Innovation Policy and the Invisible Hand of the State

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Which U.S. Model ?

What the U.S. tells other nations to do.

OR

What the U.S. practices at home—a decentralized and aggressive set of industrial policies.

Inspired by Karl Polanyi

- Research funded by Ford Foundation when Leonardo Burlamaqui was a program officer.
- Carried out in collaboration with other researchers including Linda Weiss and Mariana Mazzucato.
- Goal has been to document and understand the peculiar nature of the U.S. developmental state.

Long History of U.S. Developmentalism

- Alexander Hamilton's *Report on Manufactures* (1791)
- Government role in building canals and railroads
- Department of Agriculture and land grant universities

Two key inflection points

- The first was World War II
- Manhattan Project and the federalization of science
- Many ongoing government laboratories

The Second happened between 1978-84

- In response to
- Japanese competition
- Success of Apple and Genentech

The Key Features of this Model

- Mobilize university and federal laboratory based researchers to focus on critical technology challenges.
- Encourage and support new small firms that will compete directly with established firms.
- Highly decentralized; multiple initiatives to overcome key technological barriers co-exist often with little coordination.

Key role of federal laboratories

- Department of Energy laboratories
  - Lawrence Berkeley
  - National Renewable Energy Laboratory
  - Sandia
  - Oak Ridge
- National Institutes of Health laboratories
- National Nanotechnology Infrastructure Network

  14 User Facilities at research universities
- National Institute of Standards and Technology

(previously National Bureau of Standards)

What happens at these laboratories?

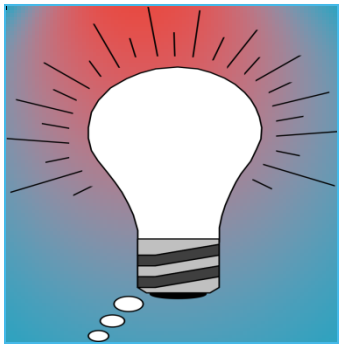
- Collaborations between public and private scientists and engineers
- Big and small corporations sometimes pay the laboratories to help overcome technological barriers
- Government scientists and engineers are encouraged to spin off new firms
- Many of these new firms get support from SBIR—Small Business Innovation Research

Program Descriptions

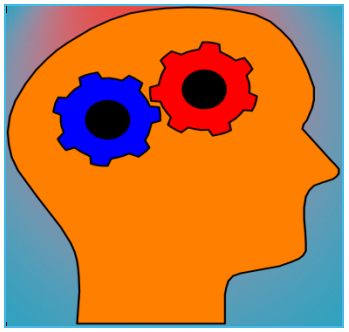
- SBIR: Set-aside program for small business concerns to engage in federal R&D --with potential for commercialization.
- STTR: Set-aside program to facilitate cooperative R&D between small business concerns and U.S. research institutions -- with potential for commercialization.

SBIR/STTR: 3-Phase Program

- **PHASE I**
  - Feasibility study
  - $100K and 6 months (SBIR)
    or 12 months (STTR)



- PHASE II
  - Full R/R&D
  - 2-Year Award and $750K (SBIR)
    or $500K (STTR)



- PHASE III
  - Commercialization Stage
  - Use of non-SBIR Funds

SBIR Grants and Shift of Ph.D Scientists

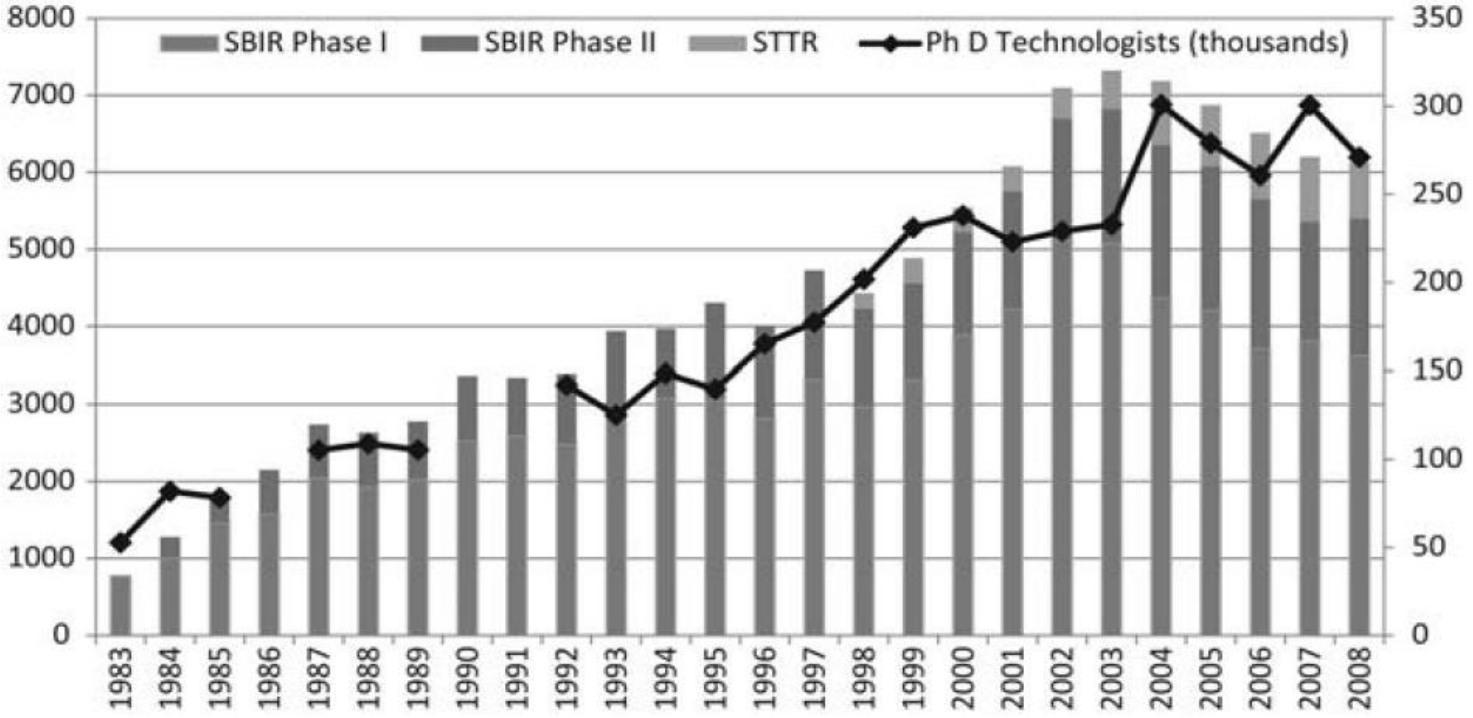
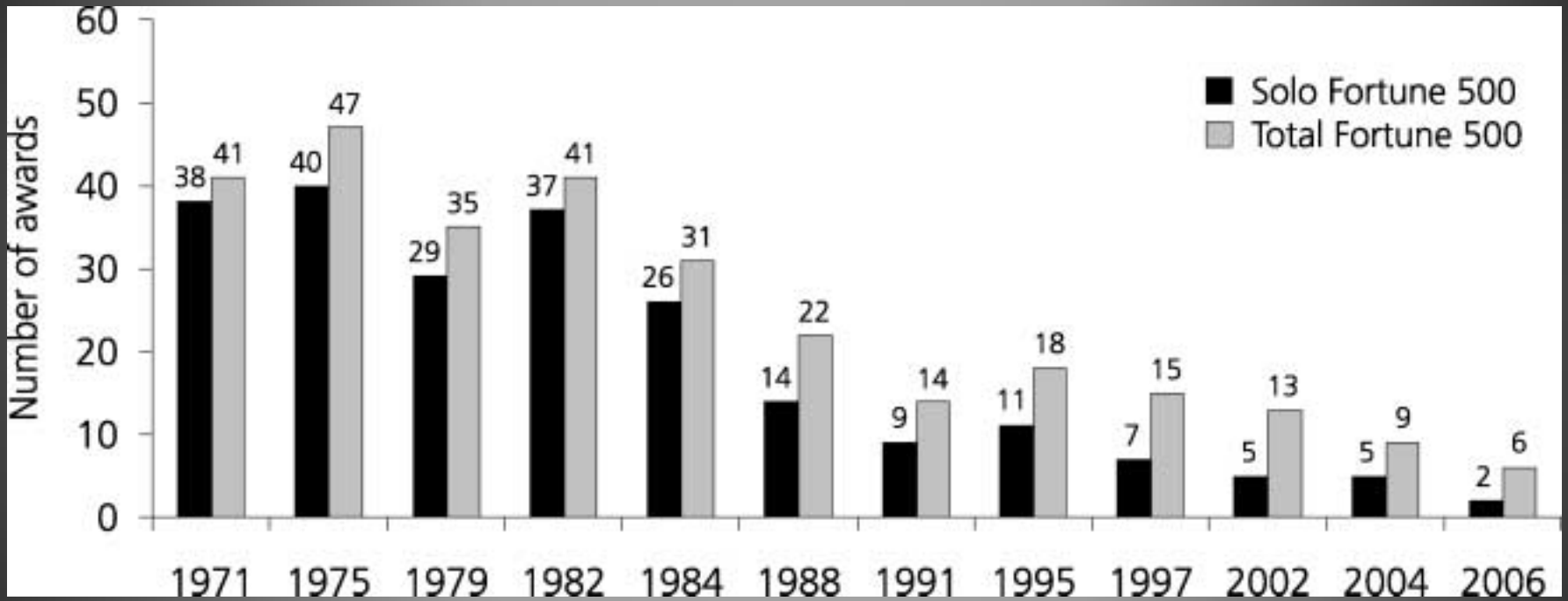
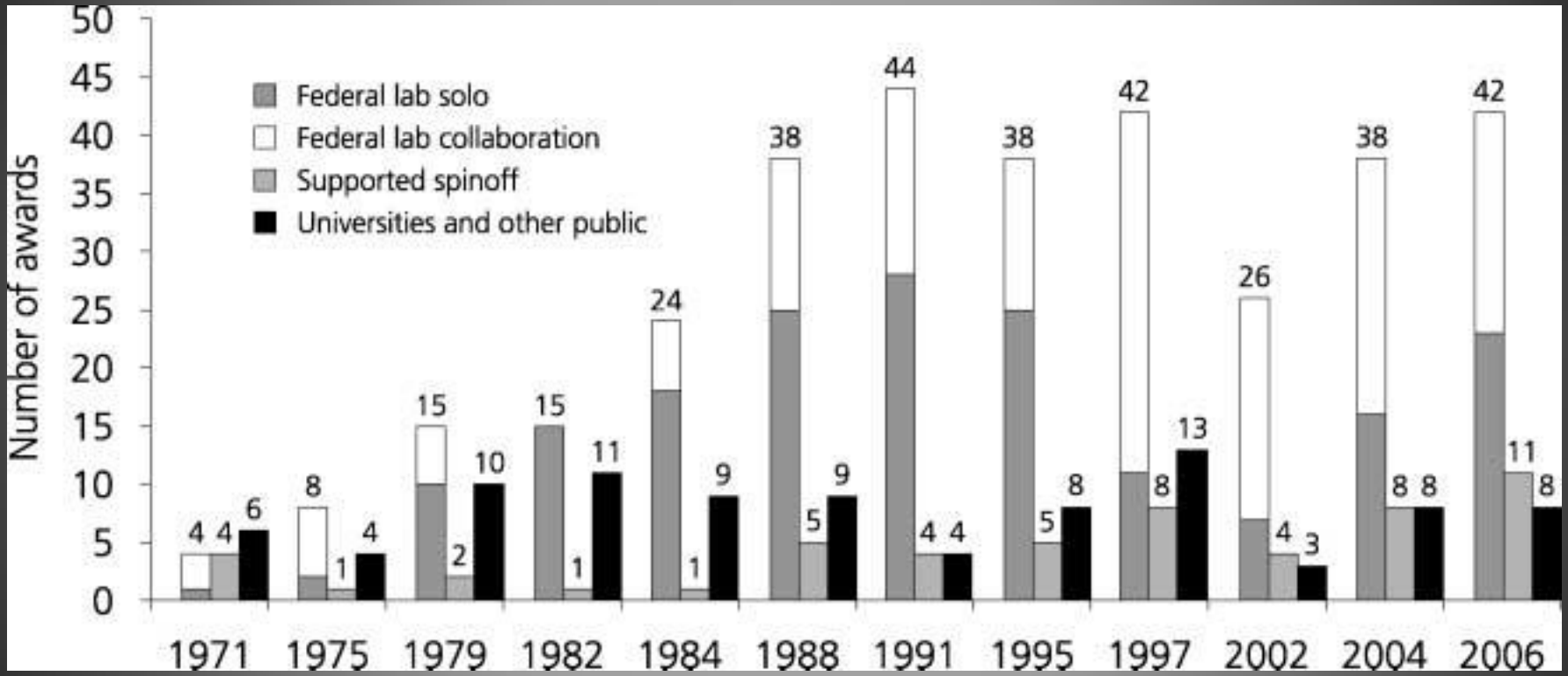


Figure 2 Trends in SBIR awards and PhD technologists employed by firms with fewer than 500 employees. *Note*: Data for 1983–1984 are for firms with fewer than 1000 employees; see note 7.

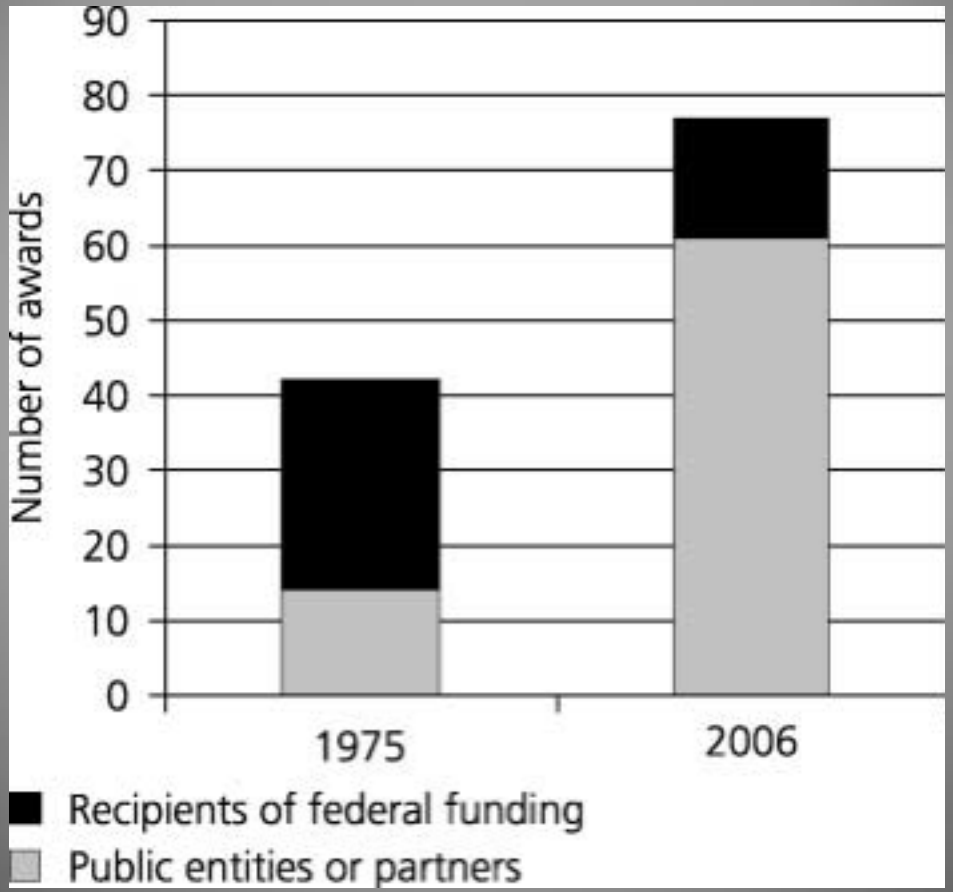
Awards to Fortune 500 Companies



Awards to Public and Mixed Entities



Winners with federal funding



Global rules have been shaped to support the U.S. Model

- WTO Agreement outlaws export subsidies but initial language permits governments to fund 50% of pre-competitive R&D.
- That language expired in 1999, but with the exception of the ongoing litigation pitting Boeing against Airbus, there have been few cases in which nations have taken action against pre-competitive R&D.
- Entities receiving 50% of their pre-competitive funding could be worker owned or nonprofit firms as long as they are able to raise some nongovernment financing.

Why these programs work: Overcoming Network Failures

Occur in decentralized production systems when:

1. Firms cannot find the partners they need.
2. The potential partners lack the needed competence.
3. The potential partners lack integrity and honesty.

Public programs can help participants with all of these issues.

Source: Josh Whitford and Andrew Schrank.