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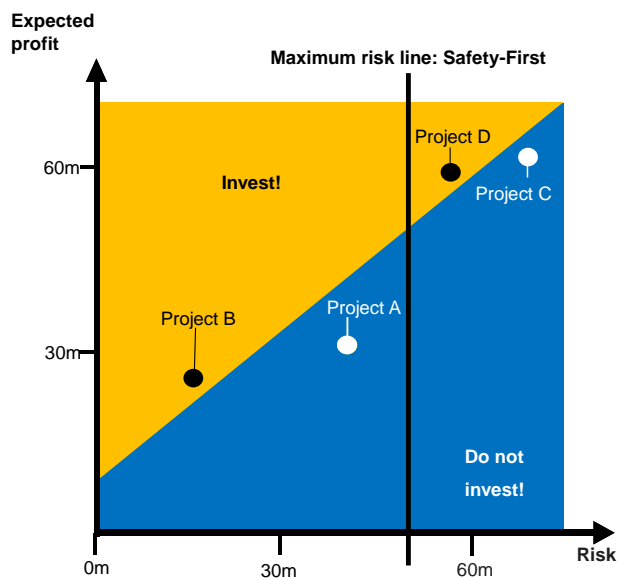
Risk management – the basics

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Environment and role

Companies have always concerned themselves with avoiding risks to the company as a going concern. The need to systematically identify, evaluate and manage risks has increased in recent years. One reason for this is that the level of risk in many areas has vastly increased. This is reflected in the speed of change of technological processes, the dependency on few customers, or the emergence of entirely new risk categories (for example, potential new competitors from abroad as a result of an increasingly globalised world). Further to this, as a result of the Control and Transparency Act (Kontroll- und Transparenzgesetz - KonTraG) enacted in 1998 and its “radiating effect” on small and medium-sized companies, it may be assumed that the failure to implement a risk management system – also in corporations – can result in managing directors being held personally liable. Finally, as a result of Basel II and Basel III, both regular and savings banks are required to be more cautious when it comes to risk. The impact of risks that have occurred (for example, the loss of a major client or an unexpected increase in material costs) have become apparent in the annual accounts and the key financial figures derived from them (for example, equity capital quota or overall return). As these figures define the conditions for loans and interest in the typical company rating process, risks can have a considerable impact on company financing. For instance, a coincidental combination of several risks can quickly give rise to a situation in which the financing of a company is no longer secured because of an unsatisfactory rating. This can also happen despite a company demonstrating strong performance over the long-term. This issue is particularly likely to be present where companies have reduced risk capacity (especially capital), regardless of the existence of other factors that indicate excellent potential for success.

On the whole, these recent developments call for thorough engagement with the issue of risk management. Guidelines must be put in place to appropriately tackle potential risks to the company as a going concern and, when it comes to major company decisions (for example, investments), expected profits must be weighed against related risks.



Profitability and risk could also be used, e.g. return vs. cost of capital both in%

Figure 1: Profit-Risk Profile

Such a risk management process must be integrated into work processes and organisational structure, which will lead to what is known as a “risk management system” being established.

Risk management involves much more than (what practically goes without saying) adhering to statutory obligations (for example, labor and environmental law), taking out insurance, and creating emergency plans. Risk management is essentially a comprehensive process of identifying, assessing, aggregating, monitoring and the target-based management of all risks which could result in deviation from defined company goals.

Identifying risk

The first phase of risk management involves a systematic and structured identification of potential risks that focuses on the essentials. Analyzing work processes, workshops, benchmarks or checklists can be used to identify risks.

In practice, the following ways of identifying risk have proven to be especially useful:

(1) Strategy and strategic risks

Companies must be very clear when it comes to their success potentials (such as core competencies, internal strengths and competitive advantages as perceived by customers) within the framework of strategic company planning. By systemically studying their most important success potentials and the potential threats to which they are exposed, companies can identify the most important strategic risks.

(2) Controlling, operational planning and budgeting

Particular assumptions are made when it comes to controlling, company planning or budgeting (for example, the economic situation, exchange rates and success in marketing activities). All uncertain planning assumptions represent a potential risk, as they can lead to deviations from plans.

(3) Risk workshops (risk assessment) for performance risks

Certain types of risk are best determined through critical discussions in a workshop. Risks relating to performance (operational risks), legal and political risks, as well as those relating to support processes (for example, IT) fall under this category. For operational risks relating to the value chain, work processes (including the principle interfaces) could, for example, be described and then analyzed step-by-step to see which risks could cause a deviation from the planned process sequence.

<i>Risk</i>	<i>Field</i>	<i>Impact</i>	<i>Action to be taken</i>	<i>Relevance</i>
<i>New competitor</i>	<i>S/M</i>	<i>T/SP</i>	<i>Further strengthen sales</i>	4
<i>Volume of sales</i>	<i>P</i>	<i>T</i>	<i>Warning and forecasting system for turnover</i>	4
<i>Interest rate changes</i>	<i>F</i>	<i>FI</i>	<i>Interest rate agreement</i>	3
<i>Staff costs</i>	<i>M</i>	<i>FC</i>	<i>Company covers it</i>	3
<i>Damage to machinery</i>	<i>P</i>	<i>T</i>	<i>Redundant design</i>	3
<i>Sales price fluctuation</i>	<i>M</i>	<i>T</i>	<i>Company covers it</i>	3
<i>Dependency on Company ABC</i>	<i>M</i>	<i>T</i>	Contract structure, <i>strengthen sales</i>	2
Pricing errors	<i>P</i>	<i>T/FC</i>	Organisational measures	2
Liability losses to customers	<i>P</i>	<i>ER</i>	Optimise insurance coverage	2
Growth-related EC deficiencies	<i>S</i>	<i>SP</i>	Reinvest profits	2
Takeover Company ABC	<i>F</i>	<i>FI</i>	Due diligence	2
Lack of competence in country A	<i>S</i>	<i>SP</i>	Sell business division	2
Problems with motivation in sales	<i>G</i>	<i>SP/T</i>	Increase performance-based remuneration	1
Risk fields: S = strategic P = performance M = market G = corporate governance F = finance market L = legal/societal/political			Impact: SP = success potentials FC = fixed costs T = turnover FI = finance + investment res. V = variable costs ER = extraordinary results	

Figure 2: Risk inventory

Significant risks are then summarized in a risk inventory, a type of risk “hit list”. In order to prioritize risks, as a first step, an initial evaluation of the risk can be carried out with the use of a “relevance scale”. An example of an appropriate relevance scale (see figure 2) here would be from 1 (insignificant) to 5 (risk to the company as a going concern).

Quantifying risk

By quantifying risk, the risk is next assessed using an appropriate (mathematical) distribution function. Risks are often quantified according to probability of occurrence and potential extent of harm, which corresponds to what is known as a “binomial distribution” (digital distribution). Certain risks, such as deviations in maintenance costs or interest charges, may reach varying levels of risk with different probability and would be better described using other distribution functions (for example, triangular distribution with minimum value, highest probability value and maximum value or normal distribution with expected value and standard deviation).

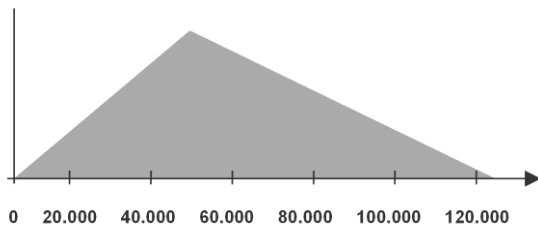


Figure 3: Triangular distribution

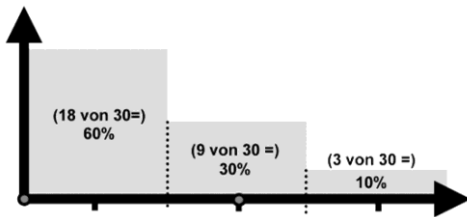


Figure 4: Binomial distribution/ Distribution scenario

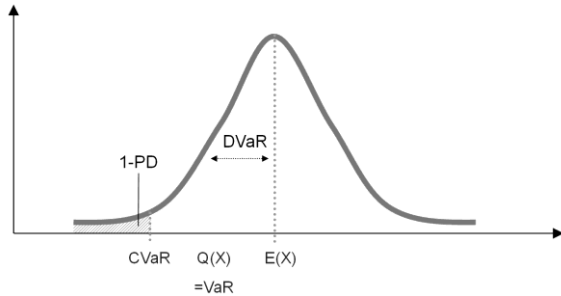


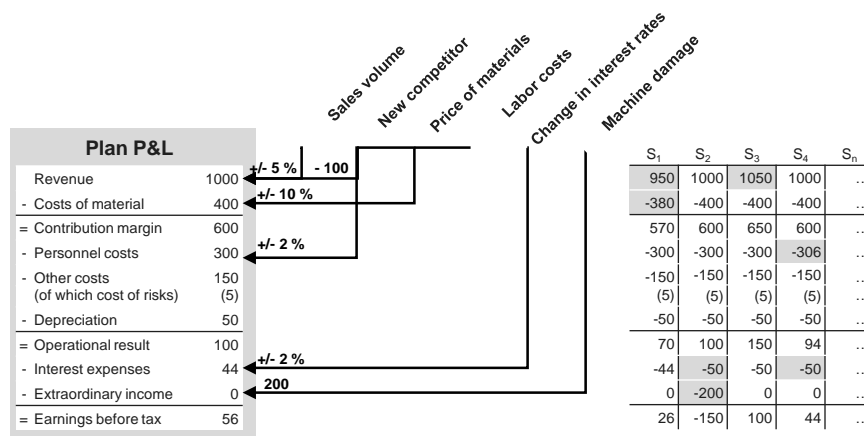
Figure 5: Normal distribution

When assessing risks, it is possible to look back to the actual impact of risk (losses) that occurred in order to benchmark values from the industry or self-created (realistic) damage scenarios. These scenarios should then be described in detail and illustrated in terms of potential quantitative effects on company results.

In order to compare all forms of risk with each other in terms of significance, a consistent risk measure (such as value at risk) is useful. There must be a realistic maximum loss that cannot be exceeded, where probability within a particular planning period has already been defined. This can be interpreted as need for capital.

Determination of total level of risk and need for capital

A risk inventory only allows a company to derive which risks in and of themselves present a threat to a company as a going concern. To determine the extent of the total level of risk (and therefore the extent of the threat to the company as a going concern resulting from a combination of all forms of risk), what is known as a “risk aggregation” is needed. Risk aggregation enables analysis of the combination effect of multiple individual forms of risk. Risk aggregation involves putting the assessed forms of risk in the context of company planning and demonstrating which form of risk threatens deviations at certain points in planning (success planning). With the help of a risk simulation process, a large number of potential future risk-related scenarios can be identified and analyzed. Conclusions may be drawn about total level of risk, planning security and a realistic frequency range e.g. company results (“Monte Carlo simulation”). From the risk-related frequency range that is determined, conclusions can immediately be drawn about the level of potential risk-related losses. As a result, it is possible to deduce the need for capital and liquidity to safeguard against risk which, in turn, allows conclusions to be made on an appropriate rating. This allows key risk figures to be determined, for example capital coverage which shows the relationship between available capital and need for capital.



Risk simulation shows possible deviations and the capital requirement to cover possible losses!

Figure 6: Integration of Risks within Plan P&L (Source: Gleißner, W. (2015): Controlling und Risikoanalyse bei der Vorbereitung von Top-Management-Entscheidungen, in: Controller Magazin, Juli/August 2015, Heft 4, pp. 4-12)

Risk management, risk monitoring and risk reporting

Based on research on the comparative significance of individual risks and total level of threat which, for example, is expressed by capital coverage, action is required when it comes to developing a targeted risk management system. The aim of risk management strategies can range from avoiding risk, to limiting damage or reducing the probability of occurrence. Transferring risks to a third party is especially important in risk management, particularly when it comes to the important special case of insuring against the impacts of identified risks.

As causes of potential risk are constantly changing, it is essential that significant risks are monitored on an ongoing basis, both to make economic sense and to operate in line with the Control and Transparency Act (Kontroll- und Transparenzgesetz). In accordance with the Control and Transparency Act (Kontroll- und Transparenzgesetz), responsibility for monitoring significant potential risks must be

documented in a clear and structured fashion, including information on the extent of monitoring conducted and the cycle of monitoring. Furthermore, management must formulate a risk policy that establishes the basic requirements for dealing with risk. Limits must be set and a reporting channel for risks must be defined and also documented here. Existing management systems should cover as many of the basic tasks relating to risk management as possible. Therefore, for example, through the systematic collection of uncertain planning assumptions (risks) in planning, budgeting and controlling, a risk management system can effectively be built and integrated.

Management bears overall responsibility for risk management. However, it is normal that essential tasks, especially the coordination of all risk management processes, are passed onto a risk manager. The risk manager is also responsible for compiling all information pertaining to potential risks in a risk report.

To be conducted efficiently, risk management is normally supported by an appropriate IT solution. Software should support the checklist-based risk identification, enable quantitative evaluation and aggregation (using simulation) and store essential organisational instructions relating to risks. Additional important software functions include supporting company planning, forecasting risk-related vulnerability to crises and company rating. Risk assessment is then conducted through simply entering a relevance ranking which can be complemented through detailed quantifying.

Risk management in preparation for decision-making as a success potential and an important element of value-oriented management

Risk management skills are key to success when an unexpected development occurs in the company environment. When it comes to avoiding crises, risk management skills secure ratings and financing, and help to evaluate investment options or projects in terms of risk. On the whole, risk management supports the central company task of using sound judgement when weighing expected income and potential risks with regards important decisions (“evaluation”). It is crucial that risk analysis is conducted when preparing to take company decisions, and it shows how the level of potential risk to the company would change if one course of action were chosen over another (“what-would-happen-if analysis”).

In contrast to traditional valuations based on a “capital market perspective” the capital cost rate can directly be derived from the earnings risk (risk analysis and risk aggregation) rather than from historical fluctuations of stock returns (as usually expressed in the CAPM beta factor).¹ This form of assumed capitalisation interest rate (discount interest rate k), which is often simplified as a constant, can be derived from the standard deviation of earnings $\sigma_{earnings}$ as a risk measurement specifically, for example. Risk measurement is the outcome of the risk analysis and risk aggregation.²

The expected value for earnings E^e and the following equation for the risk-adjusted capitalisation rate are based on the risk-free interest rate r_f :³

¹ Compare with Gleißner: Risikoanalyse und Replikation für Unternehmensbewertung und wertorientierte Unternehmenssteuerung, in: WiSt 7/11, pp. 345–352 und Gleißner: Kapitalmarktorientierte Unternehmensbewertung: Erkenntnisse der empirischen Kapitalmarktforschung und alternative Bewertungsmethoden, in: Corporate Finance, 4/2014, pp. 151–167 sowie Dorfleitner, G./Gleißner, W. (2018): Valuing streams of risky cashflows with risk-value models, in: Journal of Risk, Vol. 20, No. 3 (February 2018), pp. 1-27.

² Compare with Gleißner: Grundlagen des Risikomanagements (Basic Principles of Risk Management), 3rd edition, Vahlen Munich, 2016 (forthcoming).

³ Compare with Gleißner: Risikoanalyse und Replikation für Unternehmensbewertung und wertorientierte Unternehmenssteuerung, in: WiSt 7/11, pp. 345–352.

Formula 1

$$k = \frac{1 + r_f}{1 - \lambda \cdot \frac{\sigma_{\text{earnings}}}{E^e} \cdot d} - 1 = \frac{1 + r_f}{1 - \lambda \cdot V \cdot d} - 1$$

The variation coefficient V is the ratio of earnings risk σ_{earnings} to expected earnings E^e which both depend on opportunities and risks. It is a key figure for planning security and earnings risk.

The value λ shows the excess return per unit of risk.

Formula 2

$$\lambda = \frac{\text{market risk premium}}{\sigma_{r_m}} = \frac{r_m^e - r_f}{\sigma_{r_m}}$$

This depends on the yield expected from the market index r_m^e , its standard deviation σ_{r_m} and the risk-free base interest rate r_f . It expresses the return-risk profile of alternative investments: to evaluate means to compare.

As owners do not necessarily bear all the risks of the company σ_{earnings} , the risk diversification factor (d) also needs to be considered.⁴ This indicates the proportion of risk borne by the owners in formula 1 and is therefore relevant for the deduction.

It is necessary to compare the risk-return-profile of different strategies, projects or investments. The value is a performance measure that express the risk-return-profile.

Risk management is an essential component for company leadership that aims to be strategically far-reaching, as well as focused on risks and values. When preparing to make decisions, a sound strategy, operational planning built on this strategy, and even an analysis of opportunities and threats (potential risks) are essential.⁵ When it comes to "real" value-oriented management to be defined as today's "capital market-oriented" management system, decision-making calculations (for example, through the capital cost rate) capture the return risk, such as volatility in cash flow (and not fluctuations in historical earnings per share). Additionally, considering the importance that rating and finance restrictions took on during the recent economic crisis, evaluating one course of action over another is also essential with respect to future ratings, also for possible risk-related stress scenarios ("stress test").

On the whole, many unused opportunities exist for further developing management tools with the aim of improving company decisions as well as offering a better foundation on which to base decisions. However, numerous barriers exist to implementing these tools in practice as this book explains through a fictional conversation between the management board and a risk manager.

⁴ It is often assumed that the correlation between results and the return from market portfolio is just as high as the correlation between company stock and market portfolio.

⁵ See the new "Principles of Proper Planning" in Gleißner, W./Presber, R. (2010): Die Grundsätze ordnungsgemäßer Planung - GOP 2.1 des BDU: Nutzen für die betriebswirtschaftliche Steuerung, in: Controller Magazin, Ausgabe 6, November/Dezember 2010, pp. 82 - 86.

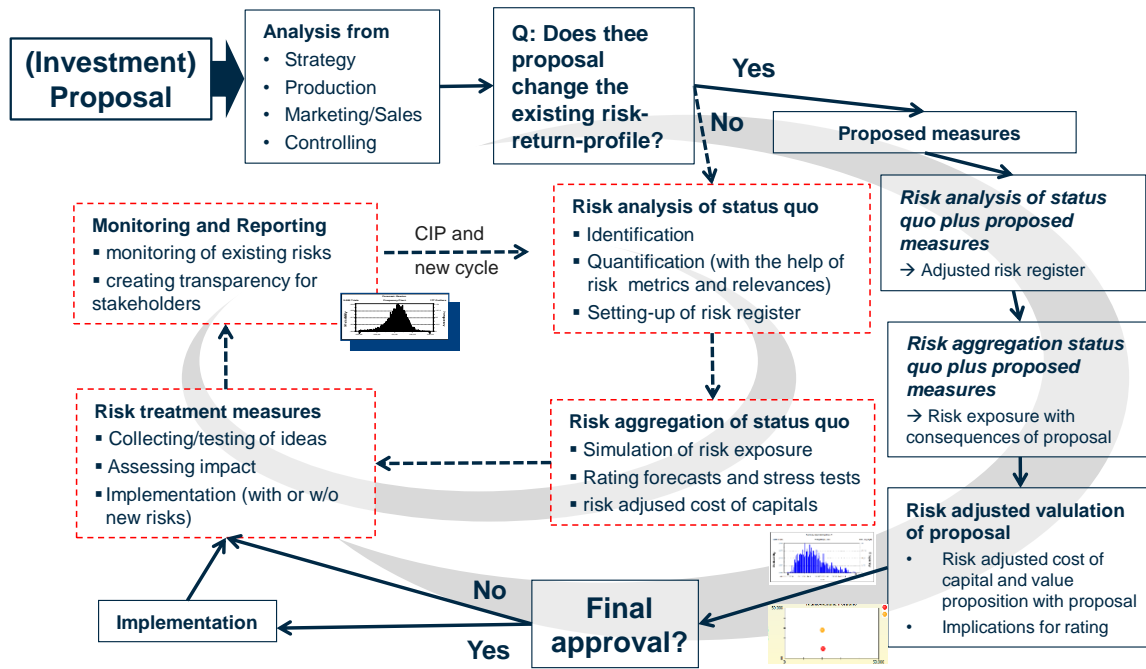


Figure 7: Traditional Risk Management Cycle vs. Decision-Driven Risk Management Cycle: Risk Analysis as Part of Every Decision (Source: Gleißner, W. (2015): Controlling und Risikoanalyse bei der Vorbereitung von Top-Management-Entscheidungen, in: Controller Magazin, Juli/August 2015, Heft 4, pp. 4-12)

About the Author

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As chairman of the FutureValue Group AG, a research and development-oriented management consulting company, Prof. Dr. Werner Gleissner generally deals with value-based management on the basis of enterprise valuation models for imperfect capital markets, taking account of corporate risk information and appropriate risk measures.

His research and work both focus on risk management, rating and strategy development and the method development of risk aggregation and value-based management and also on investment and portfolio management.

He published a large number of specialist publications and is lecturer at various universities. Since 2014 he has been honorary professor at the University of Dresden.

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