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Effect of Reinsurance on Retained Risk (Theory)

A Swiss Re Presentation

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Subjects Covered

- Reinsurance
- Risk
- Making the link

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Reinsurance

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Types of Reinsurance Covered

- Proportional
  - ***Quota Share Treaty***
  - ***Surplus Treaty***
- Non-proportional
  - ***Per Risk Excess of Loss***
  - ***Catastrophe Excess of Loss***

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Quota Share

- Each risk proportionally shared
  - ***theoretically a proportional reduction in quantum of risk***
  - ***theoretically no reduction in relative risk***
- Commission payments change this!

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Leverage Effect

- Commission often exceeds expenses
  - ***difference referred to as "leverage"***
- Ceded business positive contributor to result
  - ***premiums in = premiums out***
  - ***claims out = recoveries in***
  - ***expenses out < commission in***

Example

- Expenses = 25%
- Commission = 30%
- "Leverage" = 5%

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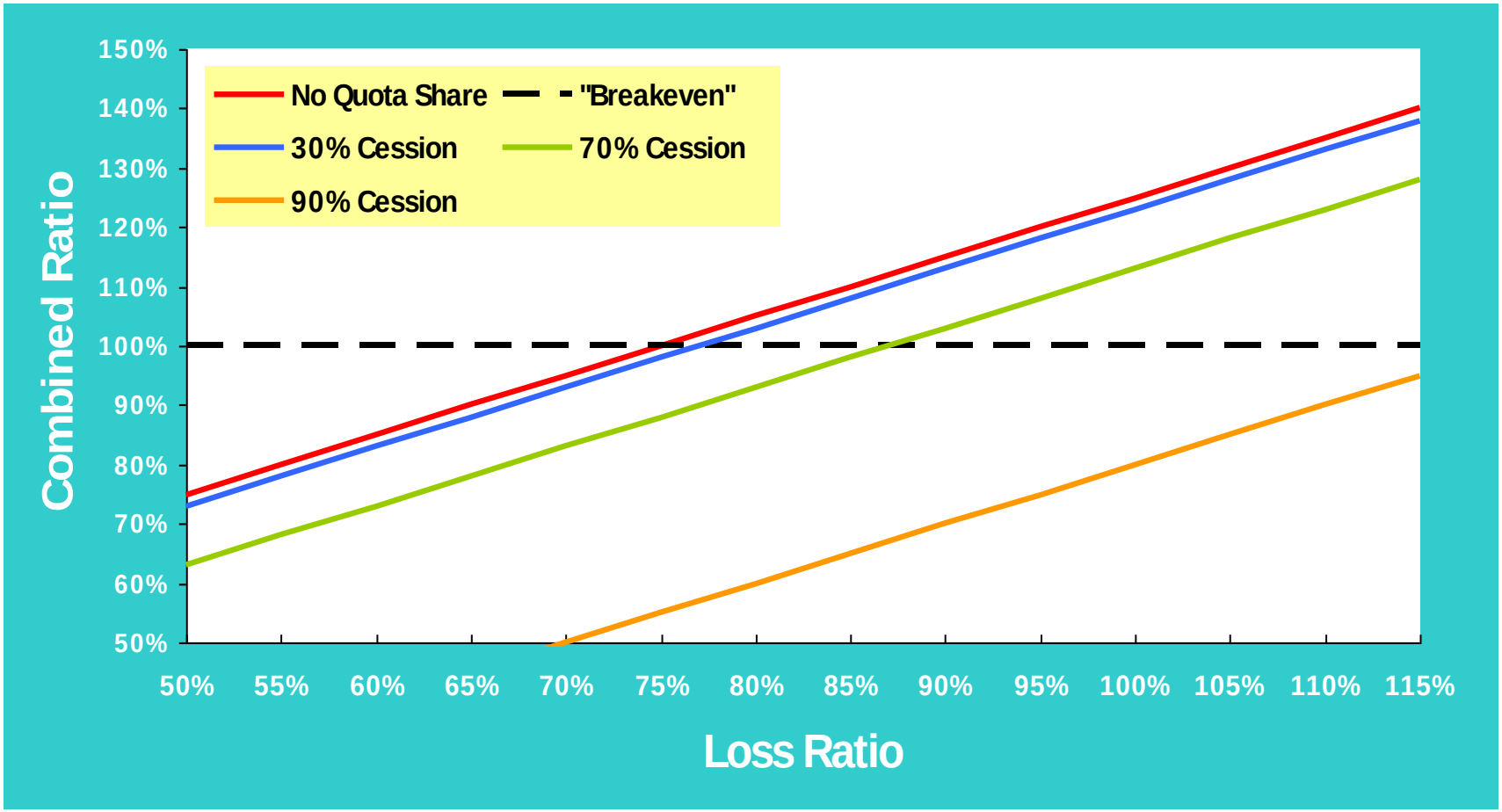
Leverage Effect



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Sliding Scale Commission

- Commission sometimes linked to loss ratio
- This can dramatically effect risk

Example

- Expenses = 25%

Commission	35%	15%
Loss Ratio	50%	90%

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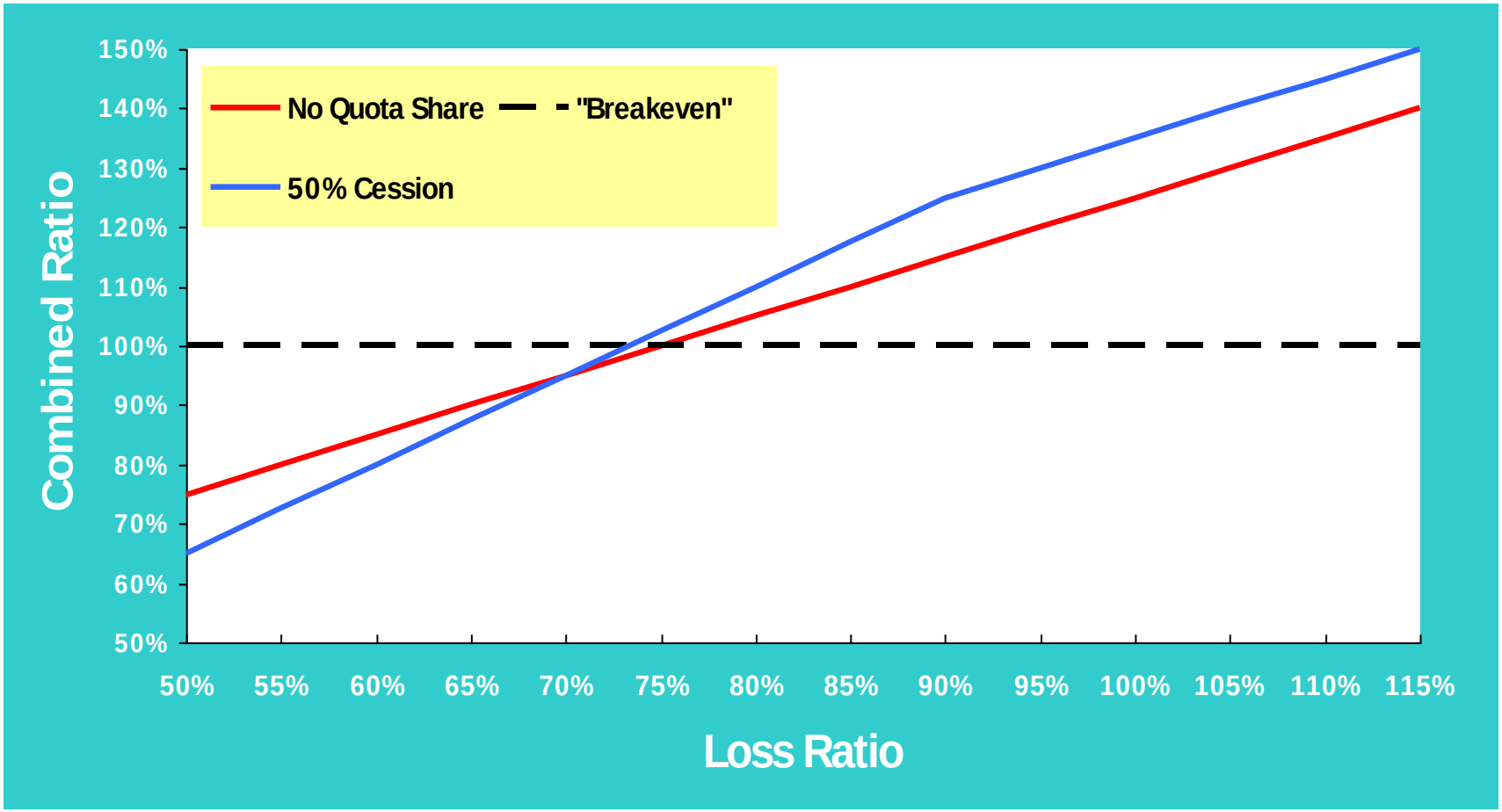
Sliding Scale Effect



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Surplus Treaties

- Larger the risk, larger the proportion ceded
- Leverage or sliding scale effect still applies
  - ***magnified due to larger percentage cession***
  - ***magnified due to fixed expenses***

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Summary: Proportional

- Reduction in quantum of risk
  - ***sharing of risk***
- Commission plays a key role in shaping profile

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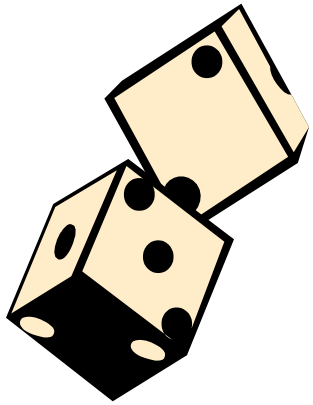
Excess Of Loss

Consider an example……

- A game of chance
- 1, 2, 3, 4, 5
  - ***You win $10***
- 6
  - ***You lose $20***



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Rating Agencies

Moody's		Standard & Poor's	
Aaa	Exceptional	AAA	Extremely Strong
Aa	Excellent	AA	Very Strong
A	Good	A	Strong
Baa	Adequate	BBB	Good
Ba	Questionable	BB	Marginal
B	Poor	B	Weak
Caa	Very Poor	CCC	Very Weak
Ca	Extremely Poor	CC	Extremely Weak
C	Lowest	R	Regulatory Action

Strong

Weak

Secure

Vulnerable

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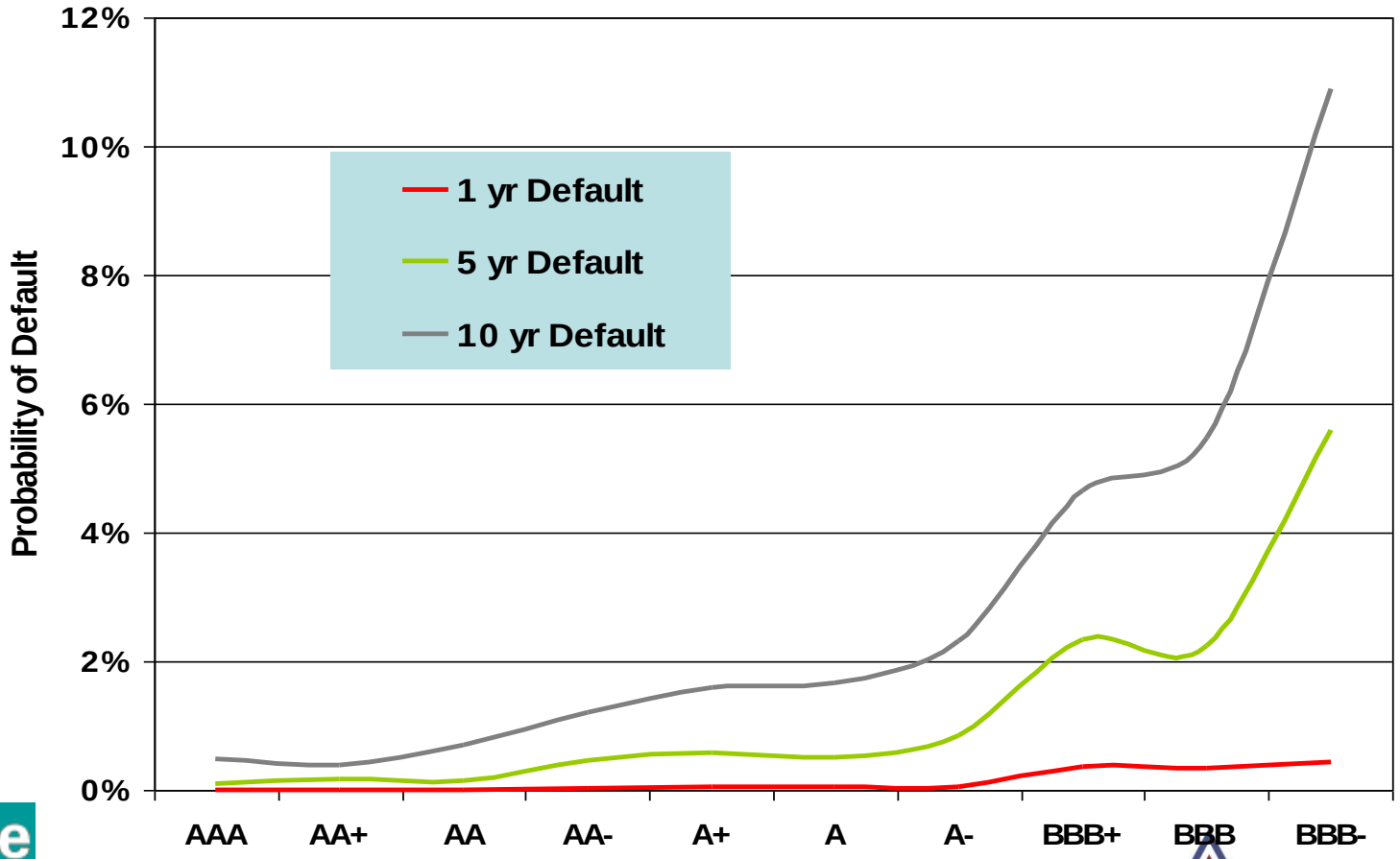
Chances of Default

Based on S&P bond default data from 1981 to 2002



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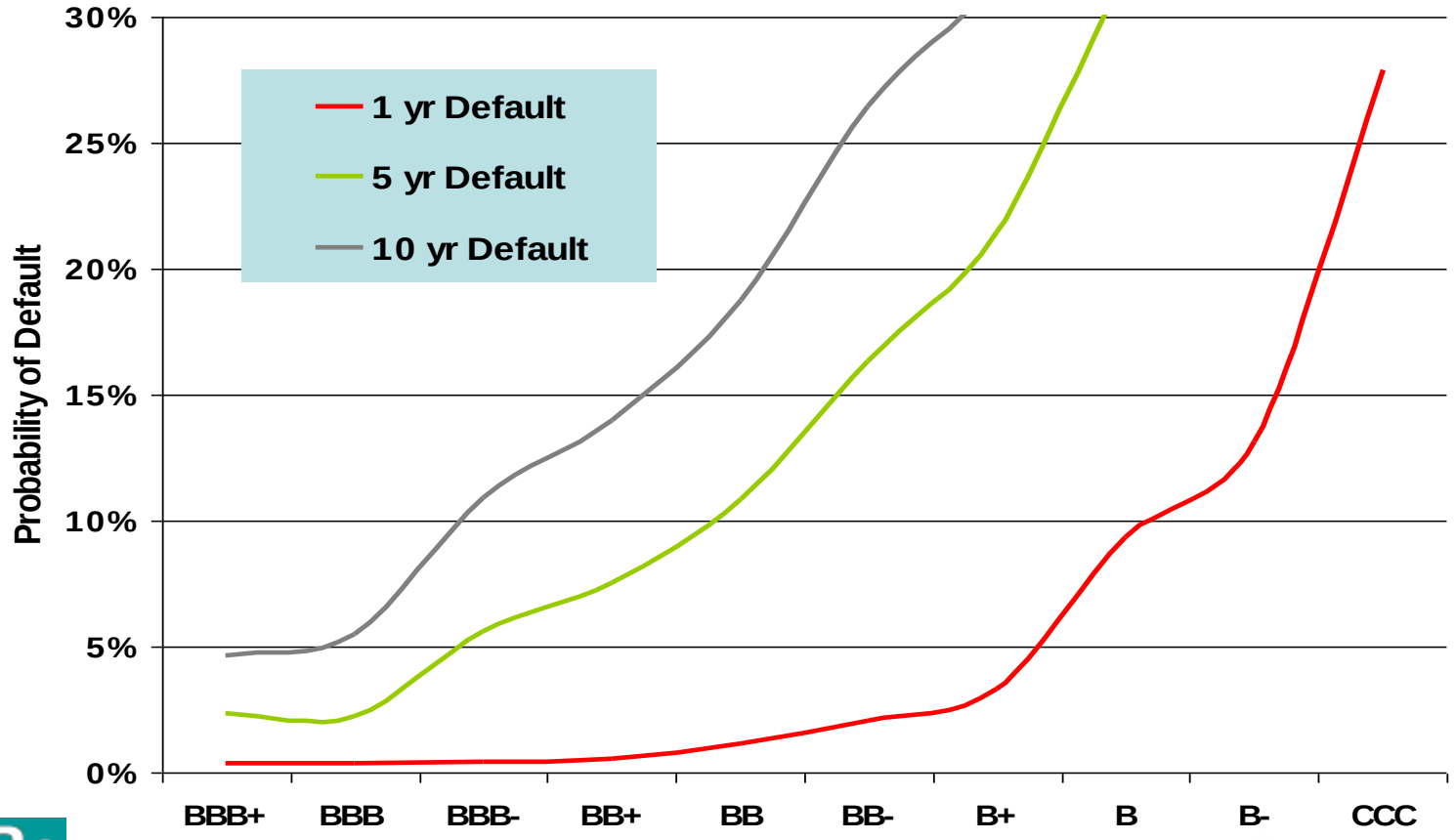
Chances of Default (2)

Based on S&P bond default data from 1981 to 2002



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Back to the Example

- $10 win, $20 lose
- 30 games a year
- Expected profit of $150
  - *25 x $10 = $250 less*
  - *5 x $20 = $100*

- Default occurs when losses exceed 10
  - *20 x $10 = $200 less*
  - *10 x $20 = $200*
- Chances of default is 2%
  - *BB, marginal/weak*

Good return

- 0.5% chances of default is required
  - *A, Strong*
- Equivalent to 13 losses
  - *17 x $10 = $170 less*
  - *13 x $20 = $260*
- $90 Capital required

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Reinsurance Effect

- $7 recovery for every loss
- Expected Recovery
  - *5 x $7 = $35*
- $50 Reinsurance Premium
- Expected profit reduces to $135

- 13 losses
  - *17 x $10 = $170 les*
  - *13 x $13 = $1[illegible] less*
  - *$50 (RI Premium)*
- $49 Capital Required

Return increased from 167% to 270% !

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Summary: Non-Proportional

- Removes extreme downside risk

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Risk

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Types of Risk

- Result Volatility
  - *One off large claims*
  - *Unusual high number of medium claims*
  - *Unusual higher number of claims*
  - *Systemic pricing deficiencies*

Extreme

- Insufficient Capital
  - *To meet solvency requirements*
  - *To meet obligations*

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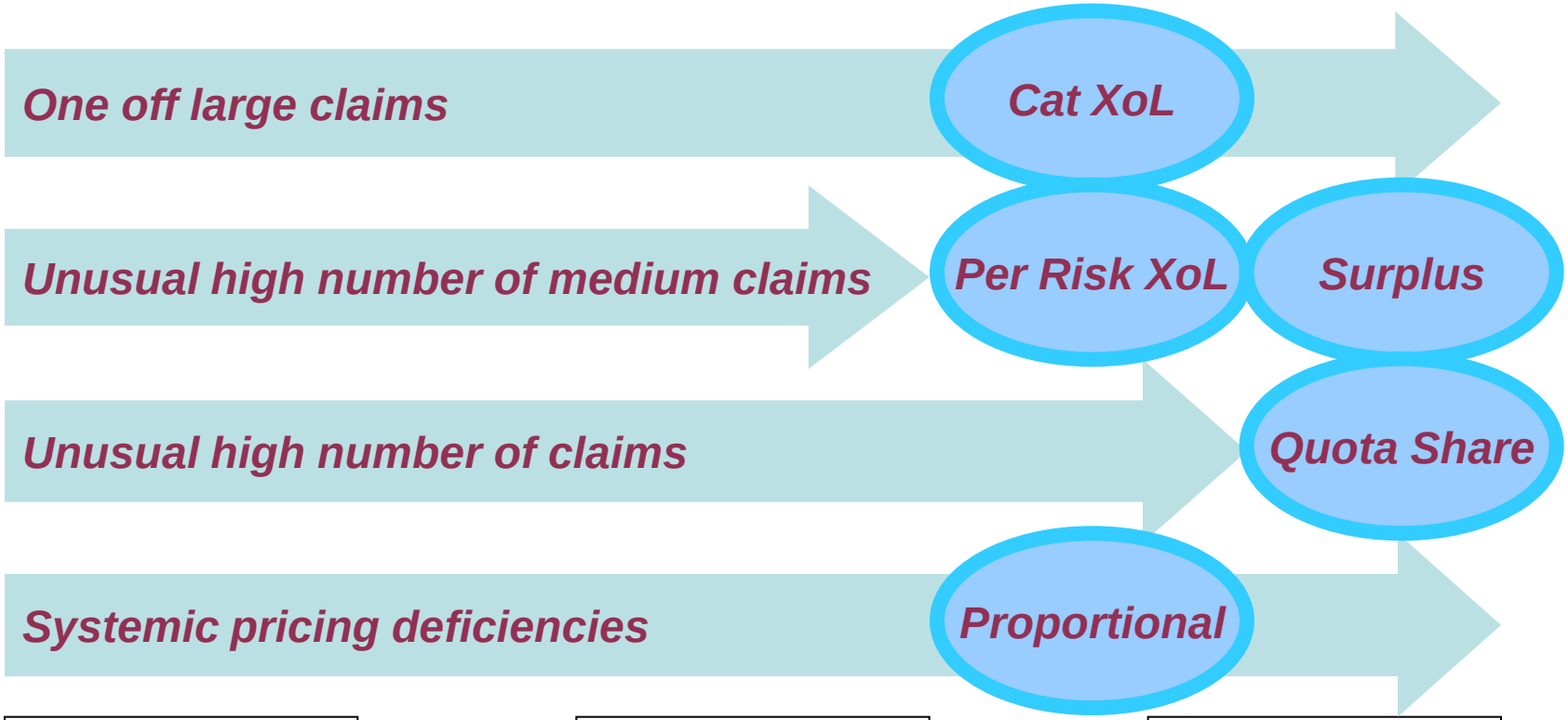
Relative Risk



Some result volatility	Significant result volatility	Capital Impairment

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What is important?

Not significant concern
- ***comfortable with volatility***
- ***significant product diversification***

Established pricing models, stable exposure

Some result volatility	Significant result volatility	Capital Impairment

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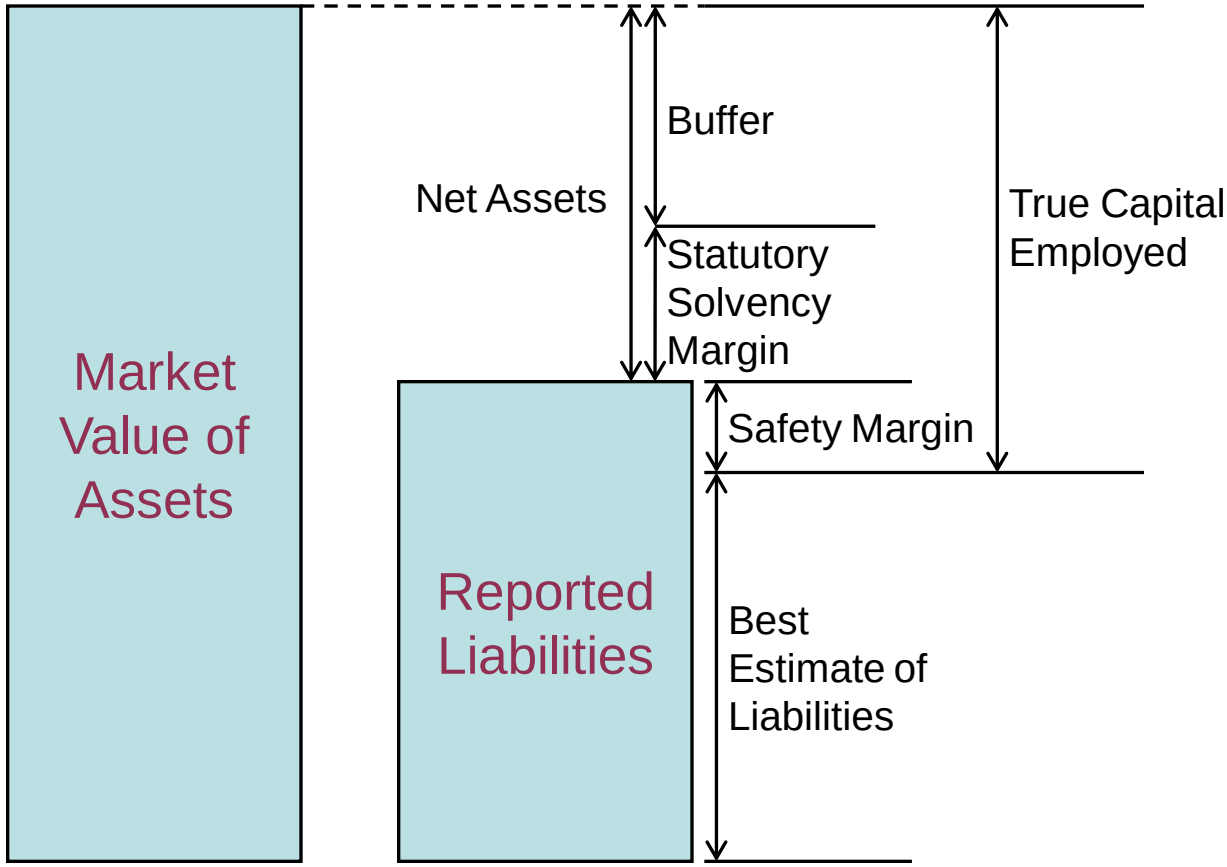
Capital



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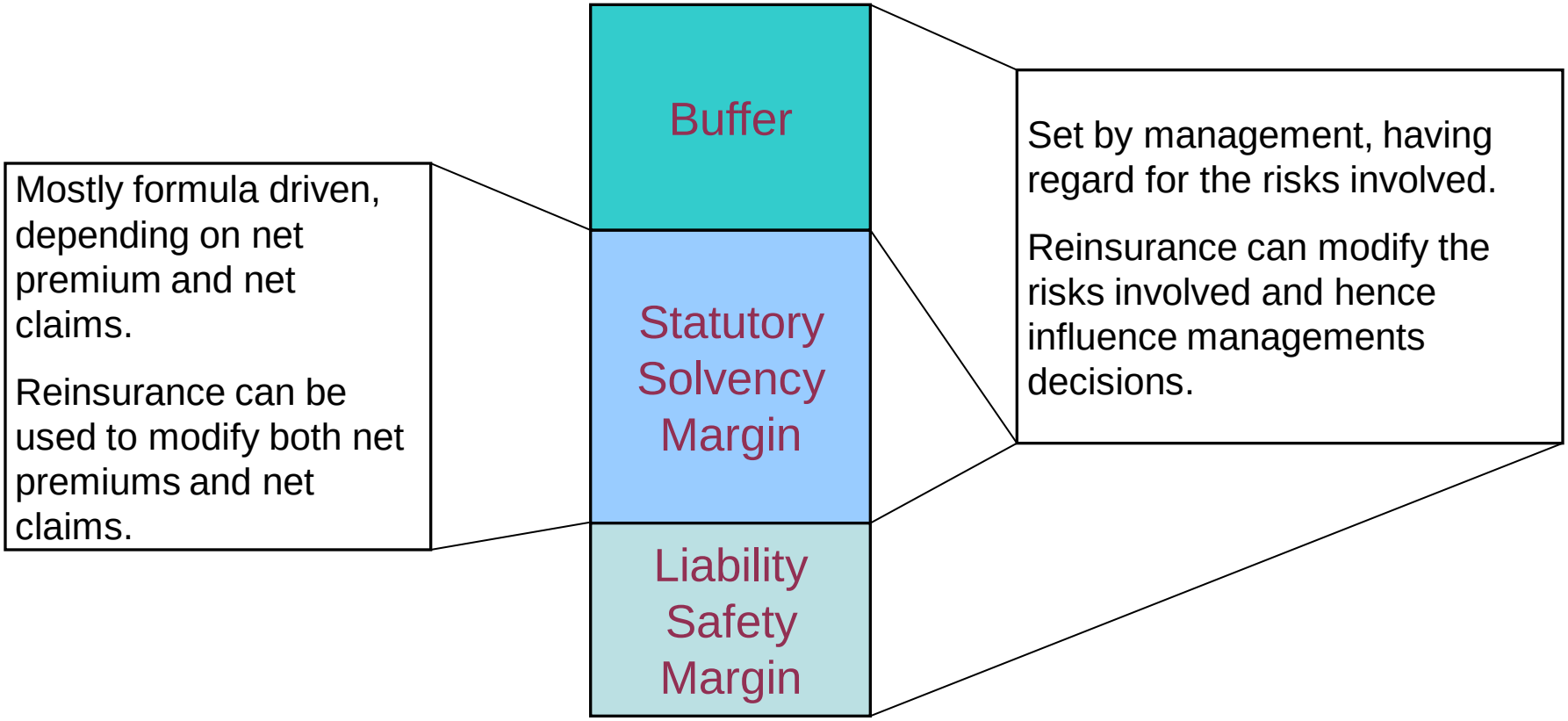
Capital Employed



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Role of Management

- Manage risk
- Manage capital
- Don’t let it just happen!!!

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