IBP Awareness Session on SBP Revised Guidelines on Stress Testing

(Islamic Financial Institutions)

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Guidelines on Stress Testing

- State Bank of Pakistan (SBP), in order to further strengthen the risk management capacity of banks, DFIs & MBFs, has revised the existing stress testing (ST) guidelines to align with changing local dynamic and global best practices.
- Islamic Banks (IBs) / Islamic Banking Branches (IBBs) are required to submit ST results on the shocks under section 4.2 of the said Guideliens for four quarters (As per Annexure-B)
- Additionally, Banks, DFIs, and IBs / IBBs shall submit quarterly data set for SBPs in house ST as per revised template (Annexure-C)
- The results of SA along with data set is required to be submitted to SBP with in 15 working days after the end of quarter with first submission based on Dec 31, 2020.

4.2 IBs / IBBs

- IBs / IBBs are required to perform a set of sensitivity based ST to evaluate their resilience against *credit, market, liquidity, and operational risk*.
- Two integrated shock scenarios are also required to be performed to evaluate resilience in crisis like situation.

Types of Regulatory Shocks

Credit Shocks (Section A)
Operational Shocks (Section B)
Market Shocks (Section C)
Integrated Credit & Market Shocks (Section D)
Liquidity Shocks (Section E)

Credit Shock 1A (C1A): Increase in Non Performing Financing (NPF) for different financing types

 The shock assumes that 10% of all performing financings move to sub standard. Additionally, the migration rates from Sub standard (SS) to Doubtful (DF) and DF to Loss categories:

Table 1: Assumed Increase (%) in NPFs Portfolio			
Financing Type	Doubtful	Loss	
Murabaha Financing	25%	20%	
Salam Financing	10%	5%	
Istisna Financing	20%	15%	
Musharaka Financing	50%	30%	
Ijara	15%	10%	
Diminishing musharaka Financing	50%	40%	
Export Finance	5%	5%	
Other Islamic modes of finance	30%	20%	

- Calculate the impact of increase in NPFs upon provisions
- Effective Provision Coverage Ratio would be as per the relevant prudential regulations
- Calculate the tax adjusted impact of increase in provision on postshock CAR & CET1 ratios

Credit Sock 1B (C1B) Decrease in Value of Banking Book Assets

- Decline in **Market Value** of banking book assets under scenario is coupled with increase in NPFs in scenario C1A.
- Includes equity exposure i.e. Musharaka, Mudaraba, & Sukuk (AFS & HTM)
- Market Value of Banking Book Assets will decline as per following table:

Assumed decline in Investment Value under Banking Book		
Investment Type	Percent	
Mudaraba Investments	15%	
Musharaka Investments	15%	
Public sector Sukuk	10%	
Private sector Sukuk	30%	

Calculate the tax-adjusted impact of decrease in market value of investments on post-shock CAR & CET1 ratios

Credit Sock 1C (C1C) Impact of Displacement of Commercial Risk (DCR)

- The Shock uses extreme assumption that all stressed assets under C1A (Increase in NPFs for difference financing types) and C1B (Decrease in Value of banking books assets) are financed by unrestricted profit-sharing investment account holders (UPSIA).
- Banks are required to have capital cover to manage DCR. Alpha represents the risk of share borne by IBs / IBBs. They may use appropriate value of Alpha in the light of their business practices. Alpha will be calculated and multiplied with the with the combined impact of both an increase in NPFs and a decrease in market value of investments.

Displaced Commercial Risk

- The risk that the Bank may confront commercial pressure to pay returns that exceed the rate that has been earned on its assets financed by investment account holders.
- The extent of additional risk borne by an IBs shareholders (i.e its own capital) in comparison to the situation where the IAH assume all commercial risks associated with the assets financed by their funds.
- The Bank foregoes part or its entire share of profit in order to retain its fund providers and dissuade them from withdrawing their funds.
- Larger the DCR to which shareholders are exposed, larger the capital requirement

What is Alpha?

- Alpha is the ratio of actual risk transferred to shareholders of Islamic banks in relation to Profit-Sharing Investment Accounts (PSIAs)
- Commercial risks of assets financed by Unrestricted Profit-Sharing Investment Account (UPSIA)
- The quantification and use of this alpha parameter in the CAR calculation are subject to supervisory discretion.

What is Alpha?



Credit Shock 2A (C2A): Increase in NPFs for different sectors of economy

 The shock assumes that 10% of total performing financing move to sub standard (SS). Additionally, the migration rates from Sub standard (SS) to Doubtful (DF) and DF to Loss categories:

Assumed Increase (%) in NPFs Sector wise	Doubtful	Loss
Chemical & Pharmaceuticals	5%	20%
Textile	5%	50%
Agribusiness	5%	20%
Cement	5%	20%
Sugar	5%	15%
Shoes & leather garments	5%	10%
Automobile & transportation equipment	5%	50%
Financial	5%	10%
Insurance	5%	5%
Electronic & electrical appliances	5%	10%
Production & transmission of energy	5%	10%
Individuals	5%	50%
Others	5%	50%

Credit Shock 2 (C2B): Impact of DCR

- Credit Shock 2B (C2B): The second stage of shock assumes that sector wise financing portfolio has been financed by UPSIA and alpha will be applied.
- For calculation of post-shock CAR & CET1, the Alpha result will be calculated and multiplied with the impact under C2A similar to the one already done in C1C-Impact of DCR.
- This shock does not take into account the decline in investment value of banking book.

Credit Shock 3 (C3): Increase in NPFs for different segments

- Credit Shock 3A (C3A): Increase in segment wise NPFs.
- The shock assumes that **10% of performing financings related to all segments become sub standard (SS).** Additionally, the migration rates from Sub standard (SS) to Doubtful (DF) and DF to Loss categories:

Assumed Increase (%) in NPFs- Business Segment	Doubtful	Loss
Corporate	10%	50%
SME	10%	30%
Agriculture Financing	10%	10%
Consumer Financing	10%	30%
Commodity Financing	10%	10%
Others	10%	10%

- Calculate the impact of increase in NPFs on provisions
- Calculate the tax adjusted impact on post shock CAR & CET1

Credit Shock 3B (C3B): Impact of DCR

- **Credit Shock 3B (C3B):**The second stage of shock assumes that business segment wise financing portfolio has been financed by UPSIA and alpha will be applied.
- For calculation of CAR & CET1, The Alpha result will be calculated and multiplied with the impact under C3B similar to the one already done in C1C Impact of DCR.
- This shock does not take into account the decline in investment value of banking book.

Credit Shock 4 (C4): Default of Top Financings

- Credit Shock 4A (C4A): Impact of Fund Based top exposures.
- The shock estimates the additional provision required against the default of **top 2, top 3, & top 5** performing financings of private sector (Fund Based).
- The impact of increase in NPFs should also be taken on risk weighted assets, by increasing the risk weight of the un-provided part of the additional NPFs to 100%.
- Credit Shock 4B (C4B): Impact of fund based and non fund based top exposures as defined above- Gross Sum
- For calculation of impact under this shock, the credit conversion factor, as prescribed under BSD Circular # 8 of 2006, should be applied to the non-fund based exposure to arrive at credit equivalent amount (CEA).
- Credit Shock 4C (C4C): Impact of DCR

Credit Shock 5 (C5) Depletion in value of collateral

- This scenario assumes that the forced sale value (FSV) of overall pledged/collateralized (underlying) assets, against the performing financings, falls drastically due to stressed economic conditions.
- This would lead to an increase in RWAs as the risk profile of financing will deteriorate.
- Following are the three levels of shocks

Shock	Fall in FSV will lead to	
	increase in RWAs by:	
Shock Level 1	10%	
Shock Level 2	20%	
Shock Level 3	30%	

• To calculate impact under this shock, RWAs will increase as a result of fall in FSV and post shock CAR & CET1 will be calculated.

Credit Shock 6 (C6) Critical Infection Levels

- This shock estimates NPFs to Financing Ratio (NPFR), assuming that outstanding financing remains same and additional NPFs are directly categorized as loss.
- Following are the three levels of shocks

S #	NPFs rise to the extent that:
I	CAR fall below regulatory requirement
II	NPFR raise to the maximum level reached in last 10 years
	Capital is wiped out

• Post shock NPFs to financing ratio (NPFR) will be calculated by applying above shocks.

Operational Risk Shocks (Section B)

Assume that losses are paid by cash / low risk assets i.e. no impact on RWAs. The impact on capital would be adjusted for tax as in credit shocks.

Penalty / Losses due to:

1. AML/CFT Violations (O1)

- I. 1% of total assets
- II. 3% of total assets and
- III. The largest penalty imposed on the institution over the last 10 years.

2. Cyber Security Breaches (O2)

- I. 1% of total assets
- II. 2% of total assets and
- III. The largest cyber security related loss suffered by the institution over the last 10 years.

Shocks levels – Tax Adjusted Impact on Capital and CAR and CET1 ratio will be taken due to losses/penalties

Operational Risk Shocks (Section B)

Assume that losses are paid by cash / low risk assets i.e. no impact on RWAs. The impact on capital would be adjusted for tax as in credit shocks. Penalty / Losses due to:

3. Sharia-Non Compliance (O3)

- I. 0.5% of total assets
- II. 1.5% of total assets and
- III. The largest Shariah Non-Compliance related loss suffered by the institution over the last 10 years.

4. General Operational Losses (O4)

- I. 1x quarterly gross income
- II. 2x of quarterly gross income and
- III. 3x of quarterly gross income.

Shocks levels – Tax Adjusted Impact on Capital and CAR and CET1 ratio will be taken due to losses/penalties

Market Shocks (Section C)

Market shock 1 (M1): Inventory Price Shock Market shock 2 (M2): Shock to Trading Portfolio of Sukuk, Mutual Funds and Equities Market shock 3(M3): Currency Price Shock

Market shock 1 (M1): Inventory Price Shock

 This shock assumes deflationary trend in the economy where prices of commodities fall drastically, thus causing a significant decline in the market value of the inventory held under the financings contracts.

Inventory Type	Percent
Murabaha Inventory	15%
Ijara Assets	20%
Istisna Inventory	15%
Salam Inventory	15%
Tijara Inventory	15%
Other Inventory (Musawwama etc.)	15%

Assumed decrease in Prices of Inventory

- Under this scenario, the decrease in the prices of inventory will require to book deficit, therefore the impact of this shock is taken to common equity.
- The impact is also adjusted in RWAs to arrive at aftershock CET-1 & CAR ratio.
- Similar to the methodology explained in Credit Shock C1B. Only difference is application of shocks on different types of Inventories rather than Investments.

Market shock 2 (M2): Shock to Trading Portfolio of Sukuk, Islamic Collective Investments (ICI) and Equities

- Market Shock 2A(M2A): Shock to value of Sukuks, ICIs and equities.
- This Shock assumes significant decrease in the market value of Sukuks, Mutual Funds and Equity/ Shares portfolio held in the Trading Book.

Investments	Percent
Sukuk	
- Public Sector	10%
- Private Sector	30%
Mutual Funds	15%
Equity Position	30%

Assumed Decrease in Market Value in Trading Portfolio

 Methodology for calculation of post-shock CAR and CET1 is similar to Credit Shock C1B. However, risk weights for Sukuks, Mutual funds and Shares would be 50%, 150% and 200%, respectively.

Market shock 2B (M2B): Impact of DCR

- It is assumed that the investments portfolio, considered in M2A, was funded by the un-restricted profit-sharing investment account holders (UPSIA), hence, the impact of alpha factor has been considered while estimating post-shock CET1 and CAR ratio.
- Using the methodology explained in Credit Shock C1C, M2B assesses the implication of DCR.

Market shock 3 (M3): Currency Price Shock

- This shock assesses resilience of IFI towards depreciation of local currency against the major currencies in the trading book. The IFI should assume a depreciation rate equal to the maximum local currency depreciation (annual) over the last three years against major currencies and any other currencies if it constitutes equal to or more than 10% of net position.
- Short position in any of these major currencies would result in a deficit for the Bank. This trading book loss will reduce the Common Equity as well as RWAs.
- Revaluation losses will be calculated, summed in terms of local currency and will be subtracted from pre-shock capital and RWAs to compute post-shock CAR and CET1 Ratio.

Integrated Credit and Market Shocks (Section D)

Integrated Credit and Market Shock Scenario 1 (ICM-1)

This shock is the combination of:

- Increase in NPFs of financing portfolio Facility/ Product wise
- Decline in Banking Book and Inventories

Integrated Credit and Market Shock Scenario 2 (ICM-2)

This shock is the combination of:

- Increase in NPFs of financing portfolio Business Segment wise
- Decrease in Market Value in Trading Book

Both the above Shock scenarios incorporate Alpha factor to account for implications on DCR

Liquidity Shocks (Section E)

Liquidity Risk 1 (L1): Significant Withdrawals of Deposits Liquidity Risk 2 (L2): Consecutive withdrawal of PSIA Liquidity Risk 3 (L3): Shock to (Proxy) Liquidity Coverage Ratio

Liquidity Risk 1 (L1): Significant Withdrawals of Deposits

- This shock considers that under distressed macroeconomic scenario, the losses from asset side force a reduction in profits to be distributed to UPSIA-may result in significant drawdown of following deposit categories leading to decrease in liquid assets.
- Bank should apply separate drawdown factors to each of the following:
 Assumption of withdrawals

Deposit Category	Percent
Wholesale Deposits	30%
Retail / Individuals Deposits	20%
Financial Institutions Deposits	100%

• This scenario uses **post-shock liquid assets to total assets ratio (LAR) and post-shock liquid assets to total deposits ratio (LDR)** to assess the impact of this shock on the liquidity profile.

Liquidity Risk 2 (L2): Consecutive withdrawal of PSIA

• This shock assumes significant withdrawal of UPSIA for consecutive 5 days and assesses its impact on liquid assets of the IFI.

Withdrawals on	Percent
Day 1	2%
Day 2	5%
Day 3	10%
Day 4	10%
Day 5	10%

Assumed withdrawals of PSIA

- By sequentially subtracting cumulative withdrawals from pre-shock value of liquid assets, we may assess level of liquid assets at different days of shock. This can determine on which day liquidity crunch is faced by the IFI and pushes it into liquidity crisis.
- Indicative LAR and LDR may be calculated by using quantum of liquid assets at DAY 5.

Liquidity Risk 3 (L3): Shock to (Proxy) Liquidity Coverage Ratio

- This shock assumes a decline in the value of High Quality Liquid Assets (HQLA) under the distressed market and liquidity scenario, which would affect the bank's capacity to meet its short term obligations.
- Additionally, shock also assumes an increase in contractual outflows and decline in contractual inflows during the next 30 days.

Changes in liquid inflows/outflows	Percent
Decline in the HQLAs	20%
Increase in Cash Outflows	10%
Decrease in Cash Inflows	10%

Assumed Shock to LCR

• Proxy LCR may be calculated after applying above shocks.

Challenges

- Appropriate Value of Alpha- Standardization
- Excel based calculations
- Enhanced role of Board/ BRMC-Cultural shift
- Consultative approach among stakeholders/ Ownership/ Involvement
- Risk Management Tool/ Decision Making
- Macro Stress Test
- Comprehensive Documentation
- Organizational Structure
- Capacity Building/ Adequacy of Resources
- Model Development and their Inventory, Assumptions and Judgement
- Risk Coverage/ Construction of Scenarios- Consistent and Plausible
- Data and IT Infrastructure
- Results Communication and Feedback- Interpretation of Results

Stress Testing Result Template

Annexure-B IBs / IBBs results

Name of Islamic Bank/Islamic Bank Branch

Table: 1 - Stress Testing Results

For the Quarter ended on Month Date, Year

(Amount in Million PKR, Ratios in percent)

Credit Shocks			
	Shock to Financings Portfolio		
	Change in Profit		
	After shock NPFs to Financings Ratio (%)		
C1A - Increase in NPEs for	Increase in Provisions		
different financing types	Tax adjusted impact of provisions		
amerene manen B cypes	After shock capital		
	After shock CAR (%)		
	After shock CET1		
	After shock CET1 (%)		
	Increase in NPFs		
C1B - Increase in NPEs for	After shock NPFs to NPFs Ratio (%)		
different financing types	Increase in Provisions		
plus	Tax adjusted impact of provisions		
Decline in value of banking	After shock capital		
hooks assets	After shock CAR (%)		
00000 000000	After shock CET1		
	After shock CET1 (%)		
C1C - Increase in NPEs for	Increase in NPFs		
different financing types	After shock NPFs to NPFs Ratio (%)		
	Increase in Provisions		
Decline in value of banking	Tax adjusted impact of provisions		
books assets	After shock capital		
	After shock CAR (%)		
Impact of DCR	After shock CET1		
impact of Derv	After shock CET1 (%)		

Shock to Sector-wise Financings			
	Increase in NPFs		
	After shock NPFs to Financings Ratio (%)		
C2A - Increase in NPEs for	Increase in Provisions		
different sectors of	Tax adjusted impact of provisions		
economy	After shock capital		
economy	After shock CAR (%)		
	After shock CET1		
	After shock CET1 (%)		
	Increase in NPFs		
C2B - Increase in NPEs for	After shock NPFs to Financings Ratio (%)		
different sectors of	Increase in Provisions		
	Tax adjusted impact of provisions		
economy	After shock capital		
pius Impact of DCP	After shock CAR (%)		
inipact of DCN	After shock CET1		
	After shock CET1 (%)		

C2

Name of Islamic Bank/Islamic Bank Branch

Table: 1 - Stress Testing Results

For the Quarter ended on Month Date, Year

(Amount in Million PKR, Ratios in percent)

Shock to Segment-wise Financings		
	Increase in NPFs	
	After shock NPFs to Financings Ratio (%)	
	Increase in Provisions	
C3A - Increase in NPFs for	Tax adjusted impact of provisions	
different segments	After shock capital	
	After shock CAR (%)	
	After shock CET1	
	After shock CET1 (%)	
	Increase in NPFs	
	After shock NPFs to Financings Ratio (%)	
C3B - Increase in NPFs for	Increase in Provisions	
different segments	Tax adjusted impact of provisions	
plus	After shock capital	
Impact of DCR	After shock CAR (%)	
	After shock CET1	
	After shock CET1 (%)	

C3

Default of Top Private Financings					
		Shock Level-1	Shock Level-2	Shock Level-3	
	Increase in NPFs				
	After Shock NPFs to Financings Ratio				
	Increase in Provisions (25% of NPFs)				
	Tax adjusted Impact of Provisions				
C4A - Fund based exposure	After Shock Capital				
	After Shock Risk Weighted Assets				
	After Shock CAR				
	After Shock CET1				
	After shock CET1 (%)				
	Increase in NPFs				
	After Shock NPFs to Financings Ratio				
	Increase in Provisions (25% of NPFs)				
C4B - Fund based exposure	Tax adjusted Impact of Provisions				
plus	After Shock Capital				
Non fund based exposure	After Shock Risk Weighted Assets				
	After Shock CAR(%)				
	After Shock CET1				
	After shock CET1 (%)				
	Increase in NPFs				
	After Shock NPFs to Financings Ratio				
C4C - Fund based exposure	Increase in Provisions (25% of NPFs)				
plus	Tax adjusted Impact of Provisions				
Non fund based exposure	After Shock Capital				
plus	After Shock Risk Weighted Assets				
Impact of DCR	After Shock CAR				
	After Shock CET1				
	After shock CET1 (%)				

C4

Shock to Collateral Value					
			Shock Level-1	Shock Level-2	Shock Level-3
C5	Depletion in Value of Collateral	After Shock RWA			
		After Shock CAR%			
		After shock CET1 (%)			
Shock to Critical Infection Levels					
Shock Level-1 Shock Level-2 Shock Leve					Shock Level-3
C6	Critical Infection Levels	Level of NPFs where relevant shock-level criteria is met for			
		CAR			
		Level of NPFs where relevant shock-level criteria is met for			
		CET1 ratio			

Name of Islamic Bank/Islamic Bank Branch					
	Table: 1 - Stress Testing Results				
		For the Quarter ended on Month Date	, Year		
			(Amount	in Million PKR, R	atios in percen
		Operational Shocks			
			Shock Level-1	Shock Level-2	Shock Level-
		Amount of Loss/Penalty			
	Densibus due ANAL/CET	After Shock Capital			
01	Violations	After Shock CAR			
	Violations	After Shock CET1			
		After shock CET1 (%)			
		Amount of Loss/Penalty			
		After Shock Capital			
02	Losses due to Cybersecurity Breaches	After Shock CAR			
	Dreaches	After Shock CET1			
		After shock CET1 (%)			
		Amount of Loss/Penalty			
		After Shock Capital			
O3	Losses due to Sharia-Non	After Shock CAR			
	compliance	After Shock CET1			
		After shock CET1 (%)			
		Amount of Loss/Penalty			
04		After Shock Capital			
	General Operational Losses	After Shock CAR			
		After Shock CET1			
		After shock CET1 (%)			

Name of Islamic Bank/Islamic Bank Branch

Table: 1 - Stress Testing Results

For the Quarter ended on Month Date, Year

(Amount in Million PKR, Ratios in percent)

Market Shocks				
		Decrease in value of inventories		
		Increase in provisions		
		Tax adjusted impact of provisions		
M1	Inventory Price Shock	After shock capital		
	Inventory Price Shock	After shock RWA		
		After shock CAR (%)		
		After shock CET1		
		After shock CET1 (%)		
		Decrease in value of investments		
		Increase in provisions		
	M2A - Shock to Trading	Tax adjusted impact of provisions		
	portfolio of Sukuk, Islamic	After shock capital		
	Collective Investments (ICI)	After shock RWA		
	and Equities	After shock CAR (%)		
		After shock CET1		
N/2		After shock CET1 (%)		
		Decrease in value of investments		
	M2B - Shock to Trading	Increase in provisions		
	portfolio of Sukuk, Islamic	Tax adjusted impact of provisions		
	Collective Investments (ICI)	After shock capital		
	and Equities	After shock RWA		
	plus	After shock CAR (%)		
	Impact of DCR	After shock CET1		
		After shock CET1 (%)		
		Decrease in value of foreign currencies (based on NOP)		
		After shock capital (without tax adjustment)		
IVI3	Currency Price Shock	After shock CAR (%)		
		After shock CET1(without tax adjustment)		
		After shock (ET1 (%)		

	Integrated Credit and Market Shocks				
CM1	Increase in NPFs plus decrease in value of inventories and banking book investments	Change in NPFs and decline in value of investments			
		Increase in Provisions			
		Tax adjusted impact of provisions			
		After shock capital			
		After shock CAR (%)			
		After shock CET1			
		After shock CET1 (%)			
	Increase in different	Change in NPFs and decline in value of investments			
	segments NPFs	Increase in provisions			
	plus	Tax adjusted impact of provisions			
CM2	decrease in value of	After shock capital			
	trading book investments	After shock CAR (%)			
	plus	After shock CET1			
	impact of DCR	After shock CET1 (%)			

Name of Islamic Bank/Islamic Bank Branch

Table: 1 - Stress Testing Results

For the Quarter ended on Month Date, Year

(Amount in Million PKR, Ratios in percent)

Shocks to Liquidity			
L1		After shock liquid assets	
		After shock total assets	
	Significant withdrawais of	After shock total deposits	
	Deposits	After shock liquid assets to total assets ratio (%)	
		After shock liquid assets to total deposits ration (%)	
L2	Consecutive withdrawal of PSIA	After shock liquid assets on Day-5 of shock	
		After shock total deposits on Day-5 of shock	
		After shock total assets on Day-5 of shock	
		After shock liquid assets to total assets ratio (%) on Day-5	
		of shock	
		After shock liquid assets to total deposits ration (%) on Day-	
		5 of shock	
L3	Shock to (Proxy) Liquidity Coverage Ratio	After shock HQLAs	
		After shock cash outflows	
		After shock cash inflows	

Thank You