Bank Economic Capital – An Australian Perspective

Bob Allen – APRA
Bank of Japan - Economic Capital Management Workshop
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Outline

- Overview of Australian bank practice

  - Risk coverage

  - Relationship between actual capital held and economic and regulatory capital estimates

- Comparability of economic and Basel II regulatory capital measures

- Quantifying liquidity risk economic capital

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- Overview of Australian bank practice

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  - Relationship between actual capital held and economic and regulatory capital estimates

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- Quantifying liquidity risk economic capital

Principle 1: Banks should have a process for ==assessing their overall capital adequacy in relation to their risk profile== and a strategy for maintaining their capital levels.

Principle 2: Supervisors should review and ==evaluate banks' internal capital adequacy assessments== and strategies, as well as their ability to monitor and ensure their compliance with regulatory capital ratios. Supervisors should take appropriate supervisory action if they are not satisfied with the result of this process.

Regulatory and Economic Capital Comparison

Hypothetical Bank PLC

	Basel II Regulatory Capital	Economic Capital	Economic Capital minus Basel II Regulatory Capital
Pillar 1 Risks			
Credit Risk	$5,000	$3,500	-$1,500
Market Risk	$500	$650	$150
Operational Risk	$1,250	$1,500	$250
Total Pillar 1	**$6,750**	**$5,650**	**-$1,100**
Pillar 2 Risks	**$0**	**$1,100**	**$1,100**
Total	**$6,750**	**$6,750**	**$0**

Different Perspectives

Regulatory Capital

• Depositor protection and system stability

Economic Capital

• Maximisation of stockholders wealth

Capital Definitions

Economic Capital

Required economic capital can be thought of as the maximum amount of unexpected losses potentially arising from all sources that could be absorbed **while remaining solvent**, with a given level of confidence over a given time horizon.

Regulatory Capital

Required regulatory capital can be thought of as the maximum amount of unexpected losses that could be absorbed **without any loss to depositors** (or their insurer), for a given level of confidence over a given time horizon.

Conceptual Differences

- Relevant Business Entities

- Confidence Levels

- Time Horizons

- Treatment of Expected Loss

- Allowable Capital Instruments

- Capital Deductions

- Risk Type Coverage

- Risk Type Definitions

- Scaling Factors

- Cross-risk Diversification

Relevant Business Entities

Regulatory Capital
- The individual licensed entity

Economic Capital

- The entire business group perhaps including multiple licensed and unregulated entities.

Regulatory Capital

• Probability that the bank will survive and thereby avoid potential systemic disruption

• Probability that depositors (or their insurer) will not lose any money even if the bank actually fails.

The confidence level implicitly reflects society's tolerance for the risk of depositor loss and systemic disruption arising from bank failure. It may not be explicitly specified, however

Economic Capital

• Probability that the bank will survive.

Conceptually the chosen confidence level should represent the point at which the marginal benefit, in terms of lower funding costs and access to business for which higher credit ratings (confidence levels) are a necessary condition, is estimated to exactly offset the marginal cost of raising and servicing additional equity. Unlike regulatory capital, the economic capital confidence level is not influenced by potential systemic costs of bank failure, for which the bank's stockholders are not liable.

Profit & Loss Probability Distribution
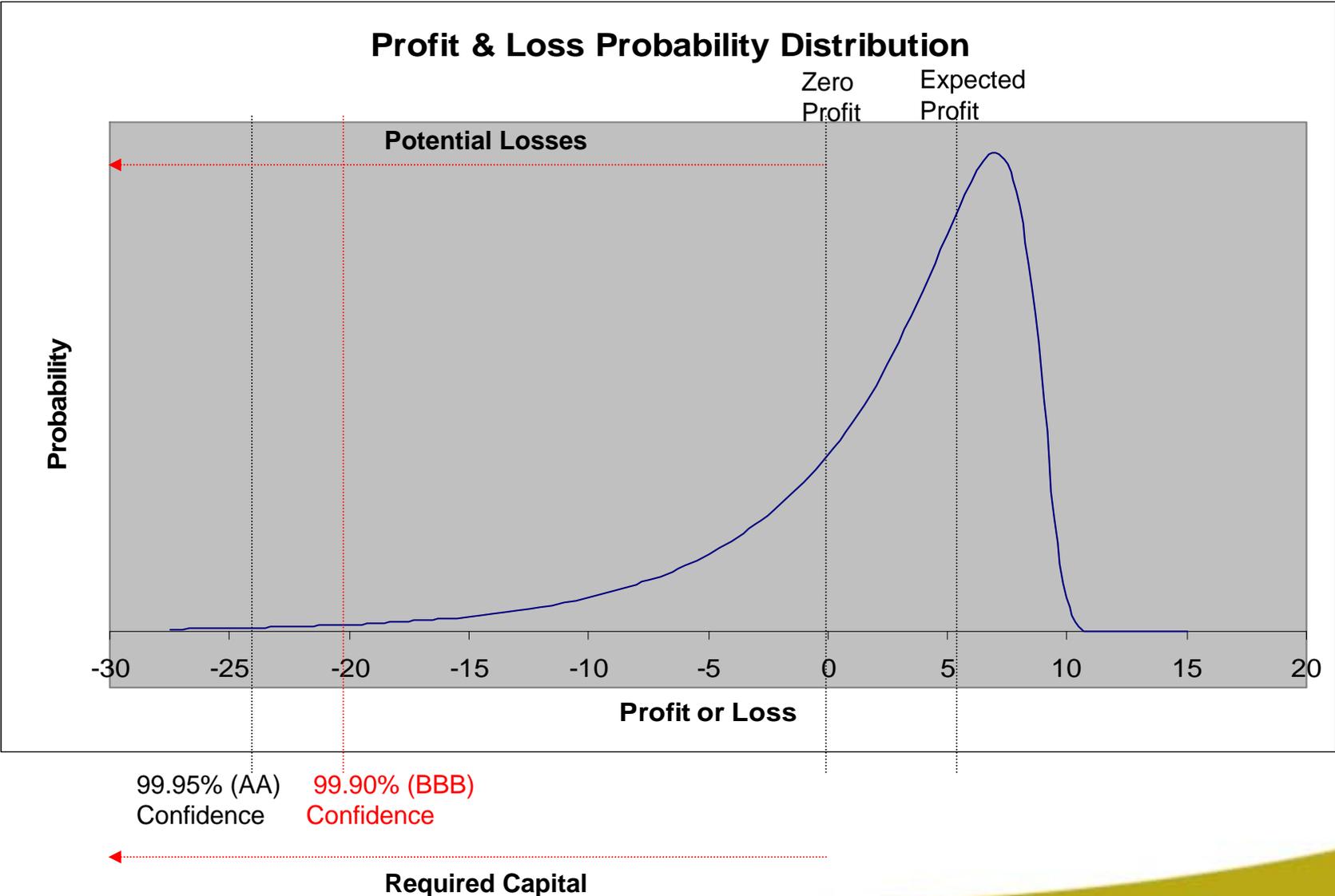
Time Horizons

For a given amount of capital, the longer the time horizon the lower the confidence level.

Regulatory Capital

• Time needed for supervisors to identify and intervene if necessary to address potentially life threatening problems

• Time needed to recapitalise after incurrence of serious losses

• Normal supervisory review cycles

Economic Capital

• Time needed to close out losing risk positions or businesses

• Time needed to recapitalise after incurrence of serious losses

• Normal business planning and performance review and reporting cycles

Treatment of Expected Loss

Regulatory Capital (Basel II)

• Provision or capital required for expected as well as unexpected losses

• Asymmetry of treatment of expected loss and expected income

• At variance with IFRS (actual impairment only, not expected future impairment)

Economic Capital

• Unexpected losses only?

• No provision or capital required for expected loss?

• Symmetry of treatment of expected loss and expected income?

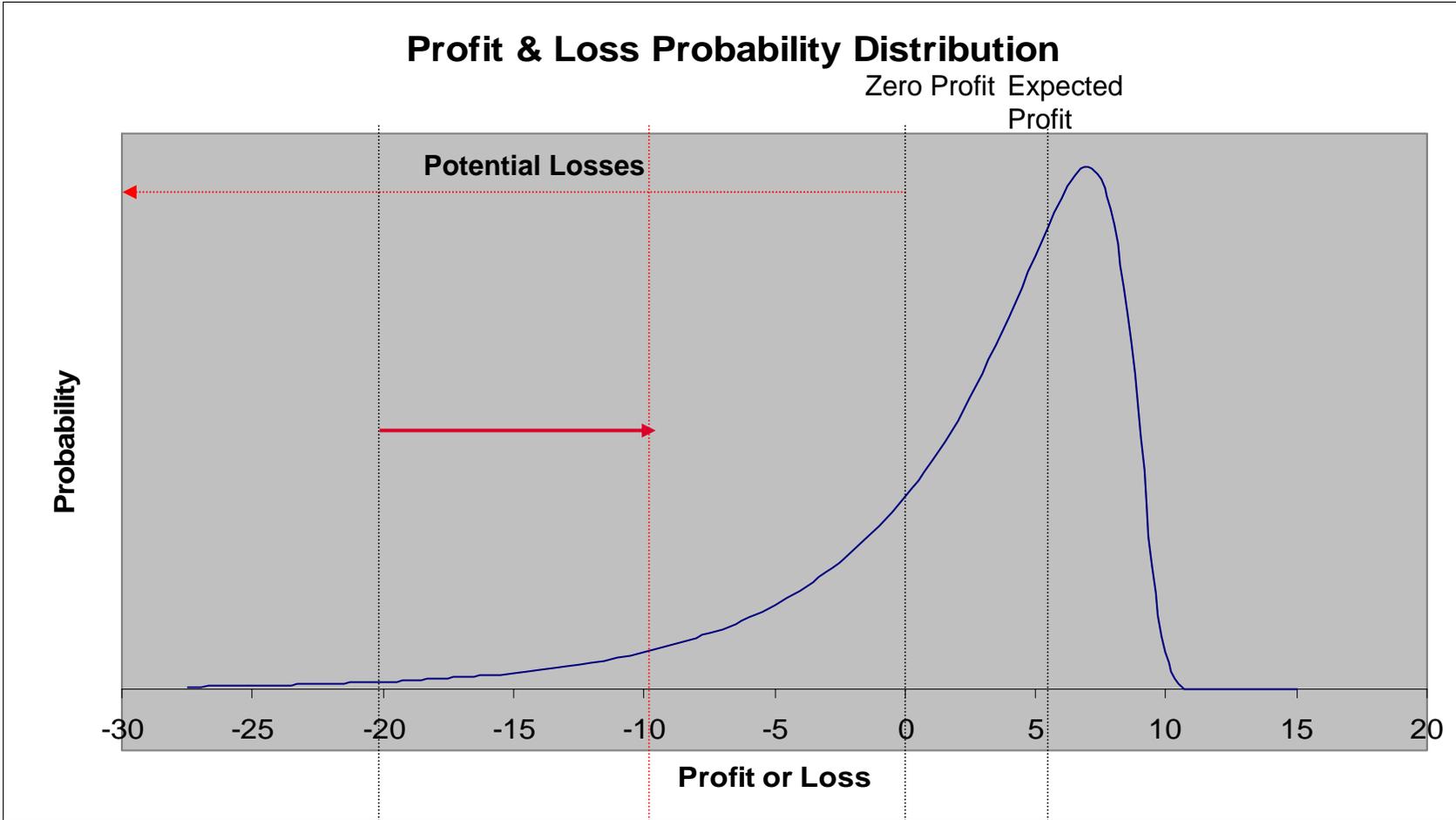# Allowable Capital Instruments

Regulatory Capital

- Shareholders funds – "Fundamental" Tier 1
- Hybrid debt/equity – "Innovative" Tier 1
- Subordinated debt – Tier 2

Economic Capital

- Shareholders funds only

Allowable Capital – Tier 1 and Tier 2

Profit & Loss Probability Distribution

Zero Profit Expected Profit

Potential Losses

Probability

Profit or Loss

Total Capital - 99.90% Confidence – 'BBB'

Tier 1 Capital (50%) - 98.58% Confidence – 'BB'

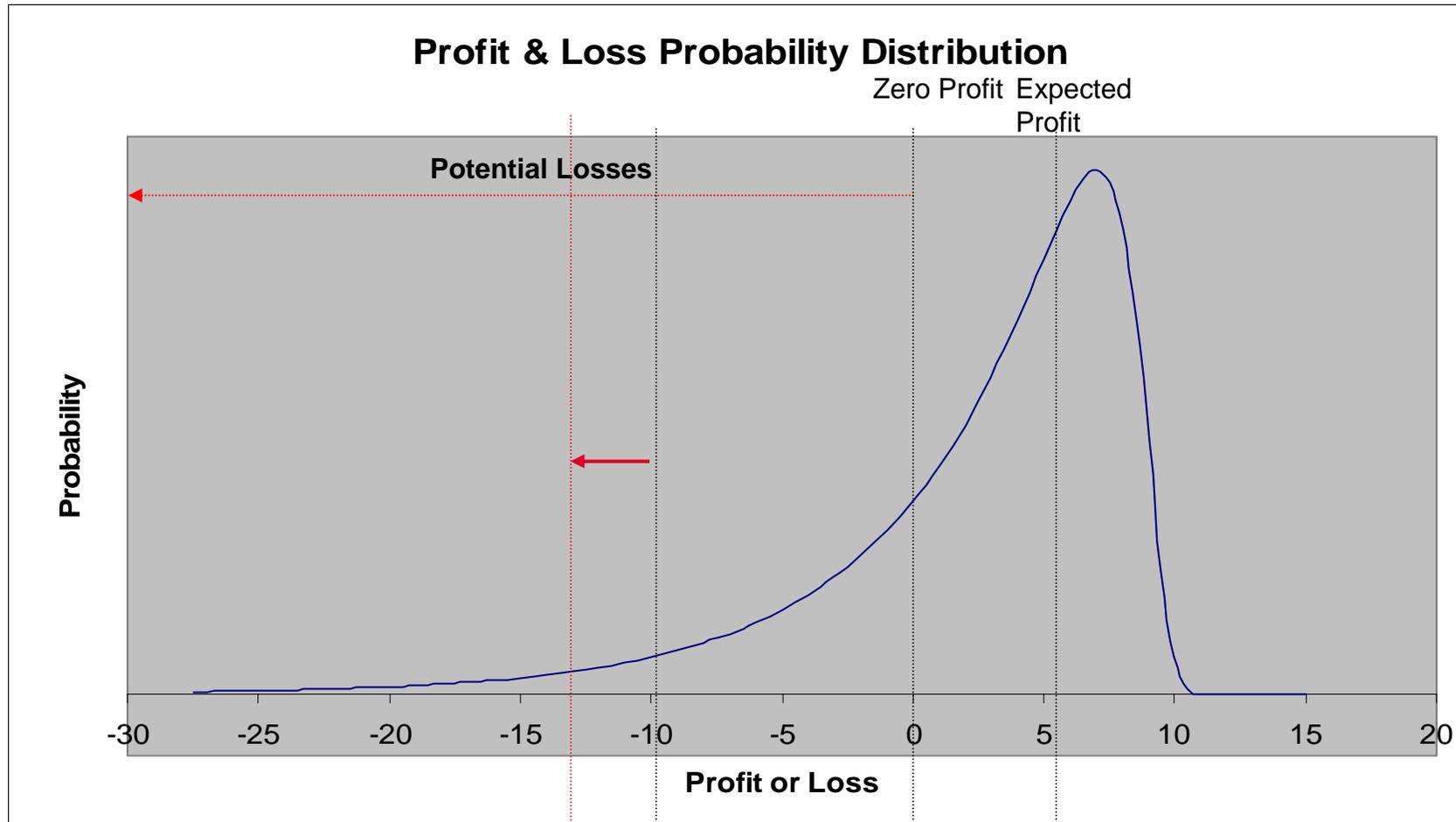Required Capital

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Regulatory Capital Deductions

Regulatory Capital

• Implicitly assumes deducted items have 100% probability of zero value in liquidation.

• Intangibles.

• Investments in insurance, certain other financial business and non-financial business subsidiaries.

Economic Capital

• 100% probability of zero value unlikely for all deducted assets in combination.

• No outright deductions.

• Model potential reductions in the value of these assets using the same time horizons and confidence levels as for all other potential sources of unexpected loss, taking correlations into account.

Allowing for Regulatory Deductions

Profit & Loss Probability Distribution

Required Capital

Risk Type Coverage and Definitions

	(Basel II) Regulatory	Economic
Pillar 1 Risks **Pillar 1 Total**	Credit (excluding concentration) (Trading) Market Risk Operational Risk Scaling Factor **$xxxxxxx**	Credit (including concentration) (Trading) Market Risk Operational Risk
Pillar 2 Risks		Non-Traded Interest Rate Risk Liquidity Risk Strategic Risk Other Risks less Diversification Benefit
Pillar 1 + Pillar 2 Total	**$xxxxxxx**	**$xxxxxxx**

Scaling Factors

Regulatory Capital (Basel II)

• 1.06 x modelled credit risk capital figure

• Calibrating factor intended to generate approximately the same number as Basel I

• Provides a buffer for "model risk" and other (Pillar 2) risks

Economic Capital

• No scaling factors as such

• "Model risk" or "All Other Risk" additions may achieve the same purpose

Cross-Risk Diversification

Regulatory Capital (Basel II)

- No explicit recognition

- Implies perfect correlation

- Correlations unstable

- Cushion for other risks

Economic Capital

- Recognises less than perfect correlations across risks

- Need to reflect "stressed" rather than "normal" correlations

- Potentially significant reduction in overall risk

Credit Risk Model Specific Differences

- Probabilities of Default (PDs)

- Recoveries (LGDs)

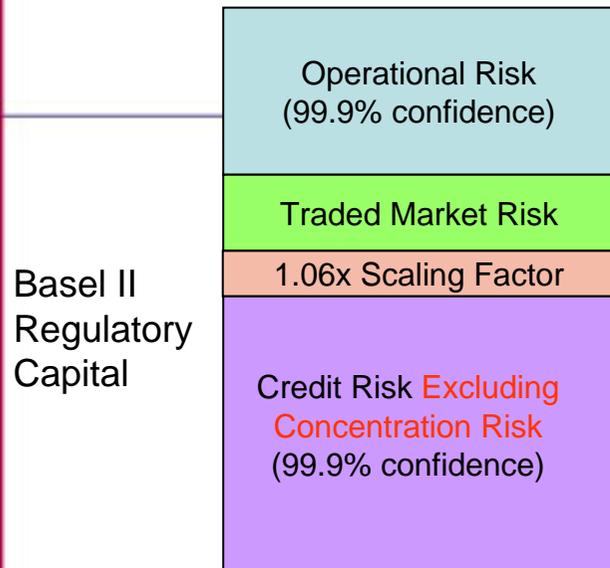- Outstanding Exposures (EADs)

- Maturities

- Correlations

- Through the Cycle (TTC) Estimates – more stable – less pro-cyclical

- Point in Time (PIT) Estimates – more volatile – more pro-cyclical

Credit Portfolio Correlation

Assumptions	Basel II IRB	Economic	Comparison
- exposure size	- infinitely granular portfolios	- reflects actual exposure sizes	-Economic more conservative
- number of risk factors	- single systematic risk factor	- may incorporate multiple geographic and industry systematic risk factors which reduce overall portfolio correlation	- Basel II more conservative
- strength of dependence on systematic risk factors	- dependence on the single systematic risk factor calculated as a simple inverse function of the PD	- estimates of actual dependence on systematic risk factors	- Economic may be more or less conservative ??

Summary Comparison of Economic and Basel II Regulatory Capital

Basel II Regulatory Capital

- Operational Risk (99.9% confidence)
- Traded Market Risk
- 1.06x Scaling Factor
- Credit Risk Excluding Concentration Risk (99.9% confidence)

Economic Capital

Summary Comparison of Economic and Basel II Regulatory Capital

APRA

Basel II Regulatory Capital

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- Including Concentration Risk
- Credit Risk (99.95% confidence)

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Economic Capital

- Strategic, Liquidity & Other Risks
- Non-Traded Market Risk

- Operational Risk (99.95% confidence)
- Traded Market Risk
- Including Concentration Risk
- Credit Risk (99.95% confidence)

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50% Net Tier 1 Capital

Strategic, Liquidity & Other Risks

Non-Traded Market Risk

Economic Capital

- Operational Risk (99.95% confidence)
- Traded Market Risk
- Including Concentration Risk
- Credit Risk (99.95% confidence)
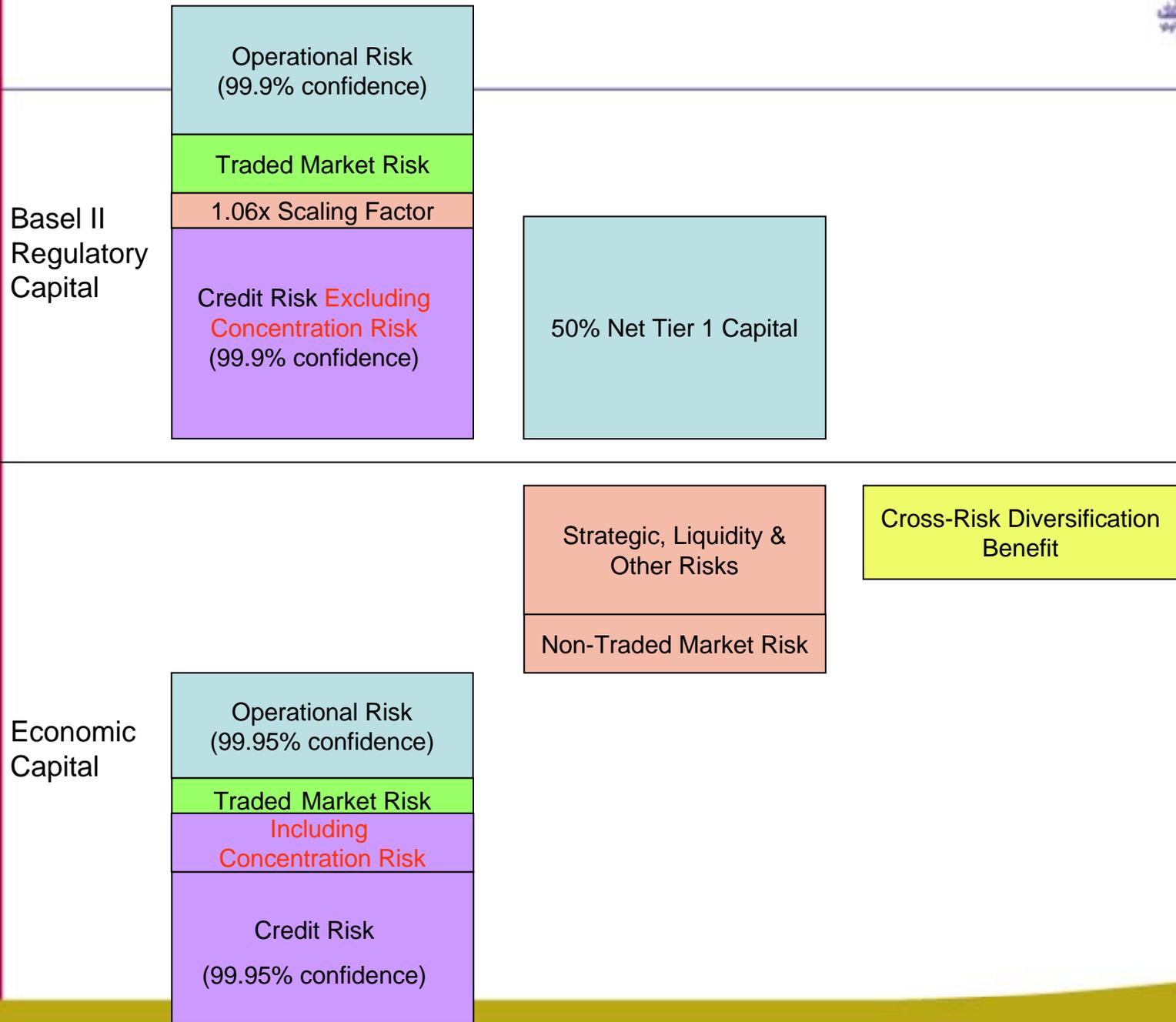
APRA

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Economic Capital

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- Non-Traded Market Risk

Cross-Risk Diversification Benefit

- Operational Risk (99.95% confidence)
- Traded Market Risk
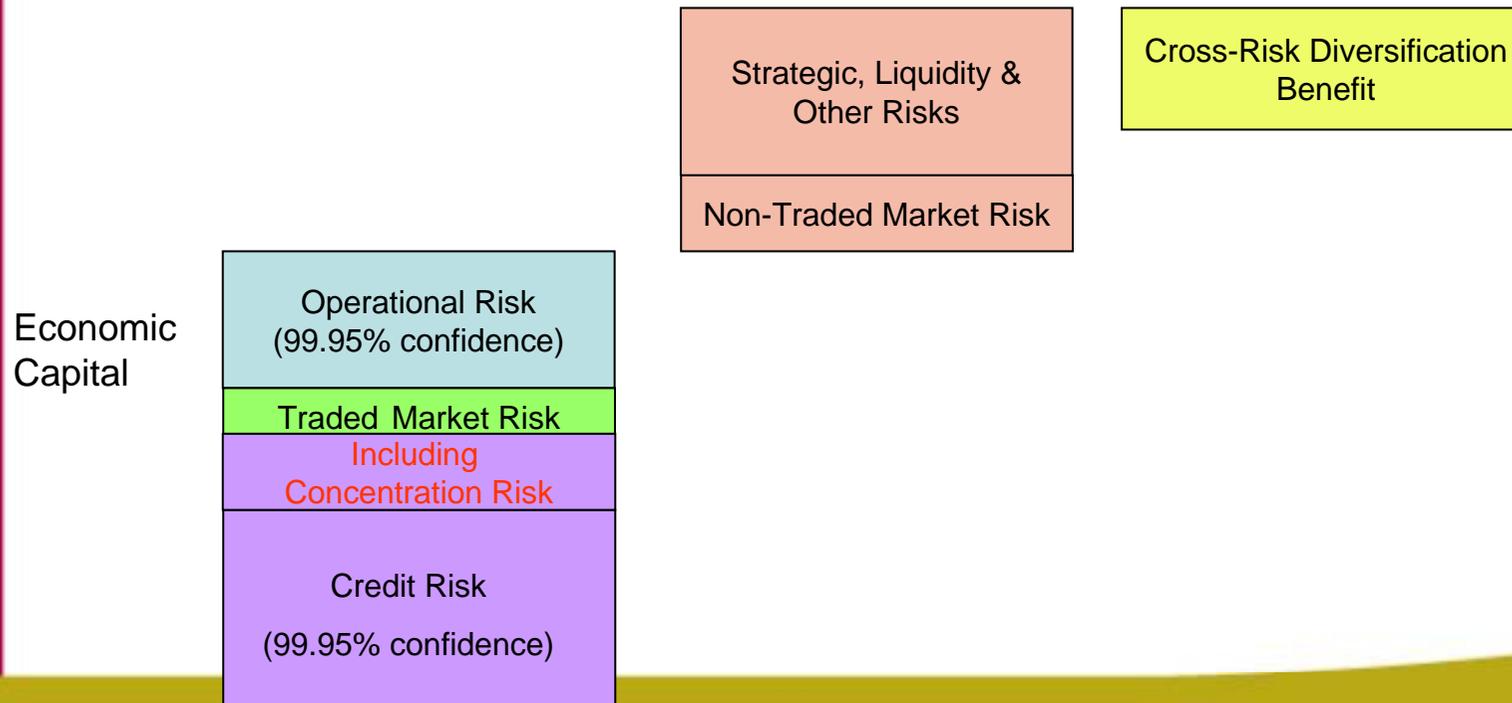- Including Concentration Risk
- Credit Risk (99.95% confidence)

Summary Comparison of Economic and Basel II Regulatory Capital

APRA

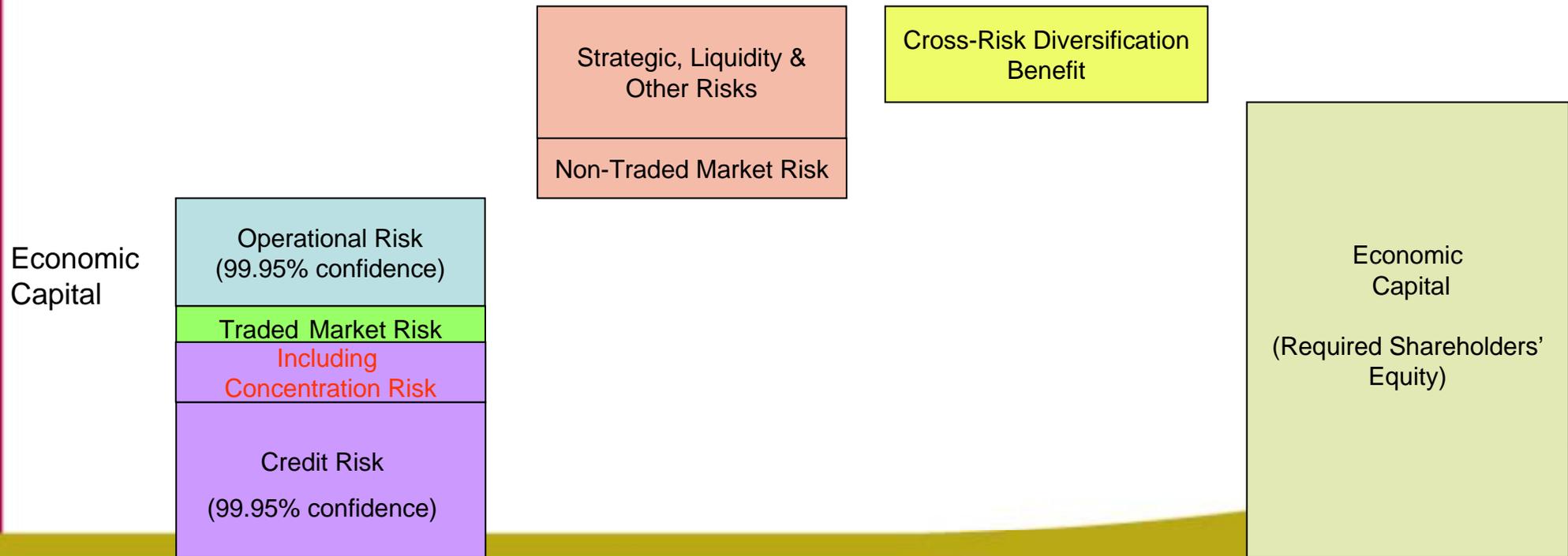**Basel II Regulatory Capital**

Operational Risk
(99.9% confidence)

Traded Market Risk

1.06x Scaling Factor

Credit Risk Excluding Concentration Risk
(99.9% confidence)

50% Net Tier 1 Capital

Regulatory Asset Deductions

Economic Capital

Strategic, Liquidity & Other Risks

Non-Traded Market Risk

Cross-Risk Diversification Benefit

Operational Risk
(99.95% confidence)

Traded Market Risk

Including Concentration Risk

Credit Risk
(99.95% confidence)

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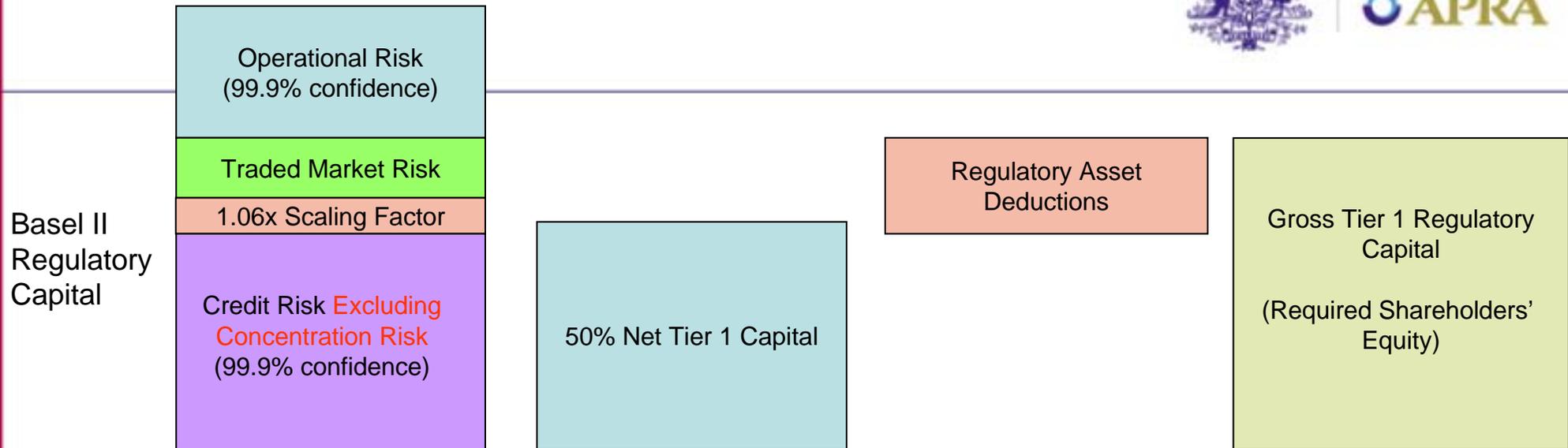# Summary Comparison of Economic and Basel II Regulatory Capital

APRA

Basel II Regulatory Capital

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- 50% Net Tier 1 Capital

- Regulatory Asset Deductions

- Gross Tier 1 Regulatory Capital (Required Shareholders' Equity)

Economic Capital

- Strategic, Liquidity & Other Risks
- Non-Traded Market Risk

- Cross-Risk Diversification Benefit

- Operational Risk (99.95% confidence)
- Traded Market Risk
- Including Concentration Risk
- Credit Risk (99.95% confidence)

- Economic Capital (Required Shareholders' Equity)

Summary Comparison of Economic and Basel II Regulatory Capital

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Basel II
Regulatory
Capital

Conceptual differences

- Risk coverage & definitions

- Time horizons

- Confidence levels

- Treatment of expected loss

Specific risk model differences

- PDs, LGDs, EADs

- Correlations

Gross Tier 1 Regulatory
Capital

(Required Shareholders'
Equity)

Economic
Capital

Economic
Capital

(Required Shareholders'
Equity)

Outline

- Overview of Australian bank practice

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IIF "Principles of Liquidity Risk Management"

"Given the practical, conceptual, and policy challenges, we believe that the industry's resources would be better spent improving capital measures related to other, more material risks and on strengthening liquidity risk management. Pursuing a costly solution to an immaterial problem is inconsistent with risk-based regulation."

Economic Capital – Unexpected Loss From All Sources

Profit & Loss Probability Distribution
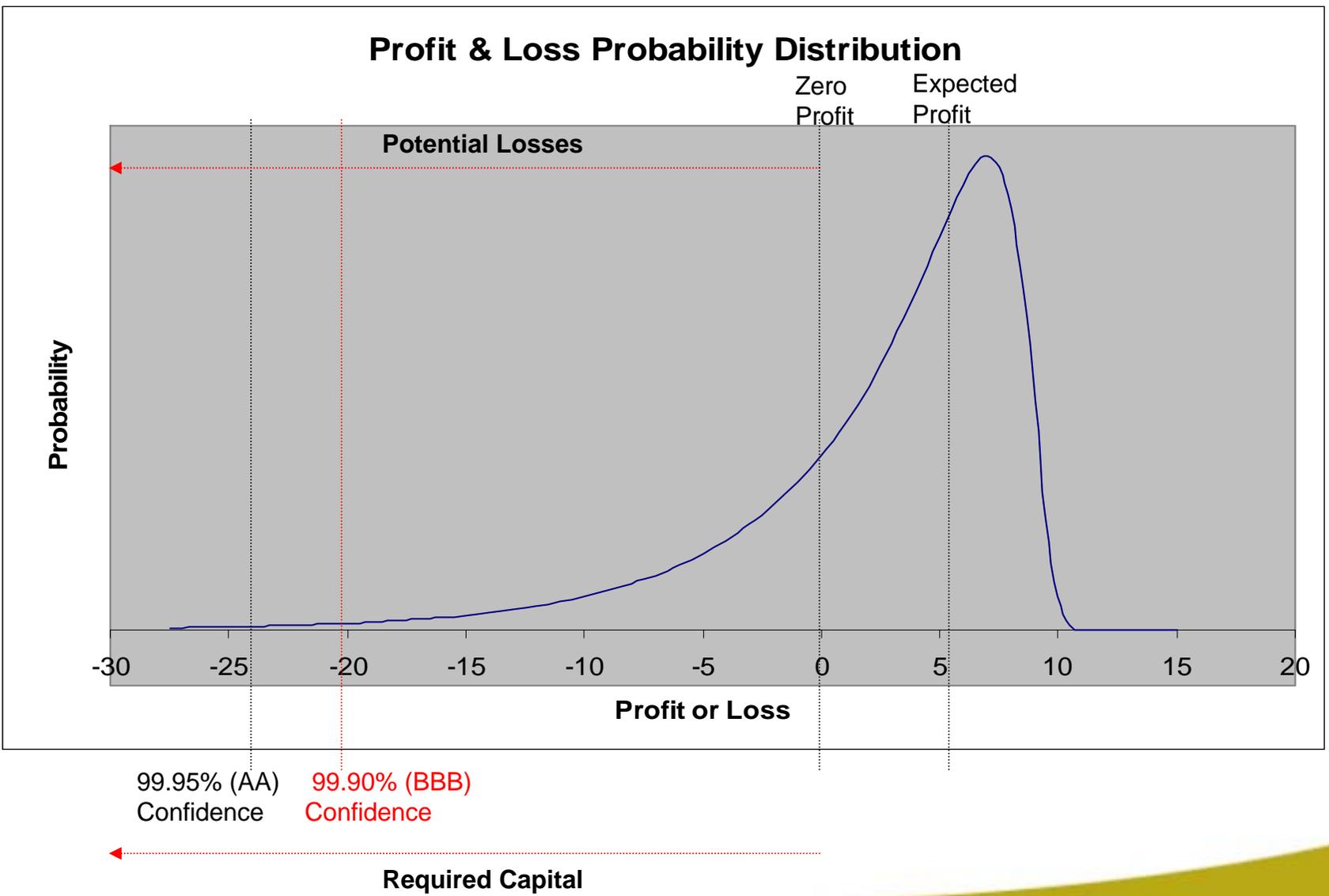
Contributors to Potential Unexpected Loss

- borrower default (credit) risk in lending activities?

- counterparty default (credit) risk in trading activities?

- interest rate risk in intermediation activities?

- market price risk in trading activities?

- operational risk?

- regulatory compliance risk?

- reputational risk?

- strategic and business risk?

- liquidity risk – why not??

Example

	Actual Bank - Economic Capital Model Risk Contributions
Pillar 1	
Credit	59.1%
Traded Market	0.9%
Operational	10.5%
Pillar 1 Total	**70.5%**
Pillar 2	
IRRBB	0.5%
Liquidity	3.7%
Business/Strategic	17.0%
Insurance Risk	2.4%
Equity Risk	1.3%
Model Risk	4.7%
Pillar 2 Total	**29.5%**
Total before Cross-Risk Diversification Benefit	**100.0%**
Diversification Benefit	-18.6%
Total after Cross-Risk Diversification Benefit	**81.4%**

From an economic capital perspective, liquidity risk can be viewed as the risk that a bank will incur unexpected costs or losses in meeting its financial obligations when they fall due because of the mismatch between the maturities of its current and contingent financial assets and liabilities.

Liquidity Risk

Institution-specific risk events

- Credit losses

- Trading losses

- Operational foul-ups

- Compliance failures

- Strategic failures

leads to

- Reputational damage

- Rating downgrade

results in

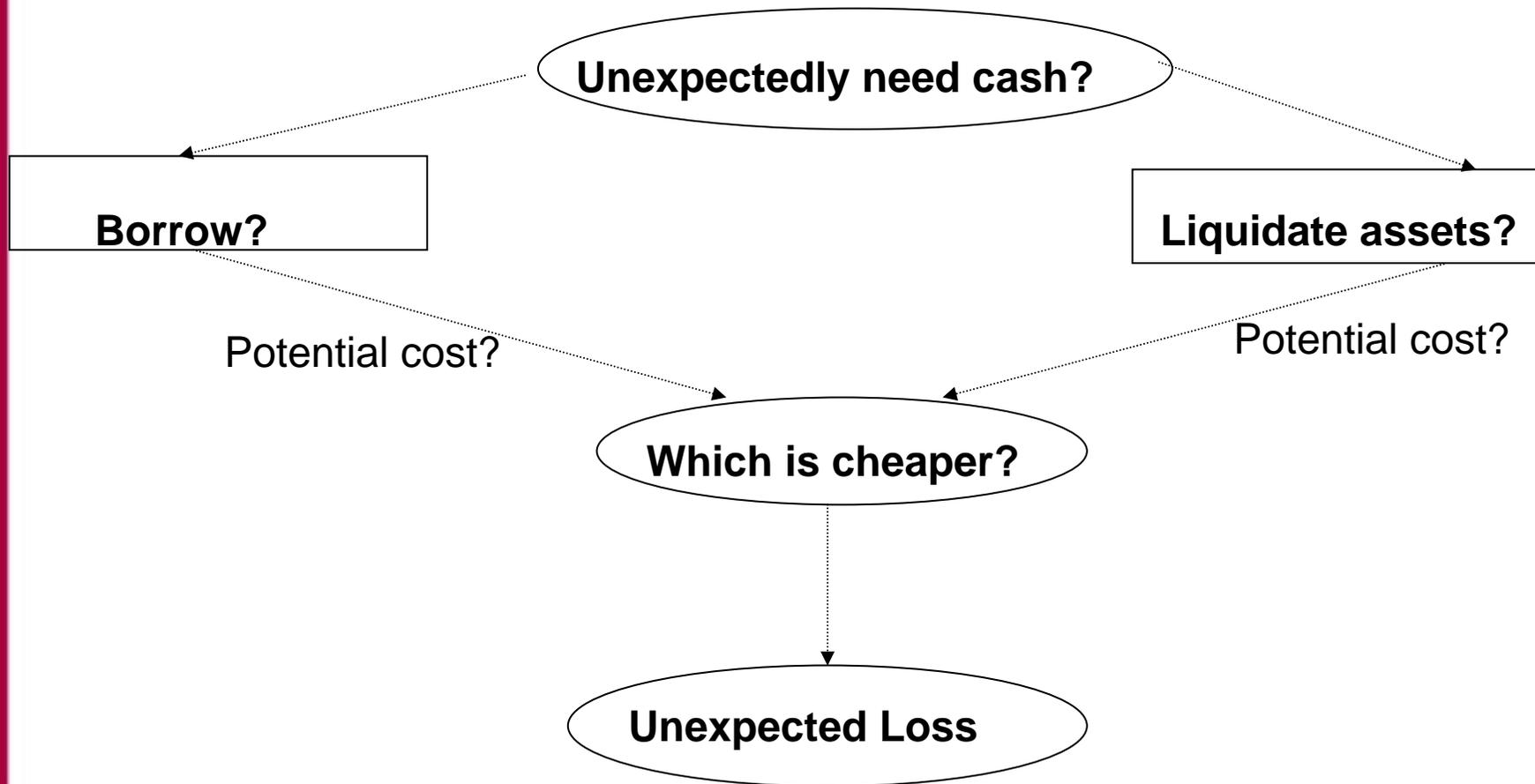- Deposit run-off and reduced availability and higher cost of replacement funding

Systemic (non-institution-specific) risk events

• Increased risk aversion across-the-board means renewal/replacement/incremental funding becomes more expensive.

• Reduced availability and higher cost of credit across-the-board means borrowers draw-down against existing lower priced commitments, increasing the liquidity shortfall.

• Across-the-board reduction in market makers' willingness to take on market risk positions means wider trading spreads and progressively lower realised prices on asset sales as the cash requirement is increased.

Funding Liquidity Risk ‹- **Asset Liquidity Risk**

Unexpectedly need cash?

Borrow?

Liquidate assets?

Potential cost?

Potential cost?

Which is cheaper?

Unexpected Loss

Credit, Market, Operational, etc. Risk Exposure

Economic Environment

APRA

Current Capital

Size of Liquidity Mismatch

Profit & Loss Probability Distribution

Probability

-30 -25 -20 -15 -10 -5 0 5 10 15

Profit or Loss

Funding Supply Surface

4000
3000
2000
1000
0

Risk Premium - Basis Points

1 2 3 4 5 A

Funding Required $ Units

Credit Quality
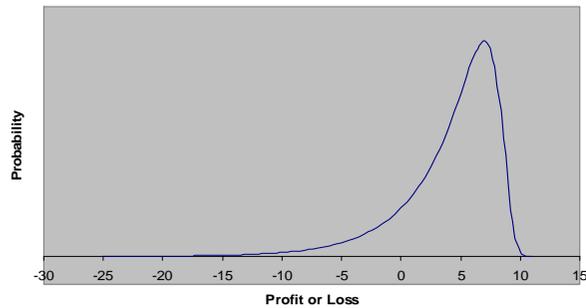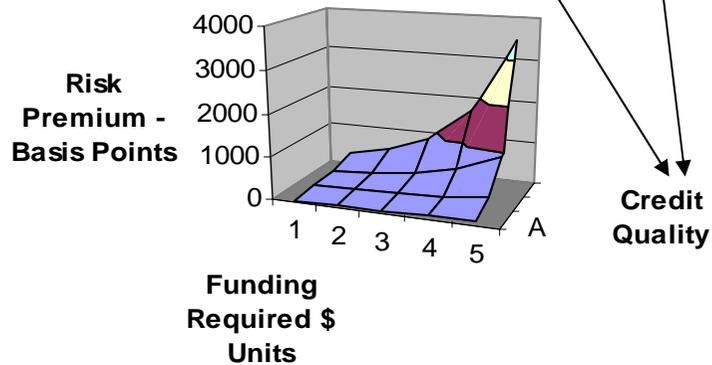
Bid-Offer Spread Surface

4000
3000
2000
1000
0

Bid-Offer Spread- Basis Points

1 2 3 4 5 A D

Transaction Size $ Units

Market Condition
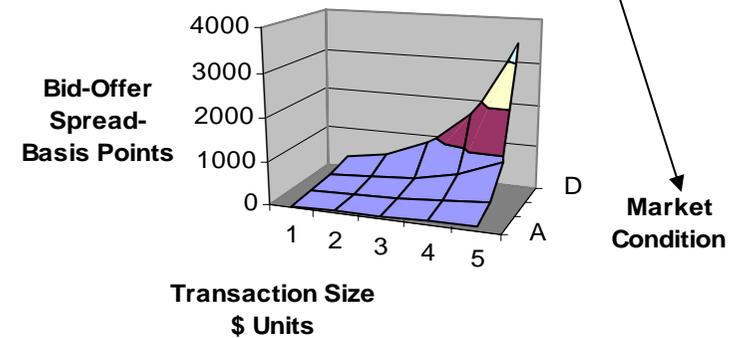
Unexpected Loss from Liquidity Risk

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