

The Economic Value of Standards

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Session: **1.3 - Fuelling the System - Economic Realities**
Date: **Tuesday, November 16, 2004**
Time: **8:45 a.m. - 10:15 a.m.**

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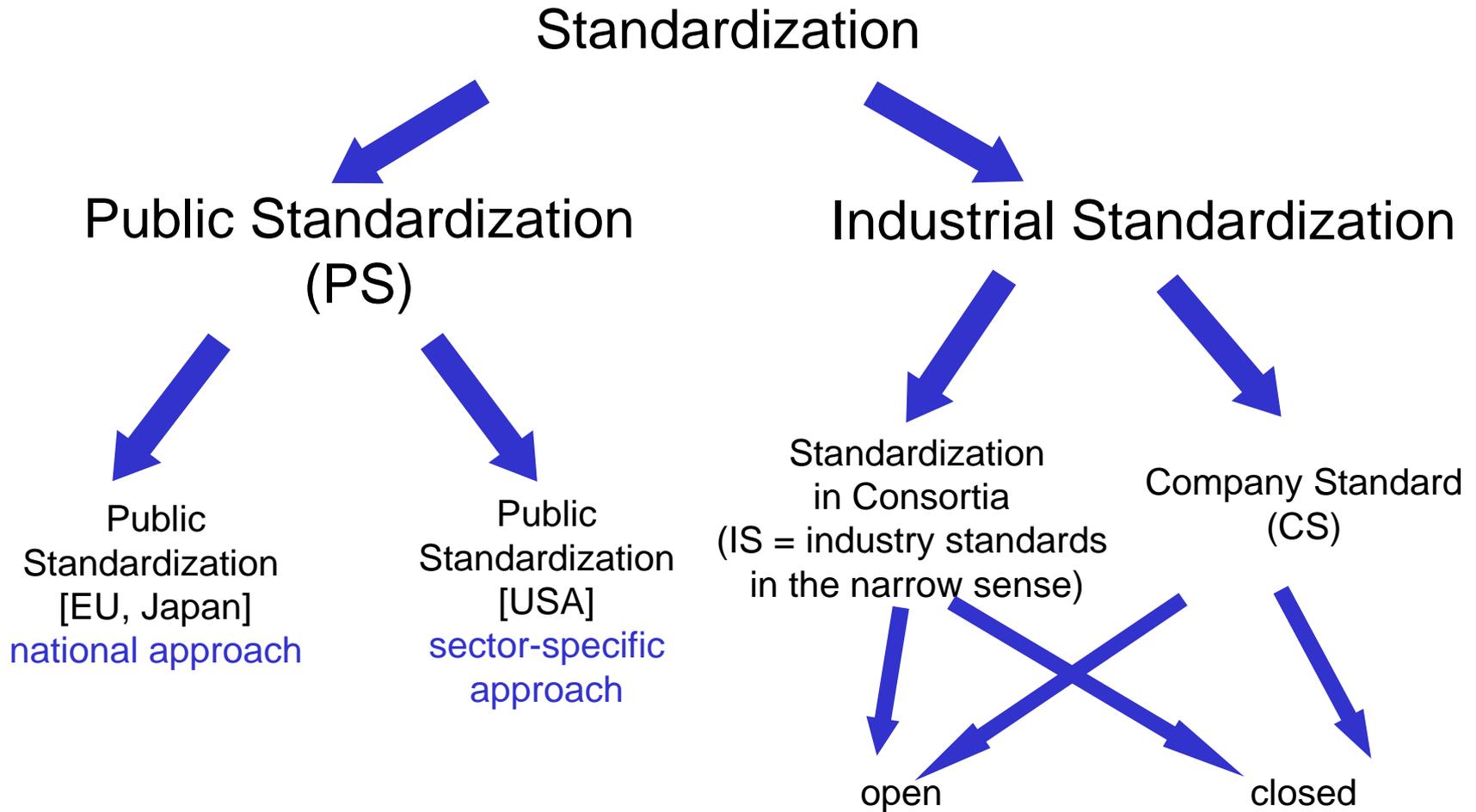
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<http://www.iwh-halle.de>;

Questions about Standards

- What type of good? Who pays?
- What impact on competition? What benefits and costs?
- What institutional changes are promoted?

... but before we start, some fundamentals:

Glossary of Standardization



Production Factors:

- Labor (Aristotle, Aquin, Marx)
- Natural Resources (Quesnay, Turgot)
- Capital (Say)

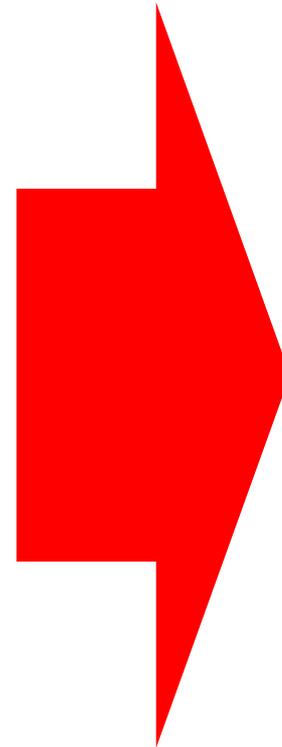
Interaction

- Trade (Smith, Ricardo)

Institutions (List, Schumpeter, North)

Human Capital (List, Romer)

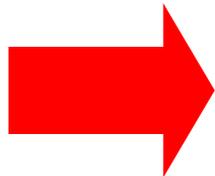
- **External Economies**
 - economies of scale
 - economies of scope
 - learning effects
 - network effects



Covered by Standardization

What is „economic thinking“?

- thinking in alternatives ...
- opportunity costs (lat.: *opportunitas*) ...
- risk and reward ...



Risk can be positive or negative

Risk can be diversified

Standardization should be evaluated
in a risk-revenue structure

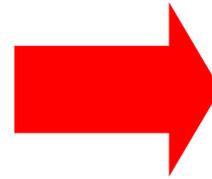
- Standardization produced and reduces transaction costs
- Standardization produces public, club and private goods
- Standardization changes information properties (inspection, experience, credence goods) and information asymmetries
- Standardization implies „sinking costs“ which is risky in case of failure and may block market entry and produce competitive edge

Decision problem:

- Put costs on more shoulders with (consortial) Industry Standards (IS) or Public Standards (PS) at the potential cost of profits through market leadership?
- What are the platform effects of a large and fast dissemination?
- Who pays and what strategy is rewarding?

Exclusion, Rivalness

- Public
- Club
- Private



Information Asymmetry

- Inspection
- Experience
- Credence

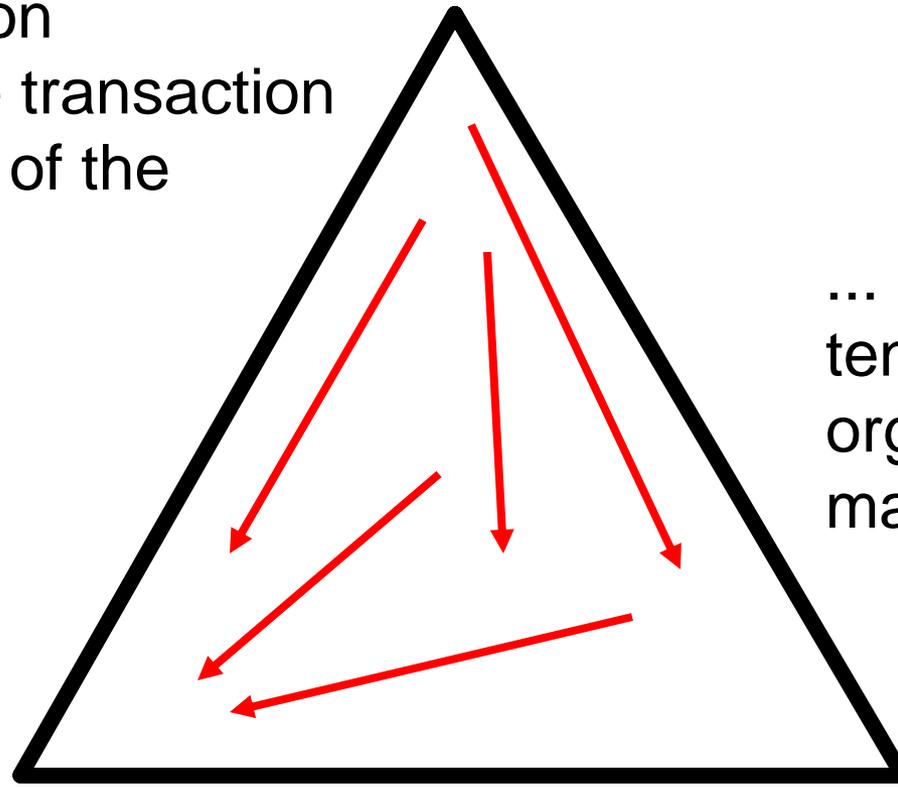
Standards change
The goods structure

Standardization influences the transaction cost structure of the economy ...

Vertical Hierarchy

„Obedience“

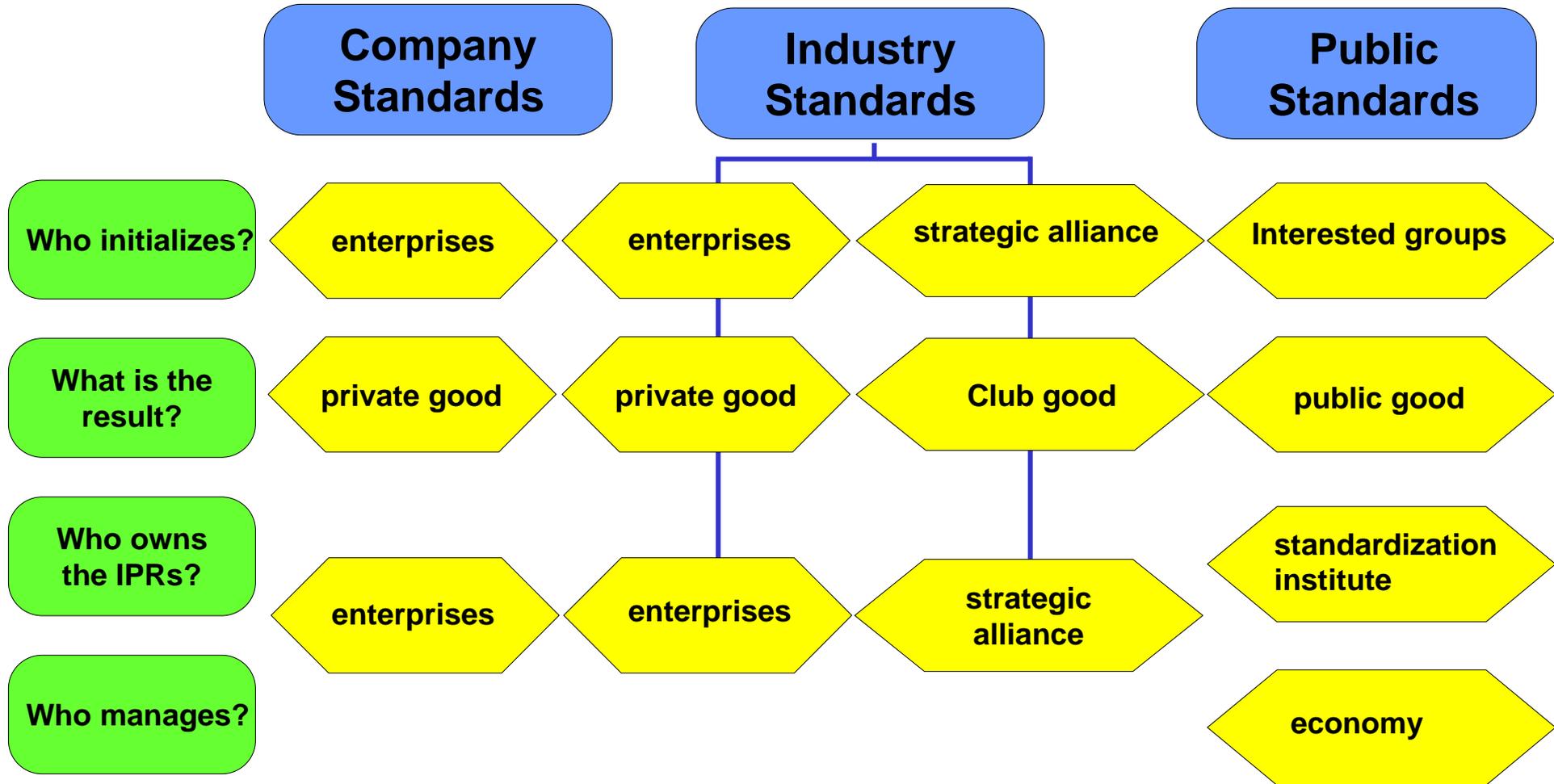
Market
„Exchange“



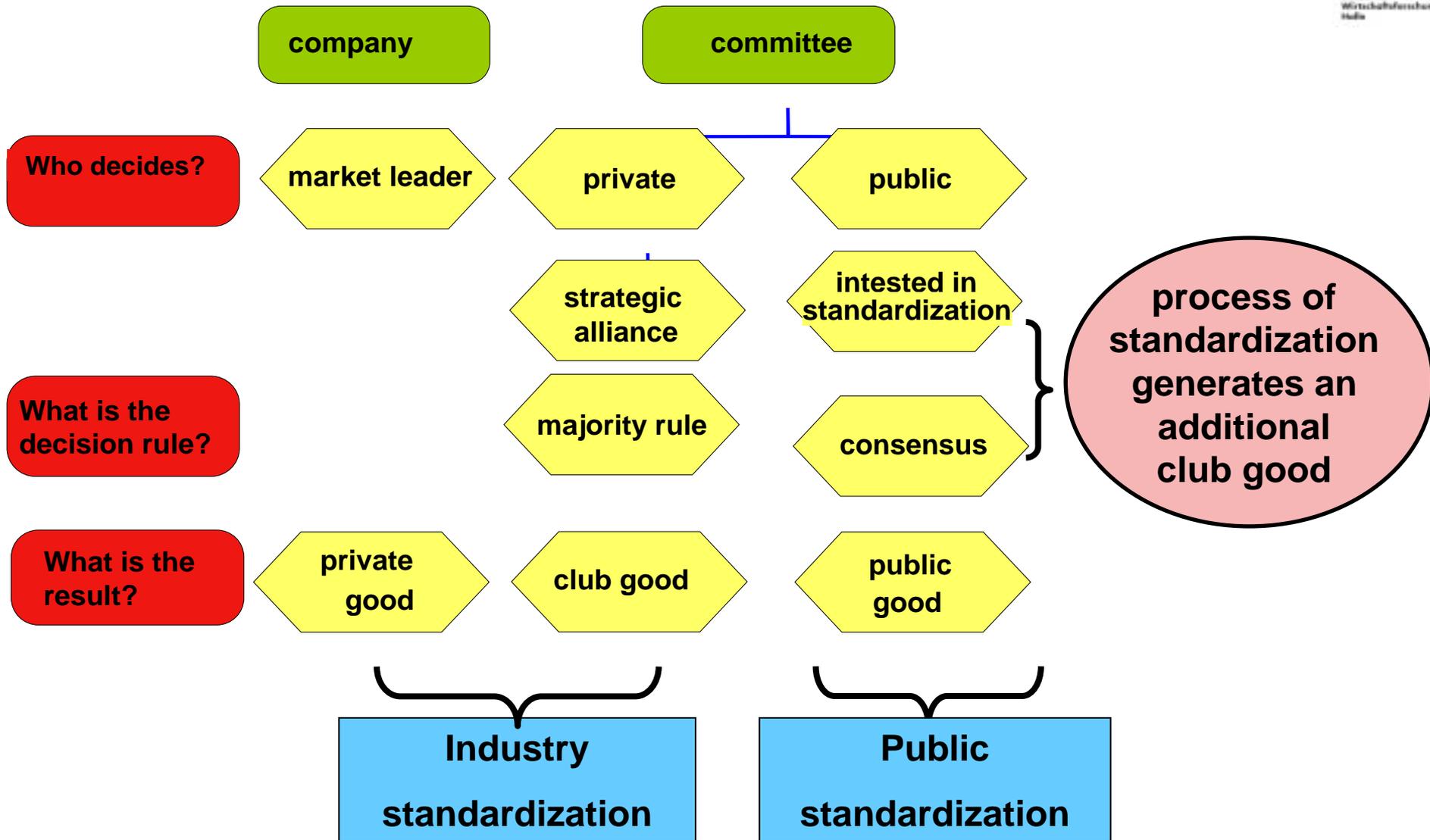
... and triggers a tendency to flatter organizations or to markets!

Flat Hierarchy
„Sharing“

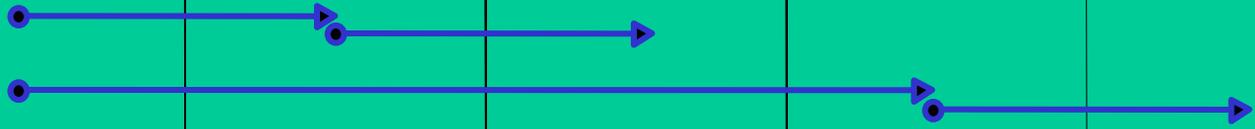
Types of Standards



Properties of the Standardization Process



Ambiguity of Standardization

No.	1	2	3	4	5
Type of standard	(pure) company standard (CS)	(pure) industry standard	CS becomes specific IS	(pure) public Standard (PS)	CS becomes PS
	CS	IS	CS-IS	PS	IS-PS
Process (selected)					
Consequences Internal to the firm	<ul style="list-style-type: none"> • Int. economies of scope • Learning effects • Cost and quality leadership 	<ul style="list-style-type: none"> • Int. economies of scope • External economies of scope 	<ul style="list-style-type: none"> • Int. economies of scope • Learning effects • Cost and quality leadership 	<ul style="list-style-type: none"> • Int. economies of scope • Learning effects • Cost and quality leadership 	<ul style="list-style-type: none"> • Int. economies of scope (EoS) • External EoS
Consequences for competition	<ul style="list-style-type: none"> ❖ In case of success monop. potential ❖ Decreasing intensity of comp. 	<ul style="list-style-type: none"> ❖ Monop. compet. In group ❖ High intensity of competition 	<ul style="list-style-type: none"> ❖ Monop. compet. In group ❖ Intensity of comp. Decreases vis-a-vis (2) 	<ul style="list-style-type: none"> ❖ Inst. standards create platform for competition ❖ Extremely high intensity of comp. 	<ul style="list-style-type: none"> ❖ Temporary Monopoly
Evaluation •Enterprises •Group/industry •Economy	<p>++</p> <p>-</p> <p>-/+ (inn.)</p>	<p>+</p> <p>-</p> <p>-/+ (inn.)</p>	<p>++</p> <p>-</p> <p>-/+ (inn.)</p>	<p>-/+ (partic.)</p> <p>-/+ (partic.)</p> <p>+ / ++ (partic.)</p>	<p>++</p> <p>-</p> <p>-/+ (inno.)</p>
Evaluation	Only positive if innovation is triggered	Dominance of IS possible; positive impacts only if innovation follow	Positive impact depends on innovation	Positive impact in case of participation	Positive impact depends on innovation

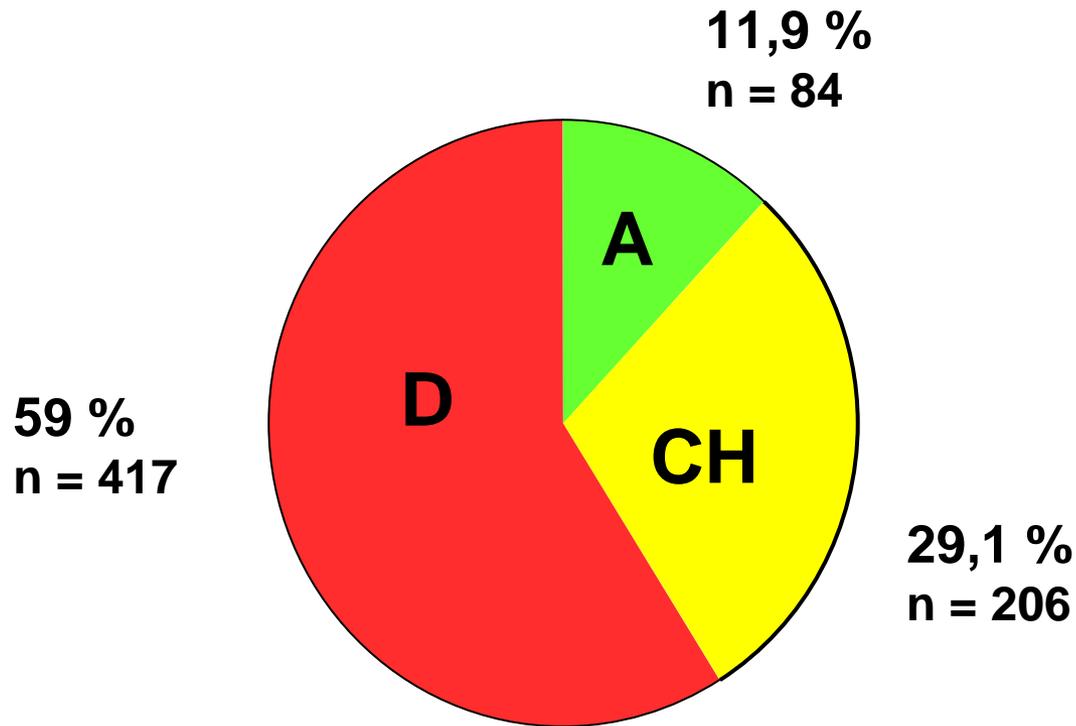
The research was conducted and the data was obtained within the context of a study for the DIN (German Institute for Public Standardization) on the Economic Effects of Public Standards

Blum, U.; H. Grupp, H; Töpfer, A. et al, 2000:

- Gesamtwirtschaftlicher Nutzen der Normung – Zusammenfassung und Ergebnisse, Wissenschaftlicher Endbericht mit praktischen Beispielen, Beuth-Verlag, Berlin.
- Economic Benefits of Standardization – Summary of Results, Final Report and Practical Examples, Beuth-Verlag, Berlin.
- Beneficios económicos de la normalización. Resumen de resultados. Reporte final y ejemplos practicos, Beuth-Verlag, Berlin.

Analysis of German-speaking countries

n = 707



caption:

D - Germany
A - Austria
CH - Switzerland

Sectors analyzed

8 branches:

- aerospace*
- construction industry
- engineering
- metallurgy
- production of rubber and plastics
- chemical industry without pharmacy
- production of vehicles
- electrical engineering

**Selection criterion:
standardization
Intensive industries**

2 branches as control groups:

- broadcast engineering, television and communication engineering*
- production of pharmaceutical goods

**Low intensity
in standardization**

* - not conducted in Austria

Companies analyzed

Return of questionnaires

Germany

- 94 large companies (numbers of employees)	45	(48%)
- 425 members of "ANP"	187	(44%)
- 2.045 companies from 10 industries	372	(18,2%)

Austria

592 companies from 8 industries	84	(14,1%)
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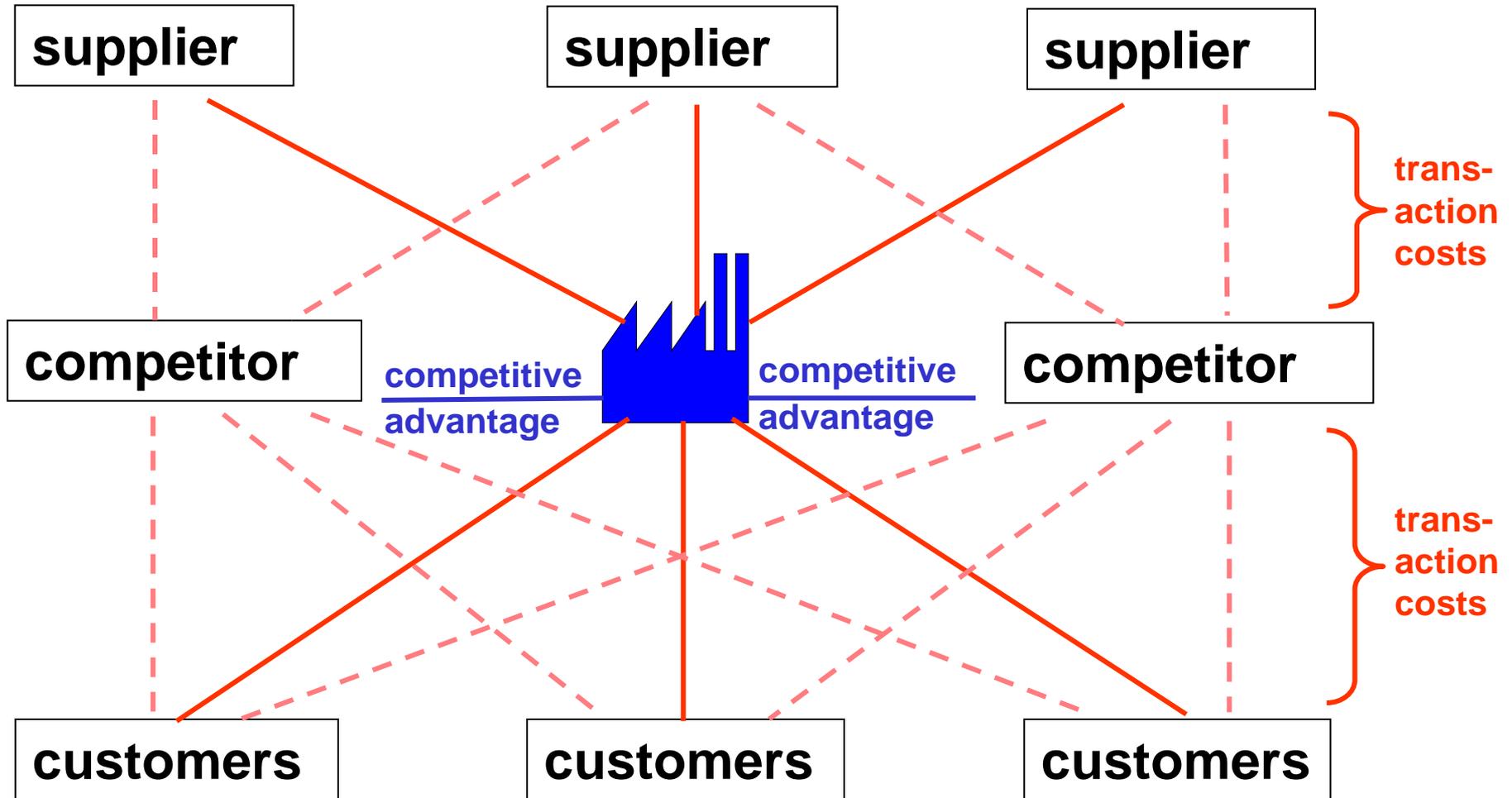
Switzerland

1.771 companies from 10 industries	206	(11,6%)
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Competition effects arise because of

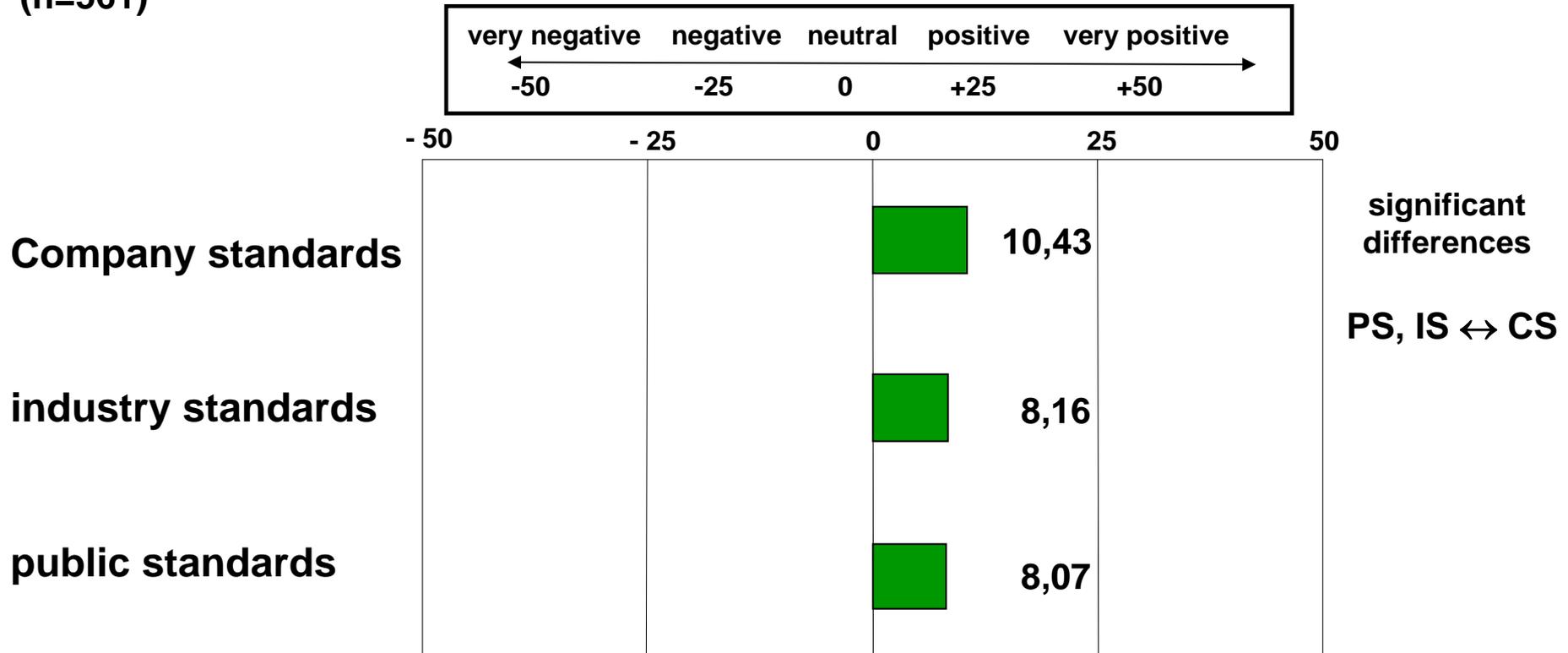
- Changes in transaction costs and institutional arrangements,
- Changes in cooperation structures
- sunk costs and changes in market structure, conduct, performance,
- changes in risk
- external economies

The Role of Standards in the Value Creation Chain



Competitive Advantage

Effect of competitive advantage vis-à-vis competitors in case of...
(n=561)

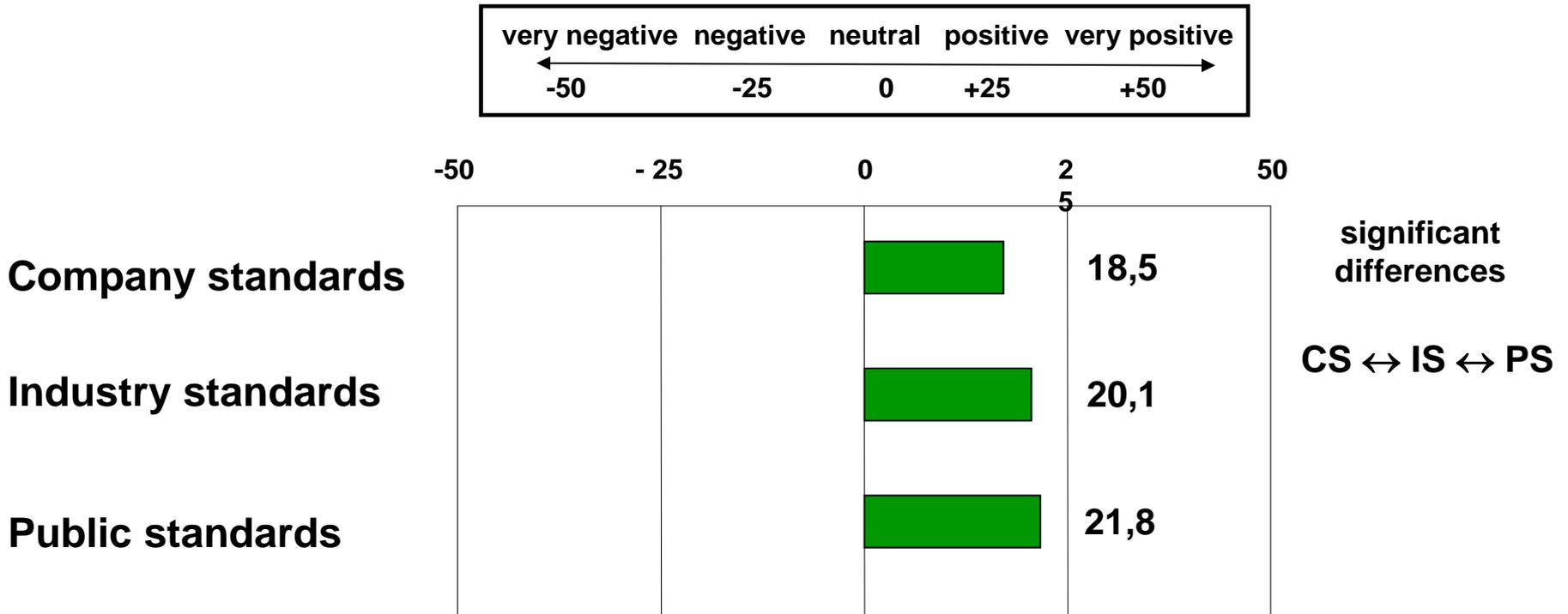


▶ The highest competitive advantage is achieved with company standards

↳ *Company standards are internal knowledge of the company with the help of which enterprises can differentiate from competitors and may, thus, achieve advantages.*

Transaction Costs

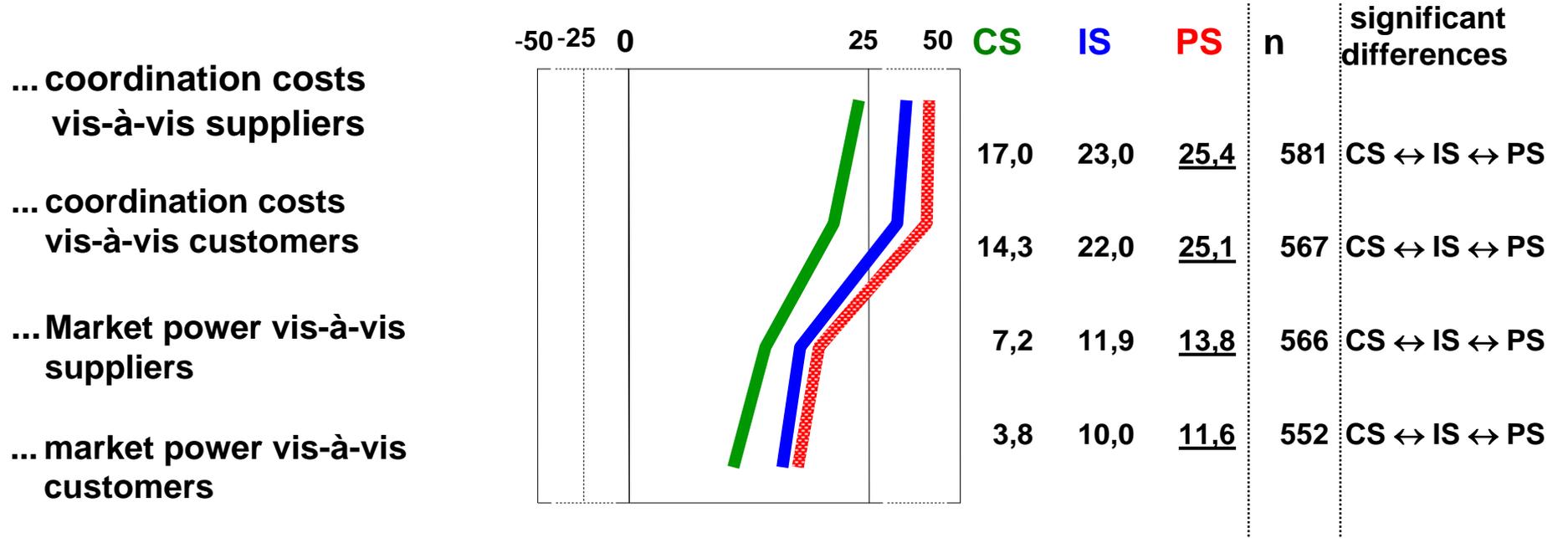
Effects on transaction costs resulting from the use of
(n=550)



Public standards contribute the most to the reduction of transaction costs.

Position of Enterprises in Vertical Competition

The impact on ...

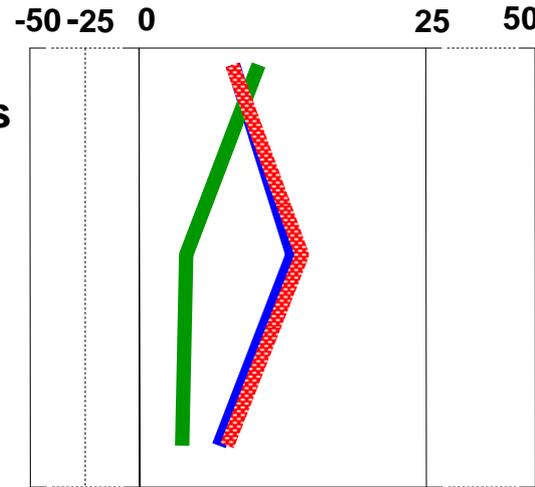
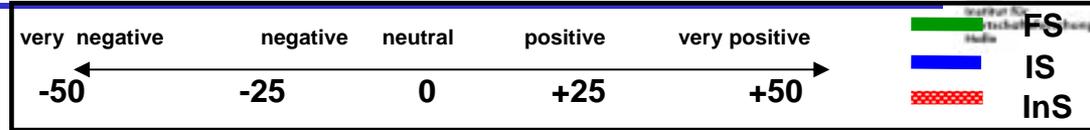


Public standardization causes the least coordination costs and increases market power

- increased market of suppliers**
- increased market position vis-à-vis customers**

Position of Enterprises in Horizontal Competition

The impact on ...



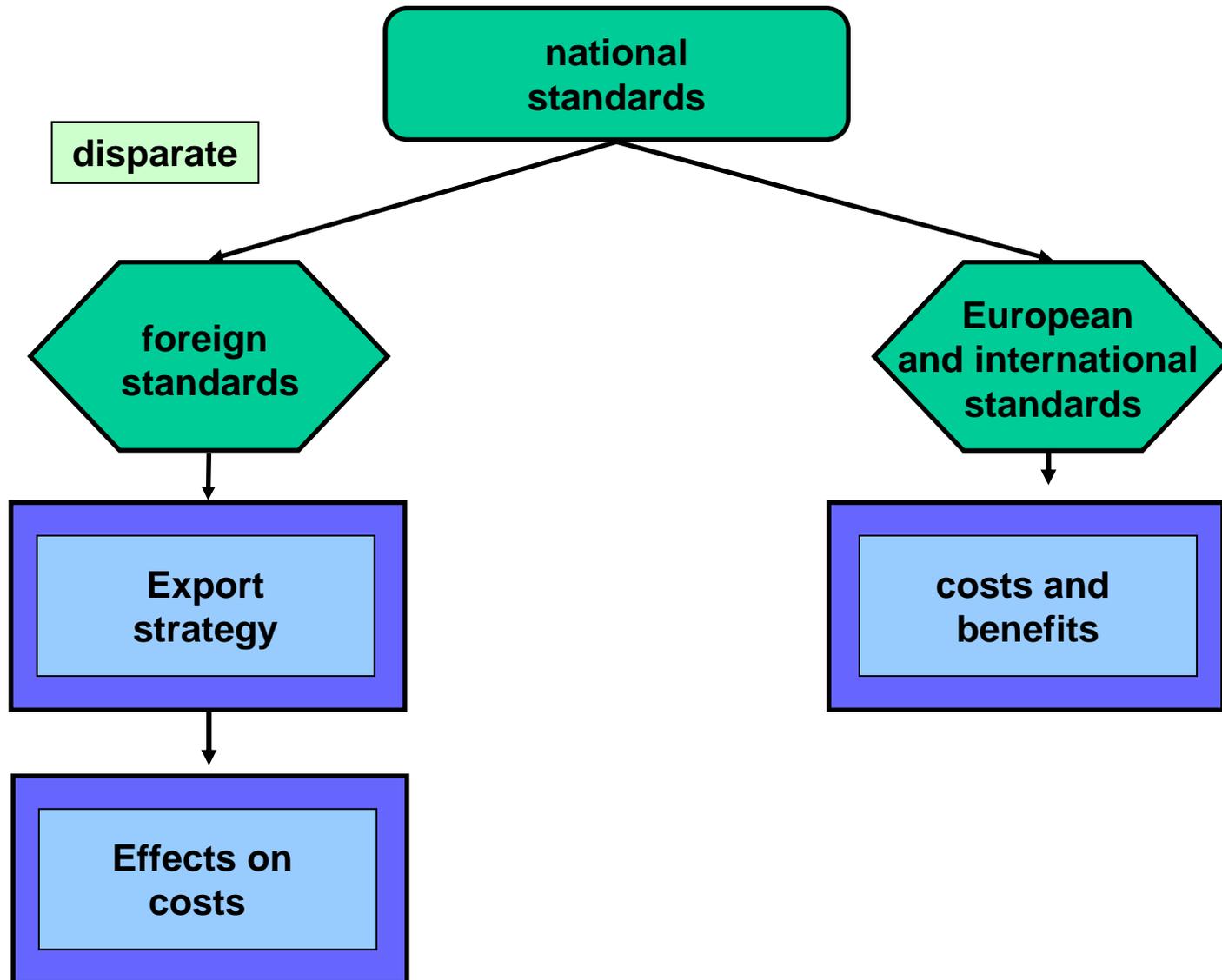
	CS	IS	PS	n	significant differences
... competitive edge vis-à-vis competitors	<u>10,4</u>	8,2	8,1	561	PS, IS ↔ CS
... cooperation with competitors	4,0	13,4	<u>14,2</u>	559	CS ↔ IS, PS
... market entry of potential competitors	3,7	6,9	<u>7,6</u>	558	CS ↔ IS, PS

- ▶ **Company standards create the highest competitive edge vis-à-vis competitors**
- ▶ ***Use knowledge internal to the firm to expand competitive edge***
- ▶ **PS and IS facilitate cooperation among competitors**
- ▶ **PS facilitate market entry of competitors**
- ▶ **Cooperation is improved by PS and IS, but also by competition**

Do standards foster more perfect or more imperfect competition?

- old trade theory vs. new trade theory
- a question of national development strategies
- a question of the structure of the value chain
- A question of political systems

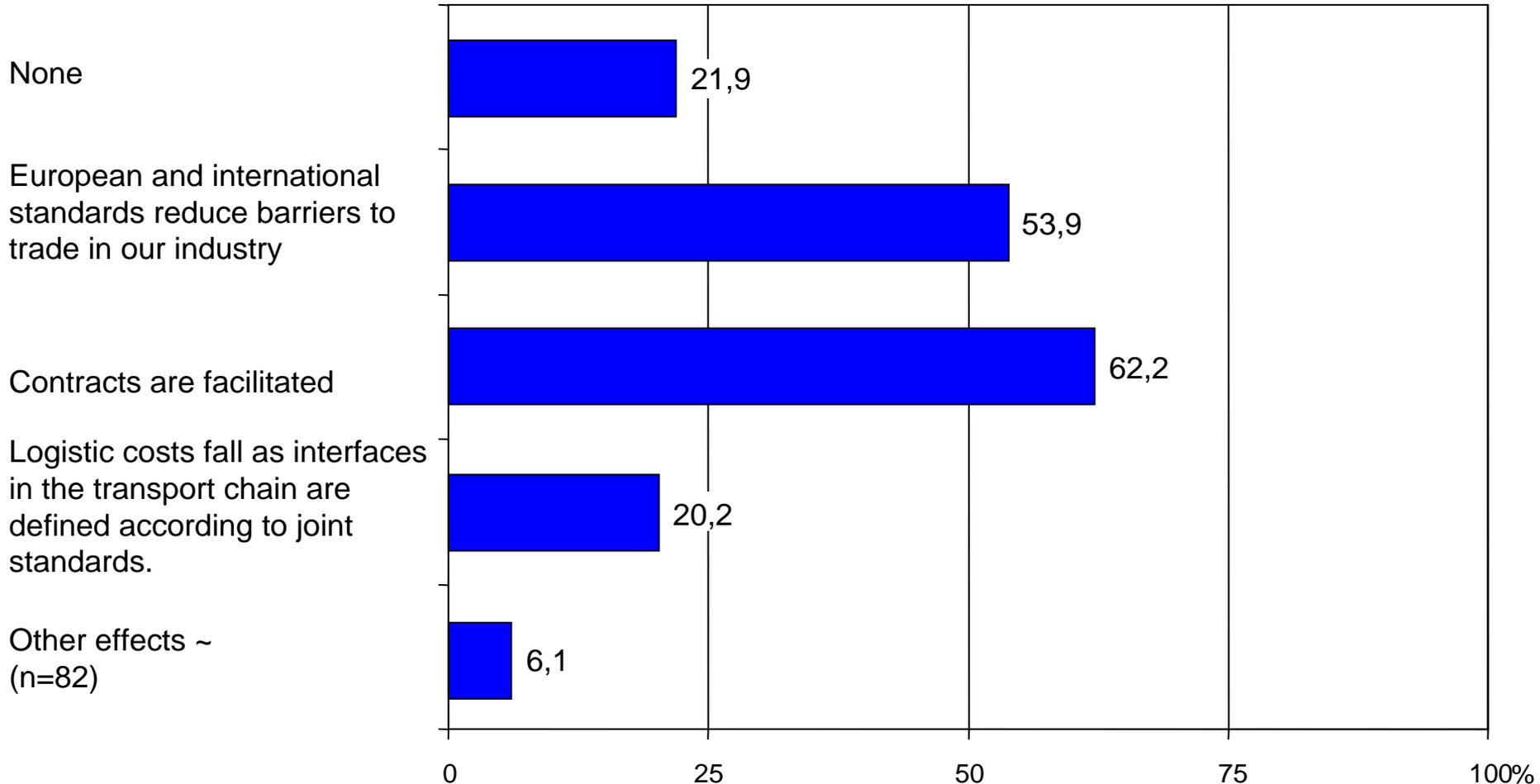
Adjustments of Export Strategy to Foreign Standards



Effects on Trade - Frequency

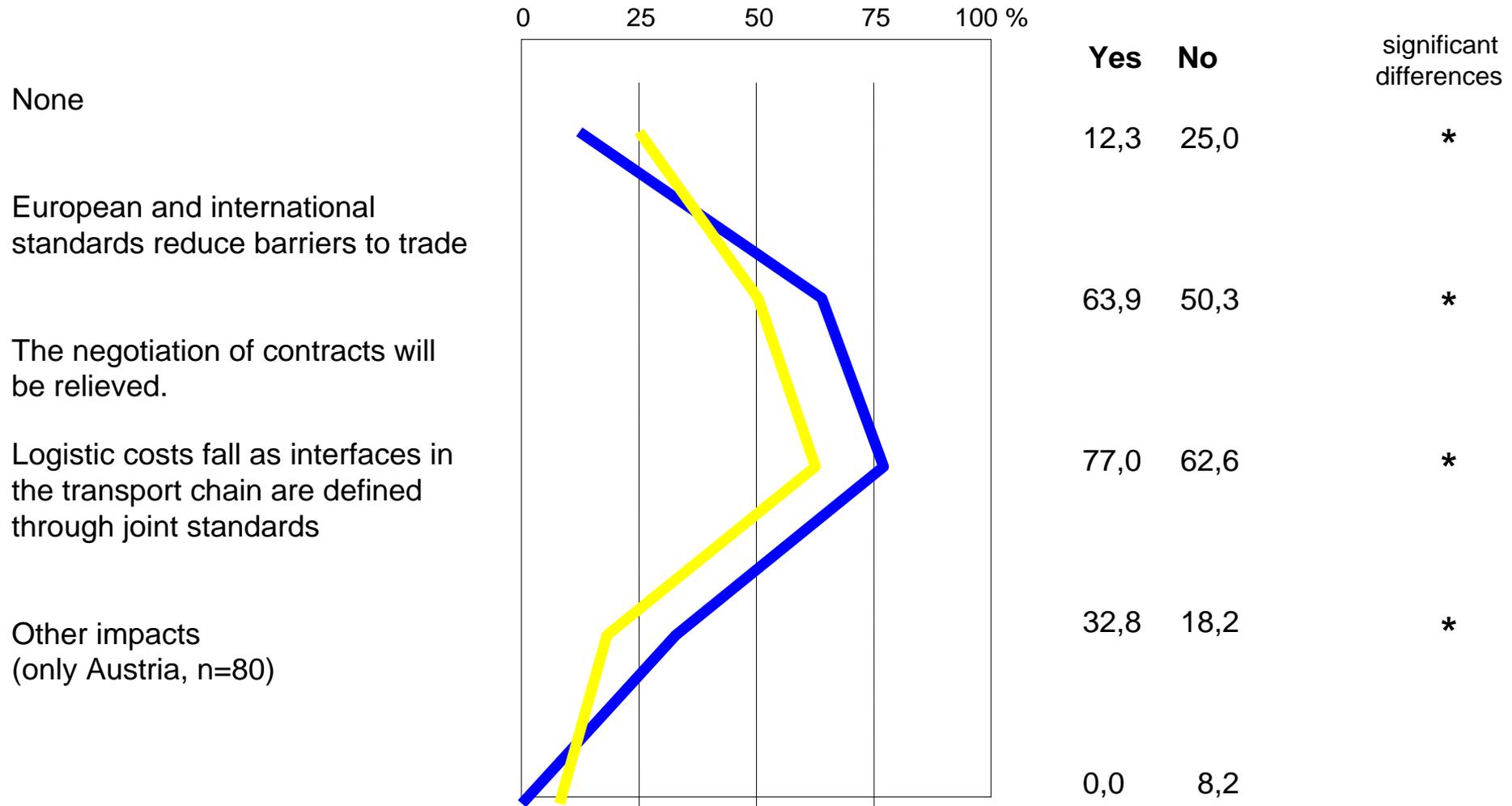
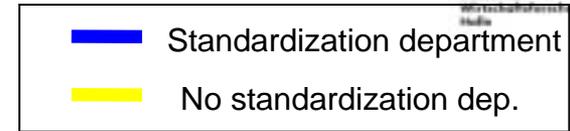
What effects do European and international standards have on trade of your company?

More than one answer possible (n=659)



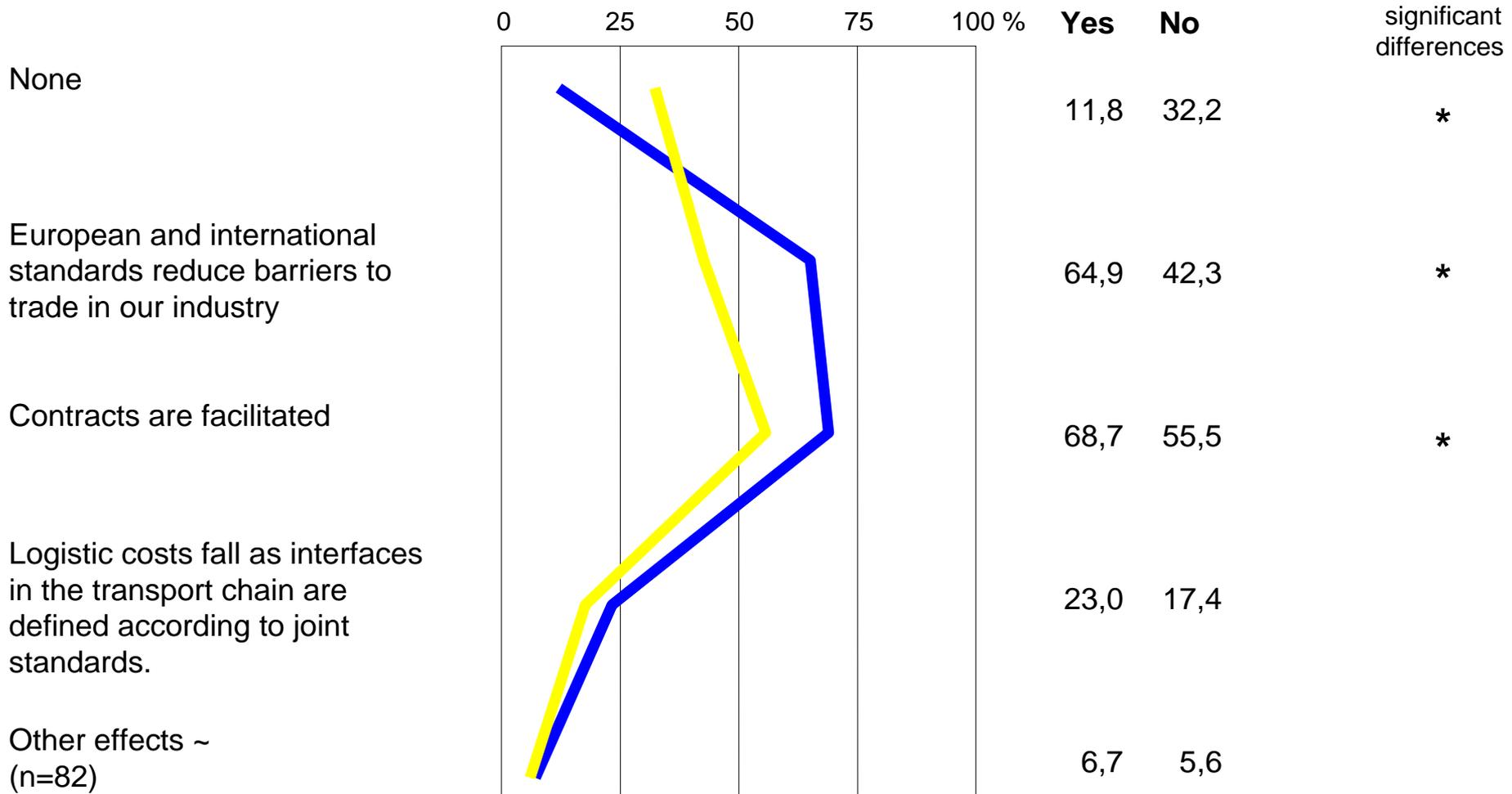
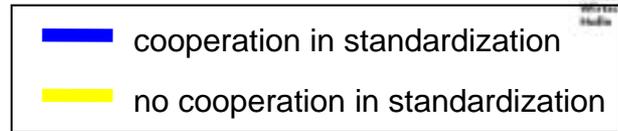
Impact on Trade – Role of Own Standardization Department

How do European and international institutional standards influence international trade in your enterprise? (n=462)



Effects on Trade – Role of Cooperation in Standardization

What effects do European and international standards have on trade of your company? (n=656)



Mean value comparison by Industries

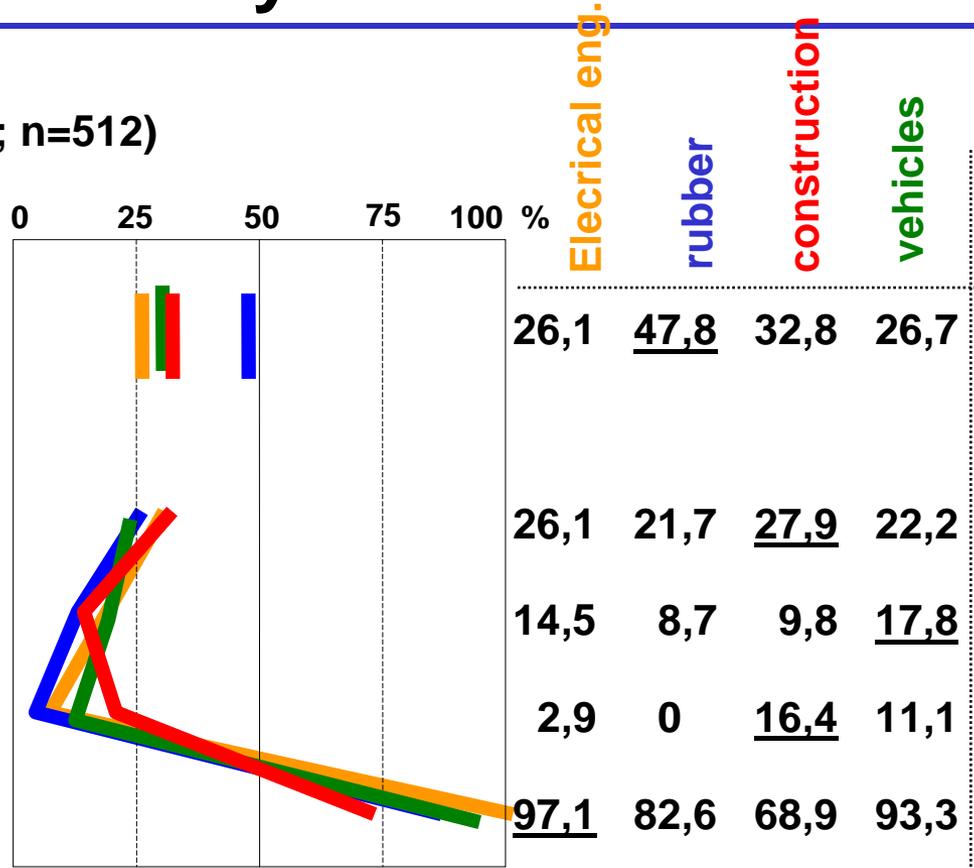
Adaptation Strategy

(more than one answer possible; n=512)

We penetrate export markets with products that contain national standards.

We adapt production to foreign standards by ...

- ...changing domestic production
- ...setting up a plant in the export country
- ...outsourcing production to a third party in the export country
- ... by using European/international standards



significant differences

rubber, electr. ↔ cons
cons ↔ veh, electr

- ▶ Construction orders are placed to a significantly higher extent to third parties in export countries than in case of electrical engineering, rubber and plastics.
- ▶ Vehicle production and electrical engineering significantly more often use European/international standards than construction.
- ▶ *Global industry standardize on international level.*

Quantitative data:

- **Tangibles = directly accessible facts**



benefit: rationalization



costs: participation

Qualitative data:

- **Intangibles = indirect accessible facts**



benefits:

safety



costs:

communication



- **Interdependent interactions**



benefits:

competitive advantage/institute of standardization

costs:

**transaction costs between
producer and supplier**



Different data qualities of separate levels: are benefits harder to measure than costs?

Value = benefits - costs

Benefit categories

examples

- uniform technical language
- rationalization
- compatibility interfaces
- security
- competitive advantage

Cost categories

examples

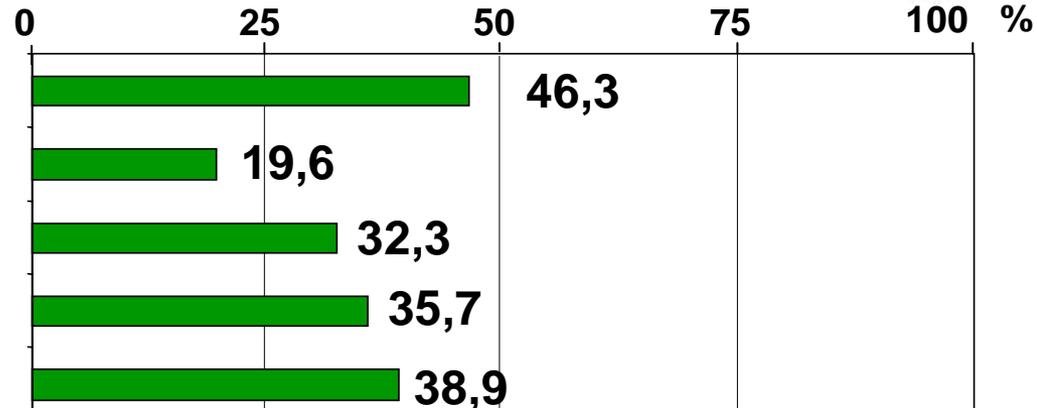
- participation
- application / conversion
- adjustment / rearrangement of value added
- adjustment to foreign / European and international standards
- communication

Costs and Benefits of European and International Standards

(more than one answer possible)

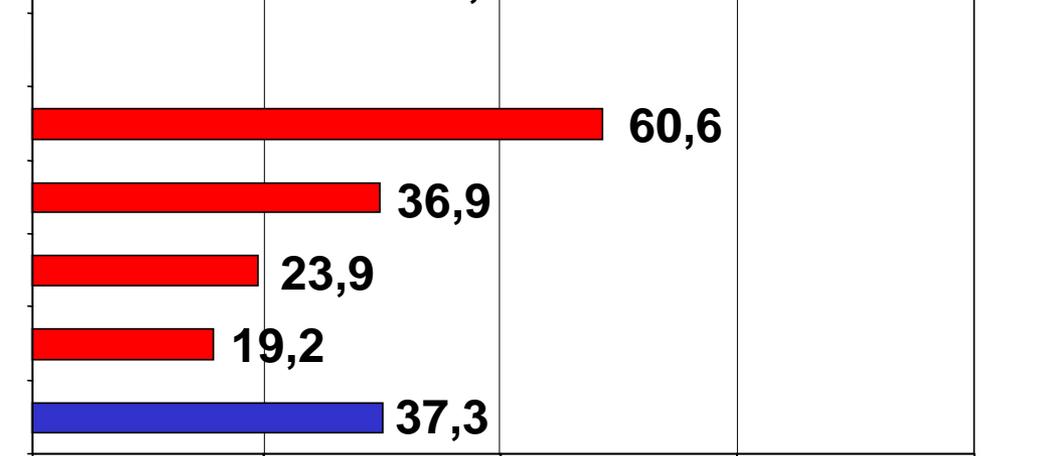
Cost savings through ... (n=555)

- ... Omission of adaptation costs in export business
- ... An increased production volume
- ... Unified government specifications
- ... An increased offer of suppliers
- ... Improved cooperation potentials



Additional costs through ... (n=556)

- ... Adaptation to standards
- ... Increased work load work for standardization personal
- ... Switching of production
- ... Switching of composition of goods



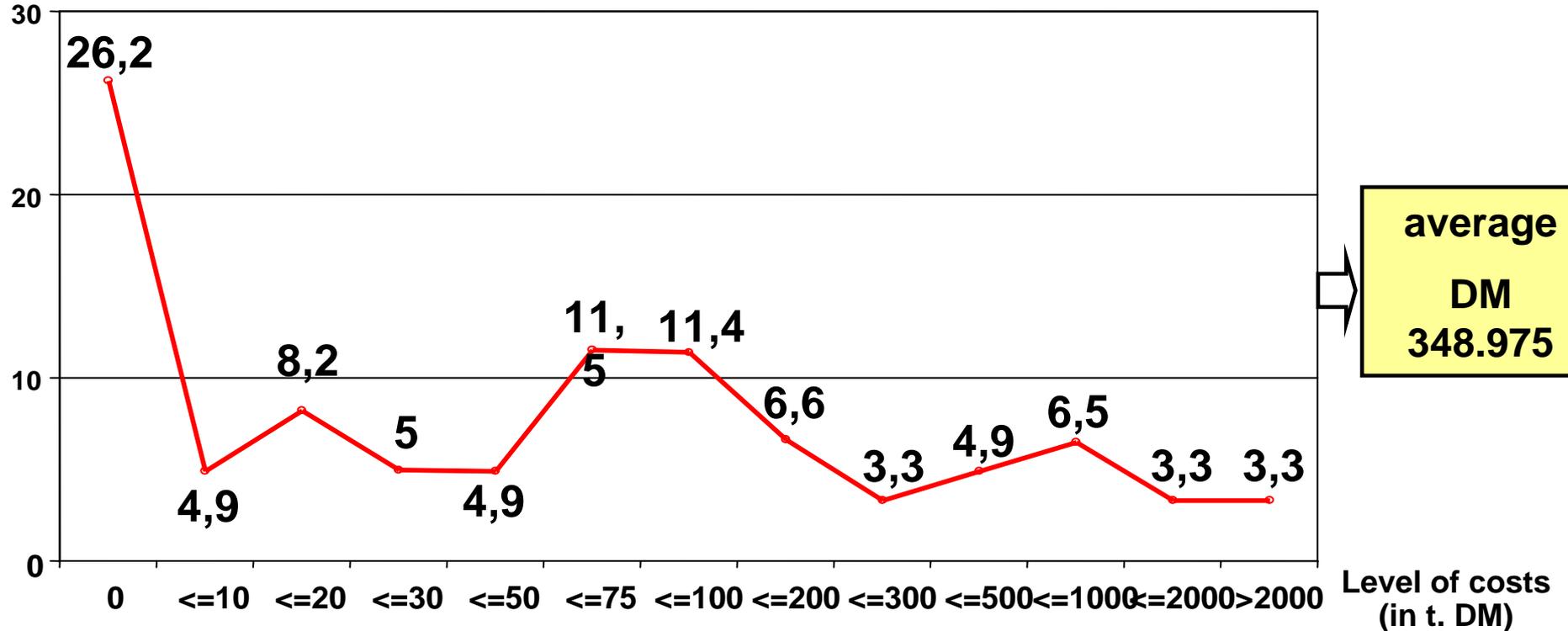

Enterprises mostly incur costs through the adaptation to European and international standards (60,6%)


Cost savings mostly emerge as adaptation costs are omitted in export business (46,3%) and as cooperation potentials through European and international standards (38,9%) become possible.

Costs of Adjustment

Adjustment costs to other foreign standards (n=61)

Share of enterprises in %



 Companies which supply data on adjustment costs encounter costs of DM 348.975

Costs and Benefits in DM

European and international standardization create

benefits amounting to
(n=44) DM 55.004.610

costs amounting to
(n=58) DM 24.217.889

balance: net benefits
(n=66) DM 30.786.721

average per company ∅ DM 466.466

Huge problems of heterogeneity

- ▶ Less than 10% of companies asked can/would like to give information to costs and benefits of standardization.
- ▶ The benefits of European and international standardization averages about half a million German Marks per company.

General idea:

- public standards are knowledge external to the firm
- Individual firms may not capture the totality of these benefits



An additional growth effect emerges



New growth theory-type estimation

- Effect of public standardization in Germany is about 1/3 of the total growth rate
- This includes, of course, the totality of technological effort behind standardization!