

Portfolio Risk and Capital Adequacy

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Agenda



- 1. Measuring Credit Risk*
- 2. Capital Adequacy and Portfolio Risk*
- 3. Economic Capital*
- 4. Portfolio Management of Credit Risk*
- 5. Stress Testing and Risk Migration*

1 Measuring Credit Risk

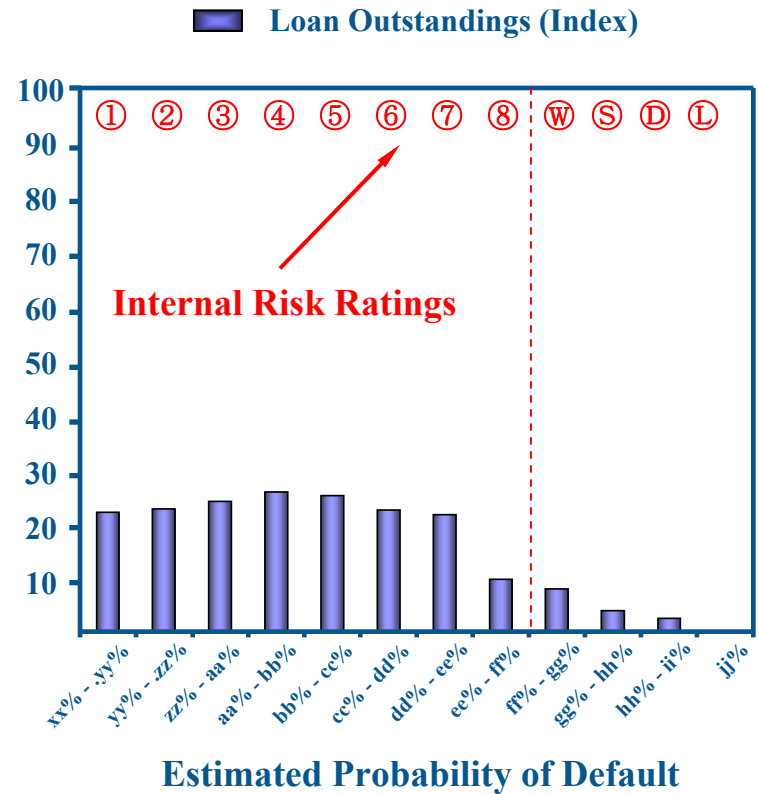
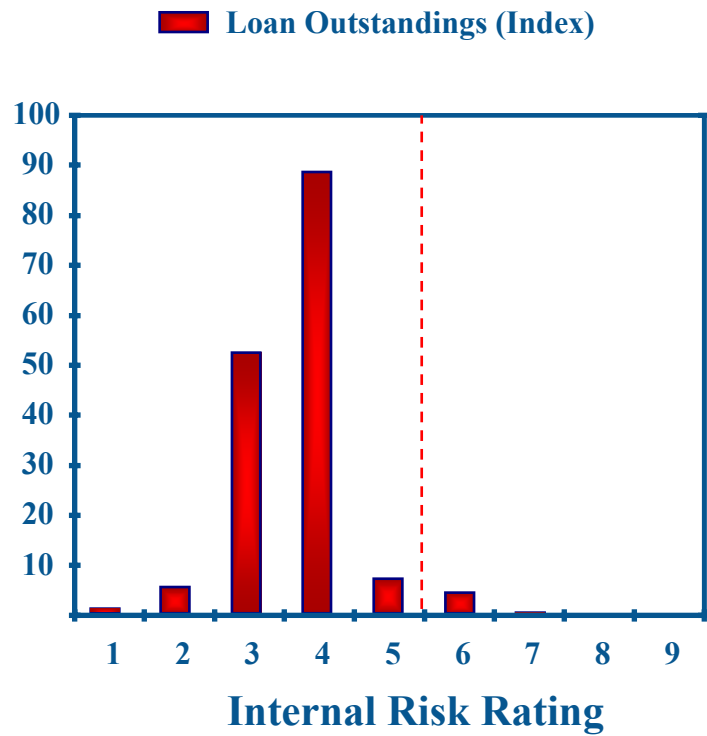
Best Practices for Risk Management

- Losses arising from credit default can be catastrophic;
- Credit Risk Management is a **strategic** function for a bank;
- “*Effective Framework*” for Risk Management is now *expected* by Regulators concerned with **Capital Adequacy**:
 - *Measuring and pricing* credit risk at origination;
 - *Measuring and managing* portfolio risk;
- Key concepts in *measuring and managing* credit risk:
 - **Risk Ratings**: obligor Probability of Default;
 - **Expected Loss**: transaction/structure risk; **Allowance for Loan and Lease Losses (ALLL)**;
 - **Capital Adequacy**: Economic Capital; portfolio stress testing.

Measuring Credit Risk

- Requires a Dual Risk approach;
 - Estimate of **Probability of Default** (PD) for *obligor*;
 - Estimate of **Loss Given Default** (LGD) for *facility*;
- Enables calculation of **Expected Loss** (EL);
- **Expected Loss** = PD x Exposure at Default (EAD) x LGD;
 - Example: .625% x 100 x 50% =
31.25 bpts;
 - ✓ PD equivalent to a BB/BB- public debt rating;
- EL is the basis for a quantitative, objective, transparent and consistent measure of credit and *risk-based pricing*.

Revised Internal Risk Ratings



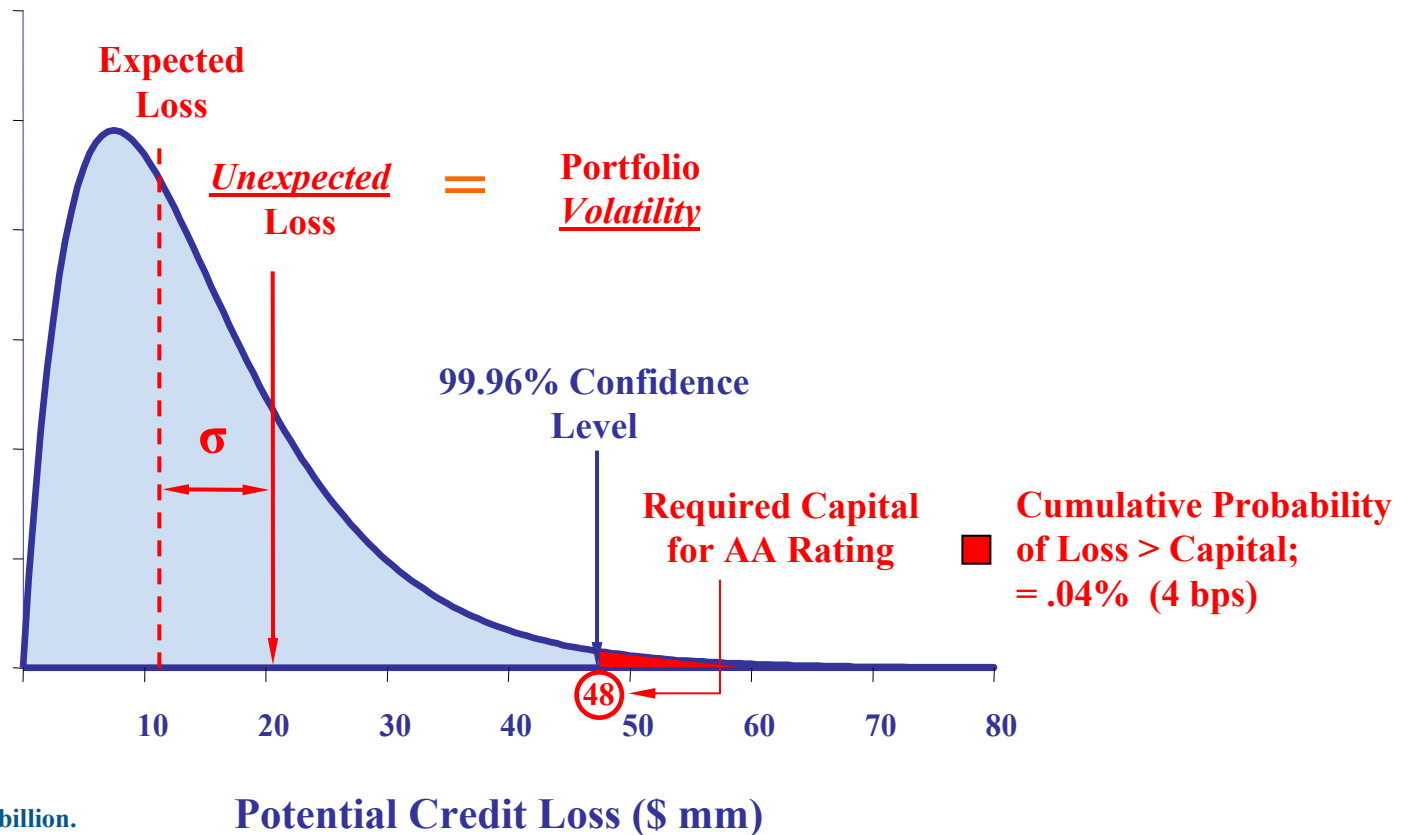
Source: Disguised client internal data.

2*Capital Adequacy and Portfolio Risk*

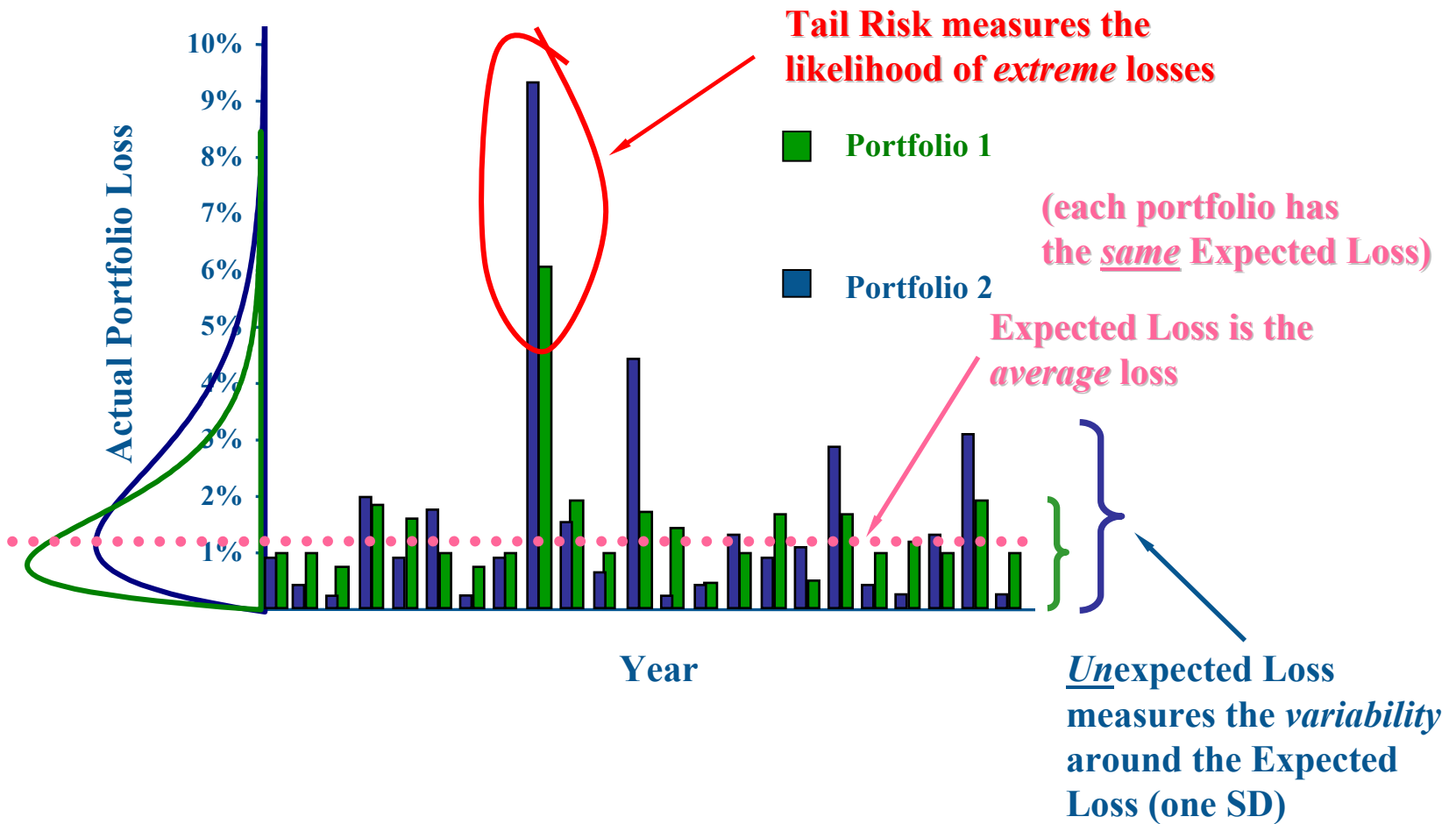
Capital Adequacy

- **Capital Adequacy** is a portfolio concept; sufficient capital to absorb extreme losses;
- **Economic Capital** is the measure of Capital Adequacy;
- Expected Loss is **additive**; portfolio EL is the sum of all obligors/facility EL's;
 - **Risk-based provisioning, i.e., determination of Allowance for Loan and Lease Losses (ALLL)**;
- Economic Capital covers the risk of **Unexpected Loss**;
 - Real risk is volatility of losses; ALLL covers Expected Loss;
 - Return on Economic Capital (ROEC) should be charged to each loan.

Portfolio Risk Characteristics



Portfolio Risk Characteristics (cont.)

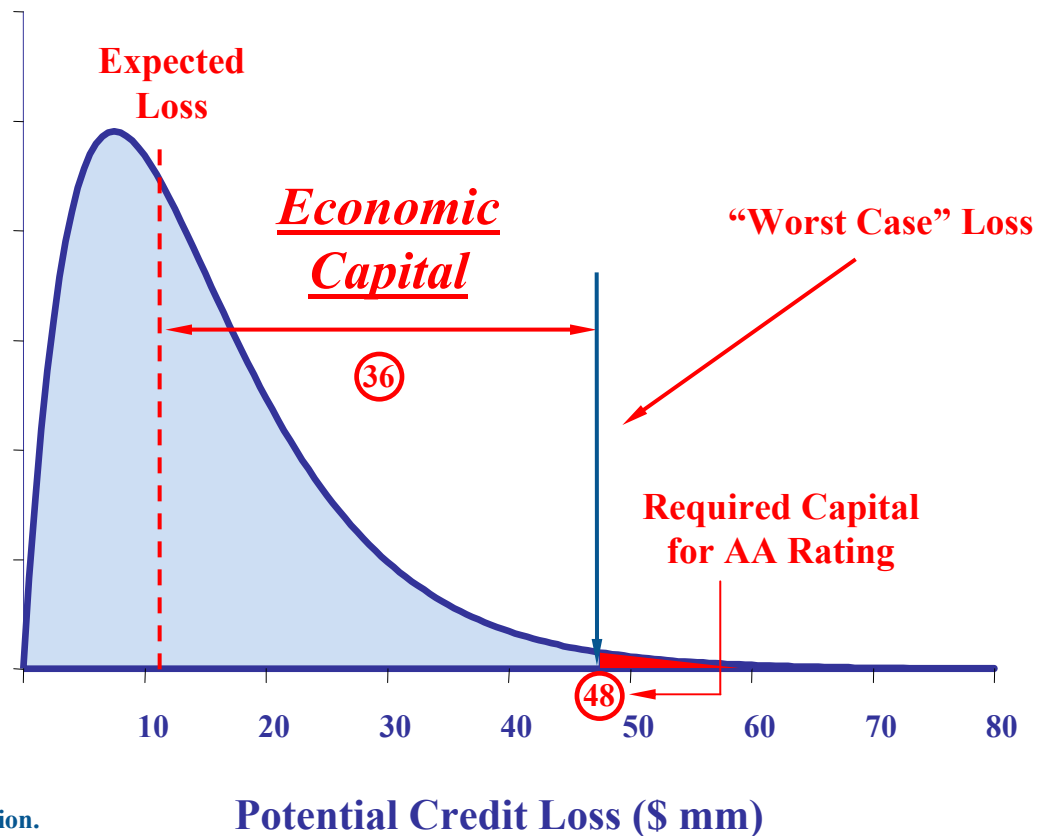



3
Economic Capital

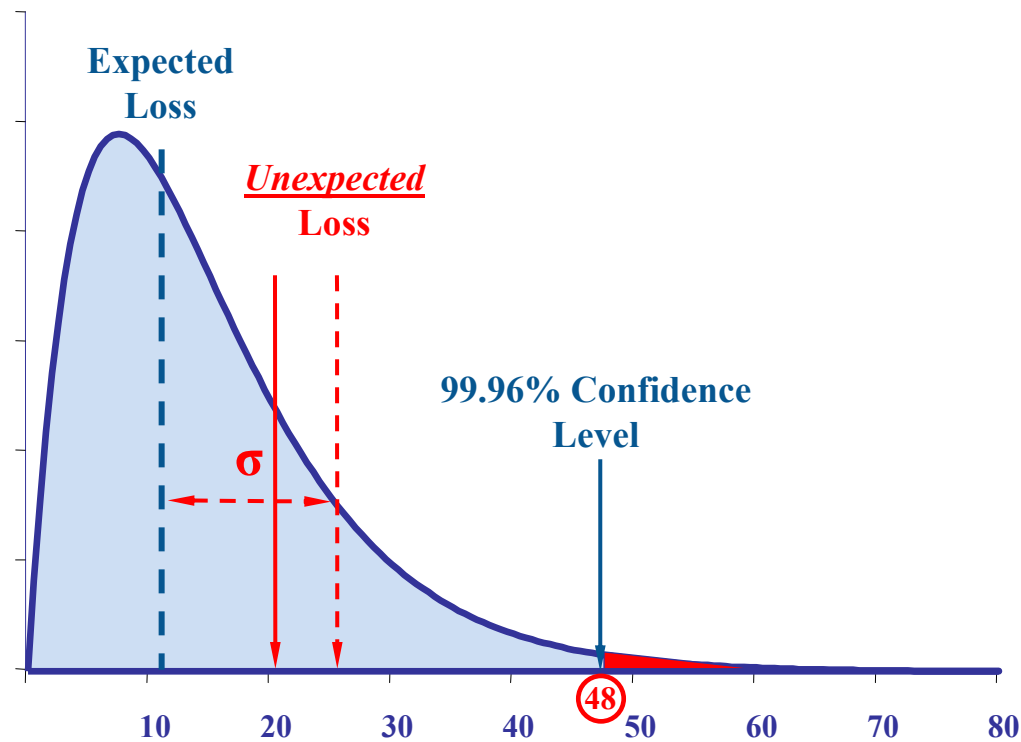
Portfolio Risk and Economic Capital

- Economic Capital covers “*worst case*” *loss* and is a function of:
 - Portfolio *Expected Loss*;
 - Portfolio *Unexpected Loss* or volatility;
 - Desired institutional credit quality;
- *Portfolio* UL is *less* than sum of obligor UL’s; “Diversification Effect”;
- Individual obligors make a *Risk Contribution* to Portfolio UL and Economic Capital based on the *correlations* among obligors;
- Several simple approaches to approximate Economic Capital attribution and calculate *Return on Economic Capital* (ROEC).

Portfolio Risk and Economic Capital (cont.)



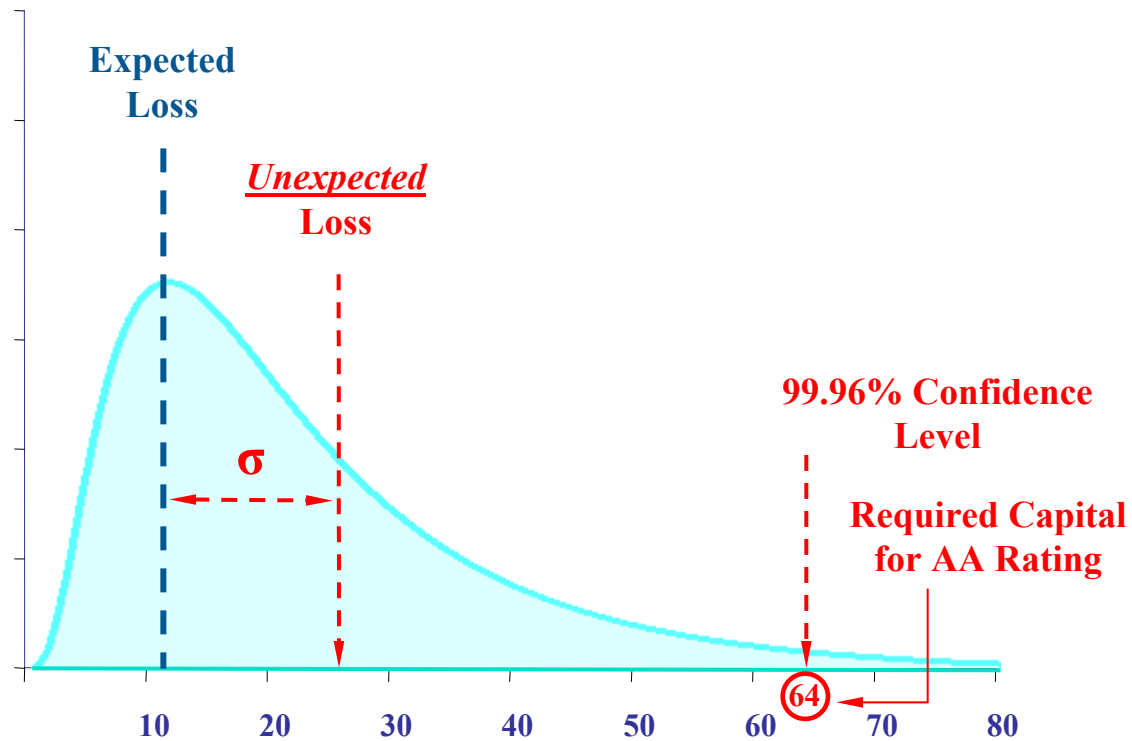
Economic Capital and Volatility



Note: Portfolio BV = \$1 billion.

Potential Credit Loss (\$ mm)

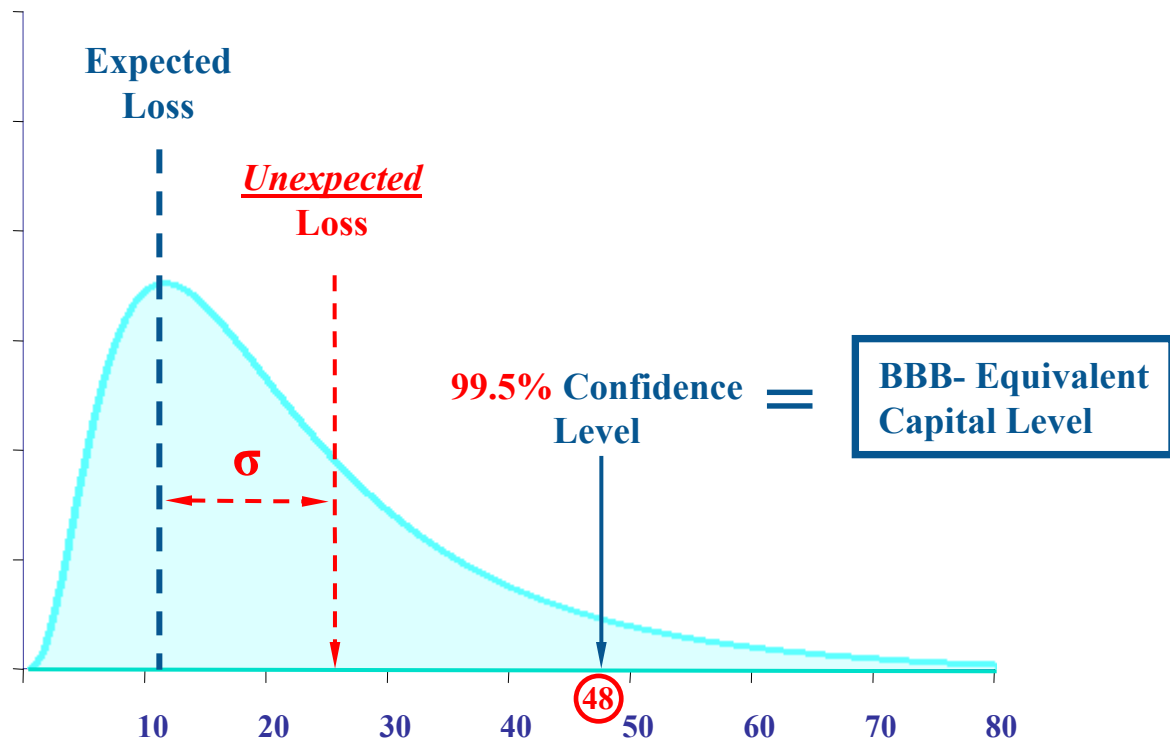
Economic Capital and Volatility (cont.)



Note: Portfolio BV = \$1 billion.

Potential Credit Loss (\$ mm)

Economic Capital and Volatility (cont.)

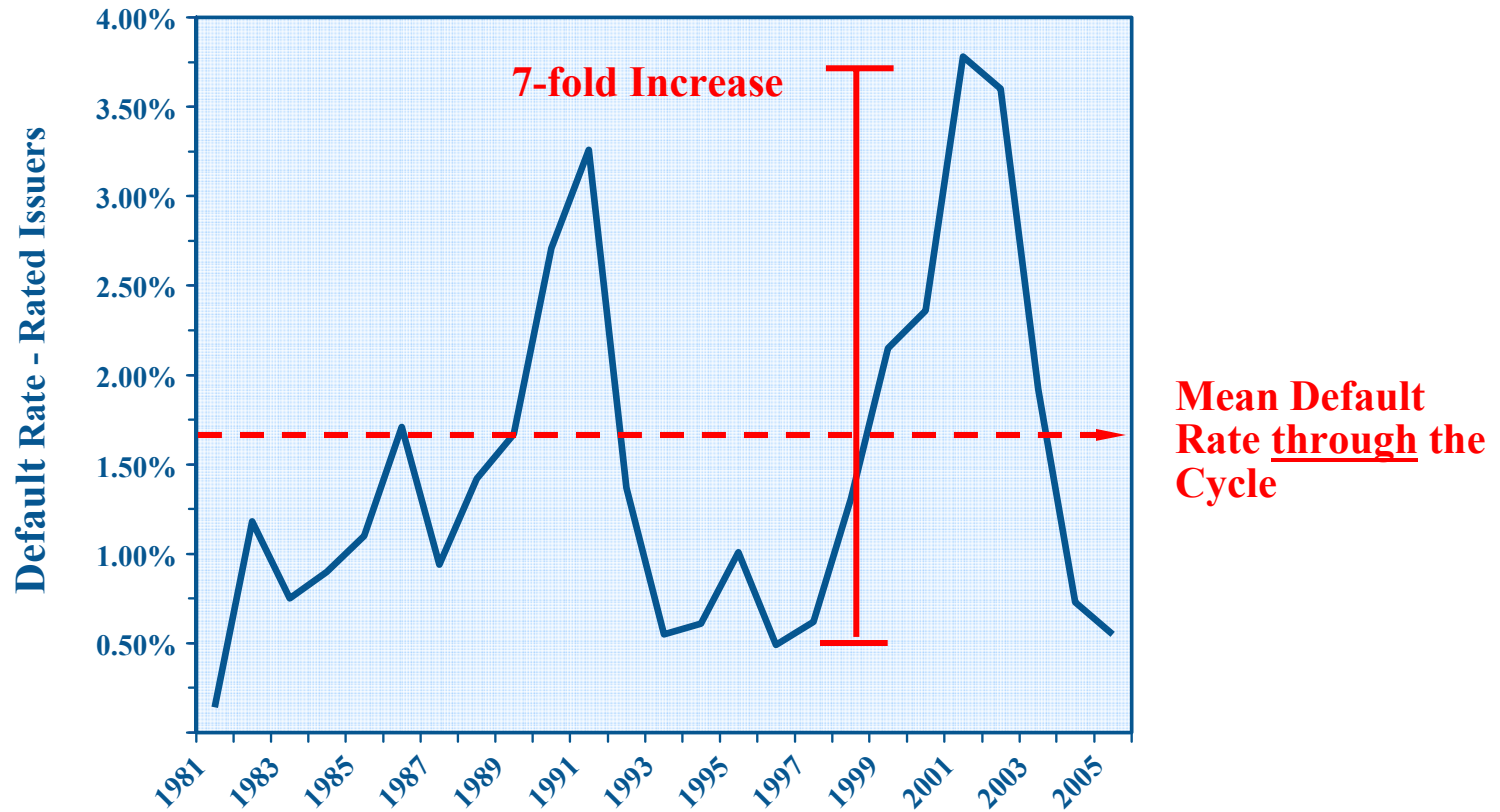


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Potential Credit Loss (\$ mm)

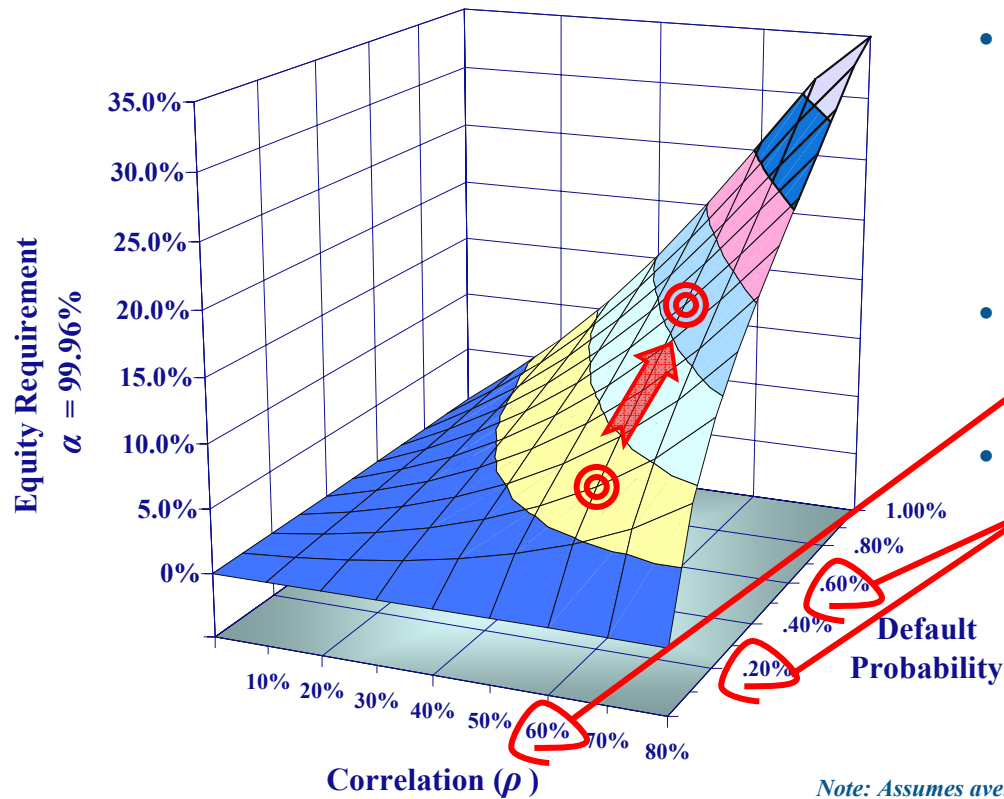
4 *Portfolio Management*

Credit Cycle



Source: Standard & Poor's

How Portfolios Behave: Concentration Risk



- Sub-portfolios may be relatively homogenous;
 - Obligor with same PD's;
 - Facilities with same LGD;
- CRE portfolios may be highly correlated;
- For such portfolios, as PD increases portfolio equity requirement can increase dramatically.

Note: Assumes average 25% LGD.

Source: Uwe Wehrspohn, "Credit Risk Evaluation",
Center for Risk & Evaluation GmbH & Co. KG, 2002,
pp.109 – 112.

Portfolio Management: Diversification

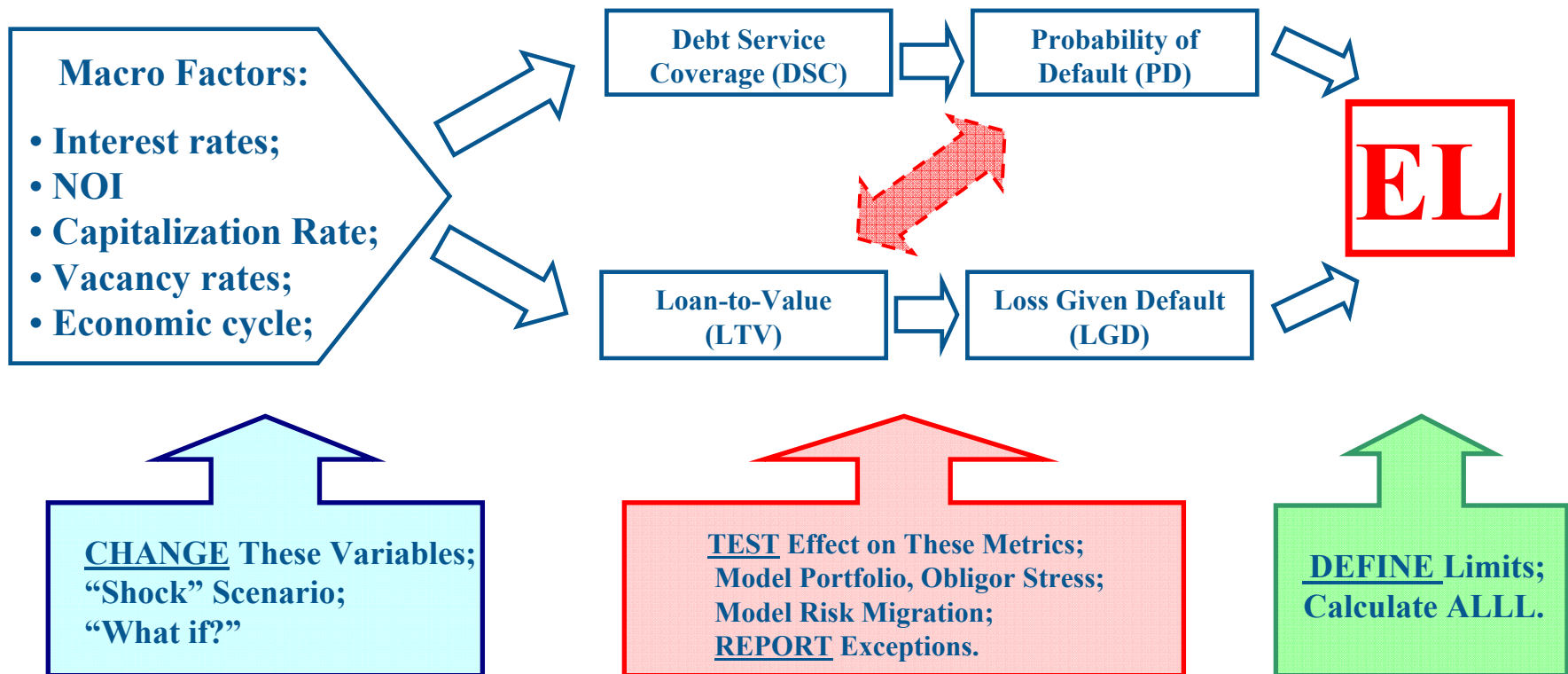
- Key to “best practices” is portfolio **diversification**;
- All banks originate with “natural **concentrations**”;
- *Active Portfolio Management* can reduce risks from concentrations;
 - Segment portfolio, *e.g.*, by industry, geography;
 - Stress testing concentrations simulates portfolio UL and Economic Capital;
 - ***Risk-based pricing*** at origination; based on EL and ROEC;
 - ✓ Enhances liquidity, syndication;
 - “Credit and cross-sell”;
 - Consider asset sales, derivatives to reduce concentrations.

5*Stress Testing and Risk Migration*

Stress Testing

- Modeling and stress testing required at the obligor and portfolio levels;
 - “What if?”...(e.g., interest rates increase by 100 bpts);
 - “Shock” scenarios;
- Confirm Capital Adequacy, identify **concentrations**;
- Test for anticipated Risk Migration;
- **Approximation of UL/Economic Capital**;
- *Risk Migration* analysis is possible **ONLY** with a quantitative risk rating system;
 - Can be based on either *predictive* PD model OR on *deterministic* models.

Stress Testing (cont.)



Expected Loss in Portfolio Strategist™

Portfolio				
Total Current Balance	Total Ead	Total EL\$	Total Factored Value	Total LGD Discounted Recovery
1,383,965.00	1,855,000.00	0.00	1,869,600.00	1,619,600.00
297,411.00	316,100.00	121.00	624,000.00	518,000.00
2,002,030.00	2,965,000.00	1,020.00	3,000,000.00	2,625,000.00
162,742.00	230,000.00	308.00	120,000.00	90,000.00
1,957,599.00	3,138,500.00	4,377.00	3,127,400.00	2,700,800.00
39,679,985.00	66,224,084.00	479,411.96	57,278,331.90	45,146,770.20

Portfolio				
Total Current Balance	Total Ead	Total EL\$	Total Factored Value	Total LGD Discounted Recovery
1,383,965.00	1,855,000.00	0.00	1,869,600.00	1,619,600.00
297,411.00	316,100.00	121.00	624,000.00	518,000.00
2,002,030.00	2,965,000.00	1,020.00	3,000,000.00	2,625,000.00
162,742.91	230,000.00	304.71	120,000.00	90,000.00
1,957,597.57	3,138,500.00	0.00	3,127,400.00	2,700,800.00
43,363,406.70	66,224,084.00	841,932.06	57,278,331.90	45,146,770.20

Portfolio EAD w/ undrawn commitments

Aggregate Portfolio EL

Stress EL increases 75%; > 50 bpts.

Portfolio Strategist™ Risk Migration Analysis

Risk Migration Table

		Group Risk Category - To												Total Companies
		1	2	3	4	5	6	7	8	9	10	11	12	
Group Risk Category - From	1													
	2													
	3			7	34									41
	4				57	36	1							94
	5					2								2
	6							2						2
	7								1					
	8													
	9													
	10													
	11													
	12													

Risk Migration

Companies moved from Risk Category - '4' to Risk Category - '5'

Company Name	Risk From	Risk To	Risk Migratic
Ash Brothers Bar	2.19	1.79	4 => 5
Simon's Bar	2.06	1.55	4 => 5
Ray and George Wine Bar	2.11	1.70	4 => 5
The Gregorian P/L	2.11	1.70	4 => 5
The Flying Hawk Hotel	2.11	1.70	4 => 5
Pizza Co.	2.11	1.70	4 => 5
Coopers Inn	2.11	1.70	4 => 5
Highbett Hotel	2.11	1.70	4 => 5
Milners Griller	2.11	1.70	4 => 5
The Hotel William	2.35	1.68	4 => 5
Rosebud Hotel	2.11	1.70	4 => 5
Test Company 15	2.36	1.69	4 => 5
Flagtown Motel	2.35	1.68	4 => 5
Paykel Hotel P/L	2.55	1.93	4 => 5

‘Clicking’ on the migration cell identifies the account movements that make up the ‘stressed’ portfolio;

‘Clicking’ on the individual customer name enables Optimist™; the full sensitivity analysis capability is available for an obligor.

Summary

- Credit Risk Management is a **strategic** function for a bank;
- Diversification is the best defense --- but banks are constrained;
- *Concentrations* make *measuring* credit risk all the **MORE** important;
- Regulators and the *market* will *require* “best practices”:
 - *Measuring* obligor/facility risk;
 - Stress-testing the loan portfolio;
- Measuring ***Expected Loss*** leads to ***risk-based*** provisioning and pricing;
- Potential to move from “Originate and Hold” to “Underwrite and Distribute” banking model.

Fundamentals of Banking

“When done properly, the business of banking has no upside.”

-- Attributed to John Maynard Keynes
(1883 – 1946)



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