

MSAP 2
Malaysian Standard of Actuarial Practice 2

**Financial Analysis of Social Security
Programs**

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Introduction

This Malaysian Standard of Actuarial Practice (MSAP) applies to [actuarial services](#) performed in the context of [social security programs \(SSPs\)](#). It is intended to:

- Promote the development of consistent actuarial practice for [SSPs](#) throughout the world; and
- Narrow the range of practice considered acceptable under MSAP 1 – General Actuarial Practice.

Where this MSAP defines as acceptable a practice that would not be acceptable under [MSAP 1](#), it is clearly identified.

Because of their significant expertise in preparing long-term financial projections, [actuaries](#) often play an important role in carrying out [financial analyses](#) of [SSPs](#). [Financial analyses](#) are commonly referred to as valuations. Due to the reliance placed on actuarial projections in public policy decision-making, it is important that the short- and long-term demographic and economic analyses of these [SSPs](#) provide objectively-prepared projections of their future conditions.

Few existing professional standards and guidelines specifically apply to [SSPs](#). Most countries have no specific standards in this area. The [IAA](#) has decided to issue IMSAP 2 to fill this gap. Its action is supported within the International Social Security Association (ISSA) and the International Labour Organization (ILO).

This MSAP2 is intended for ASM members practicing in this area.

Section 1. General

1.1. Purpose – This MSAP provides guidance to [actuaries](#) performing [financial analyses](#) of [SSPs](#), or reviewing, advising on, or opining on such analyses, 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.

1.2. Scope – This MSAP applies to [actuaries](#) when performing or reviewing, advising on, or opining on [financial analyses](#) of [SSPs](#).

1.3. Compliance – An [actuary](#) may fail to follow the guidance of this MSAP but still comply with it where the [actuary](#):

- 1.3.1. Complies with requirements of [law](#) that conflict with this MSAP.
- 1.3.2. Complies with requirements of the actuarial code of professional conduct applicable to the [work](#) that conflict with this MSAP.
- 1.3.3. Departs from the guidance in this MSAP and provides, in any [report](#), an appropriate statement with respect to the nature, rationale, and effect of such departure.

Paragraphs 2.6, 2.8, and 2.9 of [MSAP 1](#), as modified by paragraph 2.6 of this MSAP, cover the situation where the [actuary](#) is directed to use certain assumptions or methodology. The [actuary](#) who complies with these paragraphs is not deviating from this MSAP.

1.4. Relationship to MSAP 1– Compliance with [MSAP 1](#) is a prerequisite to compliance with this MSAP, except where [MSAP 1](#) is overridden by this MSAP. Whenever guidance in this MSAP overrides the guidance in [MSAP 1](#) the caption [**This paragraph replaces paragraph x.y [title of paragraph x.y] in MSAP 1**] will be shown at the start of the paragraph. References in [MSAP 1](#) to “this MSAP” should be interpreted as applying equally to this MSAP 2, where appropriate.

1.5. Defined Terms This MSAP uses various terms whose specific meanings are defined in the Glossary. These terms are highlighted in the text with a dashed underscore and in blue, which is also a hyperlink to the definition (e.g., [actuary](#)).

1.6. Effective Date – This MSAP is effective for {[actuarial services](#) performed/[actuarial services](#) commenced/[actuarial services](#) performed relevant to an event}¹ on or after [Date].

¹ Phrase to be selected and date to be inserted by standard-setter adopting or endorsing this MSAP.

Section 2. Appropriate Practices

- 2.1. Consideration of all Relevant Features of the SSP and Law** – The [actuary](#) should consider all relevant [SSP](#) features, the policies and the stated intentions of the sponsoring organization, and current [law](#), if that information exists and is reasonably available to the [actuary](#). The [actuary](#) should also take into account established practice (if relevant) when no [law](#) exists with regard to certain benefit provisions or financial measures (for example, the basis for future indexation of retirement benefits). For a newly established or substantially changed [SSP](#), the [actuary](#) should take into account other relevant information, including relevant experience in comparable [SSPs](#).
- 2.2. Data** – The [actuary](#) should consider what [data](#) are required in order to perform, review, advise on, or opine on the [financial analysis](#) of the [SSP](#). These [data](#) might include:
- a. National or regional demographic statistics on variables such as fertility, mortality (life expectancy), morbidity, and migration (if such [data](#) are not available on a national or regional basis, the [actuary](#) might consider information from a wider geographical area that might apply, or it may be necessary to rely on relevant and reliable statistics of international organizations);
 - b. Demographic status and experience of the [SSP](#), as applicable;
 - c. Economic experience, labour market conditions, and inflation;
 - d. Financial attributes of the [SSP](#), such as contributions, investment earnings, and liquidity of assets;
 - e. Benefits of, or claims on, the [SSP](#);
 - f. Number and experience of classes of contributors and beneficiaries of the [SSP](#);
 - g. Covered salaries and past service credits; and
 - h. Censuses and population surveys covering, for example, family statistics.
- 2.3. Assumptions** – If the [actuary](#) sets the assumptions, the [actuary](#) should use neutral assumptions in a [financial analysis](#) of an [SSP](#). Neutral assumptions are such that the [actuary](#) expects that the resulting projection of the [SSP](#) experience is not a material underestimate or overestimate.
- 2.3.1. The [actuary](#) should consider performing an experience analysis to the extent that the available [data](#) permit, to analyze past experience and to set future assumptions.
 - 2.3.2. The [actuary](#) should select assumptions that reflect the time horizon of the analysis (which might be 75 years or more). The [actuary](#) may select different assumptions for different time intervals in the projection (e.g., a common technique for this is to use recent experience as the basis for the [model](#) assumptions for the first “n” years of projection, with longer-term trends applied to the ultimate assumptions after the first n years (select and ultimate)).
 - 2.3.3. The [actuary](#) should consider any automatic balancing mechanisms that exist in an [SSP](#) when selecting the [model](#) variables and assumptions for an [SSP financial analysis](#). The [actuary](#) should consider to what extent the [SSP](#) is “immunized” from the volatility of some variables (e.g., life expectancy) by the automatic balancing mechanisms.
 - 2.3.4. Credible experience [data](#) might not exist for a newly introduced [SSP](#), or for

new benefits to be provided by an existing [SSP](#). To establish assumptions in such cases, the [actuary](#) may:

- a. Investigate the risk characteristics of the potential covered population through surveys or enquiries until credible [data](#) are available;
- b. Consider the relevant external experience, including:
 - Other [SSPs](#) (including the program being replaced, if any), or
 - Other countries;
- c. Use reasonable proxies or default values as may be appropriate.

If credible experience [data](#) do not exist, the [actuary](#) should disclose in the [report](#) that the [financial analysis](#) has been based on incomplete [data](#) (and perhaps none relating to the [SSP](#) itself), and should consider recommending that [financial analyses](#) should be performed again as new information becomes available.

2.3.5. If the [actuary](#) uses assumptions that include margins, then the [actuary](#) should disclose in the [report](#) the basis and rationale for the margins and explain the relationship between the result using the assumptions that include margins and the result using neutral assumptions.

2.3.6. The [actuary](#) should consider including in the analysis projections based on other sets of assumptions such as those that would result in high projected costs and those that would result in low projected costs when such projections are helpful in analysing the uncertainty of the projections and communicating the financial status of an [SSP](#).

2.4. Consistency with the Financing Method – The [actuary](#) should use a methodology that is consistent with the financing method used for the [SSP](#).

2.4.1. For pay-as-you-go or partially funded [SSPs](#), the analysis should use an open group methodology, under which contributions and benefits of both current and future participants are considered.

2.4.2. For fully funded [SSPs](#) (that is, where accrued liabilities are intended to be funded over participants' working years), the analysis should use a closed group methodology, under which only current participants are considered, with or without their assumed future benefit accruals.

However, if the [actuary](#) judges an alternative approach to be more appropriate, that approach should be used with justification communicated in the [report](#). In such circumstances, the [actuary](#) may also consider reporting the results of the [financial analysis](#) under:

- a. An open group methodology for pay-as-you-go or partially funded [SSPs](#); and
- b. A closed group methodology for fully funded [SSPs](#).

If the [law](#) specifies a methodology for measuring the actuarial assets and obligations that does not follow either section 2.4.1 or 2.4.2, as applicable, the [actuary](#) should communicate that fact. The [actuary](#) should also comply with the guidance of paragraph 2.6 of this MSAP.

2.5. **Independent Expert Review** – A [financial analysis](#) is often subject to review by an independent expert.

2.5.1. This review might address:

- a. Whether the assumptions used in the [financial analysis](#) are within a reasonable range both separately and in the aggregate;
- b. Whether the results of the [financial analysis](#) are within a reasonable range; or
- c. Other aspects of the [financial analysis](#).

2.5.2. “Independent expert” means a suitably experienced reviewer who:

- a. Has not been involved in preparing the [work](#) that is subject to review; and
- b. Is not employed by the [principal](#) or its sponsoring agencies.

In this context a reviewer contracted by the [principal](#) to perform the review is not considered to be employed by the [principal](#) or its sponsoring agencies.

2.5.3. The [actuary](#) who prepared the [financial analysis](#) should cooperate with the reviewer by providing the reviewer with any requested material in the [actuary](#)’s possession if the terms of the [actuary](#)’s engagement so permit, and by being available to discuss [data](#), methodology, assumptions, and other factors as necessary, with the reviewer.

2.6. **Assumptions and Methodology Mandated by Law** – [This paragraph replaces paragraph 2.9 “Assumptions and Methodology Mandated by Law” in MSAP 1] When an assumption or methodology is mandated by [law](#), the [actuary](#) should apply the guidance of paragraph 2.8 of [MSAP 1](#) as if the assumption or methodology were prescribed by the [principal](#) or another party.

Section 3. Communication

3.1. Report on Financial Analysis –

- 3.1.1. The [actuary](#) should communicate the results of any [financial analysis](#) in a [report](#) that:
- a. Includes enough information to enable sound decisions to be made;
 - b. Discloses who the [principal](#) is, what the purpose of the [financial analysis](#) is, and the instructions given to the [actuary](#);
 - c. Indicates the nature and timing of future cash flows being quantified;
 - d. States the nature and significance of material risks faced by the [SSP](#);
 - e. Explains the approach taken to the risk in the analysis;
 - f. Indicates the nature and extent of any material uncertainty in the information it contains; and
 - g. Indicates the sensitivity of the results to variations in key assumptions and methodology.
- 3.1.2. There are several measures the [actuary](#) might use to present the results, including:
- a. Projected cash flows and ending positions;
 - b. Discounted cash flows; and
 - c. Required contribution rates for sustainability.
- 3.1.3. This section applies specifically to [reports](#) concerning the projected financial status of an [SSP](#). The [actuary](#) should include at least the following information in an [SSP financial analysis report](#). The appendix (which is educational and not part of the guidance of this MSAP) shows lists of possible content for most sections of a [report](#).
- a. Description of the relevant provisions of the [SSP](#);
 - b. Key dates:
 - [Valuation date](#);
 - [Report date](#); and
 - Date up to which all relevant information had been taken into consideration, if it differs from the [report date](#).
 - c. Methodology, [data](#), and assumptions;
 - d. Results and findings;
 - e. Analysis of results; and
 - f. The actuarial [opinion](#).
- 3.1.4. The [actuary](#) should include a formal statement in the [report](#) that the [report](#) has been prepared, and the [actuary](#)'s [opinion](#) given, in accordance with the applicable local standards of practice or this model MSAP.

3.2. Actuarial Opinion – The [actuary](#) should provide an [opinion](#) on the [actuary](#)'s assignment:

- 3.2.1. Unless paragraph 3.2.3 applies, the [opinion](#) should state the extent to which the following hold, or do not hold:
 - a. The [data](#) upon which the [report](#) is based are sufficient and reliable;
 - b. The assumptions used for the [report](#) are reasonable and appropriate both in the aggregate and individually; and
 - c. The methodology employed is appropriate and consistent with [accepted actuarial practice](#).
- 3.2.2. Unless paragraph 3.2.3 applies, the [opinion](#) should include a statement with respect to the extent to which the [SSP](#) is financially sustainable over the period covered by the projections used for the [financial analysis](#). Financial sustainability of an [SSP](#) relates to its continuous capacity to support the benefits offered by the [SSP](#) when considering the applicable financing rules and the future demographic and economic environment in which it will operate.
- 3.2.3. The [actuary](#) may answer questions about an existing financial analysis of an [SSP](#). (For example, the [actuary](#) might be asked to estimate the effect of using a revised population projection while keeping all other assumptions the same.) In such case the [opinion](#)'s scope (especially what is not included) should be clearly articulated and pertinent to the question.

APPENDIX

Possible Report Content

Note: this appendix is provided for informational purposes, and is not part of the MSAP. It contains lists the task force drafting the MSAP assembled to show possible items covered by the various sections of the [actuary's report](#).

1. Description of the provisions of the [SSP](#) related to:
 - a. Coverage;
 - b. Nature of the [SSP](#), e.g., defined benefit or defined contribution;
 - c. Financing approach, e.g., pay-as-you-go, partially funded, or fully funded;
 - d. Source of funding, e.g., worker or employer contributions, transfers from government revenues, including legislated or contractual contribution rates; and
 - e. Benefit provisions, e.g., contingencies covered, formulae, amounts, restrictions, and eligibility conditions.
2. Methodology, [data](#), and assumptions:
 - a. Description of the methodology used;
 - b. Key demographic assumptions such as mortality (longevity), morbidity, fertility, migration, and unemployment;
 - c. Key historical demographic [data](#), such as:
 - i. Eligible and beneficiary population by relevant demographic characteristic groupings, and how these populations compare to the total population;
 - ii. Dependency ratios;
 - iii. Employment earnings by age groups and gender, and averages;
 - iv. Contributory earnings and averages by age groups and gender;
 - v. Labour force participation rates by age groups and gender; and
 - vi. Covered payroll and workforce;
 - d. Key economic [data](#) and assumptions such as rates of inflation, economic growth, and return on investments (if any);
 - e. The extent, if any, of interdependency among assumptions;
 - f. Summaries of the [data](#) used as a basis for the [SSP financial analysis](#) assumptions, and as a starting point for the projections; and
 - g. Sources, quality, and relevance of the [data](#) used.
3. Results and findings:
 - a. Projected demographic values at selected future points in time, such as:
 - i. Eligible and beneficiary population by relevant demographic characteristic groupings, and how these populations compare to the total population;
 - ii. Dependency ratios;
 - iii. Employment earnings by age groups and gender, and averages;
 - iv. Contributory earnings and averages by age groups and gender;
 - v. Labour force participation rates by age groups and gender; and
 - vi. Covered payroll and workforce.

- b. Financial projections showing cash flows and balance sheet values for the recent past and for the future, such as:
 - i. Contributions;
 - ii. Investment earnings;
 - iii. Other income;
 - iv. Total income;
 - v. Benefits or claims;
 - vi. Administrative expenses;
 - vii. Total expenditures;
 - viii. Annual balance (income minus expenditure);
 - ix. Actuarial deficit and funded ratio as of [valuation date](#) and other representative dates (for fully-funded pension schemes);
 - x. Nature of assets and/or individual accounts;
 - xi. Market value of financial or tangible assets;
 - xii. Fund value, if any; and
 - xiii. Value of notional assets (such as value of future contributions, if that is recognized as an asset).

The results may be expressed in relation to one or more relevant volume measures, such as the size of the jurisdiction's economy.

- c. Cost rates as appropriate:
 - i. Pay-as-you-go cost rate;
 - ii. General average premium or partially funded cost rate; or
 - iii. Fully funded cost rate.
 - d. A presentation designed to provide an indication of the financial sustainability of the [SSP](#), if appropriate.
4. Analysis of results:
- a. Reconciliation with the prior [report](#), along with explanations of significant changes in results.
 - b. Discussion of the pattern of financial projections (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. The [actuary](#) may include a comparison of how benefits are projected to grow or decline as a result of different levels of inflation or economic growth and during which part of the projection period, as an indicator of potential stability or instability of the system in the longer term.
 - c. Sensitivity of results to variations in one or more assumptions.
 - d. Effect of automatic balancing mechanisms (if any) under each scenario used for the projections in the [report](#), where “effect” covers both how the automatic balancing mechanism alters the key parameters of the [SSP](#) (such as the pension age, or determination of benefits) and how the alteration of the key parameters changes the amounts paid to beneficiaries.
 - e. Findings with respect to the short-, medium-, and long-term financial sustainability of the [SSP](#) with due regard to the funding rules under the [law](#) if such funding rules exist.

- f. Indications of possible sources of future financial instability (e.g., depreciation of future benefits either because of non-indexation or because indexation may lag behind economic growth, or inadequacy of future contributions due to non indexation of contribution limits).
- g. Potential recommendations on possible measures to ensure the long-term financial sustainability of the [SSP](#).
- h. Impact of any options or guarantees embedded in the benefits of the [SSP](#) on the cash flows shown.
- i. The suitability of the approach for calculation of any capitalized value of liabilities used for an [SSP](#) in light of the particular funding method and the time horizon used.