Selective public R&D funding

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Structure of the presentation
- main content of the project
- data
- characteristics of applicants and non-applicants
- related research conducted in Finland recently
Purpose is to analyse the selection mechanism underlying the allocation of public R&D subsidies.

Focus on direct public R&D subsidies - grants and loans - to business enterprise sector.

Starting point: The selection mechanism consists of two interlinked decision problems.

1) Firms decide whether to apply for a subsidy or not, for which projects to apply and what to apply.

2) Given the technology policy guidelines and budget constraints the public agency decides for which projects to give a subsidy, how large and what kind of a subsidy to give. Based on some criteria it ranks the applications and funds the best.

Main idea: Firms integrate their knowledge of the public agency’s behaviour in their decision problem, i.e. there is a feedback from the public behaviour to the firm behaviour.
- **Research method**
  
  *theory:* general game theoretic model that summarises the decision rules of the firm and the public agency and the interaction between them.

  *empirical analysis:* quantitative approach, econometric model of a system of two equations

- **Goal:** assess how changes in the funding policy are reflected in the composition of non-applicants, applicants and those funded

- **Relevance of the expected results:** provides a systematic description of the selection mechanism and helps in assessing how changes in funding policy affect firm behaviour
• In 2001 Tekes received in total 1358 business R&D applications for product development and industrial research.

• 67% of applications were accepted.

• Corresponding amount applied was 526 million euros and 211 million euros were granted (40%).

• Subsidy applications covered 83% of the applications.
Firm financial data
• 15,641 firms
• 2,671 firms that have applied for Tekes funding at some point in time

Etla business survey
• 936 firms
• 259 firms that have applied for Tekes funding at some point in time

Tekes application data 2001
• 1,358 applications
• 1,039 firms
Some general characteristics of the applicants and non-applicants

Basic issues

- among applicants relatively more firms from electronics and data processing industries
- among applicants relatively more young firms
- applicants more internationally oriented and have greater growth expectations

R&D-activities

- even compared to the non-applicants that have reported R&D expenditures the applicants are clearly more R&D intensive, have more often experienced considerable R&D intensity growth over the last three years
- large majority of applicants have introduced a product or process innovation during the last three years while the same is not true for the non-applicants
Ownership

- applicants have had more often considerable changes in the ownership structure over the last three years
- ownership is on average somewhat more diversified among applicants
- foreign ownership is more common among applicants - however it is rare in general

Public funding

- among applicants relatively more firms have received some kind of public funding from other sources than Tekes

Financing structure

- with the exception of venture capital and public funding, which are more common among applicants, financing structure of the applicants and non-applicants looks on average relatively similar
Quantitative studies related to the impacts of business R&D subsidies conducted in Finland recently:

**Additionality of business R&D subsidies:**

- *business R&D subsidies increase firms’ own R&D investments* (Lehto, 2000)

- *business R&D subsidies increase the own R&D investments of firms with high R&D intensity* (Niininen, 1999)

- *business R&D subsidies increase the own R&D investment of partially credit constrained firms* (Toivanen and Niininen, 2000)

**Effect on employment:**

- *Firms that have received Tekes funding have contributed much more to the net employment growth than the non-supported firms* (Maliranta, 2000)
Effect on productivity:

- Firms that have received Tekes funding have higher productivity level and growth than Finnish firms on average (Lehtoranta, 2000).

- At the firm level no evidence that public R&D funding has direct positive effect on the firm's productivity, however the R&D intensity of the firm’s industrial environment has a positive effect on the firm’s productivity (Maliranta, 2000)

- At the industry level both firms’ own and public R&D investments increase productivity growth (Niininen, 2000).