



Emerging Liability Risks

The business of insurance relies on prediction of loss and its uncertainty. There are two main scenarios to address: 1) well behaved change and, 2) abrupt change.

1. Where losses are recurrent, are diluted among a pool of policy-holders and, the drivers for those losses are 'well-behaved'¹ then projection forwards from loss experience has proved to be a reliable guide to the future² permitting a profitable insurance industry. Changes in the drivers of loss are picked up as changes of loss experience and included in next year's projections. Variances eventually even out³.
2. Where losses are new or when the drivers for exposure change suddenly then the hope is that the effects start small, allowing time for the projections to become less uncertain. But this is not always borne out in practice. Recent examples of abrupt large changes in exposure include noise-induced hearing loss (NIHL) in the UK and the short-lived RSI epidemic in Australia.

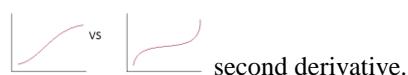
A particular problem for the second scenario is that some liability insurance policies include retrospective cover⁴. In these, losses may be silently accumulated for years before any claims are reliably foreseen and ultimately made. A surge in payments then follows as the backlog is cleared.

Shareholders, PRA (BoE) and ratings agencies⁵ alike expect that insurers will make allowance for such emerging risks.

Method and Qualities

An insurer seeks to identify and evaluate⁶ changes in loss which could mean that his planned risk appetite is exceeded. In practice emerging risks are a problem when *changes in exposure cannot now be predicted precisely enough from claims experience*.

¹ Well-behaved means: varies smoothly e.g. no step changes. In technical terms they have a small



² If the exposure base is large enough then total losses from domestic fires, vehicle damage, wind storm, falls from height, can be predicted with high precision even if the loss to the individual policy-holder is not foreseeable. High precision means that the ratio of loss uncertainty to total loss is small e.g. < 5%.

³ The timescale for this process is important. Insurers can afford to be behind the loss curve provided they are not too far behind and provided convergence is foreseeable. Convergence occurs when the cause of the change becomes steady or decreases, allowing the projection to catch up with real exposure. Convergence occurs when the second derivative of the loss curve goes to zero (becomes a straight line) or, becomes negative (loss curve starts to level off).

⁴ Employers' liability is the obvious example e.g. the date of knowledge in NIHL was assigned to a date when very few insurers had factored it into their premium, but public liability can have this effect as well. For example, injury-in-fact is assigned to previous policy years e.g. mesothelioma.

⁵ PRA seeks to ensure that policy promises are honoured, partly by ensuring solvency. Ratings agencies have a similar duty to investors.



For example, the insurer notices that a new technology is being introduced and has high take-up potential. The technology is associated with an unfamiliar disease in some of those who use it. Causation, breach of duty, diagnosis, frequency and degree of harm are all uncertain. A prudent response is to estimate the loss and its uncertainty⁷ and to manage on the basis of that estimate. This includes setting trigger conditions for review.

As and when new information emerges, the initial estimates can be refined and compared with agreed trigger conditions. Decision-makers record their opinion and also what would need to change for them to change that opinion. Accurate monitoring is thus enabled.

It is very likely that there will be more than one emerging risk at any one time and that these will be in different product lines⁸. If risk to product line and group of products are to be managed prudently, proportionately and transparently there must be a way of monetising all potential risks. Probabilistic methods provide a transparent mechanism⁹ by which to estimate loss and its uncertainty¹⁰.

Risk appetite can be recorded as the difference between the most likely estimated loss, based on objective analysis, and the loss which the decision-maker chooses to work with. Judgement can then be objectively reviewed and refined.

It is also very likely that opportunities for advantage will be identified. For example, the research may discover a new defence strategy for handling known loss mechanisms, a new policy wording or, a new market¹¹. In that way, the emerging risks identification and evaluation function is immediately beneficial at an operational level.

Changes in drivers of exposure can be analysed and quantified in advance, leading to better actuarial models for known risks. Emerging risks work will help predict where and when a well-behaved change in claims experience will plateau. For example if half the new users of a known defective product are vulnerable, then doubling the number of those exposed will

⁶ The *Radar* service extracts knowledge from scientific, technical, legal and sociological literature and compares this with known exposure mechanisms. <http://www.reliabilityoxford.co.uk/radar/>

⁷ The method of attributable fractions provides a transparent, reviewable approach.

⁸ PRA and ratings agencies expect that emerging risks will be aggregated in an appropriate way. Comparing each separately to the action threshold is only valid if the emerging risks must manifest at different times.

⁹ Actuarial projections include modelling parameters whose real world meaning is not apparent, but which are needed to improve the fit to historic data i.e. they are dummy variables. On the other hand, probabilistic methods are transparent, making them ideal for validation against objective data.

¹⁰ Uncertainty can be estimated analytically by varying parameters according to new information or using Monte Carlo methods.

¹¹ *Radar* has: identified a new defence for cases involving chronic pain; developed an objective test of material contribution; defined nanotechnology in a way which can be used in policy wordings; developed a nanotechnology risk evaluation tool; foreseen an expansion of claims for osteoarthritis; recommended that the date of knowledge for mobile phone emfs has not arrived and is increasingly unlikely...



eventually lead to a 50% increase in claims. This knowledge would come from the scientific literature. Experience-based projection might take several years to arrive at the same conclusion.

Key characteristics of the emerging risk identification and evaluation function are:

- that it is fully informed of current loss mechanisms,
- has a very broad scope for identifying new evidence-based loss mechanisms,
- has the technical capacity to compare new information with orthodoxy,
- has the freedom to flag up challenges to orthodoxy,
- has the technical capacity to monetise the effect of that challenge, and its uncertainty, or to propose to insurers how they might do this,
- can identify which changes would significantly revise estimates of the probability and magnitude of loss,
- can be directed to focus on issues where an action threshold is being approached,
- can be directed to include new scope e.g. 'green' buildings and 'green' employment,
- has an avenue for proposing changes to regular operations e.g. claims strategy,

Summary and checklist for emerging liability risk management.

As a general rule, action is needed when the size and uncertainty in any risk or emerging risk have [or are likely to have] exceeded acceptable tolerances.

Management systems should point this out before additional loss is manifest, and should provide guidance as to where a growth curve will eventually plateau.

The management system should include the following features:

- change detection (both experience-based and as IBNR),
- evaluation (timing, size and uncertainty),
- comparison with thresholds on risk,
- comparison with thresholds on uncertainty ,
- specifying the conditions for review (if no immediate action arises), and,
- suggested actions should those conditions be met, and
- variance management.

None of these features is unique to emerging risk; they are normal practice in risk management.

In addition to the usual experience-based systems, emerging liability risk requires non-traditional tools to be used both in change identification and evaluation¹².

From 2013, PRA will positively evaluate emerging liability risk identification and evaluation systems and will assess whether reasonable responses are being enacted.

¹² The *Radar* service provides identification and evaluation. <http://www.reliabilityoxford.co.uk/radar/>