

The Importance of Start-Ups in Tech Transfer

Dr. Ashley J. Stevens
President



April 4, 1992

OLYMPIA & YORK HOW BAD? AUTOS HAGGLE-FREE BUYING YOUR TAXES THIS YEAR AND BEYOND

BUSINESS WEEK
APRIL 06, 1992


BusinessWeek

APRIL 6, 1992 A MCGRAW-HILL PUBLICATION \$2.50

INDUSTRIAL POLICY

The very phrase rattles the teeth. It implies bureaucracy. It suggests government will pick winners and losers. Done badly, it would certainly hurt America. But with the cold war over and a global economy taking shape, America needs to shore up its competitiveness.

How? Certainly, by investing in education and infrastructure. But that's not enough. We must recharge the "knowledge base"—the basic science and technology that are the foundation of an advanced industrial society. Perhaps we should call it a growth policy.



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STRATEGIES ▶ GM ▶ CBS
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POLL THE PUBLIC VOTES
ON ECONOMIC POLICY

GERMANY READY FOR
A RATE CUT?

BusinessWeek

OCTOBER 19, 1992

A MCGRAW-HILL PUBLICATION

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HOT SPOTS



**AMERICA'S
NEW GROWTH
REGIONS**

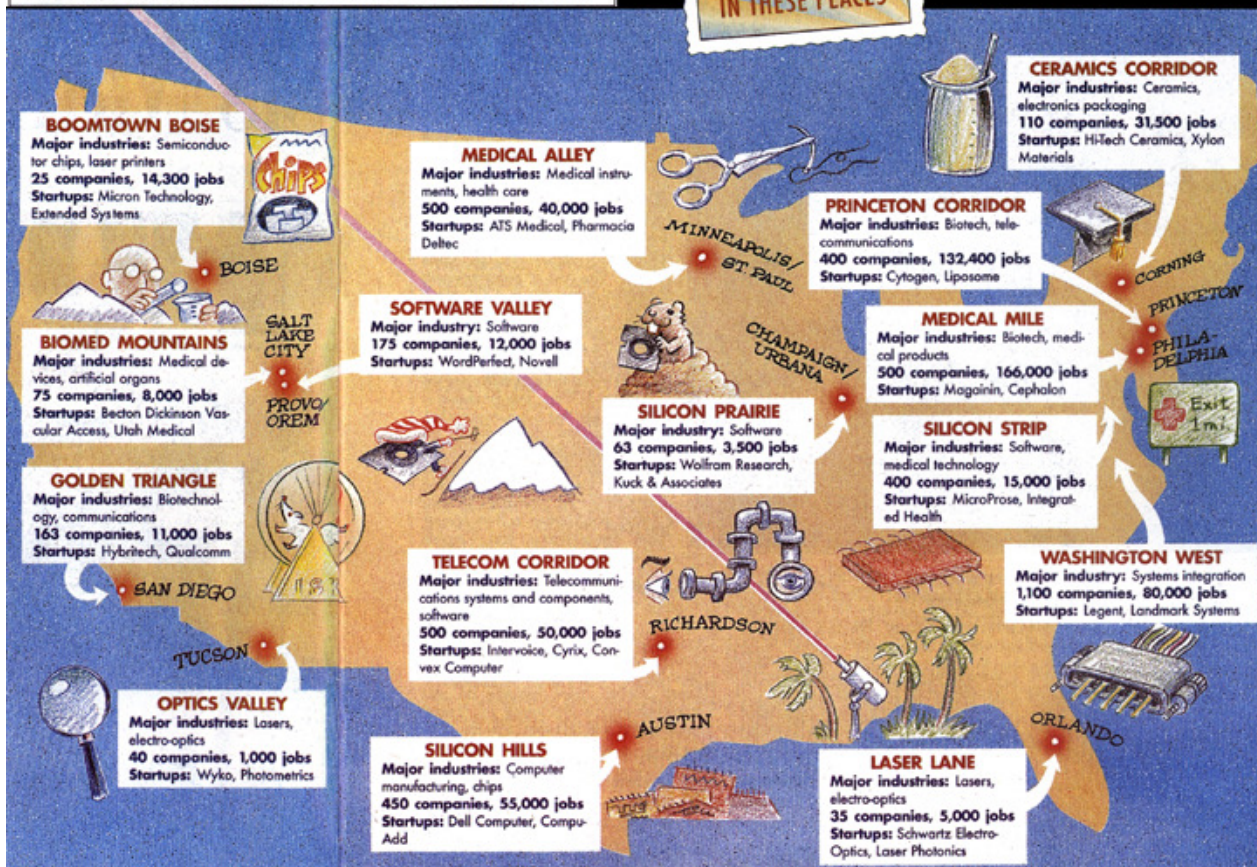
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HOT SPOTS

AMERICA'S NEW GROWTH REGIONS ARE BLOSSOMING DESPITE THE SLUMP

AT LEAST 600,000 PEOPLE HOLD HIGH-TECH JOBS IN THESE PLACES



Ingredients of a High Tech Cluster

- ❑ A major research university
- ❑ Quality of life
- ❑ Build on local industry
- ❑ Cooperation between local university, business and government
- ❑ Technology transfer from the university
- ❑ Funding sources -- state, VC, angels
- ❑ Incubators

Phases of Economic Development

- ❑ Start-ups
- ❑ New division of major US company
- ❑ Foreign companies move in
- ❑ Export lead growth

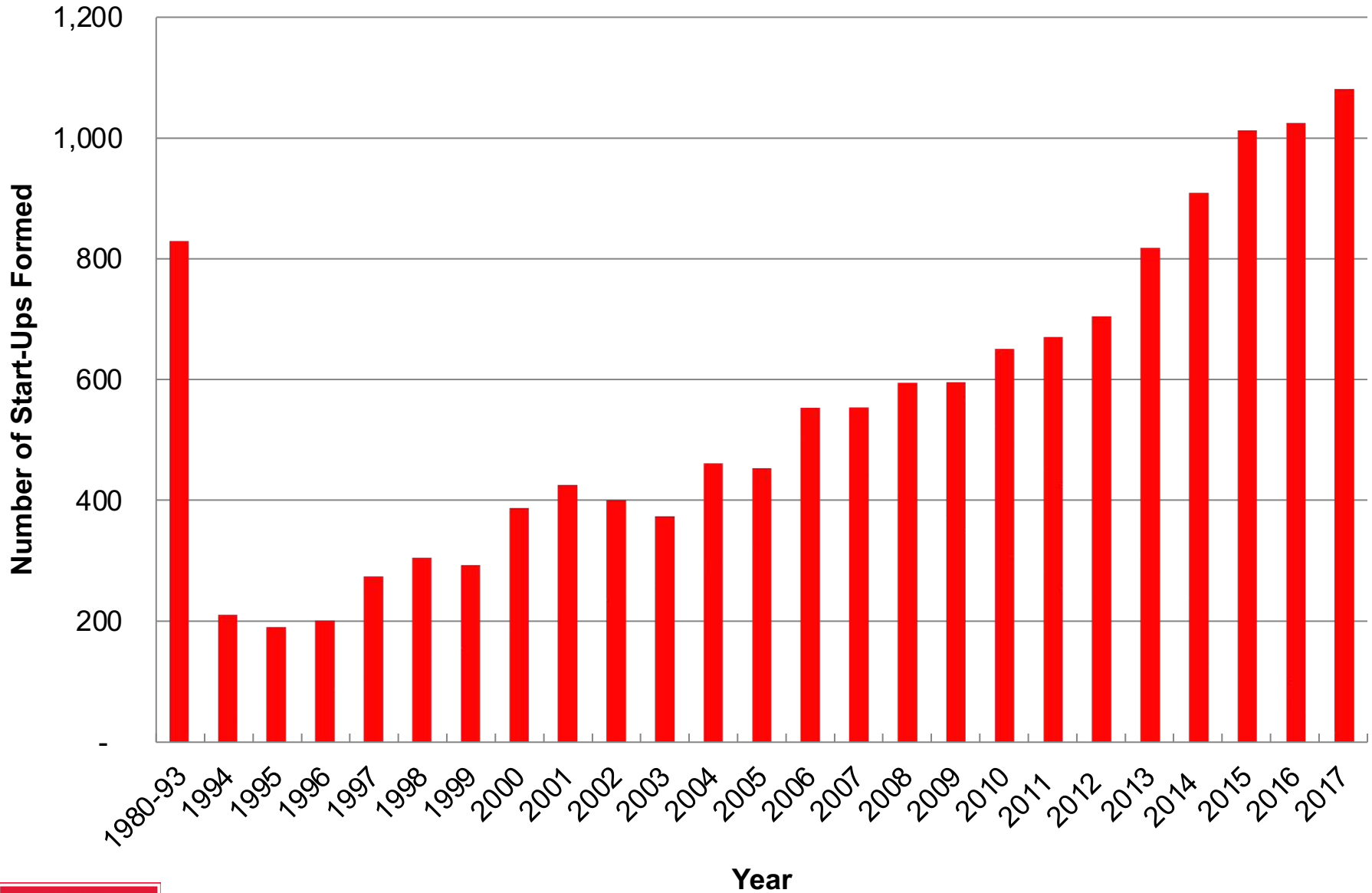
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Start-Ups Formed



Start-Up Companies

- ❑ 16,105 formed 1980-2020
 - ❑ 80.4% located in same state as institution
 - ❑ Every state
 - ❑ 12.3% from California institutions*
 - ❑ 11.8% from Massachusetts institutions*
 - ❑ 363 by MIT*
 - ❑ 349 by University of California System*
 - ❑ 175 by University of Utah*
 - ❑ 39.9% still active in 2020

AUTM Annual Licensing Activity Survey 1994-2020

* Through 2010

100 SUCCESS STORIES



GOVERNMENT FUNDING
+
UNIVERSITY RESEARCH
=
INNOVATION, COMPANIES, JOBS

SPARKING ECONOMIC GROWTH

How federally funded
university research
creates innovation,
new companies
and jobs



The Transformation of Massachusetts
into
a Major Pharmaceutical Center

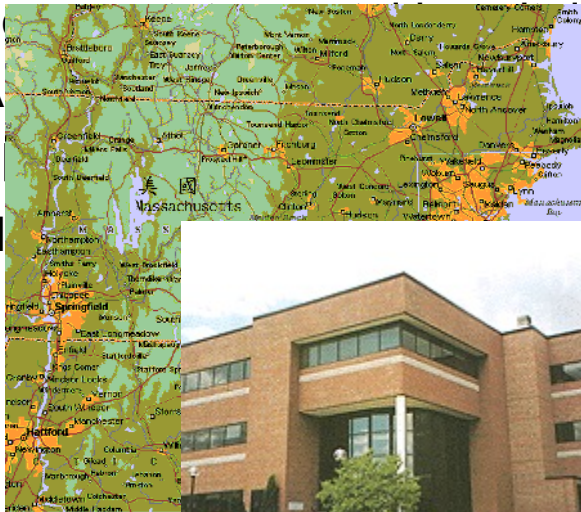
The Pharmaceutical Industry in Massachusetts

- ❑ In 1975, one pharmaceutical company in Massachusetts
 - ❑ US HQ of Astra AB
- ❑ Two events:
 - ❑ Spin-outs from Harvard, MIT, BU, Tufts, etc.
 - ❑ Some succeeded and are FIBCO's today
 - ❑ Biogen, Vertex
 - ❑ Some stumbled and were acquired
 - ❑ Genetics Institute → AHP → Wyeth-Ayerst → Pfizer
 - ❑ Some succeeded and were still acquired
 - ❑ Genzyme → Sanofi

The Massachusetts Biotechnology Research Park

- ❑ First biotech-specific research park created worldwide
- ❑ Worcester, MA

- ❑ F
- ❑ A
- ❑ Cam
- ❑ N



1980's – The First Big Pharma's

- ❑ BASF was first pharmaceutical company to move to Massachusetts (1989)
 - ❑ Massachusetts  **BASF** Research Park
 - ❑ Highly restrictive patent laws in Germany drove Big 3 abroad
 - ❑ Invented



- ❑ Top  billion sales in 2016



Universities

- ❑ Leaders in new biotechnologies
 - ❑ 8 Nobel Prizes 1960 – 1990
- ❑ Established offices of technology transfer early

Funding

- ❑ Massachusetts was the birthplace of organized venture capital
 - ❑ 1947 – American Research and Development Corporation
- ❑ Substantial number of vc firms to fund the start-ups
- ❑ Proximity to Wall Street a plus

1995 – Rise of Biopharmaceutical Manufacturing

- ❑ Production of biopharmaceuticals inherently more closely tied to R&D than traditional pharmaceuticals
 - ❑ Produced from living cells
 - ❑ Sensitive to changes in production
 - ❑ Two step regulatory process
 - ❑ Safety and efficacy – BLA
 - ❑ Production – Premises License

1995 – Rise of Biopharmaceutical Manufacturing

- ❑ Genzyme received substantial incentives to produce its first major product in Massachusetts



1995 – Rise of Biopharmaceutical Manufacturing

- Others followed

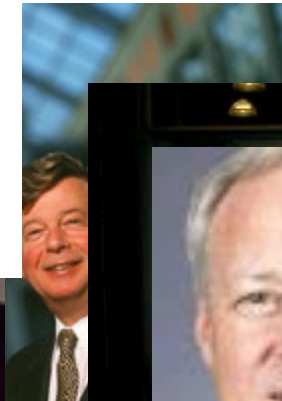
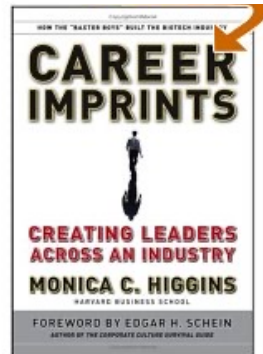


1995 – Rise of Biopharmaceutical Manufacturing

- ❑ 2003 HBS “Life Sciences” Summit
 - ❑ Professor Michael Porter
 - ❑ Convened the “Triple Helix” in one place
- ❑ Established biopharmaceutical manufacturing as a strategic goal
- ❑ Simplified permitting process
- ❑ Early success:
 - ❑ Avant Immunotherapeutics
- ❑ Recent success:
 - ❑ Bristol-Myers Squibb
 - ❑ Shire/TKT

Management

- ❑ Because no indigenous pharmaceutical industry, early management had to be imported
- ❑ The “Baxter Boys”
 - ❑ Jim Tobin at Biogen
 - ❑ Henri Termeer at Ger
 - ❑ Gabriel Schmergel at
 - ❑ Robert Carpenter at I



Today

- ❑ World leading center of pharmaceutical R&D
 - ❑ 18 of top 20 big pharma's have a facility in Massachusetts as of 2023
- ❑ World leading center of biopharmaceutical manufacturing
- ❑ Diversified skill base in start-ups that have developed into FIBCO's

 **Biogen**

 **gsk**
GlaxoSmithKline

Alkermes[®]

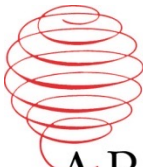
Roche

 **ALGETA**

 **Celgene**

Takeda

AMGEN[®]



ARIAD

 **IMMUNOGEN, INC.**

Eisai

AsahiKASEI

AstraZeneca

DSM



SUNOVION

Healthy bodies, healthy lives



Bristol-Myers Squibb
Company

Lilly  **Ironwood**

 **ENANTA**
Pharmaceuticals

 **MERCK**
SERONO



SERVIER

 **MERCK**
Research Laboratories

sanofi aventis

L'essentiel c'est la santé.

MERRIMACK
PHARMACEUTICALS

Shire

KERYX
BIOPHARMACEUTICALS, INC.

IPSEN
Innovation for patient care

pSivida
corp

Baxalta

B:OMARIN

Johnson & Johnson

Aegerion
Pharmaceuticals

VERTEX

Pfizer
22

 **NOVARTIS**

Lessons

- ❑ Took 25 years
- ❑ Built on exceptional strengths of Harvard, MIT, BU, Tufts, etc.
- ❑ Imported management
- ❑ Funding sources were in place
- ❑ A highly networked city