

*Supporting materials for Rieg/Vanini/Gleißner, **Enterprise Risk Management, A Modern Approach**, Springer, 2025*



# Future risk viability management & value- based management

Prof. Dr. Werner Gleißner, Member of the Board

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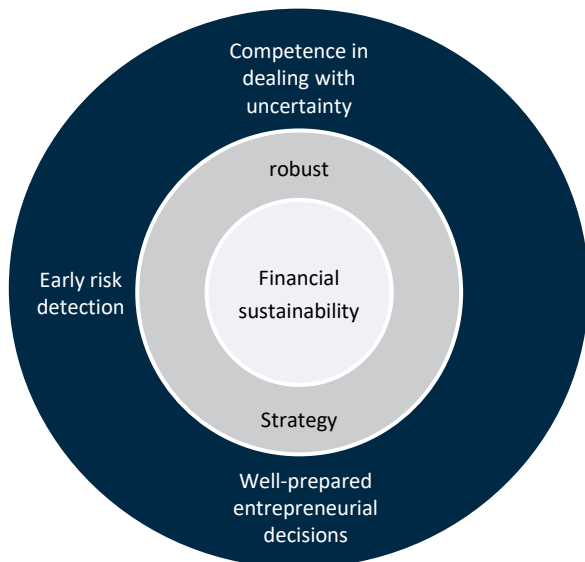
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**If you can't measure it, you can't manage it!**

# "What is demonstrably important to ensure sustainable corporate success?"

Securing success is necessary on 3 levels!






Our aim is to **use scientific findings** from crisis and risk research, strategic management and empirical capital market research for a holistic approach that focuses on the aspects that are actually demonstrably important.

Source: Gleißner, W. (2023): Uncertainty and resilience in strategic management: profile of a robust company, in: International Journal of Risk Assessment and Management, Vol. 26, No 1, pp. 75–94

The study situation....

1. **Quality companies**, especially those **with high financial sustainability**, are more successful than average
2. Companies with a good risk/return profile and **low "fundamental risk"** are also sustainably successful on the stock market, especially in crises
3. **Resilient organization** and **robust strategy** ensure long-term success
4. Family businesses are more successful than average due to their **long-term orientation**
5. Well-prepared **"entrepreneurial decisions"** (Section 93 AktG) are also relevant for medium-sized family businesses - and help to ensure success.
6. Strong **ability to deal with uncertainties (opportunities and threats)** increases crisis stability.

# The criteria for future viability (QScore) & ... and the importance of planning & risk

Criterion for future viability	
<span style="color: green;">●</span>	Fulfilled
<span style="color: yellow;">●</span>	Not fulfilled
<span style="color: red;">●</span>	Critical level
	Gold
	Silver
	Bronze

No.	Topic	Result		Vision
Q1	<b>Real Growth</b>	59 %	<span style="color: green;">●</span>	The company shows sustainably positive real growth. It is also desirable that market share does not decline and that, in the medium term, the return on equity exceeds the growth rate.
Q2	<b>Financial Stability and Credit Rating</b>	89 %		The credit rating, based on an estimated probability of insolvency, is below 2% per year (approximately equal to a BB rating) and remains at a level where even stress scenarios pose no threat to financing. The company is not at risk.
Q3	<b>Low Business Risk</b>	63 %	<span style="color: green;">●</span>	The company has no existential strategic risks (e.g., special threats to profit potential) and only a below-average return risk – thereby ensuring planning reliability.
Q4	<b>Profitability and Value Creation</b>	74 %		The company creates sustainable value – i.e., return on capital is consistently above the capital costs adjusted for risk.
Q5	<b>Guiding Principle (Purpose), Culture, and Employees</b>	71 %		The company has a forward-looking guiding principle (and business purpose, “purpose”) and a strong corporate culture. It is clearly aligned with value-based corporate leadership and has competent, engaged employees.
Q6	<b>Robust Strategy</b>	68 %	<span style="color: green;">●</span>	The company has a documented, forward-looking, and robust strategy with long-term profit potential, distinct competitive advantages (like a brand), and integrates it into daily operations.
Q7	<b>Service Delivery, Organization, and Resources</b>	52 %	<span style="color: green;">●</span>	The company delivers its services efficiently, resiliently, is strategically well organized, and appropriately engages its employees.
Q8	<b>Accounting, Planning, and Governance</b>	65 %	<span style="color: green;">●</span>	Accounting and planning meet the requirements of capital market-oriented companies and follow the “principles of orderly planning” (GoP). There is a functioning governance structure.
Q9	<b>Risk Management</b>	52 %	<span style="color: green;">●</span>	The company has a functioning risk management system that identifies risks early, evaluates them, and develops countermeasures. It is properly documented and functional (§91 AktG and IDW PS 981).
Q10	<b>Well-founded Decision-making</b>	35 %	<span style="color: yellow;">●</span>	Business decisions are based on documented and appropriate information (§93 AktG), including a risk analysis, taking into account the company’s performance metrics (e.g., profit and risk profile).

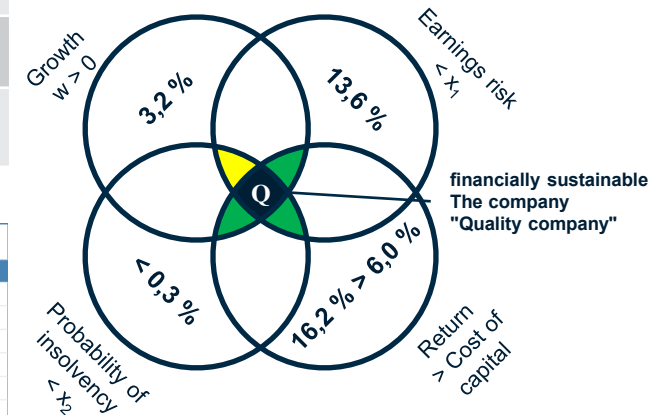
Source: Gleißner / Weissman, Das zukunftsfähige Familienunternehmen, 2024



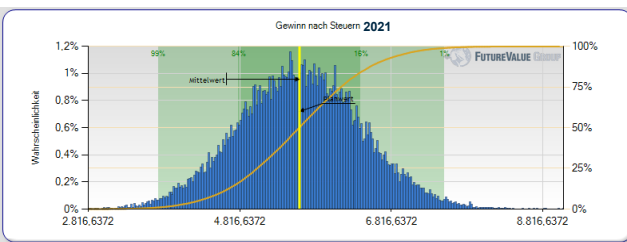
# Q1 ... Q4: "financial sustainability"—calculation requires risk analysis and risk aggregation

Example evaluation based on public information

No.	Topic	Result	Explanations and potential for improvement
Q1	Real growth	63 %	<ul style="list-style-type: none"> <li>Positive real, but only slightly above-average growth (especially in the cloud segment).</li> <li>No significant increase in market share.</li> </ul>
Q2	Financial stability and creditworthiness	93 %	<ul style="list-style-type: none"> <li>A Rating (probability of insolvency max. <math>p = 0.3 \%</math>)</li> </ul>
Q3	Low corporate risk	92 %	<ul style="list-style-type: none"> <li>High planning reliability / low earnings uncertainty (coefficient of variation of profit = 13.6 %)</li> </ul>
Q4	Profitability and value generation (return > cost of capital)	80 %	<ul style="list-style-type: none"> <li>High return on capital, far higher than the risk-dependent cost of capital (positive value spread)</li> </ul>



Finanzrating (FVG-Note: 1 - 5) gemäß Abschluss 31.12.2020									
Kennzahlen	CCC	B	BB	BBB	A	Wert			
wirtschaftliche Eigenkapitalquote, bereinigt	<10%	>10%	>20%	>35%	>50%	51,2%	🟢🟡🟠	👉	
Quick-Ratio	<60%	>60%	>80%	>140%	>200%	124,9%	🟢🟡🟠	👉	
operative Marge (EBIT-Marge)	<0%	>0%	>5%	>10%	>15%	23,6%	🟢🟡🟠	👆	
ROCE (mit aktuellem CE)	<0%	>0%	>5%	>10%	>20%	15,4%	🟢🟡🟠	👆	
Zinsdeckungsquote	<1	>1	>2,5	>4	>9	9,2	🟢🟡🟠	👆	
Dynamischer Verschuldungsgrad fürs Rating	>8	<8	<4	<1	<0,01	3,2	🟢🟡🟠	👆	
Verbindlichkeitenrückflussquote	<-10%	>-10%	>0%	>10%	>20%	34,8%	🟢🟡🟠	👆	
Kapitalrückflussquote	<5%	>5%	>10%	>15%	>25%	14,2%	🟢🟡🟠	👆	
Finanzrating (FVG-Note: 1 - 5) gemäß Abschluss 31.12.2020						2,0			
Indikation S&P Note						BBB			
PD gemäß Finanzrating für das Folgejahr 2021						0,28%			



Risk to going concern 2021: PD according to financial rating

0.3 %

Indicative Rating

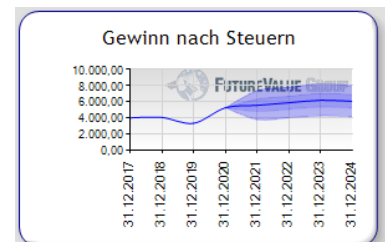
Risk to going concern 2021: PD according to simulation

0.1 %

**A**

Probability of endangerment 2021: Failure to meet the minimum rating B-

< 1.0 %





## Financial sustainability: measurement and empirical evidence

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### Abstract

Financial sustainability is underrepresented in both the research on and practice of sustainability management and reporting. This article proposes a conceptual measure of financial sustainability and examines its association with capital market returns. The measure is positioned at the intersection of sustainability management, risk management and risk governance. Financial sustainability is regarded as a crucial control parameter complementing shareholder value and can be viewed by risk-averse investors as a secondary condition of investment decisions. It reduces refinancing and insolvency risks, leading to risk-adjusted excess returns in an imperfect capital market with financing restrictions and insolvency costs. We propose measuring a firm's financial sustainability in terms of four conditions: (1) firm growth, (2) the company's ability to survive, (3) an acceptable overall level of earnings risk exposure, and (4) an attractive earnings risk profile. We show that the application of a conditions-based investment strategy to European firms with high financial sustainability (i.e., firms fulfilling all four conditions) over the period from July 1990 to June 2019 results in monthly excess returns of 0.39%. This portfolio's risk is lower than the risk of market investment. We find that the excess returns increase when incrementally adding each of the four conditions to the investment strategy.

Source: Gleißner, W./Günther, Th./Walkshäusl, Ch. (2022): 'Financial sustainability: measurement and empirical evidence, in: Journal of Business Economics, 92, pp. 467–516, <https://doi.org/10.1007/s11573-022-01081-0>.

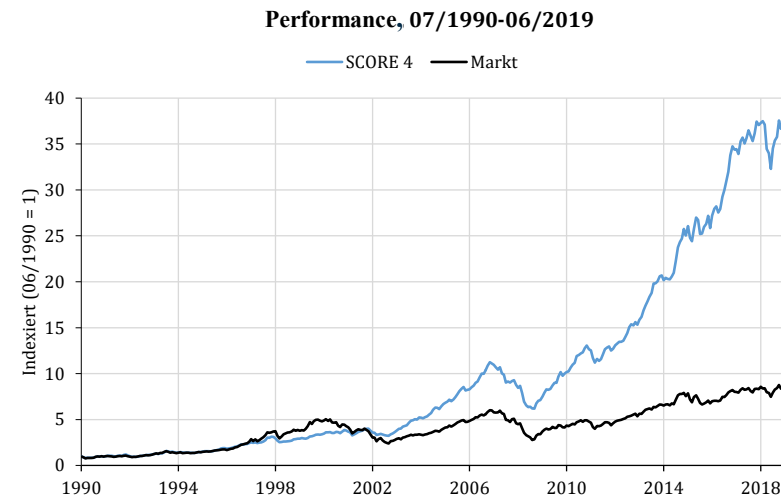
### Abstract

.....Wir suggest measuring the financial sustainability of a company on the basis of four conditions:

**(1) company growth, (2) the company's ability to survive, (3) an acceptable overall level of earnings risk and (4) an attractive earnings risk profile.**

We show that applying a condition-based investment strategy to European companies with high financial sustainability (i.e. companies that fulfill all four conditions) leads to a monthly excess return of 0.39% over the period from July 1990 to June 2019. The risk of this portfolio is lower than the risk of market investments. We find that excess returns increase as each of the four conditions is gradually incorporated into the investment strategy.

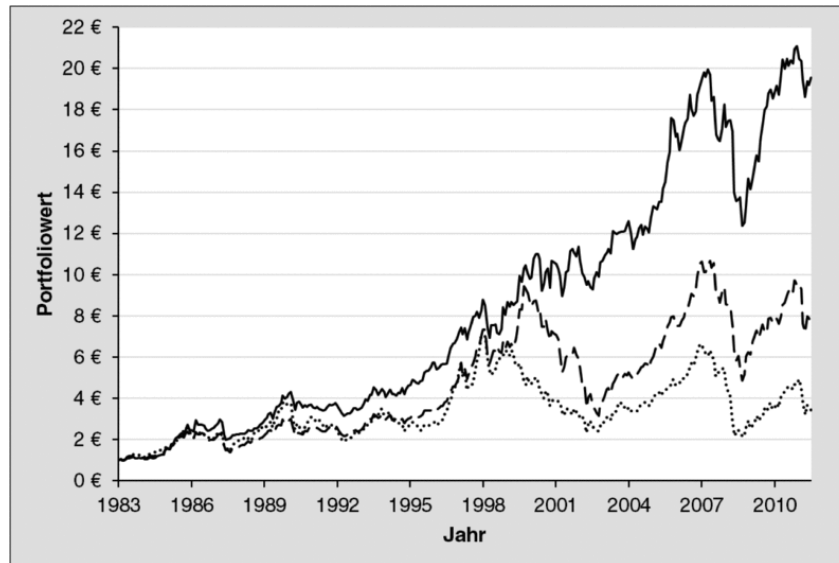
Figure 1: Indexed performance of the SCORE 4 portfolio compared to the market



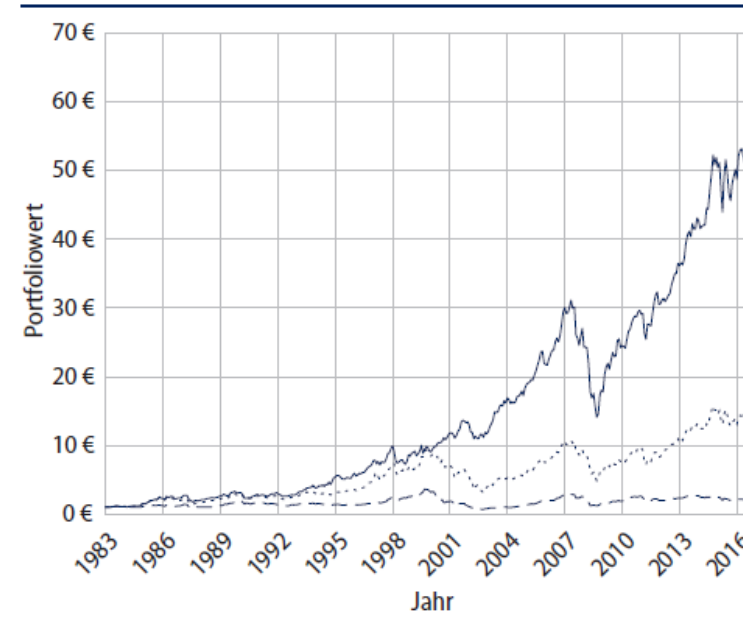


# Low fundamental risks and a good risk/return profile lead to better performance: use risk-adequate management!

- Performance of a € 1 investment in three different portfolios over the observation period 1983 to 2011 (left) and 2017 (right).
- - Portfolio with low fundamental risks,
- - CDAX
- --- Portfolio with high fundamental risks



**Fig. 1: Performance of a €1 investment in Portfolio H, the market portfolio, and Portfolio N**



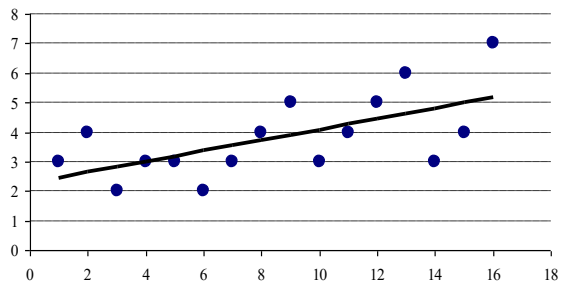
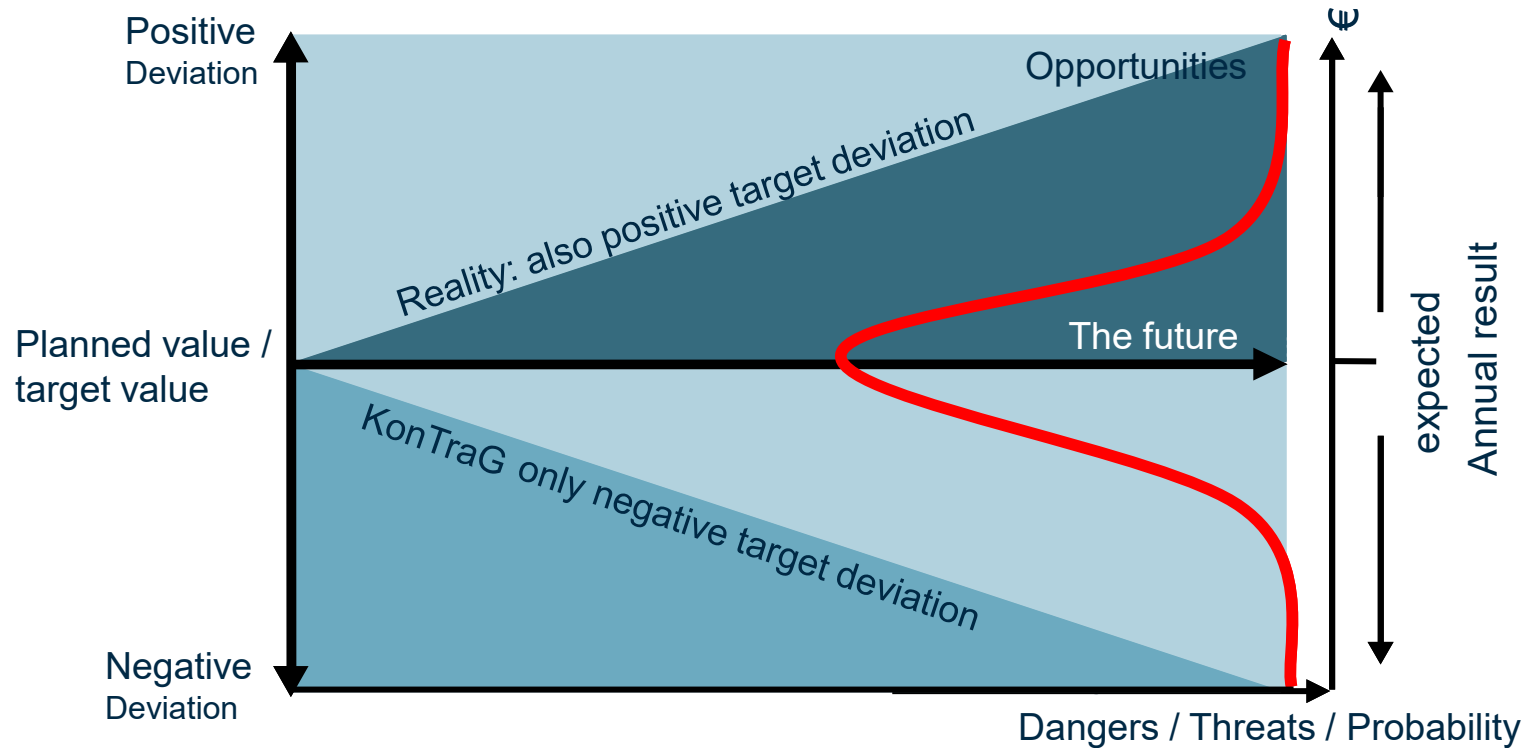
Source left: Walkshäusl, C. (2013): Fundamentalrisiken und Aktienrenditen – Auch hier gilt, mit weniger Risiko zu einer besseren Performance, in: Corporate Finance biz 3/2013, pp. 119-123.

Source right: Gleißner, W./Walkshäusl, C. (2018): Erfolgreiche Value-Anlagestrategien durch risiko- und ratinggerechte Unternehmensbewertung – Ertragsrisiken, Rating, Kapitalkosten und Aktienrenditen, in: Corporate Finance, No 05-06/2018, pp. 161-171.

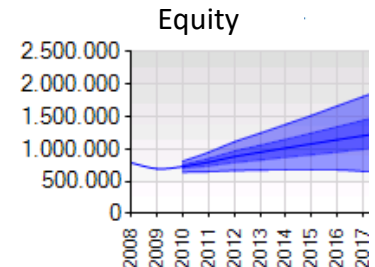


# The future always means uncertainty

## Risk as a possible deviation from the plan (opportunity & threat)



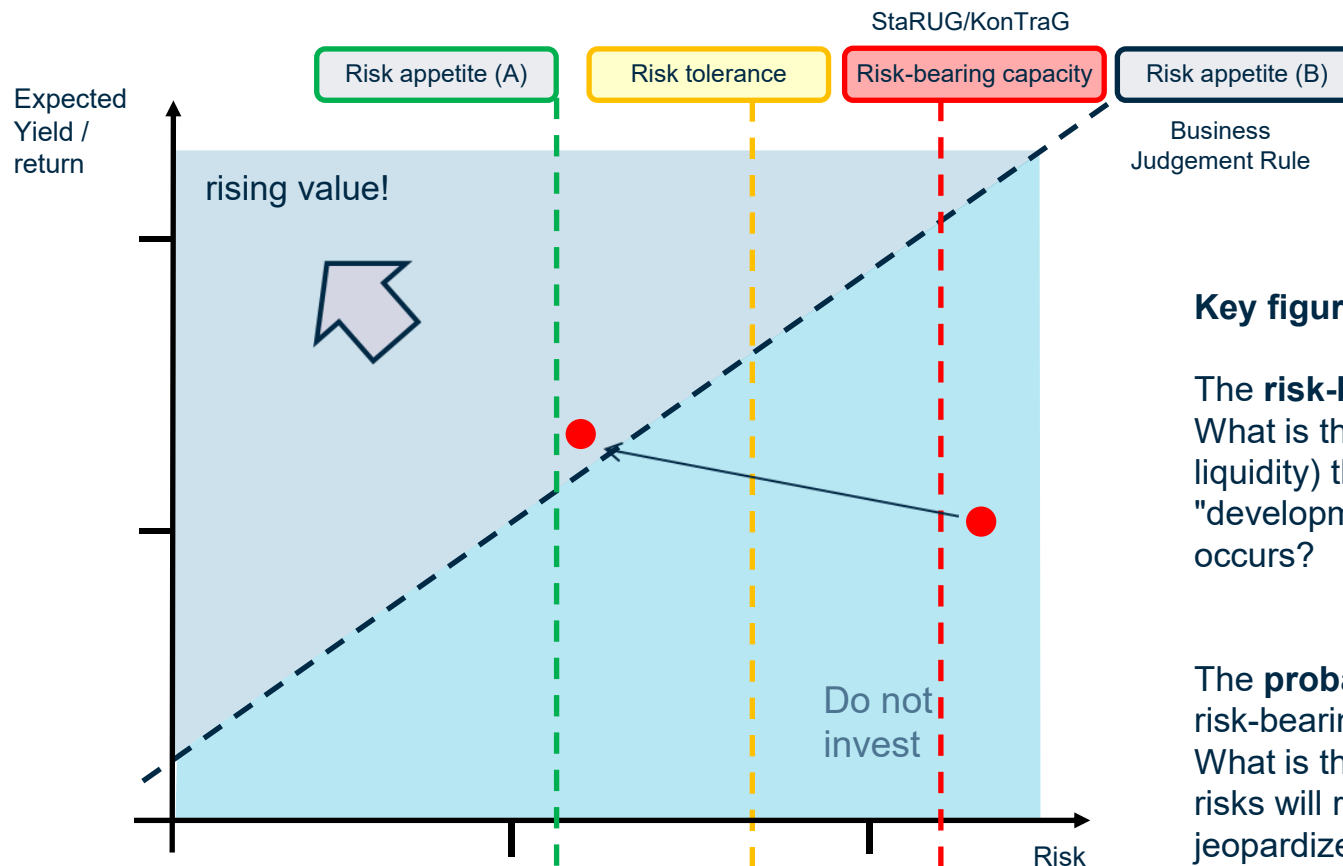
**Residuum plus. Scope of risk**



**... and risk makes decisions difficult!**



# Business decisions as a balancing of risk and return in Germany



## Key figures on the risk situation:

The **risk-bearing capacity value**:  
What is the maximum loss (affecting liquidity) that can be absorbed until a "development jeopardizing the existence" occurs?

The **probability of a crisis** (probability of risk-bearing capacity):  
What is the probability that the totality of risks will result in a "development that jeopardizes the company's continued existence"?

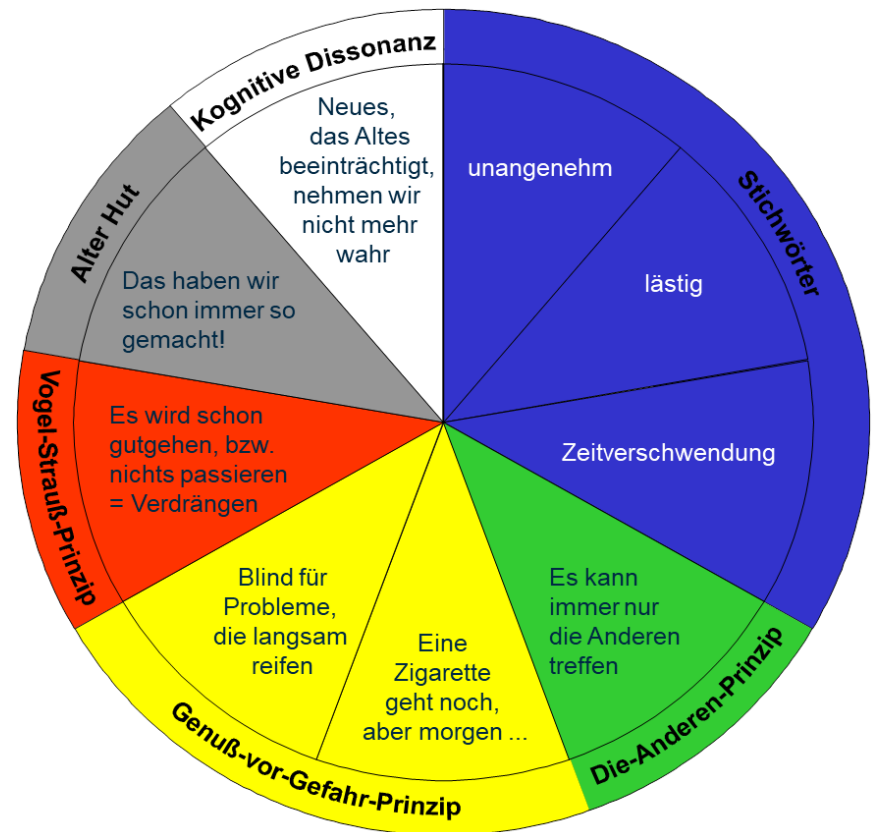
Note: A Monte Carlo simulation is required for **risk aggregation** - e.g. with the **free** "FVG Strategie-Navigator": **Download at:** <http://strategienavigator.net/software>

	Status quo		Including Measure	
	Distance	Probability of Breach	Distance	Probability of Breach
Risk-bearing capacity	€500 million	1 %	€350 million	2.5 %
Risk tolerance	€80 million	8 %	€40 million	10%



# The problem of risk blindness: people don't like to deal with risks!

1. Risks are suppressed. We love (illusory) security.
2. The **distorted perception of risk**:  
(1) striking, often repeated but insignificant risks trigger fear and  
(2) important but abstract risks are ignored.
3. Risks are not adequately factored into **decisions**.



Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, p. 67.



Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, p. 124.

# The future and planning are uncertain:

## What opportunities and risks lead to deviations from the plan?

### Strategic risks Risks

Success potentials and their threats

### Uncertain planning assumptions

Controlling, planning, budgeting

### Other risk areas

Identification by means of workshops

### 1st filter: Setting priorities

#### Determine risk priorities in the risk areas

(Basis: expert assessment, financial data, historical analysis)

### 2nd filter: Rough estimate of relevance

#### Focused risk identification (with relevance assessment)

(Basis: expert assessment, financial data, historical analysis)

### 3rd filter: Risk inventory

#### Detailed analysis of the most important risks (quantification)

- Determination of scenarios and distribution functions
- Detailed justifications and cause-and-effect relationships



# Risk areas (a structural proposal by FutureValue Group AG)

Strategische Risiken	Marktrisiken	Finanzmarkt- risiken	Risiken aus Compliance & Corporate Governance	Supply Chain Risiken/ Leistungsrisiken	Außerordentliche und spezielle operationelle Risiken	
1 Geschäftfelderstruktur und Portfoliorisiken	1 Markttrends	1 Zinsrisiken	1 Rechnungslegung: Vollständigkeit und Einhaltung von Standards	1 Akquisition und Vertriebsprozesse	1 Kalkulationsrisiken bei Projekten und langen Vertrags- laufzeiten	9 Planungs-, Prognose- und Frühwarnsysteme
2 Unsichere Prä- missen und Kon- sistenz der Strategie	2 Struktur der Wettbewerbskräfte	2 Währungsrisiken	2 Internes Kontrollsystem und Umsetzung der Compliance	2 Angebote, Kalkulation, Preissetzung	2 Ausfall zentraler Produktionskompo- nenten	10 FuE-Prozess und technologische Risiken
3 Bedrohung kritischer Erfolgsfaktoren und strategischer Ziele	3 Substitutionsrisiken (z.B. neue Produkte)	3 Wertschwankungen bei Wertpapieren (UV)	3 Unternehmenskultur und Risikokommuni- kation	3 Einkaufs- und Eingangslogistik, Lieferantenwahl	3 Schwankungen der Sonstigen Kosten	11 Datensicherheit
4 Finanzstruktur (insbes. Eigenkapitalquote und Kostenstruktur)	4 Abhängigkeit von einzelnen Kunden	4 Risiken aus Einsatz von Derivaten	4 Investor Relationship und Public Relationship	4 Auftragsplanung	4 Schwankung der Personalkosten	12 IT-Verfügbarkeit
5 M&A-Risiken/ Beteiligungswerte	5 Abhängigkeit von Lieferanten	5 Forderungsausfälle	5 Entlohnungs- und Anreizsysteme	5 Service und Lieferfähigkeit	5 Ausfall Schlüsselpersonen	13 Arbeitssicherheit
6 Megatrends und Trendrisiken: Chancen und Gefahren	6 Bedrohung von Marktposition und Wettbewerbsvorteilen	6 Wertschwankungen von Beteiligungen, Impairmentrisiko	6 Zielkongruenz ökonomischer Entscheidungsregeln	6 Ausgangslogistik	6 Sachanlageschä- den (z.B. durch Feuer)	14 Umweltrisiken
7 Managementrisiken/ Entscheidungsrisiken	7 Markteintritt neuer Wettbewerber	7 Immobilien und sonstige Asset- Klassen	7 Führungsstil, Betriebsklima und Motivation	7 Abrechnung/ Faktura	7 Markenrisiken/ Imagerisiken	15 Vorteilsnahme, Untreue und Betrug
	8 Absatzmengen- schwankungen	8 Finanzielle Stabilität, Rating und Liquidität (Kreditlinie, Covenants)	8 Rechtliches und politisches Umfeld	8 Lieferantenausfall	8 Werkschutz, exogene kriminelle Aktivitäten, Sicher- heitsorganisation	16 Allgemeine Haftpflicht
	9 Absatzpreis- schwankungen	9 Pensionsrück- stellungsrisiken	9 sonstige organisatorische Risiken (Strukturen, Prozesse)	9 spezielle Projektrisiken		17 Produkthaftung
	10 Beschaffungs- marktrisiken (Materialkosten, Rohstoffpreise)		10 Konventionalstrafen, Bürgschaften oder andere Vertragsrisiken			

Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, pp. 148-149.



## Checklist: The 30 most important business risks

1. threat to (core) competencies or competitive advantages (e.g. pricing power through brands).
2. management risks (e.g. wrong decisions from the owners' point of view due to (a) personal interests of the company management or (b) inadequate method of decision preparation).
3. cyclical fluctuations in demand (fluctuations in sales volumes; economic crisis).
4. sales price fluctuations.
5. structural risks of the markets due to unfavorable structure of competitive forces, e.g.
  - limited opportunities for differentiation in stagnating markets,
  - low barriers to market entry or
  - considerable risk of substitution.
6. market entry of new competitors.
7. strong dependencies on a few customers or a few suppliers (or risky countries).
8. possible failure of important projects (e.g. R&D, investments).
9. procurement risks (price, quality, availability).
10. currency risks (relating to current transactions, receivables or liabilities and/or the competitive position).

Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, pp. 207-208.



## Checklist: The 30 most important business risks

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11. interest rate and inflation risk.
12. counterparty default risks, in particular customer insolvency.
13. impairment risks and fluctuations in the value of investments or securities.
14. risks from the use of derivatives.
15. organizational risks due to missing or unclear task and competence regulations.
16. risks due to the loss of key personnel.
17. liability claims or product liability cases.
18. impairment of the ability to deliver due to the failure of central production components (e.g. machine damage).
19. damage to property, e.g. as a result of fire (not insured).
20. personnel cost risks.

Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, pp. 207-208.



## Checklist: The 30 most important business risks

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21. calculation risks, in particular for long-term contracts and in the project business ("project risk").
22. risks due to insufficient early information (e.g. regarding technological trends or competitors' activities).
23. IT failure, data loss and cyber risks.
24. infidelity, fraud.
25. pension provision risk.
26. refinancing risk (bond or large loan or covenants) or financing risk.
27. possible violations of laws and regulations (legal and compliance risks), e.g. weaknesses in the internal control system.
28. risks due to changes in legislation (including tax law) or unclear interpretation of laws ("regulatory risks").
29. sustainability risks (e.g. due to CO2 emissions).
30. fluctuations in the value of inventories.

Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, pp. 207-208.



## A simple measure of risk: rough estimate of relevance

Relevance Scale		
Base Value	Usual Operating Result	
Relevance	in %	Description
1	0 % to 5 %	Insignificant risk, causing barely noticeable deviations from the operating result.
2	5 % to 30 %	Moderate risk, causing a noticeable positive or negative impact on the operating result.
3	30 % to 100 %	Significant risk that strongly influences the operating result, either positively or negatively.
4	100 % to 400 %	Severe risks that could more than double the operating result in a positive case but could lead to an annual loss or significant reduction in a negative case—negative view dominates.
5	> 400 %	Risks that could, with significant probability, more than quadruple the operating result in a positive case, but in a negative case, threaten the company's continued existence—negative view dominates.

Relevance is therefore an expression of the overall significance of the risk for the company and serves as a filter for prioritizing risks.



# Necessity of risk quantification

**Risk quantification:** Description of the stochastic construct "risk" (opportunity and/or hazard) in terms of frequency of occurrence and uncertain effects (over time)

## Why is it necessary to quantify risks and express them in figures?

Because risk information is ultimately used to derive conclusions for variables expressed in figures, e.g.

- **Probability of insolvency** and risk-adequate debt capital interest rates
- **Equity and liquidity requirements**
- Cost of capital and enterprise value (or **project value contribution**)
- Maximum acceptable costs for risk management measures (e.g. insurance premiums).





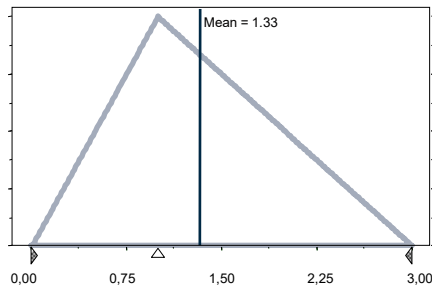
# Risk quantification: Description of risks using probability distributions

## 1 Determination of risk information for relevant risks:

- Evaluation of historical data (e.g. variance analyses)
- And/or in the form of expert assessments (as part of interviews or workshops)

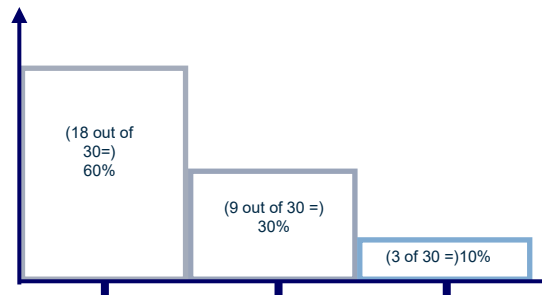
## 2 Risk quantification based on the risk information determined

- Not quantifying a risk at all means quantifying the risk as 0
- Options for quantifying risks (examples):



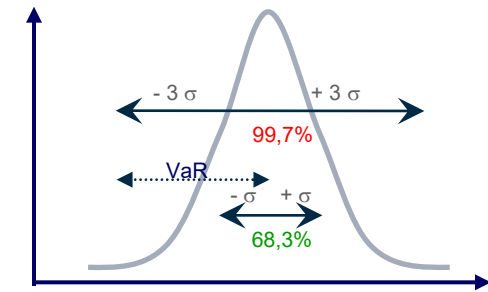
a) Triangular distribution

- Suitable for e.g. volume fluctuations in sales
- Allows simple estimation of maximum, minimum and most probable value



b) Scenario distribution

- Suitable for e.g. machine damage
- Historical data is used to indicate in how many cases the damage has reached certain values (e.g. low damage in 60% of cases)

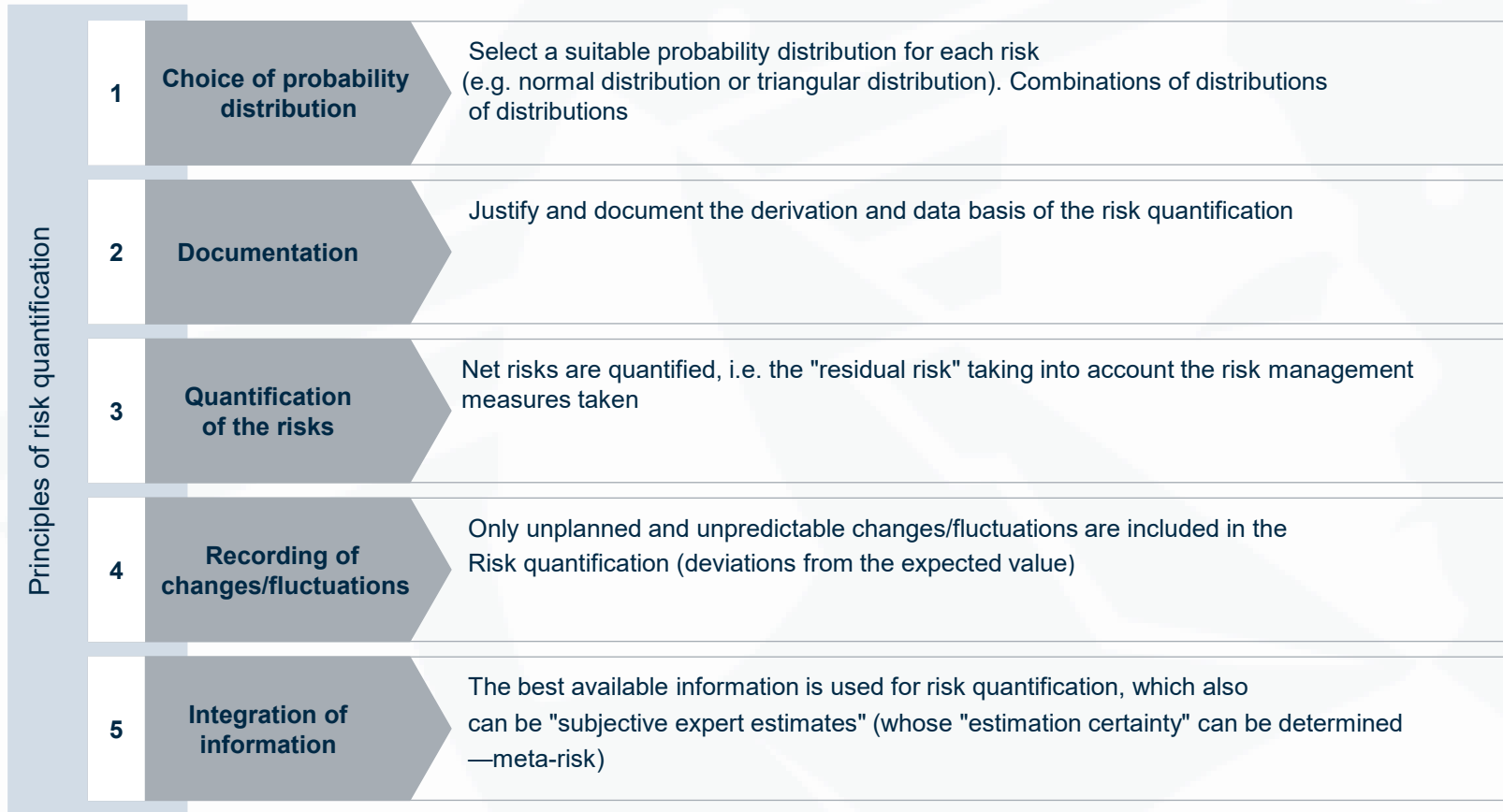


c) Normal distribution

- Suitable for e.g. planning risk (many small individual risks that are independent of each other)
- Describes risk through an expected value and its standard deviation



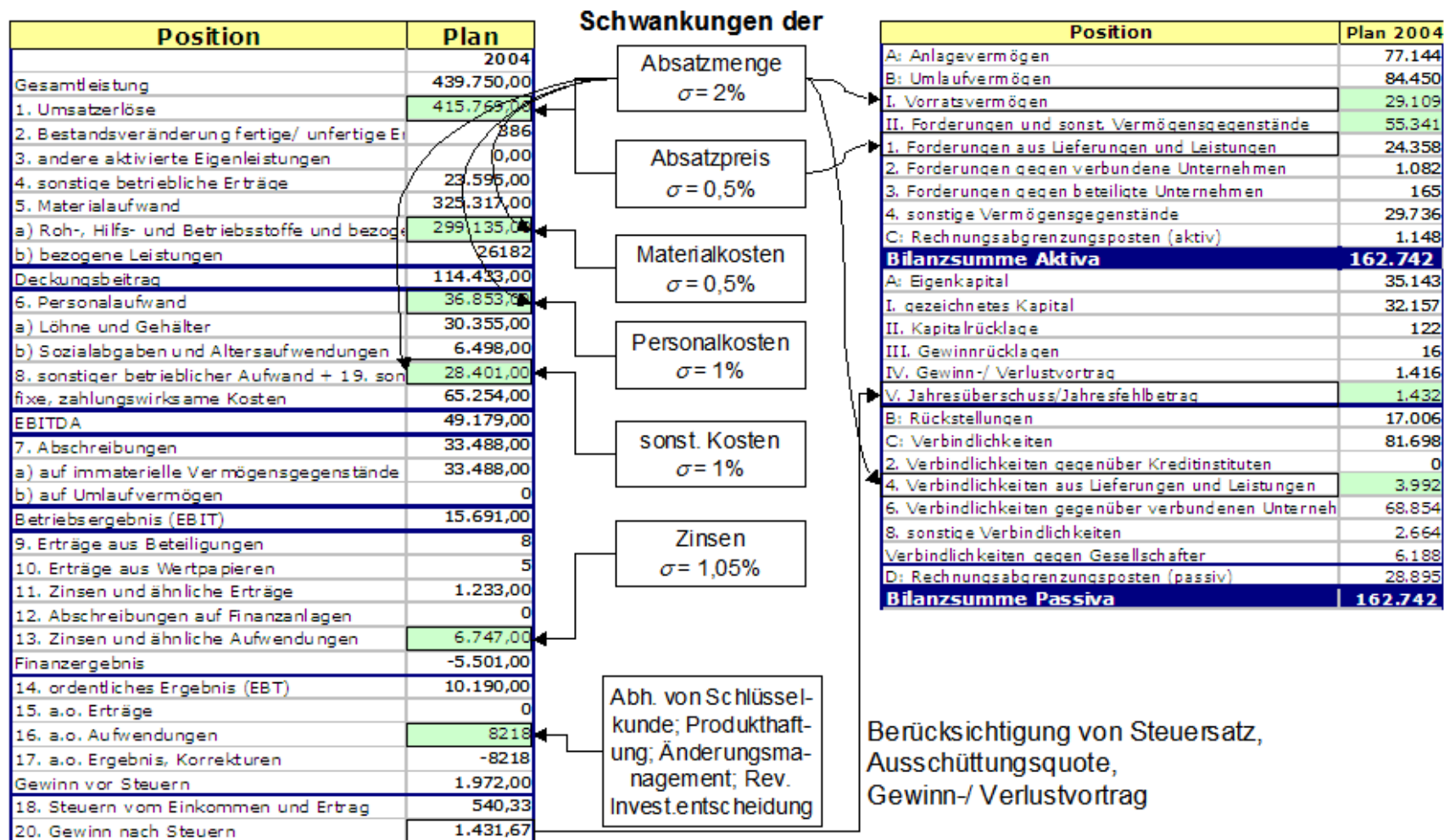
# Principles of risk quantification



Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, pp. 227.



# From strategy to operational planning and risk analysis to risk aggregation —example "Strategy Navigator" (FutureValue Group AG)

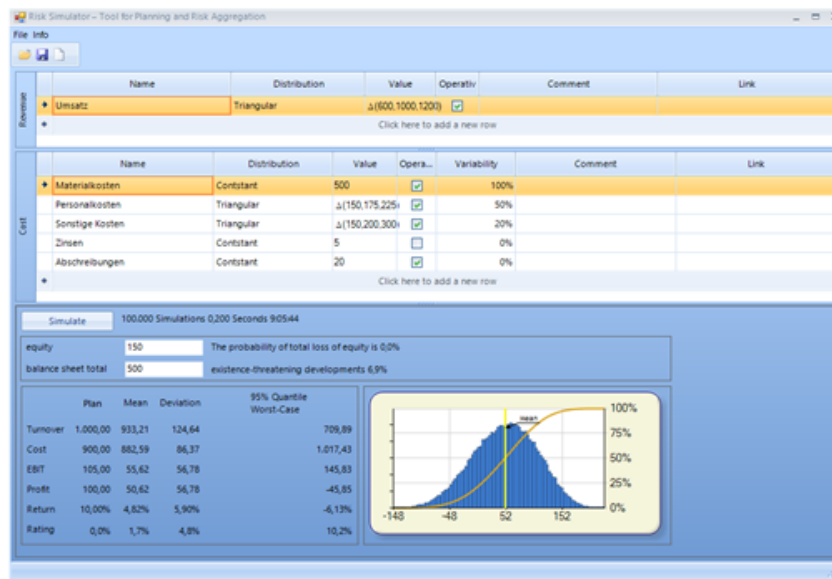


**To Do: Assess the monetary consequences of strategic measures and analyze risks that could cause deviations from the plan!**

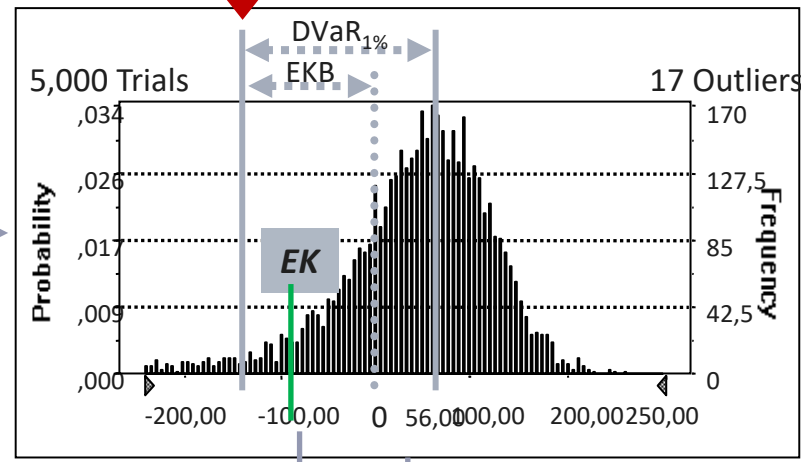


# Risk aggregation (using Monte Carlo simulation): Bandwidth planning and necessity to identify a severe crisis from the combined effects of individual risks

	Ab- satz- menge	Neuer Wettbe- werber	Mate- rial- preise	Perso- nal- kosten	Zins- ände- rung	Maschi- nen- schade n
	R1	R2	R3	R4	R5	R6
<b>Plan G&amp;V</b>						
Umsatz	1.000	+/-5%	-100			
- Materialkosten	400		+/-10%			
= Deckungsbeitrag	600			+/-2%		
- Personalaufwand	300					
- Sonstige Kosten	150					
davon Risikotransfer	5					
- AfA	50					
= Betriebsergebnis	100				+/-1%	
- Zinsaufwand	44					
- a.o. Ergebnis	0					- 200
<b>= Gewinn vor Steuern</b>	<b>56</b>					



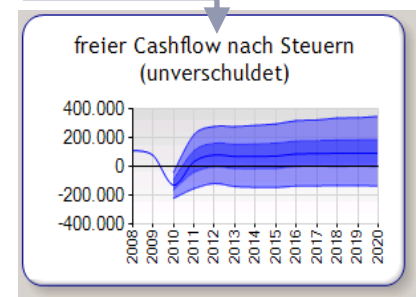
**Target level (here 1%) is rating-dependent.**



**Estimation of the probability of default (PD)**

*In what % of the simulated future scenarios does (1) over-indebtedness or (2) illiquidity occur?*

**Assignment of a rating grade possible!**



**Ratingklasse nach S&P (idealiert – nicht auf historischen Ausfallraten basierend)**

AAA	Sehr gut: Höchste Bonität; nahezu kein Ausfallrisiko	0,01%
AA+	Sehr gut bis gut: hohe Zahlungswahrscheinlichkeit, geringes Ausfallrisiko	0,02%
AA	Sehr gut bis gut: hohe Zahlungswahrscheinlichkeit, geringes Ausfallrisiko	0,03%
AA-	Sehr gut bis gut: hohe Zahlungswahrscheinlichkeit, geringes Ausfallrisiko	0,04%
A+	Gut bis befriedigend: angemessene Deckung von Zins und Tilgung; Risikoelemente vorhanden, die sich bei Veränderung des wirtschaftlichen Umfeldes negativ auswirken	0,05%
A	Gut bis befriedigend: angemessene Deckung von Zins und Tilgung; Risikoelemente vorhanden, die sich bei Veränderung des wirtschaftlichen Umfeldes negativ auswirken	0,06%
A-	Gut bis befriedigend: angemessene Deckung von Zins und Tilgung; Risikoelemente vorhanden, die sich bei Veränderung des wirtschaftlichen Umfeldes negativ auswirken	0,09%
BBB+	Befriedigend: angemessene Deckung von Zins und Tilgung; spekulative Elemente oder mangelnder Schutz gegen Veränderungen des wirtschaftlichen Umfeldes vorhanden	0,13%
BBB	Befriedigend: angemessene Deckung von Zins und Tilgung; spekulative Elemente oder mangelnder Schutz gegen Veränderungen des wirtschaftlichen Umfeldes vorhanden	0,22%
BBB-	Befriedigend: angemessene Deckung von Zins und Tilgung; spekulative Elemente oder mangelnder Schutz gegen Veränderungen des wirtschaftlichen Umfeldes vorhanden	0,39%
BB+	Ausreichend: mäßige Deckung von Zins und Tilgung (auch in einem guten wirtschaftlichen Umfeld)	0,67%
BB	Ausreichend: mäßige Deckung von Zins und Tilgung (auch in einem guten wirtschaftlichen Umfeld)	1,17%
B+	Mangelhaft: mäßige Deckung von Zins und Tilgung (auch in einem guten wirtschaftlichen Umfeld)	2,23%
B-	Mangelhaft: mäßige Deckung von Zins und Tilgung (auch in einem guten wirtschaftlichen Umfeld)	3,51%



# The FVG risk simulator for risk aggregation (see Section 1 StaRUG)

Download at: <http://strategienavigator.net/software>

- **Free** software for simple and fast risk aggregation as an introduction to decision support under uncertainty

**Risikosimulator – Tool für Planung und Risikoaggregation**

Name	Verteilung	Wert	Operativ	Bemerkung	Link
Umsatz	Dreiecksverteilt	Δ(600.1000.1200)	<input checked="" type="checkbox"/>		
	Dreiecksverteilt	Δ(0,0,0)	<input checked="" type="checkbox"/>		

Name	Verteilung	Wert	Operativ	Variabilität	Bemerkung	Link
Materialkosten	Konstant	500	<input checked="" type="checkbox"/>	100%		
Personalkosten	Dreiecksverteilt	Δ(150.175.225)	<input checked="" type="checkbox"/>	50%		
Sonstige Kosten	Dreiecksverteilt	Δ(150.200.300)	<input checked="" type="checkbox"/>	20%		
Zinsen	Konstant	5	<input type="checkbox"/>	0%		
Abschreibungen	Konstant	20	<input checked="" type="checkbox"/>	0%		

Click here to add a new row

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Simulieren 100.000 Simulationen 0,216 Sekunden 15:05:30

Eigenkapital der Vorperiode: 150 Die Wahrscheinlichkeit eines Eigenkapitalverlustes (Überschuldung) beträgt 0,0%

Bilanzsumme der Vorperiode: 500 Die Wahrscheinlichkeit einer Bestandsgefährdung beträgt 7,0%

Anteil Capital Employed an Bilanzsumme: 70% erwartetes Rating (PD für das nächste Jahr) 1,7%

Kopieren	Planwert	Mittelwert	Standardabweichung	95% Quantil Worst-Case
Erlöse	1.000,00	933,71	124,97	708,21
Aufwendungen	900,00	882,98	86,57	1.017,94
EBIT	105,00	55,73	56,90	-41,45
Gewinn	100,00	50,73	56,90	-46,45
Rendite	10,00%	4,83%	5,92%	-6,21%
EKQ	50,00%	40,15%	11,38%	20,71%
ROCE	30,00%	15,92%	16,26%	-11,84%

**Gewinn**

5% 95%

Mittelwert planwert

100% 75% 50% 25% 0%

-145 -45 55 155

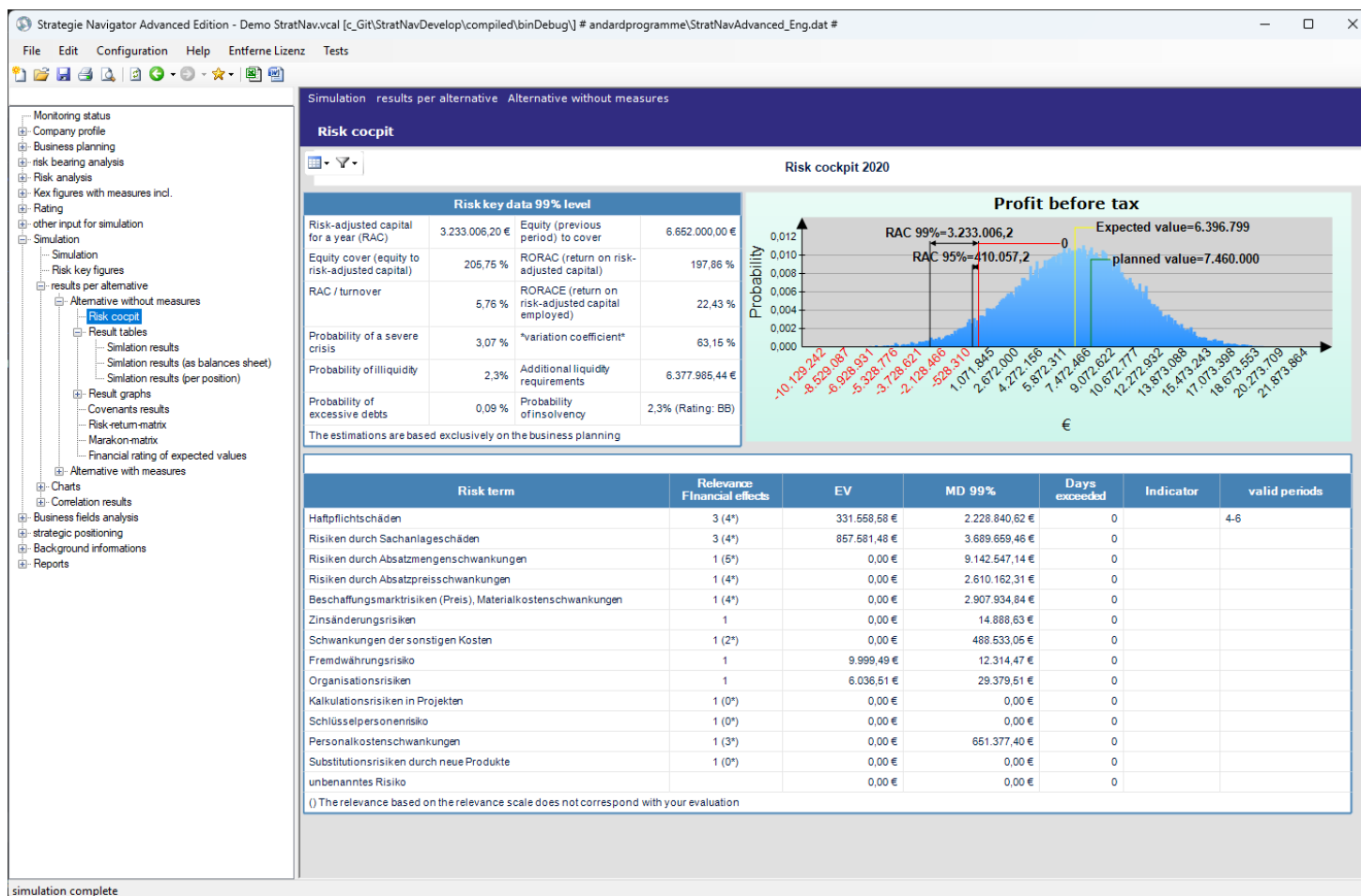
Risikosimulator führt eine Risikoaggregation durch, um Kombinationseffekte von Einzelrisiken zu bestimmen und die Bestandsgefährdung zu ermitteln gemäß § 91 Akt und § 1 StaRUG.

Bestandsgefährdung ist die Möglichkeit der Illiquidität in Folge der Überschreitung der Mindestanforderung an das Rating (siehe Erklärung Rating in der [Kurzbeschreibung](#)) oder der Eintritt einer Überschuldung durch Verluste.

Für eine Schulung über die Verwendung der Software (inkl. methodischem Verständnis) oder für die gemeinsame Durchführung einer quantitativen Risikoanalyse Ihrer Unternehmung schicken Sie uns eine Email an: [Software@futurevalue.de](mailto:Software@futurevalue.de).

Weitere Informationen finden Sie auch in der Literatur zur Methode: W. Gleißner, [Grundlagen des Risikomanagements](#).

Download at: <http://strategienavigator.net/software>

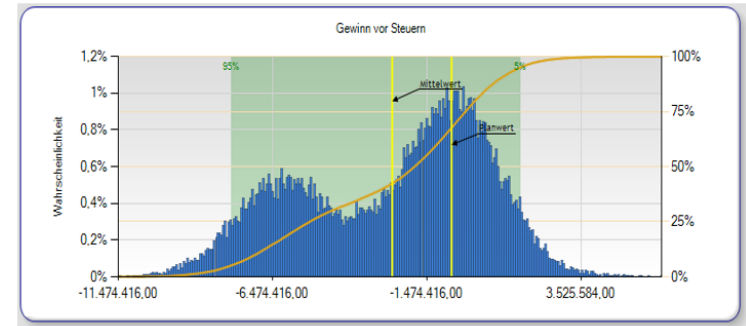


**Strategie-Navigator  
Basic Edition  
(free of charge)**

- Pre-filter for relevant individual risks
- Quantification of net risks (threats and opportunities)
- simplified* Workflows for monitoring etc. *complex possible*
- Quantification of „usual fluctuations“
- Planned values with integrated planning logics
- Linking of risks and planning
- With reference to integrated planning Risk aggregation (Monte Carlo simulation) (if at all) without reference to planning
- Simulated ranges of key figures, esp. rating and capital requirements
- Early risk detection
- going-concern-threatening development
- Probability of covenant breach

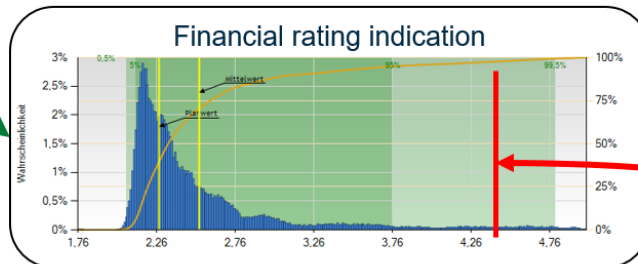
**Typical risk management software**

- Gross risks (threats and opportunities)
- Risk-altering measures



Compliance with legal requirements of corporations

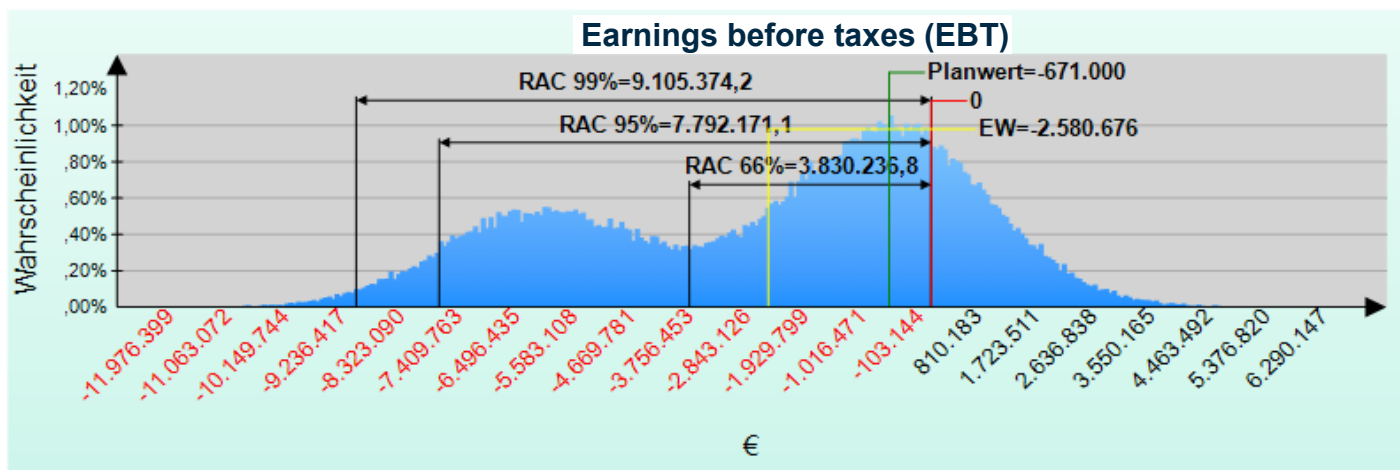
- § 1 StaRUG
- § 91 Abs. 2 AktG
- § 93 AktG



**Risk threshold**



# Overall scope of risk: risk aggregation with Monte Carlo simulation in the context of planning (sample results)



**Risk metrics at the 95% confidence level**

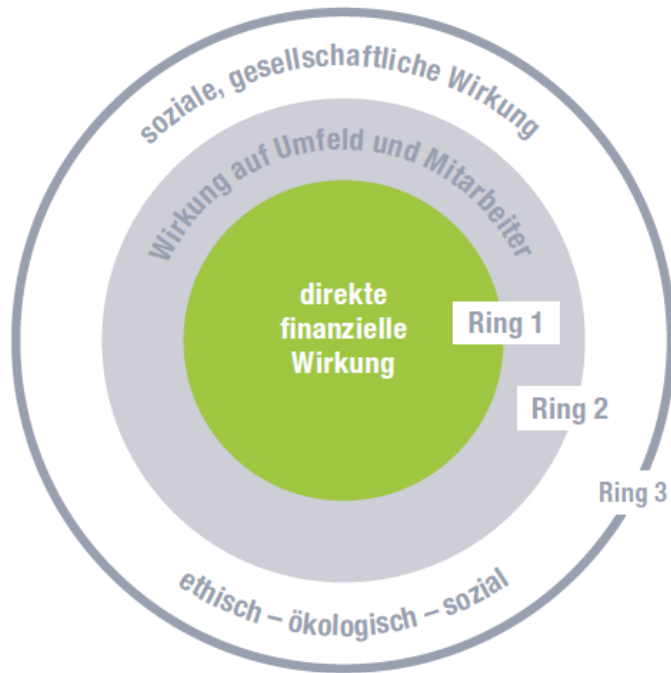
Equity requirement for one year (RAC)	€7,792,171.10	Economic capital (previous period) for coverage	€13,256,000.000
Equity coverage (equity in relation to equity requirement)	170.12%	RoRAC (Return on Risk-Adjusted Capital)	-33.12%
RAC/Total Output	13.64%	Coefficient of variation	-118.01%
Probability of illiquidity	0.0%	Additional liquidity requirement	0.00€
Probability of over-indebtedness	0.0%	Probability of insolvency	0.0% (Rating AA)

These estimates are based solely on the company's planning.

- Degree of threat to the company as a going concern and early detection of "developments jeopardizing the company as a going concern" in accordance with Section 91 AktG (from the combined effects of individual risks)
- The probability of insolvency (derived from the simulation) broken down into illiquidity and overindebtedness
- Distribution of profits, mean value, quantiles
- Equity requirement and equity cover
- Additional liquidity requirements
- Coefficient of variation of profits



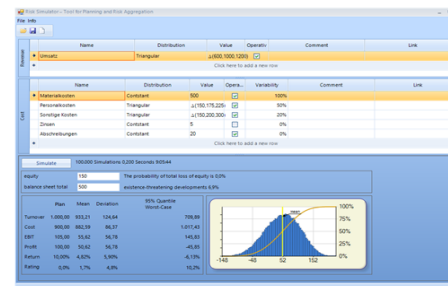
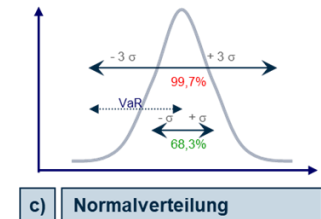
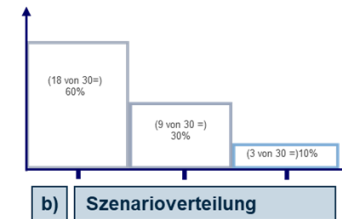
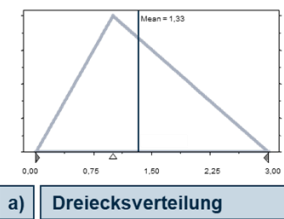
# Special aspect: "Sustainability risks" (ESG risks) are risks that also (!) have non-financial effects!



	Finanzielle Wirkung	Nicht-finanzielle Wirkung
<b>Ring 1:</b> Risiken mit einer direkten finanziellen Wirkung auf das Unternehmen.	X	X
<b>Ring 2:</b> Risiken mit Wirkung auf Kunden, Lieferanten und Mitarbeiter (indirekte finanzielle Wirkung).	(X)	X
<b>Ring 3:</b> Risiken mit „nur“ sozialer oder ökologischer Wirkung	(-)	X

Non-financial metrics required, e.g. DALY, CO<sub>2</sub> emissions (in tons), ...

- Costs due to permissible emissions (e.g. CO<sub>2</sub>)
- Damage due to unacceptable effects on the environment or third parties (e.g. damage payments for environmental pollution)
- Financial impact as a result of (perceived) negative effects of the company's activities on (a) the environment or (b) society (reputational risks with loss of sales)



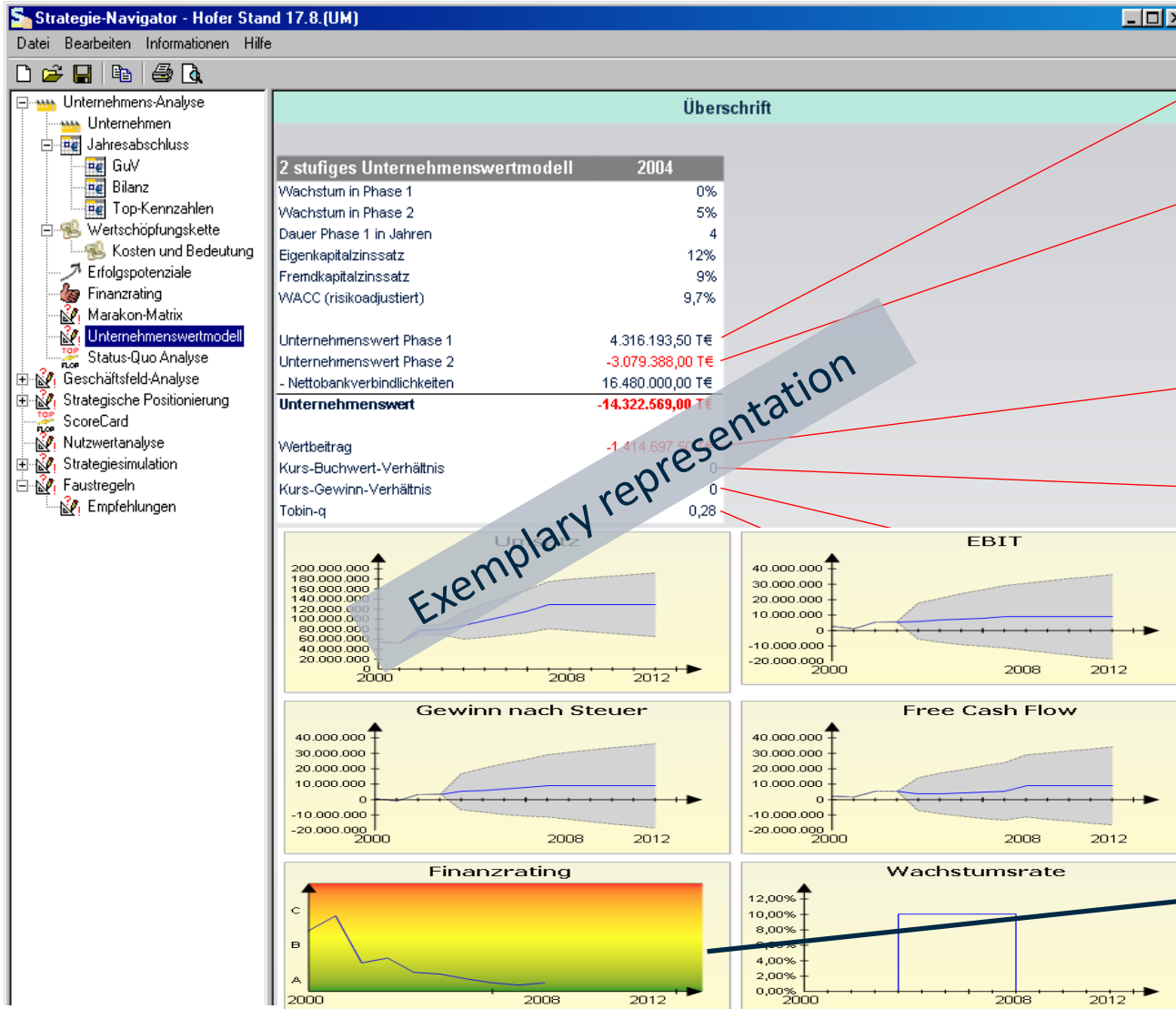
**Attention:** Consider sustainability risks in risk aggregation (§1 StaRUG)

The free **FVG risk simulator**; download at: <http://strategienavigator.net/software>

Source: Gleißner, W. (2019): Nachhaltigkeit, CSR-Risiken und Risikomanagement. Vom CSR-Risiko zum finanziellen Risiko, in: Controller Magazin, No 4, 2019, pp. 95 and Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Verlag Franz Vahlen, Munich 2022.



# Bandwidth planning and simulation-based company valuation based on earnings risk and insolvency risk (Strategie-Navigator, <http://strategienavigator.net/software>)



$$= \sum_{t=0}^T \frac{\text{free Cashflow}_t}{(WACC + 1)^t}$$

"Terminal value", i.e. DCF of the extrapolation period  $t > T$

$$= \text{Capital Employed} \cdot (\text{ROCE} - \text{WACC})$$

$$= \frac{\text{Enterprise Value}}{\text{Equity}}$$

$$= \frac{\text{Enterprise Value}}{\text{EBT}}$$

$$= \frac{\text{Enterprise Value} + \text{Debt}}{\text{Total Assets}}$$

## Valuation of covenants:

- Probability of injury
- Expected loss



# The concrete alternative courses of action developed are visualized in the Risk Optimization Matrix

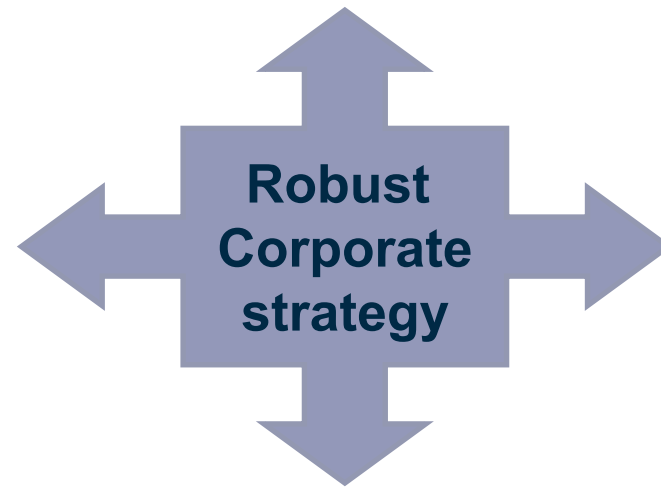
	Strategic risks	Market risks	Financial risks	Legal risks	Performance risks
Avoid	Exit from business segment		Avoid derivatives		Outsourcing
diminish	Expand core competencies	New business areas		Optimize contracts	Design machines redundantly
limit			Interest rate cap		Define revision processes
transfer		Hedging commodity prices	Currency swap	Liability insurance	Business integration insurances
carry yourself (equity)	Increase equity		Develop rating strategies		



# Managing strategic risks and "robust companies"

- Mission statement
- Securing the future for companies
- The development and implementation of a risk-conscious corporate strategy

- Valuable and versatile core competencies in the long term
- Diversification and loss limitation
- Competitive advantages:
  - Differentiation from competitors
  - Long-term customer loyalty



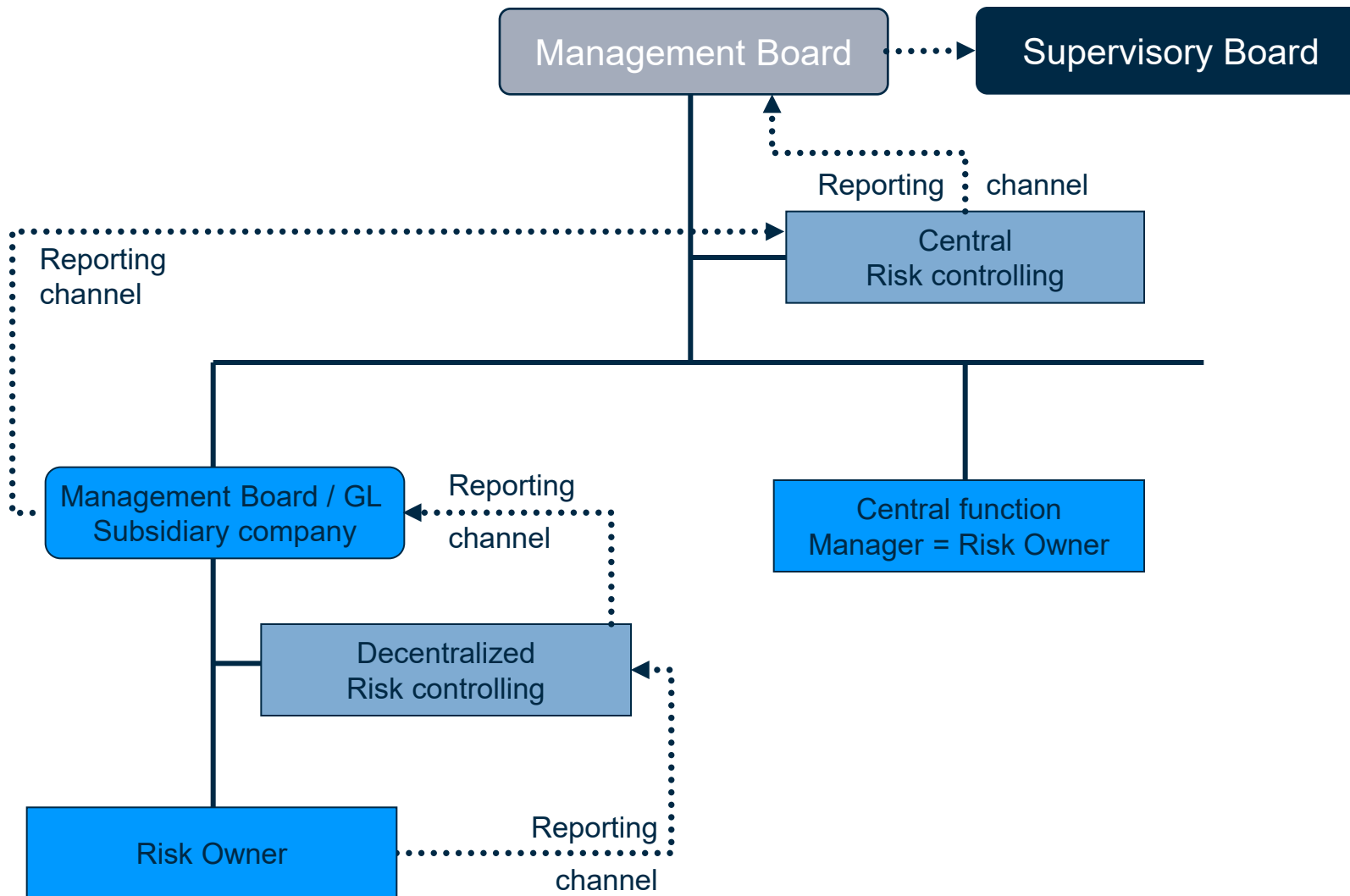
- Optimization of the value chain
- Uncomplicated, stable and flexible workflows
- Redundancies and conditions for self-organizing structures

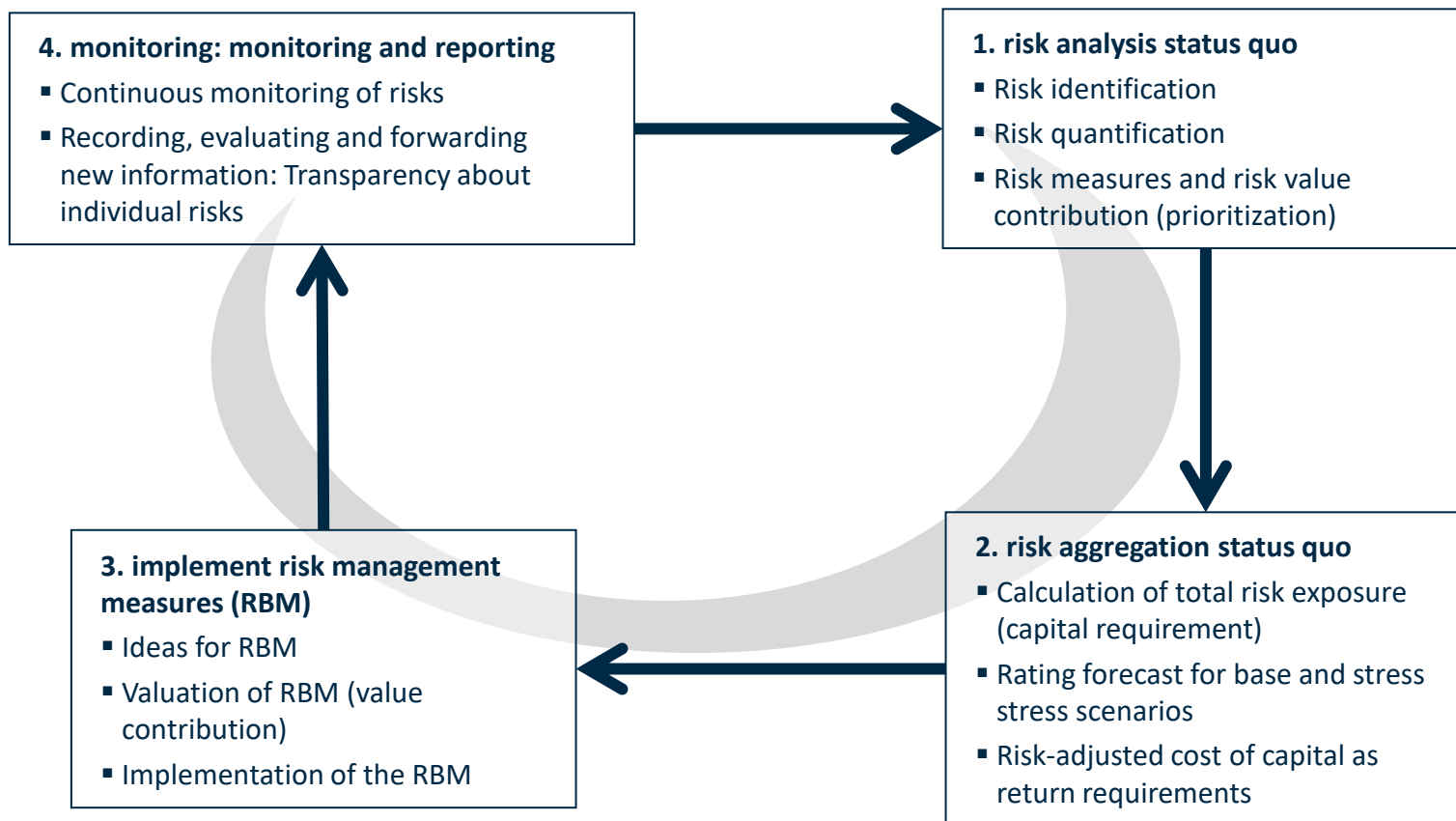
- Flexibility, agility and organizational resilience
- Adaptability to unforeseen developments (e.g. through reserves)
- Reduction of dependencies (e.g. through redundancies)
- Sufficient risk coverage potential (for passive hedging)

Source: Gleißner, W. (2023): Uncertainty and resilience in strategic management: profile of a robust company, in: International Journal of Risk Assessment and Management, Vol. 26, No 1, pp. 75–94.



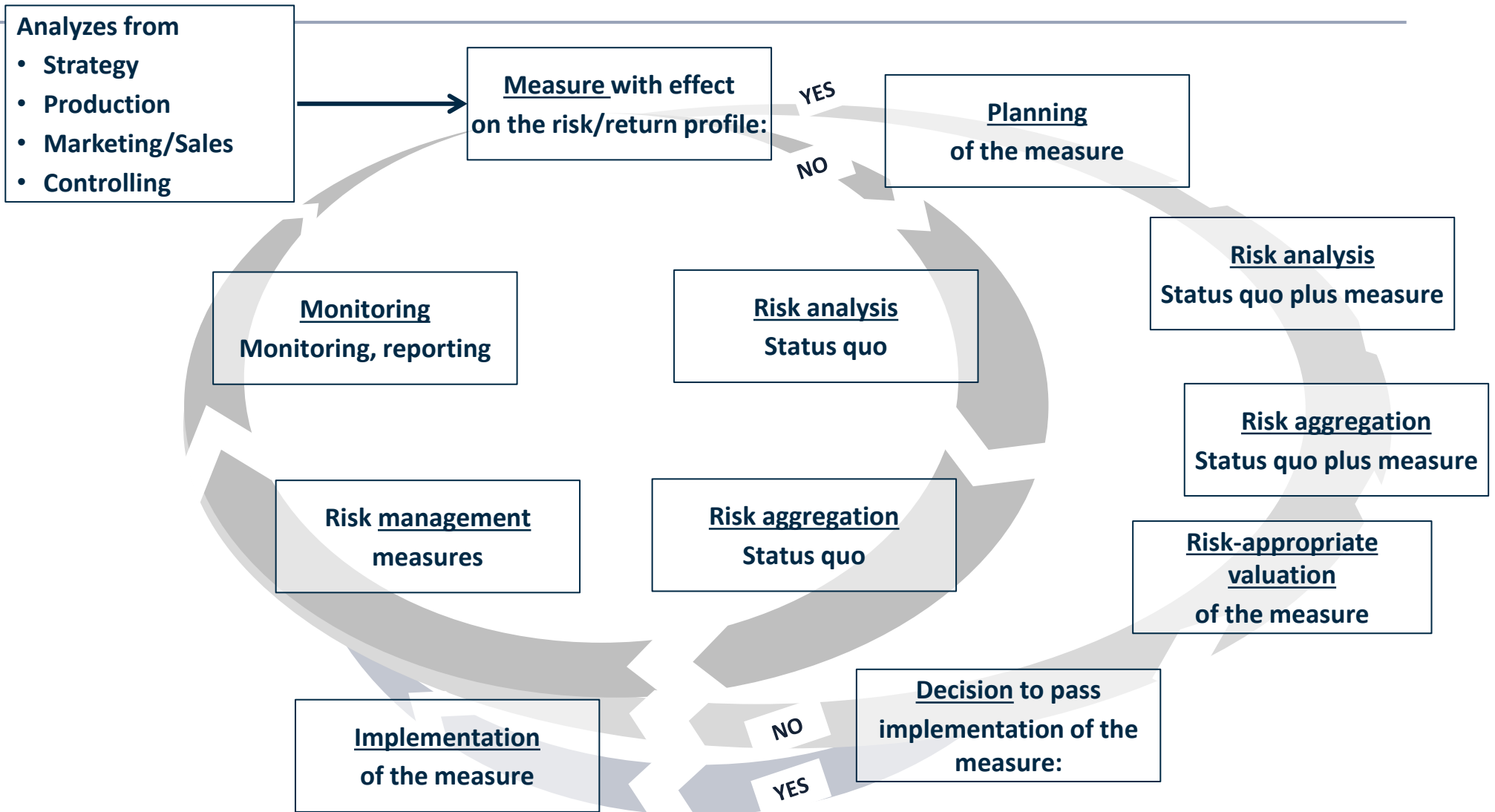
# Organization of the risk management system







# Process in the integrated, decision-oriented risk management system



Cf. Gleißner, W. (2020): Integratives Risikomanagement. Schnittstellen zu Controlling, Compliance und Interner Revision, in: Controlling, 32. Vol., No 4, pp. 23–29;  
Gleißner, W. (2018): Risikomanagement 20 Jahre nach KonTraG: Auf dem Weg zum entscheidungsorientierten Risikomanagement, in: Der Betrieb, No 46, pp. 2769-2774  
and Gleißner, W. / Berger, Th. (2024): Enterprise Risk Management: Improving Embedded Risk Management and Risk Governance, in: Risks, Vol. 12, No 12, 05.12.2024.



# 10 criteria for analyzing the risk management of ...

Early crisis detection (§ Section 91 (2), (3) AktG and Section 1 German StaRUG )		Points
1	There is a documented and explained risk management system (Section 91 (3) AktG) whose organization and processes appear appropriate and effective (in particular for identifying, analyzing and monitoring risks).	
2	Risk aggregation is available and is carried out using an appropriate method (Monte Carlo simulation) and with reference to corporate planning.	
3	All material net risks (threats and opportunities) are analyzed, including those that only or primarily have an impact on liquidity or the balance sheet (risks are not only considered in terms of their impact on earnings).	
4	The risk management system considers rare but relevant "extreme risks" with potential effects that could jeopardize the company as a going concern (e.g. possible economic crises).	
5	Risk quantification is carried out appropriately, i.e. suitable distribution functions are used (and risk quantification is not based solely on probability of occurrence and (expected) loss amount).	
6	The term "going concern risk" is properly operationalized (taking into account, for example, possible threats to ratings and covenants) and there is a key figure for the "degree of going concern risk".	
7	There is a threshold value for the key figures on the threat to the company's existence, above which (1) "suitable countermeasures" are initiated and (2) the supervisory body is informed (Section 1 German StaRUG).	
		<b>0</b> from 14 points
Preparation of decisions / business judgment rule (§ Section 93 German AktG)		Points
8	There are regulations and processes in place to provide and document verifiably appropriate information for "entrepreneurial decisions" by the management, e.g. the risks associated with the decisions.	
9	The decision templates contain neutral and quantitative risk information, the effect of the decision on the company's overall risk exposure is calculated and taken into account in the decision calculation.	
10	Easily identifiable risks, e.g. uncertain planning assumptions, are analyzed in the decision documents.	
		<b>0</b> from 6 points
Points per statement: 0 "not fulfilled" (or not specified) 1 "partially fulfilled" 2 (almost) "fully fulfilled"		<b>0</b> from 20 points



## Criteria for level 3 ("regulatory minimum requirements")

	<b>Level 3: Regulatory Risk Management</b>	<b>Fulfilled</b>	<b>Partly fulfilled</b>	<b>Not fulfilled</b>
1	Are tasks and responsibilities in risk management clearly assigned?			
2	Are all regulations regarding the identification, quantification, and monitoring of risks appropriate, effective, and clearly documented in a way that is understandable to third parties?			
3	Are appropriate types of probability distributions used for risk quantification (for example, triangular distribution with minimum, most likely, and maximum values for cost growth)?			
4	Are the existing risk mitigation measures taken into account as part of the risk quantification?			
5	Is there a suitable and consistently used risk measure to quantitatively compare and prioritize individual risks?			
6	Is it clearly explained what constitutes a "development that endangers the company's continued existence" (§ 91 of the German Stock Corporation Act), e.g. violation of covenants?			
7	Is risk aggregation carried out regularly to identify developments that could endanger the company's existence due to the combination effects of individual risks?			
8	Are the processes for efficient internal risk reporting and risk communication (with reference to appropriate thresholds) clearly defined?			
9	Is there an adequate procedure regarding "ad hoc disclosures" about risks and their impacts?			
10	Are the management board and supervisory board regularly informed about individual risks and the overall risk exposure?			

Source: Gleißner, W. (2018): Prüfung des Risikomanagements – ein Reifegradmodell, in: Der Aufsichtsrat, No 2/2018, pp. 18–21.



# Criteria for level 4 ("decision-oriented risk management")

	<b>Level 4: economic risk management (decision-supporting)</b>	<b>Fulfilled</b>	<b>Partly fulfilled</b>	<b>Not fulfilled</b>
1	Are opportunities and threats (risks) considered in relation to planned values (risks as a key cause of deviations from the plan)?			
2	Are strategic risks also identified and regularly discussed in corporate management, especially threats to the company's success potential?			
3	Are existing (management) systems, such as controlling, treasury, or quality management, integrated into the risk analysis?			
4	Is risk aggregation performed over multiple years within the context of integrated corporate planning, meaning that risks are assigned to the positions where they can cause deviations?			
5	Are documented risk analyses conducted to prepare executive board decisions, showing how the scope of risk would change as a result of those decisions (§ 93 German Stock Corporation Act)?			
6	Are the implementation and effectiveness of risk mitigation measures assessed and monitored?			
7	Is a risk policy formulated that is consistent with the company strategy and defines the framework for risk management and risk-oriented corporate governance?			
8	Does the risk manager have the necessary skills, resources, and authority (for example, the right to access information about all potentially risky activities such as planned acquisitions or investments)?			
9	Are the implications of risk analyses evaluated regarding the financing structure (equity requirements) and appropriate debt conditions?			
10	Is risk considered an important factor in strategy development when selecting strategic options (goal: robust strategy)?			

Source: Gleißner, W. (2018): Prüfung des Risikomanagements – ein Reifegradmodell, in: Der Aufsichtsrat, No 2/2018, pp. 18 – 21



# Value-based management & valuation of a strategic option (strategy evaluation: valuation of the risk-return profile)

The value of a payment series is the certain amount of money that is "equivalent" to the (uncertain) payments to be valued ("provides the same benefit").

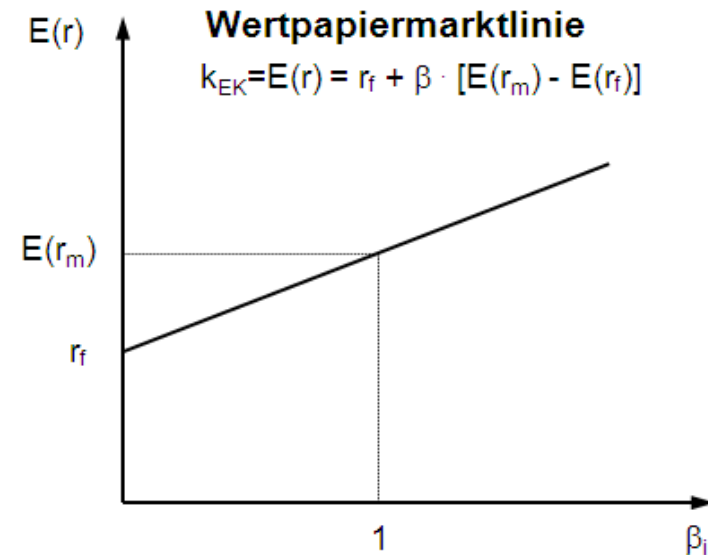
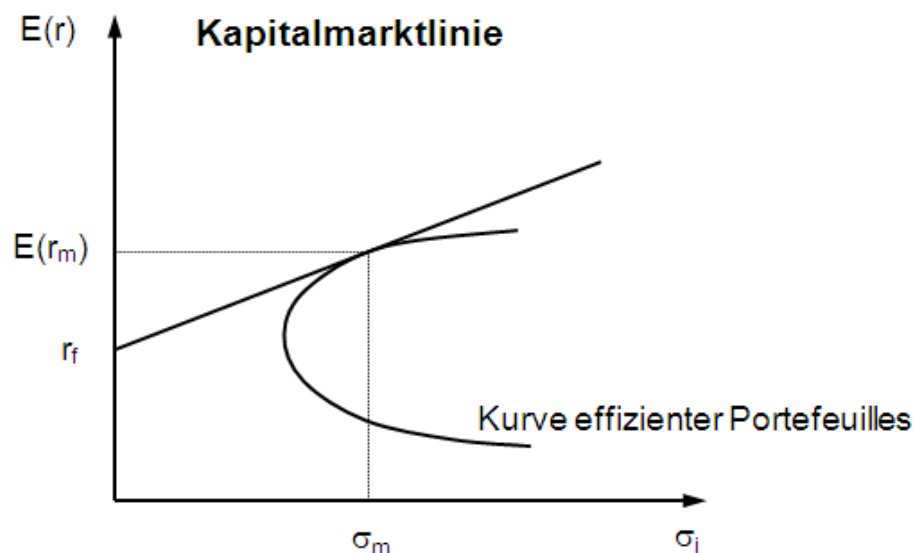
**Therefore: cost of capital from earnings risk, not capital market data (CAPM beta)**

	Status quo	Option for action: foreign expansion	
Earnings (EBIT, plan 2025)	16	18,5	Significant increase in earnings
Risk (coefficient of variation return)	19%	21%	Moderately increased risk
Cost of capital (k)	5,50%	5,70%	
Rating	BB+	BB+	
Rating (stress scenario)	BB	BB-	Stable rating
Value (in € million)	153	168	Clear increase in value
Strategic fitting			Competencies available

Source: Gleißner, W. (2015): Controlling und Risikoanalyse bei der Vorbereitung von Top- Management-Entscheidungen – Von der Optimierung der Risikobewältigungsmaßnahmen zur Beurteilung des Ertrag-Risiko-Profiles aller Maßnahmen, in: Controller Magazin, No 4/2015, pp. 4–12; Gleißner, W. (2019): Cost of capital and probability of default in value-based risk management, in: Management Research Review (MRR), Vol. 42, No. 11, pp. 1243–1258 and Gleißner, W. / Ernst, D. (2024): Neue Wege der Unternehmensbewertung – Der BGH-Beschluss zur Bestimmung der angemessenen Abfindung und seine Auswirkungen, in: BFuP, No 4, S. 414–431.



# Problems of the CAPM: alternative ways of calculating the cost of capital required



$r_f$  = Risikofreie Rendite  
 $E(r)$  = erwartete Rendite einer Aktie (EK)  
 $\sigma$  = Standardabweichung der Rendite  
 $\sigma_i$  = Kovarianz der Renditen

$E(r_m)$  = Erwartungswert der Rendite des Markportefeuilles  
 $\sigma^2$  = Varianz der Rendite  
 $\beta$  = systematisches Risiko des Eigenkapitals

## Die Probleme der traditionelle Verwendung des CAP-Modells:

1. Kennt der Kapitalmarkt die Risiken so gut wie die Unternehmensführung?
2. Sind nur systematische Risiken relevant?
3. Sind historische Kapitalmarkt-Daten (Aktienrenditen) repräsentativ für die Zukunft?
4. Was tun, wenn keine Kapitalmarktdaten existieren?

Source: Gleißner, W. (2014): Kapitalmarktorientierte Unternehmensbewertung: Erkenntnisse der empirischen Kapitalmarktforschung und alternative Bewertungsmethoden, in: Corporate Finance, 4/2014, pp. 151–167 und Gleißner, W. (2019): Cost of capital and probability of default in value-based risk management, in: Management Research Review (MRR), Vol. 42, No. 11, pp. 1243–1258.



# From risk analysis to risk-adequate valuation: effects on the expected value of cash flow, insolvency risk and discount rate

## 1. earnings risk of the company as a basis

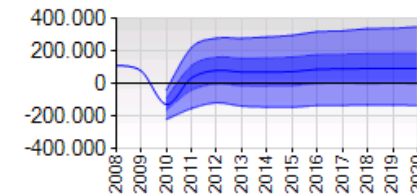
- In contrast to the capital market-based models (e.g. CAPM), the **expected values and the valuation-relevant risks are determined** on the basis of the **uncertain income/cash flows** to be valued (risk discount) and no recourse to (historical) capital market data is necessary (risk-value model, "imperfect replication").

$$E(EBT) - \lambda \cdot R(EBT)$$

$$c = \frac{1 + r_f}{1 - \lambda \cdot V(E) \cdot d} - 1$$

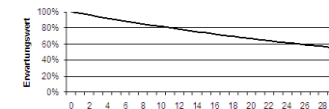
## 2. simulation-based valuation approaches

- The **uncertain payments** to be valued are determined on a forward-looking basis using a **stochastic planning model** for the valuation object by means of **Monte Carlo simulation**. This makes it possible to link **operational planning and all uncertainties**.



## 3. insolvency risk & risk coverage approach (rating restrictions)

- The **"finiteness"** of a **company's** existence (or the income stream for the owners) due to **insolvency (probability, p)** must be taken into account. The **risk coverage approach** also takes existing **rating and financing restrictions** into account in the valuation.



$$V(EBT_t) = \frac{E(EBT) \cdot (1 - p)}{c + p}$$

Cost of capital (c), risk-free rate ( $r_f$ ), Sharpe Ratio ( $\lambda$ ), Coefficient of variation of return ( $V(EBT)$ ), Risk diversification factor (d), Cf. Gleißner, W. (2014): Kapitalmarktorientierte Unternehmensbewertung: Neue Erkenntnisse der empirischen Kapitalmarktforschung und Relevanz einer investitionstheoretischen Bewertung, in: CF, 4/2014, pp. 151-167; Gleißner, W. (2019): Cost of capital and probability of default in value-based risk management, in: MRR, Vol. 42, No. 11, pp. 1243-1258 und Gleißner, W./Follert, F. (2022): Unternehmensbewertung im Spannungsfeld zwischen Zweckadäquanz und Praktikabilität. Ein Lösungsansatz für die gerichtliche Abfindungsbemessung, in: BFuP, 74. Vol., No 4, pp. 395-419..



# The value (V) as a performance measure combines expected cashflows (CF) and risks—often via the cost of capital (C) as a risk-adjusted return requirement

(A) **Payment series:** expected values(!) of the result variable

$$V(CF) = \sum_{t=1}^{T-1} \frac{E(CF_t)}{(1+c)^t} + \frac{1}{(1+c)^{T-1}} \cdot \frac{E(CF_T)}{c - g_T + p_T \cdot (1 + g_T)}$$

(B) **Risk:** risk-adjusted cost of capital as discounting factor

(C) **Rating:** Probability of insolvency as "negative growth rate"

1. **Generation** : Derivation of capital costs from historical share return fluctuations (CAPM); neglect of insolvency risks (rating and financing restrictions)
2. **Generation** : simulation-based valuation based on planning and risk analysis takes into account earnings and insolvency risks (higher earnings risks lead to higher equity requirements and higher capital costs)



# Methodology: How do you capture risks in company valuation?

## Discount rate from the "earnings risk" according to risk analysis

- **How do you achieve "risk equivalence"?** The problem: From historical stock returns ( $\beta$  - factor from CAPM) cannot be used in an imperfect capital market to infer the risks of future cash flows (and thus the cost of capital or discount rate) of a company, a strategy, a business unit or a project. But practice wants cost of capital rates (discount rate) for DCF!
- **Solution approach based on the aggregated risk scope  $R(Z)$ , i.e. earnings risk** (with probability of insolvency  $p = 0$  or recorded in  $E(\cdot)$ ):  
Valuation possible via (1) risk-adjusted cost of capital  $k$  or

(2) risk discount from the expected value of the payment  $Z$

**Assumption for deriving the valuation equation using "incomplete replication": Two payments have the same value if they match in (a) time, (b) expected value and (c) risk measure! Here: For alternative investments (a) German government bonds ( $r_f$ ) and (b) global equity index**

$$V(CF) = \underbrace{\frac{E(CF)}{1+c}}_{(1) \text{ Risk-adjusted cost of capital}} = \frac{E(CF) - \lambda_R \cdot R(CF) \cdot d}{1+r_f}$$

(2) Risk discount from the expected value

$$k = \frac{1+r_f}{1 - \lambda_\sigma \cdot \frac{\sigma(\tilde{Z})}{E(\tilde{Z})} \cdot d} - 1 \approx r_f + \lambda_\sigma \cdot V \cdot d$$

$$\lambda_\sigma = \frac{E(\tilde{r}_m) - r_f}{\sigma(\tilde{r}_m)}$$

Source: Gleißner, W.: Die risikogerechte Bewertung alternativer Unternehmensstrategien: ein Fallbeispiel jenseits CAPM, in: Bewertungspraktiker, 3/2013, pp. 82 – 89; Gleißner, W. (2011): Risikoanalyse und Replikation für Unternehmensbewertung und wertorientierte Unternehmenssteuerung, in: WiSt, 7/11, pp. 345 – 352  
Gleißner, W. (2019): Cost of capital and probability of default in value-based risk management, in: Management Research Review, Vol. 42, No. 11, pp. 1243-1258  
und 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.



# Insolvency risk and expected duration of existence

The primary effect of insolvency risk is that a company does not exist forever. Like insolvency costs, this influences the amount and timing of expected cash flows/income.

Even with an insolvency probability of  $p > 0$ , companies can exist indefinitely, i.e. there is no certain point in time at which they will cease to exist.

The probability of insolvency thus leads to a finite expected value of the service life, but not to a limit on the service life.

Rating	$p$ (per year)	Expected service life (= $1/p$ )
A	0.1 percent	1000
BBB	0.5 percent	200
BB	1.0 percent	100
BB-	2.0 percent	50
B	5.0 percent	20

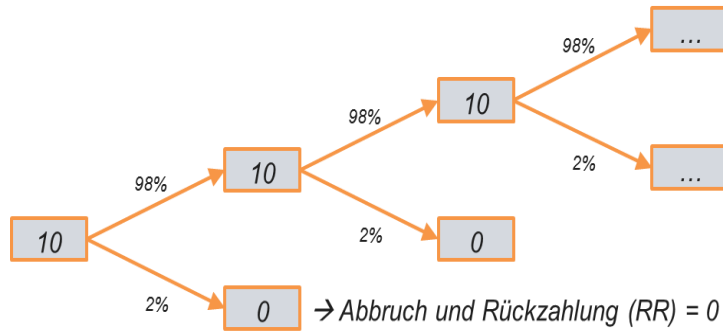
Of particular relevance to the valuation is the probability  $p$  that the cash flow will be interrupted within a year, because the payments to the owners are usually zero anyway in the event of insolvency.

Source: Gleißner, W. (2010): Unternehmenswert, Rating und Risiko, in: WPg, 14/2010, 63. Vol., pp. 735–743 und Franken, L./Gleißner, W./Schulte, J. (2020): Insolvenzrisiko und Berücksichtigung des Verschuldungsgrads bei der Bewertung von Unternehmen – Stand der Diskussion nach Veröffentlichung des IDW Praxishinweises 2/2018, in: Corporate Finance, No 03-04 vom 30.03.2020, pp. 84-

96.



# The probability of insolvency must be taken into account in the detailed planning and updating phase



Company-specific (!) insolvency risk must always be considered.

Recording via (1) p surcharge in the usual annuity model (2) binomial tree, which, however, does not allow negative fCf (3) Monte Carlo simulation.

Time (t)	1	2	3	4 ff.
E(CF) without insolvency (conditional)	10	15	20	20
Probability of insolvency $p_t$	0,02	0,02	0,02	0,02
Probability of survival	0,98	0,96	0,94	$(1-p)^t$
Expected value ( $CF_t^e$ )	9,8	14,4	18,8	18,4

$$V = \sum_{t=1}^{\infty} \frac{CF_t^e}{(1+c)^t} = \sum_{t=1}^T \frac{CF_t^e}{(1+c)^t} + \frac{CF_{T+1}}{(1+c)^T(c+p)} = \frac{9,8}{1,1} + \frac{14,4}{1,1^2} + \frac{18,8}{1,1^3} + \frac{18,4}{1,1^3 \cdot (0,1+0,02)} = 150$$

with a risk-adjusted discount rate of  $k=10\%$  and a long-term growth rate of  $w=0\%$

Gleißner, W. (2017): Das Insolvenzrisiko beeinflusst den Unternehmenswert: Eine Klarstellung in 10 Punkten, in: BewertungsPraktiker, 2/2017, pp. 41-50.; Lobe, S./Hölzl, A. (2011): Ewigkeit, Insolvenz und Unternehmensbewertung: Globale Evidenz, in: CFB, No 04, pp. 252-257; Gleißner, W. (2010): Unternehmenswert, Rating und Risiko, in: Die Wirtschaftsprüfung, 14/2010, 63. Vol., pp. 735-743.; Friedrich, T. (2015): Unternehmensbewertung bei Insolvenzrisiko und Gleißner, W. (2002): Wertorientierte Analyse der Unternehmensplanung auf Basis des Risikomanagements, in: Finanz Betrieb, No 7-8/2002, pp. 417-427.



# Rating forecast—comparison of base and stress scenario

In the rating forecast, the expected future rating is derived by using the company's financial planning to calculate the key financial ratios that significantly influence the rating.

Financial rating 12/31/2016								
Kennzahlen	CCC	B	BB	BBB	A	Wert		
wirtschaftliche Eigenkapitalquote, bereinigt	<10%	>10%	>20%	>35%	>60%	49,8%		→
dynamischer Verschuldungsgrad (a)	>8	<8	<4	<1	<0,01	5,2		→
Zinsdeckungsquote	<1	>1	>2,5	>4	>9	32,1		↑
operative Marge (EBIT-Marge)	<0%	>0%	>5%	>10%	>15%	5,5%		↑
Kapitalrückflussquote	<5%	>5%	>10%	>15%	>25%	13,7%		↑
Gesamtkapitalrendite (ROCE, mit vorjahres CE)	<0%	>0%	>5%	>10%	>20%	9,1%		↑
Quick-Ratio	<80%	>80%	>90%	>140%	>200%	136,4%		→
Verbindlichkeitenrückflussquote	<-10%	>-10%	>0%	>10%	>20%	4,1%		↑

Financial rating 12/31/2013	<input type="range" value="2.5"/>	2,5
PD_according to financial rating		0,72%

Base scenario: 6,7 % growth  
Stress scenario: 20 % drop in sales

Rating Forecast 2016 Basis (above) and  
Rating Forecast 2016 Stress (right)

Financial rating 12/31/2016								
CCC	B	BB	BBB	A	Wert			
<10%	>10%	>20%	>35%	>60%	45,5%		→	
>8	<8	<4	<1	<0,01	+ ∞		→	
<1	>1	>2,5	>4	>9	-12,2		↓	
<0%	>0%	>5%	>10%	>15%	-2,7%		↓	
<5%	>5%	>10%	>15%	>25%	0,6%		↓	
<0%	>0%	>5%	>10%	>20%	-4,1%		↓	
<80%	>80%	>90%	>140%	>200%	133,2%		→	
<-10%	>-10%	>0%	>10%	>20%	14,2%		↑	

Financial rating 12/31/2013	<input type="range" value="3.9"/>	3,9
PD_according to financial rating		5,83%

In the base scenario, the rating improves by one notch to a BBB rating, while in the stress scenario, a drop to a B rating is observed.



# Ten points of clarification on insolvency risk

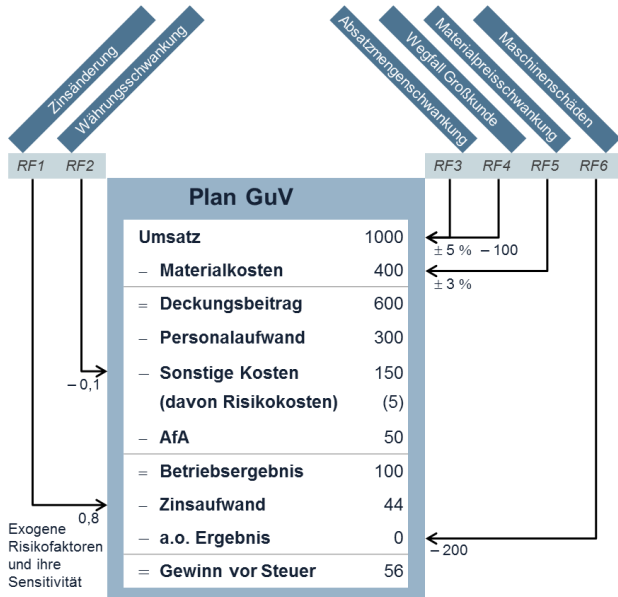
(which depends on the earnings risk)

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1. In a perfect market without insolvency costs, there is no need to include insolvency risks in the valuation; but there is also no need for company valuations
2. Insolvency risk leads to deviations between contractual borrowing rates and borrowing costs
3. The credit spread is usually higher than necessary to compensate for the probability of insolvency (or expected loss)
4. Insolvency costs reduce the value of the company as a whole (entity value)
5. The possibility of insolvency must be taken into account when deriving the "expected" plan values
6. The probability of insolvency must be taken into account in the detailed planning and extrapolation phase and also reduces the value of the tax shield (note: if convergence of return against cost of capital is assumed, this may be "implicit")
7. Recognizing the insolvency risk in the continuation phase requires (a) a probability of insolvency in the denominator (TV formula) and/or (b) a Monte Carlo simulation.
8. Even with an option valuation model, the insolvency risk does not lead to an increase in company value
9. Only insolvency scenarios with restructuring can be value-enhancing
10. Companies with high levels of debt can expect below-average returns on the stock market

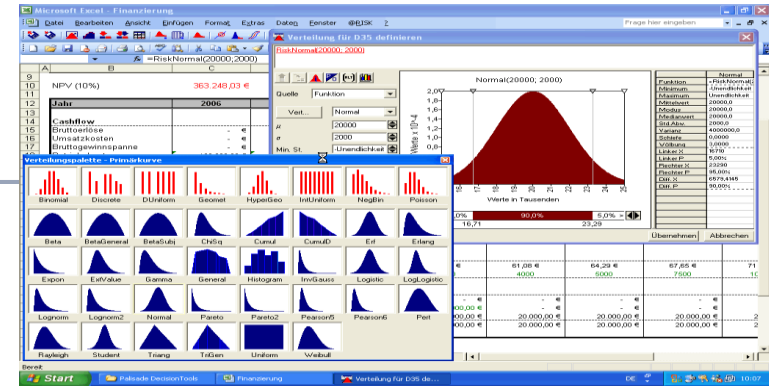
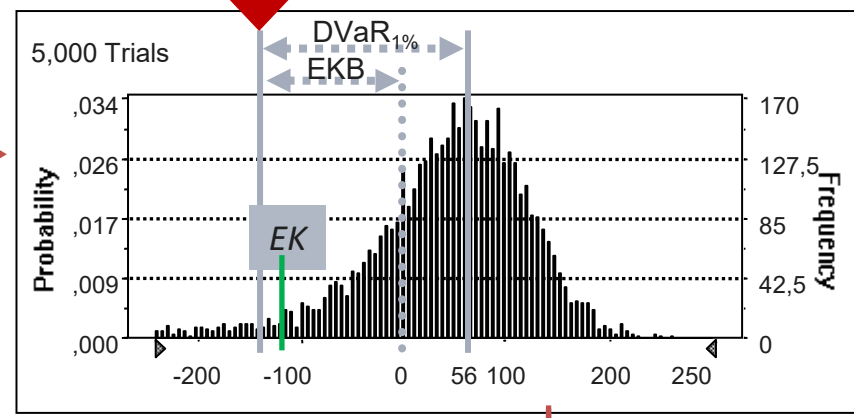
Source: Gleißner, W. (2017): Das Insolvenzrisiko beeinflusst den Unternehmenswert: Eine Klarstellung in 10 Punkten, in: BewertungsPraktiker, No 02, pp. 42-51; Gleißner, W. / Ernst, D. (2019): Company valuation as result of risk analysis: replication approach as an alternative to the CAPM, in: Business Valuation OIV Journal, Vol. 1, No 1, pp. 3–18; Gleißner, W. / Ernst, D. (2023): The Simulation-Based Valuation of Companies and Their Strategies – Classification, Methodology and Case Study, in: EBVM – The European Business Valuation Magazine, Vol. 2, No 2, pp. 4-16.

# The methods: Risk quantification, risk aggregation & valuation



Target level (here 1%) is rating-dependent.

Risk aggregation

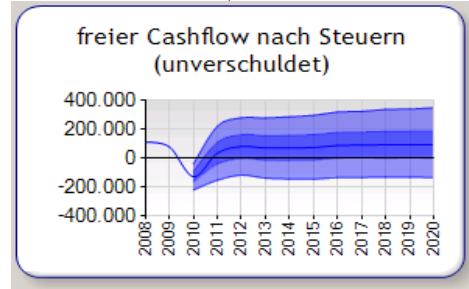


Europe (1981-2016)	Time (years)						
Rating	1	2	3	4	5	6	7
AAA	0	0	0	0	0	0	0
AA	0	0,03	0,07	0,14	0,21	0,29	0,33
A	0,04	0,08	0,13	0,19	0,29	0,39	0,51
BBB	0,08	0,23	0,39	0,54	0,65	0,9	1,13
BB	0,41	1,38	2,35	3,06	4,2	5,15	6,11
B	2,53	6,21	9,37	11,86	13,86	15,26	16,06
CCC/C	26,38	35,4	40,64	45,64	48,01	48,01	49,05
Investment grade	0,04	0,12	0,19	0,28	0,38	0,5	0,63
Speculative Grade	2,73	5,4	7,59	9,28	10,84	11,94	12,83
All ratings	0,67	1,3	1,8	2,19	2,54	2,83	3,08

Estimation of the probability of default (PD)

In what percentage of the simulated future scenarios does (1) over-indebtedness or (2) illiquidity occur?

Assignment of a rating grade possible!



Equity = equity capital  
EKB = equity capital requirement

Amount of risk and cost of capital

Expected profit

Enterprise value

Transformation of  $p$  in the rating

\*Mock, T. (2017): Auf was Bewerter beim Rating achten sollten!, Presentation during EACVA's 11th Annual Conference 2017, p. 14.



## Capital market orientation vs. value orientation

	"Common understanding" of capital market orientation	Value orientation
<i>Primary goal</i>	Increase in the share price	Increase in the fundamental value of the company
<i>Target group</i>	Currently committed (short-term) investor	Investor committed to the long term
<i>Information relevance of the capital market</i>	Use of capital market data (e.g. beta factor) for business decisions	Use of even <u>superior</u> internal company information for business decisions
<i>Focus on information policy</i>	Creation of (advantageous) transparency and reputation (IR)	Severe restriction of IR ("information relevant to competition")
<i>Credo</i>	Capital market (stock market) is always right	Stock market prices may deviate temporarily from the fundamental value due to capital market <u>inefficiencies</u> .

Source: Gleißner, W. (2009): Kapitalmarktorientierung statt Wertorientierung: Volkswirtschaftliche Konsequenzen von Fehlern bei Unternehmens- und Risikobewertungen, in: WSI Mitteilungen, 6/2009, pp. 310 -318.

# Risk reporting: the core content

- **Equity coverage** as a threat indicator

The ratio of the available equity to the equity requirement (from risk aggregation) (e.g. on a three-year view for a BBB rating, for example):

- **Planning reliability**

The coefficient of variation of earnings (or EBIT) shows the relative range of fluctuation and therefore the extent of possible deviations from the plan

- **Risk-adjusted cost of capital**

Risk-adjusted cost of capital (based on earnings risk V) converts risk into required return ("value-based management")

- **Rating and threat to target rating, minimum rating or covenants**

Probability of insolvency (p) as a measure of "portfolio threat"

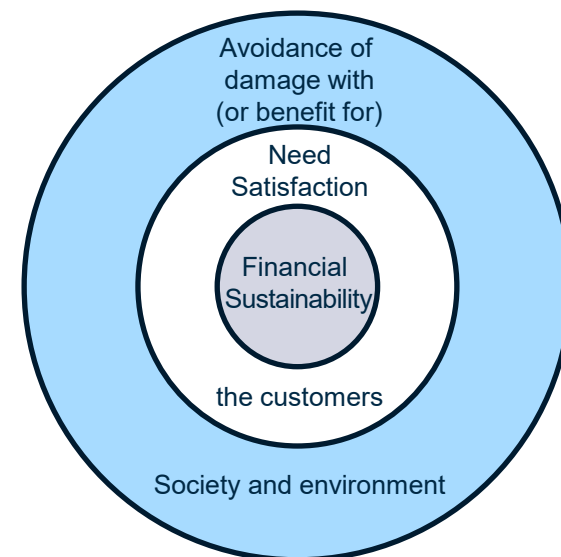
Kategorie	Risikobezeichnung	Relevanz	Risikobeauftragte	Höchstschaden 99%	Handlungsbedarf	Frühwarnindikator
Leistungsrisiken	Lieferantenausfall	3	Frau Müller	15.000.000,00 €	sofort	gelb
Marktrisiken	Substitutionsrisiken durch neue Produkte	3	Herr Marschall		halten	grün
Marktrisiken	Beschaffungsmarktrisiken (Preis), Materialkostenschwankungen	3	Herr Marschall	27.817.072,00 €	halten	
Marktrisiken	Risiken durch Eintritt eines neuen Wettbewerbers	3	Herr Marschall	10.000.000,00 €	sofort	rot
Leistungsrisiken	Hoher Fixkostenanteil	3	Frau Müller		halten	gelb
Marktrisiken	Risiken durch Nichterkennen von Marktentwicklungen oder Trends	1	Herr Marschall		halten	
Finanzmarktrisiken	Risiken durch Forderungsausfälle	1	Herr Wohleben		später	rot
Marktrisiken	Risiken durch Absatzpreisschwankungen	2	Herr Marschall	8.263.058,50 €	halten	
Marktrisiken	Risiken durch Absatzmengenschwankungen	2	Herr Marschall	9.721.247,00 €	halten	
Finanzmarktrisiken	Zinsänderungsrisiken	1	Herr Wohleben	48.365,70 €	halten	gelb
Leistungsrisiken	Personalkostenschwankungen	3	Frau Müller	2.489.936,75 €	halten	
Leistungsrisiken	Schwankungen der sonstigen Kosten	2	Frau Müller	223.355,70 €	halten	

Finanzrating						
Kennzahlen	CCC	B	BB	BBB	A	Wert
Eigenkapitalquote	<10%	>10%	>20%	>35%	>60%	38,6%
Dynamischer Verschuldungsgrad (a)	>8	<8	<4	<1	<0,01	7
Zinsdeckungsquote	<1,2	>1,2	>2,5	>4	>9	3
EBIT-Marge	<2%	>2%	>5%	>10%	>15%	10%
Kapitalrückflussquote	<5%	>5%	>10%	>15%	>25%	22,1%
Gesamtkapitalrendite (ROCE)	<5%	>5%	>10%	>15%	>25%	17,8%
Verbindliche Zinsrückflussquote	<-10%	>-10%	>0%	>10%	>20%	23,4%
<b>Finanzrating</b>	●					



# The three levels of sustainability

1. Activities are sustainable if they do not impair the **satisfaction of the needs of people in the future.**<sup>1</sup>
2. **Sustainable companies** must
  - **contribute to the satisfaction of needs (of their customers) perform,**
  - **their own existence as a prerequisite** for this permanently **secure** (financial sustainability) and
  - **no unreasonable damage** as a secondary condition **for third parties**, especially not for the company and **the environment** (at least to the extent that this satisfies the future people).
3. **Financial sustainability** is a fundamental prerequisite for sustainable corporate governance and a key parameter within the ESG concept of "G" (governance) of "G" (governance).



<sup>1</sup> See Brundtland Commission (1987): Report of the World Commission on Environment and Development: Our Common Future, United Nations, <http://www.un-documents.net/our-common-future.pdf>, accessed 11.03.2022).

Source: Gleißner, W./Günther, Th./Walkshäusl, Ch. (2022): Financial sustainability: measurement and empirical evidence, in: Journal of Business Economics, Vol. 92, No. 3, pp. 467–516; Gleißner, W. (2023): Nachhaltigkeit ist mehr als ein guter ESG-Score, in: ESGZ, No 1.2023, pp. 43-47.

# Steps towards risk management

Module 0	Version 1	Version 2
(optional)	<ul style="list-style-type: none"><li>Benchmarking of risk management against IDW PS 340 / GoP / DIIR RS 2.1</li></ul>	Recording of management/board decisions and need for risk information in order to weigh up risk and return
Module 1	<ul style="list-style-type: none"><li>Systematic risk identification: strategic and operational risks</li><li>Quantification of the top risks</li><li>Risk inventory: transparency of existing risks</li></ul>	
Module 2	<ul style="list-style-type: none"><li>Linking risk analysis and planning (risk aggregation model: simulation)</li><li>Determination of the aggregated total risk exposure ("earnings risk") and capital requirements (financing structure), ranges of future earnings</li><li>Rating forecast for base and stress scenario</li></ul>	
Module 3	<ul style="list-style-type: none"><li>Prioritization of risk management measures (improvement of planning security)</li></ul>	
(optional)	<ul style="list-style-type: none"><li>Measures to reduce risk costs</li></ul>	
Module 4	<ul style="list-style-type: none"><li>Concept for efficient organization of risk management (KonTraG/ IDW S 340)</li><li>Risk monitoring</li></ul>	



# The most important information on risk management

1. Entrepreneurship is always associated with uncertainty. Sustainable success requires dealing with opportunities and threats (risks) that can trigger deviations from the plan.
2. All risks must be analysed, e.g. strategic risks (threat to success potential), planning risks and also 'sustainability risks' (see CSRD).
3. As a cross-sectional function, risk management deals with the identification, quantification, aggregation, management and monitoring of risks.

It serves the early detection and avoidance of crises, the optimisation of risk costs and the provision of risk information in the preparation of management decisions ('entrepreneurial decisions' in Germany: § 93 AktG).

4. Risk management must be able to assess the insolvency risk ('degree of threat to the company as a going concern' in Germany, see § 1 StaRUG) depending on the overall scope of risk in order to initiate 'suitable countermeasures' to avert crises above a critical threshold and to inform the supervisory board immediately (in Germany: see minimum requirements in accordance with § 1 StaRUG).



Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, pp. 680 ff.



# The most important information on risk management



5. The risk quantification that follows the systematic identification of risks requires the use of suitable probability distributions (the specification of the minimum value, most probable value and maximum value of a planning item, e.g. Beta Pert-Distribution).
6. The determination of the overall risk scope (equity capital needed, VaR) and the probability of insolvency of a company requires an aggregation of the risks with reference to the corporate planning (using Monte Carlo simulation). Only in this way can the combined effects of individual risks be analysed and 'bandwidth planning' anchored in management accounting ('controlling').
7. Management decisions (e.g. on investments or M&A) require a weighing up of expected earnings (profit) and risks, i.e. a measure of success for the risk/return profile (performance measure). One such measure is the

enterprise value, which can be calculated directly from the results of a risk aggregation without historical capital market data (beta in the CAPM). In this way, earnings risk (profit volatility) and insolvency risks are taken into account (simulation-based strategy valuation). Risk management is thus a platform for value-based management.

8. Modern integrative risk management is efficient and unbureaucratic due to the utilisation of existing management systems such as management accounting, quality management, treasury or project management

Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, pp. 680 ff.



# The most important information on risk management

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9. In addition to financial sustainability and a robust strategy, the ability to deal with uncertainty is the central building block for securing the company's long-term success (high future viability of a 'robust company', see the QScore). Risk management enables potentially threatening risks to be recognised and managed in good time and the risks associated with management decisions to be included in the decision-making process. A fundamental improvement in the risk-return profile, and thus the value, requires an adjustment of the strategy on the way to becoming a robust company (e.g. reduction of dependency and expansion of core competences that lead to pricing power).
10. Due to the omnipresence of risks in all areas of the company, the aim should be to integrate suitable risk management methods into all processes and thus make them available to all employees ('embedded risk management'). All management should also be seen as risk management.

Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, pp. 680 ff.

## Additional literature

Gleißner (2019): Cost of capital and probability of default in value-based risk management, in: *Management Research Review*, 42(11), pp. 1243–1258

Gleißner (2023): Uncertainty and resilience in strategic management: profile of a robust company, in: *IJRAM – International Journal of Risk Assessment and Management*, 26(1), pp. 75–94

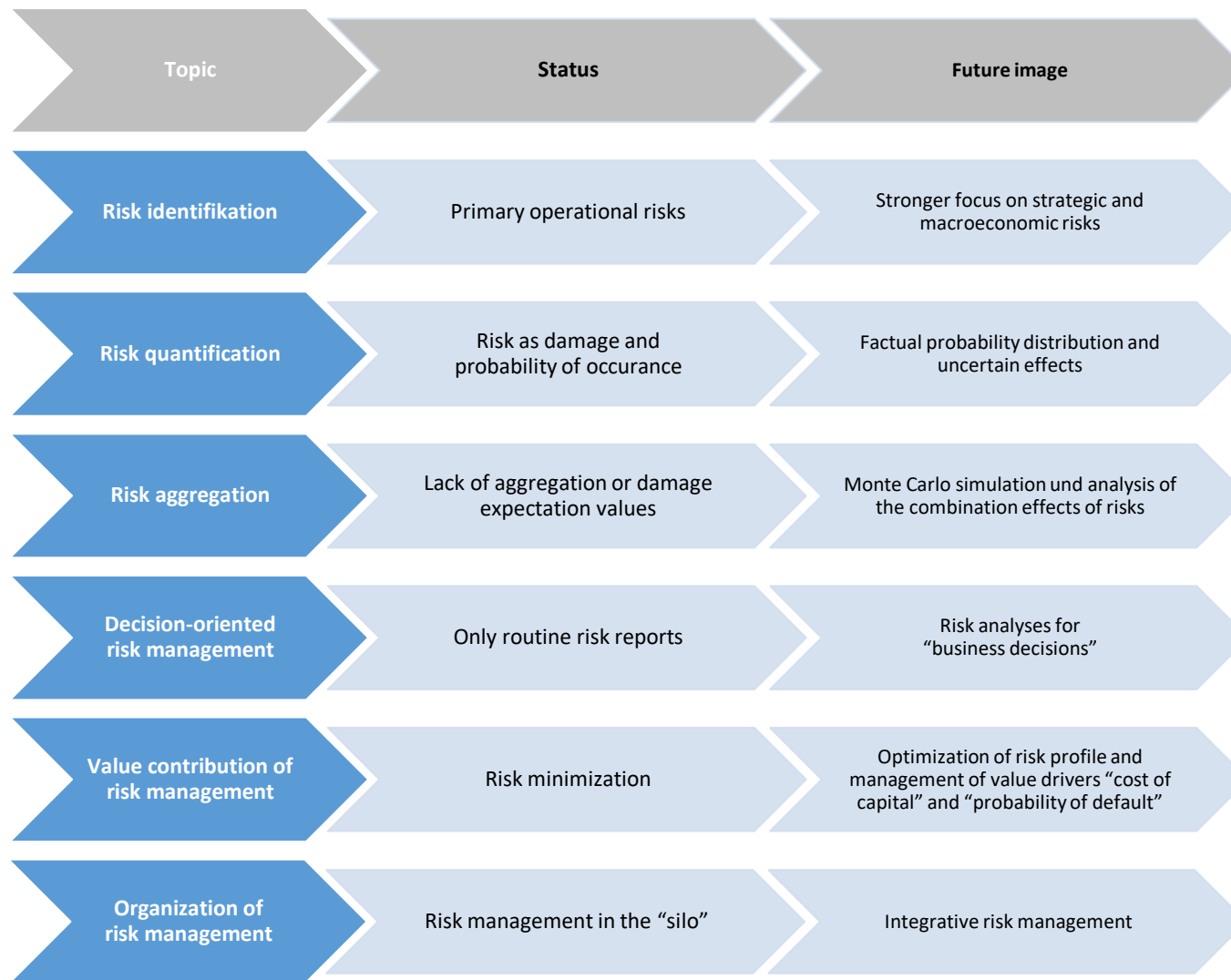
Gleißner / Berger (2024): Enterprise Risk Management: Improving Embedded Risk Management and Risk Governance, in: *Risks*, 12(12), 05.12.2024, <https://www.mdpi.com/3074192>

Gleißner / Ernst (2023): The Simulation-Based Valuation of Companies and Their Strategies – Classification, Methodology and Case Study, in: *EBVM – The European Business Valuation Magazine*, 2(2), pp. 4–16



# Early crisis detection is the task of risk management!

## Development perspectives of risk management



Source: Gleißner, W. (2022): Fundamentals of Risk Management, 4th edition, Vahlen Verlag Munich, p. 16.



## System design: parties involved in the risk management process

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## System design (I): Management / Board of Directors

Management/Management Board is responsible for the RMS (Section 91 (2) AktG) and communicates the risk strategy and RMS within the company

Adopts corporate strategy and risk strategy/policy based on it

Decides (as RO) on strategic risk position on the basis of corporate planning and MIS

Defines objectives of the risk management system RMS and distribution/delegation of tasks

Regularly informs the Supervisory Board (SB) through summarized risk reports

Communicates risk strategy and RMS within the company



## System design (II): Risk controlling through controlling (I)

Defines indicators/measurement parameters/limits with RO and ensures uniformity of methods

Defines tasks/responsibilities/reporting for newly identified risks

Monitors the status of risk management measures and coordinates overarching measures

Is responsible for the design and necessary adjustments to the RMS working documents

Aggregates risks annually using the statistical tool

Informs the Management Board regularly about the risk situation and achievement of risk targets



## System design (II): Risk controlling through controlling (II)

Risk Controlling is the central point of contact and communication for all those involved in the RM process

Collaborates on the development / any necessary adjustments to the risk strategy/policy

Communicates risk strategy and RMS within the company (together with the Executive Board and management).

Initiated Identification of new risks: Risk identification and assessment with the participation of department heads (AL) and representatives. Method: Questionnaire, workshops or similar, including cause-effect relationships, scenario development, classification into relevance categories.

Systematizes the individual risks, defines duplicate and multiple entries, summarizes (bundles) risks, checks plausibility and consistency and ensures communication with the RO.


## System design (III): Risk Owner (RO)



Implements and enforces risk management in business units



Carries out recurring risk identification and assessment



Proposes suitable risk management measures (documentation in risk folders); develops projects if necessary



Updates/maintains the risk folders for risks relevant to further processing




Implements risk management measures following a decision or arranges for implementation by other departments




Communicates relevant risk information in accordance with the specified reporting system



Checks the implemented RMS for effectiveness and efficiency



Develops principles and standards for monitoring (auditing) the RMS



Supports and advises Risk Controlling in the development of principles and standards for the RMS



Informs Risk Controlling about audit results and coordinates necessary changes



# "Risk Intelligence Indicator"—indicator for the future orientation of corporate management (1/2)

Questions	Answer options		
	no (=0)	partially (=1)	yes (=2)
Do the management systems ensure that all significant opportunities and threats (risks) for the company are systematically and regularly identified over the entire planning horizon?			
Are all material risks quantitatively described by adequate probability distributions (e.g. by (a) minimum value, (b) most probable value and (c) maximum value)?			
Are assumptions made about the maturity, i.e. possible times of occurrence for risks?			
Is information on changes in risk positions and early warning indicators available quickly, meaningfully and consistently?			
Is the aggregated overall scope of risk or the scope of possible deviations from the plan calculated for the company as a whole, a business unit or a significant project?			
Is the aggregated risk information used to determine "true-to-expectation" plan values, i.e. plan values that express the mean of all risk-related possible scenarios?			
Are adequate risk management measures implemented and is their risk-reducing effect taken into account in the risk quantification?			
Is the aggregated overall scope of risk, e.g. expressed by the equity requirement (or value-at-risk), taken into account when determining the company's required equity capitalization (financing structure)?			
Are suitable risk transfer measures (such as insurance) determined using information from the risk analysis?			

Source: Chrobok, S./Gleißner, W. (2012): Risk Intelligence - Indikator für die Zukunftsorientierung des Controllings, in: Controller Magazin, September/Oktober 2012, pp. 70-71.



# "Risk Intelligence Indicator"—indicator for the future orientation of corporate management (2/2)

Questions	Answer options		
	no (=0)	partially (=1)	yes (=2)
Is the probability known that a target rating or agreed covenants will be breached - and are these findings incorporated into the financing and rating policy?			
Are capital cost rates (discount rates) for investment valuation and value-oriented management (performance management) derived on the basis of the quantified risks?			
Are expected returns and (quantified) risks weighed up when assessing strategic options for action?			
Is the development of risk positions continuously monitored in order to be able to react to developments at short notice?			
Are the effects of risks that have occurred determined by means of plan deviation analysis included in the risk assessment?			

Class	Score	Your "risk intelligence" ...
I	0 to 5	... is still in its infancy.
II	6 to 10	... is still in need of improvement.
III	11 to 15	... is good average, but still has room for improvement.
IV	16 to 22	... is "leading practice".
V	23 to 28	... is "best in class".



The point total according to your self-assessment corresponds to your "Risk Intelligence Indicator":

Source: Chrobok, S./Gleißner, W. (2012): Risk Intelligence - Indikator für die Zukunftsorientierung des Controllings, in: Controller Magazin, September/Oktober 2012, pp. 70-71.



## Checklist for DIIR Auditing Standard No. 2: Questions on the inclusion of risk management in the preparation of "business decisions" (§ 93 German AktG) (1 of 2)

		fulfilled	partially fulfilled	not fulfilled
1	Is there a precise definition of what is (and what is not) a "business decision"?			
2	Is it organizationally ensured that no "entrepreneurial decisions" are made without adequate decision templates?			
3	Is it defined what content must be included in a decision paper in order to be able to assume "appropriate information" (Section 93 AktG)?			
4	Are the core contents of decision papers generally available (e.g. statements on the objective, assessment criteria, possible courses of action, initial situation, assumptions, forecasts, risks, possible "developments jeopardizing the continued existence of the company" (rating)?			
5	Is the method used to weigh up the impact of an "entrepreneurial decision" on future (1) earnings and (2) risk (risk-adjusted valuation)?			
6	In particular, are documented risk analyses carried out in preparation for decisions by the Management Board that show which changes in the scope of risk are caused by the decisions (Section 93 AktG)?			
7	Is it ensured that risk management is involved in the preparation of major business decisions by means of suitable processes (and that risk analyses are carried out for other business decisions in accordance with the methodological requirements of risk management)?			
8	If necessary, are existing (management) systems, e.g. controlling, treasury, QM, integrated into the risk analysis (e.g. to record all uncertain planning assumptions that show these risks)?			
9	Is risk aggregation carried out for important business decisions in order to determine the effect on the overall scope of risk (capital requirements)?			
10	Is the effect of the decision on risk-bearing capacity and risk tolerance measured using suitable key figures?			

Source: Gleißner, W. (2022): Grundlagen des Risikomanagements, 4th ed., Vahlen Verlag Munich, pp. 628-630.



## Checklist for DIIR Auditing Standard No. 2: Questions on the inclusion of risk management in the preparation of "business decisions" (§ 93 German AktG) (2 of 2)

		fulfilled	partially fulfilled	not fulfilled
11	Is it ensured that the methods generally used in risk management for risk identification and risk quantification are observed in the risk analyses used to prepare decisions?			
12	Are strategic risks also recorded and regularly discussed in the company management, in particular threats to the potential for success?			
13	In particular, are the risk analyses required in the decision documents reviewed in a structured manner by a neutral body (i.e. one that has not prepared the risk analysis itself)?			
14	Are there regulations for an appropriate "informational foundation", i.e. an appropriate use of resources (time and money) in view of the significance of a decision (risk content, investment volume)?			
15	Are equity requirements and capital costs derived from the risk situation (earnings risk from risk aggregation) in a risk-appropriate manner?			
16	Are risk and return weighed up in a comprehensible manner in decision templates for the company management (e.g. by deriving capital costs as a return requirement from the risk analysis)?			
17	Has it been clarified which department submits the decision papers to the Management Board/management (and archives them later - with the decision made)?			
18	Are procedures for "quality assurance of decision papers" and the associated review criteria defined?			
19	Are there suitable mechanisms in place to ensure the neutrality of decision papers?			
20	Are the templates for "business decisions" actually neutral decision templates (and not applications from an interested applicant)?			
21	Are all templates for "business decisions", including the decision made, recorded and archived?			

Source: Gleißner, W. (2022): Fundamentals of Risk Management, 4th edition, Vahlen Verlag Munich, pp. 628-630.



# List of questions for QScore 1/3 (Gleißner / Weissman, Das zukunftsfähige Familienunternehmen, 2024)

		--	-	0	+	++
Q 1	The company has recorded a positive real sales growth rate in recent years and is also expected to grow at a positive rate in the coming years.					
Q 2	The probability of insolvency derived from financial ratios is very low.					
Q 3	The earnings risk (planning uncertainty), which depends on the extent of the risks, was low and will remain low in the coming years.					
Q 4a	The total cost of capital is clearly higher than the cost of capital rate (the required rate of return), which depends on the scope of risk.					
Q 4b	The (adjusted) EBIT margin is high.					
Q 5a	The company has highly competent and motivated employees.					
Q 5b	The company is attractive for competent employees.					
Q 5c	Do the owners and employees see the business activity as a purpose (vision) that will secure the company's existence for generations to come?					



## List of questions for QScore 2/3 (Gleißner / Weissman, Das zukunftsfähige Familienunternehmen, 2024)

		--	-	0	+	++
Q 6a	Is the company mainly active in attractive and growing markets that offer opportunities for differentiation?					
Q 6b	Does the company have solid core competencies that lead to clear competitive advantages in terms of key purchasing criteria for customers?					
Q 6c	Is the company able to avoid critical dependencies on a small number of customers or suppliers?					
Q 7	Are the value creation processes and support processes resilient, e.g. through redundancies, inventories and flexibility?					
Q 8a	Does the company meet the accounting requirements of capital market-oriented companies and the requirements of the "Principles of Proper Planning" (GoP)?					
Q 8b	Is there effective (family) governance, i.e. e.g. arrangements for conflict resolution and succession as well as a competent and effective advisory/supervisory board?					



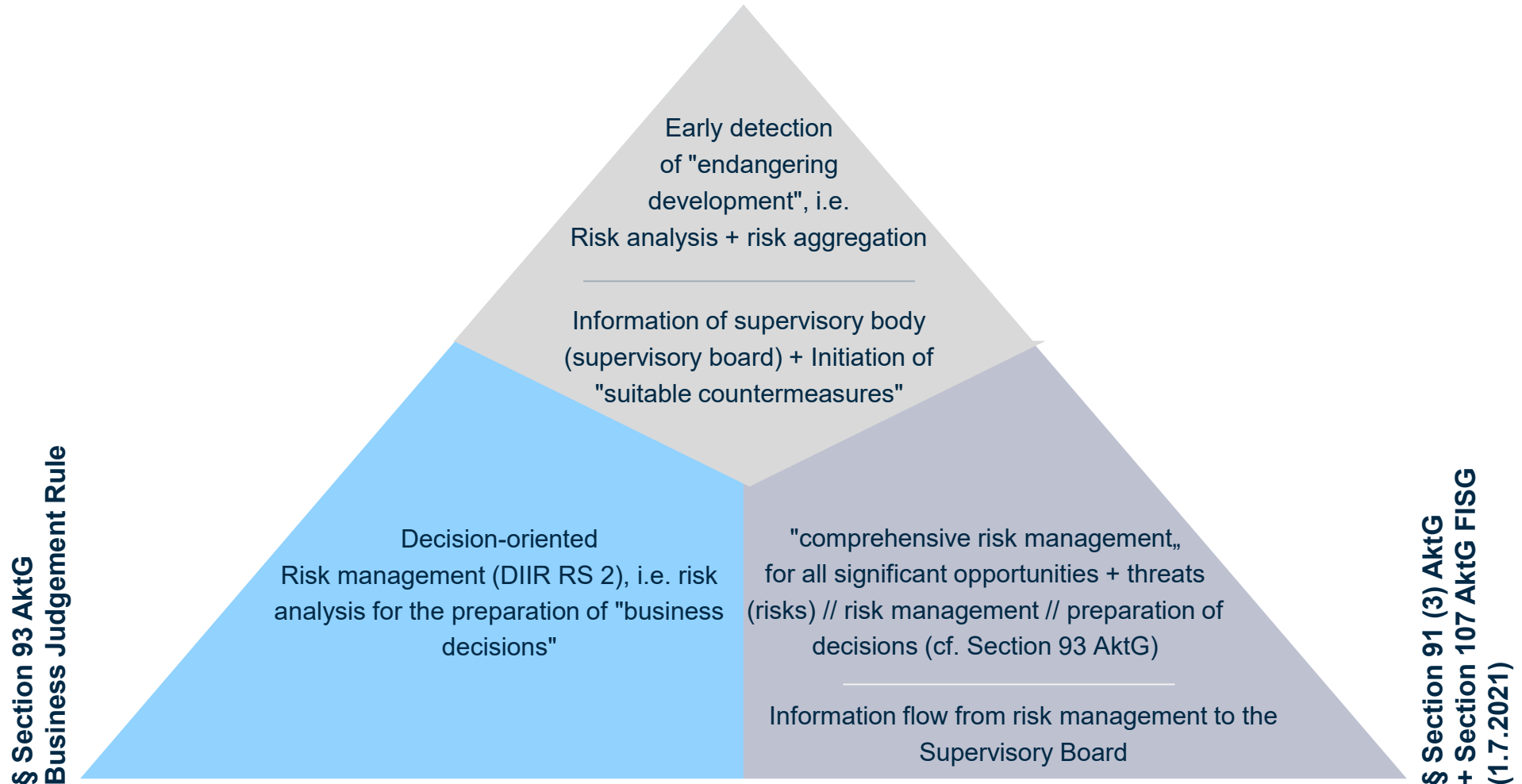
## List of questions for QScore 3/3 (Gleißner / Weissman, Das zukunftsfähige Familienunternehmen, 2024)

		--	-	0	+	++
Q 9a	Can the company exclude with a high degree of probability individual risks that could jeopardize its existence (e.g. threat to success potential) on the basis of its robust strategy?					
Q 9b	Is the company's risk coverage potential (equity and liquidity) demonstrably significantly greater than the aggregated total risk exposure (value-at-risk )? <sub>1%</sub>					
Q 9c	Does the risk management system meet all requirements (DIIR RS 2), i.e. in particular are the main risks systematically identified, properly quantified and monitored?					
Q 9d	Does risk aggregation (Monte Carlo simulation) take place with reference to integrated corporate planning in order to be able to assess equity requirements and the probability of developments that could jeopardize the company as a going concern?					
Q 10a	Are there binding sets of rules for the preparation of "business decisions" (e.g. on investments) and are neutral decision papers prepared on this basis?					
Q 10b	Are documented decision templates available for all business decisions made by the management, which contain all key content, e.g. options for action, assumptions, forecasts and the effects of the decision on the overall scope of risk?					



# Legal requirements for risk management in Germany (status 2021)

§ Section 91 (2) AktG + Section 1 StaRUG (January 1, 2021)





# Risks lead to crises: StaRUG and DIIR RS No. 2.1 (2022): All corporations should have risk analysis & risk aggregation!



StaRUG (1.1.2021) in Germany.

*"Section 1 Early crisis detection and crisis management for **limited liability entities***

*(1) The members of the body appointed to manage a legal entity (managers) shall continuously monitor developments that could jeopardize the continued existence of the legal entity. If they recognize such developments, they shall take appropriate countermeasures and report immediately to the bodies appointed to supervise the management (supervisory bodies). ..."*



**Note:** "Existentially threatening developments" - i.e. serious crises - are usually the result of a combination of risks.

Quantitative **risk analysis and risk aggregation with reference to corporate planning** (Monte Carlo simulation) are therefore required to calculate the **"probability of exposure"**

Source: DIIR – Deutsches Institut für Interne Revision e.V. (2022): DIIR Revisionsstandard No 2: Prüfung des Risikomanagementsystems durch die Interne Revision, Version 2.1, Februar 2022, download: [https://www.diir.de/fileadmin/fachwissen/standards/downloads/DIIR\\_Revisionsstandard\\_Nr.\\_2\\_Version\\_2.1.pdf](https://www.diir.de/fileadmin/fachwissen/standards/downloads/DIIR_Revisionsstandard_Nr._2_Version_2.1.pdf) (accessed 07.07.2025).



## Practical implications in a group (AG / SE) in Germany

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The **following is required to implement StaRUG:**

1. Informing the managing directors of (German) subsidiaries about their new due diligence obligations under StaRUG.
2. Roll-out concept for the (German) subsidiaries and linking with the (decentralized) risk recording in the Group (goal: data consistency & improvement of the quality of risk data)
3. Definition of "going concern risk" for all (German) subsidiaries and measurement concept for "going concern risk" (as well as associated threshold value for "countermeasures" and information for a (!) monitoring body to be defined).
4. Focused risk analysis and risk aggregation (to be updated regularly in accordance with rules to be defined)



# Act to Strengthen Financial Market Integrity (FISG) and the new § 91 (3) AktG: Risk management instead of just early risk detection!

---

*"(1) The Management Board shall ensure that the necessary trading books are kept.*

*(2) The Management Board shall take appropriate measures, in particular to set up a monitoring system, to ensure that developments that could jeopardize the continued existence of the company are identified at an early stage.*

*(3) **The management board of a listed company must also set up an appropriate and effective internal control system and risk management system in view of the scope of the company's business activities and its risk situation.***

## **Business implications of § 91 para 3:**

- 1. Consideration of all material risks (opportunities and threats); irrespective of a possible threat to the company's existence**
- 2. Obligation to take risk management measures (risk management (see esp. § 1 StaRUG)**
- 3. Inclusion of risk analyses in "business decisions"**



# The main implications of the FISG for listed stock corporations

In addition to an internal control system, "comprehensive risk management" must now be implemented.<sup>1</sup>

*Note: This gives risk management a prominent position because - unlike controlling and compliance management, for example - it is a "legally required program"*

**§ Section 107 AktG** also provides for direct communication between risk management (as well as ICS, internal audit) and the Supervisory Board (Audit Committee).

*Note: This is intended to give the Supervisory Board a more undistorted picture of (1) the company's risk situation and (2) existing deficits in risk management.*

See Berger, Th./Ernst, D./Gleißner, W./Hofmann, K. H./Meyer, M./Schneck, O./Ulrich, P./Vanini, U. (2021): Die Prüfung von Risikomanagementsystemen und die Defizite des IDW Prüfungsstandards 340, in: Der Betrieb, 74. Vol., No 46, pp. 2709-2714;

Velte, P. (2020): Der Referentenentwurf für ein Finanzmarktintegritätsstärkungsgesetz (FISG). Reform der internen Corporate Governance nach dem Wirecard-Skandal, in: Steuer- und Bilanzpraxis (StuB), No 21/2020, pp. 817–826

Velte, P. (2021): Regulierung von Corporate Governance-Systemen durch das geplante FISG: Eine kritische Würdigung, in WPg, 74. Vol., No 6/2021, pp. 387–398;

Gleißner, W. (2020): Integratives Risikomanagement. Schnittstellen zu Controlling, Compliance und Interner Revision, in: Controlling, 32. Vol., No 4, pp. 23–29;

Velte, P./Eulerich, M. (2021): Das geplante Finanzmarktintegritätsstärkungsgesetz (FISG). Eine kritische Diskussion aus Sicht der Internen Revision, in: Zeitschrift Interne Revision (ZIR), 56. Vol., No 2/2021, pp. 64–69.



## Risk and decisions—German Stock Corporation Act § 93: Duty of care and responsibility of the members of the Management Board

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*"(1) The members of the Management Board must exercise the diligence of a prudent and conscientious manager in their management of the company. There is no breach of duty if the Management Board member could reasonably assume when making a **business decision** that they were acting for the benefit of the company on **the basis of appropriate information**.*

*(2) Members of the Management Board who breach their duties shall be jointly and severally liable to compensate the company for any resulting damages. If it is disputed whether they have exercised the diligence of a prudent and conscientious manager, they shall bear the **burden of proof**. ....*

*(4) The company shall not be **liable to pay compensation** if the action is based on a lawful resolution of the Annual General Meeting. The fact that the Supervisory Board has approved the act shall not exclude the obligation to pay compensation."*

So: Decision templates with risk analyses (with risk quantification and aggregation) and risk-appropriate strategy evaluation!



# Significant limitation of the auditor's test certificate

Important:

The auditor does not check all legal requirements for risk management (but the audit must do this)!

IDW PS 340 (2020) only considers section 91 (2) AktG (and even its implications are insufficiently examined, as studies regularly show).

Current examples: euromicron, Gerry Weber, Wirecard, ...

Section 93 AktG and StaRUG are not the subject of the audit!

... and FISG (Section 91 (3) AktG)?



Cf. Gleißner, W. (2020): Wie beweist man, dass das Risikomanagement den Anforderungen der §§ 91 und 93 AktG nicht genügt (obwohl bestätigende Prüfberichte der Abschlussprüfer existieren)?, in: RWZ, No 7-8/2020 (August 2020), pp. 273-280

Berger, Th./Ernst, D./Gleißner, W./Hofmann, K. H./Meyer, M./Schneck, O./Ulrich, P./Vanini, U. (2021): Die Prüfung von Risikomanagementsystemen und die Defizite des IDW Prüfungsstandards 340, in: Der Betrieb, 74. Vol., No 46, pp. 2709-2714.



# Management decisions under uncertainty: Business Judgement Rule (Section 93 AktG, see DIIR RS No 2)

§ Section 93 AktG: "(1) The members of the Management Board must exercise the diligence of a prudent and conscientious manager in their management of the company. There is no breach of duty if the Management Board member could reasonably assume when making a business decision that they are acting for the benefit of the company on the basis of appropriate information."

**Entscheidungsvorlage**  
Nr. III. 1/2019  
– Finale Version, 12.04.2019 –  
über  
**Markteintritt Ozeanien**  
zur Vorlage an den Vorstand

Status: Entscheidung bei der Vorstandssitzung Mai 2019 geplant.

Antragssteller: Geschäftsbereich (815) Export, Leitung Herr J. Locke

Erstellung der Vorlage durch die Abteilung 481 Konzern-Controlling

Verantwortlich: Herr Dr. J. Schäfer, Leitung Konzern-Controlling (481)

Mitwirkung: Frau S. Kwon, Leitung Risikomanagement (516)  
Frau K. Austen, Corporate Strategy (234)  
Herr J. Ford, Planung- und Controlling (482)

Qualitätssicherung: Herr H. Reyes, Vorstandsbüro (150)

Eveszett AG  
Entscheidungsvorlage – Finale Version  
Markteintritt Ozeanien

**Inhaltsverzeichnis**

1 MANAGEMENT SUMMARY.....	3
2 ENTSCHEIDUNGSUMFANG (WAS WIRD FREIGEgeben UND WAS NICHT) .....	5
3 ANMERKUNG ZU PROBLEMEN DER VORLAGE UND ENTSCHEIDUNGSVORBEHALTE .....	6
4 ZIELE, BEWERTUNGSMARSTAB UND NEBENBEDINGUNGEN.....	7
5 SITUATIONSCHREIBUNG / STATUS QUO.....	8
6 HANDLUNGSOPTION 1 .....	10
6.1 Kurzbeschreibung, Vor- und Nachteile.....	10
6.2 Annahmen und ihre Begründungen.....	10
6.3 Auswirkungen und Planung (Prognose): Status Quo vs. Handlungsoption 1 .....	12
6.4 Risikoanalyse: Chancen und Gefahren (Risiken) und Gesamtrisikoumfang.....	14
7 HANDLUNGSOPTION 2 .....	15
7.1 Kurzbeschreibung, Vor- und Nachteile.....	15
7.2 Annahmen und ihre Begründungen.....	15
7.3 Auswirkungen und Planung (Prognose): Status Quo vs. Handlungsoption 2 .....	17
7.4 Risikoanalyse: Chancen und Gefahren (Risiken) und Gesamtrisikoumfang.....	19
8 BEURTEILUNG, INSB. ABWÄGEN VON ERTRAG UND RISIKO („BEWERTUNG“) .....	20
9 FAZIT: ZUSAMMENFASSUNG & EMPFEHLUNG .....	22
A ANHANG .....	23

12. April 2019      Inhaltsverzeichnis      2 / 23





# The new DIIR RS No 2.1 (2022) standard taking into account the implications of Section 93 AktG, StaRUG, FISG (unlike IDW PS 340 (2020))



Phase model of risk management (from DIIR Auditing Standard No. 2, p. 11)

- Independent consideration of two test tasks
  - The audit of organization and processes in risk management and
  - The audit of the business methods used in risk management (e.g. for risk quantification and risk aggregation), cf. section 91 AktG.
- Risk as a possible deviation from plan (opportunity and danger)
- Focus topics: Risk quantification, risk aggregation, risk-bearing capacity, decision orientation, risk culture, 3 lines of defense, risk management

"The method of risk aggregation, which ensures that the combined effects of individual risks are also recognized with regard to a resulting development that could endanger the company's continued existence, must be examined."

"Particular attention must be paid to strategic risks that threaten the key potential for success and which can generally only be analyzed with the involvement of the management. " (RZ 45)

"It is also one of the tasks of risk management to ensure that the implications of major business decisions for the future scope of risk are clearly identified as early as the preparation stage in order to at least recognize at an early stage any developments that may jeopardize the company's continued existence. " (margin no. 16; see also margin no. 25)



# Significant aspects of DIIR Auditing Standard No. 2 (DIIR RS No. 2) (1 of 2)

1. Risk is understood as an umbrella term for possible positive deviations (**opportunities**) and negative deviations (**threats, risks in the narrower sense**) (see RZ 15).
2. With reference to the legal requirement in Section 91 (2) AktG with regard to the identification of possible "developments that could jeopardize the continued existence of the company", the **risk aggregation method** becomes **the central audit area**, as this is the only way to ensure that possible developments that could jeopardize the continued existence of the company from the combined effects of individual risks are also recorded (see margin no. 19 and margin no. 58).
3. DIIR Auditing Standard No. 2 also emphasizes the need to quantify risks (in line with IDW PS 340) and recommends the **measurement of risk-bearing capacity and risk tolerance** based on this (as does IDW PS 981).
4. It is of fundamental importance that the implications of Section 93 AktG with regard to "**decision-oriented risk management**" are also taken into account when examining risk management. Accordingly, the tasks of risk management are clearly stated (see margin no. 16): *"It is also one of the tasks of risk management to ensure that the implications of major entrepreneurial decisions for the future scope of risk are already comprehensibly identified during the preparation of such decisions, in order to at least recognize at an early stage any development that might jeopardize the continued existence of the company."*

Source: Gleißner, W./Kimpel, R. (2019): Prüfung des Risikomanagements und der neue DIIR Revisionsstandard No 2, in: ZfR, No 4/2019, pp. 148-159.



## Significant aspects of DIIR Auditing Standard No. 2 (DIIR RS No. 2) (2 of 2)

5. DIIR Auditing Standard No. 2 also emphasizes **the importance of risk culture** and makes it the subject of the audit.
6. DIIR Auditing Standard No. 2 emphasizes the **strategic focus of risk management**, similar to the new version of COSO Enterprise Risk Management (ERM) from 2017 (see Hunziker, 2019). This means, for example, that strategic risks (as well as uncertain planning assumptions) must also be taken into account when identifying risks. RZ 45 reads: *"Particular attention must be paid to strategic risks that threaten the main potential for success and that can generally only be analyzed with the involvement of management."*
7. According to DIIR Audit Standard No. 2, **all management systems, e.g. including controlling or quality management, must be included if they deal with opportunities and risks.**
8. DIIR Auditing Standard No. 2 emphasizes the **division of responsibilities between risk management and operational management**. RZ 61 reads: *"According to the **three lines of defense model**, risk monitoring tasks are the responsibility of both operational management (risk owner) and central monitoring functions (e.g. risk controlling or central risk management)."*
9. DIIR Auditing Standard No. 2 clarifies that the main objective of risk reporting and communication is to ensure that **decision-makers and supervisory bodies are informed promptly about the organization's risk situation.**

Source: Gleißner, W./Kimpel, R. (2019): Prüfung des Risikomanagements und der neue DIIR Revisionsstandard No 2, in: ZIR, No 4/2019, pp. 148-159.



# Principles of proper planning (GOP): meaningful planning as the basis for decision-making—Update 2022 (Version 3.0)

## Requirements of the principles of proper planning (GOP)

- Operational planning must be derived from the strategy, Integration of the sub-plans.
- Transparency and clarity of terms, in particular "Planned values" (planning in line with expectations).
- Knowledge of opportunities and threats (risks), which can trigger deviations from the plan.
- Analysis of the scope of possible deviations from plan (aggregated scope of risk, e.g. expressed by the equity requirement).
- Assessment of the planning from the perspective of lenders (rating forecast) and Rating of adequate debt capital interest rates.
- Deviation analysis and feedback



Corporate planning has to fulfill the following basic functions:

a) **Decision preparation function:** Corporate planning is the basis for management decisions, especially for the "entrepreneurial decisions" that can only be made by the management.

b) **Crisis early warning function:** Corporate planning, especially liquidity planning and risk analysis, are used for the early detection of crises, especially possible "developments that could jeopardize the company's continued existence" (Section 1 StaRUG).

Source: Gleißner, W./Presber, R. (2010): Die Grundsätze ordnungsgemäßer Planung – GOP 2.1 des BDU: Nutzen für die betriebswirtschaftliche Steuerung, in: Controller Magazin, No 6, pp. 82–86

Legal and regulatory requirements, especially for Germany



## The most important facts about risk management in 10 points (1 of 4)

1. Entrepreneurship is always associated with uncertainty, i.e. risks. If the future cannot be predicted with certainty, risks can lead to deviations from the plan. Risk is the generic term for opportunity and danger (i.e. possible positive and negative deviations from the plan). The ability to deal with uncertainty is of great importance for securing the continued existence and sustainable success of companies.
2. Particularly significant risks are "strategic risks" (especially threats to potential success), economic risks and uncertainties regarding key planning assumptions (e.g. regarding the development of demand, commodity prices or exchange rates). However, operational risks to service provision and "sustainability risks" must also be systematically analyzed.
3. As a cross-divisional function within the company, risk management deals with the systematic identification, quantification, aggregation, management (control) and monitoring of risks. The aim is to create transparency about the scope of risk, in particular in order to identify potential developments that could jeopardize the company's continued existence in good time. The need for risk coverage potential, i.e. equity and liquidity, is calculated as a function of the overall scope of risk. Economic added value is created in particular if the implications for expected future earnings on the one hand and risk and rating on the other are assessed when preparing business decisions.

Source: Gleißner, W. (2022): Fundamentals of Risk Management, 4th ed., Vahlen Verlag Munich, p. 680 ff.



## The most important facts about risk management in 10 points (2 of 4)

4. The degree to which a company's existence is at risk in the future is expressed by the probability of risk and probability of insolvency or the future rating. The calculation of the implications of existing risks for the future rating, i.e. the assessment of a company from a creditor's perspective, is necessary in order to be able to assess developments that could jeopardize the company's continued existence. Risk management is therefore the basis for early crisis detection and crisis prevention, because crises are the result of risks that have occurred. Determining the probability of insolvency and danger depending on the scope of risk and the risk coverage potential (equity and liquidity resources) enables the timely initiation of "suitable countermeasures" to avert crises and safeguard the company as a going concern (Section 1 StaRUG).
5. All of the company's material risks should and can - assuming adequate expertise - be described using suitable probability distributions (e.g. by specifying the minimum value, most probable value and maximum value of a planning item).
6. As it is not normally individual risks but the combined effects of several risks that lead to crises and "developments that threaten the existence of the company" (as defined in Section 91 (2) AktG, Section 1 StaRUG), risk aggregation is the key technology in risk management. Risk aggregation determines the overall scope of risk by calculating a large representative number of risk-related possible future scenarios (Monte Carlo simulation). It thus combines traditional corporate planning with the company's risks and shows the "average" expected development of cash flow and profit as well as the planning reliability ("bandwidth planning").

Source: Gleißner, W. (2022): Fundamentals of Risk Management, 4th ed., Vahlen Verlag Munich, p. 680 ff.



## The most important aspects of risk management in 10 points (3 of 4)

7. Weighing up expected returns and risks using a performance measure is possible using the key figure "enterprise value" (decision value). This can be calculated on the basis of the aggregated earnings risk using risk-adjusted capital costs and thus, for example, compare different strategic options ("strategy evaluation"). Risk analyses are therefore a necessary basis for value-oriented management because, due to capital market imperfections, it is not possible to draw conclusions about the company's future earnings risks relevant to valuation from "historical share return fluctuations" (beta factor of the CAPM). When preparing "entrepreneurial decisions" (Section 93 AktG), "decision-oriented risk management" provides neutral and well-founded risk analyses that show the change in a company's scope of risk and make it possible to weigh up risk and return through a risk-adequate valuation.
8. As far as possible, a company's risk management should use existing and proven management systems - such as controlling, quality management, treasury or project management - to fulfill its tasks and, often in conjunction with the further development of controlling, lead to an integrated "value-oriented corporate management approach" ("integrative risk management"). The aim is to enable company management to take better account of the uncertainties of an unpredictable future when making decisions (and thus promote the company's long-term success).

Source: Gleißner, W. (2022): Fundamentals of Risk Management, 4th ed., Vahlen Verlag Munich, p. 680 ff.



## The most important aspects of risk management in 10 points (4 of 4)

9. In addition to a robust strategy and financial sustainability, the ability to deal with uncertainty (risks) is the third building block for securing the long-term success of a company ("robust company"). Risk management measures contribute to the optimization of the risk-return profile and must be assessed taking into account their costs and effects on the overall scope of risk (optimization of risk costs). A fundamental improvement in the risk-return profile usually requires a change in strategy on the way to becoming a "robust company". This avoids critical dependencies, has a high risk coverage potential, high flexibility and builds on core competencies that sustainably secure competitive advantages (pricing power) in as many attractive markets as possible.
10. If the future cannot be predicted with certainty, all employees - and in particular the company management - should view all management as risk management. Opportunities and threats, including those arising from the uncertain effects of the company's own activities and decisions, should also be adequately taken into account in normal day-to-day business ("embedded risk management"). This goes hand in hand with an integrative approach to strategic management that takes uncertainty into account and ensures and continuously improves the company's long-term survival and future viability.

Source: Gleißner, W. (2022): Fundamentals of Risk Management, 4th ed., Vahlen Verlag Munich, p. 680 ff.



# Risk management as a crisis prevention system requires risk aggregation using Monte Carlo simulation

§ Section 91 para. 2 AktG: "The Management Board shall take appropriate measures, in particular to set up a monitoring system, to ensure that developments that could jeopardize the continued existence of the company are identified at an early stage."

..... supplemented by **StaRUG (1.1.2021)** .

## **"Section 1 Early crisis detection and crisis management for limited liability entities**

*(1) The members of the body appointed to manage a legal entity (managers) shall continuously monitor **developments that could jeopardize the continued existence of the legal entity**. If they recognize such developments, **they shall take appropriate countermeasures** and report immediately to the bodies appointed to supervise the management (supervisory bodies). ..."*

§ Section 93 (2) AktG: "(1) The members of the Management Board must exercise the diligence of a prudent and conscientious manager in their management of the company. There is no breach of duty if the Management Board member could reasonably assume when making a business decision that they are acting for the benefit of the company on the basis of appropriate information."





## Das zukunftsfähige Familienunternehmen – Mit dem QScore zu Unabhängigkeit, Resilienz und Robustheit (essentials)

Prof. Dr. Werner Gleißner / Prof. Dr. Arnold Weissman

75 pages, ISBN 978-3658427863, Publisher: Springer Gabler Wiesbaden, 2023, 14,99 €

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The QScore concept explained in the book shows, based on a large number of scientific studies, how the future viability of a company can be specifically assessed and potential for improvement derived.

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<https://link.springer.com/content/pdf/10.1007/978-3-658-42787-0.pdf>

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