

Entrepreneurial Impact: The Role of MIT

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Table 1. Estimated Employment and Sales Data for All Active MIT Alumni Companies[°]

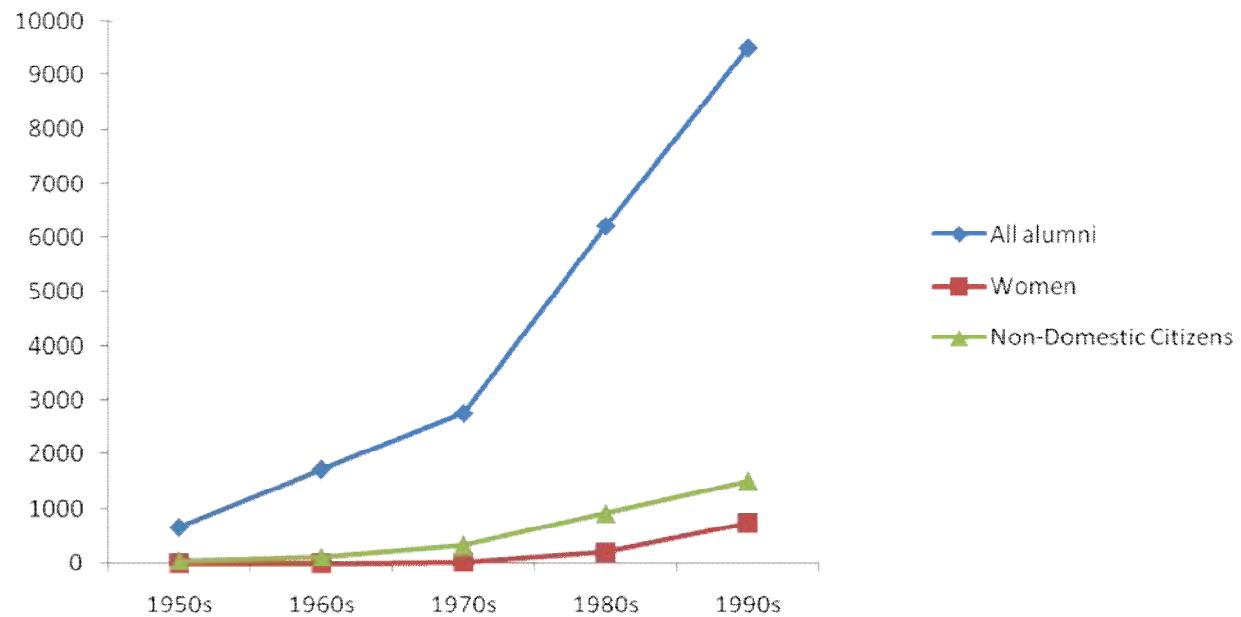
| Jobs | Percent of Companies | Median Employees | Median Sales (\$Millions) | Estimated Total Employees | Estimated Total Sales (\$Millions) |
|---|----------------------|------------------|---------------------------|---------------------------|------------------------------------|
| More than 10,000 | 0.3% | 15,000 | 1,523 | 1,339,361 | 1,389,075 |
| 1,000-10,000 | 1.8% | 1,927 | 308 | 1,043,932 | 235,532 |
| Others, including <1,000 and employment unknown | 97.9% | 39 | 11 | 900,001 | 226,671 |
| Total | 100.0% | 155 | 3 | 3,283,294 | 1,851,278 |

[°]Underlying data from 2003 MIT survey of all living alumni, updated to 2006; ~25,800 active companies.

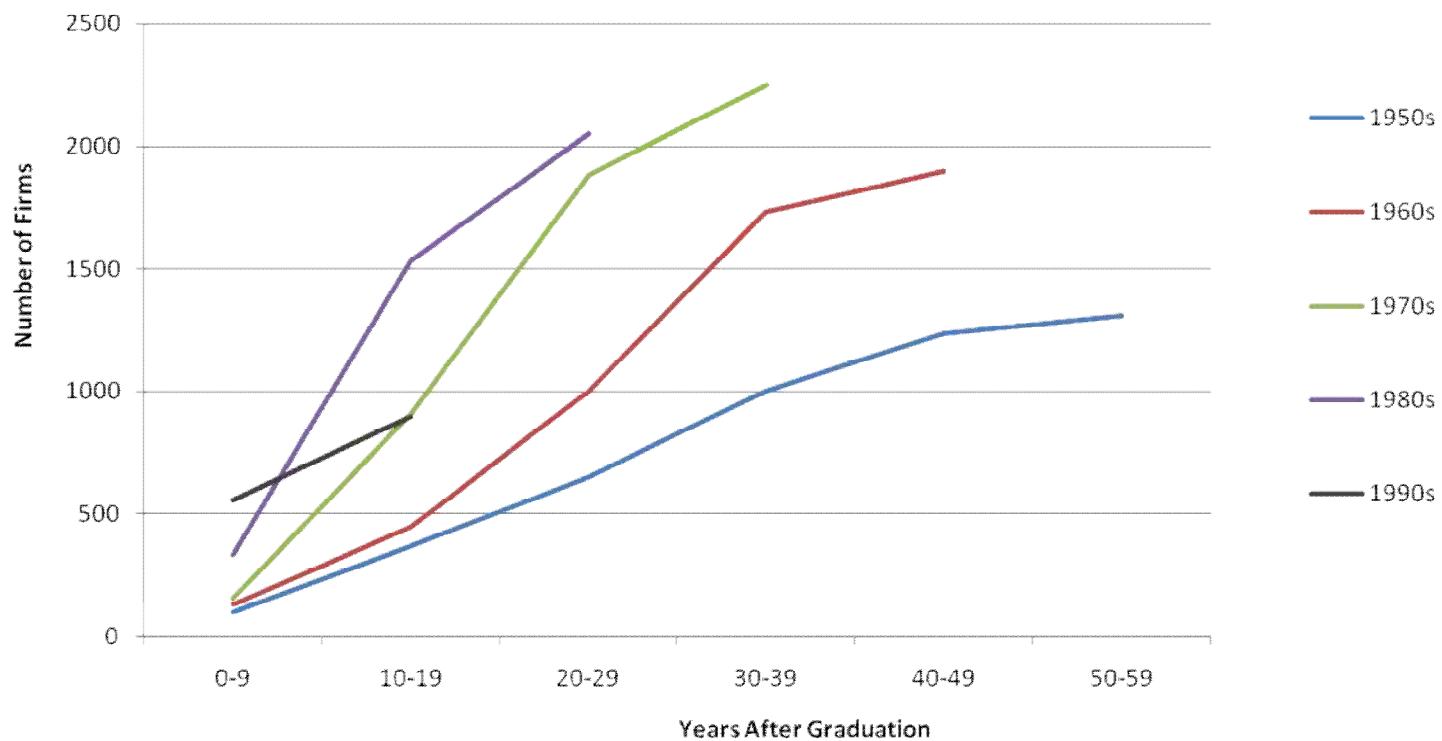
Estimated jobs created by MIT alumni firms headquartered in these states:

| | |
|----------------------|--------------|
| Massachusetts | 960,000 |
| California | 526,000 |
| New York | 231,000 |
| Texas | 184,000 |
| Virginia | 136,000 |
| Fifteen other states | >10,000 each |
| Eleven states | < 1,000 each |

Estimated Number of “First-Time” Firms Founded Each Decade By MIT Alumni



Cumulative Firms Founded (Bachelors Degree)



More entrepreneurs emerge from each successive MIT class, and they start their companies sooner and at younger ages.

Table 2. Estimated Number of Companies Founded by MIT “Foreign-Student” Alumni

| Location of Companies | Total | Manufacturing |
|-----------------------|-------|---------------|
| United States | 2,340 | 673 |
| Europe | 790 | 51 |
| Latin America | 495 | 63 |
| Asia | 342 | 43 |

30% of MIT’s foreign-student alumni become entrepreneurs;
half remain in the U.S.

Table 3. Median Age of Founders When They Established Their First Firms

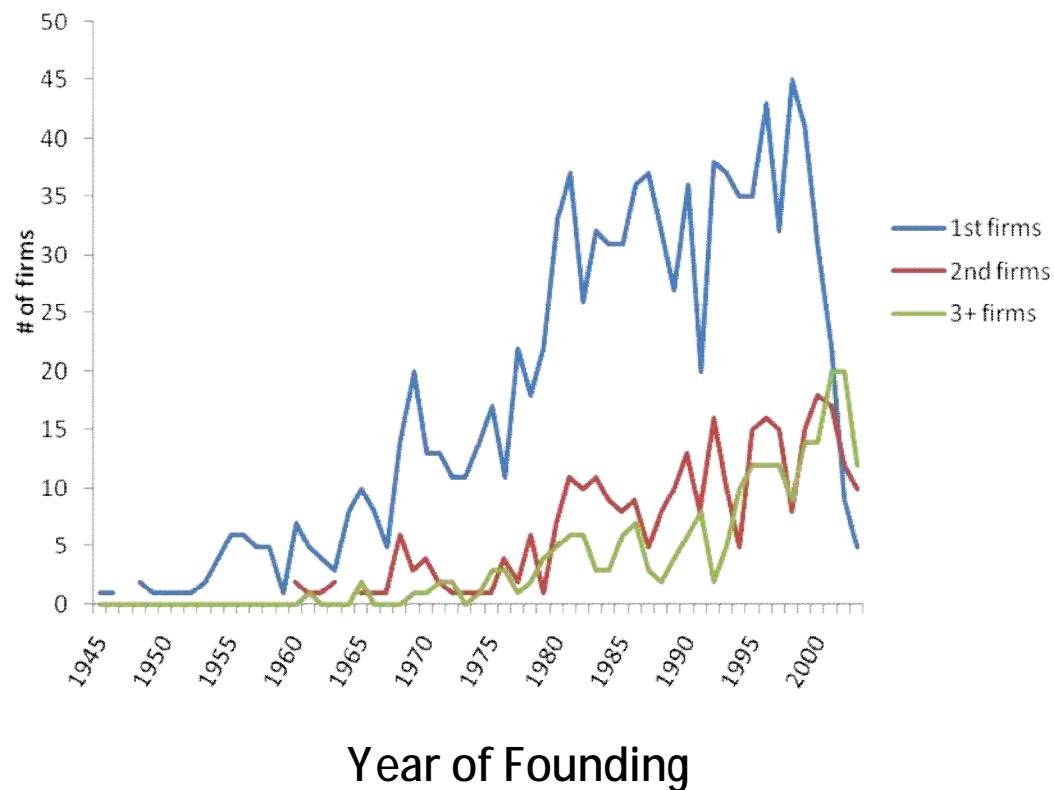
| Decade of Graduation | 1950s | 1960s | 1970s | 1980s | 1990s |
|----------------------|-------|-------|-------|-------|-------|
| All | 40.5 | 39. | 35. | 32. | 28. |
| Non-U.S. Citizens | 38. | 35.5 | 36.5 | 32. | 29. |
| Women | 42. | 41. | 40. | 35. | 29. |

Table 4. One-Time and Repeat MIT Founders by Decade of Graduation (percent)

| | | Decade | | | | | | | |
|-----------------------|----------|--------|-------|-------|-------|-------|-------|-------|-------|
| | | 1930s | 1940s | 1950s | 1960s | 1970s | 1980s | 1990s | 2000s |
| Total # Firms Founded | 1 | 67 | 61 | 56 | 54 | 48 | 57 | 61 | 59 |
| | 2 | 0 | 11 | 21 | 20 | 23 | 22 | 23 | 28 |
| | 3 | 0 | 9 | 10 | 11 | 16 | 11 | 9 | 9 |
| | 4 | 11 | 8 | 7 | 7 | 6 | 5 | 3 | 3 |
| | 5+ | 22 | 11 | 7 | 9 | 7 | 5 | 4 | 0 |
| | % Repeat | 33 | 39 | 44 | 46 | 52 | 43 | 39 | 41 |

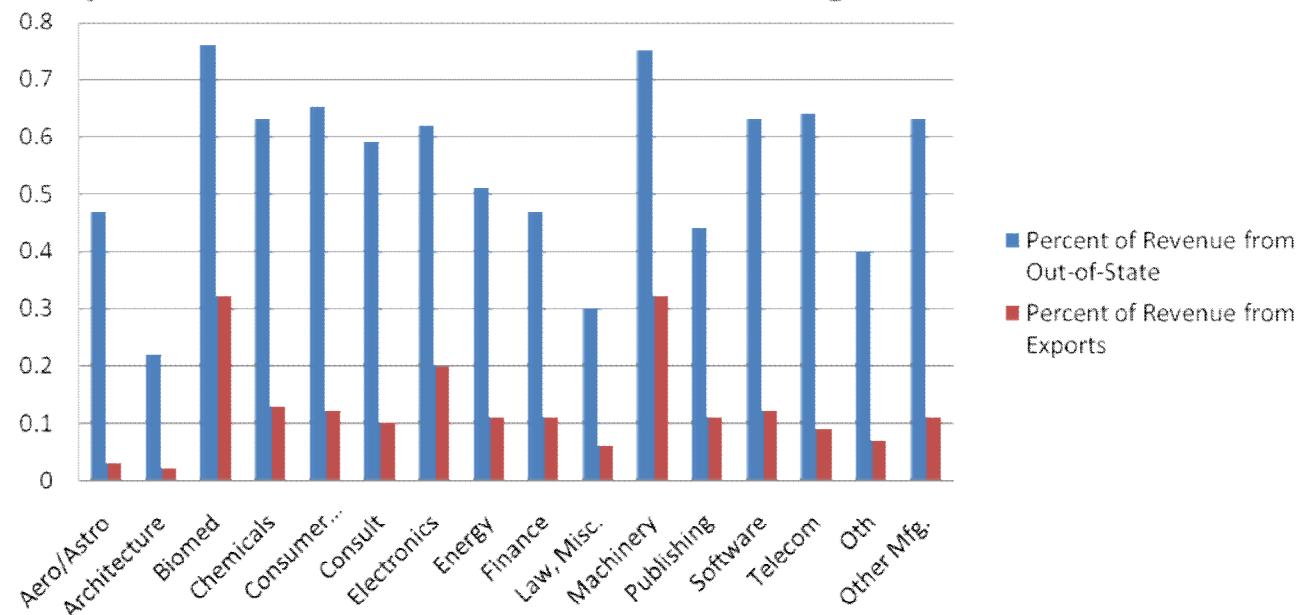
Over time, the number of multiple companies founded per MIT alumnus has been increasing, with dramatically increased economic impact per entrepreneur.

Repeat Founders Among MIT Alumni Entrepreneurs (from limited sample only)



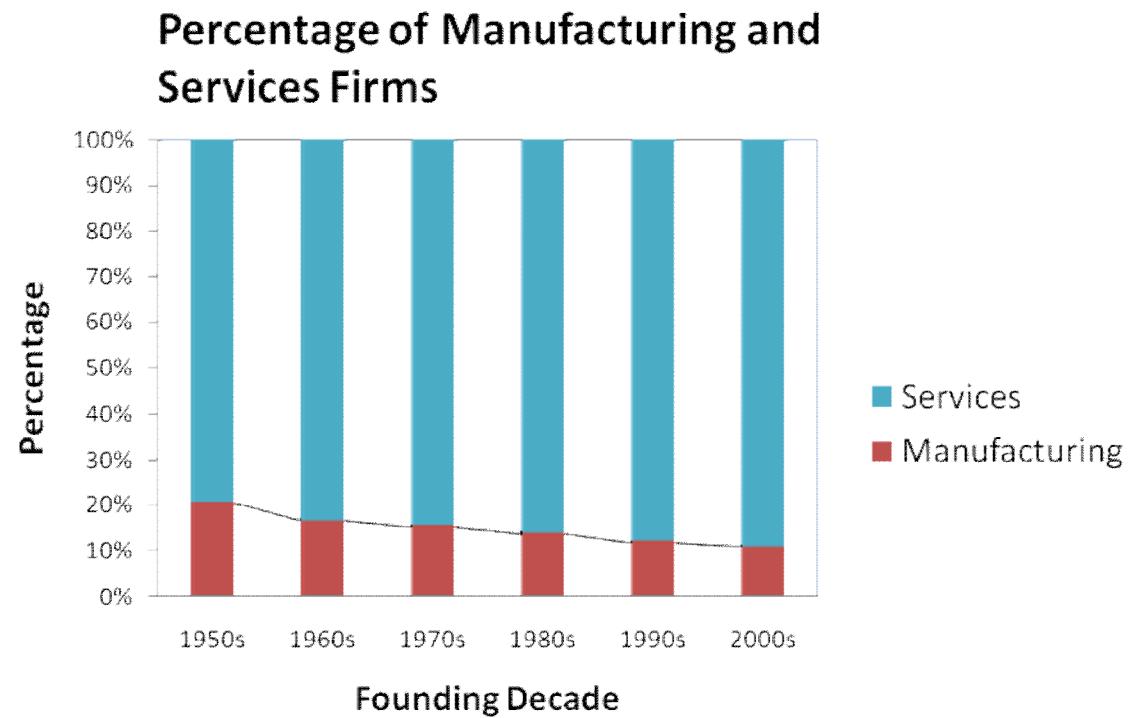
Sales of MIT Alumni Companies Out-of-State and Exported Abroad

Proportion of Revenue not from Founding State



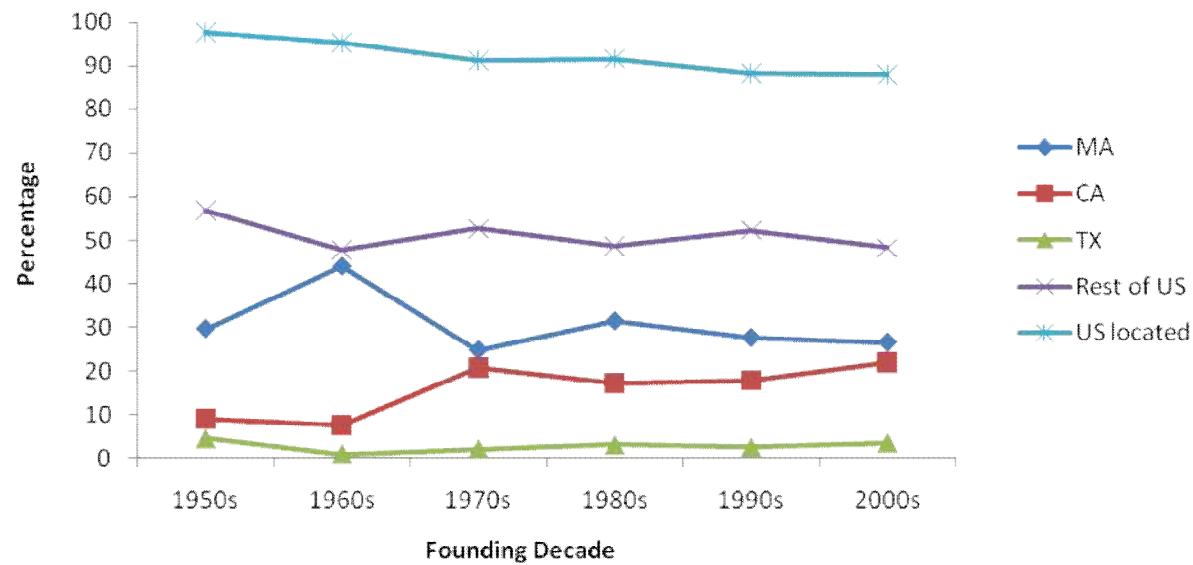
54% of domestic sales to out-of-state, 13% exported

Steady Decline in Manufacturing vs. Services Startups (percent)



But 30% of alumni-created jobs are still in manufacturing.

Geographic Location of U.S. MIT Alumni Firms



MIT Entrepreneurial Ecosystem has grown in its components and impact over the years

Underlying culture, history, role models, and policies

Alumni initiatives: MIT Enterprise Forum

Re-oriented Technology Licensing Office

MIT Entrepreneurship Center:

Classes: 0 to 30 in 15 years

Clubs, including MIT \$100K Business Plan Competition

Conferences, and many forms of internal and external networking

Recent MIT institutional broadening and growth

Venture Mentoring Service

MIT Deshpande Center

Entrepreneurship & Innovation MBA Track

Table 10. Examples of Important MIT-Alumni Founded Companies (ordered by \$ sales) *

| Company | Location | Employment (Thousands) | Sales* (\$Millions) | MIT Founder | MIT Class | Founded |
|--|-----------------------|---------------------------|---------------------|---|----------------------|----------------------|
| Koch Industries | Wichita, Kan. | 80 | 110,000 | Charles Koch David Koch | 1957 1962 | 1967 (consolidation) |
| Intel Corporation | Santa Clara, Calif. | 86 | 38,300 | Robert Noyce | 1954 | 1968 |
| Hewlett-Packard | Palo Alto, Calif. | 156 | 22,600 | William Hewlett | 1936 | 1939 |
| Raytheon Corporation | Lexington, Mass. | 72 | 21,300 | Vannevar Bush | 1916 | 1922 |
| McDonnell Douglas | St. Louis, Mo. | 70 | 14,470 | James McDonnell, Jr. | 1925 | 1939 |
| Texas Instruments | Dallas, Tex. | 30 | 13,830 | Cecil Green | 1923 | 1930 |
| Digital Equipment Corp. (DEC) (acquired by Compaq/HP) | Maynard, Mass. | 140 | 13,000 (in 1997) | Kenneth Olsen Harlan Anderson | 1950 1953 | 1957 |
| Genentech | San Francisco, Calif. | 12 | 11,724 | Robert Swanson | 1970 | 1976 |
| Qualcomm Inc. | San Diego, Calif. | 13 | 9,800 | Irwin Jacobs | 1959 | 1985 |
| ThermoElectron | Waltham, Mass. | 30 | 9,000 | George Hatsopoulos | 1949 | 1956 |
| America Online | Dulles, Va. | 15 | 6,110 | Marc Seriff | 1973 | 2001 |
| Symantec Corp. | Cupertino, Calif. | 16 | 4,143 | Denis Coleman | 1968 | 1982 |
| Analog Devices | Norwood, Mass. | 8.8 | 2,570 | Ray Stata, Matthew Lorber | 1957 | 1965 |
| Gillette | Boston, Mass. | 29 | 2,250 (in 2003) | William Emery Nickerson | 1876 | 1901 |
| Bose Corporation | Framingham, Mass. | 10 | 2,000 | Amar Bose | 1956 | 1964 |
| Teradyne | Boston, Mass. | 4 | 1,600 | Alex d'Arbeloff, Nick DeWolf | 1949 | 1960 |
| International Data Group (IDG) | Boston, Mass. | 13 | 1,520 | Patrick McGovern | 1959 | 1964 |
| E*Trade Group | New York, N.Y. | 4 | 1,400 | William Porter | 1967 | 1991 |
| 3Com Corporation | Marlborough, Mass. | 6 | 1,300 | Robert Metcalfe | 1969 | 1979 |
| Sepracor | Marlborough, Mass. | 2 | 1.225 | Robert Bratzler | 1975 | 1984 |
| Avid Technology | Tewksbury, Mass. | 1 | 930 | Bill Warner | 1980 | 1987 |
| Millennium Pharmaceuticals | Cambridge, Mass. | 1 | 527 | Eric Lander | 1986 | 1993 |
| Medical Information Technology | Westwood, Mass. | 3 | 400 | Neil Pappalardo, Edward Roberts Curtis Marble | 1961 1957 1961 | 1969 |
| The Math Works | Natick, Mass. | 2 | 230 | Jerome Grossman Jack Little | 1962 1978 | 1984 |

*All sales and employment data used in this table are from 2006 where available and otherwise from the most recent year available, and are rounded off to the nearest whole number.

Table 16. Primary Universities Doing Startup Licensing, 2006*

| University | Startups Licensed |
|----------------------|-------------------|
| U. California system | 39 |
| MIT | 23 |
| U. Utah | 17 |
| Purdue | 14 |
| SUNY | 12 |
| U. Colorado | 10 |
| U. Florida | 10 |
| U. Washington | 10 |

* Compiled by the authors from AUTM data

Number of Startups Licensed by MIT Technology Licensing Office, 1998-2007

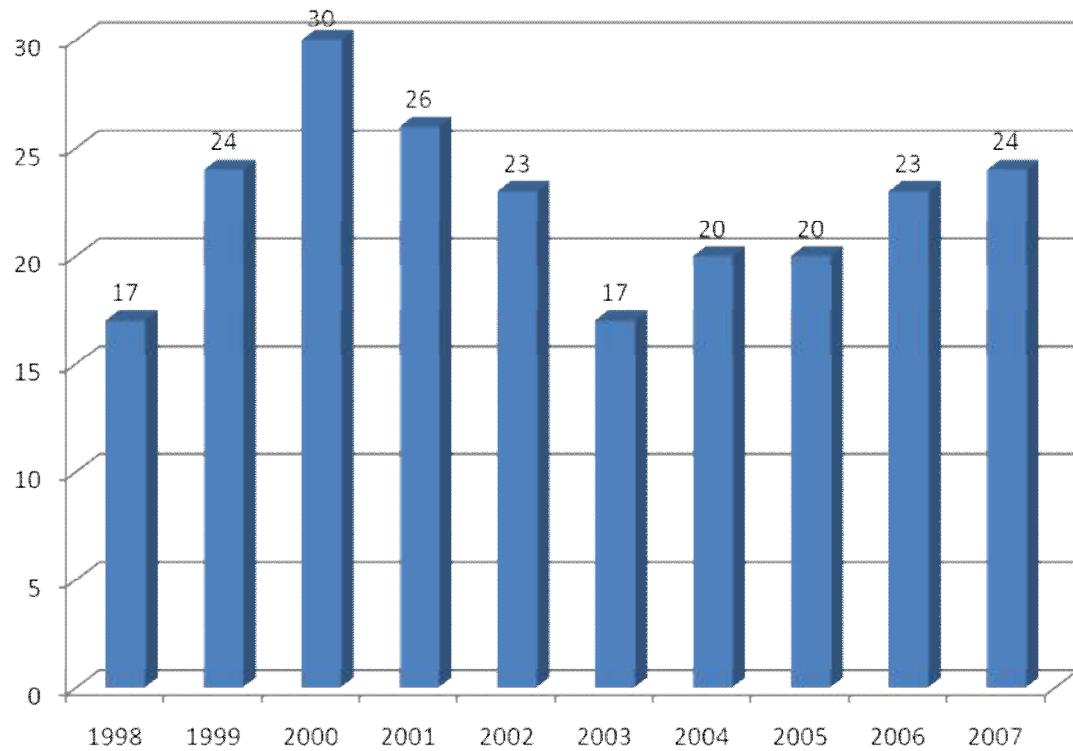


Table 14. Entrepreneurship Center Factors Important to Venture Founding (from limited sample only)

| | | Proportion Rating University Factors as Important in Venture Founding* (%) | | | | |
|-------------------------------|--|--|------------------|------------------|------------------|------------------|
| | | 1950s (N=73) | 1960s (N=111) | 1970s (N=147) | 1980s (N=144) | 1990s (N=145) |
| Graduation Decade | | | | | | |
| MIT Business Plan Competition | | 0 | 1 | 0 | 3 | 30 |
| MIT Entrepreneurship Center | | 3 | 1 | 2 | 1 | 12 |
| MIT's Entrepreneurial Network | | 26 | 25 | 32 | 40 | 50 |

*Respondents could check all relevant categories.

Table 18. Some Venturing Mentoring Service Data (mid-2007 report)

| | |
|---|------------------------|
| Ventures served since 2000 | 469 |
| Entrepreneurs served | 932 |
| Companies formed | 88 |
| Funding raised by companies | \$350M + |
| Current mentor pool | 121 |
| Mentoring hours (just in the past 12 months) | More than 9,000 |

**Table 8. Role of MIT's Positive Feedback Loop
in Venture Founding (from limited sample only)**

| Proportion of Founders Choosing MIT for the Entrepreneurial Environment (%) | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Graduation Decade | 1950s (N=207) | 1960s (N=313) | 1970s (N=373) | 1980s (N=315) | 1990s (N=214) |
| Chose MIT for its Entrepreneurial Reputation | 17 | 12 | 19 | 26 | 42 |

Enhancing the Role of Research/Technology Universities in an Entrepreneurial Economy: Recommendations

Institutional leadership critical, with senior role models if possible

Remove barriers to entrepreneurship from rules and regulations; perhaps provide incentives

If neighboring support infrastructure is weak, university may need to provide supplemental “incubation”, and even investment, resources

Engage alumni in university ties with labs, faculty and students

Build internal entrepreneurship education programs, with integrated academic and practitioner participants

Create student business plan competitions

Orient university licensing office toward encouragement of new enterprises

Adapt to your own settings models comparable to MIT Venture Mentoring Center, Deshpande Center, and Entrepreneurship & Innovation MBA track.