



STRESS TESTING GUIDELINES

**Requirements for the Reporting of Stress Testing
for Life and General Insurers**

FINANCIAL SERVICES COMMISSION

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DEFINITIONS

“*appointed actuary*” means an actuary who has been appointed by a registered insurer pursuant to Section 44(1) of the Act;

“*base scenario*” is a set of realistic assumptions used to forecast the insurer’s financial position over the forecast period that is consistent with an insurer’s business plan.

“*corrective management action*” are actions which require escalation to senior management or the board of directors of an insurer

“*forecast period*” is, for a general insurer, three years, and for a life insurer, five years.¹

“*generally accepted actuarial practice*” shall be

- Caribbean Actuarial Association (CAA) Actuarial Practice Standard 0: General Actuarial Practice (December 2019), and any other relevant standards, educational notes, guidance and technical papers issued by the CAA; and
- any other actuarial standards and documents that may be specified by the FSC in respect of actuarial work required under the Act.

“*minimum capital required*” or “*MCR*” for a life insurer is 90% and for a general insurer is 125%.

“*plausible adverse scenario*” is a set of credible assumptions that exposes potential threats to an insurer’s financial position and condition over the forecast period;

“*prescribed capital required*” or “*PCR*” for a life insurer is 100% and for a general insurer is 150%

“*ripple effects*” are events or incidents that occur when an adverse scenario triggers a change in one or more interdependent assumptions or risk factors and includes policyholder actions, routine management actions, regulatory actions.²

“*routine management actions*” are those an insurer considers to be a component of its standard policies and procedures. They form part of an insurer’s normal course of business. To determine whether an action is routine, the AA must consider the effectiveness of insurer’s management information systems and adjustment mechanisms, the insurer’s historical record of promptness and willingness to respond to adversity; policyholder action; and the external environment.

A “*scenario*” is often the intermediate or ultimate condition caused by a hypothetical or actual event(s), it can also be the result of the continuation of a trend or change in condition.³

¹ Regulation 72H(2)(i)

² [Educational Note—Financial Condition Testing \(cia-ica.ca\)](https://cia-ica.ca)

³ [*IAA Paper on Stress Testing and Scenario \(actuaries.org\)](https://actuaries.org)

“*Scenario testing*” uses a hypothetical future state of the world to define changes in risk factors affecting an institution’s operations. This will normally involve changes in a number of risk factors, as well as ripple effects.

“*Sensitivity testing*” typically involves an incremental change in a risk factor (or a limited number of risk factors). It is typically conducted over a shorter time horizon, for example an instantaneous shock.⁴

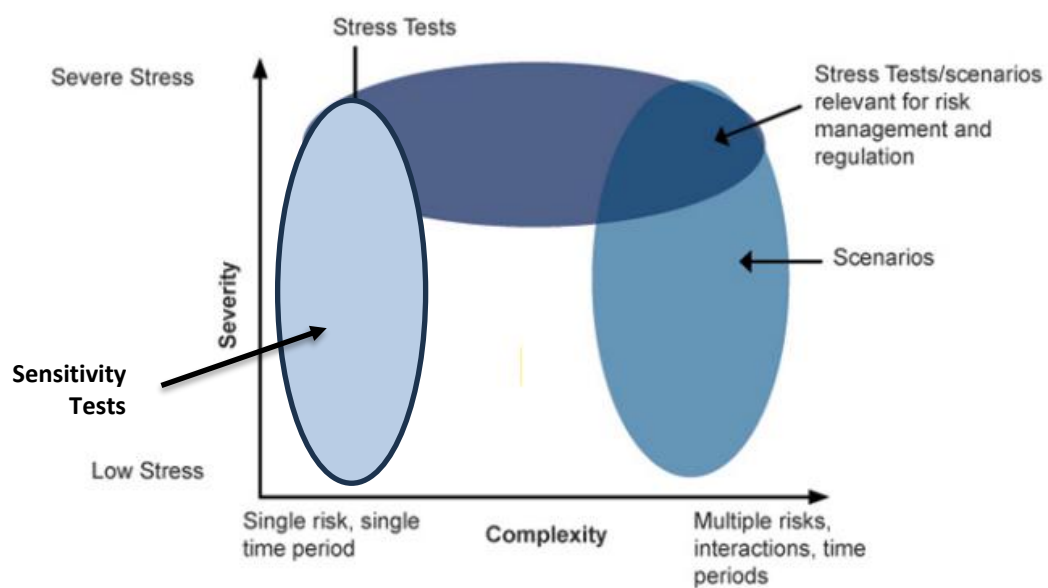
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⁴ [Educational Note—Financial Condition Testing \(cia-ica.ca\)](https://www.cia-ica.ca/educational-note-financial-condition-testing)

1. INTRODUCTION

The principle aims of stress testing (e.g. scenario and sensitivity testing) are to allow boards of directors and management of registered insurers to understand the impact of their company's business plan has on capital, to identify possible threats to the financial condition of the insurer and to recommend appropriate risk management or corrective management actions to address those threats. Since it is based on a range of forecasts rather than a single best-estimate projection, it can enhance the risk culture of an insurer by alerting decision makers to potential financial vulnerabilities and provide a structure for the development and refinement of corporate strategies and risk mitigation activities.⁵ It should, therefore, be a fundamental element of an insurer's enterprise risk management framework and not be viewed as a regulatory burden or exercise.

Figure 1



2. REGULATORY REQUIREMENTS

Regulation 72H(1) of The Insurance (Amendment) Regulations, 2022 ("the Regulations"), requires insurance companies as part of their Enterprise Risk Management Program to conduct a stress testing study of its financial position and financial condition annually at the end of each financial year and in other circumstances required in the Regulations or by the Financial Services Commission ("FSC"). The investigation must be performed by an insurer's appointed actuary ("AA") and it must be conducted in accordance with the Regulations, generally accepted actuarial practice and such requirements as may be determined by the FSC⁶.

⁵ [*IAA Paper on Stress Testing and Scenario \(actuaries.org\)](#)

⁶ Regulation 72H(2)(f)

After conducting a stress testing study, an AA is required under Regulation 72I to prepare a written report on the study (“STR”) and present its findings to the board of directors of the registered insurer. The STR shall include the results of the stress tests and the conclusions and recommendations of the AA in relation to the insurer’s financial position and condition.

Within ninety days after the end of the review period or shorter timeframe set by the FSC, the STR must be submitted by the registered insurer to the FSC along with confirmation by each member of the insurer’s board of directors that he/she reviewed the STR and understands the threats to maintaining a satisfactory financial condition that were identified and the possible mitigation actions for dealing with those threats.

3. PURPOSE

The main purpose of these guidelines is to set out the FSC’s expectations of AAs who are performing a stress testing study in accordance with the Regulations. The guidelines are based on the Educational Notes on Financial Condition Testing issued in 2023 by the Canadian Institute of Actuaries (CIA) and CIA Standard of Practice, January 2023, Section 2500.

4. PROCESS

The key elements of stress testing are as follows:

- a. Review of current and recent years’ operations and financial position of the insurer: An understanding of the regulatory capital adequacy and risk management requirements, the insurer’s enterprise risk management program in particular its capital management policy, internal target capital ratios and benchmarks is an important and necessary component of this exercise. The investigation must be current. The AA must, therefore, consider events and operating results between the calculation date and the date of the report.
- b. Establish standards of materiality: which are no less stringent than the standards used in the annual valuation of net actuarial liabilities of the insurer.⁷
- c. Development and modelling of a base scenario⁸: The projection shall start at the prior year-end, use the data of the prior year’s statement of financial position as well as assumptions and methods that reflect up-to-date studies and analysis. The actuarial and other policy liabilities must be revalued throughout the forecast period.
- d. Assessment of risk categories: to identify those which are relevant to the insurer and those posing the most significant threat, including ripple effects (See Appendix III for lists of potential risk

⁷ Regulation 72H(2)(d)

⁸ Regulation 72H(2)(e)

categories to be considered). Sensitivity testing may be used to determine the relevant risk categories. Risk concentration should also be considered.

- e. Development, modelling and selection of material, plausible adverse scenarios: The scenarios should be applied across all product and business lines and activities of the insurer in- and out-side of Jamaica⁹, and should have a material and adverse impact on the insurer's equity and regulatory capital ratios or other internal breakpoints/targets.

The FSC expects that the adverse scenarios build on the assumptions and actual experience reflected in the base scenario, and that a wide range of risks, sensitivities and scenarios that take into account system-wide interactions and ripple effects will be investigated.¹⁰ As in the base scenario, the actuarial and other policy liabilities must be revalued throughout the forecast period. Reverse stress testing may be used to determine how far risk factor(s) need to change to cause the insurer to fall below established thresholds and to evaluate if that degree of change is plausible. An AA may not use a comfortable surplus or liquidity level to justify doing little or no stress testing.¹¹

The AA is expected to examine in further detail, scenarios (including ripple effects) to which the insurer shows the greatest vulnerability. Any scenario that causes the insurer to fall below or come close to the insurer's defined thresholds during the forecast period should be subject to further examination and reporting.

- f. Identification and analysis of corrective management actions to mitigate risks. For each adverse scenario that would result in a threat to satisfactory financial condition, the AA must identify plausible corrective management actions that would reduce the likelihood of or mitigate the threats.¹² Consideration should be given to the insurer's ability to effectively take the proposed corrective actions in a volatile or stressed environment.
- g. Preparation of STR on the results of the analysis and provide recommendations to the board of directors including an opinion on the financial condition of the insurer. The requirements are set out in Section 5 of these guidelines.
- h. Submission of STR and presentation of its results and recommendations to the board of directors of the insurer. If an adverse event occurs between the date of the report and the date of its presentation to the insurer's board of directors, the AA should in the presentation to the insurer's board of directors, address the event and its potential implications on the results of the investigation.¹³ If appropriate, the AA should redo the investigation.¹⁴

⁹ Regulation 72H(2)(b)

¹⁰ Regulation 72H(2)(g)

¹¹ Regulation 72H(2)(a)

¹² Regulation 72H(2)(h)

¹³ [SOP Part 2000: Insurance \(Jan 1, 2023\) \(cia-ica.ca\)](#)

¹⁴ [SOP Part 2000: Insurance \(Jan 1, 2023\) \(cia-ica.ca\)](#)

It is essential that throughout the stress testing process the AA consult with the board of directors and senior management of the insurer to determine the applicable risk factors and scenarios and to identify the material threats to the insurer's financial position and condition.¹⁵

5. REPORTING

The purpose of the STR is to provide to the board of directors of an insurer the results of the stress tests, and the conclusions and recommendations of the AA in relation to the financial position and condition of the insurer.¹⁶ In the report, the AA communicates the plausible threats to the satisfactory financial condition of the insurer, actions that could be taken to lessen the likelihood of or mitigate the threats, if they were to materialise. The AA's opinion on the financial condition of the insurer also be disclosed.

The FSC expects that the STR shall include, in addition to the scenarios specified by the FSC, a minimum of three integrated scenarios comprising of at least one going concern and two solvency scenarios.

An *integrated scenario* is an adverse scenario which is constructed by combining two or more risk factors. An integrated scenario must be internally consistent¹⁷ and must have a higher percentile ranking than the ranking of scenarios that investigate the impact of the individual risk factors.

A *solvency scenario* is a plausible integrated scenario which includes ripple effects, with a percentile ranking of at least 95th percentile (99th percentile or beyond is strongly recommended) over the scenario horizon. A *going concern scenario* is also a plausible integrated scenario which considers ripple effects but, the minimum percentile ranking over the scenario horizon is lower, at 90%. A going concern scenario is, therefore, more likely to occur and/or less severe than a solvency scenario. It may also examine risks not considered in the solvency scenarios. If the AA is unable to ascertain the percentile ranking of a scenario, the scenario must be of sufficient adversity to appropriately test the insurer's ability to meet or exceed the MCR, in the case of solvency scenario, or PCR, in the case of a going concern scenario. AA must disclose in the STR the percentile ranking of each scenario or the reasons/rationale for selecting each scenario in relation to frequency, severity and period of adversity.

A detailed description of each scenario (including ripple effects) must be disclosed. The results of the scenarios before and after corrective management action must also be given. The AA must detail management actions and categorise them as either routine or corrective.

In the report the AA must identify any, and all transfers assumed to occur between legal entities, including any risk-sharing agreements between legal entities or between a legal entity and a parent company, dividends to parent companies, capital infusions into legal entities, etc., whether in the base scenario or in the adverse scenarios. If a given legal entity requires a capital infusion in any of the scenarios, the report should include a discussion on the likelihood of such infusions being made.

¹⁵ Regulation 72H(2)(c)

¹⁶ Regulation 72I(a)

¹⁷ The AA may have to adjust other assumptions in the base scenario to reflect the interdependence of assumptions

In the following sections, the format and order of the STR is specified. It must be followed to ensure consistency in reporting within the insurance industry. A table of content must be included at the beginning of the report showing the required sections and page numbers.

5.1 Executive Summary

The executive summary should provide a high-level overview of the results and recommendations of the stress testing analysis, including the following:

- a. Summary of the results of the base and selected adverse scenarios. Results for the adverse scenarios must be presented before and after corrective management actions.
- b. Recommendations for management to mitigate or eliminate risk.
- c. Conclusion of the financial condition of the legal entity.
- d. Assessment of both internal and external events (such as recent economic event changes, acquisition of a block of business, etc.) since the previous STR was submitted.
- e. Commentary on management's action in response to the recommendations in the previous year's STR, if appropriate.
- f. Material deviations from the regulations or these guidelines and explanations for those deviations.
- g. Material findings from the external peer review, if any conducted.
- h. Summary of key thresholds used to assess the financial condition of the insurer including the internal target capital ratios.
- i. Other significant findings.

5.2 Stress Testing Opinion

The AA should include his/her signed opinion on the financial condition of the insurer in Appendix I. The opinion must reflect the circumstances of the insurer. Bullet (v) of the opinion is only required when corrective management actions are necessary to meet the applicable threshold.

An insurer's financial condition is satisfactory if, throughout the forecast period:

- a. Under the scenarios specified by the FSC, if any, the insurer meets or exceeds the standard(s) set by the FSC;
- b. Under the solvency scenarios, the insurer meets or exceeds the MCR;
- c. Under the going concern scenarios, the insurer meets or exceeds the PCR; and
- d. Under the base scenario, the insurer meets its internal target capital ratio(s) set out in its capital adequacy management policies.

An insurer's financial condition is satisfactory subject to, under any of the following situations:

- The base scenario projected regulatory capital ratios are maintained or brought back above internal target capital ratios as a result of an existing plan which is consistent with regulatory expectations.
- For the base scenario
 - Regulatory capital ratios are projected to decrease below internal capital ratio(s) at a period beyond the forecast period;

- The insurer has a plan which is consistent with regulatory expectations to bring the ratio(s) back above internal targets; and
- The AA is satisfied that such plan is realistic.
- For going concern scenarios, the AA is satisfied that
 - corrective management actions are under the control of the insurer and realistic, and
 - the corrective management actions can restore the insurer's regulatory capital ratio(s) to above PCR in a manner and timeframe that are consistent with regulatory expectations.
- For solvency scenarios, the AA is satisfied that
 - corrective management actions are under the control of the insurer and realistic, and
 - the corrective management actions can restore the insurer's regulatory capital ratio(s) to above MCR in a manner and timeframe that are consistent with regulatory expectations.

Appendix II contains a decision grid for determining the type of opinion.

5.3 Introduction

The introduction shall provide a description of the purpose and basis of the stress testing report. It shall include a description of the role of the AA, the purpose and scope of the stress testing report and an overview of the processes and methods used in stress and scenario testing.

5.4 Results

In this section the AA should provide a summary of the results of the base and selected adverse scenarios. The results for the adverse scenarios must be presented before and after corrective management actions.

The report should set out any significant current events including but not limited to, an accounting basis change, regulatory capital basis change, or a pandemic. The report should describe the event/change and provide clarity on the implications to projections under the base and adverse scenarios. If the AA concludes there are no, or minimal, implications, that rationale should also be included in the report.

5.5 Capital Management and Adequacy Measurement

The AA should explain the nature of the tests used to measure the financial condition of the insurer, including the following:

- a. Definition of satisfactory financial condition used.
- b. Definition of the regulatory capital adequacy test, MCR and PCR.
- c. Disclosure of the internal target capital ratios as determined the insurer's capital adequacy management policies.
- d. Materiality standard.

5.6 Background

This section should provide an overview of the insurer and the economic environment during the forecast period, including such things as the following:

- a. Summary of the nature of the insurer's business, products, and target markets.
- b. Review of recent and current financial position.
- c. Discussion of any key events or initiatives affecting the insurer in the recent past and any associated expected future developments.
- d. Description of economic assumptions.
- e. Discussion of the current and expected market conditions.
- f. Discussion of prior year's stress testing results, recommendations, and any corrective management actions.
- g. Discussion of major risks not tested in the current year's study. The AA should comment on when the risks were last tested and the reasons for not testing them in the current exercise.
- h. Any deviations from generally accepted actuarial practice or these guidelines and explanations for those deviations.
- i. Any material findings from the external peer review, if any conducted.

5.7 Base Scenario

A clear description of the base scenario used in the stress testing analysis the following should be included:

- a. Description of the model or process used to project the base scenario.
- b. Description of main assumptions.
- c. Description of the internal target capital ratios.
- d. Discussion of consistency of the base scenario with the insurer's business plan.
- e. Description of capital plans, especially any capital injections or strategic initiatives.
- f. Discussion of key financial results, including key statement of profit and loss, and statement of financial position items, (such as roll forward of liabilities and the CSM) and capital test results. The results at the end of each year-end throughout the forecast period must be presented.

5.8 Adverse Scenarios

This section should provide detailed descriptions of the selected plausible adverse scenarios posing significant risk to the insurer, as well as any modelled scenario for which the insurer falls below, or comes close to, the defined thresholds. An overview describing the process used to identify the scenarios, including a discussion of changes in the adverse scenarios selected compared to the prior year's report, where applicable should be disclosed. For each adverse scenario, the following items should be included, where applicable:

- a. Description of the risks being tested, why the risks are significant to the insurer, and how this was determined.
- b. Description of the key assumptions used, including valuation assumptions to be updated during the forecast period to reflect the adverse scenario.
- c. Assessment of the nature of the adverse scenario as either going concern or solvency and rationale for the assessment. If the AA is unable to ascertain the percentile ranking of the scenario, the AA should disclose the reasons/rationale for selecting the scenario in relation to frequency, severity and period of adversity of the scenario.

- d. Comparison to prior year's stress testing, and consistency of the adverse scenario with the prior year's results, where applicable.
- e. Description of key financial results and the change from the base scenario. The results at the end of each year-end throughout the forecast period must be presented.
- f. Description of any ripple effects (including policy owner actions, routine management actions and regulatory actions) reflected in the scenario. The AA should report management's routine action and provide supporting information to enable the readers of the STR to assess its practicality and adequacy. This should include a discussion of the potential repercussions of these routine management actions and a quantification of their financial impact.
- g. Description of any change in the capital injections or distributions from those assumed in the base scenario, and results with and without these capital changes.
- h. Reporting of financial results with and without the impact of corrective management actions, for each scenario where these actions are required to meet the threshold for a satisfactory opinion. The AA should include disclosure regarding the corrective management actions to aid the readers of the STR in considering its practicality and adequacy.
- i. Discussion of any management actions (either routine or corrective) required to restore the insurers regulatory capital ratios to their internal target capital ratios. The AA should include disclosures regarding these management actions to aid the readers of the STR considering their practicality and adequacy.
- j. Discussion of possible regulatory actions and repercussions if the scenario results fall below the supervisory target capital ratio(s), in the absence of any change in the base scenario capital injections, capital distributions, or other corrective management actions.

5.9 Conclusions and Recommendations

Overall conclusions from the stress testing analysis should be presented, including a brief description and summary of the results of the base and selected adverse scenarios and highlights of the most significant risks to capital adequacy and threats to satisfactory financial condition. Any findings leading to follow-up actions should be discussed. Recommendations with respect to corrective management actions that are intended to better manage or mitigate risk exposures, if any, should be disclosed.

5.10 Exhibits and Appendices

The AA should provide key financial results from the application of the stress testing model, including statement of profit and loss and statement of financial position items (such as roll forward of liabilities and the CSM), and capital test results for the base scenario and adverse scenarios for the forecast period, which allows users to review the stress testing results in more detail.

APPENDIX I – EXPRESSION OF OPINION

The wording of the opinion should be as follows: [insert appropriate wording where indicated by square brackets]

OPINION OF THE APPOINTED ACTUARY

I certify that:

- i. I am a member in good standing with my governing actuarial body, [Name of Organization] and comply with its [Code/Rules of Professional Conduct],
- ii. I meet the qualification standards of Financial Services Commission to conduct a stress testing study for [Name of insurance company],
- iii. I have completed my investigation of the financial condition of [insurer name] as at [date] in accordance with the regulations, generally accepted actuarial practice in Jamaica and guidelines issued by the Financial Services Commission,
- iv. I have analysed its forecasted financial positions over a forecast period of [number of years] under a series of scenarios; and
- v. [My report includes the identification of corrective management actions that could be taken to mitigate the effect of adverse scenarios threatening [[insurer name] [solvency] or/and [its] [ability to operate on a going concern basis]].

In my opinion, the financial condition of the insurer [is satisfactory] or [is satisfactory subject to...] or [is not satisfactory for the following reason(s)...].

Name of Appointed Actuary
[Name, Title, Qualification]

Signature of Appointed Actuary

Date

APPENDIX II – DECISION GRID

| Scenario | Threshold | Is the threshold test under the scenario passed? | | |
|---------------|---|--|--|---|
| Base | Insurer's regulatory capital ratio(s) \geq Internal target ratio(s) in capital adequacy management policies | | <ul style="list-style-type: none"> - Maintained or brought back (with existing plan consistent with regulatory expectations) - Projected to decrease beyond forecast period (with plan consistent with regulatory expectations and AA satisfied plan is realistic) | No |
| Going Concern | Insurer's regulatory capital ratio(s) \geq PCR | Yes (with/without ripple effects) | <p style="text-align: center;">Yes</p> (the AA is satisfied - corrective management actions are under the control of the insurer and realistic, <u>and</u> - actions can restore the insurer's regulatory capital ratio(s) to above PCR in a manner and timeframe that are consistent with regulatory expectations) | <p style="text-align: center;">No Or Yes</p> (with corrective action but AA not satisfied) |
| Solvency | Insurer's regulatory capital ratio(s) \geq MCR | | <p style="text-align: center;">Yes</p> (the AA is satisfied - corrective management actions are under the control of the insurer and realistic, <u>and</u> - actions can restore the insurer's regulatory capital ratio(s) to above MCR in a manner and timeframe that are consistent with regulatory expectations) | <p style="text-align: center;">No Or Yes</p> (with corrective action but AA not satisfied) |
| | | ↓ | ↓ | ↓ |
| | Opinion | Satisfactory Opinion | Satisfactory Opinion subject to: | Not Satisfactory |

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APPENDIX III - RISK CATEGORIES

LIFE INSURERS

1. Mortality risk
2. Morbidity risk
3. Persistency and lapse risk
4. Inflation risk
5. Reinsurance held risk
6. Business volume and mix of business risk
7. Market and credit risk
8. Expense risk
9. Government and political issues risk
10. Off-balance-sheet items risk
11. Related companies risk
12. Climate-related risks
13. Technology and cyber risk
14. Liquidity risk
15. Operational risk

GENERAL INSURERS

1. Claim frequency and severity risk
2. Liability for incurred claims risk
3. Inflation risk
4. Reinsurance held risk
5. Business volume and mix of business risk
6. Market and credit risk
7. Expense risk
8. Government and political risk
9. Off-balance-sheet items risk
10. Related companies risk
11. Climate-related risks
12. Technology and cyber risk
13. Liquidity risk
14. Operational risk

APPENDIX IV - REFERENCES

CANADIAN INSTITUTE OF ACTUARIES, EDUCATIONAL NOTE - FINANCIAL CONDITION TESTING, JANUARY 2023

[Educational Note—Financial Condition Testing \(cia-ica.ca\)](https://www.cia-ica.ca/education/financial-condition-testing)

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INTERNATIONAL ACTUARIAL ASSOCIATION/ASSOCIATION ACTUARIELLE INTERNATIONALE - STRESS TESTING AND SCENARIO ANALYSIS, JULY 2013

[IAA Paper on Stress Testing and Scenario \(actuaries.org\)](https://www.actuaries.org/publications/iaa-paper-on-stress-testing-and-scenario-analysis)

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