Sustainable Value Creation of German Companies

Applying a monetary measure of corporate sustainability performance to German companies

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NeW Nachhaltig erfolgreich Wirtschaften

SÖF Sozial-ökologische Forschung

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What this presentation is about

- Assessment logic of the Sustainable Value approach
- Application of Sustainable Value to 28 German companies
- Further applications and discussion

Why do companies use resources?

- Companies create a return.

More return preferred to less return.

- Companies need resources.

Less resource use preferred to more resource use.

Financial market perspective vs. Sustainability perspective

- Financial markets only focus on economic capital.
- Objective: above average (risk-adjusted) return on capital.

- This falls short of the sustainability concept!
- Companies not only use economic capital but also environmental and social resources.
- Without environmental and social resources there is no return.
- From the viewpoint of sustainability focusing only on return on capital is insufficient.

➔ How can we determine if a company has created value with its economic, environmental and social resources?

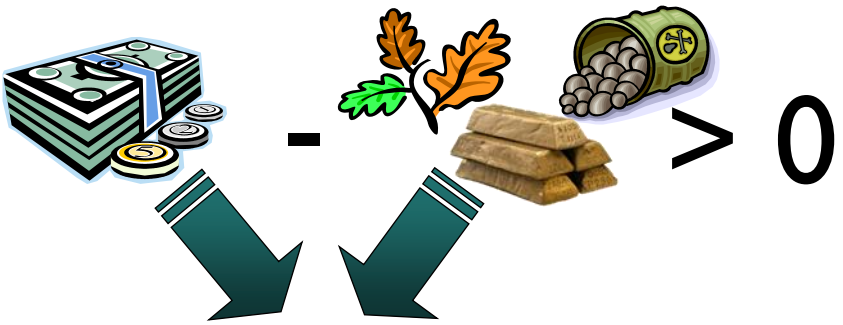
When are resources used in a value-creating way?

- In general, value is created whenever the return exceeds costs:

$$\text{Value} = \text{Return} - \text{Costs}$$

- This rule is fundamental to any economic assessment of corporate performance.
- Sustainable Value extends this basic rule to environmental and social resources.

Easy in theory – difficult in practice



Challenge: We need to express this in the same unit!

David Green, 1894

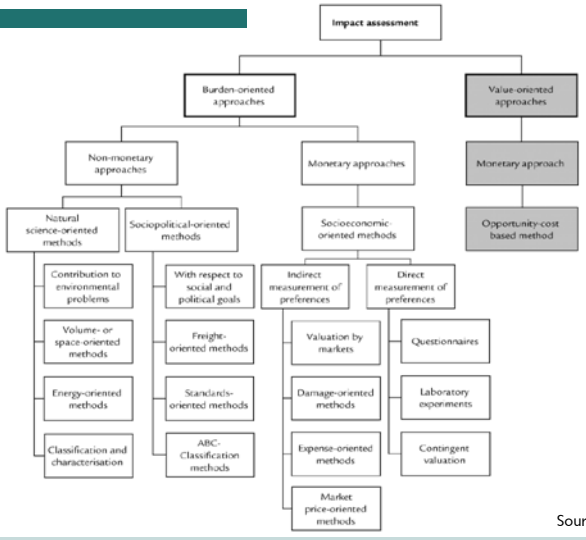
But, when we once recognize the sacrifice of opportunity as an element in the cost of production, we find that the principle has a very wide application. Not only time and strength, but commodities, capital, and many of the free gifts of nature, such as mineral deposits and the use of fruitful land, must be economized if we are to act reasonably. Before devoting any one of these resources to a particular use, we must consider the other uses from which it will be withheld by our action; and the most advantageous opportunity which we deliberately forego constitutes a sacrifice for which we must expect at least an equivalent return.

Green 1894

The Value-Oriented Approach

- How much value is created?
  - How much € return is created per ton of CO_2?
  - How much € return is created per ton of VOC?
- Compare the return of alternative uses (opportunity costs)
  - When used in another place – how much more return is created (opportunity cost)?
  - Value is created only if the return exceeds the opportunity costs.
- It's
  - Focused on how much value is created.
  - Easy to do.
  - Using the logic of the financial markets.
  - Compatible with managerial thinking.

A fundamementally new approach



Source: Figge & Hahn 2004

Performance assessment in financial markets...

	Return	-	Cost	=	Value
		Capital employed 1,000 €			
	Stock A		S&P500		
Return on capital	7%	-	4%	=	3%
	70 €	-	40 €	=	30 €

...and how Sustainable Value works (example of Bayer in 2004)

	Return	-	Costs	=	Value
		Amount of CO_2-emissions used			
		4,100,000 t			
	Bayer		Benchmark German National Economy		Value contribution
Efficiency	1,932 € / ton of CO_2	–	2,133 € / ton of CO_2	=	-202 € / ton of CO_2
Effectiveness	7,916,000,000 €	–	8,743,693,630 €	=	-827,693,630 €

The five steps of applying Sustainable Value

- Definition of the scope of the assessment
  - Choice of companies, of resources and indicators, of the return figure and the time period covered.
- Choice of the benchmark
- Data collection and verification
- Calculation of Sustainable Value
- Interpretation and use of the results

1. Definition of the scope of the assessment

- Which companies or company segments should be assessed?
- Which indicators should be taken into account?
  - Economic resources
    Capital employed, (fixed) assets
  - Environmental aspects
    Emissions, wastes, resources consumption, etc.
  - Social aspects
    Number of accidents, employment
- Which return figure should be chosen?
  - Profits, value added, ...
- Which time period should be covered?

2. Choice of the benchmark

- The choice of the benchmark heavily influences the explanatory power of the results.
- Cross-sector vs. sector-specific benchmark?
  - Different explanatory power
    Best in class vs. best in economy
  - Integrated assessment is possible
- Past-oriented vs. future-oriented benchmark?
  - Target efficiencies as benchmark
  - → Policy objectives as benchmark
- Possible benchmarks:
  Company level, regional level, national economy, industry sector, efficiency targets

3. Data collection and verification

- Collect data for the indicators that have been defined before.
  - on the company level
  - on the benchmark level
- Data has to be consistent:
  - Definition of indicators
    e.g. waste definitions, direct vs. indirect emissions, definition of assets for measuring capital use, etc.
  - Scope of the data
    Does the scope of environmental data match the scope of financial data?
  - Return figure on company and benchmark level has to be consistent.
- If necessary: Correct or amend data.

4. Calculation of Sustainable Value

1. How much return does the company create with its resources?
2. How much return would the benchmark have created with these resources (opportunity costs)?
3. How much more or less return does the company create in comparison to the benchmark with each resource (value contribution)?
4. How much Sustainable Value does the company create with its set of resources used?

Calculation of Sustainable Value using the example of Bayer in 2004

Resource	Amount of resources used by Bayer in 2004	Net Value Added of Bayer in 2004		Return of the German Economy in 2004 (Opportunity costs)		Value Contribution
Non-financial assets	€ 13,574,000,000	€ 7,916,000,000	-	€ 3,755,952,674	=	€ 4,160,047,326
CO_2-emissions	4,100,000 t	€ 7,916,000,000	-	€ 8,743,693,630	=	€ -827,693,630
NO_x-emissions	4,300 t	€ 7,916,000,000	-	€ 5,183,468,712	=	€ 2,732,531,288
SO_x-emissions	4,200 t	€ 7,916,000,000	-	€ 14,108,108,253	=	€ -6,192,108,253
Waste generated	700,000 t	€ 7,916,000,000	-	€ 3,883,765,393	=	€ 4,032,234,607
Water used	511,000,000 m^3	€ 7,916,000,000	-	€ 23,006,627,652	=	€ -15,090,627,652
VOC-emissions	4,500 t	€ 7,916,000,000	-	€ 6,888,522,764	=	€ 1,027,477,236
Dust-emissions	500 t	€ 7,916,000,000	-	€ 5,008,759,855	=	€ 2,907,240,145
Number of work accidents	279	€ 7,916,000,000	-	€ 484,150,617	=	€ 7,431,849,383
Number of employees	93,783	€ 7,916,000,000	-	€ 5,003,048,822	=	€ 2,912,951,178
Sustainable Value of Bayer in 2004		€ 7,916,000,000	-	€ 7,606,609,837	=	€ 309,390,163

Return to Cost Ratio (RCR)

- To compare companies we take into account company size.
  → Return to Cost Ratio
- Return to Cost Ratio = Ratio between the return of the company (gross value added) and the opportunity costs, i.e. the return that the benchmark *would have* achieved with the company's resources.
- Return to Cost Ratio > 1
  → Company is more eco-efficient than the benchmark
- Return to Cost Ratio < 1
  → Company is less eco-efficient than the benchmark
- Return to Cost Ratio 2 : 1
  → Company is twice as eco-efficient as the benchmark

Die Berechnung des Ertrags-Kosten-Verhältnisses am Beispiel von Bayer

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		1, 04		1		
Return to Cost Ratio 2004		1:1				

RCR: Two cases

a) Return > Opportunity costs

Bayer				
Return	-	*Sustainable Value*	=	*Opportunity costs*
7,916,000,000 €	-	309,390,163 €	=	7,606,609,837 €
		7,916,000,000 € / 7,606,609,837 €		
RCR		**1.04** : 1		

K+S				
Return	-	*Sustainable Value*	=	*Opportunity costs*
773,309,000 €	-	-515,244,733 €	=	1,288,553,733 €
		1,288,553,733 € / 773,309,000 €		
RCR		1 : **1.7**		

b) Opportunity costs > Return

Explanatory power of the return to cost ratio

- The return to cost ratio shows by which factor a company exceeds or falls short of the resource efficiency of the benchmark.
- The return to cost ratio provides an integrated measure of the efficiency of the use of economic, environmental and social resources.
- With the return to cost ratio companies of different sizes can be compared.

→ Factor X style comparisons

Application of Sustainable Value to 28 German companies

- Scope of the application
  - 28 companies
  - 10 indicators
  - 3 different benchmarks
    - Base scenario German national economy 2000 – 2004
    - Future scenario German national economy 2010
    - Sector assessments 2002 – 2004
  - Return figure:
    Net value added (corporate level)
    Net domestic product (benchmark level)

Results

Company	RCR	Sustainable Value (in € mill.)	Company	RCR	Sustainable Value (in € mill.)
BMW	5 : 1	8,224	Axel Springer	1.6 : 1	279
Bosch	3.9 : 1	10,362	VW	1.6 : 1	5,339
Merck	3.9 : 1	1,645	Bayer	1 : 1	309
Krones	3.9 : 1	430	K+S	1 : 1.7	-515
Schering	3.8 : 1	1,666	DB	1 : 1.9	-5,540
Heidelberger Druck	3.8 : 1	958	BASF	1 : 2.2	-12,908
Boehringer Ingelheim	3.6 : 1	2,767	Cognis	1 : 2.7	-1.045
Miele	3.5 : 1	450	Degussa	1 : 3.9	-10,878
Deutsche Telekom	2.8 : 1	9,296	Nordzucker	1 : 5	-923
Sirona	2.6 : 1	68	Celanese	1 : 7.1	-5,398
DaimlerChrysler	2.5 : 1	15,208	Thyssen Krupp Steel	1 : 7.4	-14,708
MAN	2.4 : 1	2,288	EON	1 : 14	-144,337
ZF Friedrichshafen	1.7 : 1	1,298	RWE	1 : 14.3	-148,996
Henkel	1.7 : 1	1,188	DSK	n.a.	-2,021

n.a. = not ascertainable

Changes over time 2000-2004

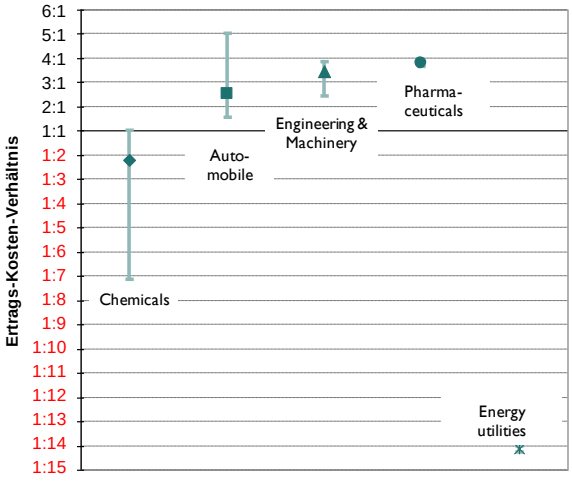
Change of RCR between 2000 and 2004			
Δ RCR	Company	RCR 2004	RCR 2000
81.0%	Henkel	1.7 : 1	1 : 1
43.5%	Thyssen Krupp Steel	1 : 7.4	1 : 10.7#
37.6%	Krones	3.9 : 1	2.8 : 1*
37.3%	Celanese	1 : 7.1	1 : 9.8
32.8%	Nordzucker	1 : 5	1 : 6.6
32.1%	Axel Springer	1.6 : 1	1.2 : 1
...			
-10.9%	BASF	1 : 2.2	1 : 2
-11.6%	ZF Friedrichshafen	1.7 : 1	2 : 1
-15.2%	VW	1.6 : 1	1.9 : 1#
-15.7%	Sirona	2.6 : 1	3 : 1
-19.2%	Heidelberger Druck	3.8 : 1	4.6 : 1
-20.5%	Bosch	3.9 : 1	4.9 : 1
n.e.	DSK	n.e.	n.e.

n.a. = nicht acertainable

* value for 2001
# value for 2002

Return to Cost Ratio in five different sectors

- A cross-sector benchmark shows the resource intensity within and across sectors.



Limits of Sustainable Value

- Application restricted to quantifiable sustainability aspects.
- Assessment provides no information on the degree of sustainability of the benchmark.
- Sustainable Value assessments provide a relative performance assessment.
- Covering entire life cycles is methodologically possible but is hampered by data problems.
- Crap in, crap out: The results will only be as goos as the data that is used.

Characteristics of Sustainable Value

- Sustainable Value applies the logic of investment performance assessment to environmental and social resources.
- To create value the return on environmental resources must cover the costs of the resources.
- Sustainable Value compares the resource use of a company to a benchmark and thus defines the cost of a resource via opportunity costs.
- As a result, Sustainable Value expresses corporate environmental or sustainable performance in monetary terms.
- Sustainable Value can cover the use of economic, environmental and social resources. → Integrated triple bottom line assessment
- Sustainable Value can be used with different benchmarks.
- The Return to Cost Ratio provides a comparative measure of corporate eco- and sustainable efficiency.

Large-scale applications of the Sustainable Value approach

- ADVANCE-Project (Application and Dissemination of Value-Based Eco-Ratings in Financial Markets)
  Assessment of the environmental performance of 65 European companies
- NeW-Project (Nachhaltig erfolgreich Wirtschaften)
  Assessment of the sustainability performance of 28 German companies
- Sustainable Value of the automobile sector
  Sustainability assessment of 15 car manufacturers worldwide
- SVAPPAS-Project (Sustainable Value Analysis of Policy and Performance in the Agricultural Sector)
  Application of Sustainable Value to the agricultural sector

Some publications on Sustainable Value (2001-2007)

- Figge, F. & Hahn, T. (forthcoming): "Sustainable Investment Analysis with the Sustainable Value Approach - A Plea and a Methodology to Overcome the Instrumental Bias in Socially Responsible Investment Research", accepted for publication in: Progress in Industrial Ecology.
- Hahn, T.; Figge, F. & Barkemeyer, R. (forthcoming): "Sustainable Value Creation among Companies in the Manufacturing Sector", accepted for publication in: International Journal of Environmental Technology and Management.
- Figge, F. Hahn, T. (2005): "The Cost of Sustainability Capital and the Creation of Sustainable Value by Companies", Journal of Industrial Ecology, 9(4), 47-58.
- Figge, F. & Hahn, T, (2005): "Sustainable Value - Ein wertorientierter Ansatz zur Ermittlung der Nachhaltigkeitseffizienz und der nachhaltigen Wertschöpfung von Unternehmen", in: Busch, T. & Liedtke, C. (Hrsg.): Materialeffizienz: Potenziale bewerten, Innovationen fördern, Beschäftigung sichern. München: ökom, 203-216.
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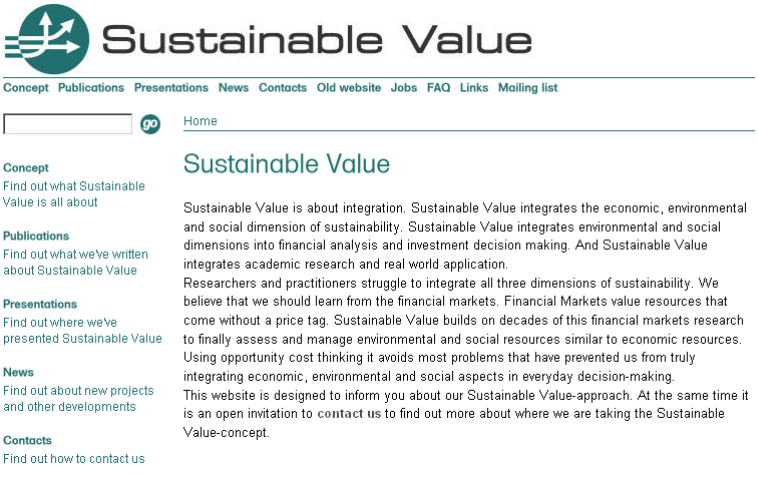
- Figge, F. (2001): "Environmental Value Added - Ein neues Maß zur Messung der Öko-Effizienz", Zeitschrift für Angewandte Umweltforschung, 14(1-4), 184-197.

More information on the internet: www.sustainablevalue.com



Project websites

- www.new-projekt.de
- www.advance-project.org
- www.svappas.ugent.be

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Thank you very much!