



The Economic Benefits on Standards

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Forming the Next Generation of ICT Standards People:
A Day of Teaching Standardization

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Agenda



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

The Economic Perspective on Standardization

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

Forming the Next Generation of ICT Standards People:
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- Economic contribution of standards
- The economic effects of standardization
- Public Procurement and standardization

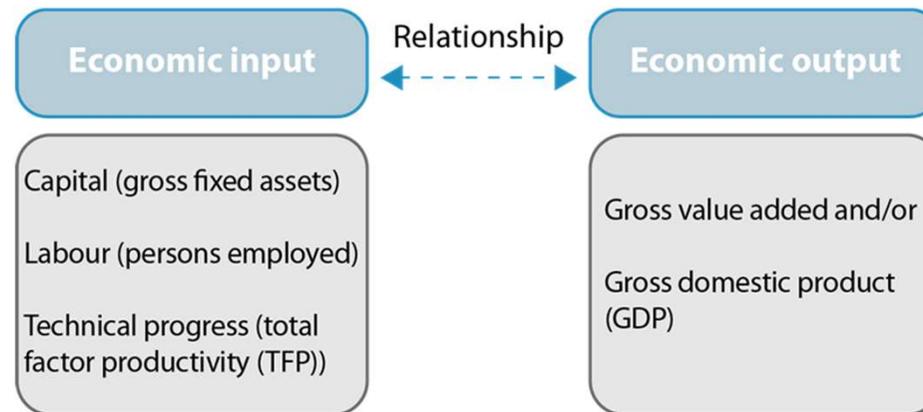
Contribution of Standards to GDP

- 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



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



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



- 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%

CONTRIBUTION TO GROWTH OF VARIOUS PRODUCTION FACTORS, IN %

	1961-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1992*-1996	1997-2001	2002-2006
Capital	2.30%	1.70%	1.60%	1.10%	0.90%	0.90%	0.90%	0.50%	0.30%
Labour	0.70%	0.10%	-0.50%	0.60%	-0.40%	1.20%	-0.70%	0.60%	-0.30%
Patents	0.50%	0.50%	-0.60%	0.60%	1.00%	0.00%	-0.70%	-0.60%	-0.60%
Licences	0.90%	0.80%	0.90%	0.30%	0.50%	2.00%	1.70%	0.10%	0.50%
Standards	0.40%	0.60%	1.80%	1.20%	0.70%	-0.02%	0.70%	0.80%	0.70%
Special factors	0.01%	0.01%	-0.70%	-0.20%	-1.30%	0.01%	0.01%	-1.10%	1.10%

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

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:

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

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

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)

	Positive Effects	Negative Effects
Compatibility/ Interface Standards	<ul style="list-style-type: none"> • Network externalities • Avoiding lock-in in old technologies • Increased variety of system products • Efficiency in supply chains 	<ul style="list-style-type: none"> • Anti-competition, leading to monopoly • Lock-in in old technologies in case of strong network externalities
Minimum Quality/ Safety Standards	<ul style="list-style-type: none"> • Avoiding adverse selection • Creating trust • Reducing transaction costs 	<ul style="list-style-type: none"> • Regulatory capture • Increasing entry barriers
Variety Reduction Standards	<ul style="list-style-type: none"> • Economies of scale • Building focus and critical mass 	<ul style="list-style-type: none"> • Reduced choice • Leading to monopoly, market access barriers
Information/ measurement Standard	<ul style="list-style-type: none"> • Facilitating trade • Reduced transaction costs • Providing codified knowledge 	<ul style="list-style-type: none"> • Regulatory Capture

Table: Effects of standards (Source: Swann (2000), Pham (2006), Blind (2013), modified)

Major Demand-Side Effects for Innovation

Different Types of Standards and their Major Demand-side Effects for Innovation

	Generation of Network Effects	Generation of Economies of Scale	Reduction of Information Asymmetries	Reducing Uncertainty and Risk
Compatibility/ Interoperability	X			
Minimum Quality/ Safety				X
Variety Reduction		X		
Information			X	

Source table: Blind (2013), p.15

- 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)

Support of Standards During Procurement Process

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?

Contact me:

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An abstract graphic at the bottom of the slide features a dark blue background with a complex network of glowing blue lines and dots, resembling a digital or data network. The lines form various geometric shapes and patterns, creating a sense of depth and connectivity.

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