

CAPITAL PLANNING

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CAPITAL WILL BE CRITICAL

Under the Basel III rule book....**91 of the world's biggest banks** – tested in an impact assessment – have an estimated \$577 billion capital **SHORTFALL** compared with the new 7% headline number for equity tier one capital...

Financial Times, Dec 17, 2010.

Credit risk Example

- 1000 1-year loans of INR 1000 each at 6.5%
- Loan Amount is INR 1000,
 - i.e., **EAD** (**Exposure At Default**) is INR 1000
- Probability of default is .01
 - i.e., **EDF** (**Expected Default Frequency**) is 1%
- Recovery of 50% when there is default
 - i.e., **LGD** (**Loss Given Default**) is 50%

EXPECTED INCOME FROM LOAN PORTFOLIO

Number of loans is 1000

1% Expected default frequency IMPLIES

Expected number of successful loans is 990

- Cash Flows to lender from a loan is INR 1065 (if everything goes well!

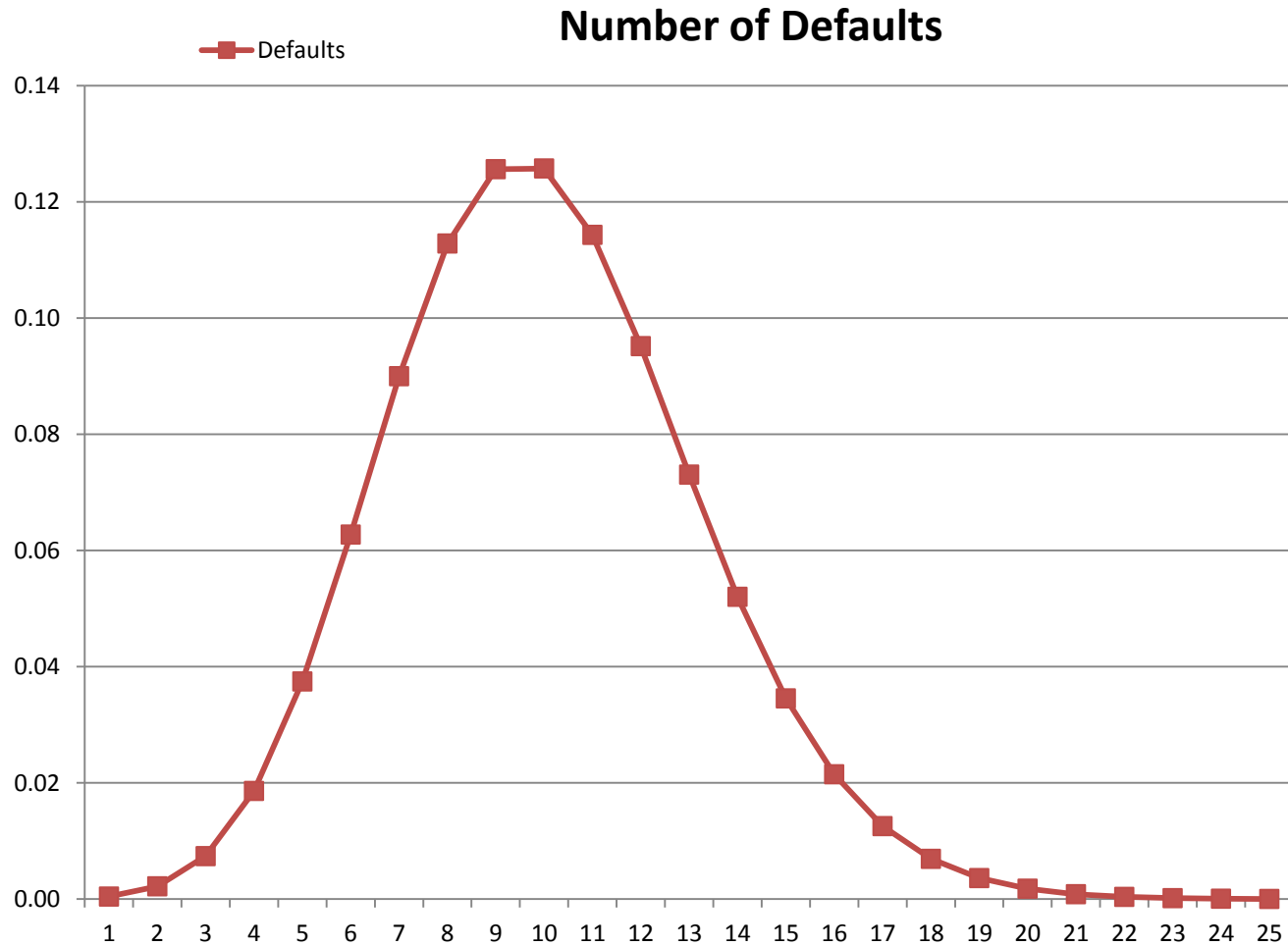
Expected number of defaulting loans is 10

- Cash flows from defaulting loans is 500

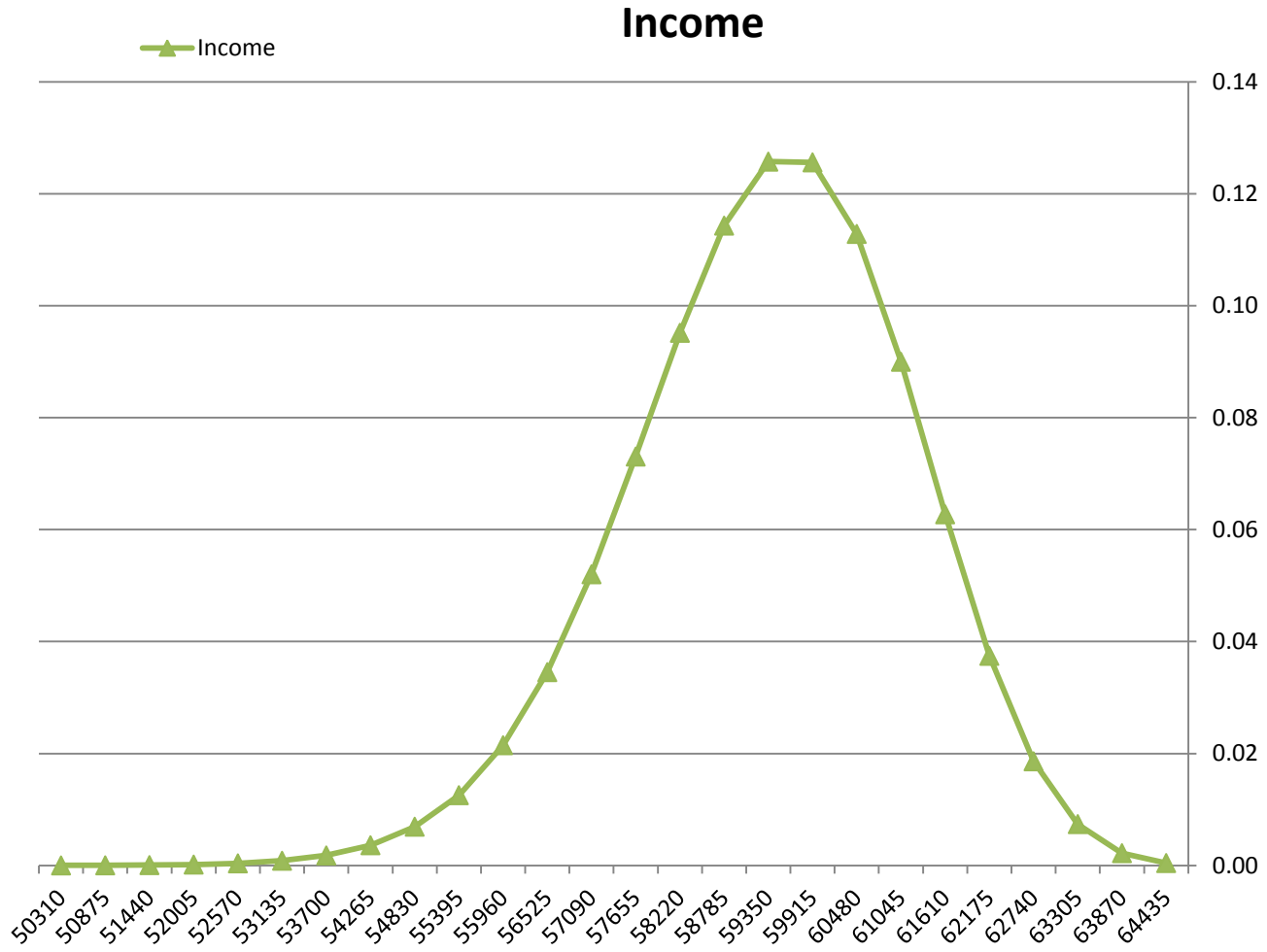
Expected Income

$$= [990 * 1065 + 10 * 500] = \text{INR } 59,350$$

NUMBER OF DEFAULTS



INCOME DISTRIBUTION



WHAT IS THE VALUE AT RISK?

- Expected Income is \$59350 (10 defaults)
 - What if there are 15 or more defaults? (the probability of ≥ 15 defaults is 0.0824)
 - How much will you lose?
 - You will lose 2825!
- i.e., **value at risk [at the 8.24% level] is -2825**

PROVISIONS

Expected loss

= Expected Income – Promised Income

= 59350 – 65000 (Recall 6.5% interest rate)

= -5650

Loan portfolio provision = 5650

VALUE AT RISK

	Defaults	Cum prob	VAR		
	15	0.082412	-2825		
	16	0.047871	-3390	5%/95%	
	17	0.026391	-3955		
	18	0.013833	-4520		
	19	0.006905	-5085		
	20	0.003288	-5650		
	21	0.001496	-6215	0.1%/99.9%	
	22	0.000652	-6780		
	23	0.000272	-7345		
	24	0.000109	-7910		
	25	0.000042	-8475		
	26	0.000016	-9040		
	27	0.000006	-9605		
		
	1000	0	-1000000		

RESERVES

Plan for a bad year

Say, 1 in 20 years will be bad

Or a 5% (= 1/20) probability event

Set aside amount to cover UNEXPECTED LOSSES
(beyond what is provisioned for)

Between 2825 and 3390 is the 5%/95% VAR

ECONOMIC CAPITAL

Plan for unexpected loss level for an exceptionally bad year

Use 0.1%/99.9% VAR (more than 21-22 defaults)

Economic Capital

Between 6215 and 6780 can be set aside as

Or

Use Moody Aa rating requirement (0.03%/99.97% VAR), which is approximately 7300

REGULATORY CAPITAL

Basel III would say

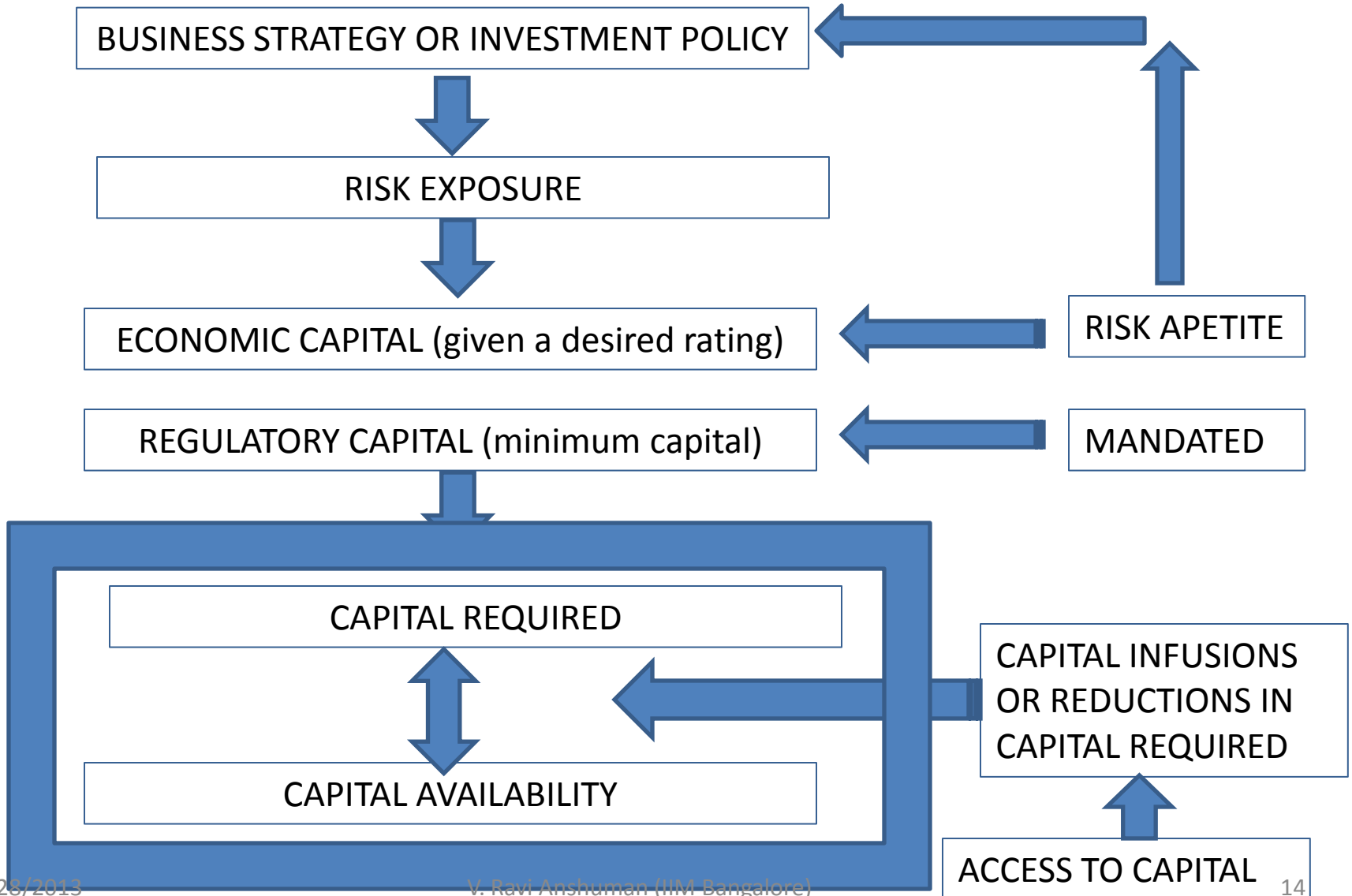
- Tier 1 capital ratio is 7% of risk weighted assets.
 - Assume loans are 10% risk weighted
- ➔ Regulatory Capital = 7% of (100,000) or 7,000

Regulatory capital refers to minimum requirements imposed by regulation to ensure a stable financial system

ACTUAL CAPITAL

- Economic capital is what shareholders would choose in the absence of regulation
- Regulatory capital is what is required to avoid restrictions on operations
- Actual capital is what is chosen by banks (a buffer above regulatory requirements)

CAPITAL FLOW

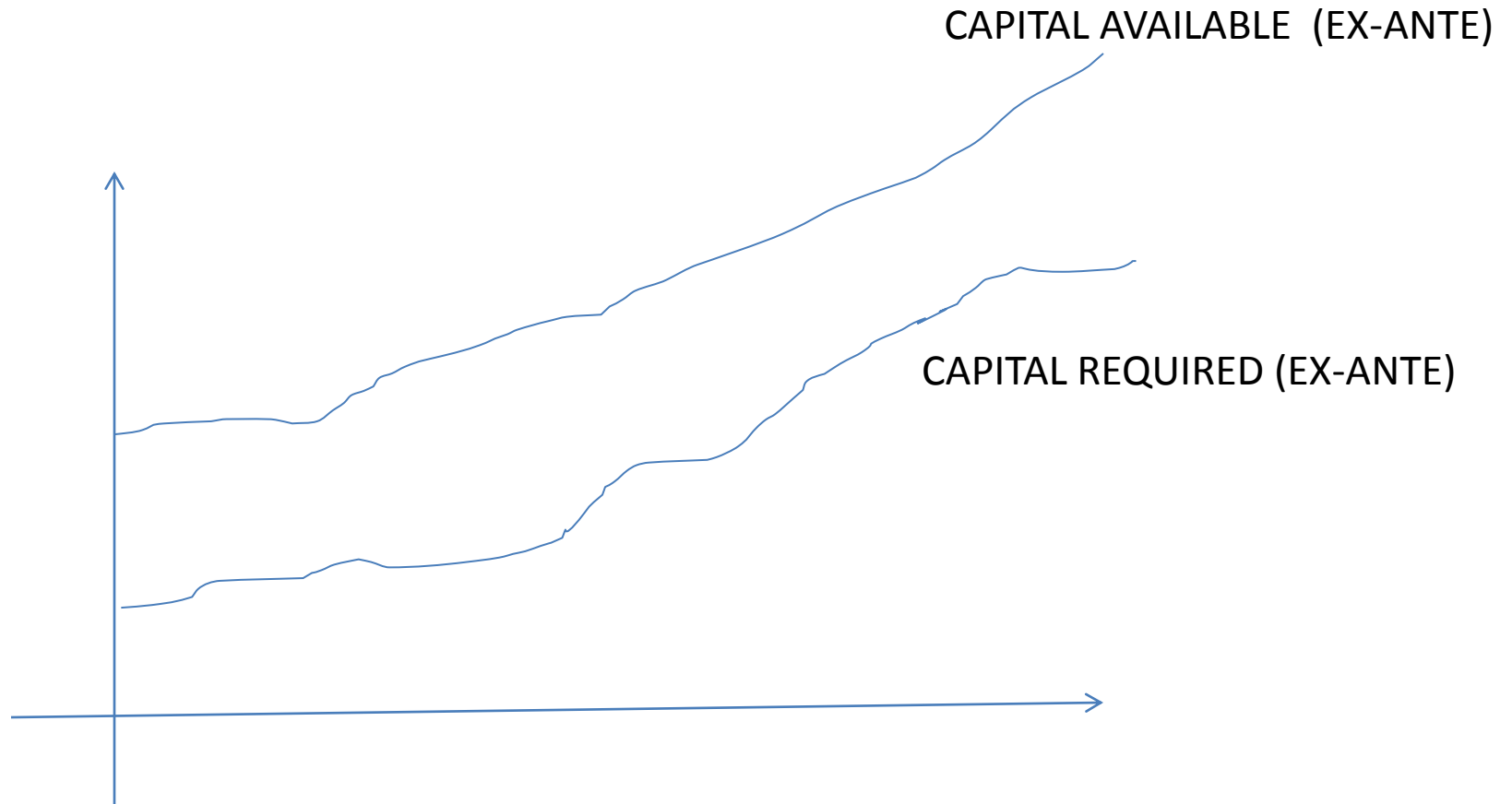


ICAAP STRESS TESTING

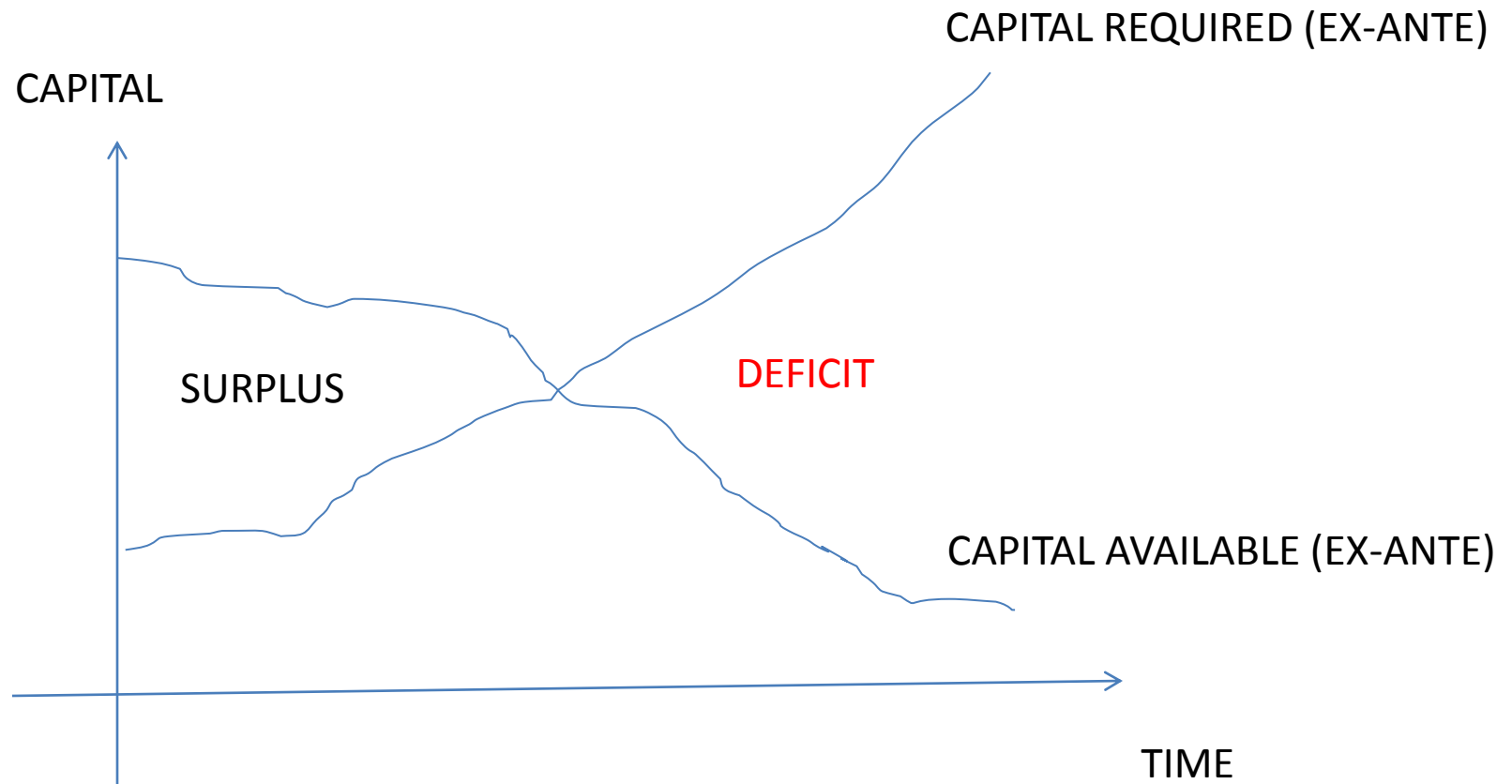
- Dynamic (over time)
- Impact of macroeconomic factors
- Business Cycle Effects
- Correlations are important
- Sensitivity Analysis
- Scenario Analysis
- Critical for larger institutions

Stress Testing is the process of estimating credit and liquidity exposures that a bank would experience during periods of extreme price and large volatility scenarios

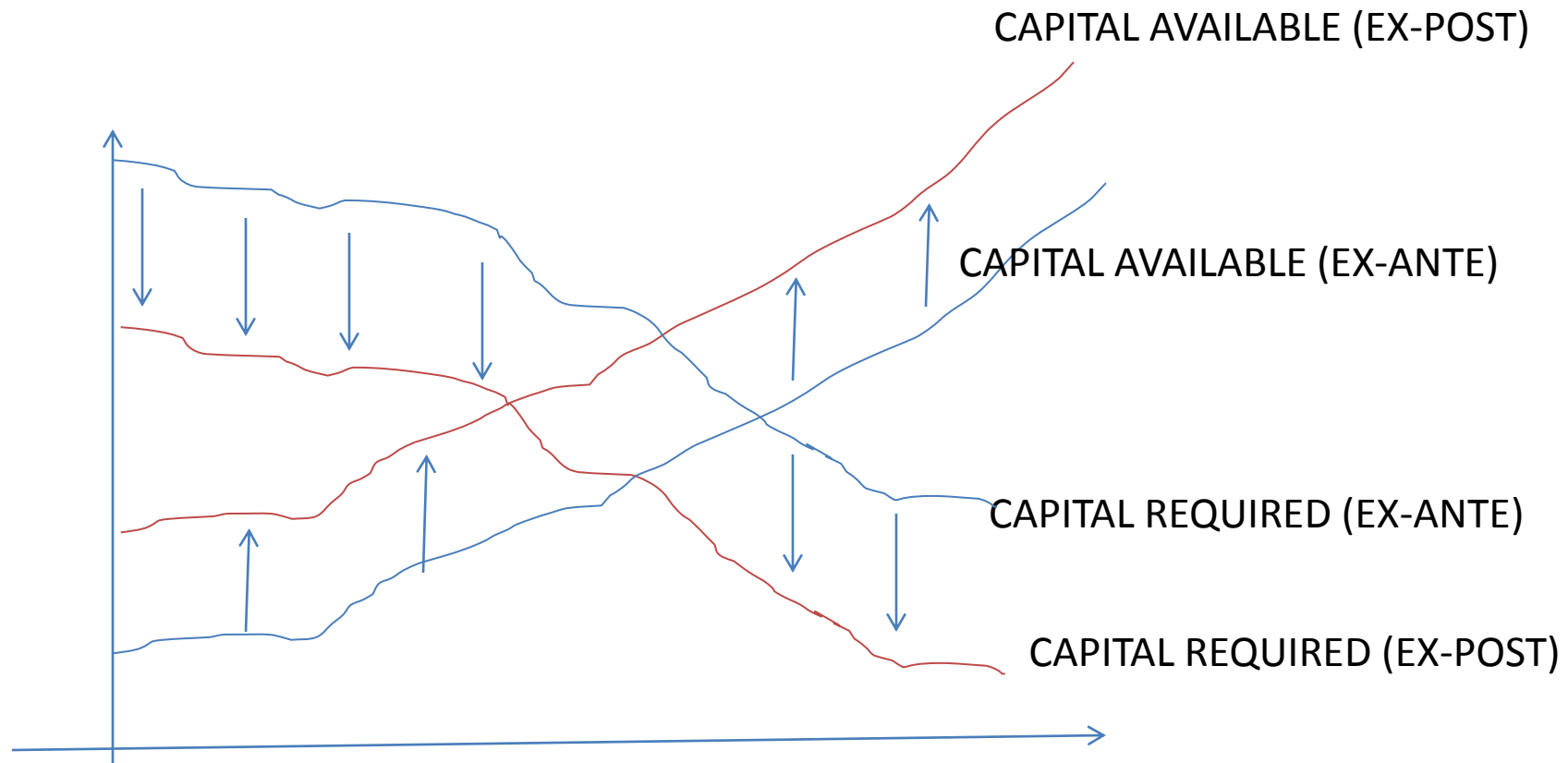
EXPECTED SCENARIO



WORST CASE SCENARIO



POST MANAGERIAL ACTIONS



CAPITAL AVAILABILITY

- Access to capital
- Revise dividend Policy
- Issue Tier 1 capital/Issue Tier 2 capital
- Pricing Policy (improve margins)
- Reduce exposure (scale down)
- Improve Operating efficiency (ROA)
- Reschedule debt payments

SUSTAINABLE GROWTH

Consider the following balance sheet.

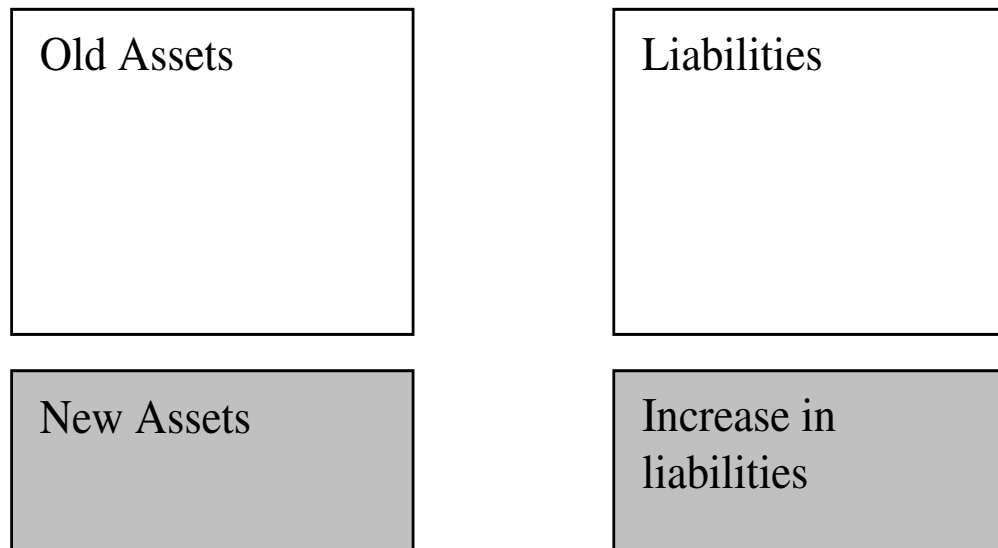
Assets

Liabilities

Total assets = Total liabilities

MANAGERIAL CONSTRAINT ON LEVERAGE RATIO

Now if the firm wishes to grow, the balance sheet will look like:



Equity change is due to retained earnings

➔ the sustainable rate of growth is driven by the growth of equity.

SUSTAINABLE GROWTH

b (PAYOUT RATIO) AND RETURN ON EQUITY (ROE)

$$\begin{aligned}g &= \Delta \text{Equity} / \text{Beg. Equity} \\ &= \text{Retained earnings} / \text{Beg. Equity} \\ &= (\text{Earnings} * b) / \text{Beg. Equity}, \text{ where } b = \text{retention ratio} = 1 - \text{payout ratio} \\ &= (\text{Beg Equity} * \text{ROE} * b) / \text{Beg. Equity} \\ &= b * \text{ROE}\end{aligned}$$

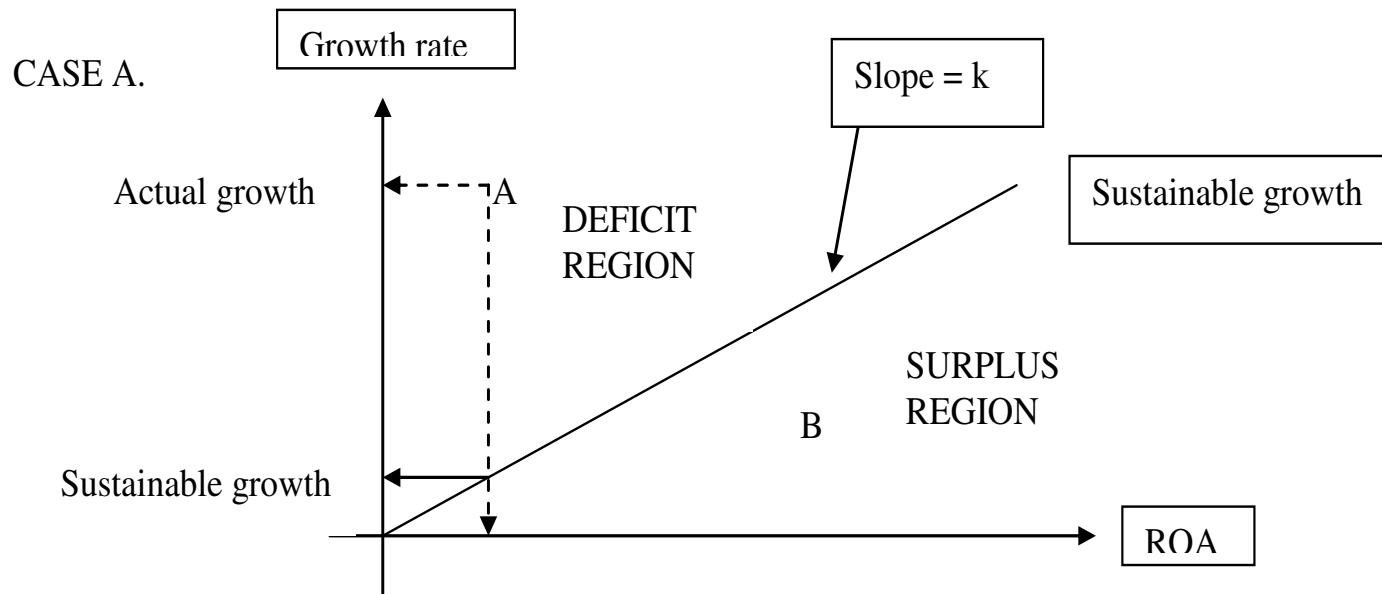
Sustainable growth, $g = b * \text{ROE}$

$$= b * \text{NI} / \text{Equity} = b * (\text{NI} / \text{Assets}) * (\text{Assets} / \text{Equity})$$

$$= b * L * \text{ROA}$$

$$= k * \text{ROA}$$

DEFICIT/SURPLUS FIRMS



→ Adjust slope (k) or adjust ROA

SETTING ASIDE BUFFER

	SETTING ASIDE CAPITAL FOR FUTURE CONTINGENCIES					
	2012	2013	2014	2015		
Base Case						
Capital Required (ex-ante)	900	960	1020	1080		
Capital Available (ex-ante)	1000	1070	1150	1250		
	100	110	130	170		
Stress Case (ex-post)	900	980	1030	1070		
Capital Required (ex-post)	1000	1050	1120	1200		
Capital Available (ex-post)	100	70	90	130		
Incremental Effects						
Incremental Capital Requirement	0	80	130	170		
Incremental Capital Available	0	50	120	200		
Net Requirement		(30)	(10)	30		
How much to set aside from today's surplus?	(30)					

CONCLUSIONS

- Involvement of Senior Management IS
CRITICAL
- Evolve managerial actions to address worst case scenarios
- **Communicate managerial action plan and the associated costs/benefits**
- Use stress testing to question assumptions about basic business model

MANAGERIAL ACTIONS

- Revise Limits?
- Reduce Exposure
- Change pricing policy (deposit rates!)

➔ Tradeoffs between costs and benefits of implementation should determine the optimal managerial actions.