

Risk classification system article

Patrick Kelliher details work undertaken by the Risk Classification Working Party to derive a common risk “language” for the Profession, and the background to the high level categories of this were chosen.

Risk classification relates to how an organization defines the risks it faces. Coherent classification is essential to enterprise risk management (ERM), as ambiguity will lead to confused reporting and management of risk.

However, while firms may have a coherent system for classifying risks that meets their own requirements, such systems are unlikely to be identical between firms. Each system represents a risk "language" bespoke to the firm, with firms using different terminology for the same risks, or the same terminology for completely different risks. The different risk languages used by actuaries in their day-to-day work can cause confusion when actuaries from different firms come together to discuss risk.

To address this, the risk classification working party was set up at the end of 2009 to develop a common risk classification system for the profession and, in doing so, establish a common risk "language" for actuaries to use when discussing risk. The working party – comprising Paul Klumpes, David Wilmot, Jaiwardhan Vij and I – have recently published a paper setting out such a common risk classification system for actuaries, together with a supporting spreadsheet setting out the very detailed risk categories identified in our work.

Note the working party was not seeking to develop a definitive, "one size fits all" classification. Firms will have their own classifications systems which meet their own requirements and we do not seek to supplant these - merely to provide a common basis for discussion between actuaries of different firms. Actuaries are not obliged to adopt the common classification system but it is hoped they will find this common reference point helpful in discussing risk with their peers in other organizations.

Differences in risk classification

Even at a high level, significant differences can exist between how different organizations classify risks. Figure 1 considers four different high-level classifications used by various regulatory bodies and insurance companies:

- FSA Prudential Sourcebook
- German regulator BaFin
- Lloyds Banking Group and
- Prudential.

Figure 1
Four different high-level risk classifications

FSA Prudential Sourcebook	BaFin Minimum Categorization	Lloyds Banking Group	Prudential
Market	Market	Market	Market
Credit	Credit	Credit	Credit
Insurance (incl. expense and persistency risks)	Underwriting (broadly similar to insurance risk)	Insurance (incl. expense and persistency risks for insurance business)	Insurance (incl. expense and persistency risks)
Operational	Operational	Operational	Operational
Liquidity	Liquidity	Financial soundness (incl. liquidity, tax, accounting and regulatory capital risks)	Liquidity
Group (risks arising intra-group exposure)	Concentration (risk from concentrations of exposure to individual counterparties)		
	Strategy	Business (broadly covering strategy risks)	Business environment (forces in the external environment affecting strategy)
	Reputation		Strategy (relating to senior management development and implementation of business strategy)

Taking just these limited examples, while there are some common categories (e.g. market risk, operational risk), there are also significant differences in terminology, even at a high level. This is particularly true of strategy-related risks.

Moreover, as one drills down to sub-categories, further confusion is possible. For instance one organization may class failure of a project as operational risk, while another may class it as strategy risk. Some other areas of doubt:

- Is non-disclosure of material underwriting information an insurance/underwriting risk or operational (fraud) risk?
- Is spread widening of corporate bonds a credit or a market risk?
- Is a shortage of buyers in a market a liquidity or a market risk?

This list is by no means exhaustive: the further one drills down into sub-categories, the greater the potential for overlap with other categories and for confused classification. To address this, the working party sought as far as possible to parse risk types into sub-components to identify where there may be overlaps, and to suggest how risk categories may be demarcated.

Risk and economic value

In their work, the working party used the following definition of risk:

“The possibility of events, or combinations of events, occurring which have an adverse impact on the economic value of an enterprise as well as the uncertainty over the outcome of past events.”

It follows that any risk classification system should start by considering what the "economic value" of an enterprise is. The working party considered the following definition of economic value:

- embedded value comprising:
 - shareholder net assets (assets less liabilities) plus
 - value in-force (VIF) - the value of existing business relating to future income less costs, including the cost of capital (covering both regulatory and other capital requirements as well as economic capital).
- plus goodwill relating to (a) the value of future new business, plus (b) future initiatives to drive down costs, improve persistency and improve the risk/reward profile.

Risks to embedded value

The adverse events which affect embedded value are:

- market movements reducing net assets and/or reduce the VIF of future income (e.g. fund-related charges)
- counterparty defaults reducing net assets
- insured perils reducing insurer net assets, while for companies in general, there is a threat to VIF from poor persistency levels
- operational loss events which deplete net assets (e.g. mis-selling compensation) and/or reduce VIF (e.g. regulatory challenges of charges).

From this, we arrived at the following high-level risk categories:

- **Market Risk** – the risk that as a result of market movements, a firm may be exposed to fluctuations in the value of its assets, the amount of its liabilities, or the income from its assets;
- **Credit Risk** – the risk of loss a firm is exposed to if a counterparty fails to perform its contractual obligations (including failure to perform them in a timely manner) including losses from downgrades and other adverse changes to the likelihood of counterparty failure;
- **Insurance and Demographic Risk** – the risk of adverse variation in life and general insurer and pension fund claim experience as well as more general exposure to adverse persistency and other demographic experience, and including adverse changes to assumptions as to future experience;
- **Operational Risk** – the risk of loss, resulting from inadequate or failed internal processes, people and systems, or from external events.

The market, credit and operational risk categories featured in the four high-level classification systems considered above, and these are also categories considered under Basel II.

Insurance risk was also common (though BaFin termed this underwriting risk) but the working party considered the term too narrow, as it implies risk relating to insurance companies only. The reference to demographic risk makes it clear that this is a broader category - persistency risk in particular is key for many firms outside the insurance industry and beyond financial services.

Liquidity risk

The high-level categories mentioned above cover threats to the quantum of embedded value, i.e. threats to the amount of realistic assets in excess of realistic liabilities. However, solvency is based not just on the amount of assets relative to liabilities but also on how liquid these are.

If assets are not sufficiently liquid, they may have to be sold at a discount to market value to meet liabilities as they fall due and/or a firm may have to borrow to cover the shortfall in liquid funds, giving rise to interest costs. In extremis, a firm may find itself unable to meet liabilities as they fall due.

There is thus the need to consider the liquidity as well as the amount of assets relative to liabilities and we need to add a high-level category for liquidity risk which is defined as:

“The risk that a firm, although solvent, either does not have available sufficient financial resources to enable it to meet its obligations as they fall due, or can secure such resources only at excessive cost.”

Risk to goodwill - strategy risk

The categories considered so far relate to existing assets and liabilities and the embedded value arising from these, but a large component of a firm's economic value relates to goodwill in respect of future new business and initiatives to extract greater value from the existing book of business. Thus a separate strategy risk category has been added to cover threats to the realization of this goodwill.

This will cover:

- risks leading to actual strategic outcomes differing adversely to expectations
- risks which may inhibit strategy and strategic choices
- the risk that the strategy chosen is sub-optimal.

Note there is a body of opinion that suggests such strategic risks should not be considered as a separate category but as manifestations of other risks, e.g. market risk may cover the impact of falling stock markets on equity-related product sales.

However, the working party has chosen to separate out strategic risks in the common risk classification system on the basis that the controls required to manage these are different from those to manage embedded value. The impact of market falls on embedded value may be hedged using derivatives, but for new business, managing the impact is more about offering a diversified product range and not being overly reliant on, say, equity funds.

Frictional Risk

The definition of economic value above includes a deduction for the cost of capital. The amount and hence cost of capital is not determined solely by the economic risks faced by a firm, but also by regulatory, accounting and rating agency requirements.

The excess of these requirements over economic capital required may be termed "frictional capital". Frictional capital requirements may increase in the absence of any change in economic risk profile with the cost of this extra capital having an adverse impact on economic value.

The common risk classification system has a frictional risk category to cover such impacts. This category also covers problems caused by operating structure such as the fungibility of capital tied up in subsidiaries.

Finally, the category also covers tax risks such as changes to the corporation tax regime and portfolio-specific impacts such as deferral of tax relief because of an adverse mix of business.

Aggregation and diversification risk

It is important in considering risk to look not just at the individual components but how they come together as a whole. Risks may be super-additive, with the combined impact greater than the sum of the individual parts. More often than not, risks are sub-additive with risks unlikely to crystallize to the same extent simultaneously.

Firms allow for this diversification benefit in assessing capital requirements, but there is a risk that the combined impact may be greater than expected, i.e. that the diversification benefit is less than expected.

Thus the common risk classification system has a final, over-arching high-level category for aggregation and diversification risk which is defined as:

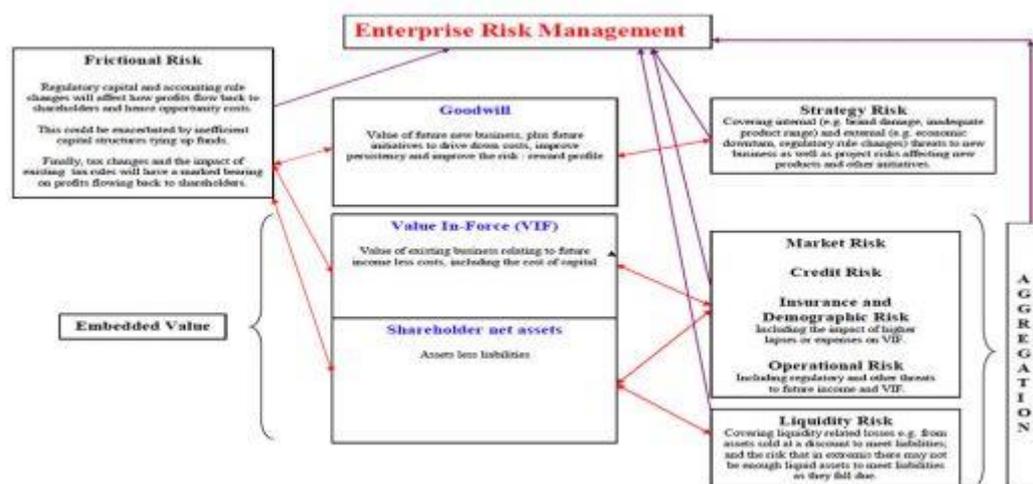
“The risk that the aggregate of risks across individual categories is greater than the sum of the individual parts and/or that anticipated diversification benefits are not fully realized.”

Aggregation and diversification is also considered as a sub-set of each high-level category, e.g. market risk will include an aggregation and diversification risk category to address the combined impact of individual market risks such as equities and property. However, this high-level category will consider impact across the other high-level categories, e.g. between market and operational risks.

Summary of High Level Categories

The working party's view of risk can be summarized in the following diagram:

Figure 2
Working party view of risk



Based on the view of risk outlined above, the common risk classification system as it stands has high-level categories for:

- market risk
- credit risk
- insurance and demographic risk
- operational risk
- liquidity risk
- strategy risk
- frictional risk and
- aggregation and diversification risk

Conclusion

Risk classification is only a starting point in ERM, which ultimately needs to consider how the individual strands represented by the individual risk categories interact both in aggregate and at each entity level, as well as the rewards available.

However is hoped actuaries will find the common reference point this system provides useful in discussing risk with their peers in other organizations. I would encourage actuaries to read the final paper (and the detailed classification underneath this) and either make use of the common definitions when discussing risk with peers outside their organization, or if using alternative definitions, to define these as precisely as possible.

Appendix – Additional Material that can be added

In addition to the content above, the InsuranceERM article also included the following:

Key principles of the common risk classification system

Aside from the view of economic value in the section above, the other principles on which the common risk classification system is based are:

- It is an event-based classification as opposed to cause-based classification.
- The focus is on gross risk and generally excludes control failures.
- In particular it treats asset/liability management (ALM) as a control and focuses more on the underlying exposures, liabilities and assets each have.
- Also, governance is seen as a control and, while weak governance is a serious issue for firms, it is market, credit and other risks that give rise to losses, not weak governance per se.
- Reputation risk is classed under strategy risk - reputation damage may also lead to mass withdrawals but this is assumed to come under the persistency risk and liquidity risk categories.
- Risk impacts include regulatory capital and accounting impacts as well as the economic impact, but as noted above, the impact of rule changes is covered under frictional risk.

Event-based v cause-based classification

As noted in the first bullet point above, the approach adopted has been to seek to classify risks by event, i.e. by what has just occurred which has given rise to an adverse impact. The alternative to such event-based classification would be to seek to classify risk by what has given rise to the event, or cause-based classification.

To take the example of Northern Rock, the event would be the "run on the bank" it experienced in September 2007, and this common risk classification system as it stands would class this as a liquidity risk (event). However, a cause-based classification may consider the bank's "originate and distribute" model that ran into problems in 2007 as the cause of the run and the bank's failure, and may class this as a strategy risk.

While such causal analysis is essential to understanding risk, a problem with cause-based classification is that multiple causes can be identified as leading up to the single event. How far back does one go in causal analysis? For instance, in the Northern Rock example, it may be argued that the flaws in the model were in turn down to poor governance, which might be classed as an operational risk.

Because of such complications, the working party opted for event-based classification. However we would stress that our purpose is limited to creating a common risk "language" for use between actuaries, and that risk management requires that the causes of events be rigorously analyzed and understood.

Systematic and idiosyncratic risk

Modern Portfolio Theory makes the distinction between idiosyncratic risk relating to individual stocks or sectors and which can be largely diversified, and systematic risk relating to the aggregate market movements. This distinction has been reflected in market risk sub-components.

For credit risk, distinction is made between process risk relating to individual exposures; regional and other sub-portfolio impacts; and portfolio-wide shocks (split domestic/overseas), which may be considered analogous to the idiosyncratic/systematic risk split used for market risk. Similarly, a distinction is made in the insurance and demographic risk category, which is split between process risk and portfolio-wide shocks.

Entity level

No distinction is made in the classification for the entity level at which the risk arises, i.e. an interest-rate swap exposure in an insurance sub-fund is not classed any differently from, say, a similar swap at holding company level. The only explicit account taken of corporate structure in the classification relates to fungibility of capital issues covered under frictional risk, and this would be more of an issue for a holding company than a particular subsidiary.

However the working party notes that corporate structure is an important consideration in ERM and risk governance arrangements.

Risk and Reward

Finally, the common risk classification system looks at risks in terms of adverse impact to economic value, but there will usually be a reward related to accepting a risk (though certain idiosyncratic risks may not be rewarded).

The common risk classification system does not address the nature of reward relating to each risk, which often varies depending on the type of firm exposed to the risk. However the working party notes that for wider ERM purposes, risks cannot be considered in isolation to reward.