BANK OF GHANA

Guideline on Stress Testing

For Banks, Savings and Loans, Finance House, Finance and Leasing and Financial Holding Companies

(EXPOSURE DRAFT)

February 2026

The Bank of Ghana (BOG) has issued the **Guidelines on Stress Testing** to solicit comments and inputs from the banking industry and the general public, in line with the BOG's Procedures for Issuance of Directives, 2020.

In light of this, the Exposure Draft shall be made available on the BOG's website at www.bog.gov.gh from date of publication to June 30th, 2026, for comments.

All comments shall be sent to the Bank of Ghana via email at bsdletters@bog.gov.gh by 30th June 2026. The Bank of Ghana shall consider all material comments received and provide a written explanation for comments that were incorporated into the final guideline or otherwise.

PREAMBLE

The Basel Committee on Banking Supervision (BCBS) published principles for sound stress testing practice and supervision in May 2009 to address key weaknesses in stress testing practices that were highlighted by the Global Financial Crisis (GFC) of 2007 to 2008. Sequel to the publication of the principles, the role of stress testing as a risk management and supervisory tool has evolved and become a core requirement in many jurisdictions.

Stress testing is an integral part of the risk management framework for banks and Specialised Deposit-Taking Institutions (SDIs), hereinafter referred to as Regulated Financial Institutions (RFIs). It facilitates forward looking identification of risks and vulnerabilities which enables the Board and Senior Management take proactive measures to reduce exposures, inform contingency planning, adjust business strategies and, where necessary, set aside additional financial resources to absorb losses in the event of severe shocks.

This Guideline is aimed at guiding RFIs in the implementation of robust, forward-looking capital adequacy assessment that reflects their unique risk profiles and systemic importance, and aligns with the expectations of the Basel Capital Framework and Basel Core Principles (BCP).

The Bank of Ghana (BOG) seeks to enhance the Risk Based Supervision (RBS) framework to incorporate the review of RFIs' stress testing processes and outcomes including as part of their Internal Capital Adequacy Assessment Process (ICAAP). Specifically, the BCP requires the BOG to evaluate RFIs' stress testing processes and outcomes to determine the quality of their risk management practices and adequacy of their capital and liquidity.

The references to stress tests in this Guideline encompasses a range of methodologies, from simple sensitivity analysis to more complex scenario analysis including enterprise-wide stress tests and reverse stress testing.

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PART I – PRELIMINARY

Title

1. This Guideline shall be cited as the Bank of Ghana Guideline on Stress Testing, 2026.

Application

2. This Guideline is issued pursuant to Section 92(1) of the Banks and Specialised Deposit-Taking Institutions Act, 2016 (Act 930).

3. This Guideline shall apply to banks, savings and loans, finance house, finance and leasing companies and financial holding companies licensed or registered under Act 930, hereinafter referred to as Regulated Financial Institutions (RFIs).

4. This Guideline should be read in conjunction with the Risk Management Directive, 2021 and other relevant Bank of Ghana directives and guidelines.

Definitions and Interpretation

5. In this Guideline, unless the context otherwise requires, words used have the same meaning as that assigned to them in Act 930 and other Directives issued by the Bank of Ghana or as follows:

"Act 930" *means the Banks and Specialised Deposit-Taking Institutions Act, 2016 (Act 930).*

"Adverse Stress Scenario" *means a set of economic and financial conditions, which are significantly worse than a base case scenario, designed to stress the financial performance of an RFI, portfolio or product.*

"Bank" *means a body corporate which engages in the deposit-taking business and is issued with a banking licence in accordance with Act 930.*

"Base Case Scenario" *means a set of economic and financial conditions that are as generally consistent with the best or average estimate of future economic and financial conditions and does not usually lead to a stressed result. The purpose of the base case scenario is to, amongst others, provide a benchmark to compare results of other scenarios such as, adverse, historical, and hypothetical.*

"Board" *means the board of directors of an RFI.*

"BOG" *means Bank of Ghana.*

"Bottom-Up Stress Tests" *means a stress test carried out using RFIs' internally developed models, data, assumptions or scenarios, with possible use of external data for some additional information.*

"Bottom-Up Supervisory Stress Tests" *means stress test assumptions or scenarios that are provided by BOG to RFIs to apply and report on specific outcomes.*

"Data Infrastructure" *means physical and organisational structures and facilities for building and maintaining data and Information Technology (IT) architecture to support the RFI's risk data aggregation and internal policy on risk reporting.*

"Enterprise-Wide Stress Test" *means stress test that assesses the impact of shock on the RFI, as a whole, as opposed to focusing on individual business lines, sectors, portfolios or products.*

"Hypothetical Scenarios" *means a stress test scenario consisting of a hypothetical set of risk factor changes, which does not aim to replicate a historical episode of distress. They could be based on subjective estimates by risk managers collaborating with different senior experts within the institution or generated by an economic or econometric model.*

"Internal Capital Adequacy Assessment (ICAAP)" *means the formal process through which a bank adequately identifies, measures, aggregates and monitors material risk, to ultimately build a risk profile that would become the basis for allocating economic capital i.e. the amount of capital that a bank holds and allocates internally to support the risks it takes on.*

"Liquidity Stress Test" *means the process of assessing the impact of an adverse scenario on RFI's cash flow as well as on the availability of funding sources, and on market prices of liquid assets.*

"Management Actions" *means actions that would be taken by an RFI in response to an adverse (stress) scenario that would otherwise not be taken in a base case scenario. These actions typically include but are not limited to raising of capital, reductions in risk-weighted assets, adjustment to business*

strategies, reductions in expenses, hedging of exposures, revision of credit policies or disposal of assets.

"Regulated Financial Institutions (RFI)" *means a Bank, Savings & Loans, Finance House, Finance and Leasing Companies and Financial Holding Companies licenced or registered under Act 930.*

"Reverse Stress Test (RST)" *means the process of assessing a pre-defined adverse outcome for an RFI, such as a breach of regulatory ratios, insolvency or illiquidity, and identifying possible scenarios that could lead to such adverse outcome.*

"Risk Universe" *means the set of material risks or risk categories the Board of an RFI has identified in its business activities, which must be managed efficiently to generate sustainable profitable returns.*

"Scenario Analysis" *means the process of applying historical data and/or hypothetical circumstances to assess the impact of a possible future event on an RFI, portfolio or product. It incorporates many economic and financial parameters in a consistent manner as compared to sensitivity analysis, which may focus on a single or subset of parameters.*

"Second Round or Feedback Effects" *means shocks or spillover effects resulting from the transmission of initial shocks from RFIs to parts of the real economy and also to the financial sector itself. They generally amplify the original shock.*

"Senior Management" *means members of the Executive Management Committee (EXCO) of an RFI and any other Key Management Personnel as may be determined by the RFI.*

"Sensitivity Analysis" *means the processes of assessing the impact of a change of a single or limited set of risk factors, variables, assumptions or other factors. Typically, sensitivity analyses do not relate changes to a cohesive narrative or underlying event.*

"Severe But Plausible Event" *means a shock or combination of shocks that has a low but non-zero probability of materializing and has the potential of imposing severe losses to portfolios or RFIs.*

"Solvency Stress Testing" *means the assessment of the impact of adverse scenarios on the RFIs economic or regulatory capital. The aim is to identify the RFI's vulnerabilities and assess its capacity to absorb losses.*

"Stress Test" *means a forward-looking risk management tool used to estimate the potential impact under adverse events or circumstances on an RFI, portfolio, or product.*

"Stress Testing Framework" *means the context in which stress tests are developed, evaluated, and used within the decision-making process, and includes elements such as governance, resources, documentation, policies, processes, infrastructure, and methodology that may be in place to guide and facilitate the use, implementation, and oversight of stress testing activities.*

Objectives

6. This Guideline seeks to ensure that RFIs:

   a) implement robust solvency and liquidity stress testing processes to facilitate early identification of vulnerabilities, enhance their overall risk management toolkit, and inform the formulation of credible management actions[1] and contingency plans to be triggered in the event of unexpected shocks;

   b) develop an enterprise-wide stress testing approach to ensure a comprehensive and consistent framework for assessing its vulnerabilities to severe but plausible events across the RFI, portfolio, products, business lines and risk universe;

   c) develop stress testing frameworks that align with their risk appetite and overall risk management capacity and uses the outcome to inform capital, liquidity and strategic planning; and

   d) clearly understand BOG's supervisory expectations in relation to the approach to stress testing processes, procedures and methodologies.

Proportionality

7. RFIs should align their stress testing processes with the requirements of this Guideline. However, in assessing the quality of RFIs' stress testing framework, the BOG will consider the principle of proportionality. In particular, the assessment will be aimed at ensuring that:

   a) RFIs' processes and methodologies for stress testing are commensurate with their risk profile and systemic importance, as well as the scale and complexity of their activities; and

   b) the regulatory objectives of promoting safety and soundness of RFIs and ensuring the stability of the financial system are effectively achieved.

Transitional Arrangements and Implementation Date

8. This Guideline shall take effect from 1st January 2027.

[1] These may include Recovery Options as stipulated in the RFIs recovery plan.

9. RFIs are expected to take steps aimed at aligning their stress testing processes with the expectations of this Guideline by 31st December 2026.

PART II – GOVERNANCE AND RISK MANAGEMENT FRAMEWORK

Governance

10. RFIs should establish effective governance arrangements to oversee and manage the stress testing process, and ensure sufficient resources are allocated to support the planning process and its implementation.

11. RFIs' stress testing frameworks should include an effective, clear, comprehensive and documented governance structure, which specify the roles and responsibilities of the Board, Senior Management and oversight bodies and those responsible for the ongoing operation of the stress testing framework. The framework should identify all key stakeholders and ensure full and consistent oversight and monitoring of the actions taken at different stages of the stress testing process.

12. RFIs should specify all aspects of the governance arrangements for their stress testing framework which should be aligned with BOG's Corporate Governance Directive, 2018 (CGD). In such arrangements, the Board should be ultimately responsible for the overall stress testing framework. Senior management or a well-constituted Stress Testing Committee should be responsible for the development and implementation of stress testing framework.

13. RFIs should document the governance arrangements for bottom-up supervisory stress tests, which should include specification of roles in such exercises. For example, responsibilities related to data quality assurance and interactions with BOG on the results and other technical stress testing issues.

14. The stress testing framework should facilitate collaboration between all the relevant stakeholders, and appropriate communication of the stress testing assumptions, methodologies, scenarios and results to stakeholders[2]. The RFIs' internal governance structures should also facilitate credible challenge of the stress testing framework at both senior and technical expert level, including assumptions, methodologies, scenarios and results, assessment of its ongoing performance and effectiveness, and the remediation of gaps identified by key stakeholders.

[2] The RFI functions that should be engaged in a given stress testing exercise depend on a number of factors, including the objectives of the framework, or particular stress test, the type of stress test (enterprise-wide versus more targeted), whether it is an internal stress test or a bottom-up supervisory exercise, and the specific structure of the RFI itself. Examples of RFI functions that are likely to be relevant include risk, finance, treasury, credit, strategy and the front-line businesses.

15. RFIs should establish processes that ensures availability of adequate resources including human, finance and Information Technology (IT) to execute stress testing. RFIs shall ensure that:

    a) staff have appropriate skills[3] and experience to carry out stress testing exercise, as well as benefit from relevant training programs.
    b) the IT infrastructure is sufficiently flexible to allow for targeted or ad hoc stress tests to monitor specific risks, especially in times of stress and rapidly changing market conditions.

Roles and Responsibilities of the Board

16. The Board holds ultimate responsibility for overseeing the stress testing framework. Board subcommittees, such as the Risk Committee and the Audit Committee, should support this oversight by ensuring that roles and responsibilities are clearly defined and appropriately assigned across all aspects of the stress testing framework, including, where applicable:

    a) scenario development and approval;
    b) model development and validation;
    c) reporting and challenge of results; and
    d) the use of stress test outputs.

17. Policies and procedures covering all aspects of the stress testing framework, should be clearly documented, regularly updated and approved by the Board.

18. The Board should ensure that stress testing frameworks meet clear and documented objectives and are consistent with the RFI's risk management policies and overall governance structure. This should inform the requirements and the expectation of the RFIs' stress testing framework.

19. The Board should have a reasonable understanding of all aspects of the stress testing framework to enable it to:

[3] The set of skills typically required includes (but are not limited to) expertise in liquidity risk, credit risk, market risk, regulatory standards, financial accounting, quantitative analysis and modelling.

a) actively engage in discussions with Senior Management or experts responsible for stress testing;

b) challenge key modelling assumptions, the selected scenario and the assumptions underlying the stress tests; and

c) decide on the necessary management actions and, where necessary, discuss them with BOG.

20. The Board should attest that it has thoroughly reviewed and adequately challenged both the stress testing framework and its results, and should provide a rationale supporting its assessment of their credibility

Roles and Responsibilities of Senior Management

21. Senior Management should oversee the implementation and performance of the stress testing processes and ensure that staff involved in the implementation of the stress testing framework have a sound understanding of the objectives of the framework to guide any discretionary or judgmental elements.

22. Senior Management should be responsible for undertaking and reviewing of stress testing and, where necessary appropriately react to the results[4]. Specifically, Senior Management should implement the stress testing framework which covers, amongst others:

a) the types of stress testing including those carried out at the single risk type, portfolio level and the enterprise-wide level and their main objectives and applications;

b) the frequency of the different stress testing exercises;

c) the internal governance arrangements including well-defined, transparent and consistent lines of responsibility and procedures related to approval and performance monitoring;

d) the relevant data infrastructure;

e) the methodological details of the entire process, periodically assessing the stress testing exercise and its outcomes as well as reporting the results to the Board;

[4] The stress testing should identify possible events or cyclical changes in market conditions that could adversely impact the RFI's earnings, liquidity or asset values.

f) the range of underlying assumptions and remedial actions envisaged for each stress test; and

g) a description of the processes for evaluating stress test outcomes and the process for using the results to inform management actions and the RFI's business strategy.

Risk Management Framework

23. RFIs should integrate stress testing into their corporate governance structure, risk management framework, and processes, for example, by linking it to the risk appetite statement, the Internal Capital Adequacy Assessment Process (ICAAP), the Crisis Management Framework, Recovery Plan and the Business Continuity Plan. RFIs should provide details on how the preparation of their stress testing is integrated with these structures, frameworks, and processes.

24. RFIs should ensure effective policies and internal controls are in place to govern the systems and processes used in both their stress testing exercise, and their participation in bottom-up supervisory stress tests.

25. Where services from third parties are used by RFIs to supplement internal resources, there should be policies and procedures in place establishing appropriate due diligence, oversight and controls consistent with the BOG's Outsourcing Directive, 2024.

26. RFIs should have robust IT infrastructure to enable them:

a) retrieve, process and report information used in both internal and bottom-up supervisory stress tests;

b) aggregate its exposures to a given risk factor, product, counterparty, industrial sector and geographical location;

c) modify its methodologies to facilitate the application of new scenarios as needed; and

d) carry out targeted and ad hoc stress test at the enterprise-wide, business line and asset class or exposure type level to assess specific risks including in times of stress and rapidly changing market conditions.

27. The stress testing infrastructure should be sufficiently flexible to allow for targeted and ad hoc stress tests in times of rapidly changing market conditions and to meet on-demand information requests from internal stakeholders and BOG.

Independent Review

28. RFIs should ensure that the stress testing framework and its implementation is reviewed by the Internal Audit Function (IAF) in line with its risk-based audit framework[5]. In addition, RFIs may engage an independent external expert to review the stress testing framework and its implementation. Such reviews should provide independent assurance on the robustness and accuracy of the models and methodologies used within the stress testing framework. The reviews should be comprehensive and include feedback on areas of improvement for the RFI.

29. The reports of independent reviews should be made readily available to BOG.

[5] Material components of the stress testing framework and exercise should be subject to independent review at least once every two (2) years.

PART III – GUIDANCE ON STRESS TESTING

Data Quality

30. To ensure the reliability of the stress test and that risks are timely identified, the data used for stress tests should be accurate, complete, and available at a sufficiently granular level and in a timely manner[6]. In this regard, RFIs should:

    a) have appropriate data quality processes to ensure that the data feeding into stress testing is accurate, complete and regularly updated;
    b) ensure consistency of data sources, processing, and aggregation across their stress tests;
    c) collect, validate and maintain historical data relevant for their internal stress testing frameworks; and
    d) ensure the data they produce for stress testing purposes are coherent with their overall risk management framework.

31. RFIs should have data infrastructure capable of retrieving, processing, and reporting information used in internal and supervisory stress tests to ensure that the information is of adequate quality to meet the objectives of the stress testing framework. Further, processes should be in place to address any identified information deficiencies.

32. RFIs should ensure that their IT infrastructure:

    a) has the capacity to capture the extensive data needed for their stress testing exercise and incorporate mechanisms to ensure its continuous ability to conduct stress testing as necessary;
    b) allows for flexibility and appropriate levels of quality controls; and
    c) allows for the performance of stress tests covering all material risks that the RFI is exposed to and their interdependencies.

[6] The granularity of the data should align with the objectives of the stress test.

Capture of Material Risks

33. Stress testing frameworks should capture all the RFI's material risks, as determined by a sound risk identification and materiality assessment process[7]. The risk identification process should include a comprehensive assessment of risks including those arising from all on and off-balance sheet exposures, earnings vulnerabilities, operational risk events, reputational loss and any other factors that could impact on the solvency, liquidity position or viability and sustainability of the RFI[8].

34. Stress test scenarios should be designed to capture key macroeconomic variables (e.g. GDP, interest rate, inflation and foreign exchange rate) within each scenario in a consistent manner. The RFI should adequately articulate how the scenario captures the potential risks and reasons for the exclusion of any material risks from the scenarios should be documented.

35. The selected scenarios should be sufficiently severe but plausible and the degree of severity should reflect the objective of the stress test exercise[9]. RFIs should particularly ensure that various degrees of severity are considered for both sensitivity analysis and scenario stress testing to provide a meaningful test of the RFI's resilience. Further, scenarios covering at least one severe economic downturn should be considered in the assessment of adequacy of capital and liquidity.

36. The severity of the scenarios should consider the RFI's specific vulnerabilities given its business model, the macroeconomic dynamics, business cycle and experience of peers with similar business models. Reverse Stress Tests (RST), which explore scenarios that could potentially lead to the RFI's insolvency and illiquidity should also be considered to facilitate the identification of an RFI's key vulnerabilities[10].

37. In determining the appropriate scenarios and sensitivities, the RFI should consider historical and hypothetical events that captures new developments including emerging risks in the foreseeable future. Where new or heightened

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[7] Material risks should include not only events that could inflict large losses but also those which could subsequently cause damage to the RFI's reputation.
[8] Where material, these may also include risk due to exposure to climate-related events.
[9] Plausibility of a scenario relates to the likelihood of a certain scenario occurring and the consistency of the scenario including the relationship or dependency of shocks to the risk factors and other components characterizing the scenario.
[10] RST helps to understand underlying risks and vulnerabilities in RFIs' businesses and products that pose a threat to its viability and helps to identify scenarios that could threaten resilience.

vulnerabilities are identified or where historical data do not contain a severe crisis event, then hypothetical scenarios should be used for the relevant risks. The scenarios and sensitivities used in stress tests should be reviewed periodically to ensure that they remain relevant.

38. RFIs should ensure that their stress test scenarios and sensitivities are tailored to their business model and, at a minimum:

    a) address the main macroeconomic factors and risk drivers (e.g. GDP, inflation and foreign exchange) and all material risks that the RFI may be exposed to as well as their interdependencies;

    b) address RFI specific vulnerabilities including specific product and business line exposures and funding policies;

    c) covers forward-looking development of the main macroeconomic factors and risk drivers including, geopolitical events and natural disasters[11];

    d) are internally coherent to ensure that the identified risk factors behave consistently with other risk factors in a stress event; and

    e) ensure that stressed risk factors are translated into internally consistent risk parameters.

39. In designing their stress test scenarios, RFIs should carefully determine the characteristics of each scenario, such as its severity and risk types impacted, ensuring that they reflect the RFI's risk appetite. RFIs should ensure that the scenario design process is transparent to relevant internal and external stakeholders.

40. RFIs should conduct their internal stress tests at relevant levels of their organisation which are consistent with the objectives at a portfolio level, business unit level, or at an enterprise-wide level. In assessing risks at an enterprise-wide level, particular attention should be given to risk concentrations[12]. The RFI's strategic orientation and its economic environment should also be taken into consideration when defining the scope of the stress tests and the relevant scenarios.

41. The selected scenarios should reflect the Board and Senior Management's insight and judgements and should take into consideration the materiality of

[11] The exclusion of certain risk factors should be fully justified and documented.
[12] In order to adequately address concentration risk, the scenario should be RFI-wide and comprehensive, covering balance sheet and off-balance sheet assets and liabilities, contingent and non-contingent risks, independent of their contractual nature.

individual business lines or units and their vulnerability to changes in macroeconomic and financial conditions.

42. RFIs should conduct stress test of their risk mitigants and internal control systems including the adequacy of their loan loss provisioning and capital given their risk profile. This is to enhance the assessment of their vulnerability to different risks and external shocks.

43. RFIs should ensure that scenarios cover a sufficient range of relevant macroeconomic and financial variables which may include GDP growth rate, inflation rate, interest rates, exchange rates, unemployment rates and assets prices that are key drivers of the RFI's material risks.

Models and Methodologies

44. The models and methodologies used to derive stress estimates and impacts should fit the purpose and intended use of the stress test and should at a minimum:

    a) adequately define at the modelling stage the coverage and granularity of the data and types of risk in line with the objectives of the stress test framework;

    b) be appropriate for both the objectives of the exercise and the type and materiality of the RFIs' portfolios being monitored using the models; and

    c) be well-justified and documented.

45. RFIs should be able to fully justify any overlays or expert judgment including assumptions within a stress testing methodology, and such overlays or expert judgement should be subject to credible internal challenge including, where appropriate, independent validation and/or review.

46. RFIs should consider a range of methodologies for quantifying the impact of the selected stress test scenarios taking into account their business lines and strategy, the risk characteristics of their activities and exposures, and the objective of the stress testing exercise. The key outputs from the stress testing exercise should include, amongst others, implied losses, impact on solvency (Capital Adequacy) and liquidity requirements.

47. Where applicable, RFIs should document quantitative models used for stress testing which should be made available to the Board and BOG.

48. RFIs should, where applicable, be able to demonstrate the linkage between the selected scenarios and the key loss drivers such as Probability of Default (PD), Loss Given Default (LGD) and Expected Credit Loss (ECL). Where relevant, the PD and LGD for the estimation of the ECL under stressed market conditions should meet the minimum requirements of the International Financial Reporting Standards (IFRS 9). The computation of the mark-to-market and operational risk losses as a result of the stress test shock should also be fully justified and supported with appropriate data and assumptions.

49. For the purpose of calculating IFRS 9 ECL under stress scenarios, RFIs should incorporate the following principles:

    a) Perfect Foresight: for the purpose of impairment calculation (both in assessing significant increase in credit risk and the calculation of ECL), RFIs should assume that they are able to accurately predict at least three years of macroeconomic and financial market data in the stress test from day one.

    b) Single scenario: for the purpose of impairment calculation, RFIs should ascribe a 100% probability weight to the stress scenario.

50. Stress tests should assess the impact of specific events (sensitivity analysis) or joint movements of a set of macroeconomic and financial variables under adverse scenarios on RFIs' exposures, including asset values, Risk Weighted Assets (RWAs), profitability, regulatory capital requirements and, where applicable, liquidity and funding sources[13].

Use of Stress Testing Results

51. RFIs should have a clear understanding of the key assumptions and limitations of their stress tests to facilitate appropriate use of the results of stress tests. Further, RFIs should also be ready to justify the rationale for their stress testing assumptions to BOG.

52. As a forward-looking risk management tool, stress testing should be an integral part of an RFI's risk identification, monitoring and assessment, and should also inform the formulation and implementation of RFIs' strategic business objectives.

[13] The design of the adverse scenario depends on the purpose of the test, availability of data and the time horizon chosen.

53. To be a meaningful risk management tool, stress tests should be undertaken regularly. While ad hoc stress tests should be performed for specific reasons, regular stress tests should be undertaken according to a defined schedule. The appropriate frequency of stress test should be determined based on, amongst others:

    a) the objectives of the stress testing exercise;
    b) the scope and type of the stress test;
    c) the risk profile, size and complexity of the RFI;
    d) portfolio characteristics; and
    e) changes in the macroeconomic environment or the RFI's business activities.

54. RFIs should ensure that stress testing results are effectively used in accordance with the set objectives and internal policies and procedures of the stress testing framework. For this purpose, the stress test results should be reported to the Board and Senior Management on a regular and timely basis and at appropriate levels of granularity. The reports should include the main assumptions as well as any significant limitations impacting on the stress test results.

55. The results of stress tests should be used to inform the RFIs' formulation and review of risk appetite and policy limits, financial and capital planning, assessment of liquidity and funding risk, contingency plans and recovery planning. For instance, RFIs should use stress tests to support ICAAP and assessments of adequacy of their liquidity buffers. Furthermore, the outputs of stress tests should be used to:

    a) support credit and investment portfolio decisions and management;
    b) inform internal approval of new product and services, and business decisions such as the evaluation of strategic options[14];
    c) identify, monitor and control concentration risk; and
    d) assess the effectiveness of new and existing business strategies and their impact on the use of capital.

[14] The business decisions should consider any shortcomings, limitations and vulnerabilities identified during stress testing.

56. Board and Senior Management should ensure that stress testing outcomes are appropriately used in risk management and capital planning processes which includes at a minimum:

    a) setting stress testing objectives;
    b) defining and selecting scenarios;
    c) discussing and challenging the results of stress tests; and
    d) assessing the potential management actions as detailed in **Part IV**.

Review and Challenge of Stress Testing Framework and Results

57. The review of the stress testing framework should be performed by the Board and Senior Management at least annually and should reflect the changing external and internal conditions. Where gaps or deficiencies are identified, appropriate actions should be taken, which may include enhancement of the framework to ensure that it continues to be fit-for-purpose.

58. The review of the stress testing framework and results should be aimed at:

    a) improving the reliability of stress test results;
    b) identifying their limitations;
    c) identifying areas where the stress testing approach should be improved;
    d) ensuring that the stress test results are being used in a way that is consistent with the framework's objectives;
    e) determining their effectiveness and robustness; and
    f) informing the update of the stress testing framework.

59. In assessing the effectiveness of their stress testing framework, RFIs should at a minimum consider the following:

    a) the effectiveness of the framework in meeting its intended purposes;
    b) the level of involvement of the Board and Senior Management in the stress testing exercise;
    c) the robustness of the data infrastructure including systems implementation and data quality;
    d) the comprehensiveness of the relevant documentation;

e) the identified risk factors, definitions and basis for the selected scenarios, assumptions and the sensitivity of results to changes in such assumptions and the role of expert judgement to ensure that it is accompanied by sound analysis;

f) the interlinkages between solvency stress tests and liquidity stress tests;

g) feedback from BOG; and

h) all assumptions and management actions envisaged, based on the purpose, type and result of the stress testing, including an assessment of the feasibility of management actions in stress situations and a changing business environment.

60. Challenge during a stress test exercise should occur at multiple points and levels within the RFI. Reviews of the stress testing framework should include:

a) validation and independent assessment of the key individual components of the stress testing process including the methodologies, scenarios, assumptions, estimations of the stressed losses, revenues and liquidity forecasts; and

b) an assessment of the overall adequacy of the stress test through for example, analysis of the sensitivity of the results to changes in the underlying assumptions.

61. RFIs should challenge the assumptions and the plausibility of outcomes relative to market experience by the relevant business areas to improve the interpretation of results and ensure that the stress test does not become a pure academic or hypothetical exercise.

62. When enterprise-wide stress tests are used to inform strategic business decisions that may affect the financial condition of the RFI, the Board should comprehensively challenge the processes, assumptions such as scenarios and sensitivities, and outcomes of the stress test[15].

63. The stress testing exercise should be challenged by the Board Risk Committee and independent units within the RFI or external experts with the relevant expertise and experience.

[15] To support the board in the effective fulfilment of these duties, the board may delegate the technical details to another group or body.

Communication and Reporting of stress testing results

64. Disclosure of results of stress tests can help improve market discipline and provide confidence in the resilience of an RFI and the banking sector to identified stresses. RFIs that choose to publicly disclose their stress test results should carefully consider ways to ensure that market participants understand the information, including its limitations and the underlying assumptions. The stress test's objectives and/or the framework may also be disclosed to help reduce the risk of market participants drawing inaccurate conclusions on the resilience of RFIs.

65. Where applicable, RFIs should have processes to support regular communication and coordination between group-level stress testing functions and other relevant entities within or across jurisdictions.

66. RFIs should clearly report the stress test results which take into account all material on and off-balance sheet exposures impacting on its capital position to the Board. The stress test results should be reported to the Board and Senior Management on a regular basis, at the relevant level of aggregation. These reports should include, where applicable, the modelling and scenario assumptions as well as any significant limitations of the RFI's stress testing exercise and outcome.

67. RFIs are required to submit **annual** stress test results to BOG as part of the ICAAP submission in the formats highlighted in Appendix II by **end of March of the ensuing year**. In addition, RFIs should at a minimum report on:

a) description of the risks, exposures and entities covered;

b) prevailing and projected macroeconomic conditions as well as justifications for assumptions used;

c) description of the methodologies used including justifications for any material changes to the previous methodologies adopted;

d) overview of the impact on the profitability, capital adequacy, liquidity as well as on all material risk indicators at each significant balance sheet date over the specified time horizon. Both absolute amounts and key financial ratios should be reported;

e) a description of management actions that have been considered and an assessment of their reasonableness;

f) where management actions have been considered, results of the stress test and reverse stress test shall be provided both with and without taking into account these actions;

g) assessment on areas of vulnerability and the associated risk factors. The assessment must be at a sufficient level of granularity in order to provide a meaningful understanding of the vulnerable areas (for instance, currency, business line, geographical sectors, economic sectors or sub-sectors, market segments, borrower groups) and the causes of stressed losses;

h) extract of minutes of the Board and Board Risk Committee meetings on the deliberation on the stress tests and reverse stress test results; and

i) assessment and result of independent reviews, where such reviews have been conducted.

PART IV – STRESS TESTING AS PART OF ICAAP[16]

Approach and Scope

68. RFIs should provide projections of their pre and post stress test regulatory capital position and the expected impact of the proposed management actions for at least three (3) years going forward.

69. As part of the ICAAP, RFIs' Board and Senior Management should assess their future capital resources against the projected capital requirements under a range of severe but plausible stress scenarios.

70. Capital and liquidity contingency plans should take into consideration the results of the stress test exercise and should form an integral part of the ICAAP. The Board and Senior Management should also, on an ongoing basis, monitor and assess the relationship between liquidity and capital.

71. RFIs should at a minimum stress test the common set of risks highlighted in Appendix I and where applicable, project the impact of the selected scenarios on Net Interest Income (NII), Non-Performing Loans (NPLs), Profitability, Investment Portfolio and Capital.

72. The risk arising from sovereign exposures should be covered under either credit risk or market risk depending on their accounting treatment as well as Interest Rate Risk in the Banking Book (IRRBB). Additionally, RFIs with significant unhedged foreign currency exposure should consider the adjusted creditworthiness of their respective obligors due to changes in foreign exchange rates under baseline and adverse scenarios.

73. As part of ICAAP, RFIs should ensure that they have adequate capital and liquidity buffers to cover risks that RFIs are, or might be exposed to. This assessment should be reflected in the capital and liquidity plans that RFIs submit as part of their ICAAP report.

74. RFIs should evaluate the reliability of their capital plans under stress conditions to ensure that they meet their regulatory capital requirements. The evaluation of reliability of capital plan under stressed conditions should take into consideration the severity and likelihood of the stress scenario. RFIs should also

[16] The approach and scope of ICAAP in this section shall apply only to banks.

test the reliability of their liquidity plans to ensure that they can meet their obligations as they fall due under stress conditions.

75. Stress tests used for ICAAP purposes should at a minimum meet the following requirements:

a) cover all material risks the RFI is exposed to, given its on- and off-balance sheet assets and liabilities including, asset classes, sectoral and geographical distribution of exposures, and deposit mix;

b) consider a range of scenarios including at least an adverse macroeconomic scenario that is severe but plausible, such as a severe economic downturn and/or a market-wide and idiosyncratic liquidity shock;

c) cover the same forward-looking period as the RFI's ICAAP, and be updated at least as regularly as the ICAAP. Specifically, ICAAP stress tests should cover a period of at least three years.

76. RFIs should, in their ICAAP report, demonstrate a clear link between their risk appetite, business strategy, and ICAAP stress tests. Specifically, RFIs should stress test their capital and liquidity plans, including capital buffers, consistent with their Board approved risk appetite and strategy, and overall internal capital needs (Pillar 1 and 2).

77. In their ICAAP stress test, RFIs should assess their ability to remain above all regulatory capital requirements as prescribed by BOG including, minimum capital adequacy requirement, Common Equity Tier 1 ratio, Tier 1 ratio, leverage ratio and paid-up capital.

Management Actions

78. RFIs should identify a broad range of credible management actions to be taken by the Board and Senior Management to address the outcome of stress tests and to ensure they remain solvent under severe but plausible stressed scenario.

79. To assess possible responses to a stressed situation, RFIs should identify the credible actions that are most relevant and when such actions should be taken. RFIs should consider the fact that some management actions may be required immediately, and others could be contingent on specific events happening, in which case clearly defined triggers for such actions should be

identified beforehand. Management actions should also be consistent with RFIs' Board approved strategies and policies, for example in the context of dividend policies.

80. Acceptable management actions may include the following, some of which may require prior BOG approval:

a) Raising of capital or funding through, equity issuance or asset sales;
b) Reductions in risk-weighted assets through divestments or decreases in lending and tightening of lending standards;
c) Review of internal risk appetite and risk limits;
d) Review of the use of risk mitigation techniques;
e) Revision of policies, such as those that relate to liquidity and funding or capital adequacy;
f) Reduction of distributions to shareholders;
g) Changes in the overall strategy and business plan and risk appetite;

81. Anticipated management actions differentiated by scenarios and adjusted to the severity of the scenario should be well-documented.

PART V – SUPERVISORY EXPECTATION ON STRESS TESTING

Overview of Supervisory Assessment

82. This Guideline should be applied by RFIs on a proportionate basis considering their risk profile, size and complexity of their activities.

83. As part of its Supervisory Review Process (SRP) and in line with the Risk Based Approach to Supervision (RBS), BOG will assess, amongst others:

a) the quality of RFIs' governance over their stress testing process;

b) the appropriateness of RFIs' selected scenarios and sensitivities given its vulnerabilities, exposures and prevailing macroeconomic conditions;

c) robustness of RFIs' stress testing methodologies;

d) the role of stress testing in the RFIs' risk management, capital and liquidity planning;

e) reasonableness of the RFIs' stress testing assumptions and proposed mitigation or management actions in response to the results of the stress testing exercise; and

f) comprehensiveness of the RFIs' stress testing exercise in terms of coverage of material risk types and portfolios.

Appendix I – STRESS TESTING OF INDIVIDUAL RISK AREAS

General Approach

1. Stress testing of individual risks should be proportional to the risk profile, size and complexity of the RFI.

Credit and Counterparty Risks

2. RFIs should analyse at a minimum[17]:

   a) The borrower's ability to repay their obligations by measuring the Probability of Default (PD);

   b) the recovery rate in the event of a borrower defaulting on their obligation including the deterioration of the collateral values or creditworthiness of the guarantor which represents the Loss Given Default (LGD); and

   c) the size and dynamics of credit exposure, including the effect of undrawn commitments from borrowers which represents the Exposure at Default (EAD).

3. The RFIs' credit risk stress test should cover all their banking and trading book positions. RFIs should ensure that their credit risk stress tests and sensitivity analysis captures:

   a) market-wide shock scenarios such as a sharp economic slowdown that would affect all counterparties;

   b) idiosyncratic shock scenarios such as bankruptcy or distress of the largest counterparty(ies);

   c) sector-specific shock scenarios; and

   d) a combination of the above.

4. When stress testing the value of financial collateral, RFIs should identify conditions that would adversely affect the realizable value of their collateral positions, which could include deterioration in the credit quality of collateral issuers or reduced market liquidity for the collateral.

[17] For the purposing of stress testing, IFRS 9 ECL models and processes are capable of incorporating the principles of perfect foresight and single scenario application when estimating credit losses

5. RFIs should assess the impact of the selected scenarios in terms of credit losses (IFRS 9 impairment and BOG provisions), Risk Weighted Assets (RWAs), income (NII, fees and commission), cost (funding and other administrative costs) and regulatory capital requirements.

6. Where possible, RFIs should consider the relevant credit risk parameters: PD, LGD, EAD, Expected Credit Loss (ECL) and RWAs, and the impact on their credit losses and regulatory capital requirements.

Market Risk

7. RFIs should, where material, take into account market risk, notably risks from losses due to adverse changes in the value of positions arising from movements in market prices across foreign exchange, equity, commodity and interest rate risk factors[18].

8. RFIs should stress tests their positions in financial instruments in trading and fair value reported in other comprehensive income (FVOCI) portfolios. RFIs should also assess the impact of a market shock on their held-to-maturity portfolio including implication on regulatory capital requirement and liquidity buffers.

9. RFIs should apply a range of severe but plausible scenarios for all market risk positions, such as, exceptional changes in market prices, shortages of liquidity in the markets and default by a large market participant.

10. As instruments and trading strategies change over time, RFIs should ensure that their stress tests evolve to accommodate those changes.

Operational Risk

11. RFIs should fully integrate their operational risk stress testing exercise into their enterprise-wide stress test and should, where practicable, include the interactions with and impact on regulatory capital requirements and liquidity. Specifically, RFIs should, at a minimum, analyse:

    a) changes to significant elements of their Information Technology (IT) infrastructure;
    b) the robustness of internal processes and procedures, products and IT systems;

[18] Interest rate risks in trading book positions should be considered by institutions as a component of market risk.

c) the extent of outsourcing and particularly the concentration risk associated with all outsourcing arrangements and external market infrastructures;

d) the impact and projected potential costs of known misconduct risks, which should exceed any existing provisions made under IAS 37; and

e) material misconduct risks, including remote risks that in aggregate, could become material under stress.

12. RFIs should at a minimum conduct annual scenario-based simulations of severe but plausible disruptions to assess their ability to maintain established impact tolerances. The scenarios should include:

a) Cloud services disruptions;

b) Cyber-attacks or data corruption;

c) Payments or market infrastructure outages;

d) Telecommunications failures;

e) Significant staff unavailability; and

f) Other extreme operational shocks such as flooding, epidemic and civil strife.

13. RFIs should also at a minimum:

a) Validate business continuity capabilities through exercises that test critical operations under a range of severe but plausible scenarios;

b) Comprehensively document tests, covering design, execution, outcomes, and remediation actions, and track remediation to closure;

c) Integrate lessons learned into business process maps, impact tolerances, response playbooks, and third-party arrangements; and

d) Conduct post-incident review after any material disruption and update the operational resilience framework and playbooks accordingly.

14. RFIs should also explore and, where relevant, use idiosyncratic risk factors as inputs for scenario design for operational risk.

Liquidity Risk

15. RFIs' analysis of liquidity risk factors should, amongst others consider:

    a) the impact of macroeconomic conditions, such as, interest rate shocks on liquidity buffers and funding cost;
    b) funding vulnerabilities due to external, internal or contractual events;
    c) unexpected significant increase in deposit withdrawals;
    d) concentration in funding; and
    e) estimates of future balance-sheet growth.

16. RFIs should apply an idiosyncratic scenario, a market-wide scenario and a combination of both when assessing liquidity risk. The idiosyncratic stress scenario should assume RFI-specific events such as the default by the largest funding counterparty(ies), a rating downgrade, a loss of market access, the default of the counterparty(ies) providing the largest inflows. A market-wide stress scenario, on the other hand, should assume an impact on a group of RFIs or the financial sector as a whole such as a deterioration in funding market conditions or the macroeconomic environment, or sovereign rating downgrades.

17. RFIs should design different time horizons in their liquidity stress testing ranging from overnight up to at least 12 months. The time horizon should include, for example, a short acute phase of stress (intraday, 5 days and up to 30 days), followed by a longer period of less acute but more prolonged stress of between 3 and 12 months.

18. RFIs should consider the impact of advances in technologies on the speed of deposit outflows particularly under stressed scenarios or following times of significant operational disruptions (cyber-attacks, system and network failures).

19. As part of their scenario design, RFIs should consider the impact of stress events from other risk types such as credit risk losses and reputational risk events, on their liquidity position, and the impact of fire sales of assets by financial institutions on their liquidity buffers and solvency.

20. The main methodology used for calculating the magnitude of the impact should be the net cash flow profile. For each scenario, at each stress level,

the RFI should identify the projected cash inflows and outflows for each future time period and the resulting net cash flows.

21. RFIs should extend their liquidity analysis, where appropriate, to other metrics such as:

a) liquidity ratios including regulatory liquidity requirements and their internal liquidity metrics;

b) their available liquidity buffer, over and above the regulatory requirements and internal limits/targets, and other counterbalancing measures (capacity) for each stress scenario[19];

c) the survival horizon of the RFI as derived from its counterbalancing capacity; and

d) solvency and profitability.

22. RFIs should, where appropriate, integrate liquidity stress test in their enterprise-wide stress tests, and take into account differences in the time periods covered in liquidity stress tests from those covered in their solvency stress tests. At a minimum, RFIs should assess the impact of increasing funding costs on profitability.

Interest Rate Risk in the Banking Book (IRRBB)

23. RFIs should establish appropriate stressed scenarios to assess the impact of Interest Rate Risk on the Banking Book (IRRBB) on earnings and capital positions under stressed conditions. The stressed scenarios established should at a minimum cover stress scenarios as outlined in the BOG Guideline on the Management and Measurement of Interest Rate Risk on the Banking Book.

24. Stress tests should support and be an integral part of the IRRBB internal management system.

25. The interest rate scenarios used for stress testing purposes should be adequate to identify all material types of IRRBB including, where material, gap risk, basis risk and option risk[20].

[19] The stress testing of this metric should be accompanied by an assessment of the impact on the proportion and nature of encumbered assets.

[20] The uncertainty in cashflows posed by embedded or explicit options in financial instruments, where one party has the right but not the obligation to alter the timing or amount of those cashflows.

Concentration Risk

26. Stress testing should be a key tool in the identification of concentration risk, as it allows RFIs to identify interdependencies between exposures, which may only become apparent under stressed conditions.

27. In assessing concentration risk in their stress testing exercise, RFIs should consider all sources of concentration including amongst others:

a) the single-name concentrations (i.e., counterparty or group of connected counterparties);
b) the sectoral and geographical concentrations;
c) the product concentrations;
d) concentration of collateral type and guarantees;
e) concentration of funding sources; and
f) concentration of specific third-party service providers.

28. The assessment of concentration risk should take into account on- and off-balance sheet exposures, as well as banking and trading positions.

29. RFIs' stress tests should take into account changes in the business environment which could lead to crystallization of concentration risk. In particular, stress tests could, where practical, consider unusual but plausible changes in correlations between risk factors and extreme and unusual changes in risk parameters.

Contingent leverage risk to the leverage ratio

30. RFIs should identify and assess contingent leverage risks arising from transactions or trade structures that may result in increased leverage exposure measure under stressed market conditions or due to counterparty default. Examples of such transactions include but not limited to:

a) Agency models for derivatives and Securities Financing Transactions (SFTs);
b) collateral swap trades; and
c) SFT netting packages and synthetic forms of financing.

31. RFIs should assess their ability to continue the transactions listed above in a stress scenario and the potential impact on their leverage ratio and other regulatory metrics if they were required to use alternative structures with higher exposure values.

32. The assessment should consider contractual obligations, liquidity management impacts and potential effects on earnings. This risk should be considered in the overall context of the RFI's capital and liquidity adequacy assessments.

Macroeconomic Risk

33. RFIs should ensure that the macroeconomic scenarios used are well-defined and appropriate for their risk profile, size and complexity of their activities.

34. The stress scenarios developed should be severe but plausible and should be carefully calibrated with justifiable assumptions underpinning the severity of the chosen scenarios in the context of specific vulnerabilities and prevailing economic environment.

APPENDIX II: STRESS TEST RESULTS AND PROJECTIONS

Summary of Stress Test Results

1. The BOG requires RFIs to adopt the format in **Table 1** below when presenting a summary of the results of their stress testing exercise as part of the ICAAP and, where applicable, Capital Restoration Plans[21].

2. The impact of the adverse scenario should be assumed to be instantaneous and should capture the feedback effect of the selected macroeconomic scenario on other risk drivers.

3. Exposures that are expected to be downgraded as a result of the adverse scenario should be risk-weighted at the appropriate risk weights in accordance with the BOG Capital Requirement Directive (CRD), 2018.

4. Where applicable, RFIs should provide justification of all expected cash inflows from the proposed management actions and underlying assumptions.

5. All definitions of capital and exposures should be in accordance with the CRD.

Table 1[22]: Summary Results of Stress Test Scenario

Amounts in GHS'000	Current	Projection		
		Year 1	Year 2	Year 3
Where applicable, current Capital Gap				
Total Regulatory Capital deficit needed to meet BOG minimum CAR	XXX			
Minimum Unimpaired Paid-up Capital deficit	XXX			
Pre - Adverse Scenario (Base Case)[23]				
CET 1 Capital	XXX	XXX	XXX	XXX
Tier 1 Capital	XXX	XXX	XXX	XXX
Tier 2 Capital	XXX	XXX	XXX	XXX
Total Regulatory Capital (Tier 1 & Tier 2)	XXX	XXX	XXX	XXX
Risk Weighted Assets (RWA)	XXX	XXX	XXX	XXX
CET1 Capital Ratio (% of RWA)	XX%	XX%	XX%	XX%

[21] This template supersedes the Guidance Notes on Preparation of Capital Restoration Plan

[22] This table applies to Pillar 1 Capital Requirements

[23] The current year should reflect the most recent audited financial position.

Amounts in GHS'000	Current	Projection		
		Year 1	Year 2	Year 3
Tier 1 Capital Ratio (% of RWA)	XX%	XX%	XX%	XX%
CAR (%)	XX%	XX%	XX%	XX%
Unimpaired Paid-up Capital	XXX	XXX	XXX	XXX
Impact of Adverse Scenario				
Losses arising from adverse scenario[24]				
Government of Ghana		XXX	XXX	XXX
Bank of Ghana		XXX	XXX	XXX
Other Sovereigns and Central Banks		XXX	XXX	XXX
Public sector entities		XXX	XXX	XXX
Multilateral Development Banks		XXX	XXX	XXX
Banks		XXX	XXX	XXX
Other Financial Sector and Regulated Institutions		XXX	XXX	XXX
Corporates		XXX	XXX	XXX
Retail Lending (including SMEs)		XXX	XXX	XXX
Past due exposures		XXX	XXX	XXX
High risk exposures		XXX	XXX	XXX
Other exposures (please specify)[25]		XXX	XXX	XXX
Total losses arising from the adverse scenario		**XXX**	**XXX**	**XXX**
Post - Adverse scenario (Stress Case) - must be equal to Table 2 below				
Stressed Total RWA		XXX	XXX	XXX
Stressed CET 1 Capital		XXX	XXX	XXX
Stressed Tier 1 Capital		XXX	XXX	XXX
Stressed Total Regulatory Capital		XXX	XXX	XXX
Stressed CET 1 Capital Ratio (% of RWA)		XX%	XX%	XX%
Stressed Tier 1 Capital Ratio (% of RWA)		XX%	XX%	XX%
Stressed CAR (%)		XX%	XX%	XX%
Stressed Unimpaired Paid-Up Capital		XXX	XXX	XXX
Capital required to meet BOG's minimum Total Regulatory Capital of 13%		XXX	XXX	XXX
Capital required to meet BOG's minimum unimpaired paid-up capital of GHS400 m		XXX	XXX	XXX
Management actions[26]				

[24] Exposure classes are based on Part 2 of BOG's CRD - Management and Measurement of Credit Risk.

[25] 'Please specify' relates to all items that need to be specified and shall be detailed in additional annexures as part of the stress testing templates.

[26] Where applicable, please provide details of the specific type of action, estimated impact and timelines.

Amounts in GHS'000	Current	Projection		
		Year 1	Year 2	Year 3
Raising of additional capital[27]		**XXX**	**XXX**	**XXX**
CET 1 Capital		XXX	XXX	XXX
AT 1 Capital		XXX	XXX	XXX
Tier 2 Capital		XXX	XXX	XXX
Revision of dividend policy		XXX	XXX	XXX
Change in Business Strategy		XXX	XXX	XXX
Sale of Assets		XXX	XXX	XXX
Risk Reduction		XXX	XXX	XXX
Other management actions (please specify)		XXX	XXX	XXX
Total Management Actions		**XXX**	**XXX**	**XXX**
Post Capitalisation				
CET 1 Capital		XXX	XXX	XXX
Tier 1 Capital		XXX	XXX	XXX
Total Regulatory Capital	XXX	XXX	XXX	XXX
Unimpaired Paid-up Capital	XXX	XXX	XXX	XXX
CAR (%)	XX%	XX%	XX%	XX%
CET1 Capital Ratio (% of RWA)	XX%	XX%	XX%	XX%
Tier 1 Capital Ratio (% of RWA)	XX%	XX%	XX%	XX%
Additional (Residual) Capital Required to meet minimum Capital Requirements (Paid-Up Capital, CAR and leverage ratio)		**XXX**	**XXX**	**XXX**

Financial Projections

RFIs are required to complete the regulatory Capital Projection Schedule (**Table 2**), the Movement in Profit or Loss accounts Schedule (**Table 3**) and the Statement of Financial Position Schedule (**Table 4)** over a three (3) year horizon. The projections should be provided under the base case and adverse scenarios which should be consistent with the RFI's business strategy and risk profile.

The baseline for the analysis (reference date/period) should be based on the relevant Audited Financial Statements (AFS).

Where applicable, RFIs are expected to provide:

a) the basis used in determining the timelines for the execution of the management actions;
b) details of any anticipated challenges, if any, in meeting the projected timelines; and

[27] Capital should comply with requirements in the CRD and Act 930.

c) details of alternative actions in case of challenges in executing the planned management actions.

Regulatory Capital

Table 2: Regulatory Capital Projection Schedule

Amounts in GHS'000	Current	Projection (Base Case)			Projection (Stress Case)		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Tier 1 capital							
Common Equity Tier 1 (CET1) Capital							
Paid up Capital (Ordinary Shares)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Income surplus (retained earnings)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Statutory reserves	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Other qualifying reserves	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Minority interest	XXX	XXX	XXX	XXX	XXX	XXX	XXX
CET1 Capital before deductions/ adjustments	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Regulatory adjustments (please provide breakdown)	**(XXX)**	**(XXX)**	**(XXX)**	**(XXX)**	**(XXX)**	**(XXX)**	**(XXX)**
Intangibles	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Investment in the capital of banks and other financial institutions	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Accumulated Other Comprehensive Income (OCI), Unrealized losses for amounts measured at fair value	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Deferred tax assets	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Investment in commercial entities	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Others (please specify)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
CET1 Capital after deductions/ adjustments	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Additional Tier 1 (AT1) Capital (capped at 1.5% of RWA)							
Perpetual non - cumulative preferred shares	XXX	XXX	XXX	XXX	XXX	XXX	XXX

Amounts in GHS'000	Current	Projection (Base Case)			Projection (Stress Case)		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Others (please specify)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Total AT1 Capital	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Total Tier 1 capital (CET1 + AT1)	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Tier 2 capital (capped at 2% of RWA)							
Subordinated debt (eligible for inclusion)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Property revaluation reserves (capped at 50%)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Unaudited year to date profit	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Hybrid instruments	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Other comprehensive income	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Others (please specify)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Total Tier 2 capital	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Total regulatory capital (Tier 1 + Tier 2)	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Credit Risk Reserve	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**

Retained Earnings

Table 3: Movement in Profit and Loss Schedule

Amounts in GHS'000	Current	Projections (Base Case)			Projections (Stress Case)		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Income surplus (Retained earnings) at the beginning of the year	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Interest income	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Interest expense	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Net interest income	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Fees and Commission income	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Net Trading Income	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Other Income (please specify)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Non - interest expenses	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Other Operating expenses	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Staff Cost	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)

Amounts in GHS'000	Current	Projections (Base Case)			Projections (Stress Case)		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Impairment Losses (including relevant losses from the stress test)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Depreciation and Amortisation	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Other components of profit and loss statement (please provide details)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Net profit or loss before tax	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Income Tax Expense	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Net profit or loss after tax	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Distributions/ adjustment (e.g., Statutory reserve, dividends)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)	(XXX)
Income Surplus (retained earnings) at the end of the year	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Credit Risk Reserve (changes from previous year)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Adjusted income surplus (retained earnings) at the end of the year (for CAR computation in Tables 1 and 2 above)	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**

Balance Sheet

Table 4 Statement of Financial Position Schedule

Amounts in GHS'000	Current	Projections (Base Case)			Projections (Stress Case)		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Foreign Assets	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Foreign Currency Notes and Coins	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Correspondent acc. In non-res. Financial inst.	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Other claims on non-residents (Net)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Others (please specify)	XXX	XXX	XXX	XXX	XXX	XXX	XXX

Domestic Assets	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Cash and Balances Due from Other Financial Institutions	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Short-Term Investments	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Financial Derivatives	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Loans, Overdrafts and Other Advances	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Long-term Investments (Other than equity) issued by Government	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Shares and Other Equities	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Properties Plant & Equipment (PPE)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Other Assets (Please specify)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Total Assets (Foreign Assets + Domestic Assets)	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Paid-Up Capital	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Retained Earnings	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Statutory Reserves	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Profit or Loss to date	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Other Reserves (please specify)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Foreign Liabilities	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Deposit	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Borrowings	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Others (please specify)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Domestic Liabilities	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Demand Deposits	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Savings Deposits	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Time Deposits	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Other Deposits (please specify)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Short-Term Borrowings	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Long-term Borrowings	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Other Liabilities (Please Specify)	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Total Liabilities (Foreign + Domestic Liabilities)	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Shareholders' Funds and Liabilities	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**

Evolution of Risk Weighted Asset (RWA) and Capital Requirements

RFIs should report the evolution of their risk weighted assets for each of the Pillar 1 risk types and capital requirements for each of the Pillar 2 risk types under base and stress case scenario over their capital planning horizon of at least three (3) years as per **Table 5** below.

Table 5: Evolution of RWA and Capital Requirements under base and stress case

	Current	Projection (Base Case)			Projection-Adverse Scenarios (Stress Case)		
Amounts in GHS'000		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Risk-Weighted Asset (RWA)							
RWA for Credit Risk	XXX	XXX	XXX	XXX	XXX	XXX	XXX
RWA for Operational Risk	XXX	XXX	XXX	XXX	XXX	XXX	XXX
RWA for Market Risk	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Total Pillar 1 RWA	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Pillar 1 Capital Requirements[28]	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Pillar 2 Risks							
Credit Concentration	XXX	XXX	XXX	XXX	XXX	XXX	XXX
IRRBB	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Sovereign	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Country and FX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Reputational	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Others	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Total Pillar 2 Capital Requirements	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**
Total Capital Requirements (Pillar 1 and Pillar 2)	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**	**XXX**

Note: The projected stressed Total Pillar 1 RWA above should equal the Stressed Total RWA in Table

APPENDIX III: SUPERVISORY STRESS TEST ASSUMPTIONS

The following risk drivers should be considered where relevant to an RFI's portfolio and risk profile:

[28] 13% of Pillar 1 RWA

a) Economic slowdown or deceleration in the GDP growth;

b) Higher than expected depreciation (appreciation) of the Cedi against major currencies;

c) Adverse fluctuations in interest rates;

d) Significant increase in inflation rate;

e) Decline in cocoa and gold prices and production;

f) Unexpected liquidity outflows;

g) Increase in funding cost;

h) Reputational damage leading to liquidity outflow or higher funding cost; and

i) Climate-related risk, including physical events (e.g. floods and droughts) affecting borrowers, supply chains and transition risk from policy changes, technological shifts and evolving consumer sentiments.

RFIs should also consider specific risk drivers that may affect their sovereign exposures across both banking and trading books including those measured at fair value and amortised cost. Key factors to consider include interest rate fluctuations, credit rating migrations, potential debt restructure and decline in fair value.

RFIs should provide to BOG their detailed analysis and justification of how macroeconomic parameters were translated into specific shocks to their individual portfolios. RFIs should also provide details of the assumed level or changes in the following drivers, where relevant, under base and adverse (stress) scenarios.

Table 6: Key Risk Drivers and Forecasting Assumptions

Risk Driver[29]	Current Year	Base Case			Stress Case		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Average yield on Government of Ghana securities							
GDP Growth Rate							
Interest Rates							
Unemployment Rate							
FX rates (USD to GH Cedi)							

[29] Indicate sources, which should include BOG, Ghana Statistical Services, and other reputable sources (Bloomberg, IMF, World Bank, Reuters, Fitch Solutions, African Development Bank and Economist Intelligence Unit).

Risk Driver[29]	Current Year	Base Case			Stress Case		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
FX rates (GBP to GH Cedi)							
FX rates (EUR to GH Cedi)							
Inflation Rates							
Year-on-Year Changes in Stock Market Valuation (GSE Index)							
Fiscal deficit							
Others (please specify)							