

First Elements of Production Portfolio Theory: A New Industrial Engineering Scientific Method

First Elements
of Production
Portfolio
Theory :

B. Heiden et
al.

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FH-Prof. Mag. DI Dr. Bernhard Heiden, MBA
MMag. Bianca Tonino-Heiden

Studiengang Wirtschaftsingenieurwesen (WING/IEM) & Maschinenbau (MB),
FH-Kärnten

02/17/2023, Onsite/Online UTC+0,
William Mong Hall, 11:20-11:40



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Introduction

- Portfolio Theory¹ is famous and widely used in finance → inspired Nobel Prizes
- Not used in other branches
- Intrinsical statistical theory

Content of the Presentation:

- Basis: Selforganisational Theory, Portfolio Theory, Meaning Theory (systemic order increase)
- Problems with risk consideration
- First Elements of Production Portfolio Theory → application to Production/Service, example
- Summary, Conclusions, and Outlook

¹Markowitz 1952.

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First Elements of Production Portfolio Theory

Evolution and Selforganisation (Götschl 2023):

- ① Creation of structures
- ② Stabilisation of structures
- ③ Dissolution of structures
- ④ Creation of structures

→ emergence contraction - by informational density increase, osmotic behaviour, overall systemic risk reduction → overall order growth in an (informational) open and operationally closed system (cybernetics of higher order)

Portfolio Theory for stocks:

- ① Return
- ② Risk

→ statistical properties, nonlinear, self-related

Preliminaries II

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(Term)	(1)	(2)	(3)	(4)
Product/ Service	part, busin ess- proc- ess	material, sub- stance, exchange entity	interesting, useful, human- valuable thing	selling/bu ying unity (norm, count- able)
Cost/ Price	abstra ctum	exchange symbol	for trading, value, energy equivalent	EURO
Market	abstra ctum	society, quantity	buyer/ seller of products, values	citizens that buy/sell in EURO
Portfolio	abstra ctum	quantity, set, society	collection of products, production steps	overall prod- uction process

Table 1: MEANING OF COST/PRICE, PRODUCT/SERVICE, MARKET AND PORTFOLIO FOR THE MEANING VECTOR COMPONENTS (1) SYNTACTIC MARKER (2) DESCRIPTIVE STEREOTYPE (3) AND EXTENSION (4)².

²Cf. Putnam 2004

Systemic Relations & Risk in Production/Service I



Figure 1: Non-linear production phenomena in lasercutting

Fallacies of Production/Energy Consumption (Heiden 2022) -
systemic generalised interpretation:

- short-term time & 'long'-room
- long-term time & 'short'-room

Systemic Relations & Risk in Production/Service II

- (1) Amortisation calculation → one-dimensional in view: Not relevant when 'doing nothing' costs nothing. Relevant when 'doing nothing' is costly → need to consider relative costs (higher order valuation method - non-linear phenomenon)
→ equivalent to risk consideration
- (2) Day, season storage for energy. Costs more but opens up new energy resource and is hence emergent in behaviour (emergence contraction³)

Systemic Relations & Risk in Production/Service III

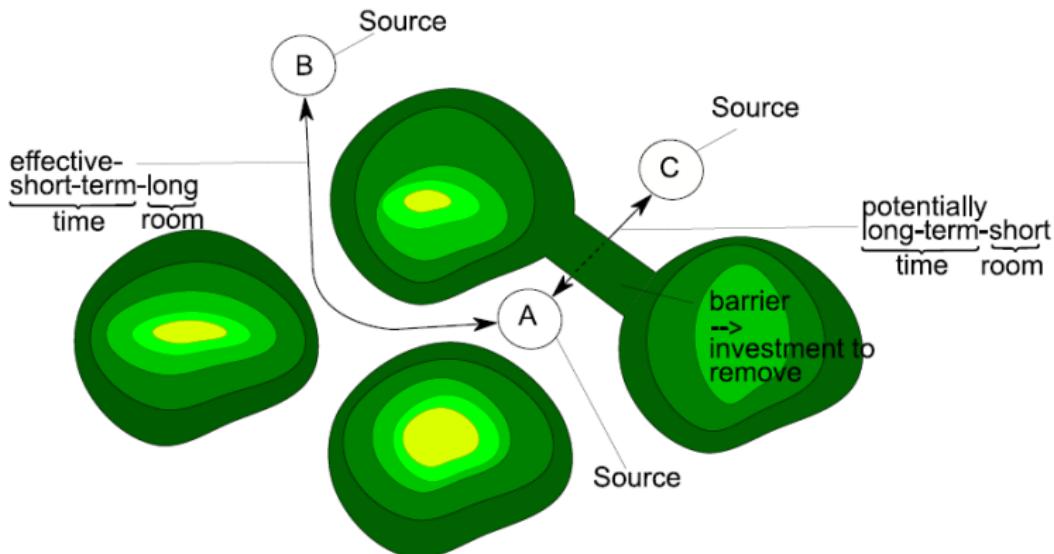


Figure 2: Near-Far-Barrier-Sources Relation

³Cf. Heiden and Tonino-Heiden 2023a

Axiom 1

The static amortisation calculation has to be corrected for a second view of the potential benefit with a lower flow distance and, hence, potentially higher efficiency

Axiom 2

The second perspective of amortisation is (a) that there is excess energy available (Source C in Fig.2), ...

Axiom 3

A market is characterised by a recurrence of (similar) processes

Axiom 4

Parallel is bidirectionally connected to a higher dimension.

Axiom 5

In an information-dense environment, there exists a co-productive factor that enables adequate power that is less in effort while it is the same with regard to the efficited or efficient power

Axiom 6

Parallel Processes that simultaneously start will increase/decrease potentially their power sharply additionally/subtractively using the co-production principle (Axiom 5)

- Company (A) A-app
- Costumer (B) Bonus or B-app → B_A Bonus in a year for sum of purchases.
- City (C) C-app → B_C Bonus
 - Barrier is information distance
 - Two cards → one card with differentiated (nonlinear) bonus
 - Emergence contraction:
 - risk reduction
 - informational density increase
 - higher informational 'productivity'
 - more value (benefit) for the same price (effort) in the overall network A,B,C

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Summary, Conclusion and Outlook

Conclusions and Outlook I

Summary and Conclusions:

- Production Portfolio Theory first elements
- Application as meta-heuristic method⁴ of valuation of production/service process steps
- Six first basic axioms as core elements (open approach)
- Business examples as illustration of partitioning of process steps

Learning:

- (1) Information density increase → higher order (risk reduction)
 - (2) Dynamisation of production/service process → emergence contraction → higher order (by means of usage of information density - 'Rendite' (return))
- (Energy) Efficiency increase ('Produktivität' with Peter Drucker 1999)

Conclusions and Outlook II

Outlook:

- Precise mathematical formulation of the production portfolio statistics → generalised Portfolio Theory for random variables (Heiden and Tonino-Heiden 2023a)
- Combination with 'Law' Systems (Rules based) → Portfolio Fairness Theory that is an informational dense application to Economic Theory

⁴with regard to evolutionary selforganisational theory, theory of meaning, portfolio theory

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Thank you cordially for your attention!



**FH-Prof. Mag. DI Dr. Bernhard Heiden¹, MBA & MMag.
Bianca Tonino-Heiden**

¹Professor for Production Engineering

E-Mail: b.heiden@cuas.at

PS.: The presentation can also be found and downloaded at:

<http://www.dr-heiden.com/Vortraege.htm>



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