

CARIBBEAN ACTUARIAL ASSOCIATION



Caribbean Actuarial Association Standard of Practice

APS 3: Social Security Programs

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APS 3:	Social Security Programs
Version 2:	Approved: December 6, 2019
Purpose	This Actuarial Practice Standard sets out required standards of practice for all actuaries of the Caribbean Actuarial Association giving advice on social security programs in operation in the Caribbean.
Target Audience:	Actuaries performing work relating to social security programs including preparation of reports of an actuarial or related nature addressing the projected financial status of a social security program, statements of opinion, papers or other analysis relating to social security program policy matters, such as the adequacy of contributions and/or benefits relating to existing provisions, proposals for changes in them, or establishment of a new social security program.
Compliance:	Compliance with APS0 is a prerequisite to compliance with this APS.

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Section 1. General

1.1. Purpose

1.1.1. This Actuarial Practice Standard (“APS”) provides guidance to actuaries of the Caribbean Actuarial Association (“CAA”) performing actuarial services to give intended users confidence that:

- Actuarial services are carried out professionally and with due care;
- The results are relevant to their needs, are presented clearly and understandably, and are complete; and
- The assumptions and methodology (including, but not limited to, models and modelling techniques) used are disclosed appropriately.

1.1.2. This APS also applies to all members of the CAA and should be read accordingly.

1.2. Scope

1.2.1. This APS is the required standard of practice for all actuaries giving advice on Social Security Programs (“SSP”) in operation in the Caribbean.

1.3. Compliance

1.3.1. Compliance with APS0 is a prerequisite to compliance with this APS.

1.3.2. References in APS0 to “this APS” should be interpreted as applying equally to this APS, where appropriate.

1.4. Applicability

1.4.1. This APS addresses SSPs which have the following attributes:

- a. Prescribed by legislation,
- b. Requires coverage of a broad segment, if not all, of the population, often on a compulsory or automatic basis,
- c. Financed by contributions from or on behalf of participants, investment income from program assets where applicable, and possibly by government subsidies,
- d. Program benefits which are generally payable or delivered upon one or more contingent events or circumstances, including old age, retirement, death, disability, invalidity, survivorship, as well as poverty-related conditional cash transfers and universal social benefits,
- e. Funded or not funded.

1.4.2. This APS also applies where benefits such as sickness, maternity, unemployment and work-related incidents form part of a comprehensive benefits package that includes benefits listed in Section 1.4.1.d.

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This APS applies to SSPs irrespective of the manner in which they are financed and administered and to the SSPs whose operations are, in substance, consistent with these attributes.

- 1.4.3. The concepts underlying this APS may also be applied, in the absence of other applicable standards, regulations or administrative requirements, to actuarial work with respect to public benefit programs for employees of a government as an employer.

This APS covers actuarial work relating to SSPs, including preparation of reports of an actuarial or related nature addressing the projected financial status of an SSP, statements of opinion, papers or other analysis relating to SSP policy matters, such as the adequacy of contributions and/or benefits relating to existing provisions, proposals for changes in them, or establishment of a new SSP.

- 1.4.4. This APS sets out general professional guidance that the actuary should apply in the circumstances. The actuary's responsibility is to apply this APS while taking into account other applicable actuarial standards of practice, legal requirements, and sound actuarial principles. This APS is not intended to inhibit the development of new and appropriate actuarial practices.

- 1.4.5. This APS seeks to ensure that reports communicate the results in as clear a manner as possible, with due regard to its expected users and stakeholders who may place reliance on the results. It is an indication of these principles having been met if an external actuary could be in a position to reproduce the projection results in broad terms.

- 1.4.6. Although reports should be addressed to the actuary's client (normally the Government or National Insurance / Social Security Board) the actuary needs to bear in mind that the advice may be made available to third parties who can reasonably be expected to rely on it.

1.5. Reasonable Judgment – The actuary should exercise reasonable judgment in applying this APS.

1.6. Language

- 1.6.1. In this APS, the following words and phrases are defined here:

- a. "Contribution" refers to amounts paid by or on behalf of participants as required and defined by legislation.

1.7. Cross-References – When this APS refers to the content of another document, the reference relates to the referenced document as it is effective on the adoption date as shown on the cover page of this APS. The referenced document may be amended, restated, revoked, or replaced after the adoption date. In such a case, the actuary should consider the extent the modification is applicable and appropriate to the guidance in this APS.

1.8. Effective Date – This APS was approved at a General Meeting of the Members on December 6, 2019 and is effective for actuarial services performed on or after December 6, 2019.

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Section 2. Appropriate Practices

2.1. Materiality

- 2.1.1. All data, models, methods and assumptions that could have a material impact on the results should be considered when the work is being performed.

2.2. Data Quality

2.2.1. Validation

- a. The data used as a basis for assumptions and for the database as of the valuation date should be reliable and sufficiently complete and relevant for the purpose. According to the circumstances, these data may include, but are not limited to:
 - i. Demographic status and experience of the SSP (such as new contributors and those leaving for various reasons) and the country (such as births, deaths and migration), as applicable;
 - ii. Economic experience, inflation, labour market developments in the country; condition of the SSP, as applicable, such as contributions, increases in benefits, investment earnings and assets, if any;
 - iii. Benefits or claims, as applicable;
 - iv. Number of contributors and beneficiaries of the SSP;
 - v. Insurable salaries and past service credits; and
 - vi. Family statistics.
- b. For newly introduced SSP benefit schemes where no experience data exist, the actuary may investigate the risk characteristics of the potential insured / covered group through surveys or enquiries until data is available. Additionally, the actuary may use the experience of other SSPs or other countries to establish sound assumptions. In any case, actuarial projections of a newly introduced SSP may need to be reviewed more frequently, often annually, to account for experience during the implementation stage.
- c. Since the actuary is reliant on the completeness and accuracy of data used, data assessment and validation are important. Validation can address accuracy and consistency with other information sources and relevance to the SSP's expected future experience.

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2.3. Assumptions and Methodology

- 2.3.1. The actuarial methodology used to develop long-term financial projections should be based on sound actuarial principles and practice and the application of relevant general demographic and macro-economic methods. These principles, practices and methods are necessary to produce an overall coherence of the actuarial projections taking into account inter-dependencies of projection variables specific to actuarial practice for SSPs.
- 2.3.2. Many differences exist between social insurance and private insurance that may require the actuary to adapt, modify, or replace actuarial methods that are generally accepted for the valuation of private insurance and pensions. The actuarial methods for computing and summarizing estimates of the SSP's finances should be consistent with the financing method that has been adopted.
- 2.3.3. All relevant program features should be considered and reflect current law, regulation and judicial decisions. Where no regulation exists in relation to certain benefit or funding provisions (for example in respect of the basis for future indexation of pensions in payment and fixed financial parameters, or when no funding rule is available to determine the financial status of the scheme objectively) established practice should be considered. The methodology and assumptions used should have regard to the materiality applicable to the purpose and the context of the actuarial work involved.
- 2.3.4. The projection period adopted should be consistent with the types of benefits being modelled. Where lifetime pensions are provided, the minimum projection period should be fifty (50) years.

2.4. Assumptions and Methodology Set by Actuary

- 2.4.1. Selection of Assumptions and Methodology
 - a. The determination of assumptions and methods used for demographic and economic projections is part of the actuary's work and should be conducted without inappropriate political or external influences in order to facilitate objectivity in reporting. This includes avoiding both real and apparent conflicts of interest. For example, if a significant assumption is set by someone or an entity outside the control of the actuary, and the actuary disagrees with it, the actuary should be transparent in disclosing that fact. When an external input is significant and relied upon in a material way in the determination of an assumption, the actuary should identify the basis of that assumption and, where appropriate, provide a sensitivity analysis of the impact of alternative assumptions.
 - b. Actuarial practice for the purpose of setting assumptions often requires the use of the work of national experts from other professions, such as demographers, statisticians, economists, public finance and finance sector specialists. Best practice requires such use to be disclosed clearly and the actuary should undertake sensitivity tests when discrepancies arise between the views of different experts. If the work is

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done by an actuary, the actuary retains final responsibility for the choice of assumptions.

2.4.2. Appropriateness of Assumptions

- a. Assumptions should be chosen bearing in mind the purpose of the projections. Normally, a financial projection of a SSP should be based on assumptions that are:
 - i. Realistic, as opposed to conservative or liberal, without introducing an intentional bias to the financial projections;
 - ii. Both individually and in combination, reflect the actuary's best realistic judgment;
 - iii. Explicit, as opposed to implicit, to the extent possible and material;
 - iv. Internally consistent, e.g., mutually consistent, reflecting their correlation or interrelationship;
 - v. Externally consistent, e.g., the economic and demographic assumptions used being consistent with historical experience and the outlook for the economy; and
 - vi. Reflective of expected participant behavior, especially in relation to the introduction of or changes in an SSP.
- b. The assumptions should reflect the indexation practice and the possible eroding effect of inflation on the real value of benefits for plans that do not provide full benefit protection against inflation.
- c. Where reports are prepared with respect to an SSP's long-term future, the assumptions should reflect expected long-term trends rather than giving undue weight to recent experience. However, where appropriate, estimates for the earlier years in the projection may consider any short-term trends, phasing in to the longer-term assumptions as appropriate. This is especially relevant for actuarial valuations involving a parametric or systemic reform for which a thorough consultation is expected to be conducted with the various parties involved in the management of the SSP, in other sectors of the economy or other relevant experts at the international level.
- d. Given the uncertainty surrounding the assumptions used, it may be appropriate for the actuary to consult other professionals with pertinent expertise in deciding upon the assumptions to be applied. Nevertheless, the actuary should take responsibility for the final decision on the choice of assumptions, subject to disclosure of any assumptions which the actuary is required to make.
- e. Where possible, the actuary should undertake a review of past performance of the projection variables in order to establish assumptions for the future. Where a report is part of a series and there have been changes in assumptions (or methods) from the

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preceding report, the report should indicate the changes made and provide an explanation of any material effect that those changes have had on the financial projections. An analysis of the observed versus the projected results will serve to make the assumption framework more robust.

- f. When past trends are not useful, or when there is a significant gap in information available to set a projection assumption, the actuary should use professional judgment. This may mean that the actuary needs to explain the assumptions used and the effect of potential deviations on projection results.

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Section 3. Communication**3.1. Report**3.1.1. Clarity

- a. A report, paper or presentation of the actuarial work should communicate its results in as clear a manner as possible. The report should be prepared with due regard to its expected users and stakeholders who may place reliance on the results.
- b. In this regard, the actuary's report should be as transparent as possible regarding the sources of information considered, as well as the assumptions and methods used.

3.1.2. Comprehensiveness

- a. A report regarding an SSP often includes demographic and financial projections of all or parts of the SSP, which are used for such purposes as input or for an evaluation of its financial condition or an estimate of the revenue and/or costs associated with one or more aspects of its design. The report should therefore include or make reference to all material information relevant to the purpose and expected users of the report.
- b. Because the content of a report can vary depending on the purpose and nature of the actuarial work involved, the following sections have been designed to apply specifically to reports on the projected financial status of an SSP.
- c. Similar types of information may also be useful for other types of reports.

3.1.3. Executive Summary

The report should include an executive summary prepared in a manner that the expected reader will understand. This executive summary should include:

- a. Identification of the SSP;
- b. Purpose of the report;
- c. Identification of key assumptions and the uncertainty involved in the projections;
- d. Primary projection results and summary results of alternate scenarios tested; and
- e. Principal conclusions and recommendations.

3.1.4. Introduction or Background

The introduction to a report should incorporate:

- a. To whom the report is addressed;
- b. Identification of the SSP;
- c. Capacity in which the actuary is acting;
- d. Purpose of the report;

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- e. An indication that any financial projection included therein is an estimate and is dependent upon the accuracy and relevance of the source data being used, and the validity of the methodology and assumptions used;
- f. The starting and ending dates of the projection period;
- g. Reference to relevant preceding reports; and
- h. The expected date of the next report, if applicable.

3.1.5. SSP Provisions

- a. Description of provisions of the SSP which have been taken into account.
- b. Where the report is part of a series and there have been changes in provisions since the last report, such changes should be described.
- c. Financial projections of an SSP depend, inter alia, on its provisions. The report should include a description of:
 - i Coverage provisions;
 - ii Nature of the SSP (e.g., defined benefit or defined contribution);
 - iii Financing, e.g., pay-as-you-go (PAYG), partially funded or fully funded;
 - iv Contribution rates; and
 - v Benefits (formulae, amounts, restrictions, etc.)
- d. The actuary should consider the effective application of the legal provisions of relevance for the actuarial valuation and document the conclusions when differences exist between the legal texts and their application. The actuary may place reliance on the statement of opinion of another recognized professional or authority for this purpose.
- e. The actuary shall make reference to observed past practice to the extent that it can predict future trends for setting assumptions where there is no legal provision available for key projection parameters, such as the indexation mechanism for fixed financial parameters and pensions-in-payment, or in respect of a funding rule against which the financial sustainability of the SSP is assessed.

3.1.6. Data Documentation

- a. Identification and discussion of the sufficiency and reliability of the data and its sources should be included in the report. Where a survey on a limited exposure group has been used, its details should be explained fully and the associated limitations documented. If available data are considered inadequate for the purposes of the financial projections, the report should mention the consequential limitations on the projections.

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- b. The discussion should indicate in which of the three main applications to the financial projections the data were used, i.e.:
 - i Starting point of the projection period;
 - ii Analysis of past experience as a basis for determining the assumptions used; and
 - iii Validation of the projections performed.
- c. Regarding data, the report should include, where relevant and available, a summary of:
 - i Eligible and beneficiary population by relevant demographic characteristic groupings;
 - ii Dependency ratios;
 - iii Employment earnings by age groups and gender, and averages;
 - iv Contributory earnings by age groups and gender, and averages; and
 - v Covered payroll and workforce by sector of economic activity.

3.1.7. Documentation of Assumptions

- a. The report should describe the basis for the determination of all significant assumptions used for the projections and summarize the conclusions of the past performance review. Significant assumptions include, but are not limited to, mortality, fertility, migration, economic growth, inflation of earnings and prices, labour force participation, contribution density and investment performance.
- b. The actuary should undertake a review of past performance for the projection variables to establish assumptions. Where a report is part of a series and there have been changes in assumptions (or methods) from the previous report, the report should indicate the changes made and an explanation of any material effect that those changes have had on the financial projections. An analysis of the observed versus the projected results should be included to make the assumption framework more robust and assist users in understanding the financial development of the SSP.
- c. The report should describe the basis for the determination of all significant assumptions used for the projections and summarise the conclusions of the past performance review.

3.1.8. Documentation of the Methodology

- a. To meet the objective of transparency, the methodology employed for the financial projections shall be described in a manner that provides sufficient information to enable an actuary or other person with relevant experience and expertise to assess the results of the report. The description of the methodology should identify the demographic and economic models used.

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3.1.9. Results

- a. The report should include applicable results of the projections that are pertinent to the purpose and expected users of the report, and presents the results in a form consistent with the specific terms of reference of the evaluation or review that is the basis of the projections. The report should address the nature of the SSP and the financing methods under which it operates, particularly when explicitly referred to in applicable legislation and regulations. Where no such legal reference exists, the report may refer to established practice or other alternative experience of relevance.
- b. The actuary should indicate in the report that the assumptions, though reasonably determined, are not predictions. Any significant differences between future experience and the report's assumptions should be analysed and taken into account in subsequent reports as applicable. The effect of the most sensitive assumptions should be highlighted for a better appreciation of potential future deviations.
- c. Following is a model template for the presentation of projection results, although deviations, reflecting the nature and purpose of the report and the SSP being reported on, are to be expected.
- d. The section on cash flow financial projections should include:
 - i Contribution rates;
 - ii Pay-as-you-go rates;
 - iii Full cost rate (if fully funded);
 - iv Contributions;
 - v Investment earnings;
 - vi Other income;
 - vii Total income;
 - viii Benefits or claims, if applicable;
 - ix Administrative expenses;
 - x Total expenditures;
 - xi Annual balance (income minus expenditure);
 - xii Projected reserve and funding ratios;
 - xiii Actuarial deficit as of valuation date (for fully-funded pension schemes);
 - xiv General average premium (for partially funded defined benefit schemes);
 - xv Value of assets and / or individual accounts; and
 - xvi Sources of change in projections from a prior period, if applicable.

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- e. Where alternative assumption scenarios are used under the base projections, namely to account for possible differences in economic and demographic assumptions, the report should present the outcomes in relation to these alternative assumption scenarios. The results should indicate whether, and to what extent, expenditures other than benefits or claims are included. Such expenditures should also be considered in any discussion concerning adequacy of contributions or other sources of expected revenue.
- f. Irrespective of the financing method, the historical and projected results shown should include a summary of the income, expenditure and assets of the SSP by calendar or fiscal year, or other suitable intervals. The projected results should usually be shown as nominal values and, when appropriate, also as real values or, alternatively, the effect of inflation should be shown in another appropriate way. Alternatively, or as supplementary information, it may be appropriate to express the results in relation to one or more relevant volume measures, such as size of the economy or premiums / contributions / taxes, or expressed in terms of the change therein.
- g. In some cases, a set of summary statistics that can provide overall indications of the performance or condition of the SSP may be presented. These can be expressed in terms of expected cash flows or in present value terms, as applicable. They can be selected by means of a method consistent with the SSP's design and its financing and investment structure. They also might be designed to provide an indication of the financial sustainability of the SSP.

3.1.10. Analysis

- a. Besides the presentation of the financial projections discussed in Section 3.1.9 the report should also present an analysis of the results including the following components:
 - i Measures of the effect of uncertainty including sensitivity analyses, showing the effects on the main projection results of variations in key assumptions (individual or in the aggregate), in order to provide an indication of the degree to which the financial projections are affected by the assumptions. (Although currently this is usually shown in the form of discrete projections using an alternative set of assumption(s) on a deterministic basis, it can also be expressed in terms of stochastically developed scenarios);
 - ii Reconciliation with the previous report, along with explanations of significant changes in results;
 - iii Discussion of the pattern of financial projections over the years (e.g., as a result of the ageing of the population, maturity of the SSP, and recent changes in SSP design or financing) and the implications thereof;

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- iv Effect, if material, on the financial projections of significant events subsequent to the beginning of the projection period and prior to the date of the report;
 - v Conclusions on the short-, medium- and long-term financial sustainability of the SSP with due regard to the funding rule under the legislation. Where no such funding rule exists, the report would be expected to include an opinion on the financial status of the SSP; and
 - vi Optional recommendations on possible measures to ensure the long-term financial sustainability of the SSP.
- b. If the SSP has a statement of investment policy the actuary should state whether, in his opinion, it is appropriate or not. In particular, the actuary should comment on any notable or particular risks in the investment strategy of the SSP relative to expected future cash flows. Where relevant, attention should be drawn to such aspects as concentration of assets, levels of self-investment and mismatching. The actuary is not required to give investment advice.

3.1.11. Conclusions

- a. The actuary may include comments beyond those listed above, even though the main objective of the report will normally be limited to the presentation of the actuary's estimates of the costs and projected financial status of or proposed changes in the existing SSP and the assessment of its long-term financial sustainability. It is important to ensure that the readers of the report understand the future financial prospects for the SSP concerned, sometimes referred to as its sustainability, taking into account the inevitable uncertainties associated with the projections.
- b. Where applicable, the report should provide indications on benefit design issues that it would be beneficial to review. It might include an indication of the expected eroding effect of inflation on the real value of benefits for plans that do not provide full benefit protection against inflation or that do not increase the ceiling of insurable earnings in line with wage growth.

3.1.12. Attestations and Reliance

- a. In the report the actuary should also provide an opinion regarding the:
 - i Sufficiency and reliability of data;
 - ii Reasonableness of assumptions;
 - iii Appropriateness of the methodology and its consistency with sound actuarial principles; and
 - iv Report's compliance with, and departures from, this APS or any other applicable standard and guideline.

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- b. Use of the work of others for certain significant aspects of the data or assumptions used in the preparation of the report, should be indicated in the report.
- c. Where included in the terms of reference of the evaluation or review performed in the preparation of the report or if required by legislative or regulatory action, the actuary should provide an opinion regarding the financial soundness or balance of the SSP and the adequacy or appropriateness of current or future contribution levels.

3.1.13. Signature

- a. The report should include the actuary's name, signature, position held and date.