminders and enforcement actions following missed filing or payment, with deadlines, channels, and sanctions codified and automated where feasible. In integrated models, the cadence is activated by portal and banking events: Day +7, a courtesy email/SMS with self-service link; Day +15, a formal notice with accrued interest; Day +30, a certified letter and suspension of compliance certificates; Day +60, a warning

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<sup>17</sup> “Operate e-portals” denotes availability and active use, not universal *mandate*; bank-only payments and rule-based penalties apply only in a subset of jurisdictions (e.g., Curaçao).

<sup>18</sup> *Posting time* is distinct from cash reconciliation: the former measures the lag until the contributor’s *individual* record reflects the payment; the latter measures ledger-level clearance. Both should have published targets (median and p95) and compliance rates.

of coercive collection and inspection referral; and Day +90, initiation of legal recovery and/or inclusion in an arrears register. In less integrated systems, coercive collection typically starts only after 30 days past due, and contribution amnesties are used intermittently, weakening deterrence.

Further, formal risk-based audit programs and data sharing with tax, labor, business-registry, and banking-KYC systems remain limited, constraining detection of under-reporting or non-payment. The absence of published audit-coverage rates further weakens accountability for supervision.

Transparency deficits are equally salient. Regular publication of operational indicators—such as on-time filing and payment rates, e-payment uptake, median/95th-percentile posting times, electronic return rejection rates, risk-based audit coverage, recoveries from penalties and interest, and arrears ageing by bucket—remains uncommon. Belize and St. Vincent and the Grenadines include partial collection data in annual reports, while The Bahamas, Barbados, Curaçao, Trinidad and Tobago, Antigua and Barbuda, and Anguilla publish no operational KPIs beyond financial statements. Quarterly dashboards with standardized definitions would improve transparency and enable cross-country comparison.

The regional pattern is uneven. While automated, data-driven flagging of non-compliance remains uncommon, Curaçao stands out for its tax-portal model mandating e-filing, bank-only payments, and automatic monthly penalties for missed deadlines. Dutch-linked systems (and Bermuda, outside this sample) are closer to best-practice integration, while others remain in transition. Interoperability beyond collections—such as linking to death registries, national identification systems, and life-certificate processes—has improved unevenly, with batch updates still more common than real-time checks.

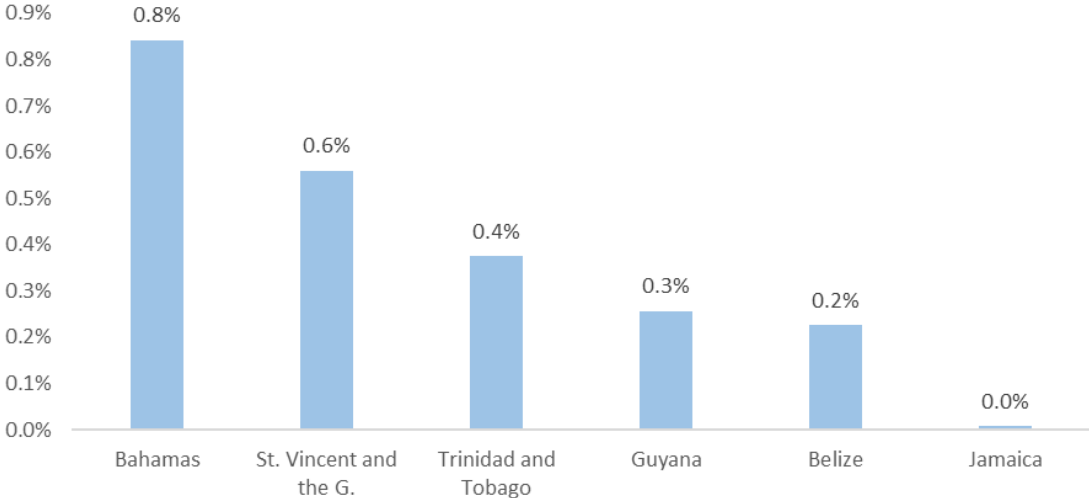
Seven of the eight schemes include self-employed contributors in law; Trinidad and Tobago being the exception.<sup>19</sup> However, legal coverage alone—without operational enrollment channels such as presumptive bases or quarterly contribution options—does little to expand the contributory base. Operationally, partial digitalization, weak publication of SLAs and KPIs, and limited risk-

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<sup>19</sup> Operationalization of self-employed coverage (onboarding channels, presumptive assessment, quarterly remittance options) is discussed in Section 6.1, and the supporting governance/supervisory architecture (dashboards, three lines of defense, supervisory templates) is addressed in Section 6.5.

based audits reduce deterrence. As shown in Figure 9, revenue from penalties, late fees, and interest remains marginal across the sample—consistently below 1% of total income across the sample – reflecting enforcement gaps and frequent waivers.

Figure 9. Income from penalties, late fees, and interest on late contributions (circa 2022)



**Source:** Annual or financial reports—Bahamas, 2021 (“other income”); Barbados, not available; Belize, 2022 (“interest on late contributions”); Guyana, 2021 (“interest on arrears contribution”); Jamaica, 2021 (“other income”); St Vincent and the Grenadines, 2022 (“surcharges and other fees”); Suriname, not available; Trinidad and Tobago, 2022 (“penalties and fees”). See Appendix 1, Table A1 for country-specific details on portals, payment channels, posting timelines, and enforcement sequences; Section 3.3 for survey scope and methods; and the Glossary at the end of Section 4.2 for standardized definitions (*posting time, dunning cadence, KPI, reconciliation*).

### 3.8.3 Informality and Compliance Gaps

Despite the size of the shadow economy, revenue from enforcement-related charges is marginal in countries that report such data. In 2022, income from penalties, late fees, and interest on late contributions was about 0.8% of total income in The Bahamas, 0.6% in St. Vincent and the Grenadines, 0.4% in Trinidad and Tobago, 0.3% in Guyana, 0.2% in Belize, and 0.0% in Jamaica (Figure 9). No comparable figures are available in the latest statements of Barbados and Suriname.

This combination of large informal sectors and near-zero enforcement income raises concerns about the effective deployment of statutory powers. It underscores the need to modernize enforcement through real-time payroll integration, e-invoicing, automated dunning and penalty application, and clear legal gateways for risk-based data sharing with tax and financial authorities.

Strengthening these mechanisms would support higher effective contribution income, reduce arrears, and level the field between compliant and non-compliant firms. The reforms proposed in Section 6.1 build on this diagnosis, setting out a unified digital backbone, risk-based compliance chain, and transparent KPIs and service levels that can convert strong legal mandates into operational deterrence and more predictable contribution flows.

#### **4. Investment Governance and Strategy**

The preceding sections showed that the long-term branches of NISs face mounting solvency pressures and that administrative weaknesses erode contribution income and reserves. This section examines the third pillar of the system's financial architecture: the governance and investment of reserves.

Building on the governance analysis in Table 7 ("Governance instruments versus actuarial alarms") and institutional details in Appendix 1, Table A1, this section clarifies who sets investment policy and which documents govern decisions in National Insurance Funds (NIFs). It compares target versus actual asset allocation, summarizes regulator-led changes in permissible assets, evaluates realized performance against actuarial hurdles (using the CPI + discount rate yardstick), and identifies governance gaps and policy options. To this end, the first subsection (4.1) discusses governance and transparency, the next (4.2) reviews the binding policy and operating constraints (statutory limits, foreign-exchange access, custody/valuation), and the final subsection (4.3) outlines the liability-relative, LDI framework used in this report for benchmarking, risk budgeting, reporting, and stress testing.

The unifying principle throughout is fiduciary discipline. Investment policy is meaningful only when it is transparent, linked to long-term liabilities, and monitored against measurable benchmarks. Absent this alignment, portfolios may satisfy statutory investment limits yet still fall short of what is needed to sustain promised benefits.

##### **4.1. Governance and Transparency (IPS, Committees)**

Published investment rulebooks are uncommon in the Caribbean. In other countries with available information, boards rely on statutory investment limits or internal IPS documents that

are not disclosed, and no national insurance institutions maintain binding funding policy (Table 8; Appendix 1, Table A1). Fiduciary responsibility cannot rest on individual judgment or actuarial warnings. It must be embedded through a public IPS and a statutory Funding Policy that ties actuarial valuation results to corrective actions.

Investment policies are typically approved by the board's investment committee, though oversight arrangements vary. Ministries of finance and labor retain influence over policy decisions, while central banks supervise prudential aspects like concentration and foreign-asset limits in accordance with fixed exchange rate targets, but documents clearly defining these roles and publicly available are few. Given that NIS liabilities are long-term, legally binding, and valued using a fixed real discount rate, transparency is essential. Stakeholders should be able to verify that strategic asset allocation aligns with projected benefit payments; performance is reported net of fees against policy benchmarks like CPI + actuarial discount rate; and fund risk exposure—including liquidity, concentration, and foreign-exchange risks—is systematically monitored and disclosed (International Social Security Association [ISSA], 2019).

Statutory limits and unpublished internal policies channel most NIF assets into domestic fixed-income instruments and bank deposits, with limited allowances for foreign and alternative assets. As shown in Table 5, investment policy is rarely determined autonomously by National Insurance Authorities; only in The Bahamas and Trinidad and Tobago do boards or ministries have authority to adjust investment policy within statutory bounds. Investment rules vary widely. While most schemes permit holdings in domestic public bonds, corporate bonds, equities, and real estate, foreign exposure is typically limited to 10–20% of assets, and instruments like exchange-traded funds (ETFs) or multilateral development bank bonds are rarely specified in statutory frameworks.

Absent a publicly available IPS paired with a funding policy defining policy ranges, rebalancing rules, and liability-linked benchmarks, these patterns will persist. Boards lack a framework to explain portfolio structure, demonstrate asset-liability alignment, or show consistent total-fund return management against actuarial benchmarks.<sup>20</sup>

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<sup>20</sup> A standard mechanism-design rationale for mandatory, standardized disclosure is “shrouding”: when some consumers underreact to hidden add-on costs, competition can sustain equilibria with suppressed/opaque attributes and cross-subsidies

*Table 5. Summary of portfolio admissible securities composition as defined by investment policies*

<b>Country / Category</b>	<b>Bahamas</b>	<b>Belize</b>	<b>Barbados</b>	<b>Guyana</b>	<b>Jamaica</b>	<b>St. Vincent and the G.</b>	<b>Trinidad and Tobago</b>
<b>Determined by Law</b>	Yes, but the NIB may alter the policy	No	No	No	No	No	Yes, the MoF may approve changes
<b>Limit by issuer</b>	Yes		Yes		No		Not specified
<b>Limit by instrument</b>	Yes		Yes		No		Not specific
<b>Local public bonds</b>	Yes		Yes		Yes		Yes
<b>Fixed income</b>							
Foreign public bonds	Yes		No		No		Yes
Corporate bonds	Yes		Yes		Yes		Yes
Equities							
Exchange-traded funds	No		No		No		Not explicit
Multilateral bank-issued bond	Not specific		Not specific		Not specific		Yes
Ordinary shares	Yes		Yes		Yes		Yes
Foreign securities	Max. 10%		Max. 15%		No		Max. 20%
Alternatives / Real Estate	Yes		Yes		Yes		Yes
Mortgages	Max. 15 years term		No		Yes		Yes
Own Subsidiaries	No		No		No		Yes
Other loans	Yes		Yes		Yes		No
Certificate of deposit	Yes		No		No		Not explicit
Cash deposits	Not specific		Yes		Yes		Yes

Source: Authors' compilation based on NIAs and actuarial valuations. Empty cells indicate unavailable information.

Since 2019, regulations for private occupational pension plan investments have been relaxed, easing quantitative ceilings that kept portfolios concentrated in government paper and bank deposits. These changes—including authorization of private-equity and infrastructure vehicles and modest increases in foreign-asset limits—apply to occupational plans, not NIFs. Nonetheless, they provide guidance and benchmarks for future reform of social-security reserve funds. The next subsection reviews these developments.

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from naïve to sophisticated users—supporting the case for auditable dashboards, standardized price units, and attribution that assigns responsibility for each decision layer (Gabaix & Laibson, 2006).

## 4.2. Investment Constraints and Policy Environment

### 4.2.1. Recent Reforms affecting Private Occupational Pension Plans and Admissible Instruments

In recent years, pension supervisors<sup>21</sup> in several Caribbean countries have eased long-standing quantitative ceilings that had kept occupational pension portfolios concentrated in government paper and bank deposits. Changes include selective authorization of private-equity and infrastructure vehicles (typically capped at single-digit shares) and modest increases in foreign-asset limits. Note that these measures apply to private occupational pension plans; NIFs are not covered, their portfolios remaining constrained by legacy limits unless legislative changes are enacted.

Examples help illustrate this emerging pattern. In Jamaica, a 2019–21 authorization allows private occupational plans to invest up to 5% of assets in domestic private equity under a prudent-person test, where trustees must show risks are understood, diversified, and align with beneficiaries' interests. Trinidad and Tobago authorizes regulator-approved private-equity funds for private plans on a case-by-case basis. In The Bahamas, a draft framework would permit the new public-service defined contribution plan to invest in private equity, infrastructure, and hedge funds, while the NIB remains unchanged. Barbados is considering allowing 5–10% of private plan assets in private equity. Guyana's draft bill would permit domestic private-equity and venture-capital funds under a prudent-person rule. In Suriname, a discretionary bucket, capped at 10% under a "bank no-objection" requirement, applies to private plans. Table 6 summarizes these reforms.<sup>22</sup>

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<sup>21</sup> Pension supervisor denotes the competent authority for occupational pensions in each jurisdiction (e.g., a Financial Services Commission (FSC), central bank, or dedicated pensions commission).

<sup>22</sup> Note on terminology. *NIS* denotes the National Insurance Scheme (the institution and its benefit branches). *NIF* denotes the National Insurance Fund (the statutory reserve portfolio). Unless explicitly stated, the post-2019 openings cited here apply to private occupational plans and do not amend the admissible-asset rules for NIFs.

Table 6. Summary of recent reforms and admissible instruments (2019–25)

Country	Year enacted	Private-equity limit	Vehicle allowed	NIF or only private plans?
Jamaica	2019-21	5% of assets (domestic companies only)	Direct stakes or closed-end funds	Private pensions; <b>NIS excluded</b>
T&T	2021	Case-by-case (market expectations $\approx$ 5 %)	Regulator-approved private equity funds	Private plans; <b>NIS excluded</b>
Bahamas	Draft 2023	To be set in regs (single-digit likely)	private equity / infra / hedge funds	New public-service defined contribution plan ( <b>NIB unchanged</b> )
Barbados	Under review	Industry proposal: 5–10 %	funds + real-estate cos.	Private plans; NIS separately considering
Guyana	Draft bill	Prudent-person ( $\approx$ 5 %)	Domestic PE/VC funds	Private plans; <b>NIS outside scope</b>
Suriname	2007 guide	$\leq$ 10 % “Bank no-objection” bucket	Discretionary	Private plans only
Belize	none	0 % (policy)	–	SSB + private plans

Source: Authors’ compilation

If these new ceilings are fully used, pension funds across the region could increase their allowed holdings of private-equity and infrastructure assets by US\$4–6 billion over the next decade, roughly the size of Trinidad and Tobago's National Insurance Fund. However, social-security reserve funds are not included in these liberalizations, such that their investment mandates remain confined to a narrow set of domestic assets. As a result, portfolio concentration in domestic instruments reflects both statutory constraints and limited investable options.

Though, even where foreign-asset limits for private plans have been relaxed, foreign exposure typically remains below the legal ceiling. When boards set higher targets and suitable instruments exist, access to foreign currency—through foreign-exchange windows, quotas, or case-by-case approvals in thin markets—often becomes the real cap. Table 6 shows the “allowed-by-regulation” range, but in practice the binding constraint is usually foreign-exchange access and approvals rather than the prudential ceiling itself. For NIFs, which haven't benefited from similar reforms, these statutory limits and foreign exchange (FX) frictions help explain the persistent home bias documented in the next subsection.

#### 4.2.2. Execution Constraints for NIF Diversification: Statutory Limits, Market Depth, Custody/Valuation, and Foreign-Exchange Access

Even where boards and investment committees pursue diversification, execution is constrained by four binding frictions: (i) statutory quantitative limits and approval processes; (ii) shallow domestic markets and limited supply of investable instruments; (iii) insufficient custody and valuation capacity for non-traded assets; and (iv) restricted foreign-exchange access, which often becomes the binding cap below legal foreign-asset ceilings. These constraints interact: thin markets push portfolios toward sovereign paper and bank deposits; limited foreign-exchange access slows the pace at which boards can implement strategic foreign allocations; and weak custody/valuation infrastructure raises governance burdens for alternatives.

In this operating environment, some schemes use direct real estate or infrastructure lending as a substitute for diversified market exposure. Unless governed by explicit risk budgets, liquidity rules, and independent valuation, this can increase idiosyncratic and governance risk. Where feasible, a more robust approach consists of sequencing foreign diversification within prudential limits under an explicit foreign-exchange protocol (access bands, custody, and hedging rules), stress-tested within the fund's risk budget. This is important given that currency exposure is material and varies sharply across fixed-peg and floating regimes.<sup>23 24</sup>

These constraints shape portfolio concentration and complicate liability-consistent benchmarking. The next section evaluates the resulting performance and the governance discipline required.

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<sup>23</sup> For a one-time exchange-rate move, the first-order mark-to-market effect on total portfolio value in the reporting currency is approximately  $\Delta V/V \approx w_u \times \Delta FX$ , where  $w_u$  is the effective unhedged foreign-currency share (foreign allocation  $\times$  (1 - hedge ratio)) and  $\Delta FX$  is the percentage change in the exchange rate (reporting currency per unit of foreign currency). As a simple approximation, if  $\Delta FX = 20\%$  and  $w_u = 10\%$ ,  $20\%$ , or  $30\%$ , the one-off portfolio impact is about 2%, 4%, or 6%, respectively ( $0.10 \times 0.20 = 0.02$ ;  $0.20 \times 0.20 = 0.04$ ;  $0.30 \times 0.20 = 0.06$ ). The sign depends on the reporting currency: measured in domestic currency, a depreciation increases the domestic-currency value of unhedged foreign assets, while an appreciation reduces it. These approximations abstract from co-movements between FX and risky-asset prices, within-asset valuation changes, and collateral/cash-flow effects of hedge overlays.

<sup>24</sup> FX hedging is not automatically stabilizing. Evidence from Chile's multi-fund system indicates that, for emerging-market-based investors with meaningful foreign equity exposure, hedging can increase volatility because local currencies often depreciate when global equities fall, providing a partial "natural hedge" when left unhedged. In 2008, a return decomposition for Chile's Fund A attributes -11.3 percentage points of the year's return to the currency-hedging component, and the fraction hedged was materially above the regulatory minimum—illustrating the risk of "excess hedging" and motivating asset-class-specific hedge-ratio bands plus stress testing of the hedge overlay within the fund's risk budget (rather than assuming hedging is uniformly risk-reducing). See López & Walker (2020).

### 4.3. Liability-Relative, Liability-Driven Investing as Solvency Discipline for NIF Reserves

#### 4.3.1 Governance Instruments vs. Actuarial Alarms: Why Funding Risk remains Episodic

Warning signals from actuarial valuations, such as reserve-to-expenditure (R/E) alarms, do not systematically inform day-to-day management. Most schemes lack governance tools to enforce solvency discipline, such as public solvency dashboards, statutory funding policies, published IPSs linked to liabilities, quarterly total-fund performance reports, and routine stress testing. As Table 7 shows, funding risk becomes visible only during periodic actuarial reviews.

*Table 7. Governance instruments versus actuarial alarms in selected Caribbean NISs*

Country	Latest published actuarial review (cut-off year)	Public solvency dashboard	Statutory Funding Policy	Investment policy statement (IPS) published	Quarterly performance attribution published	Published stress tests (beyond actuarial review)
<b>Bahamas</b>	11th Review, 2018 (ILO, publ. 2022)	No	No (actuarial recommendation only)	No (statutory limits only)	<b>No</b>	<b>Partial</b>
<b>Barbados</b>	17th Review, 2020 (laid 2022)	No	No (actuarial recommendation only)	No (statutory limits only)	<b>No</b>	<b>Partial</b>
<b>Belize</b>	Actuarial Valuation, 2022 (ILO/SSB)	No	No (actuarial recommendation only)	No (statutory limits only)	<b>Partial</b>	<b>Partial</b>
<b>Guyana</b>	9th Review, 2016 (ILO, publ. 2019)	No	No (actuarial recommendation only)	No (statutory limits only)	<b>No</b>	<b>Partial</b>
<b>Jamaica</b>	Actuarial Review, 2019 (completed 2022)	No	No	No (statutory limits only)	<b>No</b>	<b>Partial</b>
<b>St. Vincent &amp; G.</b>	11th Review, 2019 (NIS, publ. 2021)	No	No	No (statutory limits only)	<b>No</b>	<b>Partial</b>
<b>Suriname</b>	No official actuarial review (APF projections)	No	No	No	<b>No</b>	<b>No</b>
<b>Trinidad &amp; Tobago</b>	11th Review, 2020 (ILO, publ. 2022)	No	No (actuarial recommendation only)	No (statutory limits only; internal IPS only)	<b>No</b>	<b>Partial</b>

Source: Authors' compilation based on actuarial reviews, NIS/NIB reports, ISSA/ILO documentation, 2018–2025.

Note: “**Partial**” = annual or incomplete attribution/scenario analysis (no quarterly, total-fund reporting; or stress scenarios embedded only within actuarial reviews). “**ND**” = not determinable after exhaustive search.

### **4.3.2 The Actuarial Yardstick as the Investment North Star**

Without dashboards, funding policies, IPSs, and regular reporting, responses to funding gaps are ad hoc rather than continuous. This governance gap explains why portfolios drift from liability needs, and why returns fall short of actuarial targets. Section 6 presents a framework based on Liability-Driven Investing (LDI), an approach that operationalizes solvency discipline by linking the investable reserve portfolio to (i) the CPI + dr yardstick used in actuarial valuations, (ii) explicit liquidity coverage targets over the reserve runway, and (iii) a total-fund risk budget with predefined rebalancing and breach protocols.<sup>25</sup> In partially funded schemes, this strengthens the funding–investment link and reduces funding volatility without implying full liability immunization beyond the horizon in which reserves provide coverage.

### **4.3.3 Asset Allocation and Performance versus Actuarial Targets (CPI + Discount Rate)**

To translate the constraints outlined in Section 4.2 into decision-relevant diagnostics, this subsection reports observed portfolio composition and evaluates whether realized performance has tracked the actuarial yardstick (CPI + discount rate). Table 8 summarizes grouped portfolio composition circa end of 2023 for three large National Insurance Funds (NIFs).

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<sup>25</sup> In this report, “liability-driven investing (LDI)” refers to an asset–liability management discipline that sets benchmarks, liquidity targets, and risk budgets with explicit reference to projected benefit cash flows (e.g., CPI + dr), whereas “goals-based” investing refers to framing and measuring outcomes in terms of the retirement-income objective. Because most Caribbean NIS disclosures do not report portfolio duration, inflation sensitivity, or cash-flow matching metrics, duration alignment cannot be independently verified—one reason this report recommends published IPSs and dashboards disclosing these measures.

**Table 8. Grouped portfolio composition circa end of 2023**

<b>Country / category</b>	<b>Bahamas</b>	<b>Barbados</b>	<b>Trinidad and Tobago</b>
Cash and bank deposits	1.93%	0.82%	9.66%
Local equity Investments	12.2%	10.5%	36.2%
Fixed income	73.8%	69.8%	32.2%
Foreign Investments (fixed income & equities)	5.99%	9.78%	16.8%
Loans	1.69%	2.26%	3.70%
Real estate	4.34%	6.84%	1.41%

Source: Authors' compilation from NIBs websites.

Table 8 illustrates persistent home bias and uneven diversification capacity across schemes. The Bahamas and Barbados remain concentrated in domestic fixed income, while Trinidad and Tobago carries a higher equity share and foreign exposure. In small, shock-prone economies, this concentration amplifies funding volatility unless it is explicitly governed within a sovereign-risk and liquidity framework aligned with the benefit runway.

Poor diversification has measurable consequences. For instance, 69% of the portfolio in Barbados sits in government bonds, a concentration that heightens funding risk unless it is demonstrably aligned with liability cash flows and inflation exposure and managed within a sovereign-risk budget.<sup>26</sup> With increasing actuarial pressures, the Ministry of Labor has signaled parametric changes, raising qualifying weeks, lifting retirement age, revising benefit formulas, and asking the National Insurance Board to publish a new investment policy and raise foreign exposure (Jordan, 2023).

Considering inflation and liability growth, returns have been insufficient to close actuarial gaps. During the 2010s, total-fund nominal returns averaged 4.0% in The Bahamas, 4.3% in Barbados, and 5.0% in Trinidad and Tobago. One concern is that NISs generally do not set a real policy benchmark explicitly linked to the actuary's discount rate; that is, to the CPI + discount rate yardstick required to sustain future pension obligations. Without such an anchor, portfolios may comply with statutory constraints but be disconnected from the liabilities they should fund.

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<sup>26</sup> Even under an LDI framework, duration matching does not eliminate issuer concentration risk when the portfolio is dominated by a single sovereign, and the liability benchmark is real (CPI-linked).

Regional IDB simulations for Latin American and Caribbean pay-as-you-go, defined-benefit (PAYG/DB) pillars indicate that, given current contribution rates, retirement ages, and demographic trends, sustainable pensions correspond to about 37% of final salary, much less than the 67% promised under existing formulas (Berstein et al., 2016).

#### **Box 1. The Actuarial *Discount Rate* and Why it Matters**

The actuarial discount rate is the long-term real return assumed to sustain the pension promise, used to convert future benefit payments into today's value. Targeting a return different from CPI + discount rate can make a portfolio appear to outperform a market index, yet weaken the fund's ability to meet obligations, since pension promises grow with inflation and the valuation's real return. If the 12-month CPI is 5% and the real discount rate is 2%, the nominal policy benchmark is 7%. A total-fund return of 6.2% would fall short by 0.8 percentage points, and repeated shortfalls without correction would reduce the reserve-to-expenditure ratio. This benchmark guides measurement and accountability—not as a signal to chase higher returns—and should be used with IPS risk limits and liquidity safeguards.

#### **4.3.4 From CPI + Discount Rate to an Executable Benchmark: the LDI Operating Rulebook**

Typically, a Liability Driven Investment framework has four main elements:

- i. *Regular transparency.* A quarterly factsheet shows portfolio alignment with policy ranges, records key investment decisions, and reports performance after fees against both the policy target (CPI + discount rate) and investable benchmark portfolio.
- ii. *Cash-flow and liquidity alignment over the reserve runway.* The strategic asset allocation is mapped to projected benefit payments over the horizon for which reserves are expected to provide coverage, with explicit liquidity floors and (where feasible) inflation sensitivity consistent with the CPI + dr yardstick. The mapping is updated after each actuarial valuation (about every three years), and portfolio actions are governed by pre-specified rebalancing and breach protocols.
- iii. *Disciplined diversification.* Investments are diversified within legal limits, including foreign assets and private vehicles, phased in when governance and risk-management capabilities exist.

- iv. *Actuarial-based targets and risk limits.* The total-fund benchmark is CPI plus the actuarial discount rate, reflecting the real growth needed for future liabilities. Risk is managed through limits on tracking error, drawdowns, liquidity coverage, and foreign-exchange exposure. Rebalancing rules ensure portfolio alignment with the benchmark, and adjustments occur when the portfolio exceeds risk or allocation limits.

This architecture ensures that investment decisions are guided not by short-term market movements but by fund obligations. As discussed in Section 6, a CPI-linked retirement bond could help implement this benchmark in policy and portfolios.<sup>27</sup> Combined with the administrative and compliance reforms described earlier, moving toward this LDI-based approach is important for Caribbean countries, where investment strategies tend to be disconnected from liabilities and governance tools remain too limited to enforce solvency discipline.

## **5. Simulating Stronger Performance Scenarios**

Caribbean National Insurance Schemes (NISs) provide income protection for covered workers while non-contributory pensions remain essential for those outside formal employment. As mentioned, coverage remains incomplete—especially among self-employed and informal workers—and replacement rates and implicit subsidies vary across countries, creating equity gaps. Administrative weaknesses (e.g., high operating costs, fragmented registration, paper-based processes, and limited digital integration) and short-term, domestically concentrated portfolios weakly linked to long-term liabilities increase financial vulnerability.

These elements create a policy dilemma. Unless offset by stronger collection, tighter governance, or higher risk-adjusted returns, measures enhancing benefit adequacy tend to widen actuarial imbalances. Conversely, measures improving solvency—such as higher contribution rates, lower

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<sup>27</sup> See the note on “Indexation conventions” at the beginning of this report; CPI linkage is used as the baseline for feasibility and consistency with the CPI + dr yardstick, while standard-of-living/consumption indexation and VAT-hedged issuance are treated as optional extensions where feasible.

benefit ceilings, or stricter eligibility—can, without safeguards, erode coverage and poverty-prevention objectives.

Institutional strengthening is a first-order priority. Improved registration and payroll integration, automated contribution collection, risk-based compliance, and disciplined, liability-driven investment management can reduce leakage, lower costs, and enhance the return–risk profile of National Insurance Funds (NIFs). By increasing net contribution income and expected returns, such reforms extend the time available for parametric and structural changes. They can also strengthen legitimacy and public trust, both essential for securing support for sustainable change.

How much time can such measures buy? This section explores this key question, examining how improvements in administration and investment policy could extend the solvency runway of NIS reserves before a cash-flow shortfall occurs. It does so through simulations for the schemes of three countries: The Bahamas, Saint Vincent and the Grenadines, and Trinidad and Tobago. Baseline trajectories are drawn from each scheme's most recent certified actuarial review and align with latest published financial statements.

For the purposes of the simulations, "enhanced governance" is defined through three scenario levers or operational benchmarks:

1. **Administrative costs:** capping administrative expenditure at 1% of insurable wages.
2. **Compliance:** improving contribution compliance to yield a 5% net increase in contribution income at unchanged administrative cost.
3. **Investment returns:** allowing prudent portfolio diversification—within existing IPSs and admissible-instrument limits—to raise expected net returns by 2 percentage points above each scheme's actuarial baseline.
4. A fourth, combined scenario applies all three levers concurrently.

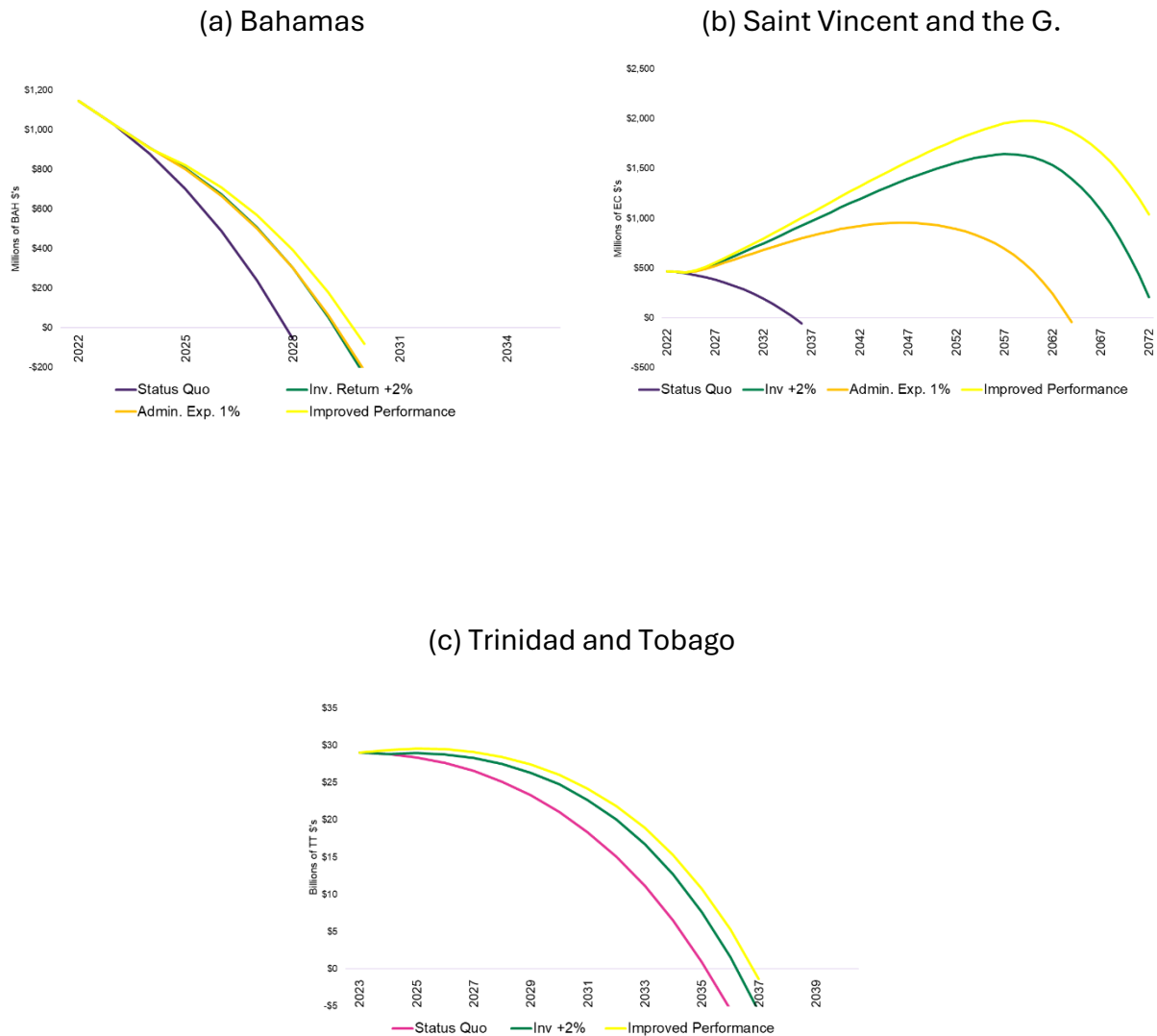
While the three cases are illustrative—selected where documentation enables replication—the method is general and applicable as new valuations are released. Table 9 summarizes, by country, (a) baseline parameters drawn from each actuarial review and enacted post-review changes embedded in the status-quo path, and (b) scenario switches applied in the simulations. It shows the status-quo parameters (as enacted by the stated cut-off date) and the precise scenario switches used in the simulations; unimplemented recommendations appearing in actuarial reviews are not included in the baseline.

*Table 9. Summary of simulated measures by country.*

<b>Country</b>	<b>Source</b>	<b>Measures and notes</b>
Bahamas	11 <sup>th</sup> Actuarial Review as of Dec 2018	<ul style="list-style-type: none"> <li>▪ The report includes projections for the long-term benefits branch.</li> <li>▪ Variances between actual and projected finances to 2021 (publicly available annual report) are not material for the long-term path; no adjustments were made.</li> <li>▪ The contribution rate increased by 1.5 percentage points (from 9.8 to 11.3%), effective July 2024. Whether additional rate increases recommended in the actuarial review will be implemented remains uncertain.</li> <li>▪ All other benefits and administrative costs are estimated at 3.3% of insurable wages.</li> </ul>
St. Vincent & The Grenadines	11 <sup>th</sup> Actuarial Review as of Dec 2022	<ul style="list-style-type: none"> <li>▪ Reforms to enhance sustainability began in 2024. These include:</li> <li>▪ A gradual increase in contribution rate from 10 to 15% by 2027.</li> <li>▪ An increase in the reduction factor for early-age pensions.</li> <li>▪ A "retirement" test for those claiming age pension before pensionable age.</li> </ul>
Trinidad & Tobago	10 <sup>th</sup> Actuarial Review as of Dec 2018	<ul style="list-style-type: none"> <li>▪ Actuarial projections were adjusted as 2022-2023 contributions and benefits were respectively 16% and 11% below projections.</li> <li>▪ Since the review date, no changes have been made to the contribution rate or benefit provisions.</li> </ul>

Source: Authors elaboration based on published actuarial reviews

Figure 10. Actuarial projections of the measures detailed in Table 9



Source: Authors' calculations based on published actuarial reviews

In panel (a), The Bahamas exhibits the most acute trajectory. Under the status quo (purple line), reserves decline sharply and deplete around 2028. The scenario where administrative expenses are capped at 1% of insurable wages (orange line) and that where investment returns are raised by 2 percentage points (green line) each provide modest extensions beyond 2028. The combined improved-performance scenario (yellow line) which caps administrative costs, strengthens compliance, and raises expected returns, delays reserve depletion to the early 2030s. Single operational levers thus offer only short relief; meaningful gains occur when cost control,

compliance, and investment governance are pursued together. Even then, however, insolvency is still imminent within a decade, highlighting the need for deeper parametric and structural reforms. Beyond enhanced governance, results are also sensitive to cohort life expectancy. A one-year increase in life expectancy at age 65 materially raises lifetime pension outlays and can accelerate the crossing of prudential reserve thresholds.<sup>28</sup> The next section discusses risk-sharing mechanisms and retirement-income anchors that can mitigate this sensitivity.

Panel (b) shows that Saint Vincent and the Grenadines has a comparatively longer runway, thanks to recent reforms. Under status quo—incorporating a gradual contribution-rate increase to 15% by 2027—reserves deplete around 2036. The investment-return-improvement scenario substantially alters this: reserves peak around 2057 and deplete near 2070. The effect of administrative efficiency alone is limited, with an earlier peak and sharper decline. The combined improved-performance trajectory delivers the strongest outcome, with reserves growing into the early 2060s and remaining positive through 2072. Recent parametric reforms have thus placed the country on a firmer sustainability path, where higher risk-adjusted returns and administrative cost control strongly influence solvency.

Panel (c) examines Trinidad and Tobago, where projections indicate severe decline under status quo, with reserves exhausting by the mid-2030s. Improved investment returns extend the fund's life modestly, and the combined improved-performance scenario delays depletion by just two to three years relative to baseline. The narrow gap between the status quo and improved-performance scenarios suggests high vulnerability to demographic pressures and structural imbalance between contributions and benefits. Even under the most optimistic scenario, reserves deplete around 2037, confirming prior warnings. The limited gains from administrative savings and return enhancements imply that challenges lie more in structural design than operational inefficiencies.

The simulations thus reveal differentiated vulnerabilities and reform levers across the three countries. The Bahamas faces a near-term solvency crisis even under optimistic assumptions. Saint Vincent and the Grenadines appears more resilient due to recent parametric changes,

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<sup>28</sup> Even modest improvements in cohort longevity can materially affect defined-benefit outlays and reserve runways in small pools. The practical implication is that unless longevity risk is pooled, reinsured, or partially absorbed through rule-based mechanisms, incremental return improvements may be offset by longevity drift (see Sections 6.4.5–6.4.7 and Section 6.2).

benefiting from better investment performance and cost control. Meanwhile, Trinidad and Tobago, despite high coverage, remains unsustainable, primarily due to design inefficiencies; decisive parametric and structural measures are needed for stability.

Across all cases, the three operational measures – capping administrative costs, strengthening compliance and enforcement, and adopting liability-linked investment governance within existing IPS and legal limits—consistently yield positive results. While they don't eliminate the actuarial gap, they can be implemented under current legislation, enhance equity and service quality by reducing leakage and delays, lengthen solvency runways, and help to rebuild credibility and trust, a necessary condition for the broader parametric and structural reforms still needed. Crucially then, the simulations demonstrate that such operational improvements are not substitutes for deeper change. Indeed, in a country like The Bahamas, maximum efficiency only delays depletion by a few years. They can, however, give governments and social partners a necessary fiscal “window” to implement comprehensive pension reforms. Operational changes must thus be viewed strictly as means of buying political time to implement the necessary structural reforms detailed in Section 6, rather than as alternatives to them.

## **6. Recommendations**

Addressing the challenges identified in the preceding sections—structural solvency issues, limited reserves, administrative gaps, and investment strategies poorly aligned with long-term liabilities—requires coordinated actions rather than isolated measures. This section sets out a series of recommendations organized around seven policy modules delineating essential steps for strengthening conduct, aligning portfolios with obligations, and building credibility through transparent rules and supervision.

1. *Administrative foundations.* Create a unified digital backbone connecting registration, electronic contribution collection, risk-based compliance, and operational integration of self-employed and platform workers.

2. *Statutory Funding Policy.* Adopt a funding rule defining a reserve-expenditure corridor, automatic adjustment mechanisms with symmetric unwind, and a standardized valuation framework linking actuarial reviews to policy decisions.
3. *Investment policy reform.* Redesign investment strategy using liability-driven principles, risk budgets and rebalancing rules, prudent foreign diversification under a foreign-exchange protocol, pooled procurement via a Caribbean Pension Investment Corporation, and regular stress testing.
4. *Automatic stabilizers in pay-as-you-go.* Introduce transparent rules that gradually adjust indexation, retirement-age path, contribution schedules (with safeguards for progressivity), and benefit-formula parameters when solvency indicators breach thresholds.
5. *Regional longevity risk sharing.* Establish shared longevity buffers: for occupational plans, allocate credit lifetime dividends from pooled survival credits; for partially funded national schemes, design an overlay paying variable supplements while preserving a CPI-linked base benefit.
6. *Funded second pillar.* Develop a second pillar around a CPI-linked Caribbean Retirement Income Bond pioneered by Brazil in January 2023) as a default investment, with safeguards for debt neutrality and consumer protection during decumulation.<sup>29</sup>
7. *Governance and supervision.* Strengthen oversight through different lines of defense, establish a Regional College of Pension Supervisors for joint examinations, and implement standardized solvency dashboards with safeguards for regional instruments.

The subsections that follow delve further into these modules: administrative foundations (6.1); funding policy and investment reform (6.2 and 6.3); automatic stabilizers, longevity pooling, and funded second pillar (6.4); and governance and supervision (6.5).<sup>30</sup>

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<sup>29</sup> See the “Indexation conventions” paragraph in the Introduction. As a pragmatic baseline, Brazil’s Tesouro RendA+ (NTN-B1) is inflation-indexed (IPCA) plus a contracted real rate and began retail issuance in January 2023 (Secretaria do Tesouro Nacional, 2022).

<sup>30</sup> These recommendations align with the International Monetary Fund’s agenda in *Unleashing Growth and Strengthening Resilience in the Caribbean* (Alleyne, Ötker, Ramakrishnan, & Srinivasan, 2017), which highlights high public debt, limited fiscal

## **6.1. Administrative Preconditions: Registration, Collections, Compliance, and Self-Employed Integration**

As discussed in Section 3, fragmented registration systems, paper-based filing, weak digital links with registries, reporting delays, and inconsistent enforcement reduce contributory coverage while increasing administrative costs, particularly for self-employed workers.

Results from the 2024 questionnaire administered to eight national insurance schemes (The Bahamas, Barbados, Belize, Curaçao, Saint Vincent and the Grenadines, Trinidad and Tobago, Antigua and Barbuda, and Anguilla) reveal five recurring weaknesses: (i) absence of live interoperability with national-ID, business-registry, tax or civil-registry databases; (ii) reliance on paper, e-mail, and counter service (e.g., Barbados lacks an online portal; Trinidad and Tobago's Empower platform isn't fully transactional; and cash receipts persist in Barbados, Saint Vincent and the Grenadines, and Trinidad and Tobago); (iii) posting lags of 1-30 days; (iv) coercive collection starting only after 90 days of non-payment (30 days in Saint Vincent and the Grenadines); and (v) no fully automated payment attribution to accounts, with the exception of Belize.

This subsection proposes a two-pronged approach: (a) proactive outreach to integrate uncovered workers into the contributory base through low-friction channels like mobile enrollment clinics; and (b) institutional modernization to implement digital workflows and identity resolution (i.e., electronic registration linked to national ID and tax numbers, a unique social-insurance identifier connected to the national ID, and interfaces linking birth registration, IDs, tax records and social-insurance registries). A regional facility could help countries adopt common standards and interoperable architectures (Glaessner & Valdés-Prieto, 1998).

In practical terms, four core elements would facilitate moving towards a unified administrative backbone:

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space, and pension-related spending pressures. This report focuses on national insurance schemes' micro-design and governance to meet macro-objectives through administrative modernization, statutory funding policy, and liability-linked investment governance. Enhancements to non-contributory pensions or funded pillars should depend on fiscal consolidation and debt-stabilization plans, not standalone social spending expansions.

1. *Universal registration and identity resolution* across tax, social-security, civil-registry, and banking rails under a single contributor identifier.
2. *Contribution assessment and collection* under a codified electronic payment architecture that reduces or eliminates cash at the counter, standardizes remittance, and preserves tamper-evident audit trails.
3. *Risk-based compliance*, including presumptive assessments where records are incomplete, proportional sanctions, and codified escalation sequences.
4. *Formal integration of self-employed and platform workers* through default enrollment and periodic remittance options that are aligned with statutory provisions.

While these elements are not strict legal preconditions, experience suggests they can enhance informational efficiency, reduce volatility in collections, and provide a more stable base for the solvency and investment policies discussed later in the section.

To operationalize this backbone while maintaining policy consistency, several measures merit consideration:

- a) *Single digital front door*. One practical step is to establish a single digital front door for registration, electronic filing and contribution payments, interoperable with national-ID and tax registries, with contributions credited upon payment validation. Comparative practice places posting windows in the range of one to two weeks. For example, Uruguay requires transfer within fifteen business days and credit within forty-eight hours (Ley 16.713, art. 69); Chile's DL 3.500 stipulates transfer within five business days with credit upon validation; Mexico's CONSAR/PROCESAR rules show funds at T+2 and individual credit at T+8; El Salvador's SAP Law allows credit within thirty days; and United States regulations define a seven-day safe harbor for small plans (U.S. DOL, 29 C.F.R. § 2510.3-102; EBSA FAB 2008-01). These benchmarks provide reference bounds for systems transitioning from batch to straight-through posting (AIOS, 2000; Superintendencia de Pensiones de Chile, 2021; CONSAR, 2020).
- b) *Risk-based compliance chain*. A complementary step consists of developing a risk-based compliance chain incorporating electronic invoicing, codified reminder sequences (at 7,

30, and 60 days), and timely legal recovery, in line with the International Social Security Association's *Guidelines on Contribution Collection and Compliance* (2013). Regional financial statements show that revenue from penalties and interest is typically below 1% of total income (Bahamas NIB 2021; Belize SSB 2022; Jamaica NIS 2021; Saint Vincent NIS 2022; Trinidad and Tobago NIBTT 2022). This pattern suggests scope for rule-based escalation and publication of outcomes, supported by operational benchmarks such as 95% on-time filings and 1% revenue from penalties and interest.

- c) *Straight-through adjudication*. Another option is straight-through adjudication for routine claims, relying on automated checks with civil-registration and vital-events databases. Experience from jurisdictions with integrated, ID-based platforms and banking rails demonstrate that service levels measured in days are feasible. A benchmark of no more than 15 days for routine claims is therefore reasonable (Chile under DL 3.500; Dominican Republic, Ley 87-01, Tesorería de la Seguridad Social; ISSA, 2022, ICT Guidelines on e-services and service-level management).
- d) *Bank-based payments and harmonized service channels*. Countries could consolidate bank payment systems and client-service channels (web portals, call centers, secure messaging), with processes aligned with ISSA's ICT guidance on payment systems and service management (ISSA, 2022).
- e) *Dashboards, stress tests, and continuous improvement*. Periodic publication of operational statistics through quarterly performance dashboards, combined with annual stress tests and continuous training and audit, can strengthen accountability and foster improvement. Specific thresholds are detailed in the technical annex.

For self-employed workers in particular, a practical operational approach could rest on the following pillars:

- i. *Default enrollment* at the point of tax registration and national-ID onboarding.
- ii. *One-click e-registration* with presumptive contribution classes and quarterly remittance options that accommodate irregular earnings.

- iii. *Data interfaces with labor platforms* to pre-populate assessed contributions, settled through electronic payment rails (automated clearing house systems and e-wallets) in compliance with data-protection law.
- iv. *Transparent reconciliation* between declared income, presumptive bases, and actual remittances, with corrective assessments defined in law.

This digital backbone is not merely an administrative upgrade; it is a fiscal imperative. With the shadow economy estimated at 20–40% of GDP, friction-heavy manual systems effectively grant a tax exemption to the informal sector. Capturing this revenue requires a high-level political mandate, where tax authorities share real-time income data with national insurance boards, dismantling bureaucratic silos.

Comparative evidence shows that while 85–90% of formal employees contribute annually, participation among self-employed workers often falls below 20–25%. Yet, where participation is mandated, labor-force coverage can exceed 90%. Programs like Brazil's *Microempreendedor Individual* (MEI), Argentina's *Monotributo*, and Colombia's *Beneficios Económicos Periódicos* (BEPS) demonstrate that combining tax and social-insurance obligations into a single digital remittance can increase participation among own-account workers (IDB, 2024; ILO, 2019; ISSA, 2022).

### **6.1.1 Digital Transformation, Client Service, and Data Protection**

Social security administration experience suggests that diagnosing existing ICT systems, business processes, and human-resource capacity is essential for digital transformation. For NISs, a useful benchmark is an integrated social insurance information system encompassing core functions like registration and identity management; contribution collection; individual accounts; claims intake and adjudication; benefit calculation and payment interfaces; and management reporting.

Such platforms can furthermore provide role-based access, multi-factor authentication, tamper-evident logs and secure connections to tax, national-ID, business-registry and banking systems,

following ISSA guidance on ICT and service quality (ISSA, 2022; ISSA, 2022a).<sup>31</sup> Digital services like web portals, mobile applications, and SMS tools allow users to verify records, obtain pension projections, update details, and submit claims. Where permitted, biometric authentication and electronic signatures may be implemented, with alternatives for those unable to use these tools. Administrations are increasingly replacing manual proof-of-life certificates with matching against civil registration databases, reducing the burden on older beneficiaries and limiting "ghost" pensions where registry coverage is adequate. Many systems have strengthened data protection and cybersecurity measures—covering data minimization, consent, encryption, access controls and disaster-recovery—while implementing staff training on digital tools. For social insurance schemes using banking channels, aligning compliance procedures for self-employed contributors with anti-money-laundering standards can ensure consistent identity assurance while supporting financial inclusion.

The specific combination of these different elements depends on local context, including the state of national ID systems, payment infrastructure, and available resources. Rather than prescribing a single model, the intention here is to illustrate directions aligned with international practice.

### **6.1.2 Compliance and Oversight Functions**

While governance of social-insurance schemes in the Caribbean varies, a common key issue is the blurring of roles between policy-setting, management, and enforcement. International experience shows that clearly delineating responsibilities for rulemaking, licensing, inspection, and sanctions can strengthen accountability and reduce conflicts of interest, particularly where one institution both manages the fund and enforces compliance.

To reinforce this dimension, countries may consider separating institutional governance from administrative compliance. This can involve assigning supervision to an independent authority for

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<sup>31</sup> While digitization can sharply reduce fixed costs and expand access, household-finance evidence stresses its dual-use nature: the same tools can be used to exploit behavioral biases, target vulnerable users, or enable fine-grained price discrimination, reinforcing the need for data-governance rules, auditable logs, and explicit accountability for automated decisions in the pension value chain (Campbell & Ramadorai, 2025).

rulemaking, licensing, inspection, and sanctions, while the social-insurance agency handles contribution collection and benefits. Common safeguards include a three-lines-of-defense structure, fit-and-proper criteria for board members, conflict-of-interest rules, fixed terms with removal only for cause, and regular public reporting through solvency dashboards and actuarial valuations.

Within the administering institution, internal compliance functions can be strengthened through clearer mandates for registration and inspection, transparent procedures for debt determination and sanctions, and information systems that match contribution records with tax and labor data. Evidence shows that where governance reforms have enhanced administrator independence and professionalism, enforcement has become more predictable (ISSA, 2019; Bahamas National Insurance Act, Ch. 350; Trinidad and Tobago, National Insurance Act, Chap. 32:01; Barbados, 2023 amendment and Ministerial Statement).

Although not strict preconditions for reform, these institutional arrangements illustrate governance choices that can support more effective contribution and collection. They can furthermore be adapted to fit each jurisdiction's legal and administrative traditions.

## **6.2. Solvency Rule: Funding Policy with Corridor and Valuation Protocol**

The evidence presented thus far points to a structural rather than cyclical solvency challenge. Population ageing, home bias in reserves, supervision gaps, and lack of formal longevity risk-sharing mechanisms mean that many Caribbean National Insurance Funds are likely to face premature reserve exhaustion within two decades. As shown in Section 2.4, reserve-to-expenditure (R/E) ratios are projected to fall below prudential thresholds before 2035, leading to rapid reserve exhaustion. Actuarial warnings alone have proven insufficient to prevent policy drift.

One option is to adopt a Statutory Funding Policy linking actuarial valuation, reserve management, and the investment policy statement (IPS) through a rules-based mechanism. This approach combines three elements adjustable to national circumstances:

1. **A solvency corridor** defined on the reserve-to-expenditure ratio, with clear “anchor,” “watch,” and “intervention” zones.

2. **An automatic action set** that is triggered when the R/E ratio falls below agreed thresholds and is unwound symmetrically once recovery is achieved.
3. **A valuation and disclosure protocol** that standardizes assumptions, frequency, independence, and public communication, so that triggers and responses are grounded in consistent diagnostics.

The Funding Policy would work in tandem with the investment-governance measures outlined in Section 4.3 and the administrative reforms discussed in Section 3. In other words, it is not a substitute for parametric or structural changes but rather would ensure emerging solvency pressures are detected and addressed predictably, and that automatic stabilizers in pay-as-you-go financing operate within a clear framework.

### **6.2.1 Solvency Corridor and Auxiliary Indicators**

The solvency corridor can be defined by the reserve-to-expenditure ratio, measured as total liquid reserves divided by annual benefit outlays. A calibration consistent with regional practice and the prudential signals discussed in Section 2.4 can distinguish three zones:

- a *central anchor* at not less than 3.0 years of benefit coverage, intended to preserve payment capacity across normal macroeconomic and demographic shocks;
- a *watch threshold* at 2.5 years, at which enhanced monitoring, stress testing and mandatory disclosure would apply; and
- an *intervention threshold* at 2.0 years, at which predefined corrective measures are triggered and remain in place until the ratio has recovered at least to the watch zone.

Relying on a single indicator has limitations, particularly in small, shock-prone economies. The corridor can therefore be complemented by auxiliary indicators showing longer-term pressures: the 30-year actuarial balance, the projected reserve depletion year, and the long-term PAYGO equilibrium contribution rate. Given volatility and exposure to climate and tourism shocks, calibration bands and smoothing rules in a technical annex can preserve automatic corridor features while dampening short-run noise.

### **6.2.2 Automatic Action Set with Symmetric Unwind**

When the R/E ratio enters the intervention zone, an automatic action set is applied in sequence, subject to review. The intention is to avoid abrupt measures by specifying which levers move, by how much, and for what duration. A typical configuration comprises three types of adjustment:

1. *Indexation filter.* A temporary indexation filter redirects benefit indexation to consumer price inflation or narrows indexation while the R/E ratio remains below the intervention threshold. The filter is removed once the ratio recovers to the watch zone.
2. *Contribution modulation.* Contribution rates increase on a graded schedule, subject to yearly caps and a maximum correction horizon calibrated on the actuarial gap and labor-market conditions. To maintain progressivity, higher rates may apply above certain earnings thresholds, with increments unwound when the anchor zone is restored.
3. *Parametric adjustments.* Selected benefit parameters are modified to improve the link between contributions and entitlements while limiting changes for current pensioners. Measures may include adjusting accrual factors, lengthening reference-wage periods, and recalibrating retirement reductions toward actuarial neutrality. A resilience clause can smooth adjustments when corridor breaches occur from exogenous shocks, while avoiding suspensions. Caps, sequencing, and override conditions can be detailed in secondary legislation or the funding policy annex.

Symmetry is important. Rules that tighten parameters when the R/E ratio falls below the intervention threshold should allow for gradual relaxation once the ratio returns to safer levels. This maintains credibility and prevents temporary measures from becoming permanent adjustments.

### **6.2.3 Linking the Corridor to a Liability-Aware Investment Policy**

For the funding rule to support the pension promise, it must connect to a liability-aware IPS. In practice, the funding and investment policies should be designed jointly, using the same liability

yardstick and cash-flow runway, so that solvency triggers, risk budgets, and benchmarks are internally coherent rather than sequential add-ons. Defined-benefit results show that optimal policies differ between underfunded and overfunded states and depend on explicit tolerance for solvency risk, conceptually reinforcing a corridor-based funding rule with state-contingent actions (Guan et al., 2023). Asset–liability management (ALM) involves joint modelling of assets and liabilities, with attention to inflation linkage, cash-flow timing, and duration. A funding policy with a solvency corridor can reference the IPS to codify these relationships.

The governing body may approve a risk budget specifying investment risk relative to liabilities. This can guide strategic asset allocation, identify risks to minimize or hedge (like excessive concentration in single issuers), and define rebalancing bands consistent with the scheme's corridor position. Tactical deviations may be permitted within defined ranges, with rebalancing rules addressing illiquid exposures and specifying conditions for reducing positions if marketability deteriorates.

#### **6.2.4 Valuation and Disclosure Protocol**

A valuation and disclosure protocol helps translate the corridor and action set into an operational discipline. Key components include:

- *Frequency and scope of valuations.* Full actuarial valuations carried out every three years, with interim updates when the R/E ratio nears watch or intervention thresholds. Valuations should document demographic, economic, and investment assumptions with stress tests. Where in-house capacity is limited, external peer review may be warranted.
- *Portfolio valuation and performance measurement.* Portfolio valuation based on fair-value principles, verified by an independent third party (custodian or performance-measurement firm) for the total portfolio and external mandates. Performance reporting presents nominal, real, and risk-adjusted returns, with indicators like tracking error, volatility, value-at-risk, and selected scenario analyses.
- *Public reporting on solvency and actions.* This can consist of a standardized publication calendar—such as annual solvency and funding reports and quarterly dashboards—

showing the R/E ratio, its trajectory, corridor status (anchor, watch, intervention), active indexation filters or contribution adjustments, and the expected timetable for unwind. Simple visual summaries can help make these elements accessible to contributors, pensioners, and stakeholders.

While the protocol's ultimate design and legal form will depend on each country's institutional setting and legislative process, these examples show how the funding concepts discussed in Sections 2 and 4 can be translated into concrete rules and information flows.

### **6.2.5 Regional Practice and Possible Next Steps**

None of the eight schemes operates under a binding, public funding policy linking actuarial valuations to a solvency corridor and automatic actions (Section 3.2.2). In Barbados, the Seventeenth Actuarial Review recommended such a policy, and the Board indicated an intention to move forward, but formal adoption remains pending. Most schemes lack public solvency dashboards, systematic R/E ratio reporting against prudential thresholds, or regular disclosure of total-fund performance against real policy benchmarks.

This framework therefore serves as a reference for countries seeking to strengthen funding discipline. It connects actuarial diagnostics to investment and parametric decisions, replaces ad hoc responses with pre-agreed adjustments, and makes solvency management continuous rather than addressed only at actuarial reviews. Implementation decisions will necessarily depend on national preferences, institutional capacity, and political constraints.

## **6.3. Investment Policy: Liability-Driven Benchmark, Diversification, Foreign-Exchange Access, and CPIC**

### **6.3.1 Why Investment Policy must Start from Liabilities**

The reserve portfolios of Caribbean National Insurance Schemes remain heavily home-biased toward domestic sovereign paper and bank deposits, with short duration relative to long-dated pension promises, and performance is rarely assessed against actuarial measures (Sections 3

and 4). Realized nominal returns in the 2010s were around 4–5%, a level insufficient once inflation and liability growth are considered (see Section 4.3.3 and Table 7).

For policymakers, this implies that schemes will struggle to keep pensions affordable if reserve portfolios do not grow at least as fast as pension promises, even with adjusted contribution rates and reduced administrative leakages. An investment policy focused mainly on statutory limits or market index performance cannot guarantee this alignment.

A liability-driven approach instead treats pension promises as its "north star" and determines the combination of assets, risk limits, and operating rules that would allow the fund to meet these promises over time. This requires a public Investment Policy Statement (IPS) anchored in actuarial valuation assumptions.

### **6.3.2 From Actuarial Yardstick to Practical Benchmark**

The actuarial valuation defines the real return needed to sustain the pension promise: the actuarial yardstick, consumer price inflation, plus the valuation's real discount rate (CPI + discount rate, or CPI + dr). The challenge lies in turning this parameter into a practical benchmark that boards, managers, and supervisors can use in their decision-making.

An IPS that links assets to liabilities can be organized around five elements:

1. *A liability-consistent total-fund benchmark.* This sets the total-fund policy benchmark equal to CPI + dr, such that the same real yardstick is used on both sides of the balance sheet.
2. *A strategic asset allocation (SAA) that respects local depth and allows measured diversification.* The SAA specifies how much of the portfolio is held domestically and abroad, within prudential bands authorized by law, considering local market depth limitations.
3. *A foreign-exchange access protocol.* Since foreign-asset ceilings often exceed executable amounts through forex windows and quotas, the IPS needs a protocol that clarifies

instruments, custody, and hedging parameters for foreign investments, consistent with balance-of-payments prudence.

4. *Access to pooled scale and specialized services.* For small schemes, a Caribbean Pension Investment Corporation (CPIC) or equivalent pooling mechanism can procure external asset management, custody services, benchmark systems, independent performance measurement, and currency-hedging facilities in a way that individual funds cannot do cost-effectively alone.
5. *A total-fund risk budget.* The IPS specifies risk limits relative to liabilities: tracking error, drawdowns, liquidity coverage, and foreign-exchange exposure, with breach protocols and rebalancing rules.

No new institution is needed to implement the CPI + dr benchmark. Rather, the IPS explicitly codifies the steps linking actuarial and investment reports.

- *First*, at each actuarial valuation, the actuary certifies the real discount rate, and management records CPI + dr as the total-fund policy benchmark until the next valuation.
- *Second*, the IPS defines an investable index mix designed to achieve this return: a combination of inflation-linked sovereign bonds, broad investment-grade bonds, listed equities, and cash, with allocation ranges and liquidity floors calibrated to projected payments.
- *Third*, the risk budget defines tracking-error limits, maximum drawdown tolerances, minimum liquidity for benefits, and foreign-exchange hedge bands, alongside clear breach protocols and rebalancing rules.
- *Fourth*, reporting follows quarterly factsheets showing allocations versus ranges, net return versus CPI + dr and benchmark mix, attribution by policy, selection, and currency, and limit breaches with corrective actions. Following each actuarial valuation, the discount rate, benchmark, and SAA are updated to reflect the new liability profile.

For non-specialists, the same number underpinning the actuarial review (CPI + dr) becomes the yardstick for judging the entire portfolio.<sup>32</sup> Returns below this yardstick signal immediate pressure on future solvency, rather than appearing years later when reserves near exhaustion.

### 6.3.3 How Liability-Driven Investing Changes the Risk Profile

Aligning valuation and investment in this way serves three purposes.

- *First*, it aligns performance assessment with pension promises. Returns are compared against the real benchmark defining pension obligation, as opposed to a generic index that may bear little relation to scheme liabilities.
- *Second*, it disciplines portfolio construction. The SAA is designed for projected benefit payment timing and size, ensuring liquidity where benefits cluster, and matching inflation risk with real-return instruments.
- *Third*, it channels diversification into forms that respect liquidity and solvency constraints. Foreign assets and alternative instruments are incorporated to help efficiently track the liability benchmark, not simply because they appear attractive or promise higher yields.

Adopting this framework implies a liability-relative implementation of LDI: the binding risk to be managed is shortfall relative to the actuarial yardstick (CPI + dr) over the reserve runway, rather than full immunization of a long-dated liability stream. In Caribbean partially funded PAYGO schemes with short runways, the practical objective is to govern a diversified total-fund portfolio with explicit benchmarks, risk budgets, and rebalancing rules that maximize the probability of meeting CPI + dr net of costs while preserving liquidity for benefit payments. This makes the governance problem operational: decisions are evaluated by their contribution to narrowing (or widening) the funding shortfall, rather than by standalone market-index outperformance. This “liability-relative” framing aligns with long-horizon results showing that liability hedging must be implemented under short-term constraints and explicit risk budgets, rather than as pure duration

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<sup>32</sup> This translation of the liability yardstick into a practical benchmark is consistent with integrated asset–liability management (ALM) frameworks that jointly price liability streams and portfolio choices (Martellini & Milhau, 2011; Fullmer et al., 2025).

immunization (Martellini & Milhau, 2010b; Badaoui et al., 2014). Without this anchor, two drifts tend to arise:

- *Valuation drift*, where assets are evaluated against indices that do not reflect liability growth (CPI + dr), obscuring persistent shortfalls until solvency alarms become acute.
- *Runway mismatch*, where a short-duration, home-biased reserve portfolio under-provides liquidity and inflation sensitivity over the reserve runway, amplifying drawdowns and forcing pro-cyclical behavior precisely when reserves are most valuable.

A liability-driven investing (LDI) framework—with an actuarial anchor, ALM-based SAA, risk-budget guardrails, and disclosure—limits these drifts. The scenarios that raise returns, reduce volatility, and extend solvency runways align with this LDI configuration.

#### **6.3.4 Strategic Asset Allocation and Measured Diversification**

In small, open economies with thin local markets, the SAA is constrained by market depth and foreign-exchange availability. Policymakers must therefore determine how to diversify while supporting solvency within these structural limits.

Historically, NISs in the Caribbean have concentrated their portfolios in domestic assets. Though liquid in the short term, this concentration increases exposure to regional shocks—such as natural disasters, commodity cycles, and tourism downturns—yielding average returns of only 4–5%, below actuarial requirements (see Section 4.2.3). International diversification can help spread risk across sectors and geographies, especially in narrow domestic markets tied to a single economic base.

Countries aiming to strengthen solvency may consider gradually raising foreign-asset ceilings. A prudent pathway is increasing foreign allocation from 10 to 30% over a decade, contingent on governance prerequisites. Experience across Latin America and Central-Eastern Europe shows that measured foreign exposure together with sound risk management reduces portfolio volatility

and improves solvency (Afanador et al., 2021; Alonso et al., 2015; Cardinale, 2005; Kurach & Papla, 2014; López & Walker, 2020; Pfau, 2011; Santos & Moreno, 2009).

Barbados provides a regional example. In 2023, its Central Bank authorized the National Insurance Scheme to gradually invest US\$40 million overseas. With 80% of assets held domestically, this could support a diversification of about fifteen percentage points over 12-15 years, subject to renewal requirements (see Section 4.2 and Table 7) and, potentially, expansion toward 30% foreign assets where appropriate.

Diversification is not an end in itself; it serves the liability profile. In addition to reducing macro concentration, equity portfolios can be engineered to improve liability-hedging benefits relative to a real liability benchmark—strengthening the case for liability-aware diversification rather than naïve market-cap exposure (Coqueret et al., 2014). The SAA from liability cash-flows ensures predictable liquidity, matches inflation risk with real-return instruments, and prevents concentration from making credit-sovereign risk the primary funding driver. It should further be noted that regional integration is not a substitute for global diversification. Given high economic correlation across Caribbean islands due to shared exposure to tourism cycles and climate shocks, concentrating assets within the region fails to effectively diversify systemic risks (Cuéllar et al., 2025). Therefore, the SAA must maintain a distinct allocation to global markets in order to protect reserves against region-wide downturns.

### **6.3.5 Governance Prerequisites: Committees, Attribution, and Stress Testing**

Diversification and LDI only work as intended if risk is governed, not assumed. This requires demanding, but feasible, governance prerequisites.

- *A specialized independent investment committee* experienced in global asset management should be constituted to monitor foreign holdings, review decisions against risk thresholds, and document compliance, helping to insulate portfolios from political pressures.
- *Quarterly, net-of-fee performance attribution.* Schemes should publish quarterly net-of-fee attribution at the total-fund level that (i) decomposes returns into policy allocation,

security selection, and currency/overlay effects, and (ii) maps each component to the responsible decision-maker under the scheme's delegation structure (board → investment committee → CIO/internal team → external managers/overlays). Attribution should therefore clarify not only *what* drove results but also *who* held responsibility for each decision and mandate. This makes breach remediation and accountability operational rather than rhetorical.<sup>33</sup> Attribution raises the signal-to-noise ratio, enables early detection of shortfalls and risk, and supports proactive rather than reactive adjustments.

- *Whole-of-fund stress testing.* Stress testing should be institutionalized in both the funding policy and IPS.<sup>34</sup> The configuration should include an annual whole-of-fund exercise by the independent risk function, reviewed by the actuary and custodian. This should include quarterly updates; standard scenarios (currency, climate, tourism, interest rates, longevity); key metrics (benefit-month liquidity, drawdown and tracking-error bands, CPI + dr gap); and pre-agreed actions linking results to rebalancing, hedge-ratios, liquidity floors, and R/E-corridor triggers.<sup>35</sup>

Notably, these measures do not replace political decisions on contributions and benefits but rather provide boards and supervisors with a clearer view of how investment choices affect solvency pressures.

### **6.3.6 Private Equity and Venture Capital: A Controlled Opening**

Within this diversification agenda, private equity (PE) and venture capital (VC) can be viewed as a complementary option. Most NIS statutes either prohibit PE/VC or limit "alternatives" to direct real estate, with zero exposure. Where regulators have opened windows—Jamaica's 2019

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<sup>33</sup> See Muralidhar (2016) for a critique of attribution frameworks that report only "what" (allocation/selection) without identifying "who" (decision-maker responsibility). The author argues that effective performance accountability requires explicit mapping of attribution components to the delegation chain and mandates.

<sup>34</sup> Section 4 notes that published stress tests beyond actuarial reviews are largely absent (see also Table 8), and Section 6.1.1 calls for routine stress testing (inflation, foreign-exchange (FX), longevity and operational shocks) with disclosure in quarterly factsheets and dashboards.

<sup>35</sup> This operational emphasis is consistent with dynamic risk-control implementations that make risk budgets and rule-based rebalancing executable at scale (Amenc et al., 2010).

prudent-person framework, Trinidad and Tobago's case-by-case approvals, and draft rules in The Bahamas—limits are 0 to 5% and exclude NIS reserve funds (see Section 4.3.2, Table 6).

A capped 5% allocation to NISs via regulated, closed-end funds would match regional thresholds while raising governance standards. Exposure should be through regulated vehicles with independent valuation; trustees should either be certified to evaluate private-equity risks or supported by qualified external advisers; and disclosure should match mutual-fund norms on fees, liquidity, manager remuneration, and performance metrics.

For policymakers, the key question is whether potential gains in returns and diversification justify the added complexity and illiquidity. A low, capped allocation within a defined risk budget and IPS can provide access to positive macroeconomic effects while aligning the performance with an optimum risk profile.<sup>36</sup>

### **6.3.7 Foreign-Exchange Access: Making Legal Limits Executable**

Legal foreign-asset ceilings often exceed what can be implemented under prevailing foreign-exchange arrangements. In practice, access to foreign currency through windows, quotas, and approvals sets a de facto cap below prudential limits, frustrating IPS ranges. To address this mismatch, supervisors and central banks can codify a protocol mapping approved foreign-asset ranges to foreign-exchange access. This would specify eligibility criteria, annual bands, rules for unused allocations, custody expectations, and allotments; the goal being to ensure diversification limits are feasible and that foreign-exchange and pension-reserve policies align rather than conflict.

### **6.3.8 Regional Pooling through a CPIC**

Regional collaboration can help address the scale, bargaining power, and tooling gaps that individual schemes are unable to overcome. A voluntary Caribbean Pension Investment

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<sup>36</sup> A household-finance concern with “democratizing” illiquid alternatives into default retirement menus is that high fees and adverse selection can leave retail/default investors holding inferior deals, while appraisal-based smoothing can understate risk and encourage over-allocation; these risks justify strict caps, non-default treatment, liquidity stress tests, and auditable fee/valuation disclosure before any expansion is undertaken (Campbell & Ramadorai, 2025).

Corporation (CPIC) could pool mandate procurement, custody services, performance measurement, and optional currency-hedging facilities for participating schemes.

International experience shows that pooled bargaining can compress management fees by 40–60 basis points yearly and reduce hedging transaction costs by up to 30%, improving international allocation efficiency. Importantly, for smaller jurisdictions like Anguilla or St. Vincent, liability-driven investment (LDI) may be theoretically sound but difficult to implement independently. Without a regional pooling mechanism to create scale, local markets often lack the depth to support the necessary inflation-linked instruments. A regional platform such as a CPIC could enable access to regional and global private-equity and infrastructure vehicles otherwise inaccessible to small jurisdictions due to minimum costs. Participation should preserve each scheme's IPS and risk budget while using shared services.

For policymakers, a CPIC would serve as a shared back-office and risk-management platform. Each board would maintain its funding policy and IPS, while the CPIC would perform functions like manager selection, custody, and hedging more efficiently on their behalf.<sup>37</sup>

### **6.3.9 Market Development and Supervisory Dashboards**

A market-development complement is needed to improve liability matching. Finance ministries and central banks should coordinate the issuance of longer-dated, CPI-linked instruments and standardize conventions for investable benchmarks so that portfolios can better match duration and inflation sensitivity without defaulting to short deposits and bills. These instruments provide reference points for pricing the CPI-linked retirement bonds and tools discussed later.

On the supervisory side, transparency can be strengthened via a quarterly pension-investment dashboard that tracks, at minimum:

- reserve-to-expenditure coverage;

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<sup>37</sup> However, it is imperative that the CPIC does not become a vehicle for subsidized development finance. To avoid 'social investing' errors that compromise solvency, any regional or infrastructure investment must strictly pass the 'Prudent Investor' test, competing on a risk-adjusted return basis with international alternatives (Cuéllar et al., 2025). Market development should be viewed as a positive externality, not the primary fiduciary objective.

- total-fund returns versus the CPI + dr policy hurdle and versus the investable proxy;
- allocation versus IPS ranges;
- concentration by issuer and sector;
- effective duration versus the duration of projected benefit cash-flows over the reserve runway;
- foreign-exchange exposure and hedge ratios; and
- standardized stress-test results.

The integrity of these dashboards depends on accurate pricing. To prevent the artificial smoothing of prices that hides true volatility—a common challenge in illiquid infrastructure assets—regional instruments like CaRIBonds should be valued quarterly by independent external auditors (Dongare & Stanko, 2025). This separation of valuation from management is essential to ensure that reported returns reflect economic reality rather than theoretical models, aligning with international best practices for social security investment governance (Cuéllar et al., 2025).

Outliers on these indicators would trigger remedial action plans tied to the scheme’s IPS and risk budget. Standardized dashboards across schemes and jurisdictions would allow ministers, partners, and the public to see whether investment risk is being deliberately taken and managed within limits.<sup>38</sup>

### **6.3.10 What this Means for Solvency and for the Simulations**

These measures aim to shift investment policy from a home-biased asset-accumulation exercise to a fiduciary mechanism financing pension promises in real terms. By sequencing foreign-exposure bands (10–20–30%) conditional on governance milestones, establishing independent committees, publishing quarterly attribution and annual stress tests, aligning foreign-exchange access with IPS ranges, and pooling mandates through CPIC, countries adopting this framework can expect a different risk-return profile.

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<sup>38</sup> See Economou et al. (2013) for an example of digital dashboards for boards of pension funds.

The simulations in Section 5 showed that configurations approximating this architecture deliver gains of one to two percentage points in expected annual real returns and 20% reductions in total-fund volatility versus actuarial baselines. Under these scenarios, the combination of higher returns and lower volatility can close up to one-third of projected funding shortfalls within a generation by extending reserve runways and reducing prudential threshold breaches. Though solely illustrative, these results show that when aligned with liabilities and supported by governance and regional tools, investment policy meaningfully extends solvency.

#### 6.4. Structural Reforms

The preceding subsections outlined operational levers under current laws: improved registration and collections, a funding policy with solvency corridor, and a liability-based investment strategy. This subsection proposes an adaptable reference architecture that combines budget-financed basic pension, a contributory PAYGO branch with solvency rules and, where feasible, a funded tier and regional mechanisms for sharing risks.<sup>39</sup> Where temporary windfall revenues exist, a disciplined option is to channel a pre-specified share into a ring-fenced pension stabilization buffer, with deposit/withdrawal rules linked to the funding policy's reserve-to-expenditure (R/E) corridor and investments governed by the scheme's IPS/LDI benchmark.<sup>40</sup>

##### 6.4.1. A Possible Roadmap (Layers and Overlays)

In what follows, a roadmap organizes this architecture into three layers with two payout-stage overlays. It combines a poverty-prevention floor, a contributory PAYGO branch under a funding policy, and funded tier with income-linked bonds alongside regional longevity-pooling, while maintaining the CPI-linked base benefit.

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<sup>39</sup> This layered "hybrid" architecture is consistent with comparative design discussions on shifting toward hybrid pension systems that combine public risk pooling with funded components while preserving fiscal anchors (EDHEC-Risk Institute, 2012).

<sup>40</sup> Windfall revenues (e.g., commodity booms or other nonrecurrent fiscal receipts) should not be treated as permanent pension financing. A more robust design is to route a pre-specified share of the latter into a ring-fenced stabilization/savings buffer with transparent deposit and withdrawal rules that are integrated with the fiscal framework and prevent ad hoc spending. In a pension context, the withdrawal rule can be explicitly tied to the funding policy's R/E corridor (e.g., transfers being permitted only when the scheme is in the "watch" or "intervention" zones, and unwound symmetrically as the corridor is restored), while the buffer's assets are managed under a published investment mandate consistent with the scheme's IPS/LDI benchmark and risk budget, and aligned with recognized sovereign-asset governance standards. See International Monetary Fund (2014); International Working Group of Sovereign Wealth Funds [IWG] (2008); Al-Hassan et al. (2018).

At the high level, the components are:

- *Pillar 0 – Budget-financed basic pension.* A state-financed basic pension guaranteeing minimum income in old age, coordinated with contributory benefits so that the basic floor prevents poverty without crowding out contributory incentives.
- *Pillar 1 – Contributory branch (PAYGO accounting, partially funded) — funding policy and corridor.* The contributory PAYGO branch is governed by a statutory funding policy with a reserve-to-expenditure corridor. When reserves fall toward thresholds, rules adjust indexation, gradually raise pension age with life expectancy, and increase contributions at higher earnings, reversing once solvency returns to safer levels.
- *Decumulation overlay 1 – Unitized longevity account (attaches to Pillar 1).* A payout-stage "top-up" mechanism for partially funded schemes. Reserves are placed in a pooled account paying retirees a variable monthly supplement. The supplement varies within a narrow band based on pool earnings and cohort longevity, while the statutory CPI-linked base pension remains unchanged.
- *Pillar 2 – Funded tier with CaRIBond default.* A funded tier that converts additional savings into predictable, inflation-linked income using a standardized Caribbean Retirement Income Bond (CaRIBond) as the default, once Pillar 1 stabilizes. Issuance is designed not to weaken public-debt risk anchors, with proceeds managed under a published IPS.
- *Decumulation overlay 2 – Regional longevity pool (for funded occupational plans).* A regional pool enables occupational plans to share cohort-level longevity risk. Each plan transfers a modest slice of retirement exposure into the pool, and retirees receive lifetime dividends that are adjusted based on returns and cohort survival, under strong governance and transparency.

Table 10 brings these elements together, showing—for each pillar and overlay—the policy objective and main operating rules. Importantly, this roadmap separates stabilization under the current statutory architecture from long-run system redesign. Placing the contributory PAYGO branch (Pillar 1) under a funding policy is a pragmatic way to convert actuarial alarms into routine discipline and manage medium-term cash flows without abrupt disruption. Over the longer run,

countries may choose to complement Pillar 1 with a funded tier (Pillar 2) to improve retirement-income hedging and governance transparency, provided that prefunding is not offset by fiscal policy and that assets are credibly ring-fenced with clear use-of-proceeds guardrails.<sup>41</sup>

*Table 10. A possible reform roadmap: layers and overlays*

<b>Layer / Pillar</b>	<b>Policy objective</b>	<b>Core instruments and operating rules</b>
<b>Pillar 0 (Budget-financed basic pension)</b>	Guarantee a poverty-proof floor and progressivity	Basic pension in budget; simple taper against contributory benefits; price adjustment yearly; credits for caregiving and unemployment in contributory accounts; separation of poverty relief from contributory insurance.
<b>Pillar 1 (Contributory PAYGO under a Funding Policy with an R/E corridor)</b>	Stabilize near and medium-term cash flows and solvency	Statutory Funding Policy with a reserve-to-expenditure corridor (anchor $\geq 3.0$ , watch 2.5, intervention 2.0); stabilizers modulating indexation, linking pension age to cohort longevity, and adding progressive contribution step-up with symmetric unwind; standardized valuation and disclosure protocol.
<b>Decumulation overlay 1 (Unitized Longevity Account)</b>	Share cohort-level longevity and market shocks without altering the statutory CPI-linked floor	Allocation of one fifth of reserves to a segregated pool; CPI-linked monthly supplement within $\pm 10\%$ collar with smoothing and stabilization reserve; very-old-age real floor (from age 85); regional actuarial board and proof-of-life hub; parameters in funding policy and IPS.
<b>Pillar 2 (Funded with CaRIBond default)</b>	Convert savings into predictable, inflation-linked retirement income and anchor liability-driven discipline	CaRIBond ladder paying CPI-linked real cash flows for twenty years from retirement; issuance present-value and duration neutral; published IPS for proceeds; regional registry and payment rails; default lifetime-income decumulation with fee caps, audited pricing, portability; alignment with CPI + discount rate policy yardstick.
<b>Decumulation overlay 2 (Regional Longevity Pool)</b>	Pool cohort-level longevity risk for funded occupational plans	Regional dividend pool governed by a 2% real hurdle, $\pm 5\%$ collar, and stabilization reserve; three lines of defense governance with independent actuarial board and tripartite oversight; transparency through quarterly factsheets and breach logs; settlement either fully funded or ledger-only where foreign-exchange or custody binds.

Recall that the activation criteria, exit conditions, and safeguards for these layers—including corridor thresholds of 3.0, 2.5, and 2.0 years of benefit coverage and the CPI + dr policy yardstick—are detailed in Sections 6.2 and 6.3.

<sup>41</sup> Modigliani and Muralidhar (2004) distinguish reforms that change the financing of retirement promises from those that merely relabel them. They note that prefunding contributes to national saving only if assets are not offset by government dissaving and are protected by credible governance. In this report, CaRIBonds are proposed as one operational mechanism to embody these governance principles (income-linked claims, ring-fencing, and use-of-proceeds constraints), and not as a claim about the original taxonomy.

## **6.4.2. Operating Sequence**

The roadmap is designed to be incremental and adaptable. Hard dependency: Pillar 1 corridor discipline, plus administrative modernization, plus a published IPS/benchmarking regime are prerequisites; the longevity overlays and the CaRIBond-funded tier are conditional add-ons only once corridor stability is demonstrated. Not every country will implement every layer, and those that do will move at different speeds. This subsection explains how layers and overlays can be activated so that core solvency risks are addressed before introducing complex instruments.

### **Step 1: Consolidate the Budget-Financed Floor (Pillar 0).**

Most Caribbean countries already have a basic pension for older people that isn't tied to contributions. Pillar 0 would formalize this into a simple, government-funded pension with clear rules. It would be part of the national budget, set at a level that covers basic needs, and updated each year for inflation. To avoid reducing contribution incentives, payments would gradually decrease as other pension income rises. Credits for caregiving and periods of unemployment would be added so people aren't penalized for time out of work. Overall, Pillar 0 will serve as a universal safety net.

### **Step 2: Place the Existing PAYGO Branch under a Funding Policy (Pillar 1).**

Most systems already run a pay-as-you-go pension with some reserves, but they often lack clear, rule-based discipline. Pillar 1 begins as a codification of the existing branch management. A statutory Funding Policy sets a reserve-to-expenditure corridor with an anchor above three years of coverage, a watch level at two and a half, and intervention at two.

When the corridor is breached downward, stabilizers move automatically based on published metrics. Pension indexation increases may be temporarily modulated and restored once the ratio improves. Adjustments in retirement age would be linked to cohort life expectancy, sharing longevity gains through rules. A progressive contribution increase applies above median wage and

unwinds when reserves return to anchor. A standardized valuation would be used, combining CPI and the actuarial discount rate to assess performance and guide adjustments.

**Step 3: Attach the First Longevity Overlay where Reserves Permit (Decumulation Overlay 1).**

While Pillar 1 is in place, countries with solid reserve buffers can add an additional payout layer to share longevity risk without changing the basic, inflation-linked pension. This layer - decumulation overlay 1, or the Unitized Longevity Account- can fit Caribbean systems with partial funding and limited administrative capacity.

In this overlay, a defined segment of reserves is placed in a pooled account that pays monthly supplements to the basic Pillar 1 pension. These payments rise with inflation within set limits, are supported by a stabilization reserve, and include a minimum real benefit at very old ages.

A regional actuarial body would validate the key parameters, while an information system tracks vital statistics of beneficiaries to keep adjustments consistent. The rules for this overlay are built into the funding policy and investment guidelines, so it works within current governance structures. This approach will be especially useful in countries in which reserves can exhaust within a decade, and where modest adjustments can deliver longevity risk-sharing without needing a full redesign of the pension system

**Step 4: Add the Funded Tier once the Corridor is Restored (Pillar 2).**

Once the R/E corridor is restored and maintained, countries can add a funded tier to convert savings into predictable income. In Pillar 2, contributions default into Caribbean Retirement Income Bonds that pays CPI-linked income in retirement. Issuance is structured to match long-term liabilities without adding pressure to short-term financing and proceeds are managed under a published Investment Policy reporting against CPI plus real discount rate.

In the Caribbean context, this requires prudential safeguards and market infrastructure. Debt-management teams should align CaRIBond issuance with refinancing calendars; custodial services should operate at the country level; and consumer protections should be standardized

to ensure credible, transparent lifetime-income options. This funded tier adds to—not replaces—the stabilization of the PAYGO branch under Pillar 1.

#### **Step 5: Run the Occupational Longevity Overlay in Parallel (Decumulation Overlay 2).**

For funded occupational plans, longevity pooling can proceed continuously where such plans exist, independent of the public corridor. Decumulation overlay 2, the Regional Longevity Pool, credits a lifetime dividend governed by a conservative hurdle, collar, and stabilization reserve, under a three-lines-of-defense structure including an actuarial board and tripartite oversight. Settlement can be fully funded where custody and foreign-exchange access are reliable, or ledger-only where frictions bind, with fair-value methods used to control counterparty risk. This overlay operates at the payout stage, sharing cohort longevity and market shocks while preserving the CPI-linked floor.

#### **Putting the Sequence Together**

The approach is gradual and tailored to each country. Pillar 0 continues with better calibration and targeting and clearer links to contributory pensions. Pillar 1 manages a PAYGO operations within a reserve corridor using automatic stabilizers.

In countries with reserves exist, the Unitized Longevity Account can run alongside Pillar 1. CaRIBonds can add a funded tier without increasing debt risks. An occupational overlay runs can also operate through funded workplace plans.

Measurement uses corridor thresholds of three, two and a half, and two years of coverage and a benchmark of CPI plus actuarial real discount rate.

#### **6.4.3. Pillar 0: Budget-Financed Basic Pension (Poverty-Proof Floor)**

Pillar 0 operationalizes the adequacy and equity objectives discussed in Sections 2.3 and 2.4. Most Caribbean jurisdictions operate a non-contributory old-age benefit. A practical reform

would consolidate existing arrangements into a single budget-financed basic pension, separated from contributory insurance and governed by transparent parameters.

The basic pension serves three purposes: preventing old-age poverty through a minimum income floor, supporting progressivity by concentrating redistribution in the state budget, and protecting contribution incentives by making redistribution visible.

The core rules are straightforward. The pension floor aligns with a defined poverty line or basic-needs basket, adjusted yearly by consumer prices. As contributory entitlements increase, the basic pension reduces gradually, preserving contributory rights. Budget-financed credits for caregiving and unemployment are recorded in contributory accounts to protect workers with interrupted careers, preventing career breaks from impacting replacement rates.

Eligibility depends on residence and age, with checks validated against civil-registration and identification databases. Enrollment and payments operate through regulated banking channels, with public reports disclosing the floor amount, indexation rule, coverage, and taper schedule.

Data needs are simple: the statistical office provides poverty metrics and price index, while the civil registry verifies residency. For small firms and self-employed workers, simplified contribution channels complement the basic pension to prevent it from substituting contributory coverage.

Pillar 0 poverty-proofs the system and anchors redistribution explicitly in the public budget, serving as the permanent universal protection layer of the broader architecture

#### **6.4.4. Pillar 1: Contributory PAYG (Funding Policy and Corridor)**

Pillar 1 builds on the existing contributory pay-as-you-go (PAYGO) branches of the National Insurance Schemes described in Sections 2.1 and 2.4. All schemes operate a contributory PAYGO branch with partial reserves; the reform proposes placing this branch under a statutory funding policy and solvency corridor as outlined in Section 6.2.

Under this approach, a funding policy in law sets a reserve-to-expenditure (R/E) corridor using the same thresholds discussed earlier:

- An anchor at or above three years of benefit coverage,
- A watch level at two and a half years, and
- An intervention level at two years.

The funding policy links these thresholds to an automatic action set. While the R/E ratio exceeds the anchor, the scheme operates steadily. Below the watch level, enhanced monitoring applies. If the ratio enters the intervention zone, automatic stabilizers adjust parameters according to preset rules, which are unwound when the ratio returns to the watch level or anchor.

The main stabilizers include:

- *Indexation of pensions in payment.* When the R/E ratio falls below the intervention threshold, indexation follows a pre-defined filter (using narrower formulas or price indexation). Normal indexation resumes once the ratio recovers to the watch zone.
- *Normal pension age.* The statutory pension age follows a transparent path linked to cohort life expectancy, as discussed in Section 6.2. For example, it may rise by a fraction of each additional year of life expectancy at retirement. This makes the sharing of longevity gains rule-based rather than discretionary.
- *Contribution step-up at higher earnings levels.* When intervention conditions are certified by actuarial valuations and the R/E ratio remains below the threshold, a progressive contribution step-up applies to earnings above median wage. This concentrates adjustment on higher earners while protecting low-income contributors. Once reserves return to the anchor zone, the step-up is removed.

The minimum pension floor linked to Pillar 0 is preserved, with earnings ceiling remaining wage-indexed to prevent coverage erosion. Early and deferred retirement follow actuarially neutral terms based on valuation discount rate and cohort mortality, reducing early exit subsidies and supporting older employment.

The funding policy includes a statutory valuation protocol. Actuarial reviews use standardized assumptions, with CPI + discount rate as the policy measure for fund performance and trigger calibration, as outlined in Section 6.3. A solvency dashboard regularly reports:

- The reserve-to-expenditure ratio and its recent trajectory;
- The PAYGO cost rate;
- The long-horizon actuarial balance;
- The contribution gap to the long-term cost; and
- The status of any active automatic stabilizers.

Each automatic rule is tied to an authoritative data source to avoid disputes over activation. Cohort life expectancy is provided by national statistical offices; price data come from the consumer price index; and portfolio results and CPI + discount rate gap are verified by independent custodians.

Administrative systems align registration, collections, and benefits so that contribution histories, credits, and entitlements are visible to contributors. Compliance onboarding for self-employed workers uses identity standards matching banking rails, making contribution channels digital by default.

Once the corridor is understood and the funding policy is credible, rule-based stabilizers can restore confidence in the scheme's cash position and solvency outlook more predictably than ad hoc measures. Pre-legislation of structural switches—like indexation filters, contribution step-ups and retirement-age paths—can reduce policy-risk premia and improve national insurance scheme pricing.

During adverse macroeconomic shocks affecting employment or investment income, the dashboard reflects the impact on the reserve ratio and actuarial balance. Automatic rules operate as specified: indexation deviations revert once the corridor is regained, contribution step-ups unwind at the anchor level, and the age-longevity linkage continues due to demographic trends.

Implementation reflect British and Dutch legacies, simplify administration through central registry and unique identifiers, while keeping poverty relief within the State budget.

#### **6.4.5. Decumulation Overlay 1: Unitized Longevity Account (Attaches to Pillar 1)**

Decumulation overlay 1 is designed for statutory schemes with partial reserves to share cohort-level longevity and investment risk, while maintaining the statutory CPI-linked base pension. It operates as a payout-stage overlay attached to Pillar 1 within the funding policy and IPS framework laid out in Sections 6.2 and 6.3.

Specifically, a defined segment of the scheme's reserve—around one fifth, subject to prudential testing—is placed in a unitized pool. When awarded a pension, the retiree receives accounting units in this pool. Each unit pays a monthly dividend that moves under a transparent rule with two inputs:

1. A smoothed measure of realized net returns on the segregated pool relative to a benchmark anchored either in long-dated domestic yields or the IPS real hurdle (CPI + discount rate); and
2. The ratio of projected survivors to actual survivors within the award cohort.

Each unit pays a variable monthly supplement reflecting both segregated reserve earnings versus the benchmark and cohort survival versus projections. A collar and stabilization reserve smooth volatility, while a very-old-age real floor ensures that the unit dividend at advanced ages doesn't fall below its value at age 85 in constant prices. The statutory base pension remains CPI-linked; only the unitized overlay supplement varies.

This overlay suits Caribbean constraints. A transparent rule replaces discretionary adjustments with actuarial discipline. International experience with automatic balancing mechanisms shows that rule-based temporary indexation adjustments can stabilize finances. Notional defined contribution conversions instead require comprehensive wage reporting, IT infrastructure, and institutional willingness to publish negative credits. They furthermore need continued budget financing of existing defined-benefit promises while building notional balances. A unitized overlay

maintains investment income from reserves, limits fiscal exposure to seeding the longevity account, and incentivizes prudent diversification for higher returns.

Institutional conditions ensure credibility. A supranational actuarial board certifies mortality assumptions, validates unit dividend adjustments, and publishes key metrics. A regional clearinghouse links databases to ensure timely recoding of deaths and prevent ghost pensions. Match rules, audit targets, and escalation timelines are codified in compliance with data-protection standards. National schemes maintain virtual sub-accounts for transparent attribution without cross-border subsidization.

Safeguards at very old ages are explicit. Beyond the threshold age, the unit dividend maintains its real value. The stabilization reserve initially finances this floor. If the floor binds persistently, symmetric clips to high-age cohort credits in favorable years can rebuild the buffer under pre-stated rules, maintaining purchasing power without unconditional guarantees.

Implementation would proceed in stages using existing institutions. A two-year back-testing phase would calibrate parameters and support public communication, including ranges for expected variability. In a three-year sandbox phase, units are credited to new retirees, while existing pensions remain CPI-linked. In calibration, if IPS benchmarks are met and reserve ratios stay within the corridor, most new pensions would show a dividend by decade's end and reserve ratios could be safer than under fixed-benefit design. Disclosures would explain how the rule works, what the corridor and buffer do, and how the very-old-age floor protects purchasing power.

Integration with the solvency and investment framework is explicit. The overlay operates within the solvency corridor and funding policy framework, under IPS discipline. Parameters and breach protocols are embedded in these instruments, and change-control provisions specify who may alter parameters, under what conditions, and with what transition rules to protect members from cliff effects.

#### **6.4.6. Pillar 2: Funded Second pillar (CaRIBond Default; Corridor-Contingent)**

Pillar 2 is a funded second pillar that countries may introduce once the funding policy has restored the reserve-to-expenditure ratio to the watch zone and maintained it there. It aims to convert

savings into retirement income, anchor investment discipline, and deepen regional capital markets without compromising fiscal anchors.<sup>42</sup> Household-finance evidence emphasizes that when consumer financial products are complex and hard to compare, competition tends to pivot toward branding and shrouded costs rather than price–quality discipline. A pragmatic regulatory response is to require a standardized “starter-kit” baseline—simple, cheap, safe, and easy to comparison-shop—while preserving room for innovation above that floor. In this report, CaRIBonds play this “starter-kit” role for retirement-income accumulation/decumulation: a standardized, income-framed contract that makes progress and costs auditable at scale (Campbell & Ramadorai, 2025).<sup>43</sup>

The income-matching default asset is a standardized Caribbean Retirement Income Bond (CaRIBond). CaRIBonds are forward-starting, income-only retirement-income bonds. The baseline design in this report is CPI-linked, consistent with the CPI + dr yardstick used for funding discipline and performance measurement. Where feasible, the same architecture can be extended toward standard-of-living (consumption) indexation and/or supported through VAT-hedged issuance (issuer-side), as described in the “Indexation conventions” in the Introduction. Each bond begins paying at retirement and delivers real cash-flows for a fixed horizon, functioning as a natural hedge for retirement-income promises. Box 6-A summarizes the concept and policy lines.

**Box 6-A. From LDI to Execution: What's Possible once SeLFIES/CaRIBonds Exist**

A forward-starting, income-only retirement-income security—conceptually aligned with the SeLFIES framework—turns the CPI + discount rate anchor described in Section 4.3.4 into a market standard by letting savers and institutions contract directly for future income rather than accumulated wealth. In the SeLFIES design, cash flows are indexed to aggregate per-capita consumption prior to the payout start date (protecting against both inflation and standard-of-living changes) and to inflation thereafter. VAT-based issuance can improve fiscal hedgeability for governments with a VAT regime (Merton, 2019). Brazil’s Tesouro Renda+ provides a pragmatic retail example, built on an inflation (IPCA) indexation plus a contracted

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<sup>42</sup> A key macroeconomic caveat is that introducing a funded tier does not automatically raise national saving or reduce fiscal risk. If public issuance or budget policy offsets funded accumulation (e.g., through higher borrowing), the “funding” can become a financing relabel rather than genuine prefunding. For this reason, the design requires explicit debt-neutral issuance constraints, use-of-proceeds guardrails, and transparent reporting so that the funded tier improves retirement income hedging and governance without creating an illusion of prefunding. (See Modigliani & Muralidhar, 2004).

<sup>43</sup> This income-first default is consistent with goals-based investing (GBI) research that frames retirement outcomes in replacement-income units and designs scalable retirement portfolios around an explicit income objective rather than account-balance wealth (Maeso et al., 2021; Martellini et al., 2021).

real rate, allowing households to build age-dated income ladders through a public platform (Secretaria do Tesouro Nacional, 2022; Muralidhar et al, 2020).<sup>44</sup>

Each bond begins paying at retirement and delivers level real cash flows for a fixed horizon, functioning as a natural hedge for what social insurance and second-pillar policies promise: retirement income, not wealth (Merton & Muralidhar, 2020; Merton, 2014). The instrument lets administrators and households buy income directly, monitor progress in income units, and manage portfolios against a liability-consistent benchmark, rather than rely on conversions from balances to pensions (Martellini & Milhau, 2020).

With CaRIBonds, the second pillar can default contributions into income units instead of account balances. Contributions map directly to indexed payments beginning in the contributor's retirement year, making the funded ratio and adequacy gap observable on every statement. An investable hedge—structured as an age-dated ladder of CaRIBonds—operationalizes the CPI + discount rate benchmark: the hedge sleeve is measured versus CPI + discount rate, while any performance-seeking sleeve is managed within a defined income-tracking-error budget relative to that hedge (Merton & Muralidhar, 2020; Martellini & Milhau, 2020).

The design enables inclusion where traditional account-based products struggle. Because purchases can be fractional and episodic, self-employed and informal workers can accumulate portable entitlements through simple on-ramps such as payroll add-ons, e-wallets, tax portals, or social-security kiosks. Adoption and distribution rails can also matter for take-up: Brazil, for example, has complemented its goal-based titles with low-friction retail mechanisms (including gift cards and simplified Pix-based funding [Cad&Pag]) and has used prize-draw campaigns to encourage participation in the education-goal bond (Tesouro Educa+)—tools that can be treated as optional participation supports rather than core solvency mechanics (Tesouro Direto, n.d.; Ministério da Fazenda, 2023, 2025; B3, 2023). For migrants, the instrument supports remittances-to-retirement: small cross-border top-ups can be recorded as future income claims payable in the retirement country and currency, with custody handled by a neutral registrar (Muralidhar, 2024). The framing is purposefully intuitive—“you have secured X units of real income starting in year T”—aligning with the communication approach advocated in the retirement literature (Merton, 2014).

A key advantage is policy coherence on the sovereign side. Because cash flows are dated and CPI-linked, CaRIBond programs can be designed to be present-value- and duration neutral relative to outstanding short-dated debt, preserving fiscal anchors while reshaping the maturity profile to match retiree cash flows; use-of-proceeds guardrails and attribution against CPI + discount rate complete the fiscal accountability loop (Merton & Muralidhar, 2020). The instrument improves market completeness by refining the long-horizon real curve and providing an investable real benchmark for pension reporting and oversight.

Building on this concept, this subsection examines how a CaRIBond-based pillar could be structured in Caribbean schemes, focusing on issuance safeguards, proceeds management

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<sup>44</sup> This “income ladder” framing aligns with goals-based retirement investing evidence on securing replacement income and with life-cycle (target-date) designs that explicitly target income paths rather than terminal wealth (Martellini et al., 2021; Maeso et al., 2021; Martellini & Milhau, 2010a).

under the IPS, sequencing under the solvency corridor, and member decumulation protections. The inclusive on-ramps in Box 6-A—fractional purchases, e-wallets, tax portals and kiosks, and remittances-to-retirement—can utilize the digital registration, payroll integration, and payment rails outlined in Section 6.1.

To operationalize this framework, a public issuer—either a sovereign or a regional platform such as a Caribbean Pension Investment Corporation (CPIC)—could offer CPI-linked retirement bonds that:

- Pay a fixed real amount each year for a specified period (e.g., 20 years) beginning in a stated future retirement year;
- Are issued in annual series, allowing workers to build an age-dated income ladder over time;
- Are sold in small denominations through a regional digital platform linked to national identification, payroll, and regulated mobile channels;
- Are portable across participating jurisdictions so that migrants can subscribe and remain covered; and
- Credit any unclaimed payments from early deaths to a ring-fenced longevity reserve that finances the unitized longevity account described in Section 6.4.5, thereby linking the second pillar to late-life risk sharing.

CaRIBond proceeds are managed under a published IPS, as per Section 6.3. Asset allocation targets CPI + discount rate through diversified global indices and governed real-return assets. Currency exposure is hedged within defined bands to protect income; liquidity floors are set to match coupon obligations; and tracking-error, duration, and concentration limits are monitored. Performance is reported net against the IPS benchmark through quarterly factsheets. Where domestic inflation-protected instruments are limited, mandates can access global CPI-linked markets within foreign-exchange bands to maintain an investable hedge.

Sequencing is corridor-contingent. A possible implementation path could proceed as follows:

- *Year 0–1*: enact enabling law with use-of-proceeds guardrails, governance provisions, and swap authority; finalize the IPS for CaRIBond proceeds; and establish the registry and payroll rails.
- *Year 1–2*: conduct a pilot for selected cohorts while the National Insurance Fund remains at or above the watch zone; document accrued rights and operational workflows (issuance, registry, posting, and disclosures).
- *Year 2–3*: scale issuance once intervention triggers are inactive and the reserve ratio has stabilized at or above the watch threshold.
- *Thereafter*: keep the pillar aligned with cohort demographics and corridor status through annual actuarial and IPS reviews. If the reserve ratio re-enters the intervention zone, new CaRIBond issuance pauses, and communications clarify that accrued CaRIBond rights remain unaffected.

Default enrollment into the second pillar provides claims on future real income rather than a volatile account balance. This makes the goal salient, reduces sequencing risk by linking assets to payouts, and supports low-fee implementation through standardized bonds. It also improves fairness by directing unspent payments from early deaths to the regional longevity pool. While alternatives may be offered, CaRIBonds would serve as the default given their liability match for median savers.

Operationally, coverage and cost control benefit from: a regional issuance calendar with national sub-ledgers; payroll integration; simplified electronic channels for self-employed workers (as per Section 6.1); standardized disclosure showing coupon schedules and fees; a stabilization reserve for CPI deviations; and independent custodianship applying the three lines of defense described in Section 6.5.

Fiscal safeguards protect anchors and private investment through caps on CaRIBond issuance, prohibition of monetary financing, verification of debt-neutrality, and reports on proceeds

allocation. Where markets are thin, regional syndication can support price discovery without compromising liability linkage.

Governance reinforces the retirement mandate through safeguards against fiscal diversion; project selection consistent with twenty-year, inflation-linked payouts; middle-office testing of cash-flow matching and stress scenarios; and back-office disclosure of allocation and returns. Procurement follows competitive tenders with independent valuation and contractual protections, maintaining consistent fiduciary standards.

Decumulation defaults to lifetime income through standardized conversion into immediate annuities, deferred longevity annuities beginning at ages 80–85, or collective defined-contribution payouts. Conversion factors use cohort mortality; fees are capped; pricing is audited; and competitive quotes are required. Simple options for single-life and joint-survivor overlays are offered, with joint-survivor set as the default for married contributors unless they opt out. An inflation-indexed floor can be financed from reserves.

For countries adding a funded second pillar once solvency is restored, CaRIBond offers conversion of contributions to inflation-indexed retirement income. The program operates under an IPS architecture, remains debt-neutral, integrates with payroll systems, and employs standardized decumulation for lifetime income with transparent pooling.

#### **6.4.7. Decumulation Overlay 2: Regional Longevity Pool (Funded Occupational Plans)**

Decumulation overlay 2 addresses cohort-level longevity risk in funded occupational plans, complementing existing design and funding covenants. As noted in Section 2.4, unexpected longevity gains create a structural tension: defined-benefit plan sponsors face higher liabilities, while defined-contribution retirees bear adequacy risk as balances must stretch over longer lifespans. While conventional remedies like mortality-table updates should continue, Caribbean evidence suggests they often shift rather than neutralize the burden.

*Longevity risk has two components.* First, there is an individual component—the risk of outliving one's life expectancy—which annuities and lifetime-income products manage effectively. Second, there is a cohort component, arising when a generation lives longer than projected. While this systematic risk cannot be diversified in a single Caribbean-scale plan, a regional mechanism aggregating multiple plans and cohorts could reduce such exposure through larger risk pools and simple adjustment rules.

*Design and operation.* Each participating plan transfers an actuarially neutral slice of retirement-phase exposure into a Caribbean Longevity Income Pool. Defined-benefit plans might transfer the final 15–20% of projected benefits; defined-contribution plans could transfer an equivalent share at retirement. In return, retirees receive a lifetime dividend that moves under a closed rule with two ingredients:

1. Realized real investment performance compared with a conservative real hurdle; and
2. The ratio of projected survivors to actual survivors within the retiree's cohort.

Each retiree receives a variable lifetime income with annual updates reflecting market performance versus target and cohort survival. A narrow year-over-year collar and buffer keep changes predictable. This "fair bet" architecture preserves individual equity and has been shown to deliver better welfare and solvency outcomes than individual drawdown strategies using the same assets.

*Parameter discipline and smoothing.* A collar of plus or minus 5% caps annual dividend changes. Amounts outside the band feed a stabilization reserve in strong years and support payouts in weaker years. A 2% real hurdle anchors expectations and can be reviewed every five years. These features convert volatile experience into small adjustments that households can plan around, while maintaining actuarial neutrality.

*Governance and legal base.* Credibility requires three lines of defense:

- An independent actuarial board that certifies mortality assumptions, validates the annual dividend, and reviews “cohort fairness” across participating plans.

- A tripartite oversight council—comprising employer, member, and independent representatives—that sets high-level strategy and approves parameter changes within agreed bounds.
- A standing audit and compliance panel that monitors controls, checks adherence to rules, and reports breaches.

A Caribbean Occupational Pensions Protocol can standardize methodology, admission, and settlement rules through a regional supervisors' college (see also Section 6.5 on governance). Quarterly factsheets would report allocation versus policy ranges, net-of-fees returns against the real hurdle, attribution by allocation and currency, and stabilization reserve changes. A breach log is maintained, and conflicts-of-interest policy with pre-trade controls would apply where domestic managers hold dual mandates.

*Entry, fairness, and selection hygiene.* Admission rules are explicit. Pricing can be unisex, sex-distinct, or transitional unisex with guardrails; this choice involves trade-offs between simplicity, fairness, and precision. Cohorts can be defined by age and year, or quarterly, which reduces timing arbitrage. Defaults favor participation: auto-enrolment with limited opt-out improves risk pooling, while a 6–24 month vesting period tempers anti-selection. Withdrawal rules after vesting prioritize pool integrity while allowing defined hardship cases.

*Survivor options are explicit at entry.* Single-life options maximize starting income, while joint-survivor options improve protection at lower initial income. Legacy defined-benefit conversions use voluntary windows with caps; mandatory migration applies only to new accruals. Late entrants are priced on current factors.

*Cross-border settlement and foreign-exchange practicality.* Two settlement architectures exist. Where foreign-exchange access and custody are reliable, a fully funded cross-border model can operate: plans remit contributions and receive dividends in the agreed currency. Where capital-flow frictions bind, a ledger-only netting model exchanges net mortality credits; fair-value methods and collateral control counterparty risk; and novation to a central agent like the Caribbean Development Bank can be used where permitted.

*Foreign-exchange stress is pre-planned.* Temporary settlement deferrals can reduce liquidity pressure, though at the cost of basis risk; increased local-currency collateralization preserves timeliness while shifting foreign-exchange exposure onto balance sheets. Tax characterization is settled with authorities; treating distributions as annuity-like simplifies reporting, while splitting return of capital and mortality credit is precise but administratively complex.

*Investment currency and hedging.* The reference currency reflects investability and optics. A US dollar anchor simplifies benchmarking and market access; a small basket diversifies inflation bases but complicates communication. Foreign-exchange risk follows an explicit rules-based policy; a 50–75% hedge band on developed-market fixed income reduces volatility while preserving currency premia. The policy portfolio is global and diversified, with tracking-error range and liquidity floors matching dividend payments. Regional tilts and private asset allocations are justified by developmental co-benefits, capacity, liquidity, and fees.

*Expected system effects.* By aggregating participants across jurisdictions, the mechanism reduces benefit variability more effectively than single employer schemes. It links investment policy with liability management and enables prudent diversification beyond short-dated domestic instruments while core promises remain intact. For participating countries, the Regional Longevity Pool manages cohort-level longevity risk at regional scale, aligned with the broader solvency and governance framework outlined in this report.

## **6.5 Governance and Prudential Supervision (Regional)**

Section 3.2.2 and the figures on solvency runways and reserve-to-expenditure ratios show short runways to reserve depletion and a lack of transparency linking investment risk to funding needs. To address these issues, governance can be recast as a system that codifies decision rights, separates oversight from execution, and regularly discloses solvency and investment performance. These elements align with good practice for social-security reserve management. The core objective is to set goals consistent with statutory mandates and implement processes

under explicit accountability, supported by clear investment beliefs, defined missions, and well-specified roles.

A three-lines-of-defense structure can be embedded in statute and scheme by-laws. The governing body sets policy, defines risk appetite, and monitors compliance. Management executes within these limits, while an independent risk function tests controls and reports breaches. The respective roles of the board, management, and investment committee should be unambiguous, with the board delegating second-level decisions through written mandates. Operational independence from political influence should be preserved. Regular supervisory reviews and documented procedures are necessary, with staff incentives aligned with long-term objectives to support solvency.

A Regional Pension Supervisors' College could harmonize prudential expectations and coordinate examinations of cross-listed instruments. Members would agree on templates for: (1) Investment Policy Statements linking assets to liabilities and funding policy; (2) risk-budget definitions; and (3) board-level reporting. This approach aligns with work conducted by the Eastern Caribbean Currency Union calling for stronger investment governance to improve efficiency in National Insurance Schemes and ensure consistent risk treatment across funds.

Third, schemes should publish quarterly pension solvency dashboards that summarize solvency and investment risk. These should show: (1) reserve-to-expenditure coverage; (2) contributions, benefits, and costs; (3) total-fund return versus the real policy benchmark and inflation; (4) asset allocation versus policy ranges; and (5) breaches and corrective actions. Region-wide standardized dashboards would enable peer comparison and risk assessment. Caribbean work on financial stability indicators already highlights key metrics for market, credit, liquidity, and solvency risks that supervisors can use for early intervention.

Fourth, investment governance should follow the 2019 ISSA Guidelines. Schemes must document investment beliefs, define their mission and governance budgets, and specify clear responsibilities. Investment execution must remain operationally independent from political influence. Conflicts of interest require management and disclosure, while performance should be monitored against benchmarks. These disciplines can be codified to enable transparent assessment against the CPI + discount rate benchmark and funding policy.

Fifth, regional minimums for control should require: (1) responsibility matrices distinguishing governing and executive functions; (2) internal audit testing of investment processes; (3) independent custodial arrangements with periodic review; and (4) supervisor authority to direct remedial actions for deficiencies. These elements help ensure detection of policy and solvency target breaches.

Sixth, supervision must emphasize funding-investment alignment. Each IPS should demonstrate how liabilities and the funding policy inform asset strategy and risk budgets. Total-fund performance should be reported against real policy benchmarks aligned with discount rates, with automatic breach protocols. This connection should be integrated into board calendars and supervisory templates to enable real-time monitoring.

Finally, for regionally issued instruments like Caribbean retirement income bonds, schemes should adopt use-of-proceeds guardrails at issuance and during oversight. These would require debt offices to disclose allocation profiles, align with medium-term strategies, and certify that funded assets match the instrument's real cash-flow profile. The supervisors' college should include debt-management observers to ensure consistent interpretations and protect pension-reserve integrity, following transparency principles for social-security investment governance and avoiding asset-liability mismatches.

Implementation can proceed in stages and be measurable. Within twelve months, schemes should adopt board-approved investment beliefs and goals and publish the first standardized dashboard. Within eighteen months, the supervisors' College should agree on a common template for IPSs and risk-budgets, while scheduling its first examination. Within twenty-four months, schemes should complete an independent review of board powers, conflicts-of-interest controls, and custody arrangements, reporting progress to the supervisors' College. This sequencing shifts governance from episodic compliance to continuous management, addressing gaps in transparency and investment governance.

These recommendations aim to stabilize the funding–investment nexus and demonstrate fiduciary discipline. They provide the supervisors' College with a common playbook for peer review and coordinated action. By anchoring board practice to ISSA standards, publishing solvency dashboards, and building a regional supervisory backbone, pension authorities can

strengthen accountability, reduce personality-driven decision-making, and better protect contributors against timing risks and solvency pressures.

## **7. Concluding insights**

Evidence from the Caribbean indicates structural solvency problems in long-term social security branches. Contributor-to-pensioner ratios have fallen as workers emigrate, and life expectancy rises. Cash deficits are projected to emerge before reserves deplete, and once the reserve-to-expenditure (R/E) ratio falls below prudential thresholds, exhaustion often follows within about nine years. Reserves remain in short-term domestic securities with real returns below actuarial requirements. Poor administration reduces contributions, while weak system integration slows benefit verification. In small economies with thin capital markets and climate exposure, the lack of codified rules leaves solvency to late ad hoc decisions. In such contexts, automatic mechanisms are essential.

A coherent policy program works best when interventions operate as a system. Pairing a funding policy with a public Investment Policy Statement (IPS) enables timely action: solvency uses corridor metrics and pre-set levers, investment performance measures against a real benchmark, and risk management follows defined steps. Administrative reforms—including digital IDs, bank payments, straight-through processing, and dedicated processes for self-employed workers—can increase contribution income by reducing leakage.

In the contributory branch (PAYGO accounting, typically partially funded in the Caribbean), automatic triggers replace ad hoc cuts with pre-set rules that activate when metrics cross specified thresholds. Examples include temporary indexation reductions when the R/E ratio is low, contribution increases for higher earners, retirement-age adjustments, and IPS breach protocols. The measures unwind once the indicators return to better levels.

As no single Caribbean scheme can fully diversify longevity risk, regional pooling is recommended. Rule-based adjustments manage these risks within set limits and backed by reserves. Once the R/E corridor stabilizes, a funded second pillar can operate alongside PAYGO.

A CPI-linked Caribbean Retirement Income Bond (CaRIBond) default would provide an income anchor, support diversification, and improve migrant portability.

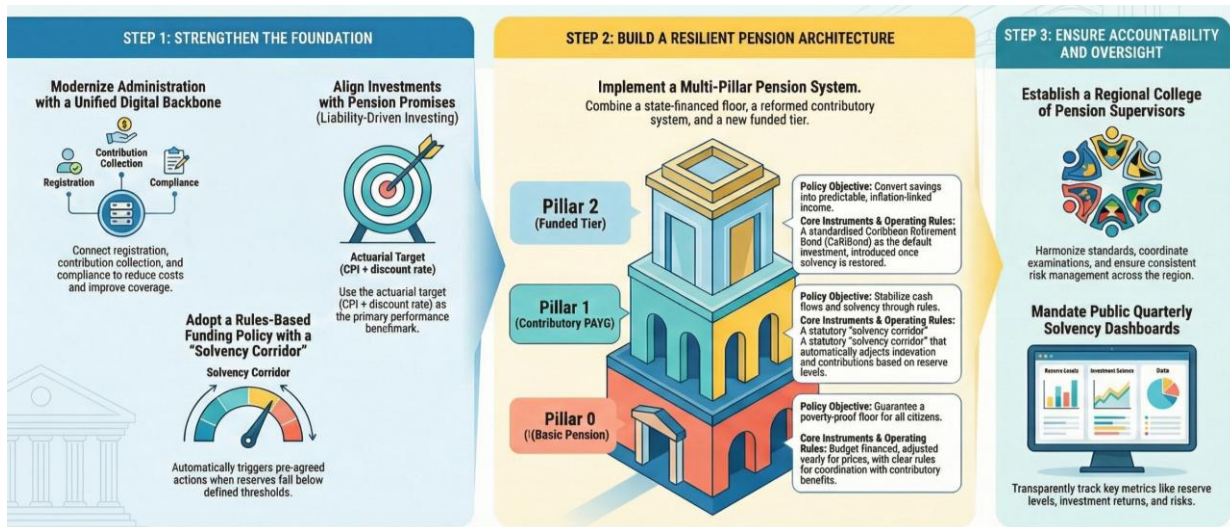
Governance should ensure financial discipline through clear, verifiable rules and a separation of execution and oversight through three lines of defense. A regional supervisors' group can standardize methods and publish enforcement reports. Rules on fund usage can align liabilities with assets, while dashboards showing reserves, investment gaps, portfolio allocation, risk exposures, and corrective actions can help manage solvency proactively. In this way, hidden risks are replaced by enforceable rules.

Equity objectives can be advanced while maintaining solvency. Expanding coverage to self-employed and informal workers, with portable lifetime-income options, supports fairness and inclusion. A budget-financed basic pension can reduce old-age poverty without destabilizing contributory finance (Arenas de Mesa & Robles, 2024).

Several key points emerge. Improved management—through administrative upgrades and liability-linked investments—can extend solvency, but it cannot replace needed parametric reform. Moreover, better administration and governance can build legitimacy for broader, more difficult structural change. Stronger supervision can also reduce information gaps that increase fiscal risk. Under current parameters, many Caribbean schemes could hit intervention thresholds within a single electoral cycle, making rule-based stabilizers essential. For small island economies facing aging populations and limited scale, managing long-term social insurance requires regional solutions with collective risk pooling and administrative collaboration.

These dynamics are illustrated in Figure 11, which shows the progression toward sustainability through incremental reforms. Ultimately, the region's long-term social insurance challenge is not only to adjust parameters, but to build institutions that can execute promises—consistently, transparently, and at a scale resilient to demographic change and shocks.

Figure 11. Step by step illustration of the strengthening process towards sustainability<sup>45</sup>



<sup>45</sup> Note: The illustration excludes the two longevity overlays to keep the visual simple.

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## Appendix 1. Questionnaire Responses

**Table A1. Responses from social insurance/security practitioners.**

Country		Bahamas	Barbados	Belize	Trinidad and Tobago	St. Vincent and the G.	Antigua and Barbuda	Anguilla	Curaçao	
Customer Service	Exclusive customer service unit	No	No	Yes	Yes	No	No	No	No	
	CRM	No	Yes	No	No	No	No	No	No	
	Channels	Digital Platform	Yes	No	Yes	No	No	No	No	No
		Mobile App	No	No	No	No	No	No	No	No
		WhatsApp	Yes	No	Yes	No	Yes	Yes	Yes	Yes
		E-mail	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Registration	Compulsory employee registration	Yes	Yes	No	Yes	No	Yes	Yes	Yes	
	Documents	Business registration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		ID of manager	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		Employment contract	No	Yes	No	Yes	No	No	No	Yes
	Response time (days)	-	1	3	-	3	1	1	1	
	End of contract notification	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Financing	Contribution collection	Yes	Yes	No	Yes	No	No	No	No	
	Rates defined by NIS/SSB									

Country			Bahamas	Barbados	Belize	Trinidad and Tobago	St. Vincent and the G.	Antigua and Barbuda	Anguilla	Curaçao
		In-office cash receipt	Yes	Yes	Yes	Yes	Yes	No	Yes	No
		Automatic payment attribution	Yes	Yes	Yes	Yes	No	Yes	Yes	No
		Days to recognize payments	-	30	1	1	5	1	1	30
		Days to coercive collection	30	-	30	90	30	30	90	90
		Exclusive enforcement by NIS/SSB	Yes	No	Yes	Yes	No	Yes	No	No
	Fund Governance and Management	Fund divided by risks	Yes	Yes	No	Yes	No	Yes	Yes	Yes
		In-sourced management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		Out-sourced management	No	Yes	No	No	Yes	No	No	No
		Investments are externally supervised	No	Yes	No	Yes	Yes	Yes	No	Yes

Country		Bahamas	Barbados	Belize	Trinidad and Tobago	St. Vincent and the G.	Antigua and Barbuda	Anguilla	Curaçao	
	Committee from board members	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Investment policies are public	No	-	No	No	No	No	Yes*	No	
	Minimum return rate	No	Yes	No	No	Yes	Yes	Yes	Yes	
	Policies pursue actuarial liabilities	No	No	No	No	No	No	No	No	
	Direct consumption loans	No	No	Yes	Yes	No	No	No	No	
	Direct real sector investments	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	
Disability and Survivor-ship Pensions	Paper-based death certificate	Yes	No	Yes	No	Yes	Yes	Yes	No	
	Digital claims possible	Yes	No	Yes	No	No	Yes	No	No	
	Cohabitation is verified	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Disability exams	Internal	Yes	Yes	No	Yes	No	No	Yes	Yes
		External	No	No	Yes	Yes	Yes	Yes	No	No

Country			Bahamas	Barbados	Belize	Trinidad and Tobago	St. Vincent and the G.	Antigua and Barbuda	Anguilla	Curaçao
		Controversies are internally solved	No	No	Yes	Yes	Yes	Yes	Yes	Yes
		Revision of disability status	No	Yes	No	Yes	No	Yes	Yes	Yes
Old Age Pension	Digital claims possible		Yes	No	No	No	No	No	No	No
	Paper free option		No	Yes	No	No	No	No	No	Yes
	Days to respond to a claim		-	90	30	14	10	30	12	1
	Payments exclusive through banking system		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Digital integration with banking system		No	No	Yes	No	No	No	No	No
	Freedom to choose bank		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Digital pension statement		No	No	No	No	No	No	No	No
	Financial costs assumed by pensioner		No	No	No	No	Yes	No	Yes	Yes
	Life certificate		Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Note: /\* "Reported yes" reflects the questionnaire response; public posting of a current IPS could not be independently confirmed as of December 2025.

## **Appendix 2. Glossary of Technical Terms (Tailored to this Report)**

*Definitions reflect how each term is used in the report and related Caribbean practice.*

### **Actuarial, solvency, and funding metrics**

- **Accrual rate:** Percentage of wage credited to a future pension for each year (or week) of covered service in a DB formula (see also: Benefit formula).
- **Actuarial balance:** Long-horizon (e.g., 30-year) difference between projected inflows and outflows, used with the solvency corridor and R/E ratio to judge funding pressure.
- **Actuarial baseline:** Status-quo projection in an actuarial review against which alternatives are tested (see also: Status-quo path).
- **Actuarial neutrality:** Early-retirement reductions and deferral credits leave the expected present value of benefits unchanged (see also: Retirement-age pathway).
- **Actuarial review/valuation:** Periodic assessment of a scheme's finances based on demographic, economic, and investment assumptions; informs parameter changes and the funding policy.
- **Actuarial yardstick (CPI + discount rate):** The real return target that matches liabilities: inflation (CPI) plus the valuation's real discount rate (dr). Used in this report as the policy benchmark for total-fund performance.
- **CPI + discount rate gap:** Shortfall (or surplus) of realized total-fund returns versus the CPI + discount rate policy hurdle; sustained gaps erode solvency.
- **Equilibrium contribution rate (PAYGO rate):** The contribution rate that would exactly finance current-year benefits under pay-as-you-go accounting (the actuarial "cost rate"). This rate concept should not be conflated with the Caribbean shorthand use of "PAYGO" to describe low-reserve schemes (see also: Premium gap).
- **Indexation (price vs wage):** Rule for updating pensions in payment. Price indexation tracks CPI; wage indexation tracks average earnings and is usually costlier over time.
- **Indexation haircut/filter:** Temporary reduction in the indexation rule (e.g., CPI-x) applied when the scheme falls below a prudential threshold and automatically removed once recovery is certified (see also: Solvency corridor).
- **Partially funded:** A financing state in which a scheme holds marketable reserves that cover more than one year of benefit outlays ( $R/E > 1$ ) so that reserves can absorb shocks and smooth the transition toward any future cash-flow financed state.
- **PAYGO (pay-as-you-go):** In actuarial terms, financing where current contributions fund current benefits with little or no reliance on accumulated reserves. In Caribbean policy usage, "PAYGO" is often used as shorthand for schemes with negligible marketable reserves (e.g., R/E around or below 1) whose benefits are essentially cash-flow financed.
- **Premium gap:** PAYGO rate minus the actual combined contribution rate; a positive gap signals immediate cash-flow shortfall.

- Real discount rate (dr): Inflation-adjusted rate used to value liabilities in the actuarial review; the anchor for CPI + discount rate.
- Reserve depletion (exhaustion): Year in which investable reserves reach zero under the central projection.
- Reserve-to-expenditure ratio (R/E): Liquid reserves divided by one year of benefit outlays. Heuristics used herein: 3.0 (central anchor), 2.5 (watch), 2.0 (intervention/red-light). In Caribbean usage, an R/E near 1 is commonly associated with an effectively pay-as-you-go state.
- Runway (solvency runway): Years remaining before reserves are exhausted.
- Solvency corridor: Policy range for the R/E ratio with watch and intervention thresholds that trigger automatic, pre-legislated measures. See also: Funding policy; Automatic stabilizers.
- Status-quo path: Forward path of reserves and cash-flows under current parameters and practices, with no new reforms.

### **Benefit design, adequacy, and eligibility**

- Adequacy floor/Minimum pension: Statutory minimum benefit to prevent old-age poverty (see also: Zero pillar).
- Benefit cap: Ceiling on benefit level or replacement rate for high earners.
- Benefit formula: Rule computing the pension (e.g., accrual rate × service × reference wage).
- Contribution credits: Budget-financed credits recorded in contributory accounts for periods of caregiving, unemployment, or disability to protect future pensions.
- Deferral credit: Actuarially neutral increase applied when retirement is delayed beyond the normal age.
- Early-retirement reduction factor: Actuarially neutral deduction for claiming before the normal age.
- Old-age (contributory) pension: Pension based on contribution history and qualifying weeks.
- Portability: Right to carry accrued entitlements across schemes/jurisdictions; a priority for migrants in the region.
- PPP (purchasing power parity): Currency conversion method that adjusts for price-level differences across countries; used for cross-country benefit comparisons.
- Qualifying weeks (service): Minimum credited contributions required to access a contributory pension.
- Replacement rate: First-payment pension as a share of pre-retirement earnings (or insurable wage).
- Retirement-age pathway: Pre-committed schedule linking the normal pension age to measured cohort life expectancy (e.g., +½ to ⅔ year of age per +1 year of life expectancy), with a dated glide path.
- Retirement test: Additional eligibility condition restricting earnings or work status for early claimants.

- Wage-indexed ceiling: Earnings cap for contributory purposes, adjusted by average wages to avoid hidden erosion.

### **Coverage, contributions, and compliance**

- Arrears ageing/ageing buckets: Distribution of unpaid contributions by time overdue (e.g., 0–30 / 31–60 / 61–90 / 90+ days), used to monitor enforcement effectiveness and recovery strategy (see also: Arrears; Dunning cadence; Recoveries).
- Compliance certificate (good-standing certificate): Document proving an employer is current on filings/payments; suspension is an enforcement lever in the escalation chain (see also: Dunning cadence; Coercive collection; Arrears ageing).
- Compliance yield: Additional revenue from audits, penalties, and enforcement relative to baseline.
- Contribution ceiling: Upper bound on earnings subject to contributions.
- Contribution density: Share of months/weeks in a working life with recorded contributions.
- Contribution rate (combined): Total of employee and employer rates.
- Dunning cadence: Standardized timeline of reminders and escalating actions after a missed filing/payment (e.g., Day +7 / +15 / +30 / +60 / +90).
- E-invoicing: Electronic invoicing data used as a compliance signal to detect under-reporting/non-payment and to support risk-based audits (see also: Risk-based compliance; Data sharing; Audit coverage).
- Insurable earnings band/insurable wage: Portion of earnings subject to contributions up to the contribution ceiling; important here because the report discusses “flat within the band” (see also: Contribution ceiling).
- Payroll wedge: Gap between employer labor cost and worker take-home pay created by payroll taxes/contributions; relevant when discussing burdens on low-wage workers.
- Platform worker/Digital labor platform: Worker earning through app-based platforms; operational implications for onboarding, data interfaces, and remittance channels (see also: Self-employed coverage; Onboarding).
- Presumptive contribution base/Presumptive classes: Simplified contribution assessment categories used when actual income is hard to verify (especially for self-employed/platform workers) (see also: Self-employed coverage [operationalization]).
- Risk-based compliance: Prioritizing inspections, audits, and reminders using data signals (e.g., late returns, mismatches), not random sweeps.
- Self-employed coverage (operationalization): Default enrollment at ID/tax onboarding, presumptive income classes, quarterly remittance options, and e-channels to accommodate irregular earnings.
- Shadow economy (informality): Market activity outside tax/social insurance that erodes detectability, coverage, and collections.
- Voluntary contributions: Optional payments by non-mandated participants (or to fill gaps), usually with narrower coverage of contingencies.

### **Administration, records, and digitalization**

- Adjudication: Decision process that grants/denies a benefit claim based on eligibility and evidence.
- CRM (customer-relationship management): System managing contributor/pensioner interactions across channels.
- Employer e-portal/E-filing (mandatory electronic filing): Digital employer interface for submitting contribution schedules/returns and paying contributions; “mandatory” implies enforcement and automated penalties tied to timestamps (see also: Posting time; Reconciliation; Dunning cadence; Bank-only payments).
- Ghost pensions: Payments continuing after death due to lags or weak proof-of-life controls.
- Interoperability: Secure, automated data exchange with public systems (i.e., national ID, tax, civil registry, health, and business registries).
- Life certificate/Proof-of-life: Periodic survival verification; best practice replaces in-person certification with data-matching against vital-events registries.
- Onboarding (contributors): Digital registration process linking national ID and tax numbers to a unique social-insurance identifier.
- Paper-free/Straight-through processing: End-to-end digital claims/returns with automated checks and no physical documents.
- Payment rails: Channels for contributions and pensions (ACH bank transfers, online banking, e-wallets) (see also: Bank-only payments).
- Posting time (attribution): Lag from verified payment/schedule to credit in individual records; a KPI distinct from bank reconciliation.
- Proof-of-life clearinghouse (regional): Coordinated service linking civil-registration databases and national ID across islands to reduce ghost pensions.
- Reconciliation (cash/ledger): Matching bank receipts to employer schedules and ledgers; prerequisite to posting.
- Service-level agreement (SLA): Published time targets for key processes (e.g., ≤ 15 days to grant an age pension; ≤ T+7 to post contributions).
- Tax-portal model (integrated collections platform): A collections architecture where filing and payment are integrated into a tax authority portal with automated penalties and high observability (the “most advanced configuration” benchmark in Section 3.8.2) (see also: E-filing; Bank-only payments; Automatic penalties; KPI).
- Unique social-insurance identifier: Persistent participant ID, ideally the national ID, used across registration, collections, and benefits.

### **Governance, regulation, and risk oversight**

- Breach remediation/Breach log: Standing rules and public record of breaches (e.g., IPS limits, corridor triggers) and the corrective actions taken.
- Conflicts-of-interest rules: Standards barring board/committee members from decisions in which they have a personal stake.
- Fit-and-proper criteria: Integrity, qualifications, and experience requirements for trustees, executives, and key functions.

- Funding policy (statutory): Rulebook that links actuarial valuations and the solvency corridor to automatic contribution/benefit adjustments and disclosure.
- Independent supervisor: Authority with rulemaking, inspection, and sanction powers over schemes.
- Investment committee: Board sub-committee that sets/oversees investment policy within statutory limits and the IPS.
- Investment policy statement (IPS): Public rulebook stating objectives, ranges, benchmarks (CPI + discount rate), rebalancing rules, breach protocols, and risk budget.
- Minimum return requirement/Guaranteed minimum return rule (statutory or policy): A rule requiring a minimum credited return; can distort portfolio choice if not aligned with the liability yardstick (CPI + dr) (see also: Actuarial yardstick; Policy benchmark).
- Prudent-person rule/Prudent-person test: Fiduciary standard used in some jurisdictions to allow broader instruments while requiring demonstrable diversification, risk understanding, and alignment with beneficiaries' interests (contrasts with purely quantitative ceilings) (See also: Fit-and-proper; IPS; Risk budget).
- Public solvency dashboard: Quarterly disclosure of core metrics (R/E, PAYGO cost rate, CPI + discount rate gaps, asset allocation vs ranges, concentration/duration mismatch, foreign-exchange exposure, stress-test results, breaches and remedies).
- Regional supervisors' college: Forum for harmonized expectations, joint exams, and shared dashboards across jurisdictions.
- Risk budget: Total-fund limits on tracking error, drawdown, liquidity, and foreign-exchange exposures, set against liabilities.
- Structural roadmap: Pre-legislated path for deeper changes (e.g., NDC/points accrual for new service, funded second pillar) if the corridor is not restored.
- Sunset clause: Legal trigger that escalates reforms (or switches system architecture) if automatic measures fail within set cycles.
- Three lines of defense structure: Separation of the front office (investments), middle office (risk/compliance), and back office (operations/settlement).
- Tripartite board: government, employer, and worker representatives.
- Use-of-proceeds guardrails: Legal conditions ensuring proceeds of long-dated, CPI-linked issuance fund assets whose cash-flows match the instrument's risk/tenor.

### **Investment strategy and portfolio management**

- Admissible instruments/Statutory limits: Asset classes and exposure caps allowed by law/regulation.
- Allocation versus ranges: Current weights against IPS policy ranges, disclosed each quarter.
- Asset-liability management (ALM): Mapping asset cash-flows, duration, and inflation sensitivity to projected benefits over the horizon in which investable reserves are expected to provide coverage, and using that mapping to set liquidity floors, risk limits, and rebalancing rules.
- Concentration limit: Maximum exposure to an issuer/sector to reduce idiosyncratic risk.

- CPI-linked retirement-income bond (baseline in this report): Forward-starting, income-only bond indexed to CPI, used here as the implementable baseline for aligning actuarial benchmarks (CPI + dr) with retirement-income instruments and for supporting transparent performance measurement and hedging.
- Currency/hedge “overlay”: A derivatives-based layer (FX hedging or tactical currency positioning) whose P&L is separated in performance attribution (“currency/overlay effects”) (see also: Hedge ratio; Performance attribution).
- Diversification lever: Scenario lever that lifts expected net returns (e.g., +200 bps) within existing legal limits.
- Drawdown (peak-to-trough): Maximum allowed portfolio fall specified in the risk budget.
- Duration/Duration mismatch: Sensitivity to interest-rate changes; mismatch arises when short-dated assets back long-dated liabilities.
- Foreign-asset limit: Maximum share in non-domestic assets (often below the effective cap created by foreign-exchange-access bands).
- Foreign-exchange access bands/Hedge band: Published annual foreign-exchange allotments and allowed hedge ratios that make foreign ranges executable in practice.
- Foreign-exchange protocol: The operational rulebook that makes foreign-asset ranges executable (FX access allocation, custody, settlement, hedge bands, repatriation expectations, governance approvals) (see also: Foreign-exchange windows/quotas; FX access bands; Hedge ratio; Repatriation requirement).
- Goals-based investing (GBI): Approach that frames outcomes in income/goal units (rather than terminal wealth), typically pairing a liability/goal-hedge sleeve with a performance-seeking sleeve under an explicit income shortfall/tracking-error budget (see also: LDI; Policy benchmark; Performance factsheet).
- Home bias: Overweight in domestic assets relative to the global opportunity set.
- Liability-driven investing (LDI): Strategy that sets the SAA and the total-fund risk budget so the investable reserve portfolio tracks the CPI + discount rate yardstick over the reserve runway, with explicit liquidity coverage where benefit payments cluster and with disciplined management of concentration, currency, and liquidity risks.
- Liquidity floor/Liquidity coverage: Minimum readily saleable assets to meet near-term benefit payments and margin calls under stress.
- Performance attribution: Net-of-fee decomposition of returns into policy (allocation), selection, and currency effects; reported quarterly.
- Policy benchmark (total-fund): CPI + discount rate hurdle used to judge total-fund performance against liabilities; paired with an investable proxy index mix.
- Present-value-neutral, duration-matched swap: Exchange of short-dated debt for longer, CPI-linked obligations that leaves net debt PV and duration unchanged.
- Private equity (PE)/Alternatives: Illiquid assets (unlisted equity, infra) accessed via regulated, closed-end funds; typically capped at low single digits.
- Rebalancing rules: Pre-set actions that return the live portfolio to IPS ranges after market moves.
- Standard-of-living (SoL)/Consumption indexation: Indexing rule tied to aggregate per-capita consumption (a proxy for living standards), which embeds both inflation and long-

run changes in living standards. In the SeLFIES design, payouts are indexed to per-capita consumption until the payout start date and to inflation thereafter (Merton, 2019).

- Standard-of-Living indexed, Forward-starting, Income-only Securities (SeLFIES): Forward-starting income-only bonds proposed in the retirement-income literature; typically indexed to standard-of-living/consumption before retirement and to inflation thereafter; conceptual ancestor to the report's CaRIBond design (see also: Standard-of-living/Consumption indexation; CaRIBond; VAT-hedged issuance).
- Strategic asset allocation (SAA): Long-horizon asset mix calibrated to liabilities; revisited after each valuation.
- Stress testing: Scenarios for inflation, foreign-exchange, climate shocks, and longevity drift to test funding and portfolio resilience.
- Tracking error: Standard deviation of active returns versus the policy benchmark.
- Value-at-risk (VaR): Statistical measure of potential loss over a horizon at a stated confidence level.
- VAT-hedged issuance/VAT linkage (issuer-side): Design feature in which a government's value-added tax (VAT)—a tax on consumption—provides a natural fiscal hedge for consumption-linked retirement-income payouts; this is an issuer-side coherence mechanism and should not be conflated with CPI indexation of benefits (Merton, 2019).

### **Demography and risk sharing**

- Cohort: Group defined by birth year entering retirement around the same time.
- Collar: Cap on year-over-year variability of pooled dividends (e.g.,  $\pm 5\%$  or  $\pm 10\%$ ) to keep changes predictable.
- Longevity pooling/Tontine overlay: Rule-based sharing of late-life longevity through variable dividends with collars and a stabilization reserve.
- Longevity risk (macro): Cohort-wide upward drifts in survival relative to forecasts; not diversifiable within a single scheme and best managed via regional pooling/reinsurance.
- Longevity risk (micro): Uncertainty about an individual's time of death; diversifiable within cohorts (basis for mortality credits).
- Mortality credits (biometric returns): Extra income in pooled designs as earlier deaths subsidize longer lives.
- Stabilization reserve: Buffer that absorbs experience outside the collar and funds floors at very old ages.
- Unitized longevity account (ULA): Segregated, unit-priced pool crediting retirees with a variable monthly supplement linked to realized returns and cohort survival, leaving the CPI-linked base intact.

### **Reform instruments and scenario work**

- Administrative-efficiency lever: Scenario limiting admin costs (e.g.,  $\leq 1\%$  of insurable wages).
- Compliance lever: Scenario raising contribution income via stronger enforcement without changing rates.

- Combined improved-performance scenario: All operational levers applied simultaneously (returns ↑, admin costs ↓, compliance ↑).
- Scenario transparency: Publishing inputs and assumptions behind solvency projections.

### **Institutions, legal architecture, and regional tools**

- Caribbean Pension Investment Corporation (CPIC): Proposed regional platform to pool procurement, custody, performance measurement, and optional hedging, compressing fees and raising governance.
- Caribbean Retirement Income Bond (CaRIBond): Proposed CPI-linked, forward-starting income bond used as the default asset in a funded second pillar; issued on a present-value-neutral, duration-matched basis with use-of-proceeds guardrails.
- National Insurance Act (NIA): Foundational law setting benefits, financing powers, governance and, in some countries, investment limits.
- Notional defined contribution (NDC)/Points formula: PAYGO designs where accruals track wages (or points) and annuity divisors reflect cohort life expectancy.
- NIB/NIS/NISv: Statutory agency administering contributions, benefits, and reserves.
- National Insurance Fund (NIF): The investable reserve portfolio held by the NIS.
- Second pillar (funded): Savings tier (auto-enrolment/mandate) governed by IPS rules, with default lifetime-income decumulation.
- Zero pillar (basic pension): Budget-financed, near-universal floor separate from contributory insurance.

### **Capital-market and operations vocabulary**

- Automated clearing house (ACH): Batch network for low-value electronic payments—preferred rail for contributions and pensions.
- Bank-only payments: Policy eliminating cash at the counter; contributions/payments flow exclusively through regulated banking rails.
- Custodian/Performance measurer: Independent firms providing safekeeping and verified valuation and attribution.
- Fair value: Market-based valuation standard for the portfolio and external mandates.
- Foreign-Exchange windows/Quotas: Administrative channels that govern access to foreign currency for overseas investments; they often set the effective cap below the legal foreign-asset limit.
- Hedge ratio: Share of foreign currency exposure covered by hedges within IPS bands.
- Liquidity coverage: Ability to meet near-term cash needs without forced selling.
- Repatriation requirement: Rule that foreign investment income be returned in local currency within a prescribed period.
- Transition management: Coordinated execution to shift portfolios while minimizing cost and tracking-error slippage.

### **Measurement and communication**

- Key performance indicator (KPI): Metric with a target (e.g.,  $\geq 95\%$  on-time filings,  $\leq T+7$  posting).
- p95/95th-percentile service level: Tail metric for operational performance (e.g., posting time) to prevent “median-only” reporting from hiding slow cases (see also: SLA; Posting time).
- Performance factsheet (quarterly): Brief public update showing allocation vs ranges, returns vs CPI + discount rate and investable proxy, attribution (policy/selection/currency), stress tests, and breaches/remedies.
- Publication cadence: Standard rhythm for dashboards, factsheets and breach logs to keep accountability continuous.

### **Common sources of confusion**

- Home bias vs developmental mandate: Supporting domestic development is a policy choice; unintended concentration is a risk choice. The IPS should separate the two.
- Indexation vs revaluation: Indexation updates pensions in payment; revaluation updates past wages used in formulas.
- Reserves vs assets: “Reserves” here mean investable financial assets held for future obligations, not accounting provisions.
- Statutory limits vs IPS ranges: Legal ceilings are hard constraints; IPS ranges are tighter, board-approved operating bands with breach protocols.

### **Illustrative thresholds used in the report**

- Foreign-asset bands (sequenced): 10  $\rightarrow$  20  $\rightarrow$  30% of total assets, contingent on governance/foreign-exchange-access preconditions.
- Indexation guard: Temporary haircut while  $R/E < 1.5$ ; automatic unwind  $\geq 2.5$ .
- PE/Alternatives: Typically  $\leq 5\%$  via regulated, closed-end vehicles.
- R/E red-lights: 3.0 (anchor), 2.5 (watch), 2.0 (intervention).