THE SOCIETY OF ACTUARIES IN IRELAND

Constructing a Risk Appetite Framework: an Introduction

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1 Introduction

1.0 Background

One of the key requirements of the recently published "Corporate Governance Code for Credit Institutions and Insurance Undertakings" from the Central Bank of Ireland is the establishment of a Board-approved risk appetite. Amongst other things, there is a requirement that the Board "understand the risks to which the institution is exposed" and that it establishes a "documented risk appetite". This paper is intended to act as an aid to those undertakings currently working towards compliance with this particular aspect of the new code by suggesting possible approaches that may be adopted when defining and setting risk appetite and highlighting some of the many considerations which must be borne in mind during this process.

Risk appetite and risk tolerance are terms which are often used interchangeably. There is no unique and commonly accepted definition for either term. In this paper, we have taken "risk appetite" to mean the qualitative and quantitative statements that define the general attitude within an organisation towards the desired level of risk. We have used the term "risk tolerance" as meaning the maximum level of variation from this desired level of risk that an undertaking is willing (or possibly able) to accept. In general, the setting of risk appetite and risk tolerance may be considered as being part of the same process.

1.1 Risk Appetite and the Risk Management Framework

An effective risk management framework needs to capture the interaction between many risk-related activities within the organisation. These include oversight, internal policies, risk management assessment, risk quantification, monitoring, reporting and escalation, risk control and optimisation. The aim of the risk management framework is to assist management in identifying, measuring and managing risks and a proper understanding of risk appetite is an essential and integral part of this framework. Hence, a risk management framework will contain many elements, examples of which are set out in the table below.

Risk Management Framework Component	Role of Risk Appetite
Oversight	Risk appetite should be Board-approved. It sets the tone from the top of the organisation and forms the foundation of attitudes towards risk
Internal policies	The Board may delegate risk management authority and risk policy[1] approval in accordance with risk appetite
Risk management assessment	Frequent risk assessment enables identification of a new or evolving risk profile in the context of overall risk appetite
Risk quantification , monitoring, reporting & escalation	Quantified risk metrics should be monitored against the risk appetite and reported to the Board. The risk management framework should contain an escalation process for material breaches of risk appetite
Control & Optimisation	Actual experience is compared to the risk appetite and the appetite is either refined accordingly or actions are taken to control the level of risk being taken

The risk appetite framework facilitates the determination, review and oversight of risk appetite. It acts as a key bridge between the organisation's strategy and its risk management framework. The risk appetite should be updated in line with changes to the strategy of the organisation (and vice versa, as neither the strategy nor the risk appetite should be developed in isolation from the other but rather as part of a unified process) and should also evolve in line with the development of its risk management framework.

[1] Risk policies, as part of the overall risk management framework, cover the process of identification, measurement, monitoring, controlling and reporting of risks at a risk category or individual risk level. Risk policies should also clearly define roles and responsibilities, authority and limits, escalation procedures and exception management.

2 Setting Risk Appetite

Readers should note that all numerical examples in this section are fictitious and by no means represent suggestions of best practice or prudent levels of risk tolerance.

2.1 Interaction of risk appetite with the strategy of the organisation

Setting risk appetite starts from an analysis of the business strategy of the organisation. An insurance or reinsurance undertaking is in the business of taking risks for the purpose of generating profits. The strategy of an organisation may be such that certain risks (such as, for example, mortality risk) might be actively sought after while other risks (such as, for example, catastrophe exposure) should be controlled or avoided altogether. The risk appetite framework encompasses a risk-based view of the strategy of the organisation and should answer questions such as:

- What are the risks that fit within the overall strategy?
- What limits is the organisation willing to accept and/or capable of monitoring and controlling?
- What are the risks that do not fit and should therefore be avoided altogether?
- What are the risks that are not sought after but will come as part of doing business and that should therefore be controlled and/or minimised?

The risk appetite framework may contain statements that consider, in broad terms, the type of risks that the undertaking would intend to take, to minimise or to avoid over short, medium and long term time horizons. Such statements help to inform how appropriate risk limits should be set in order to achieve an appropriate balance between risk and return in the context of the overall strategy of the organisation.

2.2 Categorisation and Aggregation of risk

Before setting risk appetite it helps to classify into different categories the main risks that the organisation is, or may be, exposed to in the pursuit of its objectives. Examples may include life insurance risks, non-life insurance risks, market risk, counterparty risk, liquidity risk and operational risk. Risk appetite may be set at the level of each individual risk within each risk category (for example, individual risks within the market risk category would include equity risk, interest rate risk, property risk and currency risk) or it may be set at the level of the risk category itself. In fact, it may be appropriate to do both in order to achieve a more detailed understanding of risk, which should in turn help the management of that risk.

If starting at the level of the individual sub-risks, then when aggregating these individual risk appetites to arrive at an overall risk appetite for the category in question, it is important to take into account the interaction between the individual risks themselves. The same holds true if risk appetite is set at the risk category level and this category level appetite is then broken down between the constituent risks within that category. Consider, for example, insurance risk. This risk category may contain such sub-risks as mortality risk, morbidity risk, lapse risk and expense risk, amongst others. Some of these risks will interact with one another. For example, changes in the level of lapse activity may have a bearing on the level of expenses incurred by the undertaking. Hence, appetite towards these two risks should not be set independently of one another as otherwise the interaction between them will not be taken into account.

There are a number of ways in which risks may be aggregated within the risk appetite framework. Methods such as the use of correlation matrices are relatively common (although these generally require a very significant degree of statistical analysis and validation) while the use of more complex methods such as statistical copulas are generally less common. Expert judgment may also be used, particularly in cases where statistical methods prove unworkable. This may occur, for example, in the area of operational risk exposure.

2.3 Risk Appetite

Once the types of risk that may be faced by the organisation have been identified, explicit target levels of each such risk (i.e. the risk appetite) should be determined. In order to set risk appetite, appropriate risk measures should be chosen. One common approach is to define risk appetite in terms of capital and earnings (amongst other metrics). An objective, which is essentially an expression of risk appetite, should then be set for each of the measures chosen. These objectives should ideally refer to internal benchmarks within the organisation (and which are appropriate to the organisation). Examples may include:

Capital:

a. Maintain target economic capital cover
b. Maintain a certain credit rating
c. No one event should impact regulatory solvency cover by more than a pre-defined percentage
d. Maintain regulatory solvency cover such that the undertaking is able to withstand a defined stress scenario

Earnings:

a. Maximum acceptable earnings volatility
b. Minimum acceptable profitability for new business (for example, return on capital or new business value)
c. Minimum average profitability on existing business

Organisations should evaluate the need for other measures and objectives in order to capture risks that may not be easily reflected through capital and/or earnings. For example, specific objectives may need to be set in relation to liquidity risk or reputational risk. Different objectives may be set for short, medium and long term time horizons. Specifically in an Irish context, the “Corporate Governance Code for Credit Institutions and Insurance Undertakings” states that “the [risk appetite] definition shall clearly define the appetite and address separately the short, medium and long term time horizons”.

Once these objectives have been set, the acceptable level of deviation from these targets needs to be considered. The tolerance defines the allowable variation from the target level of each risk that the organisation is prepared to take in pursuit of its strategic goals.

2.4 Risk Tolerance

Risk tolerance, wherever possible, should be set in quantitative terms. Qualitative limits should be set for risks that are not easily quantifiable. In either case, limits should be clear and should allow monitoring with the minimal level of subjectivity. Each undertaking should decide, depending on how the overall risk appetite framework is organised, the level of granularity at which risk tolerances need to be set.

Rather than attempting to set a specific risk tolerance for a particular risk it may be beneficial to set ranges within which a given level of risk may fluctuate without causing concern. This may be achieved by using “soft limits” and then determining “hard limits” around these targets, or alternatively by using something like a “traffic-light” system of Red/Amber/Green zones. Under such a system, Green effectively represents the risk appetite. Amber may be used to provide a warning that the level of risk is close to breaching the target level of that particular risk (and may trigger a remediation plan) while Red could be used to trigger immediate action and reporting to the Board.

Examples of high-level risk tolerance ranges might include:

Table 2.4.1

Risk / Tolerance	Red	Amber	Green
Regulatory capital under normal conditions as a percentage of required minimum solvency margin	< 150%	≥ 150% but < 200%	≥ 200%
Return on Capital	< 9%	≥ 9% but < 11%	≥ 11%
Sales level as a percentage of planned sales	< 50% or > 150%	50% - 75% or 125% - 150%	75% - 125%

More granular limits may then be set within each risk category. Examples of detailed limits might include:

Table 2.4.2

Risk / Tolerance	Red	Amber	Green
Regulatory capital under a pre-defined equity stress scenario as a percentage of required minimum solvency margin	< 110%	≥ 110% but < 150%	≥ 150%
Economic capital under a pre-defined interest rate stress scenario as a percentage of target level	< 115%	≥ 115% but < 125%	≥ 125%
Liquidity coverage ratio under normal conditions	≤ 1.5	< 3.0 but > 1.5	≥ 3.0
Geographical concentration of life risk exposure in a single region or area (as a percentage of total exposure)	≥ 15%	≥ 10% but < 15%	< 10%
Per event exposure (€ millions)	≥ 5	≥ 2 but < 5	< 2

Certain types of risk, such as operational risk for example, may require limits to be set at an even more granular level. The operational risks that are most relevant to the business of the undertaking should be identified and specific limits should be developed for them (if this is possible in practice). Examples of operational risk limits might include:

Table 2.4.3

Risk / Tolerance	Red	Amber	Green
Staff turnover in a given period	≥ 10%	≥ 5% but < 10%	< 5%
Cases of discrimination and harassment	0	0	0
Cases of fraud	0	0	0
Data security incidents	0	0	0
Financial loss due to processing errors in a given period (as % of free assets)	≥ 2%	≥ 1% but < 2%	< 1%

2.5 Target Allocation

It may be informative to translate the risk appetite into an “ideal”, or target, allocation of capital between each risk type. For example, 40% of capital could be allocated to insurance risks, 30% to counterparty risks, 20% to market risks and the remainder to operational risk. Red/Amber/Green zones could also be set in relation to the percentage allocation of capital between each risk type.

The current risk profile of the organisation should be analysed as a starting point for any such allocation. It is generally informative to determine the breakdown of economic capital between various categories of risk in order to understand how capital is currently being allocated. Looking then at the overall business strategy of the organisation it should be possible to assess how this breakdown might be expected to evolve in the future. If this is out of line with the expectations of the various stakeholders in the organisation then appropriate actions can be taken. For example, if excessive levels of economic capital are required to cover underwriting risks then additional reinsurance may be sought, while if counterparty risk if excessive then collateralisation may provide a solution to managing this exposure.

2.6 Monitoring, Reporting and Governance

Risk appetite and risk tolerance will be ineffective in the absence of robust and frequent monitoring and reporting. Control functions, such as Internal Audit, Compliance and Risk Management, play a key role here. Reporting should clearly address all of the objectives and limits specified. This reporting process needs to be considered when setting the risk appetite. Otherwise, tolerances may be set which turn out to be difficult, or maybe impossible, to measure.

Good reporting mechanisms facilitate a deeper understanding of the risks being borne by the undertaking.

Such reporting could, for example, include:

- Compliance with approved risk tolerance limits
- Trends in data over time (such as claims, expenses and sales)
- Compliance (or non compliance) with approved risk policies (such as Investment or Liquidity)
- Estimates of future experience
- Ratings of third parties (such as Reinsurers or Investment Counterparties)
- Notification of defaults/arrears

Additional information may also be gathered by such reporting processes. While this information may not relate directly to current risk appetite or risk tolerance it may provide lead indicators of future changes. Such information may, for example, include:

- Changes to products
- Changes within the market place (Consumer trends, Competitor actions, Regulatory etc)

As may be seen from the Table 2.4.3, it is possible that any reported incidents of a particular type may represent a breach of risk appetite (as the tolerance is zero). However, a breach does not necessarily imply that there has been a material deviation from risk appetite. There needs to be an appropriate process in place to review and document each such breach in detail in order to determine if there has been a material deviation. Such a process will often entail a degree of subjectivity.

In addition to reporting on the actual experience relative to its risk appetite, it is very informative to perform stress and scenario testing on the risk profile of the organisation in order to gain further insights into the robustness of the risk tolerance limits and on the possible volatility of results. Reverse stress testing (whereby the conditions under which the undertaking would breach its risk appetite or risk tolerance are investigated) would also form part of an effective reporting framework.

The overall reporting process needs to be facilitated by a comprehensive governance framework in order to ensure that an appropriate escalation process is in place and that appropriate actions are taken in response to risk tolerance breaches. It is important that these actions also include an effective feedback loop into the setting of the risk appetite so that the risk appetite framework can continue to be appropriate to the business. That is not to say that risk appetite should be modified each time that it is breached (simply to avoid future breaches) but rather that it is appropriately modified if the business strategy or attitude towards risk within the organisation has changed.

3 Other Considerations

There are many considerations which must be borne in mind when it comes to the practical implementation of a suitable risk appetite framework, some of which are outlined below.

3.1 Definitions

In order to avoid confusion and to aid the construction of an effective risk appetite framework, organisations should clearly state their own definition of the various terms that are used (such as appetite and tolerance). As mentioned in Section 1.0 above, there is no consensus definition for many of these terms. However, in relation to addressing the requirements of the “Corporate Governance Code for Credit Institutions and Insurance Undertakings” of the Central Bank of Ireland, undertakings may wish to interpret and use these terms consistently with the definitions set out in Section 1.0 above.

3.2 Scope

In setting risk appetite, it is important to have a holistic view of the risks to which the organisation is exposed, including risks to which the organisation is indirectly exposed. As part of this process, it should be recognised that the level of risk which may be borne in the future may not necessarily be definitively measured (for example, contagion risk or reputational risk).

3.3 Interaction between risks

Further to Section 2.2. above, while setting limits for each risk, it is important to bear in mind that individual risks should not be considered in isolation. Interaction between risks should be considered and quantified. In particular, it may often be the case that seeking to minimise exposure to one particular risk simply results in exposure to another risk growing exponentially. For example, reducing underwriting risk through reinsurance may directly lead to a significant increase in counterparty risk exposure.

3.4 Materiality

Careful consideration needs to be given to what is considered to a material breach of risk appetite, if such a breach were to occur. What may be considered material for one undertaking may not be so for another. In light of the Central Bank of Ireland requirement (as stated its “Corporate Governance Code for Credit Institutions and Insurance Undertakings”) that all material breaches of risk appetite be reported within five days of such breaches coming to the attention of the Board, it is very important that there be a common understanding of materiality within the organisation and appropriate escalation processes are put in place such that material breaches can be properly identified as such.

3.5 Top down or Bottom up

There is no unique way to develop a risk appetite framework. For example, it can be developed from the top down (in which case risk appetite is set by the Board and then implemented across the organisation). Alternatively, risk appetite can be developed from the bottom up, which would typically involve individual departments or business units determining their own appetites towards various types of risk and then aggregating these appetites throughout the organisation to arrive at an aggregated risk appetite for the entire organisation. Ultimately, it will be a matter for the Board to approve the final risk appetite regardless of whether a top down or bottom up approach is adopted.

Whichever approach is chosen, it is important to be aware of the potential advantages and limitations of that approach. The top down example mentioned above has advantages which include automatic Board

buy-in and consistency of approach across the organisation. However, such an approach can fail to achieve similar buy-in from staff at lower levels within the organisation. Bottom up approaches may have the advantage that the risk appetite is set by those working closest to the day-to-day risks being borne by the undertaking and hence may be more reflective of reality. However, such approaches may lead to a framework that is disjointed, is misaligned with the overall business strategy or lacks a holistic view of the organisation.

3.6 Regular review

Risk appetite and tolerance limits should be regularly reviewed to ensure alignment with the ever evolving business strategy, market/risk environment and business performance. In general, an annual review of risk appetite may be sufficient, though review of risk tolerances may need to occur more frequently on, say, a quarterly basis, although this would be a matter for the Board to decide. It is important to be pro-active in relation to risk management and to continually measure how the risk being borne by the undertaking compares to target levels.

In practice, breaches of risk appetite will occur but these may be of a temporary nature (for example, due to sudden market movements). Such breaches may not necessitate an acceleration of the planned review of risk tolerance provided some effective remedial action can be taken in the interim to restore the actual risk being borne to a level which falls within the stated tolerance. Regular breaches of risk appetite may also indicate that the risk tolerance has been inadequately determined or that the risk profile of the business has changed materially since the previous review of risk appetite. This may indicate the need for a more immediate review in order to address any such concerns. In general though, it will be a matter for the Board to determine the most appropriate timing of review of the different aspects of the risk appetite framework.

3.7 Integration and Communication

Once established, the risk appetite and tolerance framework should be:

- Clearly communicated and cascaded through the organisation
- Integrated into the risk management framework
- Actively used in the strategic management of the organisation

All initiatives, such as new product launches, should fit within the stated risk appetite. In the event that this is not the case, proposals should be brought to the Board for consideration as to whether it is appropriate to revise the risk appetite or risk tolerances in light of, for example, a new strategic direction.

3.8 Other stakeholders

All stakeholders need to be at least considered when setting risk appetite. Examples of different types of stakeholder include shareholders, policyholders, rating agencies and regulators. Often, these stakeholders will have competing objectives when it comes to the level of risk being undertaken by an organisation.

Additional considerations may need to be borne in mind if the organisation is a publicly listed company or is actively seeking to raise funds on the capital markets. Care should also be taken in cases where the existence of a risk appetite framework, particularly if communicated externally, might give rise to unintended consequences. For example, a policyholder may choose a particular insurer based on perceived (or advertised) security. If, for example, an insurance undertaking publishes its risk appetite and then materially deviates from it there may be a need to consider if there had been a breach of the reasonable expectations of policyholders.

3.9 Interaction between Subsidiary and Group Risk Appetite

When setting risk appetite, it is necessary to take a holistic view of the organisation. This holds true not only for individual undertakings or subsidiaries of groups, but for groups themselves. Risk appetite should be applied consistently across undertakings within a group in order to ensure a common understanding of the risks being borne at a group level. This also helps to identify additional risks which may exist at a group level such as, for example, contagion risk within the group, which may be missed if each individual subsidiary looks only at its own risk appetite. Hence, for undertakings that are subsidiaries of groups, the group risk appetite is a very important reference point when developing and refining risk appetite for the subsidiary itself.

4 Concluding Remarks

As part of good Enterprise Risk Management practice, many undertakings will already have an effective and appropriate risk appetite framework in place to formally set and approve risk appetite and risk tolerance, as well as processes for monitoring, reporting and refining risk appetite. However, others will not be so far advanced. The recently published "Corporate Governance Code for Credit Institutions and Insurance Undertakings" requirements from the Central Bank of Ireland have brought the need for a documented and Board-approved risk appetite into focus for all (re)insurance undertakings.

It is clear that the process of determining an appropriate risk appetite is a challenging one. Apart from the many practical challenges which must be overcome, ranging from achieving a consistent understanding of risk management terminology to the identification of the range of risks being borne, there are many technical aspects to be tackled as well. These include how to measure risks and how to set appetite and tolerance levels for them. Risk appetite needs to become embedded into the organisation. It does not stand alone, but rather fits into the fabric of the Enterprise Risk Management process. It requires support from key control functions such as Internal Audit, Compliance, and Risk Management in order to operate effectively. Above all though, it needs to achieve buy-in from all stakeholders.

Greater understanding of risk and the risks being faced by the organisation is a powerful tool for aligning stakeholder interests and ultimately giving the organisation the best chance of achieving its strategic goals and objectives. Constructing a risk appetite framework is one of the most important steps in this process. We hope that this paper will provide food for thought and act as a useful aid when putting such a framework in place.

5 Working Party Membership

The members of the Working Party that prepared this paper were:

- Niall Dillon
- Peter Doyle
- Colm Fitzgerald
- Viviana Pascoletti
- Eamonn Phelan (Chair)

6 Appendix – Bibliography

There is a wealth of information available for those who wish to research further into the area of Risk Appetite. A list of some of the sources of such information which the Enterprise Risk Committee of the Society of Actuaries in Ireland deems to be of particular relevance to this topic is as follows.

- Practice note on enterprise risk management for capital and solvency purposes in the insurance industry (International Actuarial Association), 2009

  www.actuaries.org/CTTEES_FINRISKS/Documents/Note_on_ERM.pdf

- Risk Appetite: Practical issues for the Global Financial Services Industry (Institute of Actuaries of Australia), Bennett and Cusick, 2007

  www.thirdeyeriskinsights.com/articles/RiskAppetiteAustralia.pdf

- Defining Risk Appetite (Society of Actuaries), Segal, 2006

  www.soa.org/library/newsletters/risk-management-newsletter/2006/july/rmn-2006-iss8-segal.pdf

- Risk Management Terms (University of Wisconsin–Madison) Kamiya, Shinichi, Peng Shi, Schmit, and Rosenberg, 2007

  www.soa.org/files/pdf/risk-management-terms07.pdf

- The CPD area in the Enterprise Risk Management section of the Actuarial Profession in the UK provides an excellent source of material

  www.actuaries.org.uk/practice-areas/pages/erm-cpd

- The Committee of Sponsoring Organisations of the Treadway Commission (COSO)

  www.coso.org

7 Appendix – excerpt from “Corporate Governance Code for Credit Institutions and Insurance Undertakings”

The following excerpt, specifically relating to risk appetite, is taken from the “Corporate Governance Code for Credit Institutions and Insurance Undertakings” from the Central Bank of Ireland.

14.0 Risk Appetite

14.1 The board is required to understand the risks to which the institution is exposed and shall establish a documented risk appetite for the institution. The appetite shall be expressed in qualitative terms and also include quantitative metrics to allow tracking of performance and compliance with agreed strategy (e.g. Value at Risk, leverage ratio, range of tolerance for bad debts, acceptable stress losses, economic capital measures). It shall be subject to annual review by the board.

14.2 The risk appetite definition shall be comprehensive and clear to all stakeholders. The definition shall clearly define the appetite and address separately the short, medium and long term horizons.

14.3 The board shall ensure that the risk management framework and internal controls reflect the risk appetite and that there are adequate arrangements in place to ensure that there is regular reporting to the board on compliance with the risk appetite.

14.4 In the event of a material deviation from the defined risk appetite measure, the details of the deviation and of the appropriate action to remedy the deviation shall be communicated to the Central Bank by the board promptly in writing and no later than 5 business days of the Board becoming aware of the deviation.

14.5 The board shall satisfy itself that all key Control Functions such as internal audit, compliance and risk management are independent of business units, and have adequate resources and authority to operate effectively.

14.6 The board shall ensure that it receives timely, accurate and sufficiently detailed information from risk and Control Functions.

14.7 The board shall ensure that the institution’s remuneration practices do not promote excessive risk taking. The board shall design and implement a remuneration policy to meet that objective and evaluate compliance with this policy.

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