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BERMUDA MONETARY AUTHORITY

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GUIDELINES ON THE ENHANCEMENT OF STRESS TESTING IN THE CAPITAL ASSESSMENT AND RISK PROFILE (CARP) FOR BERMUDA'S BANKING SECTOR

APRIL 2014

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I. EXECUTIVE SUMMARY

1. The aftermath of the 2008 international financial crisis continues to impact the development of risk management practices in the banking sector, including stress and scenario testing analysis, and in particular the ability to properly identify, quantify and monitor the vulnerability of individual banks to severe but plausible shocks.

2. The Basel Committee on Banking Supervision, in an effort to address the issues identified during the crisis issued the "Principles for sound stress testing practices and supervision" paper in May 2009. In February 2010 the Bermuda Monetary Authority ("the Authority") issued its first guidance on capital stress testing. That guidance set out comprehensive standards related to sound governance, and the design and implementation of stress testing programmes at banks. In line with the Basel principles, the Authority's paper incorporates an enhanced approach to stress testing that further integrates results into a bank's Capital Assessment and Risk Profile ("CARP"). This enhancement produces a more robust capital analysis and corresponding Pillar II requirement that is more reflective of the bank's risk profile.

3. **The Authority seeks to enhance the supervisory review process by establishing additional stress testing as a standalone requirement to assess post stress capital adequacy. The Authority will also analyse the stress test results to determine if a capital add-on is required under Pillar II. A capital add-on maybe required when stress test results reveal that an actual credit risk is inherent in the bank's loan and investment book. This will assist in determining a more risk-focused level of capital adequacy for each bank. Such analysis can also be used as part of a bank's contingency planning to determine how persistent adverse economic scenarios could require changes to a bank's strategy.**

4. This Paper addresses high-level principles, including Board and senior management involvement, risk governance and oversight, and management actions that may arise as a result of the capital assessment and stress test process. Also included (See Appendices) is a standardised stress test that should be viewed as a regulatory minimum with most of the Pillar II focus being placed on a bank's specific stress scenarios and the demonstrated linkage of those scenarios to the key loss drivers such as Probability of Default (PD), Loss Given Default (LGD) and Expected Loss (EL).

5. The Authority will also continue to monitor international regulatory and macro-prudential developments, in particular, the Basel III capital framework implementation and further enhancements to stress testing methodologies. Measures such as increasing the level and quality of minimum capital requirements over time, the imposition of various capital buffers, introducing a leverage ratio as a supplement, and harmonising the definition of capital across jurisdictions, are being phased in and will impact this guidance in the future.

6. Consistent with current international best practice, the Authority will expect banks to create a sustainable process for integrating its stress testing framework into their capital assessment and strategic planning activities.

7. While these Guidelines address the content of the annual stress testing and capital assessment submission to the Authority as part of the CARP requirement, all banks are asked to perform stress testing more frequently and required to embed this practice into their risk management program.

II. 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 provides the foundation for the following principles and required actions:

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.

8. The Authority will require all banks to clearly report stress test results. The report should take into account all material exposures impacting capital and demonstrate the impact of the selected stressors on the bank's capital position. It may therefore be necessary for banks to make additional assumptions relating to the interbank exposures, investment books, off-balance sheet exposures and any other material exposures.

9. The Authority also requires that stress tests be undertaken at least annually and that banks implement stress testing in a manner appropriate to their risk profile and approved risk appetite.

10. Banks must develop, disclose and be ready to defend the rationale for their stress test assumptions. Chosen scenarios should evidence senior management dialogue and judgment and should reflect the materiality of particular business areas and their vulnerability to changes in economic and financial conditions.

11. The selected scenarios should be plausible, yet present a serious challenge to profitability and capital adequacy. In order to completely address risk concentrations, the scenario should also be bank-wide and comprehensive (on a consolidated and unconsolidated basis), covering balance sheet and off- balance sheet assets, contingent and non-contingent risks with appropriate and logical credit risk conversions for purposes of estimating PD, LGD and EL.

12. Stress testing is a forward-looking risk analysis technique and banks should decide how far forward to look. Banks are required, however, to provide projections of their pre- and post- stress test regulatory capital position and the likely impact of the proposed management actions for at least two (2) years going forward. The Authority also expects banks to assume that the impact of the shock will be instantaneous, with the stress test losses expected to materialise within the current fiscal year.

b. Bearing in mind the significance of property and related exposures to the Bermuda economy and the balance sheets of local banks, management must continue to address the impact of a shock to the income stream in that sector and consider the impact of a sharp downturn in Bermuda's international business sector, with consequential impact on the rest of the economy.

13. As part of the suggested stress test, the Authority proposes that banks assume a persistent decrease in commercial and residential real estate prices and flat rental income. Banks should also take into consideration the potential number of vacant rental units arising as a result of a continuous elevated unemployment rate and/or flow of expatriates leaving the island: an escalating scale of default

probabilities based on how deeply eroded the equity within the loan book is and market transaction supported liquidation costs to realise the value of collateral in times of stress. Banks are to determine their own assumed expected PD under stressed conditions, taking into account the impact of current PD levels and should be in a position to persuasively support such assumptions.

14. Where a bank has chosen to apply property appreciation based on observed market data, the Authority will require the bank to demonstrate that such adjustment is based on verifiable market data supported by comparable transactions. The bank should also be ready to provide all information regarding the adjustment to the Authority upon request.

15. Banks which decide to rely on an internal scenario will be required to assess the impact of persistent deflation on the residential and commercial real estate sector, combined with increasing instances of defaults and escalation of impairment charges as they relate to the mortgage book (for example, a drop in the value of indicators affecting real estate values that is sufficiently severe yet plausible). 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 dynamic 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 on a sustainable basis. These assessments need not be overly sophisticated, but should extrapolate historical events and consider a range of options that include the depth/severity of events in both the domestic market and on any material activities undertaken globally.

16. Stress testing should provide senior management and the Board with a consolidated view of the amount of capital risk the bank is expected to be exposed to under the chosen stress events. Senior management and the Board should also therefore be presented with information that considers the impact of different risks materialising simultaneously, taking into account the correlation and severity of each risk.

17. 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. Banks that do not have sufficient historical data to cover a full economic downturn cycle will need to apply inherent conservatism to their estimates and extrapolations.

d. Two major goals of stress testing are to evaluate the capacity of the bank's capital to absorb potential material losses and to identify steps to reduce economic risk and conserve capital. This assessment is integral to evaluating the bank’s risk management strategy.

18. Stress testing should 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 be needed to absorb losses should severe, yet plausible shocks occur. The Authority proposes that banks should operate stress testing programmes that promote comprehensive risk identification and control, provide a heightened risk perspective to other risk management actions and improve the overall quality of capital management.

19. Board and senior management involvement is critical to 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 and challenging the results of stress tests and assessing potential actions.

20. The stress testing process should foster robust internal debate and provide a forum for a credible challenge of key assumptions such as the cost, risk and speed with which new capital could be raised or risk assets reduced or mitigated.

e. The results of stress testing should be actively monitored by senior management and the Board of directors.

21. 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 is essential to effectively deploy and integrate stress testing into the bank's risk management framework.

22. The Authority expects that senior management will take a direct interest in the stress testing programme by providing oversight of the scenario selection and ensuring a level of management reporting that addresses all identified concerns. Following this, senior management can assess and adjust their view of the risks that the bank faces and plan mitigating action.

23. Outputs from stress testing should be communicated clearly and regularly to both senior management and the Board. Stress testing should also 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 the bank's risk profile.

f. Banks should apply stress testing to their investment book. The possible scenarios could include changes in credit spreads, shifts in the yield curve, adverse rating migrations and jump to default (where it is deemed probable), amongst others.

24. The Authority expects banks to carry out stress tests on their investment book. While not specifically prescribing an estimation method, it is expected that banks will identify key common risk drivers and incorporate them into their scenarios. Banks may also consider the effect of ratings migration and could assess the impact of movement in rating categories on total capital requirements. The loss estimation technique employed must provide sufficient granularity to ensure that the impact of the risk drivers on the investment book is evident.

25. As part of its Pillar II review the Authority will expect that each CARP document and any supporting documentation, reflect appropriate stress testing of interest rate risk and provide evidence that all interest sensitive positions are included in the analysis. The Authority will continue to utilise an adverse and instantaneous 200 basis point yield curve shock as the Supervisory Baseline and encourages the use of more risk-focused yield curve shocks appropriate to the asset and liability profile of the individual bank.

III. RISK APPETITE

g. The key challenge for management is to demonstrate that it follows comprehensive procedures for identifying, assessing and mitigating risk and ensuring that these risks are effectively linked to the bank's high-level risk appetite and capital and strategic planning processes.

26. The Authority expects senior management to identify and articulate its risk appetite in the context of a stress test framework and to understand the implications of stress events on its capital adequacy. If such stress test scenarios are likely to result in outcomes that are outside the bank's risk appetite, then the Authority will expect management to take corrective actions. Senior management must also be able to present the effects of possible management action on the stress test results with the Board providing credible challenge and oversight to the plausibility and suitability of such actions.

27. Management should also utilise comprehensive procedures for identifying, assessing and mitigating risks, and should ensure that these procedures are effectively linked to the bank's high-level risk appetite and capital and strategic planning process.

IV. 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 bank's exposures and/or increasing capital).

28. The Authority expects that senior management and the Board will give proper consideration to the implications of the stress testing results. Should the stress test results or outcomes fall outside the bank's risk tolerance, management must formulate a response. The response may include raising of additional qualifying equity capital, restriction of dividends, revision of other limits impacting capital or other prompt corrective action. Banks may choose to complement these management actions through quantitative limits and portfolio caps, business dispositions and economic risk transfers. Any action taken must be clearly articulated with specified timeframes, acceptable to the Authority, for restoring an adequate level of capital to offset the impact of the stress.

29. Where the stress test results in a capital deficit, the bank will be required to implement policies and procedures detailing the range of prompt 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. Any capital deficit is to be assessed based on a Common Equity Tier 1 (CET1) capital ratio, which is the ratio of CET1 (before capital deductions) to total risk weighted assets (RWA), of seven per cent under stressed conditions.

i. Management should set out what action the bank/group would realistically be able to take to mitigate the potential impact of such events and over what time horizon. (This section would need to be supported by detailed documentation to be made available on request. The analysis would include financial projections (for example three years) based on the bank's business plan and contain detailed calculations). The Authority will focus on the probability that a bank would be able to manage its business and capital in such circumstances and

continue to meet minimum regulatory capital thresholds.

30. In the event that the stress test exercise results in a capital deficit, the Authority shall require the relevant bank to provide additional financial projections (CET 1 and regulatory capital, RWA and retained earnings) for a minimum of three (3) years going forward as per Appendix I – Tables 2 and 3.

31. Overall intensity of supervision will increase with the level of the capital deficit indicated. Accordingly, any submitted documentation must address measures to eliminate the indicated deficit in both a complete and timely manner.

32. The range of the proposed remedial actions should take into consideration the magnitude, severity and duration of the potential stress events and should be proportionate to those results of the stress test. In addition, the overall risk management framework and specific risk mitigating policies should be evident in these action steps.

V. CAPITAL PLANNING

j. The CARP procedures should provide specific insight into the implications of stress testing analysis on capital planning and how these affect the adequacy of the capital base and the distribution of capital around the group. In particular these implications may include the impact of capital transferability in times of stress and capital barriers that may exist (e.g. due to up-streaming dividend payments, or capital amounts "ring-fenced" by other regulators', or capital reductions due to a transfer tax).

33. Within each CARP submission management and the Board should examine future capital resources versus capital requirements under stressed scenarios. In particular, the results of forward-looking stress testing should always be considered when evaluating the adequacy of a bank's capital buffer.

34. 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.

35. Stress testing must constitute a central tool in identifying, measuring and controlling capital and liquidity risks, in particular for assessing the resiliency of the bank's liquidity profile and the adequacy of its liquidity buffers in case of both bank-specific and market-wide stress events.

36. All capital and liquidity plans should take into consideration the results of the stress test exercise and should form an integral part of the CARP submission. Senior management and the Board should also monitor and assess the dynamic relationship between liquidity and capital.

k. A sound and effective governance structure is necessary for a bank to conduct an accurate assessment of its risk profile and essential to sustaining an appropriate capital adequacy position. The Authority's assessment of the effectiveness of the governance and capital planning arrangements in place is a major factor in determining the regulatory capital

requirement set under the Pillar 2 framework.

37. A bank should have a sufficiently detailed strategic plan that clearly outlines the bank's current and projected capital position, consistent with Basel III. Senior management and the Board should also have an effective framework for assessing and providing oversight around the various risks facing the business and relating those risks to the bank's capital needs. Banks should also incorporate any strategic or other material risks inherent in their business model into their capital planning process.

38. The Authority requires that banks evaluate their capital adequacy relative to incurred risks; and should conduct ongoing analysis of the impact of severe stress test events on its capital position. The Authority also requires management to explain the rationale for the scenario it has taken as its "central" scenario for the purposes of its capital planning. Further, the Authority will also expect banks to share their views on how they plan to manage their overall financial resources through the stressed time horizon.

VI. APPENDIX I: STRESS TEST RESULTS AND FINANCIAL PROJECTIONS

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, 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 solo and the consolidated entity**.

In this section the Authority will require that all RWA computations be subject to the following risk weighting floors:

Performing Residential Mortgages – 50%

Performing Commercial Mortgages – 100%

All Past due loans – 150% or 100% if LTV<=80%

Troubled Debt Restructurings (TDRs) – 100% (if performing in accordance with modified terms)

In addition, any assets that are fully deducted from a bank's capital base will not be subject to stress testing and should be noted as such for reconciliation purposes.

Table 1: Summary results of the stress test scenario

	Current	Projections (base case)		
		Year 1	Year 2	Year 3
Pre-stress test				
Common Equity Tier 1 Capital (CET1)	XXX	XXX	XXX	XXX
Total Capital (TC)	XXX	XXX	XXX	XXX
Risk Weighted Assets (RWA)	XXX	XXX	XXX	XXX
CET1 Ratio	**XX%**	**XX%**	**XX%**	**XX%**
TC Ratio	**XX%**	**XX%**	**XX%**	**XX%**
Stress test				
Losses arising from stress test scenario				
Residential mortgages	XXX			
Residential mortgages liquidation cost	XXX			
Commercial mortgages	XXX			
Commercial mortgages liquidation cost	XXX			
Unsecured lending	XXX			
Other retail loans	XXX			
Past due loans	XXX			
TDRs	XXX			
Claims on Sovereigns	XXX			
Claims on PSE	XXX			
Claims on Corporates	XXX			
Claims on Banks	XXX			
Equities, Mutual funds and others	XXX			
Off-balance sheet exposures	XXX			
Total losses arising from the stress test scenario	**XXX**			
Post-stress test				
RWA				
Residential mortgages	XXX	XXX	XXX	XXX
Commercial mortgages	XXX	XXX	XXX	XXX
Past due loans	XXX	XXX	XXX	XXX
Claims on Sovereigns, PSE, Corporates, Banks, etc.	XXX	XXX	XXX	XXX
Other Balance Sheet Exposures	XXX	XXX	XXX	XXX
Total RWA	XXX	XXX	XXX	XXX
Capital				
Stressed CET 1	XXX	XXX	XXX	XXX
Stressed CET1 Ratio	XX%	XX%	XX%	XX%
Capital required to get to the minimum CET1 (7.0%)	XXX	XXX	XXX	XXX
Management actions				
Raising of additional capital	XXX	XXX	XXX	XXX
Revision of dividend policy	XXX	XXX	XXX	XXX
Other management actions (please describe)	XXX	XXX	XXX	XXX
Additional Capital Required	**XXX**	**XXX**	**XXX**	**XXX**
CET1 post- management actions	XX%	XX%	XX%	XX%
TC post- management actions	XX%	XX%	XX%	XX%

a. In determining the target capital position, **the focus should be on the CET 1 capital ratio**. The Authority requires that consideration be given to the capital structure rules under the Basel III framework, which we intend to adopt formally in 2015.

b. The BMA is in the process of implementing a framework from the Basel Committee aimed at raising the quality and consistency of the sector's capital base and introducing a series of measures to promote the build-up of capital buffers that could be drawn upon in periods of stress. The final Basel III capital rules will be published toward the end of this year and the Authority will implement these rules thereafter. For purposes of this stress testing section we have decided to use the fully phased in CET1 measure with the appropriate capital conservation buffer.

c. The Authority requires banks to include all material off-balance sheet exposures in their stress testing, including but not limited to those reported in the quarterly Prudential Information Return (PIR). Specifically, banks should also take into account any material off-balance sheet exposures which are not fully reflected in the PIR but that can be estimated and included via an established credit conversion factor. In addition, to the extent that an off-balance sheet exposure may pose a material reputational or business-strategic risk to the bank, such exposure also needs to be stressed.

d. The basis for assessing the estimated losses arising from the stress test of interbank exposures must take into account the underlying characteristics of the individual exposures and all the material components of risk, which could include potential default by counterparties and adverse changes in the valuation of pledged collateral securities as a result of movements in market factors.

e. Banks are advised to incorporate realistic assumptions regarding the recovery period under the bank's base case scenario while also taking into account any possible lingering effects resulting from the stress test event. Any assumptions made will be subject to careful review by the Authority.

Financial Projections

The Authority will require the regulatory capital projection (Table 2) and the = movement in retained earnings projection (Table 3) for a minimum of three (3) years going forward from banks 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 bank'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.

a. Regulatory Capital

Table 2: Projection of regulatory capital (base case)

	Current	Projections		
		Year 1	**Year 2**	**Year 3**
Common Equity Tier 1 (CET1) capital				
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
Total CET1 capital	**XXX**	**XXX**	**XXX**	**XXX**
Tier 2 capital				
Subordinated debt (eligible for inclusion)	XXX	XXX	XXX	XXX
General provisions (eligible for inclusion)	XXX	XXX	XXX	XXX
Others	XXX	XXX	XXX	XXX
Total Tier 2 capital	**XXX**	**XXX**	**XXX**	**XXX**
Other adjustments	XXX	XXX	XXX	XXX
Total regulatory capital	**XXX**	**XXX**	**XXX**	**XXX**

b. Retained Earnings

Table 3: Projection of retained earnings (base case)

	Current	Projections		
		Year 1	**Year 2**	**Year 3**
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	XX	XX	XX	XX
(including income from off-balance sheet positions)				
Net profit and loss	**XXX**	**XXX**	**XXX**	**XXX**
Other adjustments (e.g., dividends)	**XXX**	**XXX**	**XXX**	**XXX**
Retained earnings at the end of the year	**XXX**	**XXX**	**XXX**	**XXX**

Capital Stress Testing Templates

The Authority has created specialised templates for banks to report the specific stress testing results by asset type with disclosure of the EL and adjusted RWA now being required.

We have illustrated the templates in the following pages and will provide the actual input portion of the spreadsheets upon request. The Authority seeks to standardise the manner in which banks report their stress testing results to inform its analysis of sector-wide risk levels and trends. These templates will be critical for the Authority in its parallel analysis of each bank’s stress testing results and we ask that they be completed diligently and reviewed by senior risk and/or finance managers prior to submission.

The **first template** is the Loan to Value (LTV) and Vintage breakout for both the residential and commercial loan books and is the same as previously requested;

LTV (%)	Age of the loan (Years since origination – Vintage)							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									

The **second template** is the age distribution of the residential and commercial mortgages by loan type and is the same as previously requested;

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							
5-6							
>6							
Total in BD$ '000							

The **third template** requests a breakout of the investment book (bonds) (all AFS, HTM and liquidity portfolios) by credit grade utilising a rating agency credit grade scale. The same template is **requested also for claims other than bonds**.

Bonds	Balance (in millions), Duration (years), PD (%) and Credit Spread (%)					
Ratings	Sovereigns	PSE[1]	Corporates	Banks (<3 months)	Banks (>3 months)	Securitisations
AAA						
AA+						
AA						
AA-						
A+						
A-						
BBB+						
BBB						
BBB-						
BB+						
BB						
BB-						
B+						
B						
B-						
Below B-						
Unrated						
High Quality MDB[2]						
Total						

[1] Public Sector Entities

[2] Multilateral Development Banks

VII. APPENDIX II: SUPERVISORY STRESS TEST ASSUMPTIONS

Background

The Authority continues to take into consideration comments received from the Bermuda Bankers Association Credit Sub-Committee on its proposed stress testing guidance. With regard to the following assumptions, the Authority was guided by the most recent stress testing exercises that were performed in Bermuda and in several major jurisdictions where Bermuda banks are active.

Key Macroeconomic Drivers

The Authority suggests the use of the following macroeconomic drivers:

a. Continued high unemployment rate, which also encompasses an international business drawdown with expatriates exiting or reducing their previous footprint on the island;

b. Decline or stagnation in commercial and residential real estate prices with carry forward of currently stressed PD and LGD rates as the floor rates;

c. Decline in residential and commercial rental income, including consideration of a significant increase in the number of vacant rental properties due to bank repossessions and borrower cash flow difficulties;

d. Reduction or stagnation in personal and/or corporate income;

e. Decline in tourism revenue.

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 from an 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.

Supervisory Shocks

The following table summarises the proposed assumptions to be applied by banks in carrying out their stress testing exercise. Please note that the real estate, rental income and tourism revenue shocks represent the total decline from the beginning of the economic downturn in 2008 and **not a complete shock from current levels**. However, the Authority does expect that the cumulative impact of this persistent decline will be fully reflected in the level of PD, LGD and EL used in the analysis and requires that all banks disclose the percentage decline already reflected in their analysis in addition to the incremental decline from applying the stress factors below:

Driver	**Shock**
Commercial and Residential real estate price decline	30%
Unemployment rate	12%
Rental income decline	35%
Tourism revenue drop	25%