



The Actuarial Profession

making financial sense of the future

GIRO Convention

23-26 September 2008

Hilton Sorrento Palace

**Increasing the Relevance of Risk Tolerance to
Organisations Today**

Kartina Tahir Thomson & Cherry Chan

Increasing the Relevance of Risk Tolerance to Organisations Today

Agenda



1. Introduction
2. Background on our research
3. Definition of Risk Tolerance
4. Relationship with Risk Appetite
5. Materiality Approach
6. Risk Based Approach
7. Uses and Benefits
8. Survey and Discussion
9. Summary and Next Steps

Increasing the Relevance of Risk Tolerance to Organisations Today Section

1

Introduction

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Increasing the Relevance of Risk Tolerance to Organisations Today

Who we are

- Kartina Tahir Thomson
 - Experience:
 - DFA/RBC/Pricing/Programme Optimisation
 - Consultant for a range of clients – from Governmental organisations, multinationals (including some of the largest) to middle-market corporations and local governmental bodies
 - Insurance/ Oil and Gas/ Pharmaceutical/ Mining/ Healthcare/ Technology/ Construction
- Cherry Chan
 - Experience:
 - Reserving/Pricing/Programme Optimisation
 - Consultant for a range of clients – from Governmental organisations, multinationals (including some of the largest) to middle-market corporations and local governmental bodies
 - Insurance/ Oil and Gas/ Pharmaceutical/ Mining/ Healthcare/ Technology/ Construction

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Timing and Rules

- Schedule
 - Introduction of concepts – 10 mins
 - Evaluation and quantitative approaches – 20 mins
 - Survey – 20 mins
 - Question and answers – 10 mins
- House rules!
 - Please feel free to ask questions during the presentation - there is no such thing as a stupid question
 - Warning - This is an interactive session - be prepared to be asked for an opinion and to contribute!

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Getting to know you...

What is your employment type?

VOTE

1. Insurance Company
2. Reinsurance Company
3. Consulting Firm
4. Lloyds/London Market
5. Broking Firm
6. Public Service
7. Education
8. Other

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Getting to know you...

What is your functional role?

VOTE

1. Reserving
2. Pricing
3. Capital Management
4. Risk Management
5. Finance
6. Other

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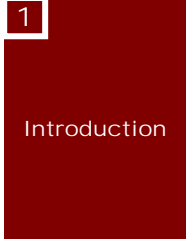
Getting to know you...

Do you know what is the level of risk tolerance of your organisation? **VOTE**

1. Yes and I know how it was set
2. Yes but I do not know how it was set
3. No idea!
4. No even sure what risk tolerance is!

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Getting to know you...



Is Risk Tolerance relevant to your work?

VOTE

1. Yes – directly
2. Yes – indirectly
3. No
4. Not sure

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Getting to know you...

Are you involved in setting the Risk Tolerance?

VOTE

1. Yes – directly involved
2. Yes – indirectly involved
3. No involvement
4. Not sure

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Getting to know you...

Who sets the risk tolerance in your organisation? **VOTE**

1. CEO
2. CRO/Risk managers
3. CFO
4. Board of Directors
5. Actuary
6. Other

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Introduction

- A rough guide to Risk Tolerance:
 - What does it mean to organisations, investor analysts and other interested parties?
 - How is it used by different parties?
 - How can we bridge the gap between its relevance to organisations and investor analysts?
 - How can we make Risk Tolerance relevant and robust without the complicated (and expensive) RBC/DFA models?
 - What is the future for Risk Tolerance?

Increasing the Relevance of Risk Tolerance to Organisations Today

Section

1. Introduction
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6. Risk Based Approach
7. Uses and Benefits
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Background

- Risk Tolerance Study
 - Establish a more sophisticated measure to significantly add value to organisations
- This paper looks at the inherent strengths and weaknesses of each approach and makes comments on the potential improvements that may be made for the understanding of risk, risk appetite and risk tolerance.

Increasing the Relevance of Risk Tolerance to Organisations Today

Section

1. Introduction
2. Background on our research
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4. Relationship with Risk Appetite
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Definition of Risk Tolerance

Which of these definition of risk tolerance do you agree with the most?

VOTE

1. Acceptable level of variation based on a set of stated objectives.
2. An acceptable amount of financial impairment that can be retained without a material impact on the business .
3. Financial ability to pay for losses as a result of risk related events.
4. The amount that an organisation is willing to retain.
5. The amount of 'free resources' available to an organisation.
6. I'm not sure

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Definition

- Risk tolerance can be defined as:
 - “The financial ability to pay for losses as a result of risk related events.”
 - Alternatively, this can be viewed as an acceptable amount of financial impairment that can be retained without a material impact on the business.
- Risk retention is commonly referred to, but not exclusively, as ‘risk tolerance’ meaning how much a company can financially retain as opposed to ‘risk appetite’ which is how much risk a company is willing to retain.

Increasing the Relevance of Risk Tolerance to Organisations Today

Section

1. Introduction
2. Background on our research
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9. Summary and Next Steps

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Relationship with Risk Appetite

VOTE

In your opinion, does risk tolerance and risk appetite has the same meaning?

1. Yes
2. No
3. Sometimes
4. Not sure

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What is the link between Risk Tolerance and Risk Appetite?

- Both risk appetite and risk tolerance set boundaries of how much risk an entity is prepared to accept.
- “Risk Appetite is the amount of risk an entity is willing to accept in pursuit of value” – COSO (a high level statement)
- “Risk tolerances set the acceptable level of variation around objectives.” - COSO (a narrower definition)

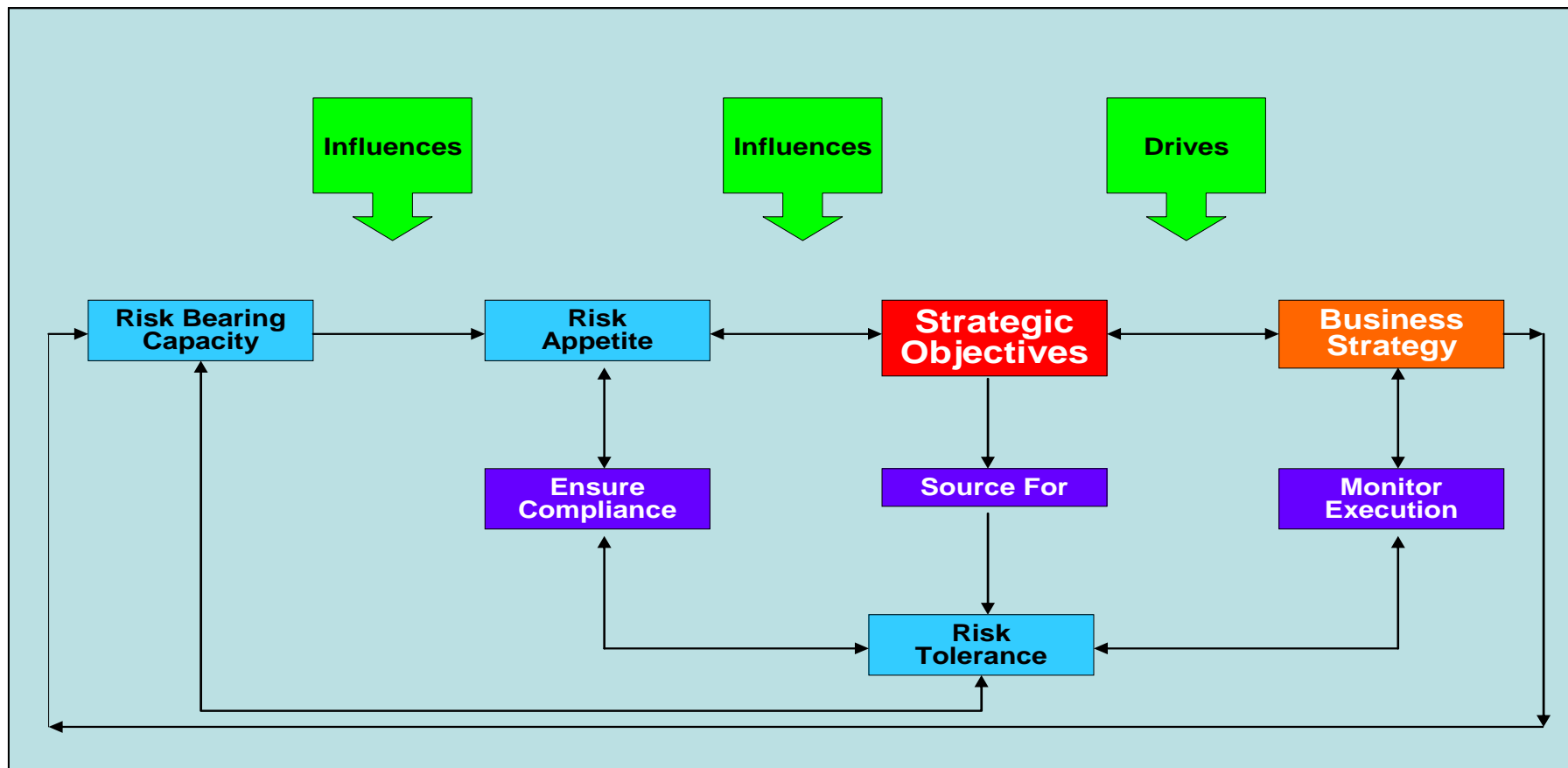
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Definition of Risk Tolerance

- What is the **strategic objective**?
 - What are the financial milestones in each future year to achieve this objective?
 - What are the financial KPIs?
 - How are these objectives apportioned by department / subsidiary?
 - How are they linked?
- How do the finance, investment and economics departments assess **financial strength** of the organization?
 - What financial metrics are considered?
 - How consistent are these metrics between departments (and between investments)?
 - How consistent are these metrics for **strategic objectives** versus **non-strategic objectives**?
- What is the tolerance of the organization?

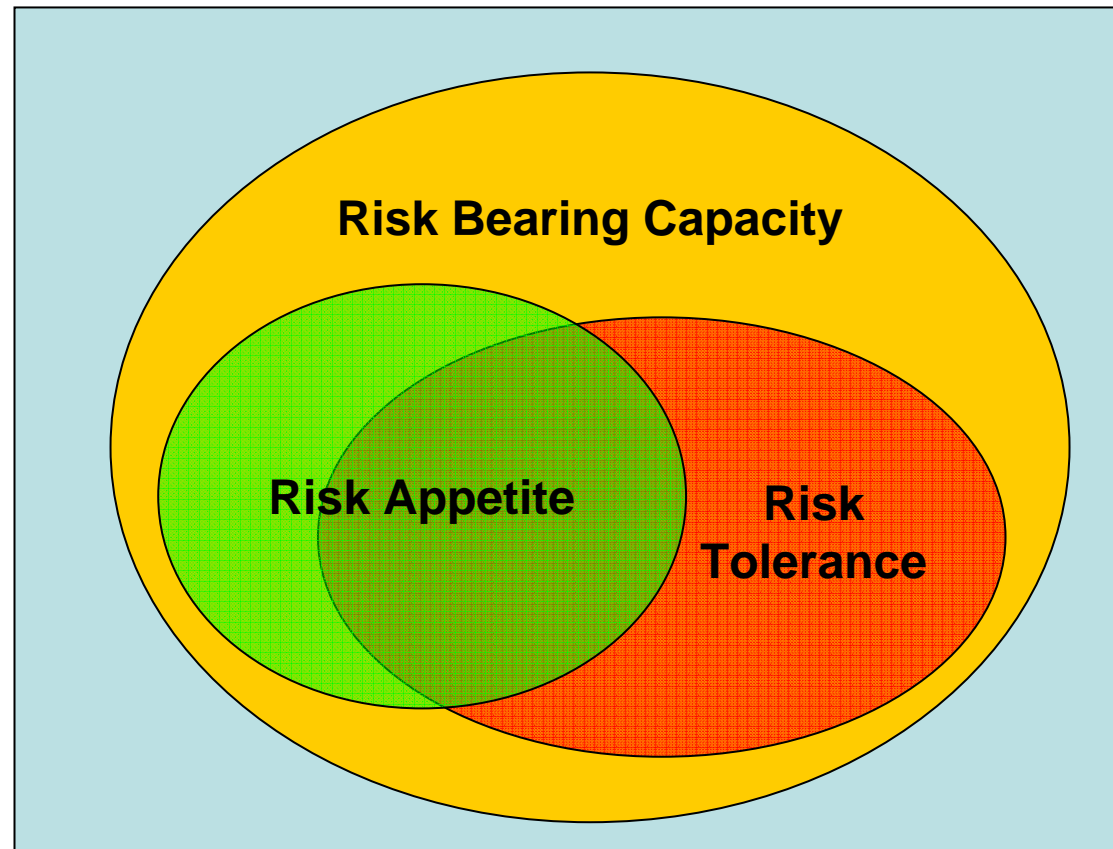
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Relationship with Risk Appetite



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Relationship with Risk Appetite



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Relationship with Risk Appetite

VOTE

How would you view the relationship between risk appetite and risk tolerance?

1. Risk appetite always exceed risk tolerance
2. Risk appetite sometimes exceed risk tolerance
3. Risk appetite never exceed risk tolerance
4. Risk appetite is the same as risk tolerance
5. None of the above
6. All of the above

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Relationship with Risk Appetite



Risk tolerance can be viewed as an acceptable amount of financial impairment that can be retained without a **material** impact on the business.

Increasing the Relevance of Risk Tolerance to Organisations Today

Section

1. Introduction
2. Background on our research
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6. Risk Based Approach
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8. Survey and Discussion
9. Summary and Next Steps

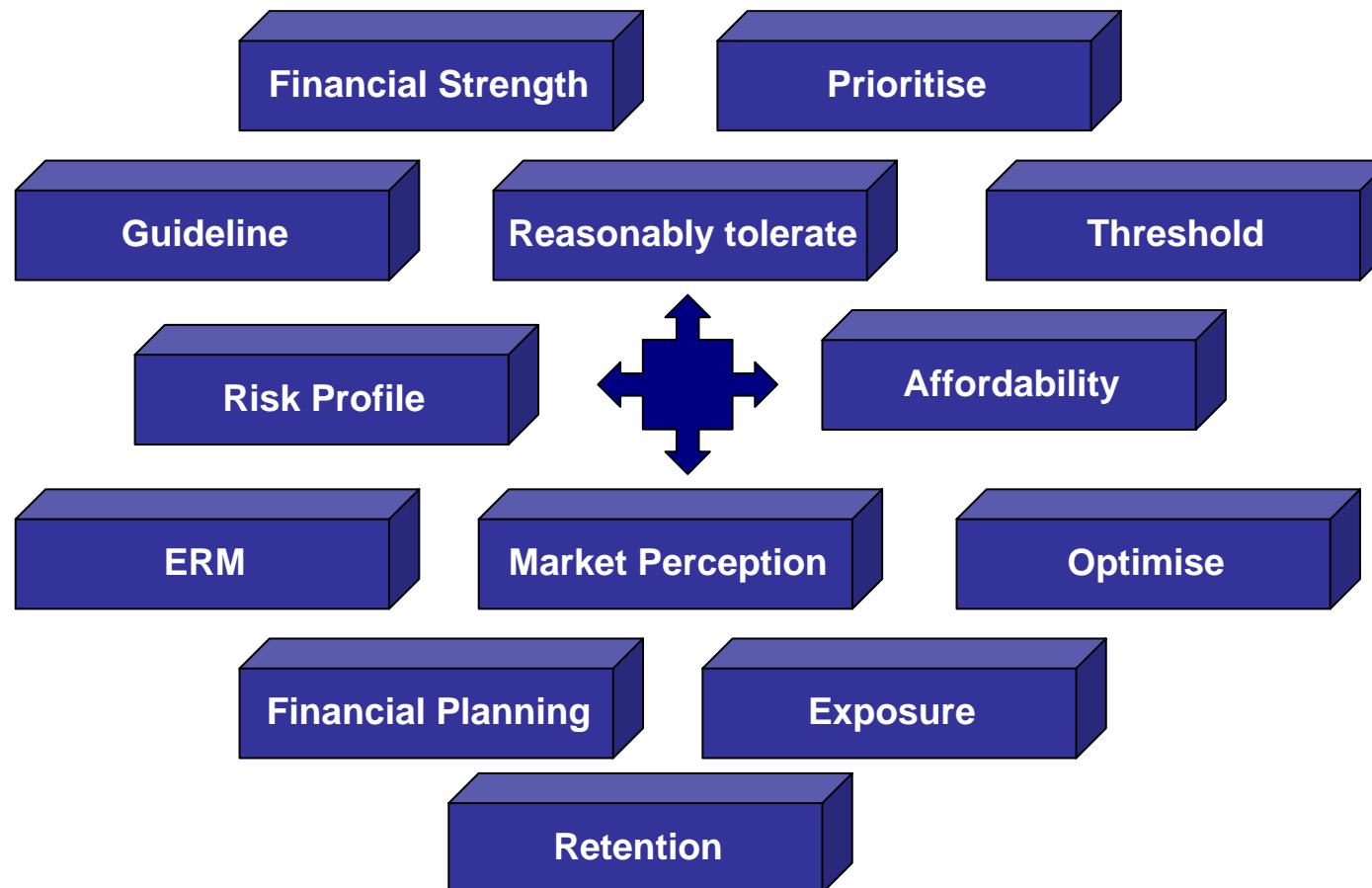
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Concept



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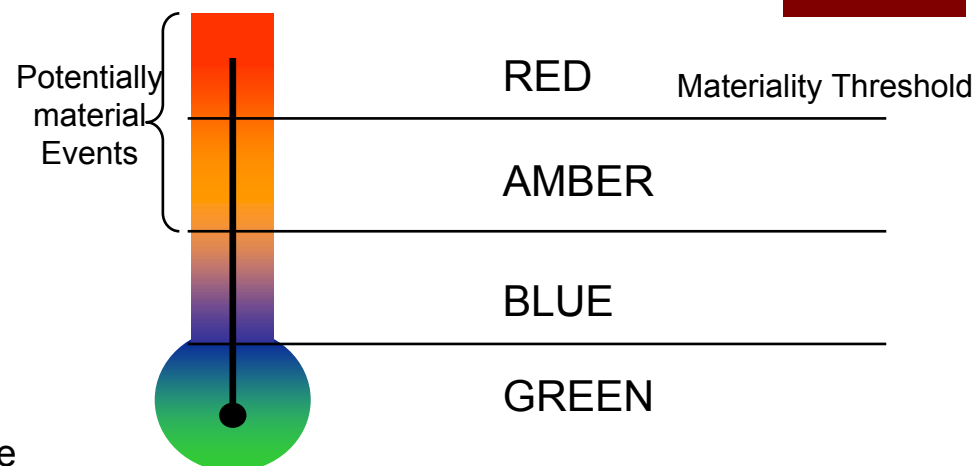
Concept



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Concept

- What constitutes a 'big' or 'significant risk to a given organisation?
- Q1: What is big for:
 - Organisation A with £10bn turnover?
 - Company B with £10bn profit?
- Q2: How is size determined?
 - Risk tolerance / risk appetite
 - Key financial indicators / Key performance indicators
 - Examples:
 - EBITDA, Revenue, Earnings Per Share, Cashflow, Headroom for financial covenants, Asset value
 - Others: Gut feel, risk averse / risk seeking, credit rating, regulatory requirements
- As financials are expected to change – definition of 'big' is expected to change over time too!



“Rules of Thumb”

	Low Variance	High Variance
Working Capital	1.0%	3.0%
Pre-Tax Earnings	1.0%	3.0%
Cash Flow	5.0%	10.0%
Earnings per share	3.0%	5.0%
Specific 1		
Specific 2		

Note: Figures Illustrative

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Decision Making Tool

VOTE

In your opinion, what is a potential material event?

1. M&A activities
2. Change of senior management
3. Change in strategy
4. Material change in share price
5. Dividend cut
6. Share split
7. Profit warning
8. All of the above
9. Other

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Materiality Concept

What is the acceptable level of frequency for ^{VOTE}breaching the materiality threshold?

1. Less than 0.1%
2. 0.1% (1 in 1000 year event)
3. 0.5% (1 in 200 year event)
4. 1% (1 in 100 year event)
5. 5% (1 in 20 year event)
6. 10% (1 in 10 year event)
7. 20% (1 in 5 year event)
8. More than 20%
9. Not sure

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Materiality Concept

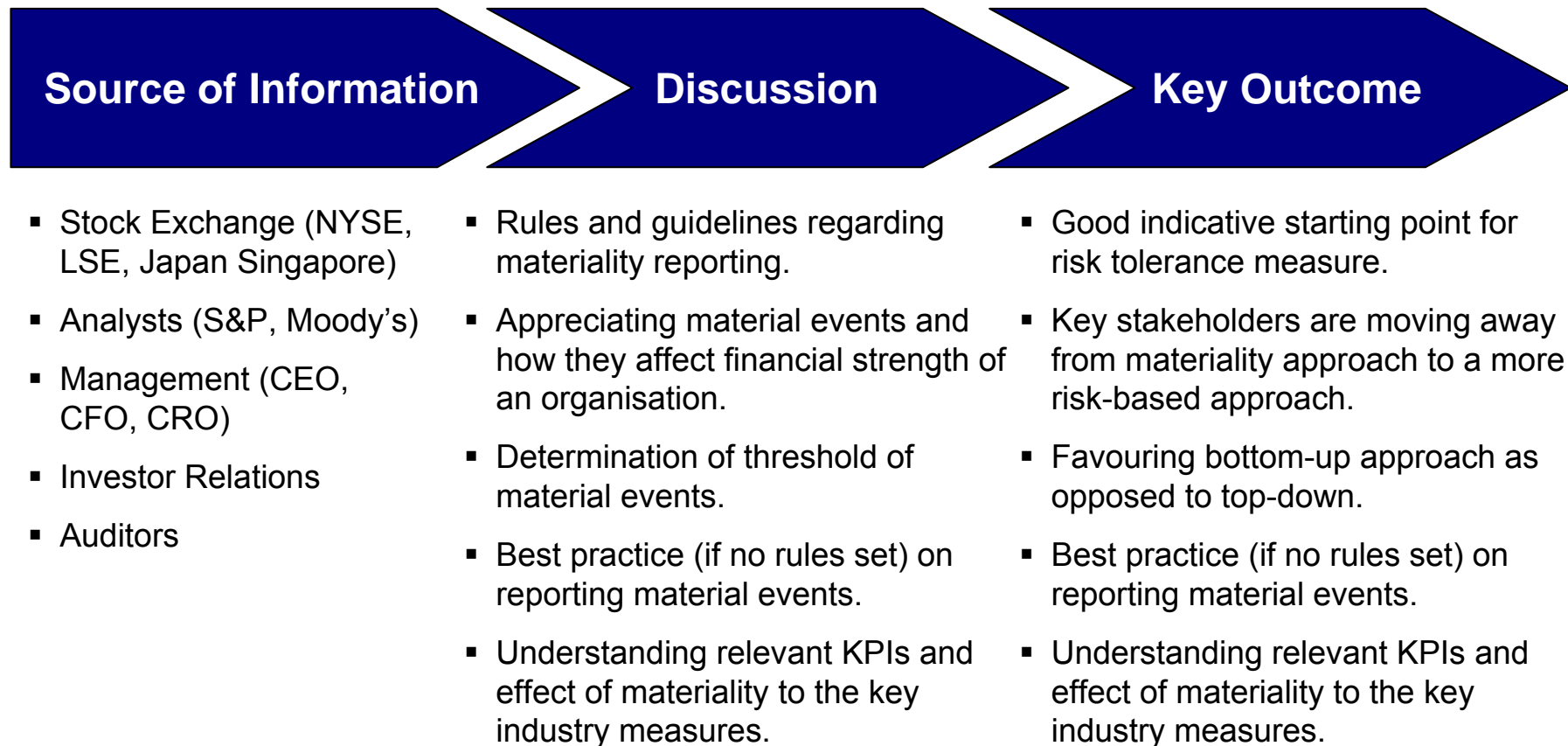
What is the key determinant of this threshold frequency?

VOTE

1. CEO tenure
2. Regulatory requirement
3. Credit rating agency requirement
4. Investor's expectation
5. Short term business plan
6. Long term strategic plan
7. Not sure

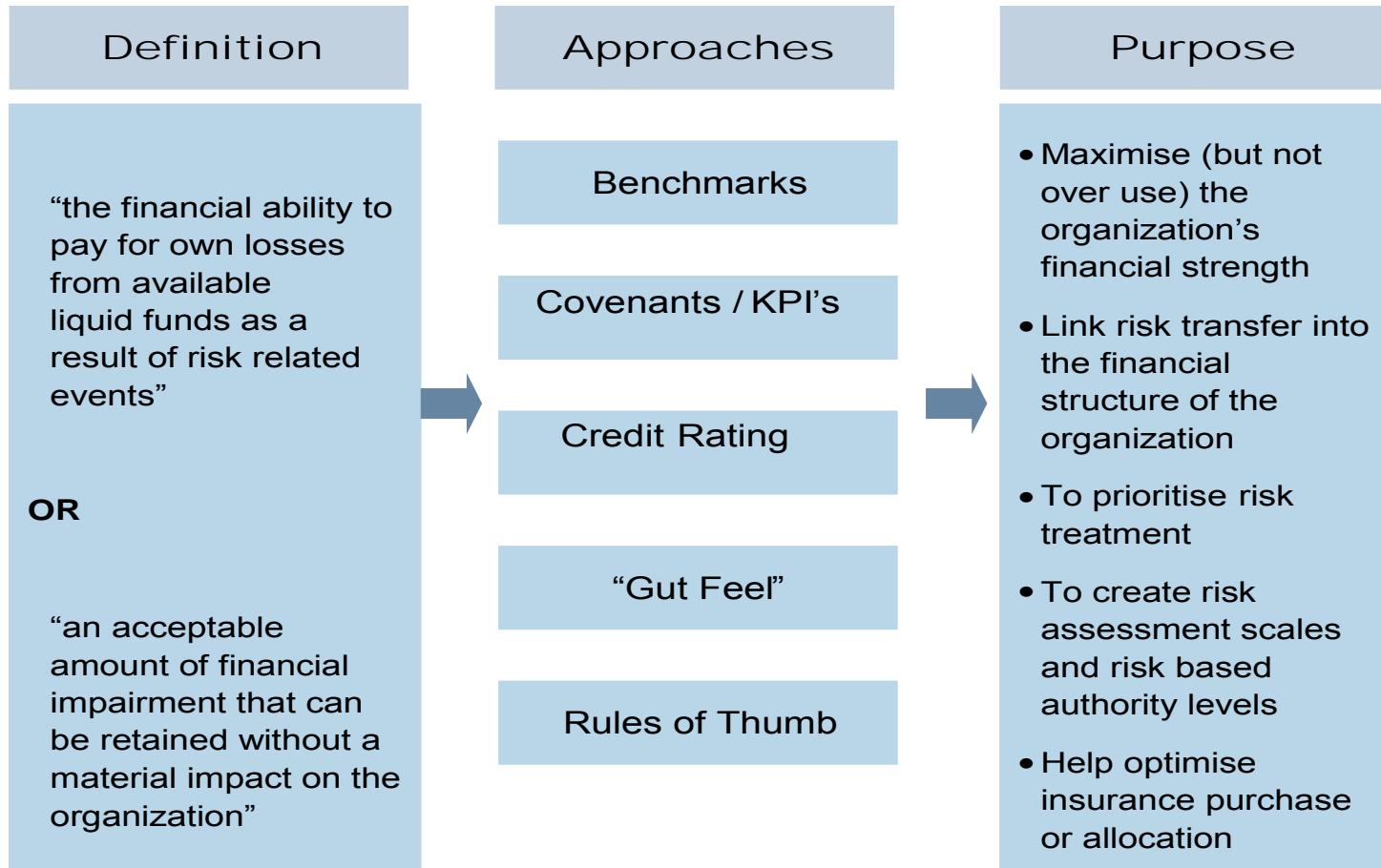
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Materiality Research to Date



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Methodology



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Materiality Approach

'Rules of Thumb'

Based upon 'industry accepted' variances as applied to the company's financials, representing minimal variances from expected performance. Deviations greater than the stated variance are considered to have an impact on investment community opinion.

Credit rating approach

Establishing a company's willingness to be subject to a credit downgrade. Rating methodologies tied to the company's own financial situation are used to highlight the level at which key ratios would be allowed to fall before there would be a risk of credit downgrading.

Key performance indicators / covenants

A maximum materiality threshold can be established by calculating the maximum amount that can be 'exposed' without breaching a stated Key Performance Indicator or Covenant. This is known as a 'headroom' calculation. These KPI's will be established from discussions with key personnel of the organisation.

'Management judgement' approach

Management making an informed decision based upon analysis including allowable variances in key operating ratios, corporate attitude to risk or simply 'gut-feel'. In the final analysis most risk tolerance decisions are based on some degree of analysis but subject to a sense of judgement by senior management. Typically this is gauged by speaking to senior managers.

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Materiality Approach

Benchmark	Industry Specific	Company Risk Profile
Description:	Process:	Rationale:
<p>A generic materiality approach taking into account market views and those of different stakeholders.</p> <p>It combines the techniques described in the previous page.</p> <p>E.g. Analysts generally considers a 3% to 5% EPS to be material.</p> <p>This approach gives a broad indication of a corporation's tolerance to risk.</p> <p>Based on:</p> <ul style="list-style-type: none"> •Market approach •Financial approach 	<ul style="list-style-type: none"> • Examine financial indicators that can include EPS, Working Capital, Cash flow, Capital and Profitability • Estimate the capacity that could be reserved for retaining risk without significantly impacting performance. • Estimate the headroom amount before a key performance indicator/covenant is breached. • Compare the impact of variances in risk tolerance on different financial ratios and business specific performance indicators. 	<p>Interested parties include CEO, CFO, COO, Senior Finance Executives, Legal Counsel, Risk Management.</p> <p>High level indication only.</p> <p>Drivers for this approach:</p> <ul style="list-style-type: none"> • Customer pressure; • Regulatory / Compliance concerns; • Board of Directors requests; • Financial reporting process concerns; • Key stakeholder pressure; • Changes to the business model.

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Materiality Approach

Benchmark	Industry Specific	Company Risk Profile
Description:	Process:	Rationale:
<p>A more specific approach building from the benchmark methodology.</p> <p>This approach concentrates on industry-specific KPIs. It also looks at differing variation in tolerance by different industries.</p> <p>E.g. Insurance industry concentrates on economic capital whilst manufacturing industry puts more weight on cash flow.</p> <p>This method implicitly takes into account the generic industry risk profile.</p> <p>It incorporates the volatility of performance of an industry relative to the market.</p>	<ul style="list-style-type: none"> • Examine financial indicators that can include EPS, Working Capital, Cash flow, Capital and Profitability for each industry. • Understand industry-specific beta and how this translate to the corporation's tolerance to risk. • Industry-specific beta reflects the volatility of a given industry. This reflects the inherent variability in performance and hence general risk profile. 	<p>Interested parties include CEO, CFO, COO, Risk Management</p> <p>A more specific technique that incorporates an industry's inherent volatility in the consideration of risk tolerance.</p> <p>Buyers typically cite the following reasons for investment:</p> <ul style="list-style-type: none"> • Customer pressure associated with a specific issue • Specific regulatory / compliance concerns • Board of Directors requests • Disclosure of specific issues in the financial reporting process • Key stakeholder pressure • Changes to the business model

Increasing the Relevance of Risk Tolerance to Organisations Today

Materiality Approach

Benchmark	Industry Specific	Company Risk Profile
<p>Description:</p> <p>A company-specific materiality approach building from the benchmark methodology.</p> <p>This approach concentrates on company-specific KPIs. It also looks at differing variation in tolerance within the industry.</p> <p>This method implicitly takes into account the company risk profile.</p> <p>It incorporates the volatility of performance of the company relative to the market.</p>	<p>Process:</p> <ul style="list-style-type: none"> • Examine financial indicators that can include EPS, Working Capital, Cash flow, Capital and Profitability for the corporation. • Understand company-specific beta and how this translate to the corporation's tolerance to risk. If the company is unlisted, use industry-specific beta. • Company-specific beta reflects the volatility of the corporation relative to the market performance. This reflects the inherent variability in performance and hence general risk profile of the company. 	<p>Rationale:</p> <p>Interested parties include CEO, CFO, COO, Risk Management</p> <p>A more specific technique that incorporates a corporation's inherent volatility as reflected in its relative performance in the market in the consideration of risk tolerance.</p> <p>Buyers typically cite the following reasons for investment:</p> <ul style="list-style-type: none"> • Customer pressure associated with a specific issue • Specific regulatory / compliance concerns • Board of Directors requests • Disclosure of specific issues in the financial reporting process • Key stakeholder pressure • Changes to the business model

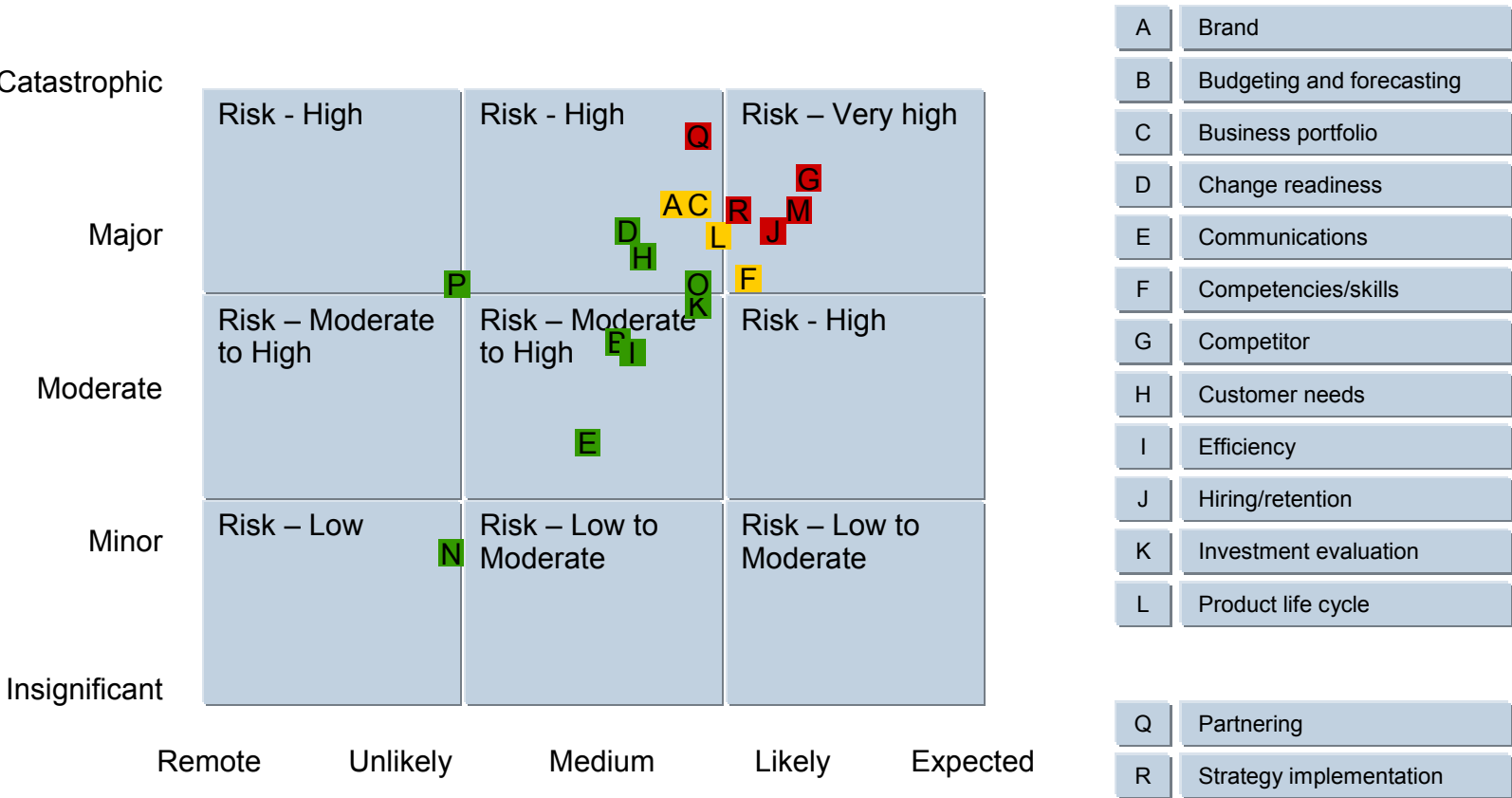
Increasing the Relevance of Risk Tolerance to Organisations Today

Section

1. Introduction
2. Background on our research
3. Definition of Risk Tolerance
4. Relationship with Risk Appetite
5. Materiality Approach
- 6. Risk Based Approach**
7. Uses
8. Survey and Discussion
9. Summary and Next Steps

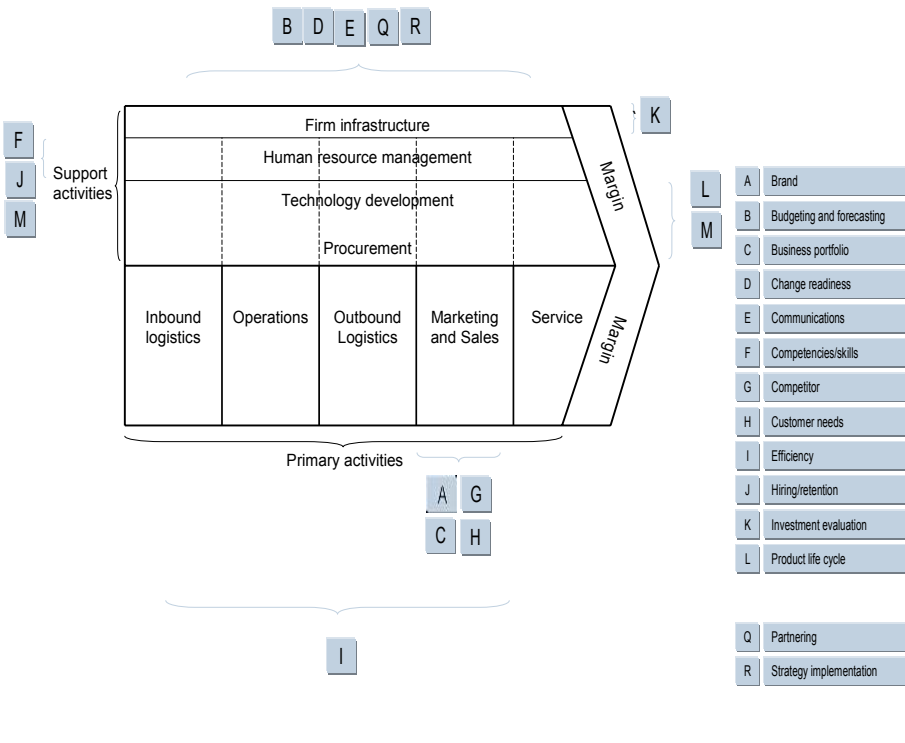
Increasing the Relevance of Risk Tolerance to Organisations Today

Risk Based Approach

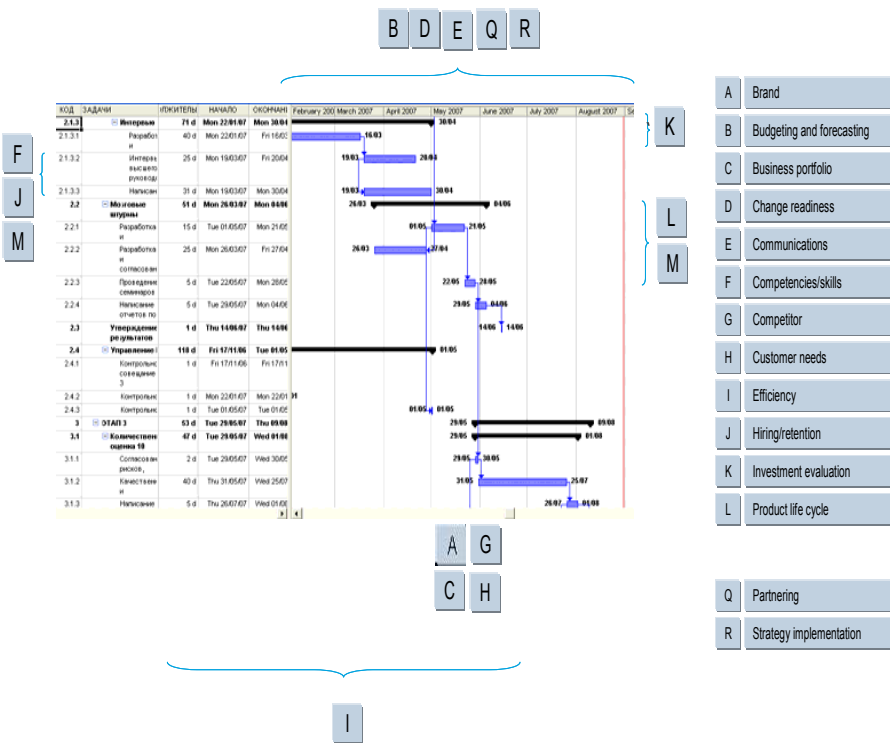


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Risk Based Approach



Supply Chain



Project Plan

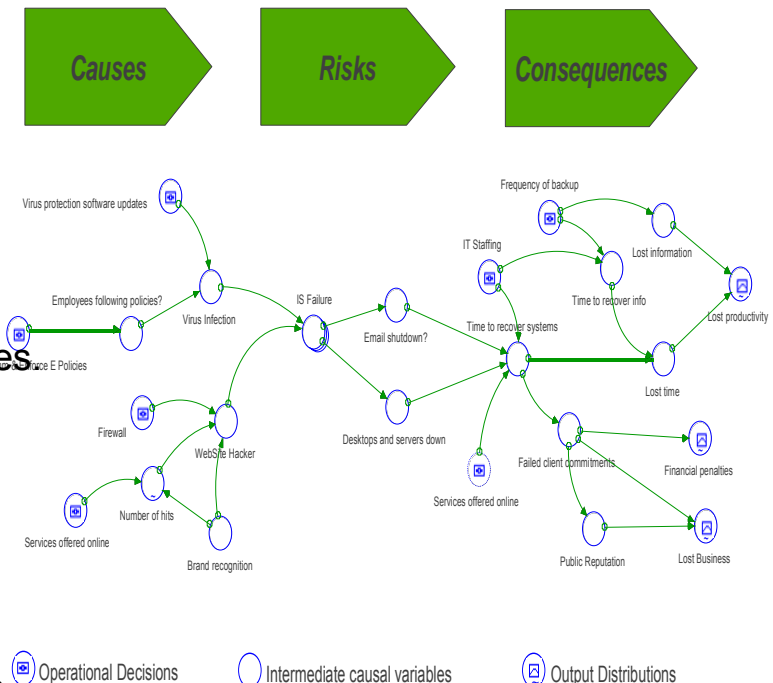
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Risk Based Approach

Fishbone diagram

Quantification of Top Risks

- In depth discussions for each risk to be quantified to give understanding on:
 - Clarity around the risk (causes and end results);
 - Financial impact;
 - Likelihood of occurrence in any one year.
- For each risk:
 - Quantify cost of each risk;
 - Understand cost of putting in place management strategies
- Co-dependencies between risk factors are taken into consideration when analysing each risk in isolation.
- Relate risk costs in financial terms and/or key metrics or covenants that enables the corporation to put risks in the context of practical terms.



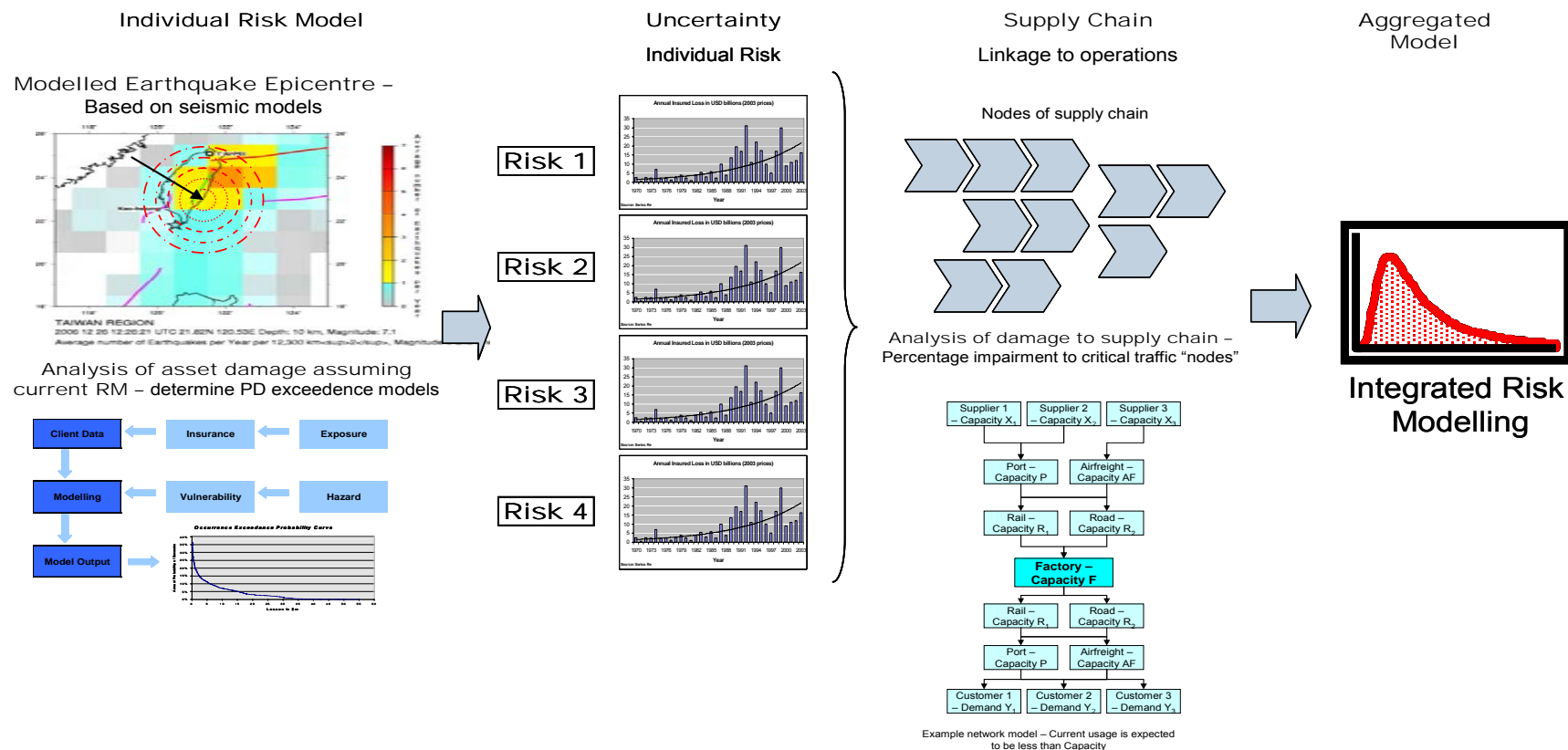
Total Cost of Risks

- Aggregate or amalgamate all the key risks quantified in the risk quantification process to obtain the total risk value.
- Co-dependencies between risks and consequential correlation between various risks are taken into account given any similarities in root causes.

Note: Diagram is for illustrative purposes only. The above is constructed at each review.

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Risk Based Approach



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Risk Based Approach

High Level	Industry Risk Profile	Company Risk Profile
Description:	Process:	Rationale:
<p>A company-specific measure of tolerance to risk. Understanding the volatility in key measures that are representative of the financial strength of the company.</p> <p>E.g. Earnings, Capital, Cash flow.</p> <p>This takes into account the variability in performance to understand the range of uncertainty in performance measure.</p> <p>This method assumes that historic risk profile and financial performance is a reasonable indication of the future.</p>	<ul style="list-style-type: none"> • Examine financial indicators that can include EPS, Working Capital, Cash flow, Capital and Profitability. • Estimate performance volatility and distribution of financial indicator by comparing actual versus expected. • Transpose materiality threshold onto the curve/distribution and understand the corresponding probability of occurrence. • Compare the organisation's 'acceptable' materiality breach to the threshold above. • Ascertain additional risk tolerance based on the range of performance. 	<p>Interested parties include CEO, CFO, COO, Senior Finance Executives, Legal Counsel, Risk Management.</p> <p>High level indication only.</p> <p>Drivers for this approach:</p> <ul style="list-style-type: none"> • Customer pressure; • Regulatory / Compliance concerns; • Board of Directors requests; • Financial reporting process concerns; • Key stakeholder pressure; • Changes to the business model.

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Risk Based Approach

High Level

Industry Risk Profile

Company Risk Profile

Description:

A company-specific measure of tolerance to risk. Understanding the volatility in key measures that are representative of the financial strength of the company.

E.g. Earnings, Capital, Cash flow.

This takes into account the variability in performance to understand the range of uncertainty in performance measure.

This method takes into account the generic risk profile of an industry and assumes that the company risk profile is consistent with that of the industry's.

Process:

- Examine financial indicators that can include EPS, Working Capital, Cash flow, Capital and Profitability.
- Estimate performance volatility and distribution of financial indicator by understanding how the significant risks of the industry affect the organisation's financial performance.
- Transpose materiality threshold onto the curve/distribution and understand the corresponding probability of occurrence.
- Compare the organisation's 'acceptable' materiality breach to the threshold above.
- Ascertain additional risk tolerance based on the range of performance.

Rationale:

Interested parties include CEO, CFO, COO, Senior Finance Executives, Legal Counsel, Risk Management.

A more specific technique that incorporates an industry's inherent volatility in the consideration of risk tolerance.

Drivers for this approach:

- Customer pressure;
- Regulatory / Compliance concerns;
- Board of Directors requests;
- Financial reporting process concerns;
- Key stakeholder pressure;
- Changes to the business model.

Increasing the Relevance of Risk Tolerance to Organisations Today

Risk Based Approach

High Level	Industry Risk Profile	Company Risk Profile
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Increasing the Relevance of Risk Tolerance to Organisations Today

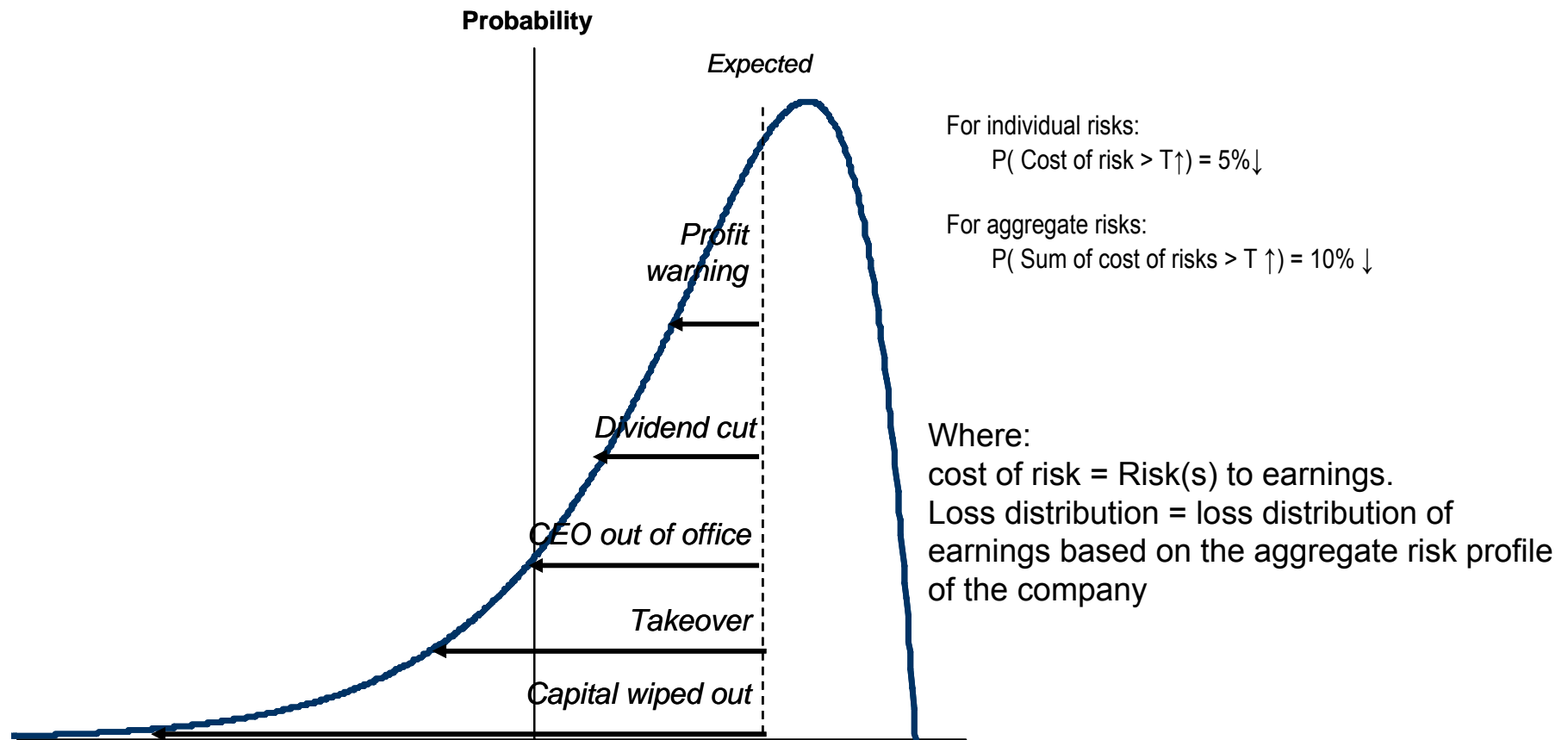
Section

1. Introduction
2. Background on our research
3. Definition of Risk Tolerance
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6. Risk Based Approach
- 7. Uses and Benefits**
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Uses

Decision Making Tool



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Decision Making Tool

VOTE

What is the acceptable frequency of profit warning?

1. Less than 0.1%
2. 0.1% (1 in 1000 year event)
3. 0.5% (1 in 200 year event)
4. 1% (1 in 100 year event)
5. 5% (1 in 20 year event)
6. 10% (1 in 10 year event)
7. 20% (1 in 5 year event)
8. More than 20%
9. Not sure

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Decision Making Tool

VOTE

What is the acceptable frequency of dividend cut?

1. Less than 0.1%
2. 0.1% (1 in 1000 year event)
3. 0.5% (1 in 200 year event)
4. 1% (1 in 100 year event)
5. 5% (1 in 20 year event)
6. 10% (1 in 10 year event)
7. 20% (1 in 5 year event)
8. More than 20%
9. Not sure

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Decision Making Tool

VOTE

What is the acceptable frequency of CEO out of office?

1. Less than 0.1%
2. 0.1% (1 in 1000 year event)
3. 0.5% (1 in 200 year event)
4. 1% (1 in 100 year event)
5. 5% (1 in 20 year event)
6. 10% (1 in 10 year event)
7. 20% (1 in 5 year event)
8. More than 20%
9. Not sure

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Decision Making Tool

VOTE

What is the acceptable frequency of takeover?

1. Less than 0.1%
2. 0.1% (1 in 1000 year event)
3. 0.5% (1 in 200 year event)
4. 1% (1 in 100 year event)
5. 5% (1 in 20 year event)
6. 10% (1 in 10 year event)
7. 20% (1 in 5 year event)
8. More than 20%
9. Not sure

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Decision Making Tool

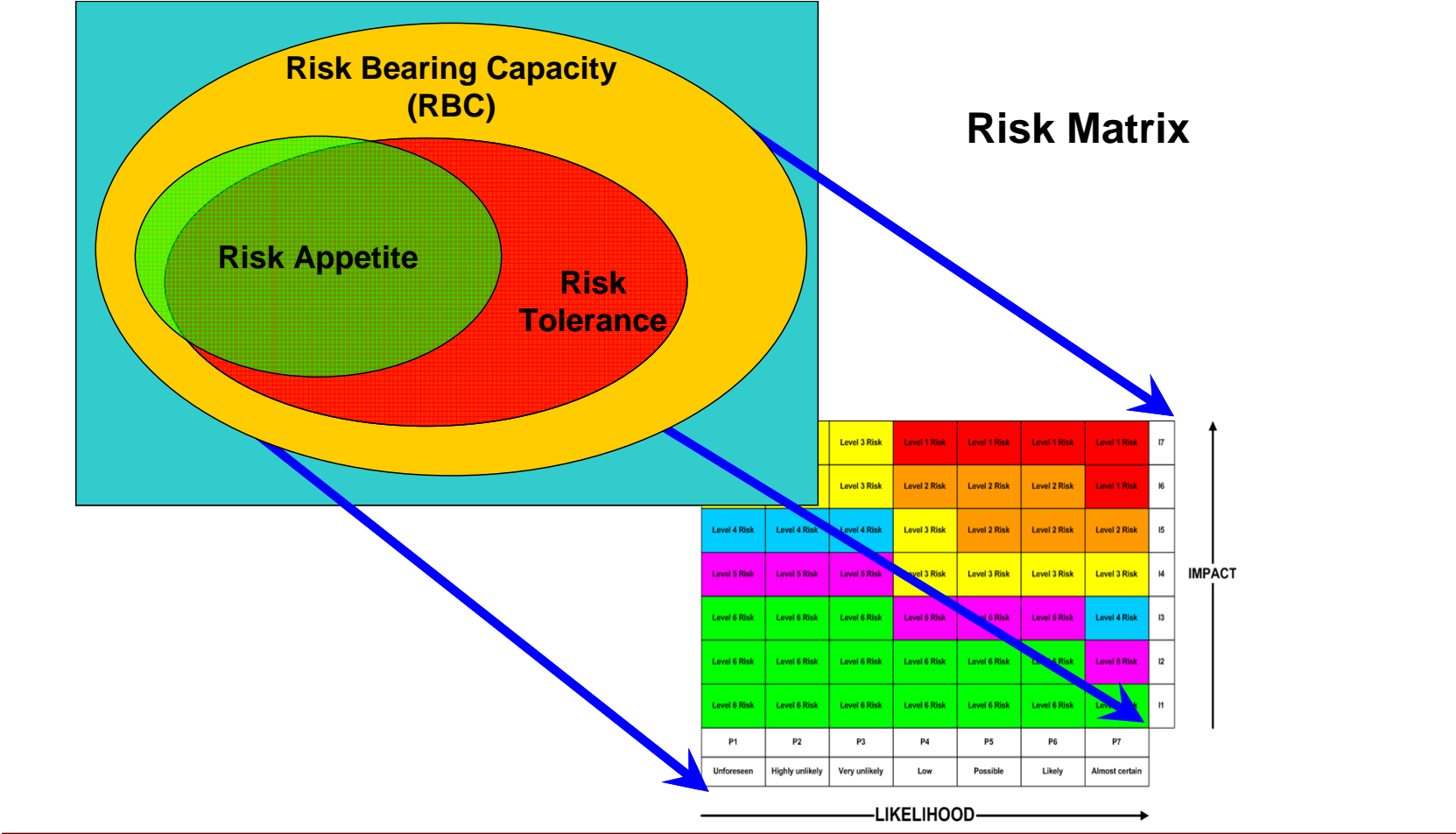
VOTE

What is the acceptable frequency of bankruptcy?

1. Less than 0.1%
2. 0.1% (1 in 1000 year event)
3. 0.5% (1 in 200 year event)
4. 1% (1 in 100 year event)
5. % (1 in 20 year event)
6. 10% (1 in 10 year event)
7. 20% (1 in 5 year event)
8. More than 20%
9. Not sure

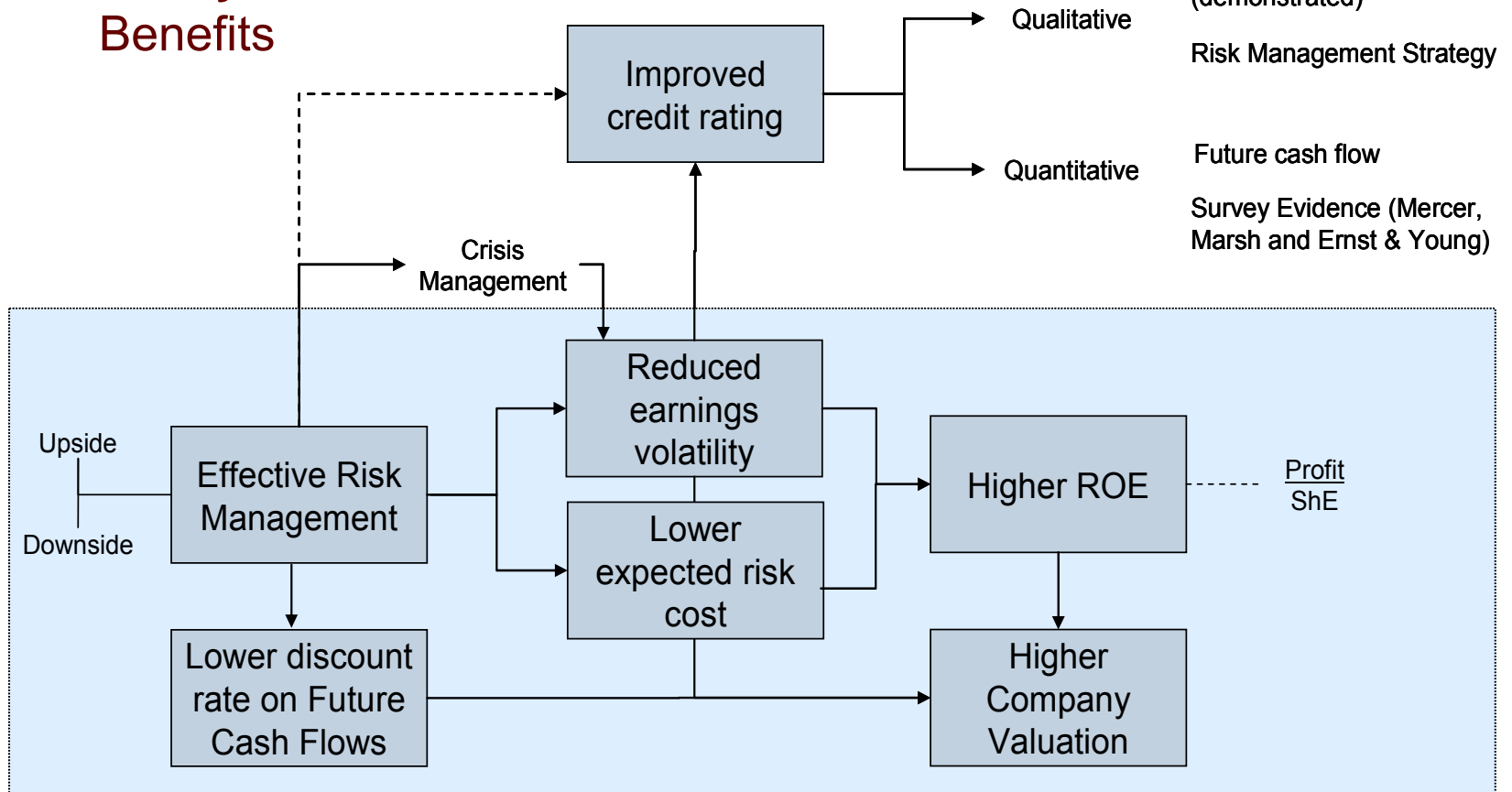
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Uses



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Today Benefits



A two year study of 1,000 UK companies over a 33-year period shows that the difference between the top and bottom quintiles of profit stability is a 25% to 30% share price premium for the most stable quintile.

Accountancy Age March 2006

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Benefits

Accurately calculating Risk Tolerance will provide the following benefits:

- in depth and financial understanding of the structure of risks;
- relate to financial terms – cost of capital, free reserves, profitability;
- understanding on dependencies between risk factors and correlation of risks;
- quantification of the uncertainty of risks to understand the extreme impact of risks;
- competitive advantage via understanding of business critical risks, their relationships, concentrations and correlations;
- ability to exploit new risk data, greatly contributing to strategic decision-making;
- identify, quantify and prioritise the ‘significant’ business risk exposures facing the organisation – a major item in corporate governance and best practice;
- evaluate the adequacy and effectiveness of controls currently in place;
- increase the level of risk awareness throughout the organisation; and
- identification of appropriate risk solutions.

Increasing the Relevance of Risk Tolerance to Organisations Today

Section

1. Introduction
2. Background on our research
3. Definition of Risk Tolerance
4. Relationship with Risk Appetite
5. Materiality Approach
6. Risk Based Approach
7. Uses and Benefits
- 8. Survey and Discussion**
9. Summary and Next Steps

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Survey

VOTE

Which method would you consider as appropriate in determining the risk tolerance?

1. Rules of Thumb
2. KPIs/Covenants
3. Credit Rating approach
4. Management judgement
5. DFA model
6. Other

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Survey

Which KPI is suitable to determine the risk tolerance?

VOTE

1. Revenue
2. Operating Profit
3. Total Assets
4. Cashflow
5. Earnings per Share
6. EBITDA
7. Other
8. Not sure

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Summary

- Risk tolerance is not a subset of risk appetite
- Many factors should be considered when setting RT
- Materiality approaches - Top down
- Risk Based approaches – Bottom up
- A decision making tool
- Act as the basic analysis required to enhance value of the company

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Next Steps

- Further Market Research:
 - Discussions with other stakeholders
 - Translating listed organisations' metrics to non-listed organisations
 - Refine and test our approaches with real data
- Ensure consistency between materiality and risk-based approaches
- Encourage more actuaries to involve in understanding the aggregate risks of their company

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Questions anyone?