

July 3, 2006

The Chairman/ Chief Executive Officer  
**All Commercial Banks**  
**(excluding RRBs and LABs)**

Dear Sir,

**Annual Policy Statement 2006 – 07: Draft Guidelines on Stress testing**

Risk management practices in banks in India have undergone considerable improvement over the past few years with the introduction of the financial sector liberalization process in the mid nineties. The process gained momentum with the issue of regulatory guidelines and guidance notes on asset liability management and management of credit risk, market risk and operational risk by the Reserve Bank since 1999. Further, the announcement of implementation of the revised capital adequacy framework in India with effect from March 31, 2007 has brought the risk management capabilities of banks into greater focus.

2. Globally, banks are increasingly relying on statistical models to measure and manage the financial risks to which they are exposed. These models are gaining credibility because they provide a framework for identifying, analyzing, measuring, communicating and managing these risks. Since models cannot incorporate all possible risk outcomes and generally are not capable of capturing 'event risks' and sudden / dramatic changes, banks need to supplement models with 'stress tests'. Internationally, stress testing has become an integral part of banks' risk management systems and is used to evaluate the potential vulnerability to certain unlikely but plausible events or movements in financial variables. There are broadly two categories of stress tests used in banks viz. sensitivity tests and scenario tests. These may be used either separately or in conjunction with each other.

- **Sensitivity tests** are normally used to assess the impact of change in one variable (for example, a high magnitude parallel shift in the yield curve, a

significant movement in the foreign exchange rates, a large movement in the equity index etc.) on the bank's financial position.

- **Scenario tests** include simultaneous moves in a number of variables (for example, equity prices, oil prices, foreign exchange rates, interest rates, liquidity etc.) based on a single event experienced in the past (i.e., *historical scenario* – for example, natural disasters, stock market crash, depletion of a country's foreign exchange reserves) or a plausible market event that has not yet happened (i.e., *hypothetical scenario* - for example, collapse of communication systems across the entire region/ country, sudden or prolonged severe economic downturn) and the assessment of their impact on the bank's financial position.

3. Banks in India are beginning to use statistical models to measure and manage risks. Further, the supervisory review process under Pillar 2 of Basel II framework is intended not only to ensure that banks have adequate capital to support all the risks in their business, but also to encourage banks to develop and use better risk management techniques in monitoring and managing their risks. Banks must demonstrate, under the internal capital adequacy assessment process prescribed by Pillar 2, that they have enough capital to not only meet the minimum capital requirements but also to withstand a range of severe but plausible shocks. In the above background, the need for banks in India to adopt 'stress tests' as a risk management tool has been emphasised in paragraph 188 of the Annual Policy Statement (extract furnished in Annex 1). Accordingly, the **draft guidelines** for implementation by banks have been prepared and are furnished in Annex 2.

4. You may please study the draft guidelines for stress testing in your bank and furnish your comments. The feedback may please be forwarded to the undersigned at the following address or by email to [kdamodaran@rbi.org.in](mailto:kdamodaran@rbi.org.in) and [minalajain@rbi.org.in](mailto:minalajain@rbi.org.in) **within a period of one month** from the date of this letter:

Department of Banking Operations & Development  
Reserve Bank of India  
12<sup>th</sup> Floor, Central Office Building,  
Shahid Bhagat Singh Marg,  
Mumbai – 400 001.

5. Please acknowledge receipt.

Yours faithfully,

( P.V.Bhaskar )  
Chief General Manager

Encls: As above

**An extract of paragraph 188 of the  
Annual Policy Statement 2006 – 07**

**Stress Testing of Asset Portfolio by Banks**

188. In the present liberalised environment, banks need to have a robust and sound stress testing process for assessment of capital adequacy. The stress testing involves identifying possible events, future economic conditions that could unfavourably impact bank's credit exposures and making an assessment of the ability of banks to withstand the loss arising out of such events. There is also a need for carrying out stress tests on the asset portfolio incorporating various scenarios, like economic downturns, industrial downturns, market risk events and sudden shifts in liquidity conditions. Furthermore, exposures to sensitive sectors and high risk category of assets would have to be subjected to more frequent stress tests based on realistic assumptions for asset price movements. Stress tests would enable banks to assess the risk more accurately and, thereby, facilitate planning for appropriate capital requirements. This stress testing would also form a part of preparedness for Pillar 2 of the Basel II framework. Against this backdrop, it is proposed:

- to advise banks to undertake sound stress testing practices.

### Draft Guidelines to banks on Stress testing

1. Banks shall put in place a Board approved 'stress testing framework' to suit their individual risk management requirements. The framework should also factor-in the following aspects:

- i) Banks may use stress tests for understanding their risk profile and communicating the same to the Board/ senior management for setting risk limits; allocating capital for various risks; managing their risk exposures; and putting in place appropriate contingency plans for meeting the situations that may arise under adverse circumstances.
- ii) While traditionally stress tests are used in the context of managing *market risks*, these may also be employed in the management of *credit risks, operational risks and liquidity funding risk*. Banks should identify their major sources of risk and carry out stress tests that are appropriate to those risks.
- iii) Banks should identify an appropriate range of realistic adverse circumstances and events in which the identified risk crystallises and estimate the financial resources needed by it under each of the circumstances to :
  - a) meet the risk as it arises and for mitigating the impact of manifestation of that risk;
  - b) meet the liabilities as they fall due; and
  - c) meet the minimum CRAR requirements.
- iv) Banks may apply stress tests at varying frequencies dictated by their respective business requirements, relevance and cost. While some stress tests may be run daily or weekly, some others may be run at monthly or quarterly intervals. However, stress tests should be conducted at least annually and the assumptions underlying the stress tests should be reviewed periodically. Banks may undertake fresh stress tests when there are significant modifications in the underlying assumptions. Such periodic reviews are necessary to ensure the integrity, accuracy, and reasonableness of the stress testing framework.
- v) The results of the various stress tests should be reported to the Board and senior management, and should be an essential ingredient of bank's risk management systems.
- vi) Banks should document the stress tests undertaken by them, the underlying assumptions, the results and the outcomes. The documentation should be preserved *at least* for five years.

- vii) As the environment in which banks are operating is quite dynamic, there are changes in macroeconomic environment, banks' instruments, trading strategies and regulatory policies. The risk measurement methodologies and stress testing techniques in banks should, therefore, evolve to accommodate these changes.
- viii) The stress test framework should be devised and implemented in a manner which factors-in the Pillar 2 requirements of Basel II and should thus serve as an essential aspect of banks' internal capital adequacy assessment processes.

6. As stress testing is an evolving area, a few illustrative examples of typical stress tests are presented in the Attachment with a view to aid in better perception of stress tests. The stress testing framework and methodology in each bank should, however, be tailored to suit the size, complexity, risk philosophy, risk perceptions and skills in each bank. Therefore, it may not be appropriate for banks to apply the illustrative stress tests without ensuring that these have been modified as relevant to each bank's requirement.

7. A copy of these guidelines may be placed before the Board of Directors at the next meeting for their information and appropriate guidance / advice. In any case, banks should operationalise their respective stress testing frameworks by the end of .....

**Illustrative Examples of Stress Tests**

As stress testing is an evolving area, a few illustrative examples of typical stress tests are presented below with a view to aid in better perception of stress tests among banks. The stress testing framework and methodology in each bank should, however, be tailored to suit the size, complexity, risk philosophy, risk perceptions and skills in each bank. Therefore, it may not be appropriate for banks to apply these illustrative stress tests without ensuring that these have been modified as relevant to each bank's requirement. Banks should construct their own stress scenarios; ensure that appropriate risk factors are included; and ensure that the stress tests are economically meaningful.

**Stress test illustration – 1 : Liquidity risk**

1. The general sources of stress on liquidity in banks are seen to emerge from
  - a) Over-dependence on more volatile funding sources, such as wholesale funds and inter-bank funds;
  - b) Depositors' ability to switch funds among accounts by electronic means;
  - c) Ratings downgrades or other negative news could cause, among others, reduced market access to unsecured borrowings from call money market; a reduction or cancellation of inter-bank credit lines; a reduction of deposits; and adversely affect a bank's capability of securitising its assets.
  - d) Off-balance sheet products that can give rise to sudden material demands for liquidity at banks include committed lending facilities to customers, committed backstop facilities, and committed back-up lines to special purpose vehicles.
  - e) Sharp and unanticipated market movements or defaults could cause demand for additional collateral calls from exchanges/ settlement platforms in connection with foreign exchange and securities transactions;
  
2. A primary liquidity risk is deposit run-offs in a bank-specific event. The assumptions that banks may utilise in the stress tests may be based on a combination of bank-specific historical data, industry data from prior stress events, and/or best guess estimates. When using bank-specific historical data, some banks may add an extra cushion to the assumed outflows to factor-in their perception that data largely based on stable historical periods may not adequately reflect depositor behaviour during a future stress event. The severity of deposit outflows in a bank's stress scenario depends upon factors including the strength of the bank's relationships with its customers, the proportion of deposits that is protected by deposit insurance, the composition of its balance sheet, and the duration of the crisis.
  
3. The broad assumptions that may be made on behaviour of liabilities during stress periods may be:
  - a) The percentage of retail deposits that may be withdrawn in a stress scenario is typically in the single digits, while a few banks may assume outflows in the low double digits. This reflects an assumption that retail depositors would be

comforted by deposit insurance and so would not withdraw their deposits. Hence, retail for the purpose of stress tests would be those enjoying the protection of deposit insurance.

- b) Corporate, bank and government deposits or other un-insured deposits may be assumed to reduce between 20 percent and 50 percent, typically over a one-month time span. Outflows may, sometimes, be assumed to be 100 percent for certain deposit types. Some banks may make finer distinction among different types of clients or on the basis of the bank's relationships with them.
- c) Banks may generally assume that time deposits will not be withdrawn until maturity and at maturity, some percentage will be renewed.
- d) Banks may recognise that disposal of assets to raise liquidity may entail haircuts (depending on the scenario).
- e) Banks may recognise that intra-group cash flows might be disrupted.
- f) Banks may undertake the stress test where the stress scenario is expected to last over different time horizons say one month or less; two or three months; and six months or more.

4. A numerical illustration of a liquidity stress test when on account of an adverse rumour the bank's reputation for meeting its liabilities as and when they mature has been eroded is presented below. The broad assumptions are mentioned below:

(Rs. crore)

Time buckets →	1-14 days	15-28 days	29 days to 3 mths	> 3 to 6 mths	> 6 mths to 1 year	> 1 to 3 yrs	> 3 to 5 yrs	> 5 yrs	TOTAL
↓ <b>Normal</b>									
Assets	100	150	200	200	300	350	250	250	1800
Wholesale deposits	30	40	50	40	50	10	10	0	230
Retail Deposits	90	140	200	310	300	190	140	200	1570
Total Liability	120	180	250	350	350	200	150	200	1800
<b>Gap</b>	<b>-20</b>	<b>-30</b>	<b>-50</b>	<b>-150</b>	<b>-50</b>	<b>150</b>	<b>100</b>	<b>50</b>	<b>0</b>
<b>Stress</b>									
Assets	100	150	200	200	300	350	250	250	1800
Wholesale deposits	130	20	25	20	25	5	5	0	230
Retail Deposits	386	112	160	248	240	152	112	160	1570
Total Liability	516	132	185	268	265	157	117	160	1800

<b>Gap</b>	<b>-416</b>	<b>18</b>	<b>15</b>	<b>-68</b>	<b>35</b>	<b>193</b>	<b>133</b>	<b>90</b>	<b>0</b>
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### **Assumptions**

The stress scenario is expected to last three months

1. Wholesale deposits - Fifty percent of these deposits are to be repaid in the first bucket and the remaining fifty percent is re-deposited with a hike in interest rate by 1%.

2. The retail deposits are fully covered by deposit insurance. However, 20% of the deposits are withdrawn in the first bucket.

3. Assets maturing beyond three months are sold at a discount of 10%, to the extent required, to meet the maturing liabilities up to three months. (i.e. Rs. 406 crore)

<b>Impact of stress on liquidity risk</b>	
Loss on sale of assets	40.60
Higher Interest on - Wholesale deposits	1.00
<b>Total cost</b>	<b>41.60</b>

## Stress test illustration – 2 : Interest rate risk – earnings perspective

Interest rate risk is the risk where changes in market interest rates might adversely affect a bank's financial condition. The immediate impact of changes in interest rates is on bank's earnings through changes in its Net Interest Income (NII). A long-term impact of changes in interest rates is on bank's Market Value of Equity (MVE) or Net worth through changes in the economic value of its assets, liabilities and off-balance sheet positions. The interest rate risk, when viewed from these two perspectives, is known as 'earnings perspective' and 'economic value' perspective, respectively. The present guidelines on asset liability management (BP.BC.8/21.04.098/99 dated February 10, 1999) to banks approach interest rate risk measurement from the 'earnings perspective' using the traditional Gap Analysis (TGA).

The following illustrations indicate a few methods of application of stress tests to assess the impact of interest rate risk from the earnings perspective.

Time buckets ➔	1-14 days	15-28 days	29 days to 3 mths	> 3 to 6 mths	> 6 mths to 1 year	> 1 to 3 yrs	> 3 to 5 yrs	> 5 yrs	TOTAL
Particulars ↓									
RSA	100	150	200	200	300	350	250	250	1800
RSL	120	180	250	350	350	200	150	50	1650
Gap (RSA – RSL)	- 20	- 30	-50	-150	- 50	150	100	200	150

(Rs. crore)

Annual Profit = Rs. 18 crore

### Example A : When interest rates increase by one percent across all time buckets both for assets and liabilities

- Increase in interest income on RSA =  $1800 \times 0.01 =$  Rs. 18 crore
- Increase in interest expenditure on RSL =  $1650 \times 0.01 =$  Rs. 16.50 crore
- Hence, NII has **increased** by Rs. 1.50 crore and the profits **increase** by 8.33%.
- The impact is equal to one percent of the Net gap between RSA and RSL ( $150 \times 0.01$ )

### Example B : When interest rates decrease by one percent across all time buckets both for assets and liabilities

- Decrease in interest income on RSA =  $1800 \times 0.01 =$  Rs. 18 crore
- Decrease in interest expenditure on RSL =  $1650 \times 0.01 =$  Rs. 16.50 crore
- Hence, NII has **decreased** by Rs. 1.50 crore and the profits **decrease** by 8.33%.
- The impact is equal to one percent of the Net gap between RSA and RSL ( $150 \times 0.01$ )

**Example C : When interest rates increase by one percent for time buckets up to one year and decrease by one percent for time buckets beyond one year both for assets and liabilities**

- RSA – RSL for time buckets up to one year = (-) 300. Hence, impact on NII for time buckets up to one year =  $(-) 300 \times 0.01 = (-)$  Rs. 3 crore; i.e., a decrease in NII.
- RSA – RSL for time buckets beyond one year = (+) 450. Hence, impact on NII for time buckets beyond one year =  $450 \times (-) 0.01 = (-)$  Rs. 4.50 crore; i.e., a decrease in NII.
- The aggregate **decrease** in NII is Rs. 7.50 crore and therefore the profits **decrease** by 41.67%.

### Stress test illustration – 3 : Interest rate risk – economic value perspective

To begin with the TGA was considered as a suitable method to measure interest rate risk. However, Reserve Bank had also indicated in 1999 its intention to move over to modern techniques of Interest Rate Risk measurement like Duration Gap Analysis (DGA) for management of interest rate risk. In this direction the Reserve Bank has since issued draft guidelines on April 17, 2006 on application of the economic value perspective.

The following illustrations indicate a few methods of application of stress tests to assess the impact of interest rate risk from the economic value perspective. It would be useful for banks to familiarize themselves with the methodologies for calculation of interest rate risk using the duration gap analysis (c.f. draft guidelines issued on April 17, 2006 until issue of the final guidelines).

(Rs. crore)

Time buckets ➡	1-14 days	15-28 days	29 days to 3 mths	> 3 to 6 mths	> 6 mths to 1 year	> 1 to 3 yrs	> 3 to 5 yrs	> 5 yrs	TOTAL
Particulars ↓									
RSA – Value	100	150	200	200	300	350	250	250	1800
RSL – Value	120	180	250	350	350	200	150	50	1650
Gap (RSA – RSL)	- 20	- 30	-50	-150	- 50	150	100	200	150

Annual Profit = Rs. 18 crore; Equity = Rs. 100 crore

**Example A : When interest rates increase by one percent across all time buckets both for assets and liabilities**

Time buckets ➡	1-14 days	15-28 days	29 days to 3 mths	> 3 to 6 mths	> 6 mths to 1 year	> 1 to 3 yrs	> 3 to 5 yrs	> 5 yrs	TOTAL
Particulars ↓									
RSA – Value	100	150	200	200	300	350	250	250	1800
RSA – MD	0.035	0.071	0.227	0.452	0.917	2.510	3.743	5.935	-206.85
Impact	-0.04	-0.11	-0.45	-0.90	-2.75	-8.79	-9.36	-14.84	-37.23
RSL – Value	120	180	250	350	350	200	150	50	1650
RSL – MD	0.036	0.072	0.233	0.463	0.939	2.635	4.016	6.642	-122.89
Impact	-0.04	-0.13	-0.58	-1.62	-3.29	-5.27	-6.02	-3.32	-20.28
<b>Impact on Equity</b>									<b>-16.96</b>

- The negative impact on equity of Rs. 100 crore is 16.96%.

**Example B : When interest rates decrease by one percent across all time buckets both for assets and liabilities**

Since the movement is in the opposite direction, the **positive** impact on equity of Rs. 100 crore will be 16.96%.

**Example C : When interest rates decrease by two percent for time buckets up to one year and increase by two percent for time buckets beyond one year both for assets and liabilities**

Time buckets Particulars	1-14 days	15-28 days	29 days to 3 mths	> 3 to 6 mths	> 6 mths to 1 year	> 1 to 3 yrs	> 3 to 5 yrs	> 5 yrs	TOTAL
RSA – Value	100	150	200	200	300	350	250	250	1800
RSA – MD	0.035	0.071	0.227	0.452	0.917	2.619	3.950	6.549	
Impact	0.07	0.21	0.91	1.81	5.50	-18.33	-19.75	-32.75	-62.32
RSL – Value	120	180	250	350	350	200	150	50	1650
RSL – MD	0.036	0.072	0.233	0.463	0.939	2.748	4.228	7.280	
Impact	0.09	0.26	1.16	3.24	6.57	-10.99	-12.68	-7.28	-19.63
<b>Impact on Equity</b>									<b>-42.69</b>

The **negative** impact on equity of Rs. 100 crore is 42.69%.

**NOTE:** Impact for each time bucket is computed as under:

RSA [or RSL] x MD [for the relevant time bucket] x Assumed change in interest rate x Direction of change in value i.e., a (-) when interest rates increase and a (+) when interest rates decrease]

Consequently the impact in the 1-14 days bucket under Example C is computed as under:

Assets:  $100 \times 0.035 \times 2 \times 1 = 0.07$  Liabilities:  $120 \times 0.036 \times 2 \times 1 = 0.09$

### Stress test illustration – 4 : Credit risk – Impact on capital adequacy

The stress tests for credit risk may assess the impact of an economic downturn on the bank's capital adequacy position especially under a Basel II scenario. An economic downturn could lead to a downgrade in the credit ratings awarded to a bank's counterparties by rating agencies. This might lead to a consequent increase in the risk weights for these exposures which will have an impact on the bank's capital adequacy position. This is a likely situation under a Basel II scenario where the risk weights will be related to the credit rating enjoyed by the counterparty exposures. A similar stress test may also be undertaken with reference to the internal rating grades awarded to the counterparties. The impact in this situation would be on the economic capital maintained by a bank.

The following two examples illustrate this impact on capital adequacy arising out of an economic downturn, under two assumptions (a) a uniform level of downgrade for all rating grades; and (b) a different level of downgrade for different rating grades.

#### Example A:

						Rs.crore
		Normal situation		Stress situation		
Rating scale	Risk weight	Exposure	RWA	Extent of down-grade (%)	Exposure	RWA
AAA	20	300	60.00	15	255	51.00
AA	50	200	100.00	15	215	107.50
A	50	100	50.00	15	115	57.50
BBB	100	300	300.00	15	270	270.00
BB & below	150	100	150.00		145	217.50
		1000	660.00		1000	703.50
<b>Minimum Capital</b>			59.40			63.32
<b>Capital funds*</b>	<b>65</b>					
<b>CRAR</b>			<b>9.85</b>			<b>9.24</b>

- Assumed capital funds.

- Example B :

						Rs.crore
		Normal situation		Stress situation		
Rating scale	Risk weight	Exposure	RWA	Extent of down-grade (%)	Exposure	RWA
AAA	20	300	60.00	15	255	51.00
AA	50	200	100.00	20	205	102.50
A	50	100	50.00	25	115	57.50
BBB	100	300	300.00	30	235	235.00
BB & below	150	100	150.00		190	285.00
		1000	660.00		1000	731.00
<b>Minimum Capital</b>			<b>59.40</b>			<b>65.79</b>
<b>Capital funds*</b>	<b>65</b>					
<b>CRAR</b>			<b>9.85</b>			<b>8.89</b>

\* Assumed capital funds

### Stress test illustration – 5 : Credit risk

The stress tests for credit risk may also assess the impact of an increase in the level of non performing loans (NPLs). This could have a two way impact – one on the bank’s NPA levels as well as on the additional provisioning requirements and therefore the profits and the CRAR. Banks may also conduct stress tests with reference to the extent of provisioning that may be required by the regulator for various asset categories.

**Example A:** The provisioning requirement is assumed as 1% for all Standard (S); 25% for Substandard (SS), and 100% for all Doubtful categories.

		Rs. Crore			
		Normal situation		Stress situation *	
Asset Classification	Rate of Provisioning	Exposure	Provision	Revised rate of provisioning	Provision
S	0.40	900	3.60	1.00	9.00
SS	10	40	4.00	25	10.00
D1	20	10	2.00	100	10.00
D2	30	15	4.50	100	15.00
D3	100	35	35.00	100	35.00
		1000	49.10		79.00
<b>Profit</b>		<b>18</b>		<b>-11.90</b>	
<b>Addl. Provisions</b>					<b>29.90</b>
<b>Impact on profits (%)</b>				<b>-166.11</b>	
<b>ROA</b>		<b>1.80</b>		<b>-1.19</b>	
<b>Capital funds *</b>		<b>95</b>		<b>70.50</b>	
<b>RWA</b>		<b>954.50</b>		<b>930.00</b>	
<b>CRAR</b>		<b>9.95</b>		<b>7.58</b>	

\* Assumed capital funds – Rs. 95 crore

**Note:**

1. **Profit** under stress situation = 18 – 29.90 = (-) 11.90
2. **Capital funds** under stress situation = 95 – 29.90 + (9.00 – 3.60) = 70.50
3. **RWA** under stress situation = 1000 – (10.00 + 10.00 + 15.00 + 35.00) = 930.00

**Example B:** The downgrade from Standard to NPA (sub standard) is assumed to be 10% (i.e., the extent of present level of gross NPAs) and the provisioning requirements are assumed as in example A above:

<b>Rs. Crore</b>							
		<b>Normal situation</b>			<b>Stress situation *</b>		
<b>Asset Classif-ication</b>	<b>Rate of Provi-sioning</b>	<b>Exposure</b>	<b>Provision</b>	<b>Extent of down-grade (%)</b>	<b>Exposure</b>	<b>Revised rate of provi-sioning</b>	<b>Provision</b>
<b>S</b>	0.40	900	3.60	10	810	1.00	8.10
<b>SS</b>	10	40	4.00		130	25	32.50
<b>D1</b>	20	10	2.00		10	100	10.00
<b>D2</b>	30	15	4.50		15	100	15.00
<b>D3</b>	100	35	35.00		35	100	35.00
		1000	49.10		1000		100.60
<b>Profit</b>		<b>18</b>				<b>-33.50</b>	
<b>Addl. Provisions</b>							<b>51.50</b>
<b>Impact on profits (%)</b>						<b>-286.11</b>	
<b>ROA</b>		<b>1.80</b>				<b>-3.35</b>	
<b>Capital funds</b>		<b>95</b>				<b>48.00</b>	
<b>RWA</b>		<b>954.50</b>				<b>907.50</b>	
<b>CRAR</b>		<b>9.95</b>				<b>5.29</b>	

**Note:**

1. **Profit** under stress situation =  $18 - 51.50 = (-) 33.50$
2. **Capital funds** under stress situation =  $95 - 51.50 + (8.10 - 3.60) = 48.00$
3. **RWA** under stress situation =  $1000 - (32.50 + 10.00 + 15.00 + 35.00) = 907.50$

## Stress test illustration – 6 : Foreign exchange risk

The stress test for exchange rate may assess the impact of change in exchange rate on the bank's open positions and consequently its capital requirements. To model direct foreign exchange risk only the overall net open position of the bank may be given an adverse shocks (say 5%, 10% and 15%). The overall net open position is measured by aggregating the sum of short positions or the sum of long positions; whichever is greater regardless of sign. The impact could be measured with reference to

- a) the additional capital that may be required to be maintained; and
- b) the loss on account of change in value

### Example A:

<b>Foreign exchange open positions</b>				
(in millions)				
Currency		Limits	Rupee equivalent	
<b>USD</b>		5	225	
<b>EURO</b>		4	232	
<b>GBP</b>		3	240	
<b>Sw. Franc</b>		7	266	
<b>Jap Yen</b>		500	225	
<b>Total</b>			<b>1188</b>	
				<b>Additional capital required (Rs. Crore)</b>
<b>Stress (%)</b>				
<b>5</b>			1247.4	0.53
<b>10</b>			1306.8	1.07
<b>15</b>			1366.2	1.60
	<b>Normal</b>	<b>5% stress</b>	<b>10% stress</b>	<b>15% stress</b>
Capital funds	65*	65	65	65
Risk weighted assets	660*	666	672	678
<b>CRAR</b>	<b>9.85</b>	<b>9.76</b>	<b>9.68</b>	<b>9.59</b>

\* Assumed

**Example B :**

(Rs. Crore)						
Currency	Rate	OB/ OS	Position	Rupee equivalent		
USD	45	OS	3	13.50		
EURO	58	OS	4	23.20		
GBP	80	OB	2	16.00		
Sw. Franc	38	OS	5	19.00		
Jap Yen	0.45	OB	450	20.25		
<b>Annual profits</b>				18.00		
Currency	Rupee equivalent 5 % stress	Net impact on P/L account	Rupee equivalent 10% stress	Net impact on P/L account	Rupee equivalent 15% stress	Net impact on P/L account
USD	14.18	-0.68	14.85	-1.35	15.53	-2.03
EURO	24.36	-1.16	25.52	-2.32	26.68	-3.48
GBP	16.80	0.80	17.60	1.60	18.40	2.40
Sw. Franc	19.95	-0.95	20.90	-1.90	21.85	-2.85
Jap Yen	21.26	1.01	22.28	2.03	23.29	3.04
		-0.97		-1.95		-2.92
<b>% of profits</b>		<b>5.4</b>		<b>10.8</b>		<b>16.2</b>

**Note:**

- a) The Rupee has depreciated against all currencies by 5%, 10% and 15%.
- b) Since Rupee has depreciated, the bank incurs a loss on oversold positions and makes a gain on the overbought positions.