



**The Space Between:
Building the
Infrastructure for Entrepreneurship
in Emerging Domains of Activity**

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**Small Business and Entrepreneurship during an
Economic Recovery
Nov 9-10, 2011**

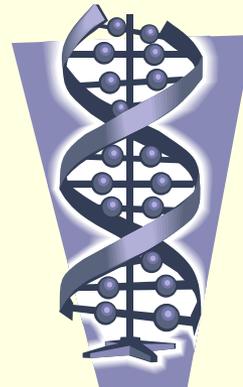
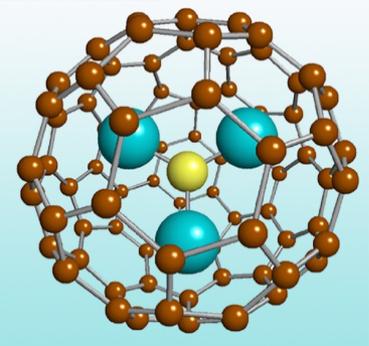
Infrastructure for Entrepreneurship

TECHNOLOGY

Innovation

Market

Infrastructure



Infrastructure for Entrepreneurship

What do we know?

Infrastructure for Entrepreneurship

Public Resource
Endowments

Proprietary Functions

Institutional
Arrangements

Infrastructure for Entrepreneurship

- The study:
- Nanotechnology
 - > 12,000 pages
 - > 40 interviews

Government agencies

Universities

Conferences

Associations and groups

Media

Firms – new and old

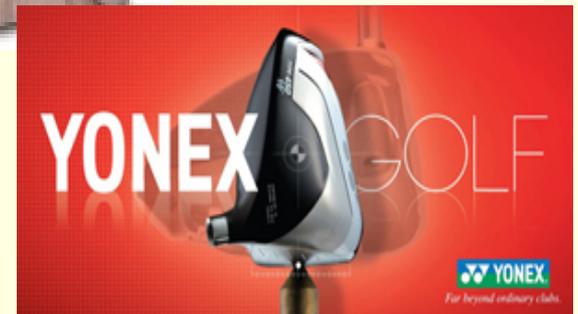
- Researchers, entrepreneurs, policy makers...

Infrastructure for Entrepreneurship

Nanotechnology

Jos. A. Bank	Yamaha
Dockers	GM
L.L. Bean	Samsonite
Eddie Bauer	J.C. Penney
Land's End	Babolat
Calloway	Easton
Adidas	Brooks Brothers
Bergdorf Goodman	

.....



Infrastructure for Entrepreneurship

Findings

- Infrastructure components
- Infrastructure developers

Universities, National labs, Firms

**Public Resource
Endowments**

I

**Proprietary
Functions**

**Institutional
Arrangements**

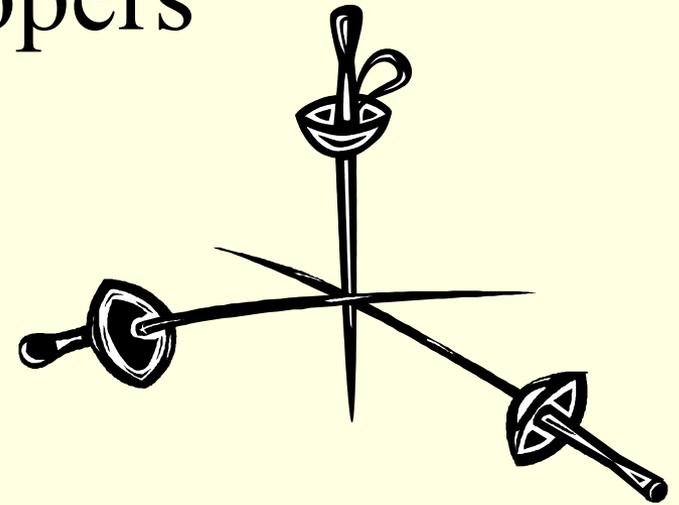
Firms

Associations and Government

Infrastructure for Entrepreneurship

Findings

- Infrastructure components
- Infrastructure developers
- All for one
- One for all
- Early entrepreneurs



Infrastructure for Entrepreneurship

Implications

- Developers roles
- Interaction
- Myopia
- Upstream

Infrastructure for Entrepreneurship

THANK YOU!!!

Jennifer L. Woolley

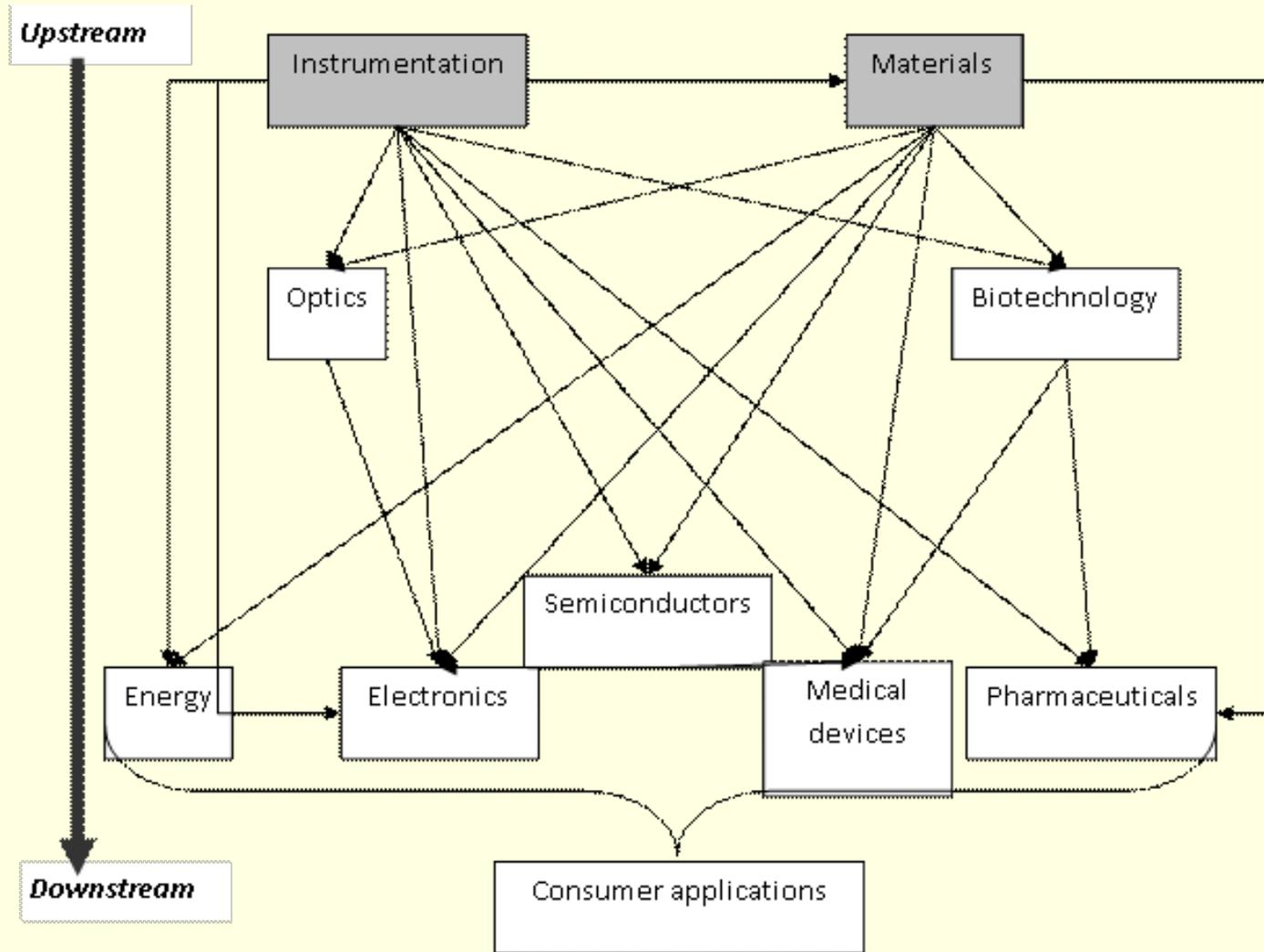
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**Santa Clara
University**

Infrastructure for Entrepreneurship



Public Resource
Endowments



Proprietary
Functions



Institutional
Arrangements

Universities, National labs, Firms

**Public Resource
Endowments**

**Scientific & Technological Knowledge, Competent
Labor, Financing**

Universities, National labs, Firms

**Proprietary
Functions**



**Institutional
Arrangements**

Universities, National labs, Firms

**Public Resource
Endowments**

**R&D, Commercialization, Supply chain creation,
Services**

Firms

**Proprietary
Functions**

**Institutional
Arrangements**

Firms

Universities, National labs, Firms

**Public Resource
Endowments**

Legitimate, Regulate, Standardize

**Industry Associations, Professional
Associations, Government Agencies**

**Proprietary
Functions**

Firms

**Institutional
Arrangements**

Associations and Government



FIGURE 4
Infrastructure for Entrepreneurship Configuration

Public Resource Endowments	
Basic scientific knowledge	Universities
Technological knowledge	Universities and firms
Competent labor	Universities
Financing mechanisms	Public organizations (government and private)

- Firms conduct exploratory research
- Firms sponsor early research
- University-Industry collaborations
- University-Industry user facilities
- University technology transfer

- Governments creates agencies to support development of foundation technology
- Governments support small scale exploratory research
- Associations support human resource development
- Associations support basic science

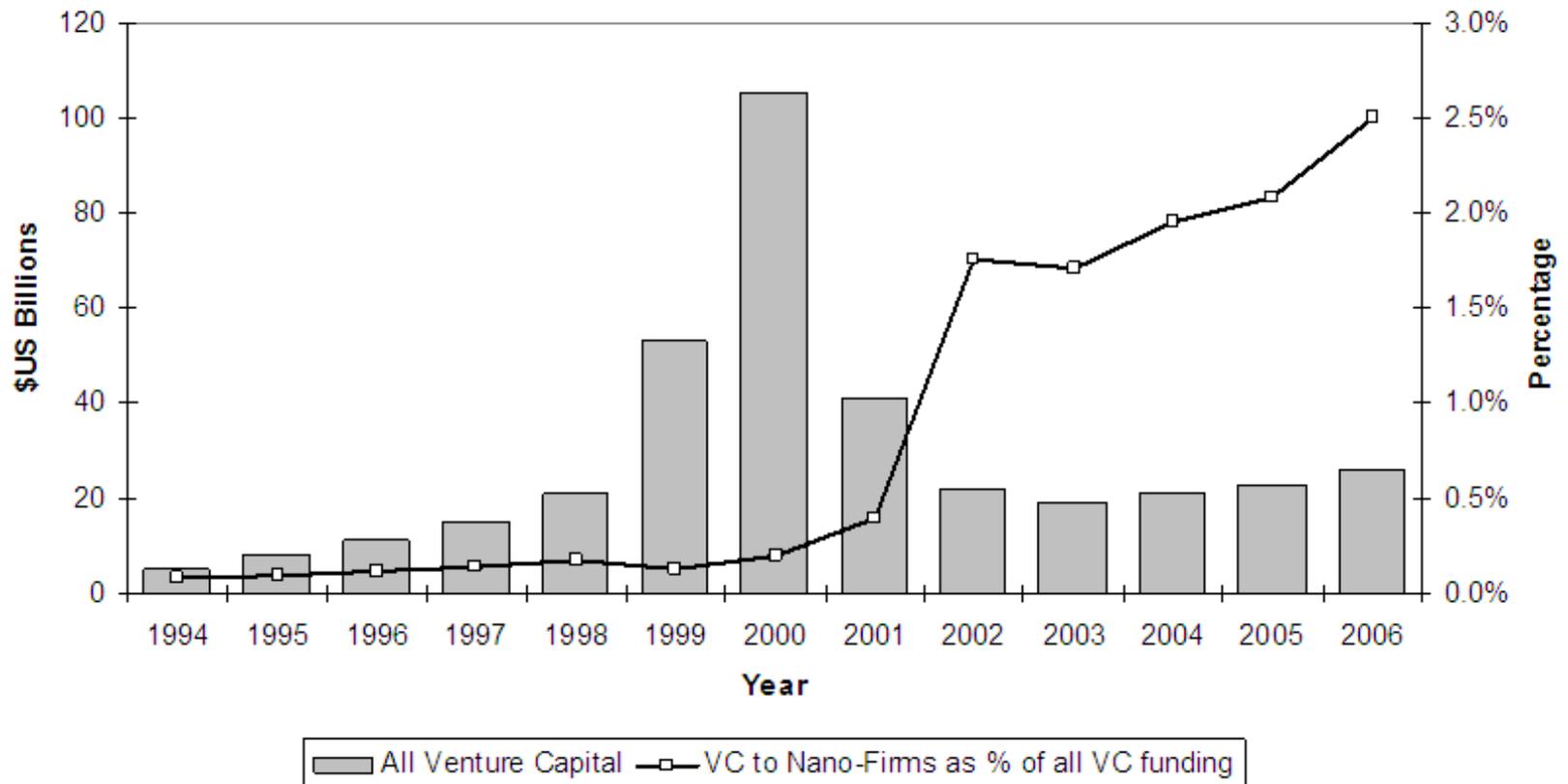
Infrastructure for Entrepreneurship

Proprietary Functions	
R&D	Firms
Appropriation of common goods	
Commercialization	
Use of complementary assets	
Supply chain creation	
Support services	

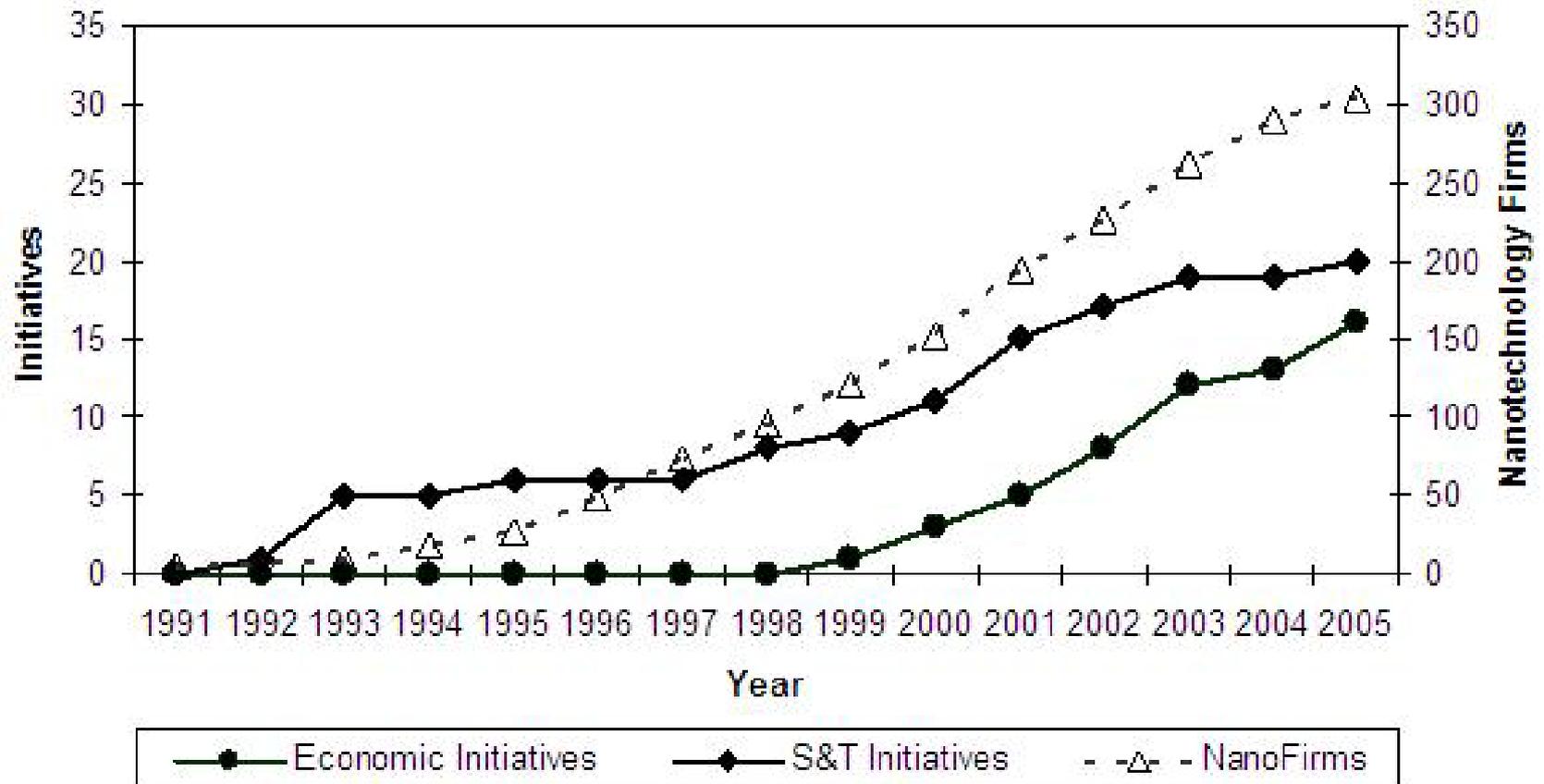
- Government support of firms using the technology
- Government support of firm R&D
- Government support industry creation
- Entrepreneurship support (e.g. VC funding)
- Government, technical, and science associations creating industry standards

Institutional Arrangements	
Legitimate	Scientific and professional associations
Regulate	Government
Standardize	Standardization boards

Venture Capital to Nanotechnology Firms as a Percentage of All Venture Capital Funding, Annually (1994-2006)

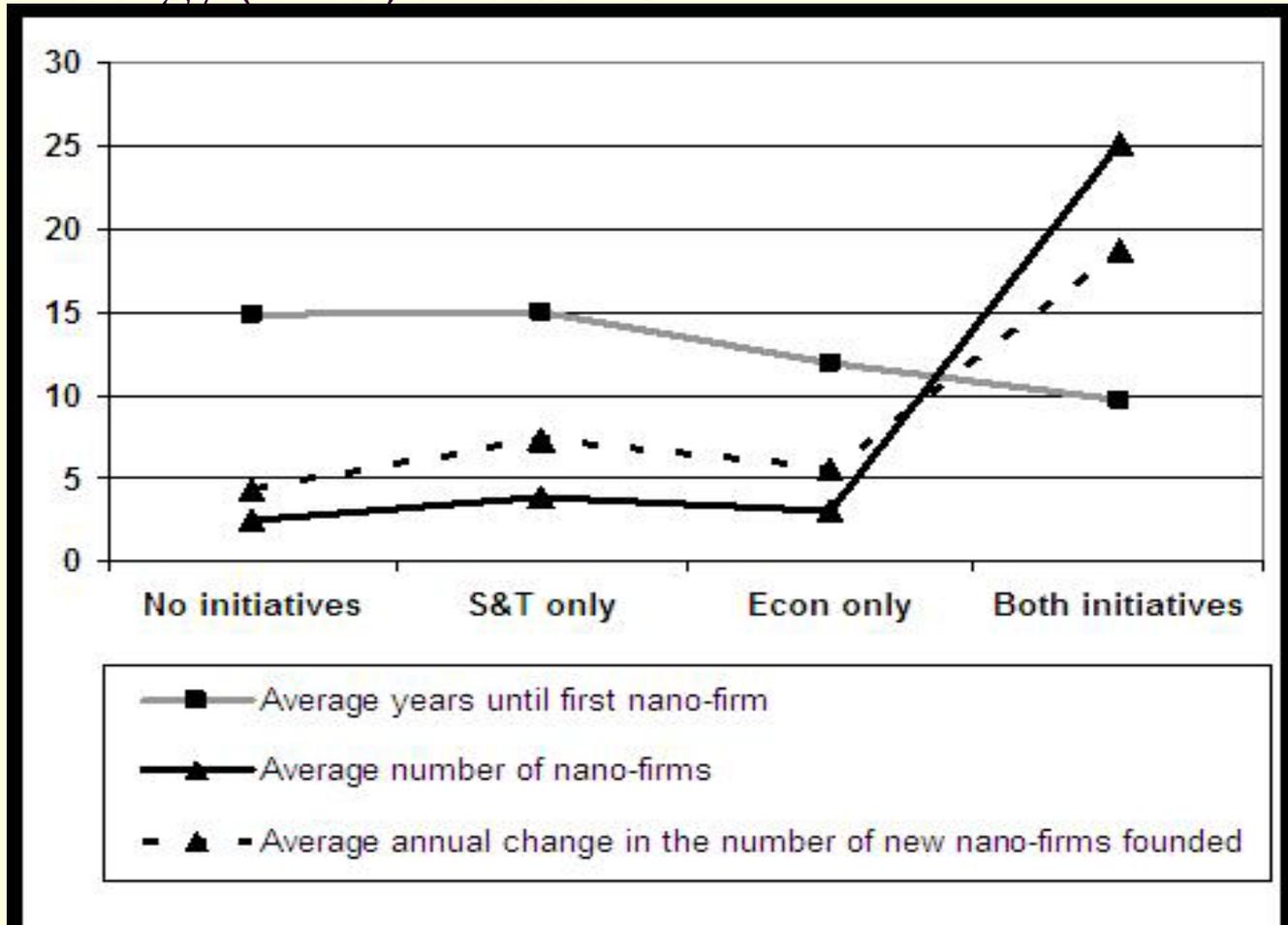


Science & Technology (S&T) and Economic Initiatives and Nanotechnology Firms, 1991-2005 (cumulative)



Woolley, J.L. & Rottner, R.M. 2008. "Innovation Policy and Nanotechnology Entrepreneurship." *Entrepreneurship Theory and Practice*.

Summary of Nanotechnology Entrepreneurship in States with and without Nanotechnology Economic or Science & Technology (S&T) Initiatives



Woolley, J.L. & Rottner, R.M. 2008. "Innovation Policy and Nanotechnology Entrepreneurship." *Entrepreneurship Theory and Practice*.

Timing and STI Policy in Nascent Domains

- The earlier a country invests in STI policy, the higher their number of related patents.
- Countries with *higher* investments in *early* STI policy have *lower* related patenting activity over time.
- Countries with *higher* investments in *later* STI policy have *higher* related long-term patenting activity.
- The amounts of early and later funding interact such that high investments at both stages hurt the countries long-term patenting activity.

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