

Enterprise Risk Management

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Abstract

The increase in speed and complexity of risk taking in the insurance industry has led to the creation of Enterprise Risk Management. Three core elements of an effective Enterprise Risk Management framework are (1) a well defined risk governance structure, (2) a clearly articulated risk appetite and (3) a common risk measurement framework. An Economic Capital Model is a good candidate to be this common risk measurement framework. Implementation of Enterprise Risk Management is by no means easy; however the benefits are vital to the health of an insurance company: optimal risk-return decisions and minimum likelihood of surprises.

Introduction

In this paper we will discuss some of the key elements of Enterprise Risk Management (ERM) for an insurance company. First we will put ERM in context. After that we will discuss three main element of effective ERM: risk governance, risk appetite and Economic Capital Model. Finally we will mention a number of issues that can arise when implementing ERM

Enterprise Risk Management in Context

In this section we will discuss what differentiates ERM from more traditional risk management practices, why it is emerging now, who its stakeholders are and how actuaries are involved in ERM.

ERM: what's new?

Risk management is clearly not new to the insurance industry. In fact, insurance is all about transferring risk from individuals to a company with a larger risk appetite. ERM is in a number of ways different from the risk management as it traditionally has been applied in insurance companies:

- Well defined ownership for risk management at all levels in the company: from the Board to the line functions.
- Clear articulation of the risk strategy and risk appetite of the company.
- An aggregate view of the risk positions in the company. I.e. aggregation of risk exposure across business units and risks as opposed to the silo approach.

These three elements are intrinsically linked. The company's risk appetite cannot be articulated without a way to aggregate risk exposure across all units and risk types. Strategic decisions about the company's risk taking can only be made at Board level and can only be effectively executed within a well defined governance framework.

Why now ERM?

The development of ERM is primarily driven by the increased complexity in insurance products, investment opportunities and the financial services industry. For example, who could have imagined two decades ago that insurance companies would be working with:

- Variable annuities with guaranteed minimum withdrawal benefits
- Life insurance securitizations
- Longevity bonds
- Swaption, CDS, CDO, CDO², CMBS

The risk governance and risk management tool kit needs to adjust to these developments. This is where ERM comes in. It is NOT the intention of risk management to limit all risks as much as possible; instead the enterprise risk management process facilitates a conscious risk-return decision and minimizes the likelihood of surprises.

Stakeholders of ERM

ERM will help insurance companies make fundamental decisions about business strategy: which risks to take, which to avoid and which to mitigate. In this context the Board is a key stakeholder for ERM implementation. External pressure is also increasing to implement ERM. Rating agencies are scrutinizing insurance company risk management to far greater extent than in the past. S&P has introduced an ERM assessment as part of its rating process for insurance companies. One of the benefits for insurance companies is that those that get the highest ERM rating¹ will be able to use their internal capital model to derive the financial strength rating; lowering the capital requirement to get the desired rating. Other external influences include regulators (particularly Solvency II builds in incentives to create a strong risk management), shareholders and analysts.

Actuaries and ERM

We can observe that the actuarial profession is playing an important role in filling up the demand for risk professionals in insurance companies. In the USA the Society of Actuaries has changed its educational program to include more risk management courses and has even created a new designation: Chartered Enterprise Risk Analyst (CERA). Similar developments can be seen in Europe. The Dutch actuarial society has re-branded the

¹ S&P defines 4 categories for the ERM rating: "Excellent", "Strong", "Adequate" and "Weak". Internal capital models can be used in the assessment of the financial strength rating if the ERM rating is "Excellent" or "Strong". S&P then uses a mix of its own capital adequacy model and the internal model.

actuary into a financial risk manager. Of course we should also mention the 11th GCA with the theme “Global Frontiers in Risk Management”.

Risk Governance

Efficient ERM starts with well defined responsibilities for risk management within the company. To be effective, the ERM framework needs to be sponsored by the Board and the Board needs to take ownership of strategic risk management decisions.

Governance Structure

Different models are possible on how risk management is organized below the Board.

On the one end of the spectrum very centralized structures exist. These are characterized by centralized decision making on risk and capital matters with limited input from operating entities. In this model the main responsibility of operating entities is to optimize sales and administration. This type of model is common for large banks.

On the other end of the spectrum is a risk governance structure in which the operating entities have full decision making authority and merely report positions to the holding company. ERM is not possible within such a governance structure since the company's overall risk position is not managed.

Most multi-national insurance companies have a risk management structure somewhere in between these two extremes. Either using a central risk committee with operating entity participation that discusses risk initiatives, sets risk policies and limits within the Board defined strategic direction, or with a structure in which the holding company allocates risk budgets to the operating units. In this latter approach the operating entities are autonomous within the boundaries set by the parent company.

Risk Lines of Defense

The fact that an insurance company has a Chief Risk Officer or a Risk Manager does not dismiss the rest of the organization from taking risks into account in their daily job. In fact, the most efficient organizations are those in which risk management is a fundamental part of the business culture: all components of the business (marketing, pricing, investments, etc.) are conscious of risk considerations when proposals and decisions are made. This makes the business components the first line of defense. The second line of defense is the risk management function, which is providing oversight on the business decisions and puts initiatives in the wider company context. The third line of defense is audit, which provides assurance that the risk governance structure and processes are working properly. The three lines of defense are illustrated in the graph below.

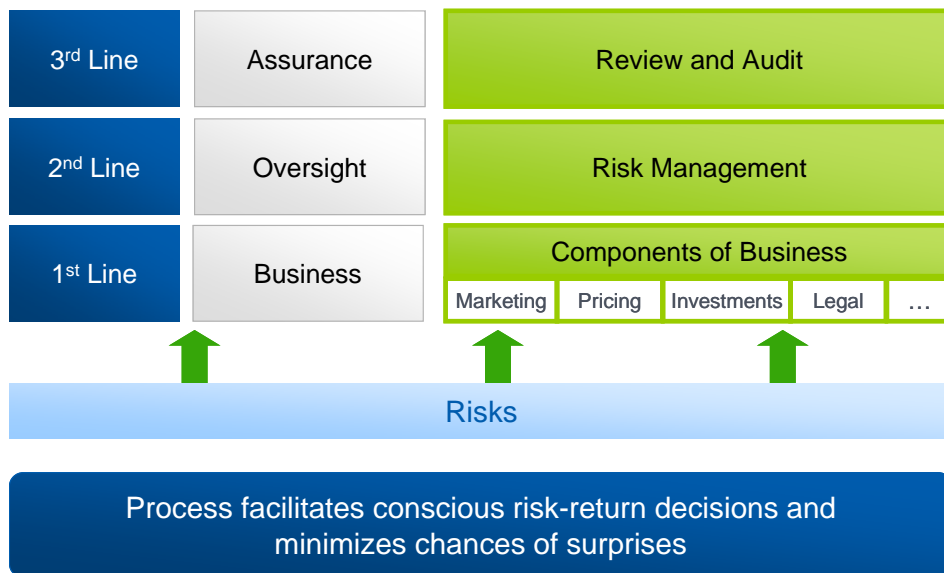


Figure 1. Risk lines of defense

Speed of Risk

The speed of risk has increased significantly in the insurance industry in the last few years. Some examples to illustrate this are:

- Dynamic hedge programs that are managed on a daily basis (e.g. variable annuities).
- Use of market value measurement (and management) which is more volatile than amortized cost accounting bases.
- Use of derivatives with far greater sensitivity to changes in risk drivers (e.g. interest rates or equity prices) than investment categories traditionally utilized by insurance companies.

The risk management structure and processes need to be tied to the speed of the underlying risks; otherwise risk management cannot be an effective line of defense against unexpected losses.

Risk Appetite

Without risk there is no reward. However, too much risk will ultimately result in failure. A clear articulation of the company's risk appetite is a key building block for the execution of the ERM framework and – in fact – for the entire business strategy of an insurance company. The risk appetite should link directly to the mission of the company.

For example, if the mission is to provide a secure financial future to the policy holder then the risk appetite statement could further explain how much security the company wants to give to the policy holder. In turn this could be further worked out into quantitative risk statements. An example would be to say that the likelihood of a

situation in which the company cannot provide the promised benefits to the policyholder is less than once every 1,000 years.

If the company targets to pay out a dividend to the shareholders each year - but accepts that there may be rare circumstances in which it cannot pay a dividend - then the risk appetite statement could say: "on average the company should at be able to pay a dividend to the shareholders 19 out of every 20 years".

Not all risks are created equal. In the previous section we already discussed the speed of risk. Other fundamental characteristics of a risk include the reward for taking the risk, the ability to exit the risk, the ability to price the risk accurately, its probability distribution, the correlation to other risks and the experience in managing the risk. Based on the company's appetite for different risks it can further refine its risk appetite. For example by setting limits or providing risk budgets for each risk separately.

In order to allocate the overall risk capacity to underlying risk and operating entities a common risk metric is necessary. To illustrate this need, consider the risk metric "duration mismatch" for interest rate risk and "credit rating" for credit risk. It is impossible to have a meaningful comparison between a 2 year mismatch position and an average credit rating of BBB. Economic Capital has emerged as the leading common risk metric in the insurance industry. It allows for an explicit comparison between risks based on how much economic value is at risk. More about Economic Capital Models can be found in the next section. Other risk metrics that can be useful for certain purposes are earnings volatility and regulatory required capital.

Economic Capital Model

An Economic Capital Model (ECM) is often a key risk management tool within an ERM framework. ECM is based on an economic (i.e. market value, or fair value) assessment of both the asset side and liability side of the company's balance sheet. Economic Capital is defined as the economic net loss that could occur within a specified time period with a specified likelihood; i.e. it is a Value at Risk metric². Solvency II – which also uses a Value at Risk metric - has been calibrated to a 1-year period and the 99.5th percentile.

ECM captures all risks the company faces. This includes market related risks (e.g. credit risk and interest rate risk), underwriting risks (e.g. mortality, morbidity) and also operational risks.

ECM allows for diversification benefits between risks. Diversification benefits are one of the most powerful tools of a risk manager. Vice versa, concentration risk is the most destructive force for an insurance company.

Diversification can be taken into account by assuming a less than perfect correlation between risks. Diversification benefits exist at many levels:

² Sometimes the Conditional Tail Expectation (CTE) is used instead of VaR. CTE has preferred characteristics as a risk metric but is more computationally intense. CTE is mostly used by companies in North America.

- Diversification within a risk type.
An example is credit risk. If the investment portfolio consists of one investment then a significant loss on that one asset would be an event that would cause the insurance company significant problems. If the investment portfolio consists of a large number of different investments then the impact of a significant loss on one of its asset will be much less severe. A similar argument can be made for mortality risk that is spread out over either a small number of individuals or over a large number. Basically, we see the law of large numbers at work.
- Diversification within an operating entity between risk types.
Even though the insurance industry had massive investment losses in 2008, most companies did survive. Partially this is because the underwriting gains remained stable during the year. One can imagine the disastrous impact if a pandemic would have occurred at the same time. This is an example of diversification between risk types.
- Diversification between operating entities.
It is unlikely that all operating entities have significant losses at the same time. For example it would be extremely rare if more than one entity has a significant operational loss because of a fire that destroyed the office and disrupted the business processes.

It is critical to recognize that correlation is not static. Risks can be relatively uncorrelated in a 'normal' scenario, however in an extreme scenario risks – particularly those financial in nature – tend to get more correlated. This so called tail-correlation should be used in ECM calculations. A clear example of tail-correlation can be seen (again) in 2008. Both investment returns (in all geographies) and interest rate movements were significantly negative. In more moderate years this correlation has been much lower.

Implementation Issues

We will discuss a number of issues that may arise during ERM implementation:

Terminology

The introduction of a common risk framework across operating entities requires clear communication. This starts with using common terminology, which is well defined and understood by everyone.

Quantification of Operational Risk

Whereas relatively straight forward methods exist to establish capital requirements for market risks and underwriting risks, it is quite a bit harder to quantify operational risk capital. However, in recent years significant progress has been made to quantify operational risk capital using internal and external loss data combined with professional judgment.

Computation Time

ECM can lead to very computationally intense calculations. For large insurance organizations a lot of effort will be spent on finding solutions to bring down the calculation time to a level that is in line with the pace of the risk management process. Solutions are possible but come at a cost, either financial or as a reduction in accuracy.

Board Sponsorship

The introduction of ERM also means that certain decision authority is transferred from operating entities to a central risk decision making body. Particularly in the latter case full Board commitment to ERM is crucial for a successful implementation.

Qualified Staff

Finding qualified risk management staff (or even consultants) to implement ERM, and in particular ECM, is a challenge across the globe. We can see that most risk management staff has either a background as financial engineer, actuary or in audit/compliance (mostly focus on operational risk). It is even more challenging to recruit staff with the right background AND experience. Regional differences exist. European companies have made most progress in implementing ERM and - as a result - more risk management staff with experience can be found in that continent. However demand is also highest in Europe at this moment. North America is lagging Europe in terms of implementation of ERM and ECM; however speed is picking up there. In Asia we can see a fairly large disconnect between companies that have a European parent and the rest. Finding staff in Asia with insurance experience is a challenge in itself; finding staff with - on top of that - ERM or ECM experience is next to impossible.

Some Last Thoughts

The credit crisis has been blamed by many on lack of proper risk management in the financial services industry. Although this statement does not tell the whole story, it does emphasize our responsibility to ensure a proper understanding of all risk we are taking in our insurance companies. This environment also creates great opportunities to make fundamental improvements to the management of what is at the core of the insurance industry: risk.