Strategic Procurement Policies for Innovation: Korean Case, Firm Survey and Empirical Results

Sept., 2009

Dr. Woosung Lee
STEPI
Korean Strategic Procurement Policies for Innovation

This presentation is part of Lee(2006), “Public procurement for firm's innovation promotion”, STEPI, Ch. 5 of “A comprehensive appraisal of policy instruments for studying firm's technological innovation” pp 264-312 (in Korean).  

The STEPI(2006) project had made an critical review on the policy instruments for firm's innovation promotion, analyzed their effects on the firm's innovation, and suggested some policy implications. In so doing, the project had dealt with 1) tax incentives for firm's innovative activities, 2) government financial measures, 3) procurement, 4) legal and institutional infrastructure (certifications and standards, intellectual property rights and test service), and 5) other measures such as promoting technology transfer, disseminating technology information, and technology consulting and assistance.

1) The basic description of the program in English is appeared in Lee(2007), “Strategic Public Procurement”, ed. APEC SME Innovation Center, Ch.10 of “Development of Human Capital for SME Innovation Policies” pp 448–484.
Government Program Cases

- New Technology Purchasing Assurance

Survey Results

Econometric Analysis Results
Case 1: New Technology Purchasing Assurance

Overview

“In an effort to further commercialize new technologies, government agencies, public institutions including Defense Ministry, KEPCO (Korea Electric Power Corp.), KOGAS (Korea Gas Corporation), and Korea Railroad Corporation and private business commission SMEs to develop a new technology with the assurance that they will purchase the technological products. Under this program, the SMBA finances the technological development of SMEs, while public institutions purchase the products for a certain period of time.”
## Case1: New Technology Purchasing Assurance

### Specifics of Application for “New Technology Purchasing Assurance”

<table>
<thead>
<tr>
<th>Category</th>
<th>Searching for the Projects</th>
<th>Application Type</th>
<th>Development Period</th>
<th>Support Limit (Total Project Cost)</th>
<th>Amount of Subsidy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Public Sector</td>
<td>Private Sector</td>
</tr>
<tr>
<td>Leading Project</td>
<td>Demand Survey</td>
<td>Assigned Project</td>
<td>Less than 2 years</td>
<td>Less than 75%</td>
<td>Less than 55%</td>
</tr>
<tr>
<td>Investment Linkage</td>
<td>Demand Survey</td>
<td>Assigned Project</td>
<td>Less than 3 years</td>
<td>Less than 75%</td>
<td>Less than 55%</td>
</tr>
<tr>
<td>Practical Project</td>
<td>-</td>
<td>Free Topic Project</td>
<td>Less than 1 year</td>
<td>Less than 75%</td>
<td></td>
</tr>
</tbody>
</table>

Data Source: Small & Medium Business Administration (SMBA)

Note1: The fund for projects involving large firms among leading/investment linkage projects will be limited to 55% of the total budget.

Note2: Government will take 20% overhead, when the technology is successfully developed.
## Case1: New Technology Purchasing Assurance

### Trends: New Technology Purchase Assurance Program

<table>
<thead>
<tr>
<th>Year</th>
<th>Subsidy (100million, KRW)</th>
<th># of Purchasing Organizations</th>
<th># of Firms Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Public Organizations</td>
</tr>
<tr>
<td>2002</td>
<td>9</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2003</td>
<td>40</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2004</td>
<td>40</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>2005</td>
<td>100</td>
<td>26</td>
<td>18</td>
</tr>
<tr>
<td>2006</td>
<td>160</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>2007</td>
<td>300</td>
<td>83</td>
<td>32</td>
</tr>
<tr>
<td>2008</td>
<td>400</td>
<td>127</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>649</td>
<td>127</td>
<td>36</td>
</tr>
</tbody>
</table>

Data Source: The Small & Medium Business Administration  
(Note: Total numbers indicate accumulated figures)  
40,000million won approximately 40million dollars
Government Program Cases

- New Technology Purchasing Assurance

Survey Results

Econometric Analysis Results
Survey Overview

- # of Effective Sample firms: 1,775
- Average # of employees: 324 persons
- Average # of researchers: 23 persons
- Sample period: 2003-2005
- Industries: Manufacturing and Knowledge Intensive Service Industries
- Large firms(19.1%), Medium(51.7%), Small(29.2%)
- Existence rates of research department in the firm: 87.7%
- # of policy programs in the survey: 30 programs
- # of procurement programs for innovation: 2 programs
Case1: New Technology Purchasing Assurance

Program recognition and utilization rates by firms

![Bar chart showing program recognition and utilization rates by firms](chart.png)

Legend:
- Large
- Medium
- Small firms
- Total
- Venture + Innobiz
Rates of firms which had Innovative Behavioral Additionality Due to the Programs

- Innov. Invst. burden DOWN
- Innov. Outcome UP
- Innov. project process ACCEL.
- Innov. project size UP
- Risky Innov. project UP
- Follow-up Innov. project UP
- Securing Stable Sales UP
- Securing Stable Prices UP
- Long-term Compt. UP

Bar chart showing rates for Large, Medium, and Small firms.
Rates of firms which experienced various Regulatory Barriers of the program procedures
Econometric Analysis

Probit model estimation

According to the econometric analysis of the policy instruments, using the survey data, it was shown evidently that the tax incentives have greater effect on the firm's innovation activities, relative to other instruments such as government financial measures, procurement, legal and institutional infrastructure, and other indirect incentives.

Meanwhile, the indirect measures for promoting technology transfer, disseminating technological information, and technology consulting and assistance are very important particularly for the small- and medium-sized firms, who are deficient in resources of technology management.
Contents

Changes of Program Scheme and Performance

- New Technology Purchasing Assurance
Case 1: New Technology Purchasing Assurance

Changes of Program Scheme in 2005
- Introduction of Target system for new technological product (5% of total procurement → 10% in 2010)
- Requirement to purchase 20% of New Excellent Product (NEP, certification product)

Improvements in regulations
- Performance Insurance for SMEs’ products
- Performance certification
- Committee for procurement promotion of SMEs’ technological products
Case 1: New Technology Purchasing Assurance

Trends: New Technology Purchase Assurance Program

<table>
<thead>
<tr>
<th>Year</th>
<th>Subsidy (100million, KRW)</th>
<th>Total</th>
<th>Public Organizations</th>
<th>Large Firms</th>
<th># of Firms Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>2003</td>
<td>40</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td>2004</td>
<td>40</td>
<td>8</td>
<td>8</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>2005</td>
<td>100</td>
<td>26</td>
<td>18</td>
<td>8</td>
<td>87</td>
</tr>
<tr>
<td>2006</td>
<td>160</td>
<td>45</td>
<td>25</td>
<td>20</td>
<td>154</td>
</tr>
<tr>
<td>2007</td>
<td>300</td>
<td>83</td>
<td>32</td>
<td>51</td>
<td>230</td>
</tr>
<tr>
<td>2008</td>
<td>400</td>
<td>127</td>
<td>36</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>649</td>
<td>127</td>
<td>36</td>
<td>91</td>
<td></td>
</tr>
</tbody>
</table>

Data Source: The Small & Medium Business Administration
(Note: Total numbers indicate accumulated figures)
40,000million won approximately 40million dollars
# Purchasing Organizations

<table>
<thead>
<tr>
<th>Participating Organizations (Purchasing Party)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>National Organizations</strong></td>
</tr>
<tr>
<td>- National Police Agency, Defense Department, National Emergency Management Agency, Defense Acquisition Program Administration, Korea Coast Guard, Korea Meteorological Administration, Ministry of Maritime Affairs and Fisheries</td>
</tr>
<tr>
<td><strong>Local Government</strong></td>
</tr>
<tr>
<td>- Daejeon, Samcheok</td>
</tr>
<tr>
<td><strong>Public Organizations</strong> (32)</td>
</tr>
<tr>
<td><strong>Local Public Utility</strong></td>
</tr>
<tr>
<td>- Seoul Metro, Seoul Metropolitan Rapid Transit Corporation</td>
</tr>
<tr>
<td><strong>Large Private Firms</strong> (Total 51)</td>
</tr>
</tbody>
</table>

Data Source: Hong (2008), “Trend & Issues on SME Public Purchasing R&D Promotion”, KIET Industrial Economy Analysis
### The Impact of Conditional Purchasing Policy

<table>
<thead>
<tr>
<th>Categories</th>
<th>Overall</th>
<th>Ratio, By Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2007</td>
</tr>
<tr>
<td>Sales (including procurement)</td>
<td>2,025</td>
<td>833</td>
</tr>
<tr>
<td>Effective Import Substitution</td>
<td>1,018</td>
<td>536</td>
</tr>
<tr>
<td>Effective Cost Reduction</td>
<td>457</td>
<td>166</td>
</tr>
<tr>
<td>Policy Impact</td>
<td>3,500</td>
<td>1,535</td>
</tr>
</tbody>
</table>

Data Source: Korea Evaluation Institute of Industrial Technology (KEIT)
(Unit: If not mentioned otherwise, 100 million, KRW)
Problems of Procurement for Innovation

- “Risk Aversion” behavior of public servants

- “Lack of Cooperation” from other public institutions for public procurement

- “Uncertainty and Unreliability” of SMEs’ new technology products: little track records
Lesson Learned

- Mitigating risk aversion behavior
  - Performance Insurance

- Enforcing Cooperation
  - Control: Requirements by Laws and Target System

- Mitigating “Uncertainty and Unreliability” of SMEs’ new technology products
  - Performance Certification (NET, NEP)
Distinguished Program Characteristics

- Hybrid model of “Push and Pull” innovation policies
  ➔ Started from R&D program to advance including procurement demand policy

- Public–Private Partnership
  ➔ gov’t provides R&D grants and public/private sectors provides procurements

- Mitigating risk aversion: Complementary Policies
  ➔ Performance Insurance and Performance Certification

- Limitations: only applies to Manufacturing not services
End of Document

Dr. Woosung Lee
Research Fellow
STEPI
82-2-3284-1781
leews@stepi.re.kr