A Taxonomy of Risk
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Introduction

▸ Risk registers and internal models aren't communicating properly.

▸ The current framework of understanding risks needs a new paradigm to help link the two approaches.

▸ The brave new world will include risk metrics from internal models that help identify, assess, monitor, manage and report risks.

▸ There is a long way to go on this journey...

Background

- Risk register driven from qualitative background risk professionals whilst internal models driven from quantitative background actuaries.

- Risk registers were designed for a risk universe not an SCR.

- Internal models have come from an ICA background where integration with the risk process wasn't a priority.

- Risk categories are well known and embedded, but are they all the same?

Risk categories

- Insurance Risk
- Credit Risk
- Operational Risk
- Market Risk
- Liquidity Risk
- Group Risk
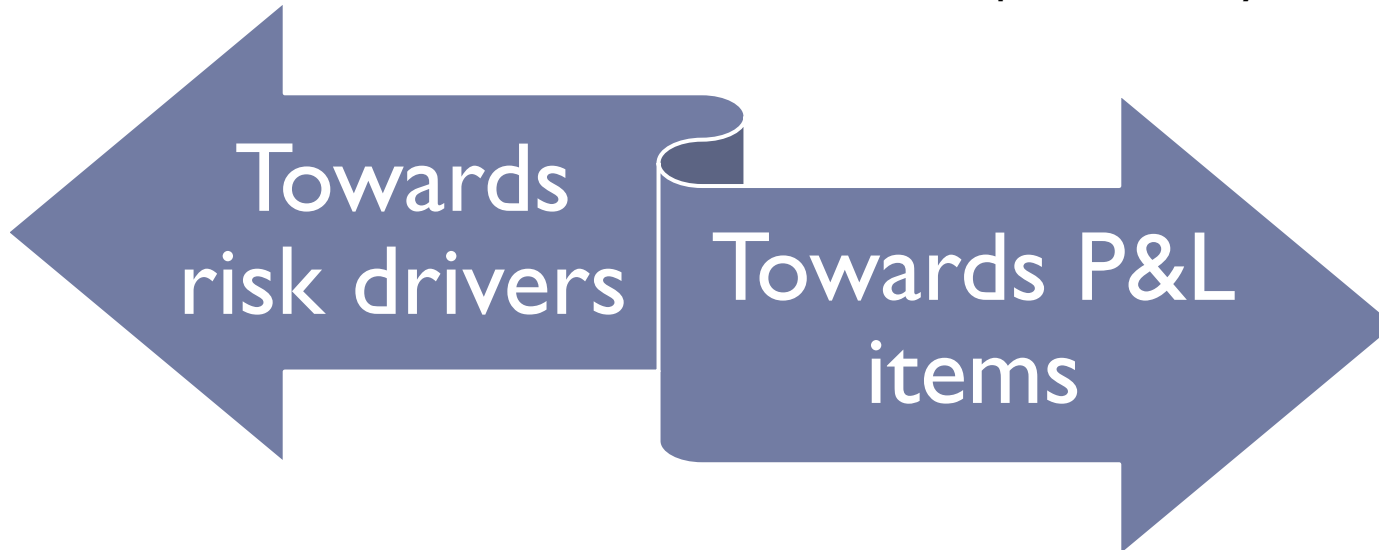
- Strategic Risk
- Model risk

Risk categories

Risk categories can be considered by way of the risk drivers that cause them.

OR

Risk categories can be considered by way of the P&L impact that they can create.

Towards risk drivers

Towards P&L items

Risk drivers vs. categories

- ## Risk driver
  - Is this the root cause of a risk?
  - This is not a new concept, and is considered in dependency conversations.
  - Does this driver impact different risk categories?
- ## Risk category
  - Established 'bucket' to help communicate risk
- ## P&L items
  - Considering risk by way of P&L impact relates to the business.
  - Creates synergies with P&L attribution.
  - An alternate approach is to have expense risk and investment return risk in contrast to operational and market risk.

Strategic risk

- ▸ **Internal model SCR risks are a sub-set of ORSA risks**
  - ▸ Material and quantifiable risks should be in the SCR.
  - ▸ There are just some things you can't capitalise for.
- ▸ **SCR capital is there to support the business plan**
  - ▸ Would be an advocate that qualitative environment is in a number of cases better than the quantitative environment.
- ▸ **Strategic risk examples:**
  - ▸ International local markets take premium income from Lloyd's.
  - ▸ Failure to manage the underwriting cycle leads to poor performance.
  - ▸ Over-reliance on a small number of brokers leads to weaker negotiating position.

Model risk

- The internal model can not be responsible for quantifying model risk…
    - Beyond the validation framework, there is still a risk that there is some inappropriate calculation of regulatory capital.
    - This might be considered to be covered by a regulatory loading, thus quantified by the regulator.
    - By definition, this is accidentally outside of the SCR. It is a 'known unknown'.
- Model risk example:
    - Stochastic modelling platform found to be inappropriate.
    - Validation limitations are considered to be material.

Operational risk

- ▸ **Operational risk seems to overlap with other risks**
  - ▸ The line drawn with insurance risk is notionally 'variability of the insurance result given the business plan' vs. 'variability in achieving the business plan'.
  - ▸ Risk registers are not necessarily aligned with this definition.
  - ▸ Even given a particular definition, there are difficulties defining particular risks where there may be double counting.
- ▸ **Difficult operational risk example:**
  - ▸ Inability to purchase anticipated reinsurance programme due to market conditions.
  - ▸ Claims are reported from inappropriate and unreviewed policy wording (claims leakage).
  - ▸ Rate changes are incorrectly measured / applied.

Market risk

- Market risk seems to overlap with other risks.
  - New technical provisions variability should include yield curve variability – is this market risk or reserve risk?
    - History of these effects with Ogden rates and now PPOs
  - Some insurance products heavily correlated to market features: Is forced correlation sufficient?
  - Life insurance industry may have better solutions to this…
- Difficult market risk example:
  - Currency risk from international policies that have different currencies for premium and local currency payment.
- Inconsistent treatment compared with operational risk.
  - Market risk seems to own overlap but operational risk doesn't.

Principles for risk registers

- Risks registers should:
  - Include the full risk universe but separate out SCR risks from others e.g. clarity of model scope.
  - Include risks that are mutually exclusive i.e. duplication.
  - Include risks and controls that are aligned to measurable statistics that can be validated and produced from reported management information including (but not exclusively) the internal model.
  - Consider carefully the optimal number of risks to inform and shape the business.
  - Find an appropriate number of risks in each category to ensure proportionality (particularly when capital allocating).

Risk register enhancements

- Duplication:
  - Breach of regulations / Failure to understand and fulfil regulatory requirement.
  - Inadequate pricing affects profitability / Unexpected terms and conditions slippage
- Poor articulation of risk:
  - Asset values fall when liabilities rise (this is a matching risk).
  - Poor returns due to concentration of asset types (this is strategic if within investment mandate)

Principles for models

- ## Models should:
    - Recognise that current practice isn't best practice. Are models fit for purpose?
    - Be focused and granular enough to produce key risk and control outputs.
    - Find ways to segment analysis to differentiate risk categories / P&L items.
    - Consider the pros and cons of replacing forced correlations with causal correlations.
    - Learn from feedback provided within the risk management construct.

Model enhancements

- Risks that might benefit from separation include:
  - Rating environment against expectation and claims leakage.
  - Market aspects of insurance risk (yield curve and inflation features).
  - Accounting features (e.g. BBNI) from premium provision risk.
- Modelling of risk features
  - The direction of a number of such initiatives would imply more links to a PEST type analysis i.e. Political, Economic, Social and Technological.
  - View might be that underwriting risk would tend to process risk only (once other drivers are removed).
  - Process risk would further tend to zero in large books.

Model enhancements

- ## Best of breed
  - Irony that operational risk, often criticised as 'goal seeking', provides clearest link between models and risk registers.
  - Best of breed approach might be to include a risk driver analysis behind operational correlations that might have controversial risks drivers such as 'poor management', and 'poor IT systems'.

- ## Control feedback
  - Substantiated improvement in controls could at some point feed back into a capital allocation process.
  - Allocation could qualitatively assess information or quantitatively model a residual risk curve.

Risk ranking

- ▶ **Risk allocation**
  - ▶ Allocate capital to risk using quantitative analysis based on initial risk category segmentation.
  - ▶ Risk ranking can be driven from this.
  - ▶ Consider that the granularity of a risk affects its ranking.
  - ▶ Reasonableness of granularity will become apparent if number of risks to allocate to distorts analysis.
  - ▶ In theory, if this allocation is reasonable, these individual risk should have an even correlation structure with other risks in that category.
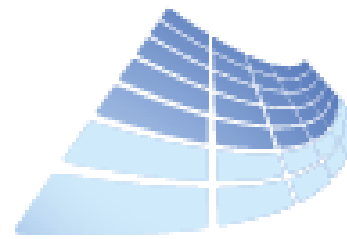
Conclusions and next steps

- Discuss internally your thoughts on risk drivers and risk categories with risk management and CROs.

- Reconsider your risk register to make them more internal model friendly.

- Reconsider your internal model to make them more risk register friendly.

- Consider the KRIs that then map between the internal model and the risk register.

- Conduct a risk level risk ranking exercise.

- Give me a call.... (absolutely shameless, I know)

Any questions?