

STANFORD PROJECT ON REGIONS OF INNOVATION AND ENTREPRENEURSHIP
 THE WALTER H. SHORENSTEIN ASIA-PACIFIC RESEARCH CENTER

“Developing Clusters for Innovation, Growth, and Value”
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The Stanford Program

The Stanford Program on Regions of Innovation and Entrepreneurship (SPRI) has studied regions and clusters world wide with heaviest concentration in Asia and the US.

The comments that follow are largely based on these studies


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THE SILICON VALLEY EDGE

A HABITAT FOR INNOVATION AND ENTREPRENEURSHIP

EDITED BY
CHONG MOON LEE
WILLIAM F. MILLER
MARGUERITE GONG HANCOCK
HENRY S. ROWEN

Making IT

THE RISE OF ASIA IN HIGH TECH

EDITED BY
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A novel journey of discovery in traditional leadership philosophies and the standard pursuit of success in innovation and entrepreneurship

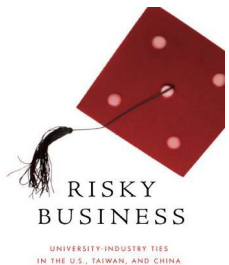
HEIDRICK & STRUGGLER

getting results in China

how China's tech executives are molding a new generation of leaders


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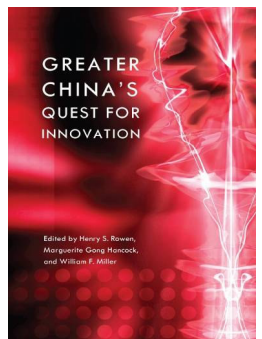
Coming Soon



RISKY BUSINESS

UNIVERSITY-INDUSTRY TIES IN THE U.S., TAIWAN, AND CHINA

Edited by Marguerite Gong Hancock, Henry S. Rowen, and William F. Miller



GREATER CHINA'S QUEST FOR INNOVATION

Edited by Henry S. Rowen, Marguerite Gong Hancock, and William F. Miller


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Business Environment

Steps toward high tech development for growth and value

1. The high tech economy is the growth part and the high value part of the global economy.
2. To participate effectively in the growth and value part of the high tech economy a region must have the following:
 - a. The fundamental resources for a high tech economy i.e. Research and research trained scientists and engineers that create the innovations
 - b. Entrepreneurs who turn these innovations into business
 - c. A “habitat”, i.e. a business, social, and political environment that facilitates entrepreneurship and breeds entrepreneurs



14 Features of a High Growth, High Value High Tech Entrepreneurial Habitat

- Knowledge Intensity
- Universities and research institutes that interact effectively with industry
- Favorable government policies
- Results-oriented meritocracy
- Flexible and Mobile work force(dense social networks)
- Climate that rewards risk-taking and tolerates failure
- Knowledgeable Venture Capital
- Open business environment
- Collaboration: business, government, and non-profits-local networks
- Specialized business service infrastructure: lawyers, accountants, etc.
- High quality of life
- Global Linkages
- Power of Multi –clusters
- Leadership to transform



Silicon Valley as a Case

Silicon Valley is an interesting case because it developed organically.

Other regions(clusters) have developed through planning and/or government actions



Evolution of Silicon Valley

Silicon Valley has gone through several phases of development. Each time the region had to adjust and change. We might roughly breakout these phases as follows

- 1890-1940 Radio vacuum tube and food machinery
eg. Federal Telegraph Corporation, Food Machinery Company
- 1940-1960 Vacuum tube applications to instruments and defense
eg. Hewlett Packard, Varian Associates
- 1960- 1980 Semiconductors
eg. Fairchild, Intel, National Semiconductor, AMD
- 1980-1990 PCs and Workstations
eg. Apple, Sun Microsystems, Silicon Graphics
- 1990- 2000 Network Computing
eg. 3Com, Cisco , Netscape, Yahoo!, eBay, Google
- 2000- Mobile Computing, Biotech, Nanotech
eg. Salesforce .com, Nanosysis, Nanostellar
- 2004- CleanTech



Silicon Valley as Habitat for Innovation and Entrepreneurship

The Valley is a gathering place for researchers, entrepreneurs, venture capitalists, and highly skilled workers who turn new ideas into the innovative products and services that fuel the economy of the region. **Silicon Valley turns technology into business.**

Silicon Valley has multiple ecosystems interacting within a favorable habitat. This “habitat” and the multiple ecosystems it supports allows the region to adapt to waves of innovation and adjust to economic cycles.



Recent developments in Silicon Valley

Silicon Valley is in Transformation Again



San Jose Mercury News

mercurynews.com PENINSULA 101 Thursday, August 7, 2008 THE NEWSPAPER OF SILICON VALLEY 75 cents

Valley reinvents itself—again

Tech transformed itself after bust, study finds, creating new jobs, but at the expense of middle-wage workers.

By Peter Carey and Patrick May
Federal study released Wednesday. Though total employment in Santa Clara County shook off the pain of the dot-com bust and regained its status as one of the nation's high-tech capitals, spurred by the growth of new giants like Yahoo and Google, according to a new study, the region's economy began to rebound. The creativity in Silicon Valley has never been stronger, argued Carl Cusack, president and CEO of the Silicon Valley Leadership Group. Whether that's clean and green tech or nanotech, other technology changes, the innovation sector is strong.

But the rebound came with a price. While average tech wages throughout the region have held up, 48 percent, that's partly due to the loss of middle-wage jobs. San Jose's 40-year-old consultant in San Bruno who has held a series of high-paying tech jobs, said he's not surprised.

The transition is not here for a few highly paid people, while all the work to keep it going is overseas," LaBoda said.

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Silicon Valley tech industries still dominate

Santa Clara County industries, 2008

One measure of the dominance of an industry in a geographic area is the "location quotient," a ratio comparing the proportion of the local work force employed in an industry with the proportion of the national work force employed in the same industry. For example, the proportion of employment in computer equipment manufacturing in Santa Clara County is about 22 times the national average.

Computer equipment manufacturing	22.8
Semiconductor manufacturing	15.1
Communication equipment manufacturing	9.2
Central instrument manufacturing	5.8
Software publishing	5.6
Computer system design	4.9
Scientific research	4.5
Internet/telecommunication data	3
Architecture	1.2
Pharmaceuticals	1.1
Santa Clara County total	4.8

Source: U.S. Bureau of Labor Statistics

High-tech jobs distribution
By county, 2008

CONTRA COSTA	5%
SAN FRANCISCO	9.2%
ALABAMA	15.6%
SAN MATEO	14.4%
SANTA CLARA	14.4%
SAN JOAQUIN	14.4%
SAN DIEGO	14.4%
SAN JOSE	14.4%
SANTA CRUZ	1%

Among the findings of the study, conducted by the U.S. Labor Department's Bureau of Labor Statistics of a six-county Bay Area region defined as Silicon Valley's "high tech corridor":

- High tech jobs are five times more densely concentrated in Santa Clara County than in the nation as a whole.
- The six-county Silicon Valley corridor is about three times more concentrated.
- The growth of a biotech cluster in San Mateo and San Francisco counties and the Web portal and Web search industries in Santa Clara County helped counter downward employment trends.
- High tech employment fell 17 percent, or 85,900 jobs — 65,000 of them in Santa Clara County. During the same period the national work force grew by 4 percent.
- High-tech wages grew 42 percent in Santa Clara County, from \$96,650 to \$137,200.
- The valley remained an innovation leader with 11 of the top 20 U.S. cities in new patents.

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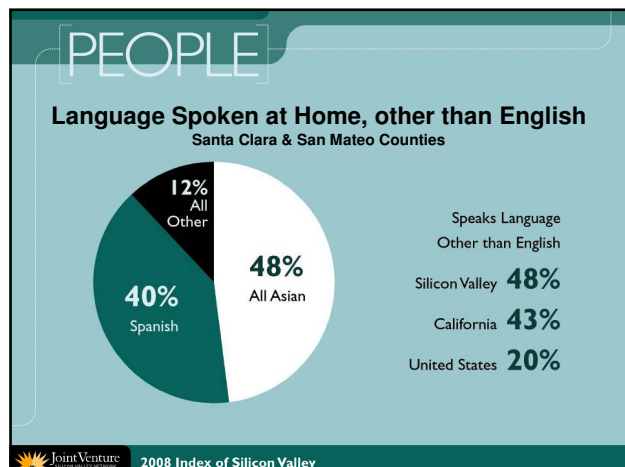
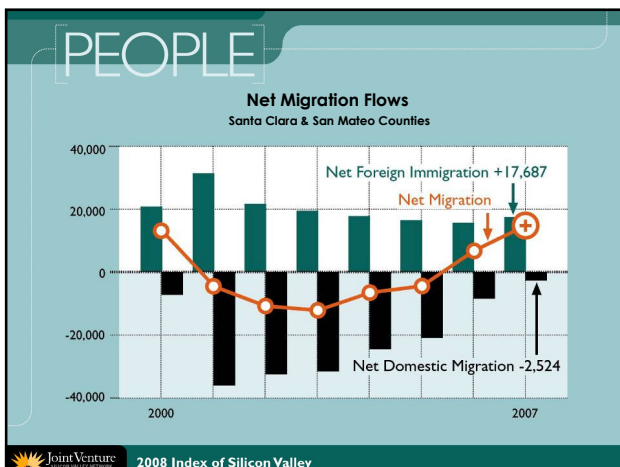
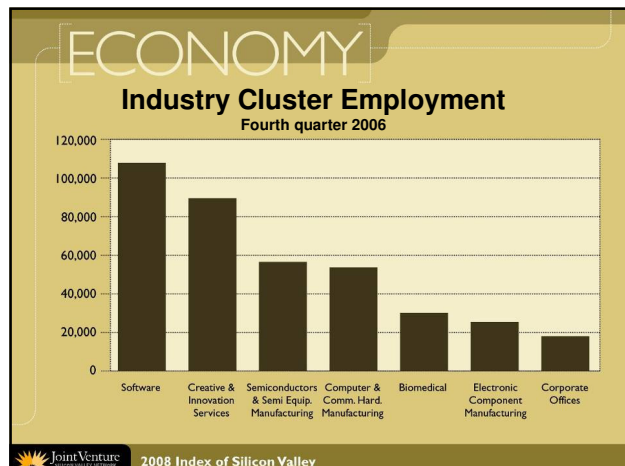
Changes in Silicon Valley Since 2000

- Changes in the IT Industry
- Consolidation in the mature parts of IT
- New application areas
- New geographical markets
- New patterns of collaboration: Global Linkages to India, Mainland China, Taiwan, Israel
- New investment patterns
- Changes in employment patterns
- The rise of new industry clusters
- Biotech
- Clean tech
- Changes in focus of venture capital investment
- Technology areas
- Geographical
- Changes in university research

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Consolidations

- HP – Compaq 2002
- Oracle
- Seible Systems 2003
- PeopleSoft 2004
- BEA Systems 2008
- IBM – Rational 2004
- Google – YouTube 2006
- Microsoft attempt at Yahoo 2008(not over yet)





New Industries – Biotech and Nanotech

Bay Area has the largest cluster of biotech companies in the world

Number two in size of cluster is Boston

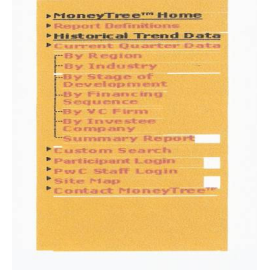
Number three in size of cluster is San Diego

Bay Area now has the largest collection of nanotech companies in the US. The Bay Area has 4% of the US population and 10% of the nanotech companies.



Pricewaterhousecoopers Money Tree

<www.pwcmoneytree.com>



Historical Trend Data

Parameters Defined: All

Graph shows: Amount

Year-Qtr	Amount	% of Total	Deals
Q1 1995	\$1802M	0.39%	497
Q2 1995	\$2488M	0.56%	651
Q3 1995	\$1653M	0.36%	411
Q4 1995	\$1863M	0.44%	494
Q1 1996	\$2704M	0.64%	677
Q2 1996	\$2410M	0.52%	585
Q3 1996	\$3067M	0.70%	790
Q4 1996	\$2934M	0.70%	760
Q1 1997	\$3000M	0.68%	760
Q2 1997	\$3200M	0.74%	840
Q3 1997	\$4270M	1.01%	885
Q4 1997	\$3504M	0.82%	951
Q1 1998	\$3700M	0.87%	999
Q2 1998	\$5073M	1.20%	911
Q3 1998	\$4749M	1.13%	901
Q4 1998	\$6132M	1.49%	960
Q1 1999	\$10683M	2.52%	1305
Q2 1999	\$10698M	2.50%	1410
Q3 1999	\$22512M	5.31%	1993
Q4 1999	\$27626M	6.52%	2120
Q1 2000	\$25504M	6.03%	1920
Q2 2000	\$13389M	3.05%	1143
Q3 2000	\$11864M	2.80%	1262
Q4 2000	\$11482M	2.73%	1262
Q1 2001	\$10918M	2.58%	1214
Q2 2001	\$9134M	2.17%	1005
Q3 2001	\$7773M	1.83%	881
Q4 2001	\$6664M	1.58%	851
Q1 2002	\$6403M	1.51%	802
Q2 2002	\$4802M	1.14%	722
Q3 2002	\$4403M	1.04%	692
Q4 2002	\$4389M	1.04%	722
Q1 2003	\$4637M	1.14%	742
Q2 2003	\$4778M	1.12%	739
Q3 2003	\$4403M	1.04%	716
Q4 2003	\$5212M	1.23%	802
Q1 2004	\$4939M	1.17%	684
Q2 2004	\$4604M	1.10%	652
Q3 2004	\$6293M	1.48%	679
Q4 2004	\$5843M	1.38%	704
Q1 2005	\$6293M	1.48%	680
Q2 2005	\$5707M	1.32%	662
Q3 2005	\$6533M	1.50%	680
Q4 2005	\$7077M	1.62%	692
Q1 2006	\$6066M	1.39%	611
Q2 2006	\$6134M	1.50%	652
Q3 2006	\$7450M	1.74%	667
Q4 2006	\$7377M	1.74%	1051
Q1 2007	\$7450M	1.74%	1051
Q2 2007	\$9322M	2.19%	1004



Year-Qtr	Amount	% of Total	Deals
Q1 2008	\$7654M	1.81%	1006
Q2 2008	\$7559M	1.78%	1059
Q3 2008	\$7190M	1.70%	980
Q4 2008	\$5674M	1.34%	884
Q1 2009	\$3191M	0.75%	603
Q2 2009	\$3674M	0.87%	612



Investments by Industry / Q2 2009

Industries Defined: All
Total \$ Invested: \$3,674,427,000
Average \$ Per Deal: \$6,003,966
Deals: 612

Industry	Amount	% of Total	Deals
Biotechnology	\$888M	24.17%	85
Software	\$644M	17.53%	135
Medical Devices and Equipment	\$628M	17.10%	75
IT Services	\$295M	8.03%	44
Industrial/Energy	\$287M	7.80%	53
Networking and Equipment	\$180M	4.91%	27
Semiconductors	\$170M	4.63%	27
Computers and Peripherals	\$132M	3.58%	15
Media and Entertainment	\$116M	3.15%	52
Telecommunications	\$95M	2.58%	26
Electronics/Instrumentation	\$85M	2.30%	14
Business Products and Services	\$50M	1.35%	15
Consumer Products and Services	\$44M	1.18%	15
Healthcare Services	\$23M	0.62%	7
Retailing/Distribution	\$19M	0.48%	5
Financial Services	\$16M	0.43%	11
Other	\$6M	0.15%	6



Silicon Valley Leads the Way

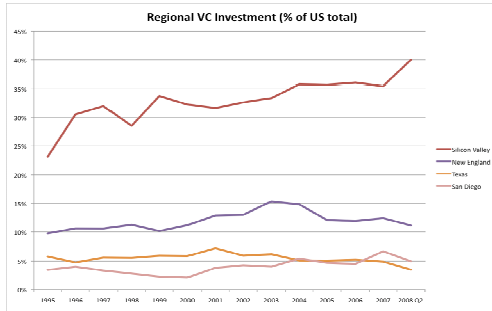
Investments by Region / Q2 2009

Regions Defined: All
Total \$ Invested: \$3,674,427,000
Average \$ Per Deal: \$6,003,966
Deals: 612

Region	Amount	% of Total	Deals
Silicon Valley	\$1177M	32.03%	174
New England	\$467M	12.71%	76
Southeast	\$282M	7.68%	34
NY Metro	\$276M	7.52%	54
Colorado	\$211M	5.75%	16
Midwest	\$201M	5.47%	52
San Diego	\$172M	4.69%	22
Philadelphia Metro	\$162M	4.41%	22
LA/Orange County	\$159M	4.33%	30
SouthWest	\$158M	4.30%	18
Northwest	\$127M	3.45%	35
North Central	\$101M	2.74%	15
DC/Metroplex	\$90M	2.44%	26
Texas	\$74M	2.02%	23
Sacramento/N. Cal	\$7M	0.20%	4
South Central	\$6M	0.16%	7
Upstate NY	\$3M	0.07%	2
Unknown	\$2M	0.05%	2



VC Investment: Regional Comparison



Bio and Medical Equal Software

Investments by Region / Q2 2009

Regions Defined	Total \$ Invested	Average \$ Per Deal	Deals
Silicon Valley	\$1,176,747,600	\$6,762,917	174

	Amount	% of Total	Deals
Software	\$336M	28.60%	40
Biotechnology	\$186M	15.85%	15
Medical Devices and Equipment	\$164M	13.90%	16
Semiconductors	\$124M	10.50%	18
Networking and Equipment	\$83M	7.02%	11
Electronics/Instrumentation	\$64M	5.46%	5
Industrial/Energy	\$58M	4.94%	12
Media and Entertainment	\$50M	4.26%	19
Telecommunications	\$34M	2.85%	9
IT Services	\$33M	2.81%	13
Computers and Peripherals	\$30M	2.51%	4
Healthcare Services	\$6M	0.50%	1
Other	\$3M	0.30%	3
Consumer Products and Services	\$2M	0.18%	2
Retailing/Distribution	\$2M	0.14%	1
Financial Services	\$2M	0.13%	1
Business Products and Services	\$1M	0.08%	4



Clean Tech

Investments:

CleanTech investments in Silicon Valley rose 94% 2006 to 2007 to reach \$1,100,000,000

CleanTech investments in Silicon Valley amount to 62% of CleanTech investments in California and 21% of such investments in all of US

Employment:

Since 2000 the number of "green" jobs has risen 41% in Silicon Valley, compared to 17% for the rest of California

43% are in energy generation and 39% in energy efficiency

Reference: The 2008 Silicon Valley Index, <www.jointventure.org>



Changes in the Venture Capital Industry

Less money to invest

Going to smaller funds

Phase out of many VC funds

Restructuring existing VC funds

New forms of venture investing