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

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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


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
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)

**Product innovation**

- **Customers/demand**: 16
- **Suppliers**: 4
- **Competitors**: 4
- **Public science**: 1
- **Regulation**: 3
- **Others***: 71

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

**Process innovation**

- **Customers/demand**: 20
- **Suppliers**: 22
- **Competitors**: 17
- **Public science**: 11
- **Regulation**: 15
- **Others***: 15

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

Source: Mannheim Innovation Panel (German CIS), surveys 1999 and 2003
Significance of Public Procurement as Innovation Source (1998 / 2002)

<table>
<thead>
<tr>
<th>NACE rev 1.1 Public customers from</th>
<th>Share in all innovation impulses by customers (%)</th>
<th>Share in total innovation output (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>product innovation</td>
<td>process innovation</td>
</tr>
<tr>
<td>75/80</td>
<td>2.8</td>
<td>0.5</td>
</tr>
<tr>
<td>85</td>
<td>1.2</td>
<td>0.1</td>
</tr>
<tr>
<td>73*</td>
<td>0.2</td>
<td>0.7</td>
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<tr>
<td>90*</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>60*</td>
<td>2.4</td>
<td>0.3</td>
</tr>
<tr>
<td>70*</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>40/41*</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Total</td>
<td><strong>7.5</strong></td>
<td><strong>2.2</strong></td>
</tr>
</tbody>
</table>

| Regulation                        | 3.5               | 15.4               |
| Public science                    | 1.5               | 10.8               |

*share of innovation impulses from public organisations estimated

Source: Mannheim Innovation Panel (German CIS), surveys 1999 and 2003

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

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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 (BMWi, 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?

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.
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References


BMWi (2010), Impulse für Innovationen im öffentlichen Beschaffungswesen, Berlin.

