



Institute
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Risk Measures

What is the best way to describe a risk and does it matter?

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Contents

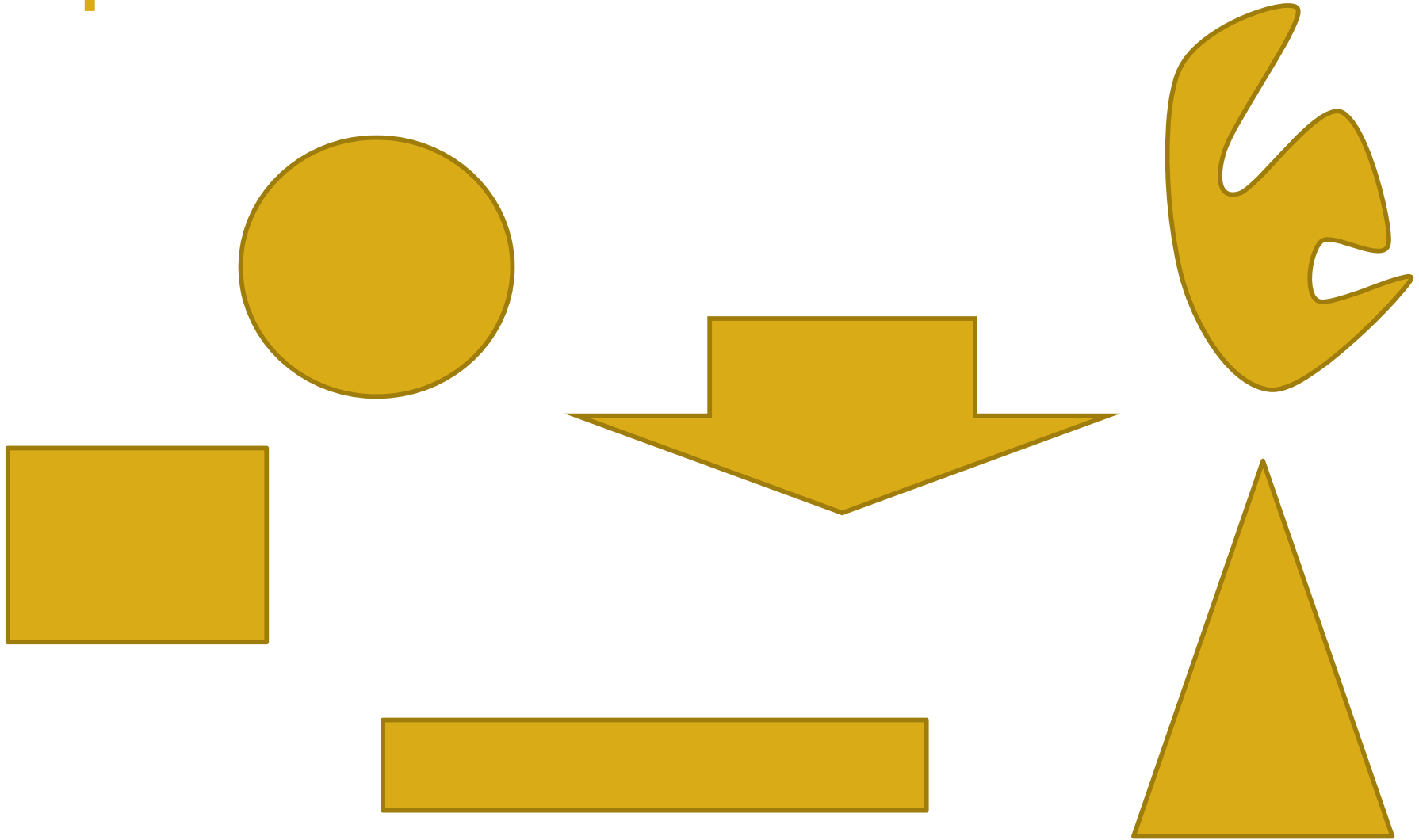
Risk measure concepts

- Why do we want to measure risk?
- Multiple risk measures
- Introducing an example
- Different stakeholders
- Translation systems

Why do we want to measure risk?

- You measure risk to differentiate risk.
- Some industries like financial services want articulated risk statements.
- Most non-financial industries still have risk management and need a way to report on it.
- For business that actively take on risk, adverse selection will occur if you don't differentiate risk.

Multiple risk measures



Introducing an example

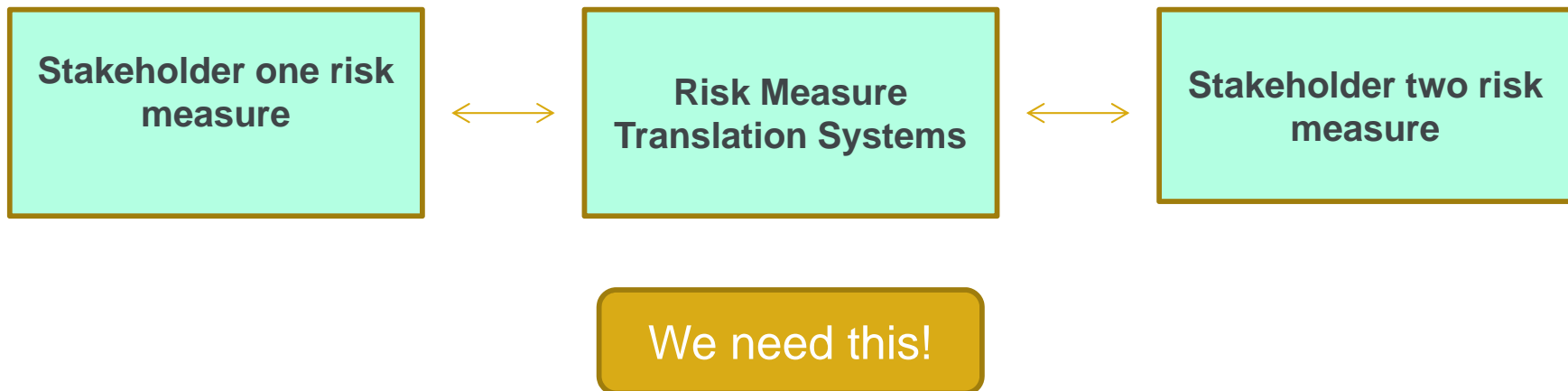
- Let's stay out of context to something that I think about daily...
- What risks and risk measures do I care about?
 - That I get sued...
 - That my team leave...
 - That the client is unhappy...
- Who are the stakeholders
 - My team
 - Me
 - My wife!

Different stakeholders

- Risk measures are everywhere and designed for different purposes and people.
- The right risk measures depends on purpose. This is why there are so many good and equally effective risk measures.
- Many excellent risk measures already exist within developed businesses and should be utilised.
- Is there a compelling need to remove excess risk measures?

Translation systems

- The problem should be split into:
 - What is the right risk measures for stakeholder one?
 - What is the right risk measures for stakeholder two?
 - How do we translate between the two stakeholders?



Joining Up Thinking For Improved Performance: How Risk Measures Can Be *Tolerably* Aligned

- A. What stakeholders are worried about
- B. Why risk measure alignment is important
- C. A survey of risk and reward measures
- D. How do we align measurements?
- E. How tolerance comes into play
- F. Examples

A: WHAT INSURANCE STAKEHOLDERS ARE WORRIED ABOUT:

Financial Goals:

- Return
- Growth
- Shareholder Value
- Controlled Aggregations
- Cash Flow
- Financial Stability
- Survival

Non Financial Goals:

- Customer Satisfaction
- Reputation
- Employee Excellence
- Strategic Initiatives
- Compliance
- Operational Excellence
- Pricing Accuracy

Other Dimensions: Short Vs. Long Term; and Individual vs. In-Aggregate

B: WHY RISK MEASURE ALIGNMENT IS IMPORTANT

- Mutual support of mutual objectives
- Minimize conflict of interest
- Common risk adjusted reward metrics
- Timely reporting
- Relative efficiencies
- Honesty
- More effective challenge
- Supports positive risk culture

C: Example Quantitative Risk Measures:

Top Down

- Combined ratio relative to peers
- Market capital
- RAROC volatility
- Aggregate loss probability
- Liquidity Scenarios
- Premium shortfall VAR at 50%, 80% etc.
- TVAR at 95%, 99.5% etc.

Bottom-Up

- Price vs. Target
- Premium
- ROE
- XS AAL
- Amounts past due
- MPL to Premium
- Specific Risk Tolerances

C: Example of Quantitative Reward Measures

Top Down

- Expected profit
- Premium growth
- RAROC
- Max single or probable aggregate loss
- Free cash flow
- Market beta
- Capital strength

Bottom-Up

- Rate changes
- Market share
- Price vs technical price
- Limits profile
- Cash flow
- 5 year operating ratio
- Contingency planning

Putting It All Together

Financial Goal	Risk Measure Top-down	Risk Meas. Bottom-up	Goal M. Top-down	Goal M. Bottom-up
Profitability	Combined Ratio Relative to Peers	Actual Price vs. Target	Expected profit	Rate changes
Growth	Market capital	Premium	Premium growth	Market share
S.H. Value	RAROC volatility	ROE	RAROC	Price vs technical price
Control Aggregat.	Aggregate loss probability	XS AAL	Max single or probable agg. loss	Limits profile
Cash Flow	Liquidity Scenarios	Am't past due	Free cash flow	Cash flow
Financial Stability	Premium shortfall VAR at 50%, 80% etc.	MPL to premium	Market beta	5 year operating ratio
Survival	TVAR at 95%, 99.5% etc.	Specific Risk Tolerances	Capital strength	Contingency planning

C: Example Qualitative Risk And Reward Measures

Non-Financial Goals:	Risk Measures	Return Measures
Cust. Satisf.	Complaints	Retention Rates
Reputation	Reputation Risk	Business Model Effectiveness
Empl. Excellence	Exit Interview Profile	Values Alignment
Strat. Initi	Complexity	Project Success Metrics
Compl'ce	Issues Detected	Issue resolution speed
Op Excell.	Strategic and Operational Risks	Innovation Levels
Price Acc.	Process Coherence Measures	Reserve Development

D: How do we align measurements?

Think top down, bottom up and side to side

In Order Presented Try:

1. Substitution

2. Translation

3. Adoption

Substitution: replace local metric with another (or replace both with a new better all-rounder!)

Advantages:

- Easy to administer and monitor
- The review process may bring better understanding of goals clash.
- May be more robust than an ad-hoc local solution

Disadvantages:

- May be less goal aligned than original local metric
- May reduce buy-in
- May require additional processes to be put in place to administer
- May require secondary monitoring as a guard against false positives/ negatives
- May lose “history”

Translation: keep the two metrics, but find a factor or formula that relates them

(This can extend to composite measures like: $(2*VAR + TVAR + MPL*1.5)/3$)

Advantages:

- Allows separate areas to manage in units that are most direct to their BAU processes
- Translation process can uncover inconsistencies between different goals/benchmarks/appetites
- Can be good validation of capital model reasonableness
- Possibly more efficient than substitution with respect to alignment of risk measure and goals

Disadvantages:

- Only works for quantitative metrics that fit a loss distribution
- May not be appropriate for stressed situations which are possibly the most important ones
- Still may require supplemental monitoring
- Requires additional capital modelling resource
- May require more model granularity to effect

Adoption: rather than substitute or translate: take on an additional measure (top or bottom)

Advantages:

- Demonstrates effective risk culture
- Fullest alignment with goals is maintained
- Allows easier conversations
- Puts incentive to understand aggregation of the new statistic
- Works with most/all quantitative and qualitative measures

Disadvantages:

- Additional effort of maintaining adopted measure
- Complexity of managing and reconciling more measures
- Risk of misalignment may be increased if the measure is too much of a force fit against differing objectives

E: How Tolerance Comes Into Play

Tolerance: how much background change will be accepted

This may involve

- Extreme events above stated size
- Environmental changes
- Goals changes
- Model Change
- “Other”

When exceeded, the risk metrics may need to be realigned.

F: Examples

The risk measure for a production area is total and average limits which it to be aligned with the insurance risk capital measure for the company as a whole

Example: Substitution

Instead of tracking average ant total limits have a premium based capital allocation (relatively easy) and a modelled maximum probable loss (hard).

Example: Translation

track average and total limits at the business unit level, but undertake modelling to determine the sensitivity of the capital requirement in relation to changes in these variables. Then select a scaling adjustment factor that projects the change in capital requirement as the metrics change.

Example: Adoption

Make average and total limits a metric for senior management. This may require collection from other business units and thought about how they should be aggregated.

Group Example



Questions



Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.