Monetarization of Delay Valuation in Freight

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Agenda

1. Introduction
2. Approach
3. Findings
4. Summary
The increased intensity of use of rail infrastructure can entail availability and quality issues.

Forecast of freight traffic [tonne kilometre] in Germany 2030

measures concerning the level of supply quality:
- operations
- vehicles
- infrastructure

Supply Quality

characteristics

requirements

SUPPLY

DEMAND
A logistics-oriented definition and valuation of delays in freight for transport mode choice is targeted.
Requirements of the modern transport market seem to be not sufficiently represented in demand models.

Objective:
evaluation of demand reactions generated by measures targeting supply quality e. g. a higher level of punctuality

Transport Demand Models:

- mostly include price and transport duration
- requirements of the supply chain might be more complex and diverse
  → requirements of the modern transport markets are not sufficiently included

- necessity to include reliability (Significance 2012 | BVU 2014)
- few approaches partially include qualitative characteristics (Oetting/Rio 2014)
  → still lacking requirements and link to logistics and production
The interviews gave an overview on the relevant criteria in mode choice.

- 21 interviews of 90 minutes duration
- forwarders and shippers
- open formulated interview guideline

Results:

criteria when choosing a mode of transport:

- no homogenous approach for a documentation of delays
- delays lead to a loss of image
- time window considered on time: 30 minutes up to one day
- information: as early as possible | proactive
Achieving a determination of value ranges and a relative assessment of criteria through a quantitative survey.

- based on the expert interviews
- pretest of the questionnaire
- 55 interviews of 20 minutes duration
- participants from not predetermined different industry sectors

1) General Section

2) Supply/Distribution Processes

3) Determination of Value Ranges of Criteria Influencing Mode Choice

4) Assessment of the Importance Influencing Mode Choice

→ reference point

→ logistics dependency

→ points in delay valuation

→ relative assessment of importance
The individual points in time of delay valuation ensure that the whole supply chain is included.

**Objective:**
- first quantification of the parts of delay valuation

**Method:**
- no partitioning along the goods or sectors
- function of the applied logistics and production concepts

**Requirement:**
- aggregation of the data

<table>
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<tr>
<td>Storage</td>
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<td><strong>36</strong></td>
<td>12</td>
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<tr>
<td>Production</td>
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<td><strong>20</strong></td>
<td>7</td>
</tr>
<tr>
<td>Others</td>
<td>42</td>
<td><strong>14</strong></td>
<td>6</td>
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The starting point of the delay valuation of moves in the range from hours to days.

Valuation of arrival deviations does not necessarily begin with the minute exceeding the delivery time.

Aggregated number of indications:

- Storage:
  - 17% assess 1-30 minutes as delayed
- Production:
  - No delay valuation from 1-30 minutes
- Greatest accumulation:
  - 12 hours to 1 day
Effects on the production occur at different points in time.

*impact on production gathers in the time frame of 12 hours until 1 day*

Aggregated number of indications:

- **Storage**
- **Production**
- **Others**

Production: 1-6 hours until impact as expected for JIT and JIS concepts

Greatest accumulation: like starting point of delay valuation
The ending point of delay is commonly located with a delay larger one day.

Ending point of delay valuation differs strongly along the categories

Aggregated number of indications

Production: early ending point distributed more equally → fallback procedures

Storage and others: impaired of a delay until the delivery arrives
The specification of the delay evaluation components by respondents is possible only restricted.

*determination ability decreases along the time course of delays*

aggregated number of indications

- **Production:** higher specification rate of an ending point of delay valuation

![Bar Chart](image)
The importance of delays has been assessed accordingly high as in the expert interviews.

*price is the most important criteria in all categories*

rate of delay is more important than the height of delay

available information in case of delay should be proactive → necessary to intervene
A conclusive assessment of planned activities optimizing supply quality is necessary.

- Different types of additional costs occur along the chronological sequence:

  - Delay valuation
  - Impacts on logistics
  - Impacts on production
  - Production standstill

- Time-and-process dependent function of impacts and resulting costs
  - Costs are located at the transport customer
  - The customer is the catalyst for a demand reaction

**Effects of delays need to be monetarized in a customer-dependent way**
Sources


