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Risk Appetite, Tolerance, Capacity and Limits

By Max J. Rudolph, FSA CFA CERA

One of the most challenging parts of ORSA is trying to understand the differences between risk appetite, risk tolerance and risk limits. Some of the resources talk about capacity in these terms as well. This paper attempts to define these terms consistently. This is an area that does not always align with what you expect going in, and not all of the sources use exactly the same definition. It is also evolving over time, so the dates of documents can be important.

I have compared nine documents

- Actuarial Standards Board
  - ASOP 46 Risk Evaluation
  - ASOP 47 Risk Treatment
  - discussion draft of Capital Adequacy Assessment for Insurers
- Financial Standards Board
  - Principles for an Effective Risk Appetite Framework
- American Academy of Actuaries
  - Actuaries and ORSA
  - Insurance ERM Practices
- International Association of Actuaries
  - Deriving Value from ORSA: Board Perspective
  - Actuarial Aspects of ERM for Insurance Companies
- National Association of Insurance Commissioners
  - NAIC Own Risk and Solvency Assessment (ORSA) Guidance Manual

It is important to note that some of these documents focus exclusively on capital assessment, while others more generally discuss enterprise risk management. ORSA is in the first camp, and this is confusing when comparing to documents like the IAA ERM paper. I will focus on capital here, but occasionally will talk generally about expanding the definitions.

The definitions for **risk appetite** are pretty consistent, describing where a company wants to operate for a going concern firm. The ASB refers to this as a risk capital target, and could be defined using a range. The term is not limited to capital and can provide guidance for companies with respect to earnings, growth, and treatment of employees as well. A risk appetite will often be a qualitative statement, with more detailed metrics that align with it.

The definitions for **risk limits** are also fairly consistent, being a granular metric that aligns with the risk appetite and risk tolerance. These are business unit metrics that may look at a single risk. For example, a company might say their risk appetite is to have a AA S&P rating and 400% RBC ratio. The risk limit would then tell each business line how much risk it could take for credit risk, mortality risk, operational risk, etc. to be consistent with this.

For **risk tolerance**, I prefer to start with the Financial Standard Board definition of Risk Capacity. Others seem to use the terms interchangeably.
The maximum level of risk the financial institution can assume given its current level of resources before breaching constraints determined by regulatory capital and liquidity needs, the operational environment (e.g. technical infrastructure, risk management capabilities, expertise) and obligations, also from a conduct perspective, to depositors, policyholders, shareholders, fixed income investors, as well as other customers and stakeholders.

The constraints for capital are set by the regulatory stakeholder, with a more general definition being the higher of internal requirements, regulatory stakeholder and other external stakeholders like rating agencies. Risk tolerance refers to capacity, the boundary where the firm would hand the keys to the doors to the regulator, or at least lose control of strategy, if it is breached. The ASB calls this the capital base. Some of the documents talk about tolerance at the risk level, but here I am talking about the aggregate constraint including diversification benefits.

These risk tolerances can be more general when considered for metrics other than capital. An insurer might not want to lose more than $X in 12 months or insists on leverage below a certain maximum.

Summary

An insurer is limited by its state regulator (a systemically important financial institution - SIFI - would also have a federal regulator) to hold a minimum level of capital. This is its capacity, and defines its aggregate risk tolerance or risk capital base. Risk tolerance for individual risks can then be set if desired, but they must be aligned with the aggregate total. The risk tolerance for capital is defined by the regulator, but other stakeholders (e.g., rating agency) might also have input based on internal goals like a specific rating.

An insurer chooses to take a certain amount of risk, often a range, as part of ongoing operations. This is its risk appetite and should tie to the firm's risk strategy. The board will formally approve the risk appetite. It defines the risk capital target, and is generally a range, for the ASB.

Risk limits are the marching orders to the business units to tell them how much risk they can take so the aggregate risk appetite is satisfied. While some firms treat it as a maximum, it should be presented as a range to allow some flexibility. Stress tests should be performed to see what happens if each unit accepts risk at the outer boundary of the range. Someone on the risk team should also consider worst case scenarios where diversification does not materialize due to high levels of one type of risk and low levels of another type.

Appendix

ASOP 46

2.7 Risk Appetite—The level of aggregate risk that an organization chooses to take in pursuit
of its objectives.

2.9 Risk Limit—A threshold used to monitor the actual risk exposure of a specific unit or units of the organization to ensure that the level of aggregate risk remains within the risk tolerance.

2.14 Risk Tolerance—The aggregate risk-taking capacity of an organization.
From comments re suggestions

The reviewers spent a considerable amount of time researching and discussing the definitions of both "risk appetite" and "risk tolerance," and understand that widely varying definitions for these terms are currently being used by organizations. For the purpose of this ASOP, the reviewers believe that the word "aggregate" is appropriate since risk appetite typically focuses on an organization as a whole, even when that focus relates to an "aggregate" view of a single type of risk. In addition, the reviewers felt the fundamental distinction between "risk appetite" and "risk tolerance" is that an organization's risk appetite reflects a choice, while their risk tolerance relates to what the organization is able to take, or "capacity." Therefore, the reviewers believe the current definitions are appropriate and made no changes.

ASOP 47

Definitions of risk appetite/limit/tolerance are exactly the same as ASOP 46

3.1 Risk Treatment—An actuary may be called upon to perform many risk treatment activities. Models can be used to provide support for risk treatment decisions, for example, the setting of specific risk tolerance or the selection of a risk mitigation strategy. In performing services related to risk appetite, risk tolerance, risk limits, and risk mitigation, the actuary should consider, or may rely on others who have considered, the following:

b. information about the organization's own risk management system as appropriate to the actuary's assignment. Such information may include the following:

1. the risk tolerance of the organization;
2. the risk appetite of the organization. This may be explicit or inferred from objectives of the organization including those related to solvency, market confidence, earnings expectations, or other non-financial objectives;

3.3 Risk Appetite, Risk Tolerance, and Risk Limits—An actuary may be called upon to review or recommend an organization's risk appetite, risk tolerance, or risk limits, or may be involved in designing, operating, or using a system to monitor risks relative to the organization's risk appetite, risk tolerance, or risk limits.

In performing services related to risk appetite, risk tolerance, or risk limits, as appropriate to the actuary's assignment, the actuary should consider, or may rely on others who have considered, the following:

a. the financial and non-financial benefits in the aggregate derived from all planned, risk-taking activities;

b. the financial and non-financial benefits associated with each planned, risk-taking activity;

c. the degree of concentration of the risks of the organization;

d. the opportunities available to mitigate breaches of risk limits and risk tolerance, as well as the cost and effectiveness of such mitigation strategies;

e. regulatory or accounting constraints that may affect the risk environment;

f. the relationships between the risk appetite, risk tolerance, and risk limits; and

g. the historical volatility of the organization's results in the context of its current risk profile.

FSB – Principles for an Effective Risk Appetite Framework (November 2013)

http://www.fsb.org/wp-content/uploads/r_131118.pdf

Risk capacity:	The maximum level of risk the financial institution can assume given its current level of resources before breaching constraints determined by regulatory capital and liquidity needs, the operational environment (e.g. technical infrastructure, risk management capabilities, expertise) and obligations, also from a conduct perspective, to depositors, policyholders, shareholders, fixed income investors, as well as other customers and stakeholders.
Risk appetite:	The aggregate level and types of risk a financial institution is willing to assume within its risk capacity to achieve its strategic objectives and business plan.
Risk limits:	Quantitative measures based on forward looking assumptions that allocate the financial institution's aggregate risk appetite statement (e.g. measure of loss or negative events) to business lines, legal entities as relevant, specific risk categories, concentrations, and as appropriate, other levels.

AAA – Actuaries and Own Risk and Solvency Assessment (ORSA). (September 2014)

https://www.actuary.org/files/ERM_Committee_Actuaries_and_ORSA_Overview_092614.pdf

Risk appetite, tolerances, and limits: A formal risk appetite statement, and associated risk tolerances and limits are foundational elements of risk management for an insurer; understanding of the risk appetite statement ensures alignment with risk strategy by the board of directors.

Risk aggregation: Actuaries can support the alignment of the risk appetite statements, risk tolerance, and risk limits to the overall mission and vision of the company, as well as the level of capital the company is holding.

AAA – Insurance Enterprise Risk Management Practices (March 2013)

https://www.actuary.org/files/ERM_practice_note_030713_exposure.pdf

1. *Risk appetite, risk tolerance, and risk limits*

Risk appetite, risk tolerance and risk limits provide three important working concepts for the risk treatment process.

. *Risk appetite* is the amount of specific risk and aggregate risk that an organization chooses to take during a defined time period in pursuit of its objectives.

. *Risk tolerance* is the level of risk to which an organization is willing and able to be exposed, taking into account the organization's financial strength, its nature, scale and complexity, the organization's liquidity, and the physical resources needed to adequately manage the risk.

. *Risk limit* is a threshold used to monitor the actual risk exposure of a specific risk or activity unit of the organization to ensure that the level of actual risk remains within the risk tolerance.

IAA – Deriving Value from ORSA: Board Perspective (April 2015)

http://www.actuaries.org/CTTEES_ORSA/Reports/PublishCopy_DerivingValuefromORSA_BoardPerspective_March%202015Final.pdf
Risk appetite definition is comparable to the other documents. Capacity, tolerances and limits are not mentioned, which makes sense since the focus is on the role of the board of a going-concern company.

3. **Risk Appetite:** The level of aggregate risk that a company chooses to take in pursuit of its objectives.

IAA – Actuarial Aspects of ERM for Insurance Companies (January 2016)

http://www.actuaries.org/CTTEES_FINRISKS/Papers/ActuarialAspectsofERMforInsuranceCompanies_January2016.pdf

Risk Appetite the level and type of risk that an organisation is willing to accept in order to achieve its objectives.

Risk Capacity the extent of risk that an organisation is capable of undertaking.

Risk Limit the maximum amount of risk that can be underwritten. Risk limits will often be identified for key risk-taking activities such as insurance underwriting and investment.

Risk Tolerance a quantitative description of the extent of risk that the company is willing to take in respect of a specific risk.

3.2.1.2 Risk Tolerances

As well as having qualitative elements in Risk Appetite statements, where possible, companies will often set risk tolerances for each risk type. These will be used to determine for each material risk the maximum level of risk within which the firm is willing to operate, based on its Risk Appetite, risk capacity, and risk profile.

Risk tolerances, are the typical measures of risk used to monitor exposure compared with the stated Risk Appetite. In practice, they enable the high-level Risk Appetite statements to be broken down into measures that are actionable and can be measured and monitored.

The aggregate maximum amount of risk the company is willing to take is expressed in terms of key measures, which often include:

- Capital adequacy (usually economic, or the higher of economic and regulatory) and/or a credit rating target.
- Earnings or earnings volatility (usually the published accounting basis but possibly other earning measures such as embedded value).
- Liquidity (for example expected or stressed cash requirement over, say, 4 to 13 weeks).
- Operational risk including conduct risk. As operational risk is often expressed as a mix of qualitative and quantitative statements, it is often difficult to develop risk tolerances for this risk.

Developing risk tolerances helps to ensure that appropriate reporting and monitoring processes can be put in place for the effective management of these risks. As such, these tolerances would benefit from being clearly articulated and readily measurable.

3.2.1.3 Risk Limits

Whilst risk tolerances are set for a company or Group as a whole, it is important that risk limits are set at the most granular level for business operations. These translate enterprise risk tolerances and Risk Appetite for each risk category into risk-monitoring measures for business units.

The consistency between risk limits and the enterprise risk tolerance helps the company to realise its risk objectives and maximise risk-adjusted returns. This tends to be a challenge for various reasons, including:

- The technical challenges of projecting future scenarios and capital requirements.

- The availability of data and its relevance to forecasting future experience, for example in respect of risk dependencies.
- The conflict that can arise between different risks and measures, for example between capital and earnings volatility.
- The interaction of risks and capital, in particular where assumptions have been made about the diversification benefits of certain strategies.
- Maintaining consistency between Business Unit and Group objectives.

Business units are sometimes expected to operate within Capital at Risk, Earnings at Risk and other limits set as part of the Group's risk limits framework. So the metrics for them to do this need be readily available – this may mean that actuaries need to develop proxies to the exact calculations (and validate them and communicate the circumstances under which they may be unreliable).

In circumstances where a limit is at risk of being, or has been, breached, the business units would normally notify the CRO team as soon as they become aware of the matter. A company's Risk Appetite statement would often cover its desired position regarding major stakeholders. Together with risk tolerances, this may include the desired level of capital adequacy and earnings volatility, target bond ratings and financial strength ratings.

Capital Adequacy Assessment for Insurers

3.4 Risk Capital Target or Base—When an actuary is called upon to propose or review a proposal for a **risk capital target** or **risk capital base**, the actuary should also take into account the following considerations in forming or reviewing a **risk capital target** or **risk capital base**:

a. the **risk capital target** or **risk capital base** is closely related to a risk appetite and therefore include the considerations from ASOP No. 47 in this work;

b. alignment with risk appetite and risk tolerance;

NAIC Own Risk and Solvency Assessment (ORSA) Guidance Manual

http://www.naic.org/store/free/ORSA_manual.pdf

- **Risk Appetite, Tolerances and Limits** – A formal risk appetite statement, and associated risk tolerances and limits are foundational elements of risk management for an insurer; understanding of the risk appetite statement ensures alignment with risk strategy by the board of directors.

Any risk tolerance statements should include material quantitative and qualitative risk tolerance limits and how the tolerance statements and limits are determined, taking into account relevant and material categories of risk and the risk relationships that are identified.

Risk Appetite – Documents the overall principles that a company follows with respect to risk-taking, given its business strategy, financial soundness objectives and capital resources. Often stated in qualitative terms, a risk appetite defines how an organization weighs strategic decisions and communicates its strategy to key stakeholders with respect to risk-taking. It is designed to enhance management's ability to make informed and effective business decisions while keeping risk exposures within acceptable boundaries.

Risk Limit – Typically quantitative boundaries that control the amount of risk that a company takes. Risk limits are typically more granular than risk tolerances and may be expressed at various levels of aggregation: by type of risk, category within a type of risk, product or line of business, or some other level of aggregation. Risk limits should be consistent with the company's overall risk tolerance.

Risk Tolerance – The company's qualitative and quantitative boundaries around risk-taking, consistent with its risk appetite. Qualitative risk tolerances are useful to describe the company's preference for, or aversion to, particular types of risk, particularly for those risks that are difficult to measure. Quantitative risk tolerances are useful to set numerical limits for the amount of risk that a company is willing to take.

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