The Economic Benefits on Standards

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Agenda

- Why the economic perspective on standardization?
- Main contents of the chapter
- How to teach the contents? A proposal
- Questions
Main learning objectives

- Understanding that standards and standardization are an important basis for a functioning economic system.
- Getting valuable insights into the far-reaching impacts of standardization on the economy, and how different stakeholders can benefit from these impacts.
- Understanding and being able to explain the impact of standardization on public procurement.
Main Contents

- Economic contribution of standards
- The economic effects of standardization
- Public Procurement and standardization
Several studies calculated the contribution of standards to economic growth:

- Great Britain (DTI, 2005)
- Germany (Blind et al., 2011)
- France (Miotti, 2009)
- Canada (Haimowitz and Warren, 2007)
- ... 

They are based on regression analysis: A statistical process for estimating the relationships among variables
Important Variables

- The Cobb–Douglas production function encompasses the entire business sector:

  ![Diagram of Economic Input and Output](image)
  - Economic input:
    - Capital (gross fixed assets)
    - Labour (persons employed)
    - Technical progress (total factor productivity (TFP))
  - Economic output:
    - Gross value added and/or
    - Gross domestic product (GDP)

- A national economy is also affected by external political factors (e.g., oil crises, “new economy” bubble burst) which have to be considered

Source: Blind et al. (2011)
The Example of Germany

- Increasing contribution of standards to the GDP throughout the 1970s
- 1986 – 1990 adjustments of the standard collection
- After German reunification the values stabilize at 0.7 to 0.8%

<table>
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</thead>
<tbody>
<tr>
<td>Capital</td>
<td>2.30%</td>
<td>1.70%</td>
<td>1.60%</td>
<td>1.10%</td>
<td>0.90%</td>
<td>0.90%</td>
<td>0.90%</td>
<td>0.50%</td>
<td>0.30%</td>
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<tr>
<td>Labour</td>
<td>0.70%</td>
<td>0.10%</td>
<td>-0.50%</td>
<td>0.60%</td>
<td>-0.40%</td>
<td>1.20%</td>
<td>-0.70%</td>
<td>0.60%</td>
<td>-0.30%</td>
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<td>Patents</td>
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<td>0.90%</td>
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<td>2.00%</td>
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<tr>
<td>Standards</td>
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<td>1.80%</td>
<td>1.20%</td>
<td>0.70%</td>
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<td><strong>0.70%</strong></td>
<td><strong>0.80%</strong></td>
<td><strong>0.70%</strong></td>
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<tr>
<td>Special factors</td>
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<td>0.01%</td>
<td>-0.70%</td>
<td>-0.20%</td>
<td>-1.30%</td>
<td>0.01%</td>
<td>0.01%</td>
<td>-1.10%</td>
<td>1.10%</td>
</tr>
</tbody>
</table>

* There is no reliable data for 1991 due to German reunification.

Source: Blind et al. (2011)
Contribution of Standards to the GDP

What does 0.7 – 0.8% of the GDP mean in monetary value?

16.77 billion Euros a year*

*from 2002–2006 in Germany

Results from other countries:

<table>
<thead>
<tr>
<th>Country</th>
<th>Publisher</th>
<th>Time frame</th>
<th>Growth rate of GDP</th>
<th>Contribution of standards to GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>AFNOR (2009)</td>
<td>1950 – 2007</td>
<td>5.4 %</td>
<td>0.8 %</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>DTI (2005)</td>
<td>1948 – 2002</td>
<td>2.5 %</td>
<td>0.3 %</td>
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<tr>
<td>Canada</td>
<td>Standards Council of Canada (2007)</td>
<td>1981 – 2004</td>
<td>2.7 %</td>
<td>0.2 %</td>
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<tr>
<td>Australia</td>
<td>Standards Australia (2006)</td>
<td>1962 – 2003</td>
<td>3.6%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

Note: The table covers different periods as no consistent data was available.

Source: Blind et al. (2011)
Costs of Standardization from company’s perspective

- Financing standardization activities:
  - Usually participants (e.g., companies, academics) have to finance standardization activities themselves:
    - Membership fees (e.g., ETSI 6000€/year for SMEs)
    - Travel costs
    - Working hours of representatives
  - Offset of short-term costs versus long-term pay-off
- Costs can also work as barriers to trade (e.g., if set at an unreasonable level)
- SMEs appear to have individually very limited resources to invest in standardization (Ernst & Young, 2015)
- Within the 3rd Generation Partnership Project (3GPP), SMEs and start-ups have a low participation level in standardization (15% of overall participation), but their contributions are as likely to be accepted as those of non-SMEs (Gupta, 2017)
# Effects of Standardization

<table>
<thead>
<tr>
<th></th>
<th>Positive Effects</th>
<th>Negative Effects</th>
</tr>
</thead>
</table>
| **Compatibility/ Interface Standards** | • Network externalities  
• Avoiding lock-in in old technologies  
• Increased variety of system products  
• Efficiency in supply chains | • Anti-competition, leading to monopoly  
• Lock-in in old technologies in case of strong network externalities |
| **Minimum Quality/ Safety Standards**   | • Avoiding adverse selection  
• Creating trust  
• Reducing transaction costs | • Regulatory capture  
• Increasing entry barriers |
| **Variety Reduction Standards**         | • Economies of scale  
• Building focus and critical mass | • Reduced choice  
• Leading to monopoly, market access barriers |
| **Information/ measurement Standard**   | • Facilitating trade  
• Reduced transaction costs  
• Providing codified knowledge | • Regulatory Capture |

Table: Effects of standards (Source: Swann (2000), Pham (2006), Blind (2013), modified)
## Major Demand-Side Effects for Innovation

<table>
<thead>
<tr>
<th>Different Types of Standards and their Major Demand-side Effects for Innovation</th>
<th>Generation of Network Effects</th>
<th>Generation of Economies of Scale</th>
<th>Reduction of Information Asymmetries</th>
<th>Reducing Uncertainty and Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility/Interoperability</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Minimum Quality/Safety</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Variety Reduction</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Source table: Blind (2013), p.15
Public Procurement and Standardization

Positive effects:
- Improve the quality of public services and infrastructures → high customer (e.g., citizen) satisfaction
- Improvement in public services can lead to intensified competition between regions
- Innovations may lower costs over the whole life cycle of a technology (lower maintenance, energy or repair costs)

Negative effects:
- Due to new features or improved functionalities the purchase price might be higher
- Innovative technologies bear higher risks for the user, but also e.g., for the environment
- New technologies can increase maintenance costs due to less experience
- Specific innovation can only be produced by a small number of companies (or even a single one)
Public procurement process and standards

- **Before procurement**
  - Analysis of appropriate standards
  - Strategic referencing of standards
- **During procurement**
  - Selection of proposals can be based on compliance to required basic standards
  - Possible conflicts can be solved with help of standards
- **After procurement**
  - Reduced transaction costs by identifying deviations using standards as references
  - Easier monitoring of technology by taking newly released standards into account
Teaching Proposal of the Chapter

- Students can read one of the studies on the economic benefits of standardization on GDP before class, or the instructor can designate a group of students that present the results of the study in class.
- Based on that, a discussion on the contribution of standards to GDP can be initiated.
- Then, the instructor should introduce the four types of standards: (1) Compatibility/interoperability, (2) Minimum quality/safety, (3) Variety reduction, and (4) information.
- Based on this information, students can be divided in groups, whereas every group can elaborate on the positive and negative effects of standards from a company’s perspective.
- The instructor can introduce and explain technical terms such as network effects, lock-in-effect, economies of scale, and information asymmetries, while taking the suggestions of students. At the end of the discussion both tables presented before could be shown to students.
- Students may not be used to the process of public procurement. The instructor may look for a public tender where standards are mentioned. Then, the he or she can deal with the process of public procurement, while highlighting the potential support of standardization.
Any further questions?

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