
Risk Management Glossary

Accumulated Risk (Catastrophe Risk)

Part of the insurance risk. One single catastrophe event like an earthquake leads to a number of different (cumulative) hazards.

Aggregation

The summarization of single risks with respect to one uniform characteristic, aiming at measuring the overall capital at risk for an institution. One important point here are correlations between single risk that must be taken into account when aggregating risks. The mostly used methods for the aggregation are variance-covariance-models, historical simulations and Monte-Carlo-Simulations.

Alternative Risk Financing

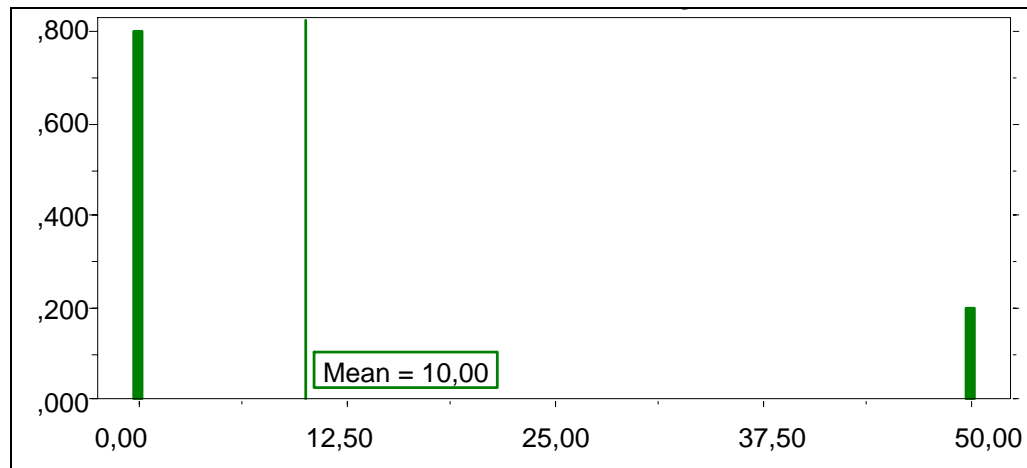
All risk management techniques that compete with commercial insurance, such as self-insurance, risk retention groups, pools, captive insurers, and finite risk insurance, but without transferring the risk.

Alternative Risk Transfer

Alternative risk transfer is the collective name given to devices of seeking risk protection using non-traditional routes (other than through traditional insurance). Apart from insurance risk securitisation, the other usual methods are captive insurance companies.

Binomial Distribution (Bernouill Distribution)

It describes the possible number of times that a particular event will occur in a sequence of observations. The event is coded binary, it may or may not occur. The binomial distribution is used when a risk manager is interested in the occurrence of an event, not in its magnitude. Often this distribution function is combined with other functions. The first step then would be to model if the risk can occur via a binomial function and the second step would be to model the risk if it does occur. Its use is limited to risks that can occur with a specific damage size only (such as penalty clauses). The following shows a risk a 20% probability of occurrence and an impact of 50.



As derivations can not be modelled this way, this distribution function can only be used in cases where the probability of a single event is exactly known and the damage can also be defined exactly.

Capital Asset Pricing Model (CAPM)

General idea

CAPM decomposes a portfolio's risk into systematic and specific risk. Systematic risk is the risk of holding the market portfolio. As the market moves, each individual asset is more or less affected. To the extent that any asset participates in such general market moves, that asset entails systematic risk. Specific risk is the risk which is unique to an individual asset. It represents the component of an asset's return which is uncorrelated with general market moves.

According to CAPM, the marketplace compensates investors for taking systematic risk but not for taking specific risk. This is because specific risk can be diversified away. When an investor holds the market portfolio, each individual asset in that portfolio entails specific risk, but through diversification, the investor's net exposure is just the systematic risk of the market portfolio.

The model

An investment or a business segment is financed through either equity capital (EC) or loan capital (LC). It follows that cost of capital is the average value of cost of loan capital C_L (loan interest) and the cost of equity capital C_E , where the tax rate T expresses the tax benefits of the loan capital. Instead of cost of capital we also talk about "weighted average cost of capital" (WACC):

$$WACC = (1-T) \times LC \times C_L + EC \times C_E$$

The equity requirements of a business segment – and thus the cost of capital and the EVA – depend on the risk. If a company has several business segments with differing risks it is possible to determine the required equity capital (EC) (risk cover potential) of each business segment with the extent of the risk (RAC) and then derive its cost of capital and value contribution (EVA) (see also the risk accumulation method, chapter 2.3). One way of determining the cost of equity capital C_E is through Sharpe's Capital Asset Pricing Model (CAPM):

$$C_E = E_0 + (E_m - E_0) \times \beta$$

β stands for the "systematic risk" – the effects of all non-company-specific influences on profitability (such as economic and interest developments). β arises from the quotient of the covariance between net yield of a share and a market net yield for the variance of the market net

yield. The variable E_0 stands for risk-free interest rate, E_m is the average market interest for risk-prone capital investment, such as shares.

Criticism

Obviously the risk-dependent capital-cost-rates (WACC) rely on the real extent of risk in a company and therefore on the planning security of the future yields respectively on the cash flows subordinated in the assessment of the company value. A risk analysis should supply exactly this Information (respectively by the risk management). The often made detour to specify the capital-cost-rates by using primarily the information of the capital market (like beta factors) instead of internal enterprise data is hardly convincing. Among the various theoretical and empirical criticism of the Capital-Asset-Pricing-Model (CAPM) and similar approaches for the derivation of capital-cost-rates an assumption stands out: The CAPM assumes efficient capital markets, which means above all, that all capital market participants can estimate the risk situation of the enterprise just as like as the management. This acceptance is surely hardly stable. Reliably, it is useful to presume the assumption that the enterprise can estimate its risk situation and the possible changes of the risk situation by planned activities better than the capital market (information asymmetry). Therefore, the enterprises should derive the capital-cost-rates for their worth-oriented control systems based on the cognition of the risk management. It solves two problems: Enterprise value (Discounted free Cash Flow) or EVA is calculated on the basis of the capital-cost-rates, which reflect the actual risk situation of the firm, and over the way of the capital-cost-rates the insights of the risk management flow directly into business decisions. This way first made the founded weighting of expected yields and the associated risks by important decisions actually possible.

Captive (Insurance Company)

One possible method for alternative risk transfer/financing in which company is set up, owned solely or in large part by one or more non-insurance entities for the primary purpose of providing insurance coverage to the owner or owners without a special insurance company. Many captives are situated on the Bahamas ("off-shore"). Advantages are the possible reducing of premium costs, easier and direct access to a reinsurer, and under certain conditions lower tax burdens.

Cash-Flow

An indicator for the "strength" of a company to internally financing its investments. Can be determined from a financial statement by adjusting the earnings before taxes, normally from depreciations and changes of accruals.

Corporate Governance

"Corporate governance is the system by which business corporations are directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among different participants in the corporation, such as, the board, managers, shareholders and other stakeholders, and spells out the rules and procedures for making decisions on corporate affairs. By doing this, it also provides the structure through which the company objectives are set, and the means of attaining those objectives and monitoring performance" (source: OECD).

Correlation coefficient

Measure for the strength of a relation of two variables, i.e. if they do compensate each other (correlation coefficient of -1 , negative correlation), are neutral (0) or would add up ($+1$, positive

correlation). These correlations are especially important when aggregating different risks as they do not easily add up to each other but could also compensate to a large extent.

Country risk

The specific risks of different countries, e.g. currency-risks, legal and political risks. Assessments of country risks are often expressed in an overall rating and incorporate political, policy and economic forecasts.

Credit risk

Risks of losses when lending money to third parties. A measure for this risk would be the probability, often expressed in the form of rating (“AAA” or “AA”).

Early warning system

A specifically designed information system or procedure designed to indicate changes that are of importance for a company's risks as early as possible. Typical indicators would be indicators of business-cycle changes like consumer confidence index.

Expected Value

The amount that is predicted to be gained, using the calculation for average expected payoff. Mathematically, this is the sum of all probabilities multiplied with the respective value. Expected Value describes the “middle” of a distribution function.

FMEA

Failure Modes and Effects Analysis (FMEA) is a methodology for analyzing potential reliability problems early in the development cycle. By looking at the whole system or part of it, FMEA is used to identify potential failure modes, determine their effect on the operation of the product, and identify actions to mitigate the failures. A crucial step is anticipating what might go wrong with a product. Correlations with other modes are not taken into account.

Hedging

A risk transfer method which compensates threats of one position with chances of another (diversification with negative correlation). One possibility would be to buy the right to buy or sell at a certain price no matter how high the actual price of the underlying position would be (call and put options).

Internal Control

All the means, tangible and intangible that can be employed or used to ensure that established objectives are met according to the company's risk policy.

KonTraG (Kontroll- und Transparenzgesetz)

A special German law from 1998 (Control and Transparency law) that made it mandatory for public companies to implement some kind of early warning system and risk management in general. Risk Management now is the liability of all members of the board.

Market Risk

Arises from the uncertainty concerning changes in the respective markets, i.e. changes in demand. The level of market risks can be assessed by looking at the forces in the respective market (Porter's five forces model).

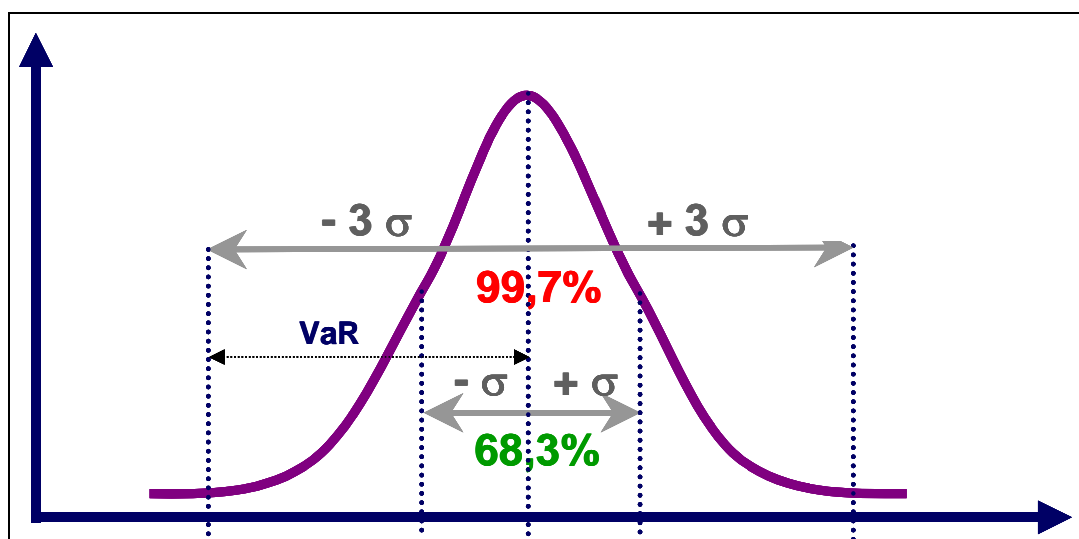
Banks also use the term for uncertainties concerning changes in market prices and rates (including interest rates, share prices, foreign exchange rates and commodity prices), the correlations among them and their levels of volatility.

Monte-Carlo-Simulation

A simulation technique based on randomly chosen scenarios within the model that produces a value for the profit or cash flow. The identified instances of the target variables lead to accumulated probability distributions which serve as the basis for the value at risk as a maximum loss. There is a probability of, for instance, 95 or 99 per cent that this figure will not be exceeded. The process starts with a mathematical model in which the effects of the individual risks are mapped to the corresponding items in a P&L statement or a balance sheet. These effects are described in terms of probability distributions. A business year is simulated several thousand times, using random figures, each time leading to a P&L statement or balance sheet

Normal distribution (bell curve)

The normal distribution – also referred to as the bell curve or Gaussian distribution – shows the distribution of many different, random events that are not correlated. It is open on both sides and has a symmetric shape.



The normal distribution can be used to model symmetric derivations of objectives like personnel costs or output. It is widely used in financial risk management to model risks. The sigma indicate one standard derivation and show the level of derivations taken into account (the three sigma level covers 99,7 per cent of all possible scenarios).

Risk Acceptance

An informed decision to accept the consequences and the likelihood of a particular risk, based on a company's risk policy and risk appetite.

Risk Adjusted Capital (RAC)

The amount of capital needed to cover all risks with a certain probability of for instance 99 per cent.

Risk Aggregation

The summarizing of all kind of risk with respect to a certain objective by taking into account correlations and different distribution functions. To do so, simulation technique like Monte-Carlo-Simulation or variance-covariance techniques are often used. The risk aggregation shows the scatter band of the target objective like EBIT or cash flow.

Risk Analysis

A step in the process of risk management with the two sub-tasks identification and evaluation. All individual risks are systematically identified and then evaluated with regard to the probability of their occurrence and with regard to quantitative effects. Methods for the identification of risks are the FMEA, Porter's five forces or checklists. Risks are then evaluated firstly with the relevance and secondly with a distribution function.

Risk Appetite

The amount of risk, on a broad level, a company is willing to accept in pursuit of objectives. It reflects the organization's risk policy and, in turn, influences the organization's culture and operating style.

Risk Avoidance

A risk control measure. The elimination of a loss exposure by ceasing or never undertaking an activity that produces the exposure. In making this decision, the person or organization must weigh the potential profit of the activity against the potential loss.

Risk Categories

Risk fields of similar types are grouped together under key headings. These include:

- **Strategic risks** e.g. threats to competitive advantages or through new competitors
- **Market risks** e.g. fluctuations in turnover and in material costs due to business cycle
- **Financial market risks** e.g. changes in interest rates and currencies
- **Legal and political risks** e.g. changes in legislation
- **Risks from corporate governance** e.g. fraud.
- **Operational risks** e.g. loss of production because of machine failure.

Risk Inventory

Contains all necessary information of the risks concerning category, risk term, expected amount, maximum amount of loss, management requirements, responsibilities, risk control measures or early warning indicators.

Risk Management

The procedures used to identify, assess, control and finance risks. It involves the risk culture, processes and structures that are put in place to effectively manage potential derivations from planned objectives. As it is not possible nor desirable to minimize all risk, the objective is to implement cost effective processes that reduce risks to an acceptable level (optimization), reject unacceptable risks and control risks.

Risk Management Manual

A manual that documents all elements of a risk management system. Typically the following:

- Corporate risk policy and limit system
- Responsibilities within risk management
- The process of risk identification
- The process of risk evaluation and risk monitoring
- The reporting system

Risk Management Process

As stated in the 2003 presentation: "Risk Management means a systematically handling of risks with the intention to ensure the efficiency and the effectivity of all company processes AND to define procedures and organise a structure in order to control risks and to make risks calculable as much as possible"

Risk Perception

Describes the appraisal of a risk situation on the basis of intuitive judgement, personal experience, and acquired information (e.g. from the media). It is the subjective judgment that people make about the characteristics and severity of a risk. The phrase is most commonly used in reference to natural hazards and threats to the environment or health, such as nuclear power.

Risk Policy (risk strategy or risk philosophy)

Part of the corporate strategy that deals with the management of risks. It provides the ground for all risk management activities and should contain statements about

- The risk appetite, that is a maximum amount of risk the management is willing to take, often express in relative terms like risk adjusted capital ratio (Economic capital to RAC) or as a targeted rating,
- Criteria for the weighing of risks and returns (e.g. with respect to shareholder value),
- Definition of core and peripheral risks
- Limits for certain risks, especially in the field of hedging instruments.

Risk Reduction

A risk control measure of handling risk by the scope or volume of a firm's operations, or through the purchase of insurance that limits the loss to a certain extend. Diversification would be one of the most commonly used risk reduction methods.

Risk Retention

A risk control measure of handling risks by internally bearing them. This is mostly the case for very important risks, close to the heart of a company, so called core risks. One example would be risks from R&D activities, as these risks should not be mitigated to outside parties due to their competitive sensitivity.

Risk Transfer

A risk control measure. Involves the contractual shifting of a pure risk from one party to another. An example is the purchase of an insurance policy, by which a specified risk of loss is passed from the policyholder to the insurer. Other examples are the hold harmless clauses in many contracts, contractual requirements to provide insurance coverage for another party's benefit, and reinsurance.

Risk Policy

A statement developed and approved at a high management level within an organization for the following purposes: 1. to commit top managers to the risk management function; 2. to disseminate risk management information throughout the organization; 3. to set a standard against which the firm's risk management performance can be judged. Acts as the basis for all risk management processes and lays the ground for the risk culture.

Special Purpose Vehicle (Special Purpose Entity)

An entity, juristically independent, but which does not undertake operative actions. Specially designed for special purposes like tax deductions.

Specific risk (non-systematic risk)

Specific risk is the risk which is unique to an individual asset/company. In financial risk management, It represents the component of an asset's return which is uncorrelated with general market moves.

Standard deviation

An arithmetic mean of the differences between each outcome and the average of all outcomes within a set. It is utilized by actuaries to indicate the degree of fluctuation that exists between a set of outcomes, mostly used in the case of a normal distribution. Standard derivation can be taken from the positive square root of variance.

Strategic Risk Management

Strategic risk management deals with the following issues:

1. What are the threats to the success factors of the company?
2. Which “core risks” will the company necessarily have to bear itself?
3. What is the risk-adjusted performance measure that serves as the basis for controlling the company?
4. Does the existing shareholder equity provide sufficient potential to cover risk?

This is closely linked with the definition of the risk policy of a company.

Systematic Risk

Systematic risk is the risk of holding the market portfolio („market risk“). As the market moves, each individual asset is more or less affected. To the extent that any asset participates in such general market moves, that asset entails systematic risk. Interest rates, recession and wars all represent sources of systematic risk because they affect the entire market and cannot be avoided through diversification. Whereas this type of risk affects a broad range of securities, unsystematic risk affects a very specific group of securities or an individual security. Systematic risk can be mitigated only by being hedged.

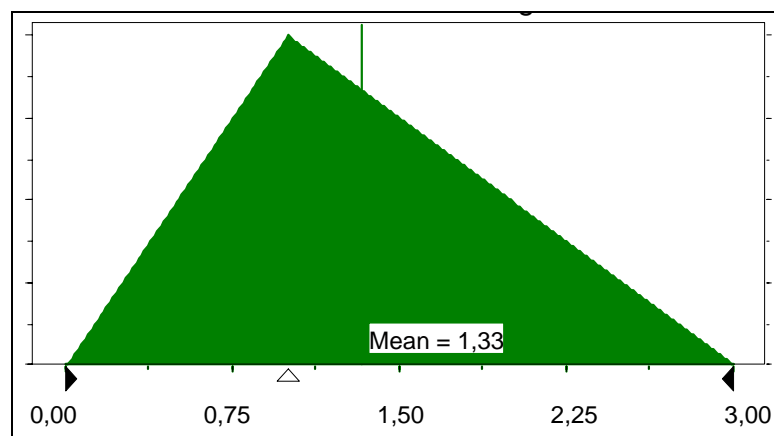
Total Cost of Risk

Approach that takes into account all costs connected to risks. There is no agreed definition which kind of costs must be incorporated. The following are normally considered:

- Costs of internal control
- Costs of risk transfers like insurances
- Costs for damages and excesses
- Costs for the handling of damages
- Costs for the economic capital needed to cover possible losses.

Triangular Distribution

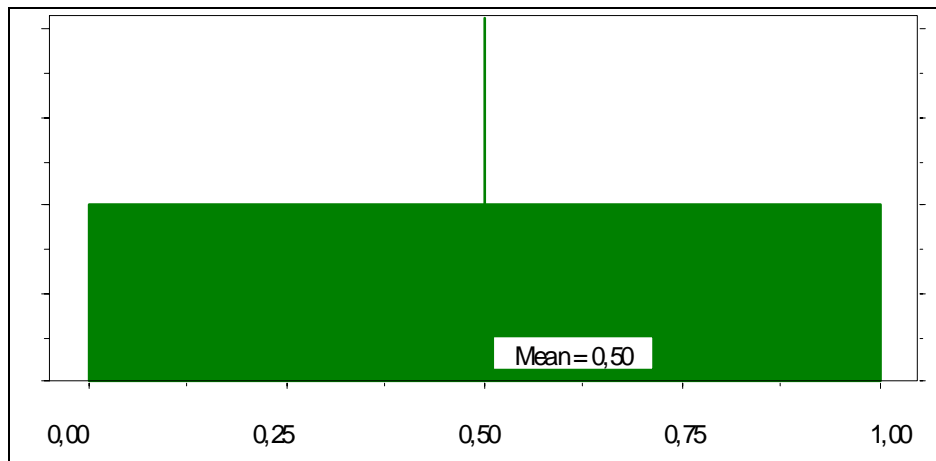
A special distribution often used in cases where a minimum and a maximum exist and one can only assume the likeliest event without knowing its exact probability. Often the triangular distribution is derived from a three-point-distribution. Some of the main advantages are the simplicity and the possibility to model events that can only be described within a range.



It can be applied when modelling key personality risks or machine failure as these risks have specific boundaries and a likeliest event.

Uniform Distribution

For all cases where a risk manager does not know different scenarios or probability but only a range of possible values, the uniform distribution can be used to solve the problem of modelling these risks.



This distribution is of special importance when there is no data available about a risk and one can only estimate range. In this case, it is better to model the risk with a uniform distribution than to leave it outside the model as this would mean it would be modelled with “zero damage”.

Value at risk

The VaR shows the loss that with a certain probability of, for instance, 95 or 99 per cent will not be exceeded.

Variance

Shows the spread of a distribution. Mathematically the medium square derivation from the mean average value.

$$s_x^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2$$