

# Public Procurement as a Demand Side Instrument in Innovation Policy – Some Experience from Germany

**Birgit Aschhoff**

Centre for European Economic Research (ZEW), Mannheim, Germany

**2013 ERAC Mutual Learning Seminar  
on Research and Innovation Policies**

Brussels, 21 March 2013

# Content

- (1) Overview of main demand side instruments
- (2) PPI-related activities in Germany
- (3) Some empirical evidence for Germany
- (4) Final remarks

# Main Demand Side Instruments

- Regulation, e.g. emission limits, health
- Stimulation of private demand for innovative products, e.g. buyer's premium, scrappage premium ("Abwrackprämie")
- **Public procurement of innovation (PPI)**
  - = Public organization places an order for a not-yet-existing product or system; innovation is a pre-condition for delivery (Edquist et al., 2012)
  - ≠ purchase of standard and already existing products

Principal reasons for PPI:

satisfying / improving the supply of public services and/or solving societal problems, e.g. security, sustainability or energy efficiency.

# PPI-Activities in German Policy

- 2006: High-tech Strategy: stress potential of PP for innovation
- 2007: joint initiative of six federal ministries: “Intensified innovation-oriented PP”
- 2009: modification of the German law against restraint of competition (GWB): award criteria have been extended by innovative aspects
- 2010: High-tech Strategy 2020: stress potential of PP for innovation further, embedded in mission-oriented policies to solve grand challenges, e.g. “public procurement is to focus more strongly on innovations in security technology” (BMBF, 2010: p.17).
- 2011: brochures to raise awareness of PP by Federal Ministry of Economics and Technology (BMWi) and encouragement of public procurers to participate in the European calls for proposals for cross-border PCP and PPI projects
- 2012: Innovation concept of BMWI: They will provide incentives for PPI.
- 2013: opening of competence centre for innovation-oriented PP
- Since 2006: annual prize “innovation creates a lead”

# Some Empirical Evidence for Germany

The seller side (results from the German Innovation Survey)

- (1) Measurement of PPI
- (2) Significance of PPI
- (3) Impact of PPI on firms' performance

The buyer side

- (1) Which factors hinder demand for innovations in PP?

# Sources of Innovation

- **Mansfield** (1991): *innovations that could not have been developed in the absence of recent academic research*
- Extending to other potential external sources that were **indispensable** for developing and introducing product or process innovation:
  - **customers/demand**
  - **suppliers**
  - **competitors**
  - **regulation**
  - **public science**
- Firms had to assess the **significance** of each source for their **product** and **process** innovations separately
- For each innovation source (except regulation), data on **sector** and location of sources was collected (textfield)
- ➔ 2-page question, included in 1999 and 2003 surveys

# Question in Survey

## 9. External Sources for Innovation

External innovation sources are defined as those innovations initiators whose impulses were indispensable in the development of a new product, service or process.

### 9.1 Customers as innovation source

Were any of the new or significantly improved products/services or processes introduced during 2000-2002 by your enterprise innovations being introduced because specific customers had expressed a wish for them or because they were explicitly demanded by buyers (e.g. identified during market research)?

- No  ► *Please continue with Question 9.2*
- Yes, product/service innovations  ► Estimated share of the 2002 total turnover of these innovation projects (incl. exports):  
 ≤ 5%...    6-15%...    16-30%...    31-50%...    >50%...
- Yes, process innovation

From which industry sectors (e.g. basic chemistry, machine tool manufacture, retail, banking, software industry, hospitals, public administration, private households) did these customers or the specific demand originate?

→ *Please list in order of significance.*

---



---

In which countries were these customers or this explicit demand located? (e. g. Germany, USA, Japan)

- predominantly in \_\_\_\_\_
- also in \_\_\_\_\_

# Measurement of PPI

- **PPI:** introduction and sale of innovative product for which the development has been **explicitly demanded** by a public authority
- Simple purchase of innovative products by public authorities is **not** PPI
- Public authorities also include **public services**



# Data Analysis

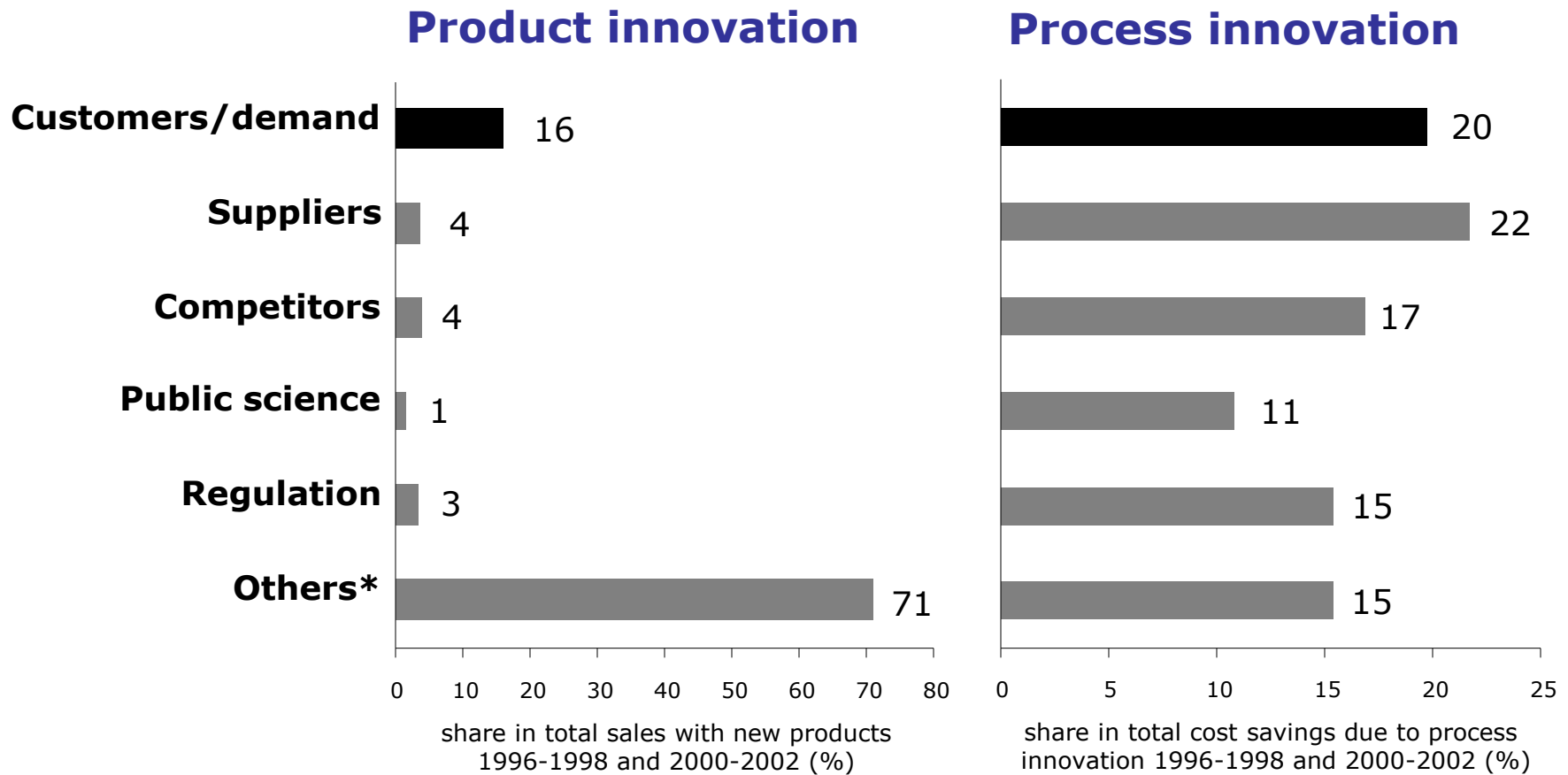
- Sectors were assigned to **NACE** (rev. 1.1) **3-digit**
- For each innovation source, **sales with new products** (for product innovation) and **cost savings** (for process innovation) triggered by that source were calculated using **weights**:

$$IO_k = \sum_i (S_i \alpha_{ik} w_i)$$

IO	innovation output
S	total sales / total costs
$\alpha$	sales share of new products / cost savings share triggered by source k
w	weight of firm i in total firm population

- A **sector's contribution** to innovation output was calculated by weighting  $IO_k$  by the (approximate) **share of sector j** in all innovation impulses received from source k
- **Public administration** and **public services** identified through corresponding NACE (rev. 1.1) sectors (75, 80, 85, 40, 41, 60, 70, 73, 90)

# Significance of Innovation Sources (1998 / 2002 average)



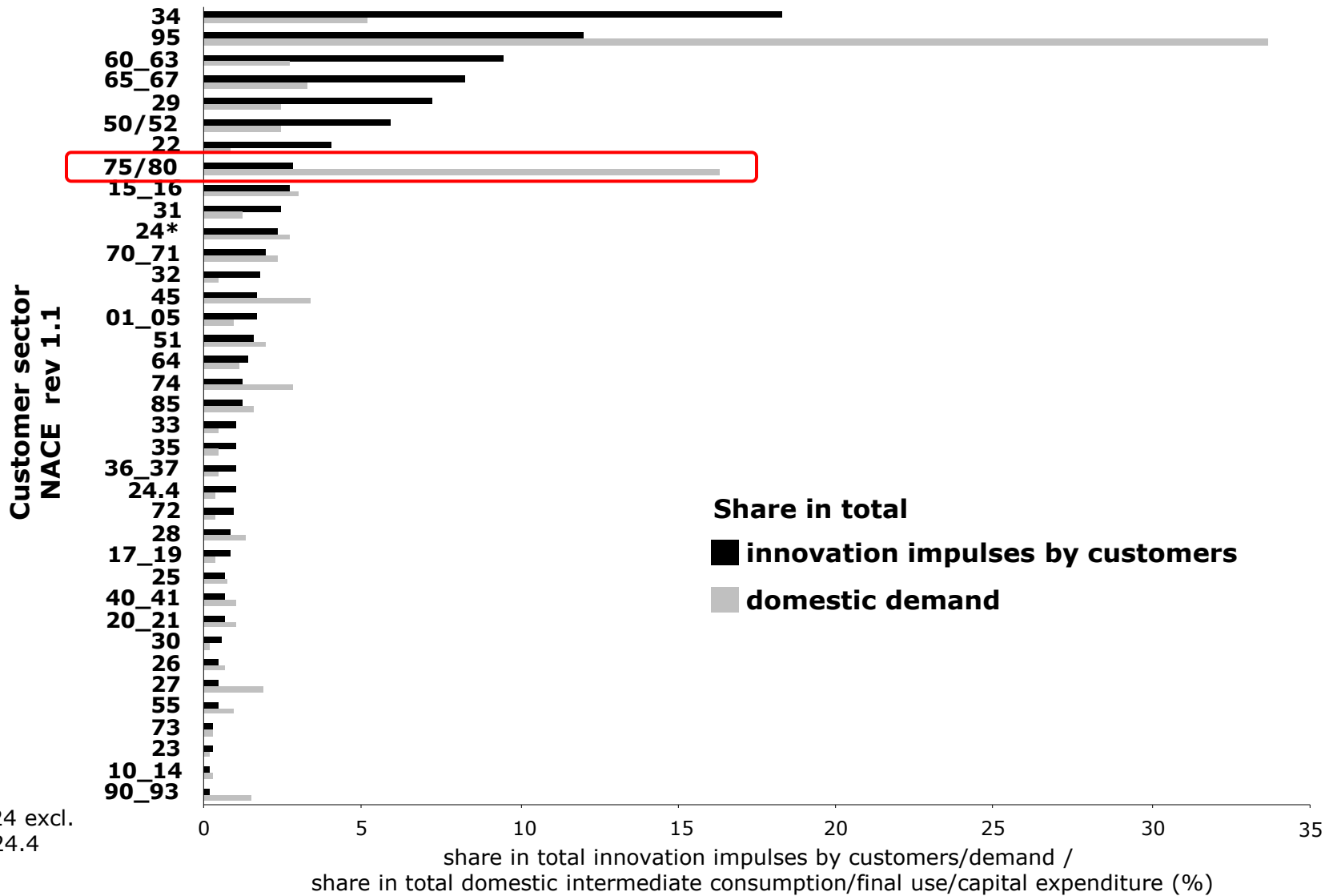
\* include in-house R&D and other creative work and other external sources

# Significance of Public Procurement as Innovation Source (1998 / 2002)

<i>NACE rev 1.1</i>	<b>Share in all innovation impulses by customers (%)</b>		<b>Share in total innovation output (%)</b>	
	<i>product innovation</i>	<i>process innovation</i>	<i>product innovation</i>	<i>process innovation</i>
<b>Public customers from</b>				
75/80	2.8	0.5	0.5	0.1
85	1.2	0.1	0.2	0.0
73*	0.2	0.7	0.0	0.1
90*	0.1	0.0	0.0	0.0
60*	2.4	0.3	0.4	0.1
70*	0.4	0.2	0.1	0.0
40/41*	0.4	0.4	0.1	0.1
<b>Total</b>	<b>7.5</b>	<b>2.2</b>	<b>1.2</b>	<b>0.4</b>
<b>Regulation</b>			<b>3.5</b>	<b>15.4</b>
<b>Public science</b>			<b>1.5</b>	<b>10.8</b>

\* share of innovation impulses from public organisations estimated

# Innovativeness of Demand (1998 / 2002)



\* 24 excl.  
24.4

# Impact of PPI on Innovation Performance

Aschhoff & Sofka (2009)

- PPI contributes to higher sales with new products
- no such effect found for defence demand, however
- SMEs, services and firms from eastern Germany profit most from PPI

Beise & Rammer (2006)

- PPI tend to limit export activities of firms, particularly for service firms that use PPI from the health sector

-----

Some new evidence probably soon... Question on PP in CIS 2012

# The Buyer Side

## Which factors hinder demand for innovations in PP?

Procurement agents / authorities (BMW, 2010; Falck/Wiederhold, 2013):

- general concerns regarding innovations
- avoidance of risk associated with introduction of new technologies
- lack of knowledge regarding new products / technologies, life cycle cost analysis, (new) public procurement rules
- increase of work
- tenders often too specific to allow innovations

Complicated conditions in Germany due to high fragmentation of PP (30,000 contracting entities)

→ Activities sufficient to stimulate PPI?

Training? Incentives? Responsibility? Project management? Coordination?

# Final Remarks

- Shift towards PPI on all policy levels (EU, national, regional)
- Mainly case studies; quantitative research on PP is still limited though increasing.
- Necessity of collecting *complete* data (after creation of measures) and *providing access* to these data.
- Need for evaluations of PPI: on firm level, industry level and regarding main objective: improving public services / mitigating grand challenges AND comparison of effects with other policy instruments.  
→ Which instrument works best for what?

**Thank you for  
your attention.**

**aschhoff@zew.de**



# References

- Aschhoff, B. and W. Sofka (2009), Innovation on Demand – Can Public Procurement Drive Market Success of Innovations?, *Research Policy* 38, 1235-1247.
- Beise, M. and C. Rammer (2006), Local User-Producer Interaction in Innovation and Export Performance of Firms, *Small Business Economics* 27(2-3), 207-222; based on ZEW Discussion Paper No. 03-51.
- BMBF (2010), Ideas. Innovation. Prosperity. High-Tech Strategy 2020 for Germany, Berlin.
- BMWi (2010), Impulse für Innovationen im öffentlichen Beschaffungswesen, Berlin.
- Edquist, C. and J.M. Zabala-Iturriagagoitia (2012), Public Procurement for Innovation as mission-oriented innovation policy, *Research Policy* 41, 1757-1769.
- Falck, O. and S. Wiederhold (2013), Nachfrageorientierte Innovationspolitik, *Studien zum deutschen Innovationssystem* Nr. 12-2013.
- Mansfield, E. (1991), Academic research and industrial innovation, *Research Policy* 20, 1-12.