



**BERMUDA MONETARY AUTHORITY**

**GUIDELINES ON STRESS TESTING FOR THE  
BERMUDA BANKING SECTOR**

FEBRUARY 2010

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## **1. EXECUTIVE SUMMARY**

- The international financial crisis has brought to light some of the shortcomings of risk management practices used in the banking sector, including stress and scenario testing analysis, and in particular the inability to properly identify, quantify and monitor the vulnerability of individual banks to severe but plausible shocks.
- The Basel Committee on Banking Supervision, in an effort to address the identified shortcomings issued the *Principles for sound stress testing practices and supervision* paper in May 2009. The paper sets out a comprehensive set of standards related to sound governance, and the design and implementation of stress testing programmes at banks. In line with such principles, this paper sets out the Bermuda Monetary Authority's ("the Authority") guideline on stress and scenario testing, applied to the specificities of the Bermuda market.
- The Authority will use the results of the stress test exercise as part of the supervisory review process to assist in determining the level of capital adequacy for each institution. Such analysis can also be used as part of contingency planning to see how significant downside scenarios could require major changes to a firm's strategy.
- The paper addresses high-level principles, including board and senior management involvement, risk governance, management actions and capital and liquidity planning that may arise as a result of the stress test. Also included is a suggested standardised stress test and details around format and content related to information to be submitted to the Authority.
- The Authority will also continue to monitor international developments. In particular, the outcome of the Financial Stability Board publication to the G20 leaders during the Pittsburg Summit proposing a revision to the current Basel II Capital framework. Measures such as increasing the level and quality of minimum capital requirements over time, introducing a leverage ratio as a supplement, and harmonising the definition of capital across jurisdictions, are being considered. As such, this guidance may be revised going forward.
- Where a bank chooses to adopt the Authority's suggested standardised stress test assumptions, which are mainly aimed at the mortgage portfolio, the Authority will not require any additional scenario tests on such a portfolio. The Authority will however expect banks to report the stress test results as per Table 1 (Page 9) taking into account the materiality of their exposures. It may thus be necessary for banks to make additional assumptions especially relating to the interbank exposure, investment book, off-balance sheet exposures and any other material exposures.

## **2. GUIDANCE ON STRESS TESTING AND SCENARIO ANALYSIS**

Our guidance is derived from the Authority's Revised Framework for Regulatory Capital Assessment published in December 2008, which stipulates the following:

**a) "The Authority expects bank management to have in place procedures to undertake, review and, where appropriate, react to the results of rigorous, forward-looking stress testing that identifies possible events or cyclical changes in market conditions that could adversely impact the bank's earnings, liquidity or asset values."**

1. The Authority requires that stress tests be undertaken at least annually and that institutions develop their coverage of stress testing in a manner appropriate to their risk profile and risk appetite. The Authority expects banks to stress test their exposure to material risks, including residential and commercial mortgage portfolios, unsecured lending portfolio (including construction), investment book, interbank<sup>1</sup> exposures and off-balance sheet exposures.
2. Banks may use the suggested standardised stress test assumptions provided in Appendix II of this paper or alternatively may choose to use their own stress test assumptions, as long as they can demonstrate the robustness of their assumptions. Chosen scenarios should be based on senior management dialogue and judgment and should reflect the materiality of particular business areas and their vulnerability to changes in economic and financial conditions. Firms should also consider incorporating feedback<sup>2</sup> effects and firm-specific and market-wide reactions into stress tests. The selected scenarios should be plausible, yet present a serious challenge to profitability and capital. In order to adequately address risk concentrations, the scenario should also be firm-wide and comprehensive, covering balance sheet and off-balance sheet assets, contingent and non-contingent risks.
3. Stress testing is a forward-looking analysis technique and firms should decide how far forward to look. Firms are required, however, to provide projections of the pre- and post - stress test regulatory capital position, and the likely impact of the proposed management actions for at least three (3) years going forward. The Authority also expects firms to assume that the impact of the shock will be instantaneous, with the stress test losses expected to crystallise within the current fiscal year.

**b) "Bearing in mind the significance of property and related exposures to the local economy and the balance sheets of local banks, one scenario that management should consider would be the impact of a shock to the income stream in that sector. ...consider the impact of a sharp downturn in Bermuda's international business sector, with consequential impact on the rest of the economy and, in particular, the property sector."**

4. As part of the suggested standardised test, the Authority proposes that firms assume a 30% decrease in commercial and residential real estate prices and 35% decline in rental income.

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<sup>1</sup> For the purpose of the stress testing exercise, interbank exposure shall refer to all exposures to bank counterparties other than those already classified as either loans or investments.

<sup>2</sup> This refers to the second and any other subsequent impact of the stress test scenario.

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The institutions should also take into consideration the potential number of vacant rental units arising as a result of the increase in the unemployment rate and/or expatriates leaving the island: an escalating scale of default probabilities based on how deeply negative the equity within the loan is and liquidation costs to realise the value of collateral in times of stress. Banks are to determine their own assumed expected probabilities of defaults (PDs) under stressed conditions and should be in a position to justify such assumptions.

5. Where a firm has chosen to apply property uplift (appreciation) based on market data, the Authority will require such a firm to demonstrate that such uplift is based on reliable market data and the firm should be ready to provide further information regarding the uplift to the Authority upon request.
  6. Banks which decide to deviate from the standardised test will be required to assess the impact of deflation on the real estate sector, combined with increasing instances of defaults and escalation of the impairment charges as they relate to the mortgage book (for example, 10%, 20%, 30%, and 40% drop in real estate values combined with an increasingly severe impairment charge). Justification for the selected scenarios and approach must be provided to the Authority.
- c) **“As well as the risk-specific stress tests the Authority also expects management to undertake more general scenario testing that estimates the impact of a combination of factors at different stages in the business cycle on its ability to meet regulatory capital. These assessments need not be overly sophisticated, but should extrapolate historical events and consider a range of options as to the depth/severity of events in both the domestic market and on any material activities undertaken globally.”**
7. Stress testing should provide senior management with a consolidated view of the amount of risk the firm is or might be exposed to under the chosen stress events. Senior management should therefore be presented with information that considers the possibility of different risks materialising simultaneously, taking into account the materiality of each risk.
  8. The Authority recognises that one of the key challenges will be the availability and reliability of data for past periods of stress and the need to support and inform stress tests by historical precedents. Firms that do not have sufficient historical data to cover periods of economic downturn will need to apply conservatism to their estimates.
  9. In assessing capital adequacy, bank management needs to be mindful of the particular stage of the business cycle in which the bank is operating.
- d) **“Two major goals of stress testing are to evaluate the capacity of the institution's capital to absorb potential large losses and to identify steps it can take to reduce its risk and conserve capital. This assessment is integral to setting and evaluating the institution's risk management strategy.”**
10. Stress testing can be used as a tool to alert bank management to adverse unexpected outcomes related to a variety of risks and provides an indication of how much capital might

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be needed to absorb losses should large shocks occur. The Authority proposes that firms should operate stress testing programmes that promote risk identification and control, provide a complementary risk perspective to other risk management tools and improve capital management.

11. Board and senior management involvement is critical in ensuring the appropriate use of stress testing in a bank's risk governance and capital planning. This includes setting stress testing objectives, defining scenarios (where applicable), discussing the results of stress tests and assessing potential actions and decision-making.
  12. Stress testing practice should foster internal debate and challenge of assumptions such as the cost, risk and speed with which new capital could be raised or that risky positions<sup>3</sup> could be hedged or sold.
- e) **“The results of stress testing should be routinely communicated to senior management and, periodically, to the board of directors”.**
13. Stress testing should form an integral part of the overall governance and risk management culture of the bank. The Authority would expect the results from stress testing analyses to impact decision-making at the appropriate management level, including strategic business decisions of the board and senior management. Board and senior management involvement in the stress testing programme is essential for its effective operation.
  14. The Authority proposes that senior management take a direct interest in their firm's stress testing programme, resulting in scenario selection, where applicable, and management reporting that addresses the concerns of management. Following this, senior management can assess and adjust their view of the risks that face their firm and plan mitigating action.
  15. Outputs from stress testing should be communicated clearly and regularly to both senior management and the board. There is also the need for stress testing to have a meaningful impact on business decisions, with the board and senior management having an important role in evaluating stress test results and the impact on a bank's risk profile.
- f) **Firms should carry out stress testing on their investment book. The possible scenarios could include changes in spreads, changes in asset prices, shift in the yield curve, rating migrations and jump to default (where it is deemed probable) amongst others.**
16. It is the Authority's expectation that firms carry out stress tests in respect of their investment book. The possible scenarios could include changes in spreads, changes in asset prices, shift in the yield curve and jump to default amongst others. Firms may also consider the effect of ratings migration and could assess the impact of movement in rating categories on overall ratings and determine the impact on total capital requirements. The purpose of this test is to identify the extent to which firms' capital requirements vary during stressed conditions.

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<sup>3</sup> This refers to any position or exposure that could result in a material loss as a result of shifts in market factors such as equity prices, interest rates, foreign exchange rates, commodity prices etc. What should constitute a material exposure is left to the discretion of each individual bank but should be based on the balance sheet size, earnings and/or capital levels.

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17. As part of its Pillar II review the Authority will expect to find, in the Capital Assessment and Risk Profile (“CARP”) document and any other supporting documentation, evidence that the approach taken to interest rate risk stress testing includes all material interest rate positions of the bank and is fully consistent with the Authority’s detailed requirements (including stress testing for a 200 basis point shift in the yield curve).
18. The stress test of the investment book should also take into consideration events which may require the portfolio, including the held-to-maturity (HTM) portion, to be liquidated to meet the short-term liquidity requirements of the bank. In carrying out such a test, the bank should report any expected realised loss as a result of the likely sale in a stressed market environment.

### **3. RISK APPETITE**

- g) **“The key challenge for management is to satisfy itself, and the Authority, that it has in place comprehensive procedures for identifying, assessing and mitigating risk and ensuring that these are effectively linked into the high-level risk appetite and the capital and strategic planning processes.”**

19. The Authority expects senior management to identify and articulate their risk appetite in relation to stress test metrics and to understand the implications of stress events within this context. If such stress test scenarios are likely to result in outcomes that are outside the firm’s risk appetite, then the Authority will expect management to take mitigating actions. Senior management must also be able to present the effects of possible management action on the stress test metrics.

20. Management should also have in place comprehensive procedures for identifying, assessing and mitigating risks, and should ensure that these are effectively linked into the high-level risk appetite and the capital and strategic planning process.

### **4. MANAGEMENT ACTION**

- h) **“Where stress tests reveal particular vulnerability to a given set of circumstances, prompt steps should be taken to manage those risks appropriately (e.g., by hedging against that outcome or reducing the size of the institution’s exposures, or increasing capital).”**

21. It would be the Authority’s expectation that senior management give proper consideration to the implications of the results of the stress testing exercise. Should the results or outcomes of stress testing fall outside the firm’s risk tolerance<sup>4</sup>, then management should consider formulating a response, including raising of additional capital, revision of dividend policy, revision of limits or other management action. Institutions may choose to complement the above management actions by more traditional quantitative limits and portfolio caps, such as

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<sup>4</sup> This refers to the bank’s documented maximum level of risk or exposure that it can accept under normal market conditions taking into account its risk appetite and capital level.

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credit limits by industry, sector or country as they relate to the more vulnerable areas of the business.

22. Where the stress test results in a capital deficit, the firm will also be required to have in place policies and procedures detailing the range of remedial actions envisaged, based on the purpose, type and result of stress testing, including an assessment of the feasibility of corrective actions in stress situations. Capital deficit is to be assessed based on a minimum Tier 1 capital ratio, which is the ratio of Tier 1 capital (before capital deductions) to total risk weighted assets (RWA), of six (6) per cent under stressed conditions.
- i) **“Management should set out here briefly what action the firm/group would realistically be able to take to mitigate the potential impact of such events and over what time horizon. (This section is one that would need to be supported by detailed documentation available on request. The analysis would include financial projections forward for, say, three years based on business plans and contain detailed solvency calculations). The Authority will focus on how a firm believes it would be able to manage its business and capital in such circumstances and still meet minimum regulatory capital thresholds.”**
23. In the event that the stress test exercise results in a capital deficit, the Authority shall require the relevant institution to provide additional information. Specifically, the Authority will require additional financial projections (regulatory capital and retained earnings) for a minimum of three (3) years going forward as per Appendix I (Table 2 and Table 3).
24. The level of supervisory assessment of a bank’s submission will increase with the level of capital deficit while the documents requested by the Authority for further assessment will also depend on the level of risks emanating from the stress testing exercise.
25. The range of the proposed remedial actions should take into consideration the magnitude of the likelihood of potential stress events and should be proportionate to the severity of the impact of the stress test, the overall risk management framework and other limiting or risk mitigating policies.

## **5. CAPITAL PLANNING**

- j) **“The CARP procedures should provide an insight into the capital planning implications of the stress testing analysis and how these affect: the structure of the capital base (between Tiers 1 and 2), and the distribution of capital around the group – including the transferability of capital in times of stress and any barriers that exist (for instance on upstreaming dividend payments; or where capital amounts are “locked-in by other regulators’ minimum requirements; or would be reduced by tax).”**
26. Banks under their CARP should examine future capital resources and capital requirements under adverse scenarios. In particular, the results of forward-looking stress testing should be considered when evaluating the adequacy of a bank’s capital buffer.

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27. Capital adequacy should be assessed under stressed conditions against a variety of capital ratios including regulatory capital ratios, as well as ratios based on the bank's internal definition of capital resources.
28. Stress testing should also be a central tool in identifying, measuring and controlling funding liquidity risks, in particular for assessing the bank's liquidity profile and the adequacy of liquidity buffers in case of both bank-specific and market-wide stress events.<sup>5</sup>
29. A bank's capital and liquidity plan should take into consideration the results of the stress test exercise and should form part of the CARP submission. Senior management should also consider the relationship between liquidity and capital.
- k) **“A sound and effective governance structure is the foundation for an accurate assessment of an institution's risk profile and how best this can be managed in relation to the adequacy of its current and future capital position and strategic business plan. An assessment of the robustness of the governance and capital planning arrangements in place is a major factor in determining the eventual regulatory capital requirement set by the Authority under the new Pillar 2 framework.”**
30. A bank should have a sufficiently detailed strategic plan that clearly outlines the bank's capital position. Senior management should also have an effective framework for assessing the various risks facing the business and relating those risks to the bank's capital needs. Banks should also incorporate any strategic or cyclical risks inherent in their business model into their capital planning process.
31. The Authority requires that banks evaluate their capital adequacy relative to their risks; and should consider the potential impact of severe stress test events on their capital position. The Authority also requires management to explain which scenario (if different from the suggested standardised stress test assumption as per Appendix II) it has taken as its “central” scenario for the purposes of its capital planning. Further, the Authority will also expect firms to share their views on how they plan to manage their financial resources through the adverse circumstances stressed.

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<sup>5</sup> See also, Principles for Sound Liquidity Management and Supervision, Basel Committee on Banking Supervision, September 2008.

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## 6. APPENDIX I: STRESS TEST RESULTS AND FINANCIAL PROJECTIONS

### a) Summary of Stress Test Results

Table 1 below is a suggested template for presenting the results of the stress testing exercise. The Authority requires banks to follow the same or a similar format when presenting the summary of their stress test results.

The current balance should be based on the most recent financial year-end results while financial projections should be provided under a base case scenario<sup>6</sup>, supported by adequate assumptions to justify projected numbers. The impact of the stress test scenario (shock) is assumed to be instantaneous. All results should be presented for both the parent and the consolidated entity.

**Table 1: Summary results of the stress test scenario**

<i>Amounts in millions</i>	<b>Current Balance</b>	<b>Projections (base case)</b>		
		<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
<b>Pre-stress test</b>				
Total (net) regulatory capital	XXX	XXX	XXX	XXX
Tier 1 capital (before capital deductions)	XXX	XXX	XXX	XXX
Risk Weighted Assets (RWA)	XXX	XXX	XXX	XXX
Risk Asset Ratio (RAR) <sup>7</sup>	XX%	XX%	XX%	XX%
Tier 1 RAR (before deductions)	XX%	XX%	XX%	XX%
<b>Stress test</b>				
Losses arising from stress test scenario				
Residential mortgage	XXX			
Commercial mortgages	XXX			
Unsecured lending (including construction)	XXX			
Other retail loans	XXX			
Interbank exposure	XXX			
Investment book	XXX			
Off-balance sheet exposures	XXX			
<b>Total losses arising from the stress test scenario</b>	<b>XXX</b>			
<b>Post-stress test</b>				
Total (net) regulatory capital minus losses arising from stress test scenario	XXX	XXX	XXX	XXX
RWA post-stress test losses	XXX	XXX	XXX	XXX
Stressed RAR	XX%	XX%	XX%	XX%
Capital required to get to the minimum Tier 1 stressed RAR (6.0%)	XXX	XXX	XXX	XXX
<b>Management actions</b>				
Raising of additional capital	XXX	XXX	XXX	XXX
Revision of dividend policy	XXX	XXX	XXX	XXX
Revision of Limits	XXX	XXX	XXX	XXX
Other management action	XXX	XXX	XXX	XXX
<b>Additional Capital Required</b>				
RAR post- management actions	XX%	XX%	XX%	XX%
Tier 1 RAR post- management actions	XX%	XX%	XX%	XX%

<sup>6</sup> The base case may be adjusted to take into consideration the stressed market conditions and any relevant strategy which the bank could take in response to the stressed market conditions.

<sup>7</sup> Refers to the ratio of total (net) regulatory capital to total risk weighted assets (RWA). The total (net) regulatory capital to total RWAs should be computed as per BMA guidance on completion of the Prudential Information Return for banks issued in December 2008.

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- In determining the target capital position, the focus should be on the Tier 1 capital ratio. The Authority requires that consideration be given to the capital structure rules under the *Revised Framework for Capital Assessment* published in December 2008 when determining the capital level required to get to the minimum Tier 1 stressed Risk Asset Ratio<sup>8</sup>.
- The term “Tier 1 capital ratio” as used in this paper shall refer to the ratio of Tier 1 capital (before deductions) to total risk weighted assets computed as per the BMA guidance on completion of the Prudential Information Returns for banks issued in December 2008.
- The term “capital structure rules” shall refer to those rules relating to limits on various tiers of capital and on subordinated term debt as per the BMA’s *Revised Framework for Regulatory Capital Assessment* published in December 2008. The Basel Committee on Banking Supervision (BCBS) consultative document on how to strengthen the resilience of the banking sector (“*Strengthening the resilience of the banking sector*”) issued on 17<sup>th</sup> December 2009 is however likely to result in changes in these capital rules. Specifically, the BCBS proposals are aimed at raising the quality and consistency of the capital base and on introducing a series of measures to promote the build-up of capital buffers in good times that could be drawn upon in periods of stress. The final BCBS capital rules will be published by the end of this year (2010) and the Authority will likely amend its policy thereafter.
- The Authority requires banks to include in their stress tests all their **material** off-balance sheet exposures, including but not limited to those reported in the quarterly Prudential Information Returns. Specifically, banks should also take into account any material off-balance sheet exposures which are not fully reflected in the PIR as a result of the use of credit conversion factors (CCFs). In addition, to the extent that an off-balance sheet exposure may pose a material reputational risk to the bank, such exposure also needs to be stressed.
- The basis for assessing the estimated losses arising from the stress test of interbank exposure shall be left to the discretion of the individual banks. The stress test should however take into account the underlying characteristics of the individual exposures and all the material sources of risks, which could include possible default by the counterparties and adverse changes in the valuation of securities as result of movements in the market factors.
- Banks are advised to make realistic assumptions regarding the recovery period under the bank’s base case scenario but while also taking into account any possible feedback effects resulting from the stress test event. Any assumptions made may be subject to a review by the Authority.

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<sup>8</sup> This refers to the proportion of post stress test Tier 1 regulatory capital (before capital deduction) to post stress test risk weighted assets (RWA).

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b) Financial Projections

The Authority will require the projection of the regulatory capital (Table 2) and the projection of the movement in retained earnings (Table 3) for a minimum of three (3) years going forward from firms reporting a capital deficit as a result of the stress test exercise. The projections should be provided under the base case scenario and should be consistent with the institution's specific forward-looking business plan. The current balance should be based on the most recent audited financial year-end results. The results should be presented for both the parent and the consolidated entity.

▪ Regulatory Capital

Table 2 below is a template for the presentation of the projected regulatory capital.

**Table 2: Projection of regulatory capital (base case)**

<i>Amounts in millions</i>	<b>Current Balance</b>	<b>Projections</b>		
		<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
<b>Tier 1 capital</b>				
Ordinary shares	XXX	XXX	XXX	XXX
Share premium account	XXX	XXX	XXX	XXX
Perpetual non-cumulative preferred shares	XXX	XXX	XXX	XXX
Retained earnings at the end of the year	XXX	XXX	XXX	XXX
Others	XXX	XXX	XXX	XXX
<b>Total Tier 1 capital</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>
<b>Tier 2 capital</b>				
Subordinated debt (eligible for inclusion)	XXX	XXX	XXX	XXX
General provisions (eligible for inclusion)	XXX	XXX	XXX	XXX
Others	XXX	XXX	XXX	XXX
<b>Total Tier 2 capital</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>
Other adjustments	XXX	XXX	XXX	XXX
<b>Total Tier 1 and 2 capital</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>
<b>Total Tier 3 capital</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>
<b>Total (net) regulatory capital</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>

▪ Retained Earnings

Table 3 below is a template for presentation of the projected movement in retained earnings.

**Table 3: Projection of retained earnings (base case)**

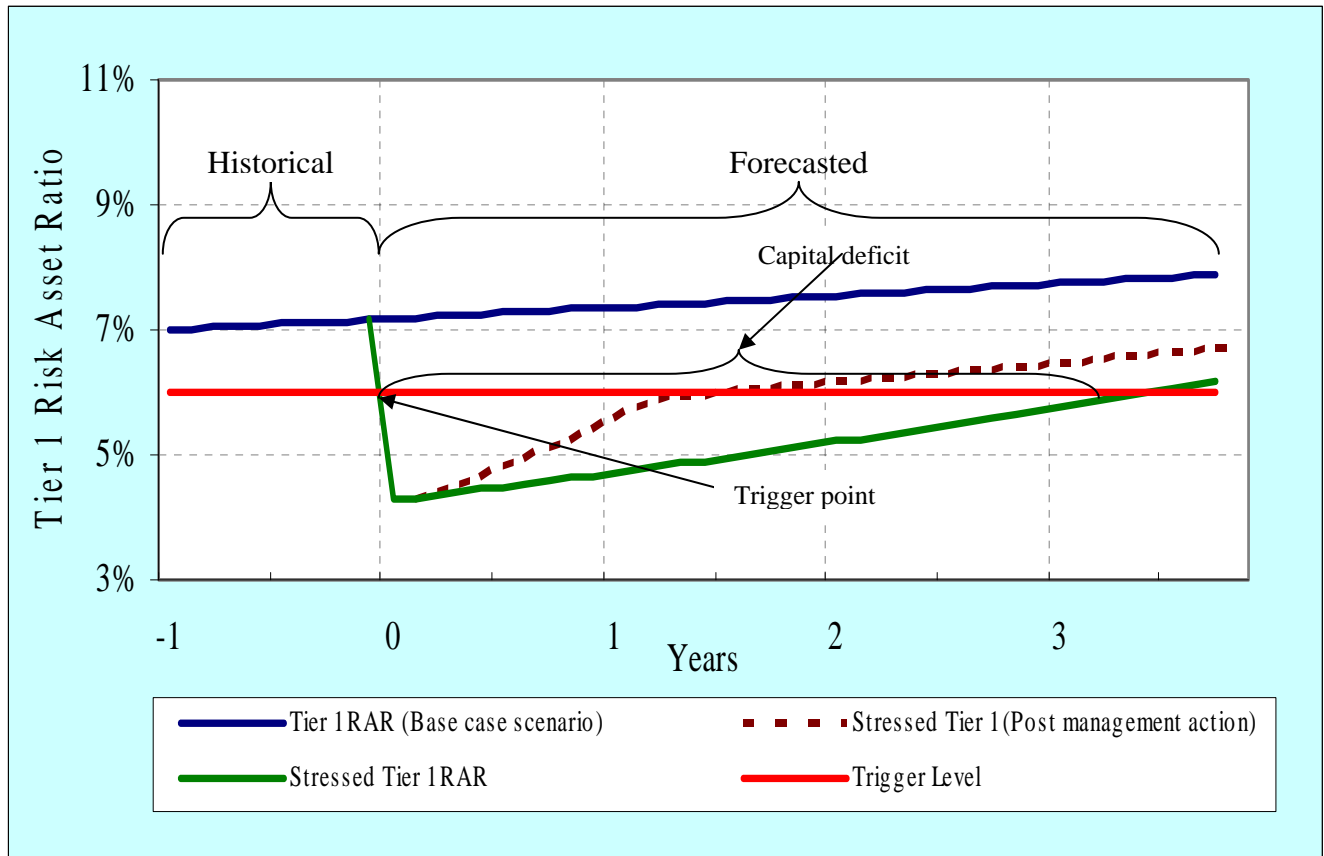
<i>Amounts in millions</i>	<b>Current Balance</b>	<b>Projections</b>		
		<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
Retained earnings at the beginning of the year	XXX	XXX	XXX	XXX
Net interest income	XX	XX	XX	XX
Non-interest income	XX	XX	XX	XX
Non-interest expenses	XX	XX	XX	XX
Others components of profit and loss statement (including income from off-balance sheet positions)	XX	XX	XX	XX
<b>Net profit and loss</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>
Other adjustments (eg, dividends)	XXX	XXX	XXX	XXX
<b>Retained earnings at the end of the year</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>	<b>XXX</b>

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c) Capital Position

Figure 1 below shows an example of the relationship between the stressed Tier 1 RAR and Base Tier 1 RAR. Where the stressed Tier 1 RAR falls below the trigger level (based on Tier 1 RAR) of 6%, the Authority will require the entity to provide additional information to the Authority (including the projections as per Table 2 and Table 3) and to clearly articulate the proposed management actions to ensure that the entity is returned into compliance with the required minimum stressed Tier 1 capital ratio of 6%.

**Figure 1: An Example of Potential Capital Position**



- When a firm is projecting its available capital and required capital resources under the severe stress test scenario, the gross effect of the stress test on the firm’s position may be offset by the mitigating effects of any realistic management actions, to arrive at a net impact.
- Where a firm’s stressed Tier 1 RAR falls below the trigger level of 6% over the time horizon, the relevant firm will be required to put in place management actions to return the capital position (based on the stressed Tier 1 ratio) to above the trigger level (point). The Authority will discuss with the firm the proposed management actions needed to ensure that they remain compliant with the requirement to maintain adequate financial resources.

**7 APPENDIX II: SUGGESTED STANDARDISED STRESS TEST ASSUMPTIONS**

Background

In coming up with the following assumptions, the Authority took into consideration the comments received from the Bermuda Bankers Association Credit Sub-Committee, the assumptions in use by other regulators - in particular the most recent stress testing exercises that were performed in Europe<sup>9</sup> and the US<sup>10</sup> as well as Bermuda-specific factors.

Key Macroeconomic Drivers

The Authority suggests the use of the following macroeconomic drivers:

- Decline in commercial and residential real estate prices
- Increase in unemployment rate, which should also encompass international business and/or expatriates leaving the island
- Decline in rental income, including consideration of a significant increase in the number of vacant rental properties
- Reduction in personal and/or corporate income

In addition, the Authority will expect further consideration related to drivers that are expected to have an impact on the investment and the interbank books, such as interest rate, equity price and rating migrations. The impact of the unsecured portfolio, if material, also needs to be considered.

Banks should also take into account the impact of concentration of income sources, used to service mortgages, on the default rates during times of stress. Specifically, banks should consider the likely increase in default rates, during times of stress, for borrowers with multiple rental properties supporting one or more mortgages. The Authority also recommends that banks take into consideration the potential number of vacant rental units arising as a result of the increase in the unemployment rate and/or expatriates leaving the island.

Banks should provide, as part of their stress testing exercise, detailed analysis as to how the macroeconomic parameters translate into specific shocks to the individual portfolio of the bank.

Suggested Shocks

The following table summarises the proposed assumptions to be applied by banks in carrying out their stress testing exercise.

<b>Driver</b>	<b>Shock</b>
Commercial and residential real estate price decline	30%
Unemployment rate	12%
Rental income decline	35%

In addition, the Authority would expect banks to demonstrate their assumptions around shocks that would impact the unsecured portfolio, investment and interbank books.

<sup>9</sup> Committee of European Banking Supervisors (CEBS), Press Release on the Result of the EU-wide Stress Testing Exercise, 1 October 2009.

<sup>10</sup> Board of Governors of the Federal Reserve System, The Supervisory Capital Assessment Program: Design and Implementation, April 24, 2009.

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**8. APPENDIX III: INFORMATION REQUIREMENT**

- a) Banks must explain and justify the methodology and assumptions used (if different from those suggested by the Authority in Appendix II) and the results of the assessment. Assumptions should also be justified in line with historical performance.
- b) Banks should provide detailed analysis of how the macroeconomic parameters have been translated into specific shocks to the individual portfolio of the bank.
- c) A firm should project both its capital resources and its required capital resources over a period of at least three (3) years, taking into account its business plan and the impact of the relevant adverse scenario. The capital plan should include a base case, based on the firm's expected business plan.
- d) Banks should explain the rationale for the selected management actions intended to maintain or restore the firm's capital adequacy. These could include raising additional capital, restricting dividend payment, reducing the size of the balance sheet and any other realistic management actions. The firms should also provide a quantitative analysis of the impact of the proposed management actions. The timing of the proposed actions should also be provided.
- e) Banks are required to provide projections (based on the base case scenario) for at least three (3) years in respect of the net regulatory capital, Tier 1 capital, Risk Weighted Assets (RWA), Risk Asset Ratio (RAR) and Tier 1 RAR. The immediate and projected impact of the proposed management actions should also be provided as part of the summary results of the stress test and should be reported as per Table 1- Appendix I.
- f) Banks are required to report the losses arising from the stress test scenario in respect to the following: residential mortgages, commercial mortgages, unsecured lending (including construction loans<sup>11</sup>), interbank exposures, investment book, and off-balance sheet exposures. The impact of the stress test scenario should be assumed to be instantaneous and all the stress test losses should be reported in the current fiscal year. This should form part of the summary results of the stress test scenario and should be reported as per Table 1- Appendix I.
- g) Banks reporting a capital deficit as a result of the severe stress test scenario will be required to provide the projection of Tier 1, Tier 2 and Tier 3 regulatory capital together with their components as per Table 2- Appendix I.
- h) Banks reporting a capital deficit as a result of the severe stress test scenario are required to provide a projection of the movement in the retained earnings for at least three (3) years. The reconciliation should, in particular, show the impact to net profit or loss and other adjustments. The firm should also disclose the projected net interest income, non-interest income, non-interest expenses, and the net impact of any other component of the profit and loss statement

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<sup>11</sup> Construction loans refer to loans to all areas of the construction industry, including materials and labor. Both commercial and residential construction financing falls under this category.

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(including income from off-balance sheet positions) and all these should be presented as per Table 3 in Appendix I.

- i) Banks are expected to provide estimates of non-performing loans and provisions for bad and doubtful debt for the relevant projection period.
- j) Banks should provide stressed values related to the investment book on a mark-to-market basis, where losses are fully captured.
- k) Banks are required to provide information on their current distribution (outstanding amounts) of residential and commercial mortgages by loan-to-value (LTV) and, **where data availability allows, by age of the loan**. The commercial mortgages should be reported separately from the residential mortgages. The Authority proposes that the following format be used when reporting the data.

LTV (%)	Age of the Loan (Years since origination)							Total Exposure	Weighted Average LTV
	<1	1-2	2-3	3-4	4-5	5-6	>6		
<50									
50-60									
60-70									
70-80									
80-90									
90-100									
>100									
Total in BD\$ '000									

- l) Banks should also provide information on the age distribution of their residential and commercial mortgages (outstanding balance) by loan type on a **“best effort basis”**. The Authority recommends that the following format be used when reporting such data.

Age (years)	Residential mortgages			Commercial Mortgages			Total
	Occupied by the owner	Rented out	Subtotal	Occupied by the owner	Rented out	Subtotal	
<1							
1-2							
2-3							
3-4							
4-5							
5-6							
>6							
Total in BD\$ '000							

- m) To the extent that the transferability of resources affects the assessment of resources required by each member of the relevant group, a firm should explain how it has satisfied itself that resources are transferable between members of the group in question under the severe stress test case.