I Introduction

Why This Volume?

Over the past two decades the venture capital industry in the United States has experienced dramatic growth. Annual inflows into venture funds have expanded from virtually zero in the mid-1970s to a high of \$105 billion in 2000. Disbursements by these funds into portfolio companies have displayed almost as great a growth. Many of the most visible new firms over the past decades—including Apple Computer, Genentech, Intel, Lotus, and Microsoft—have been backed by venture capital funds. This growth has led to increasing attention to the venture capital industry from the popular press, executives of major corporations, and policy-makers worldwide.

Yet despite this recent attention, misconceptions persist about the nature and role of venture capitalists. One claim, frequently encountered in guides for entrepreneurs, is that venture capitalists are purely passive financiers of entrepreneurial firms who are unlikely to add much value. An extreme, though not unrepresentative, example is Manweller's (1997) *Funding High-Tech Ventures*. In a chapter entitled "Venture Capitalists: The Companynappers," the author observes:

The term Venture Capitalists (V/C) is an oxymoron. It should be U/Bs (Unadventurous Brokers), especially in hard times. V/Cs today prefer to invest in products which are being developed by sedate, well entrenched companies. If that's your company, V/Cs are a good source to approach for additional equity funding.... [The V/Cs] have developed personality traits more akin to professional wrestlers than professional investors. If you've got the time, try it. You'll get a real education in how to string along future vendors.

Another common misperception relates to how venture capitalists unwind their holdings in young firms. As discussed later in the volume, the exiting of venture capital investments is a controversial area, and venture

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funds have been known to behave in opportunistic ways. But the discussion of this process is often extremely one-sided and not representative of the broader historical record, as this discussion from the Washington Post (Sloan 1997) shows:

Venture capitalists ... take a company public while the ink is still drying on its incorporation papers. Venture capitalists would rather have you risk your money than risk their own. Besides, going public lets them profit now, rather than waiting.

Distorted perceptions about the venture capital industry are commonplace among policy-makers. One of many examples is Dr. Mary Good, Undersecretary of Commerce for Technology, commenting before the U.S. Senate Governmental Affairs Committee (1997):

As the competitive pressures of the global marketplace have forced American firms to move more of their R&D into shorter term product and process improvements, an "innovation gap" has developed.... Sit down with a group of venture capitalists. The funding for higher-risk ventures ... is extraordinarily difficult to come by.

(Similarly extreme and misleading claims, sad to say, have appeared even in the *Harvard Business Review*; Zider 1998.)

More disturbing than these accounts, however, have been the actions taken by entrepreneurs, corporations, and academic institutions based on misconceptions about the venture capital industry. Particularly misguided is the belief that venture capitalists can add little value to young firms aside from money or can be easily duplicated by an institution whose core strengths are very different. These misconceptions have often led to a failure to capitalize on attractive opportunities and to the substantial destruction of value.

One example that illustrates this point is an instance where a university sought to duplicate the role of venture capitalists, with few of the venture funds' checks and balances and little understanding of the potential pitfalls. In 1987, Boston University invested in a privately held biotechnology company founded in 1979 by a number of scientists affiliated with the institution. As part of its initial investment, the school bought out the stakes of a number of independent venture capital investors, who had apparently concluded after a number of financing rounds that the firm's prospects were unattractive. Between 1987 and 1992, the school, investing alongside university officials and trustees, provided at least \$90 million to the private firm. (By way of comparison, the school's entire endowment in the fiscal year in which it initiated this investment was \$142 million.) Although the company succeeded in completing an initial public offering, it encountered a series of disappointments with its products. At the end of 1997, the university's equity stake was worth only \$4 million.¹

These misconceptions have motivated us to undertake this volume, which draws together our recent research into the form and function of venture capital funds.² We have two goals. First, we seek to gather our research efforts into a more accessible volume than the various finance and economics journals in which they originally appeared. Second, we want to draw out some of the common themes in these studies with a series of interpretative essays about venture capital fund-raising, investing, and exiting.

Three key themes run throughout this volume. The first is the tremendous incentive and information problems that venture capitalists must overcome. Venture investors typically concentrate in industries with a great deal of uncertainty, where the information gaps among entrepreneurs and investors are commonplace. These firms typically have substantial intangible assets that are difficult to value and may be impossible to resell if the firm fails. Similarly market conditions in many of these industries are highly variable. The nature and magnitude of the information gaps and uncertainty at each stage of the cycle leave many opportunities for self-interested behavior by the various parties. At each stage of the cycle, the venture capital industry has developed novel checks and balances, ensuring that incentives are properly aligned and increasing the probability of success.

The second theme is the interrelatedness of each aspect of the venture capital process. Venture capital can be viewed as a cycle that starts with the raising of a venture fund; proceeds through the investing in, monitoring of, and adding value to firms; continues as the venture capitalist exits successful deals and returns capital to their investors; and renews itself with the venture capitalist raising additional funds. To understand the venture capital industry, one must understand the whole "venture cycle." The organization

^{1.} This account is based on Seragen's filings with the U.S. Securities and Exchange Commission. In a 1992 agreement with the State of Massachusetts' Attorney General's Office, the university agreed not to make any further equity investments. The school, however, made a \$12 million loan guarantee in 1995 (subsequently converted into equity) and a \$5 million payment as part of an asset purchase in 1997. The firm was merged in 1998 into a subsidiary of another biotechnology company. Even if all the contingent payments associated with the transaction are made, the university will have received far less than the amount it invested.

^{2.} The distinction between venture capital and private equity funds is not precise. Private equity funds include funds devoted to venture capital, leveraged buyouts, consolidations, mezzanine and distressed debt investments, and a variety of hybrids such as venture leasing and venture factoring. Venture capital funds are those primarily devoted to equity or equity-linked investments in young growth-oriented firms. Many venture capital funds, however, occasionally make other types of private equity investments.

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of this volume mirrors this cycle. Each part will highlight the interrelated nature of the various aspects of the cycle.

A final theme is how slowly the venture capital industry adjusts to shifts in the supply of capital or the demand for financing. Academics are used to thinking that financial markets instantaneously adjust to the arrival of new information. This does not appear to be true in the venture capital market, where regulatory and policy shifts generate disruptions that take years to resolve. Put another way, long-run adjustments in supply and demand curves can be very slow to respond to short-run shocks.

The nature of venture-backed companies contributes to this slow adjustment. Because venture funds must make long-run illiquid investments in firms, they need to secure funds from their investors for periods of a decade or more. The supply of venture capital consequently can not adjust quickly to changes in investment opportunities, as is the case in mutual or hedge funds. More generally, even identifying which sectors or groups are likely to be receiving too much or too little investment is often difficult. The supply of venture capitalists is also difficult to adjust in the short run. Not only is it difficult to raise a new venture capital fund without a track record, but the skills needed for successful venture capital investing are difficult and time-consuming to acquire.³ During periods when the supply of venture capitalists and venture capital organizations appear to take place very slowly.

Why a New Edition?

A natural second question is why we have chosen to produce a second edition of *The Venture Capital Cycle*. The answer is twofold.

First, our own scholarship has progressed. This volume contains six new chapters that reflect the research that we have completed over the past five years. These projects explore issues that in the previous volume we indicated as important but did not explore in depth there. These new chapters enhance our understanding of each aspect of the venture capital cycle, from the determinants of the volume of fund-raising by venture funds to the way in which lockup requirements affect the way that venture capitalists liqui-

^{3.} Practitioner accounts emphasize that venture capitalists have highly specialized skills, which are difficult to develop or even identify. For instance, Robert Kunze (1990, p. 49) of Hambrecht and Quist notes: "The life of the associate [in a venture capital organization] is akin to playing house. Since associates never make the actual investment decision ... it's impossible to tell whether or not they'll be successful venture capitalists if and when they get the chance."

date their holdings in recently public companies. Other new chapters illustrate the consequences of venture capital, such as the impact that these investments have on the pace of innovation in the United States. We have also updated the discussions throughout the volume, for instance, adding discussions of recent academic works by others in the overview chapters that begin each section of the volume.

Second, the venture capital industry has changed dramatically in the past five years. While cycles have always been part of venture capital, the magnitude of the boom of the late 1990s and the bust of the early 2000s is far greater than any earlier events. Reflecting these dramatic shifts, many of the chapters seek to understand the origins and consequences of the cyclicality in the venture business.

This second point can be illustrated by considering the new chapters we have added to the volume in a little detail. Chapter 3 is devoted to what is arguably the most essential question of the industry: What is behind the kind of ebbs and flows we have seen in the venture capital cycle. In this chapter we look systematically at the determinants of the level of fund-raising in the industry, and highlight the importance of tax policy as driver of venture capital fund-raising. We suggest that capital gains taxes do not affect directly the level of venture capital fund-raising, as most investors are tax exempt, but rather indirectly. This is because more individuals decide to become entrepreneurs, and thus the demand for venture capital increases.

One of the big questions suggested by the "bubble years" of 1999 to 2000 is what kind of distortions are introduced when the venture capital market grows dramatically. In chapter 9 we seek to understand one type of distortion: whether the amount paid by venture capitalists for new investments increases noticeably. We relate the level of fund-raising to the amount paid by venture capitalists, and find that money does appear to chase deals. Even after controlling for the changing investment environment, we find that a period of intensive fund-raising was followed by higher valuations paid by venture capitalists.

Venture capital is a modestly sized financial intermediary, far smaller than, for instance, mutual funds. Why, then, should we care especially about venture capitalists and the way they work? The "bottom line" is that we believe that the venture capital process is especially successful at encouraging innovative activities. In chapter 12 we seek to test this claim. We carefully try to sort out causality issues: that is, whether "venture capital causes innovation" or whether "venture capitalists show up where innovation is taking 6

place anyway." We conclude that the answer to the title question is indeed yes.

Numerous governments—in many state and federal agencies in the United States, as well as in Asia, Europe, and Latin America—have launched initiatives to encourage the formation of venture capital pools. Despite the many billions of dollars spent on these programs over the years, there have been few efforts to systematically understand what makes the programs successful. In chapter 13 we examine this issue by looking in depth at a single U.S. program, the SBIR initiative. We conclude that the programs did stimulate new firm growth but only in regions such as Silicon Valley and Massachusetts, where there were already established venture capital communities.

The scandals of the past two years have led us to be especially sensitive to the distortions that conflicts of interests can introduce to the financing process. In chapter 17 we seek to test whether conflicts of interests led to distortions in one part of the venture capital cycle: when investment banks took public firms that they had invested in through their venture capital subsidiaries. It might be thought that these offerings would be overpriced and subsequently perform poorly in the market. Surprisingly, we find little evidence that any such problems occurred.

Finally, one of the ways in which investment banks seek to limit conflicts is by "locking up" investors such as venture capitalists. Essentially, the investors are prohibited from selling their shares for a number of months after the firm goes public. In chapter 18 we look at how lockups are used, and how the behavior of venture capitalists and other investors changes as the lockups expire and they are free to sell or transfer their shares.

Thus we see this new edition as an opportunity both to incorporate the research that we have completed in the past half-decade and to highlight work that addresses some of the most contentious and challenging issues facing the venture capital industry today.

The Nature and History of Venture Capital

Before turning to a discussion of venture capital fund-raising, it is helpful to review the nature and history of the venture capital industry. The venture capitalists' role is an old one. Entrepreneurs have long had ideas that require substantial capital to implement but lacked the funds to finance these projects themselves. While many entrepreneurs have used bank loans or other sources of debt financing, start-up companies that lacked substantial tangible assets, expected several years of negative earnings, and had uncertain prospects have often been forced to struggle to find alternatives. Solutions to this problem date back at least as far as Babylonian partnerships at the time of Hammurabi (Lutz 1932). Venture capitalists represent one solution to financing these high-risk, potentially high-reward projects.

The venture capital industry today is a well established, if modestly sized, industry. The industry consists of several thousand professionals, working at about 500 funds concentrated in California, Massachusetts, and a handful of other states. These individuals undertake a variety of roles. The first is maintaining relationships with investors—primarily institutions such as pension funds and university endowments, but also wealthy individuals—who provide them with capital. Venture capitalists typically raise their capital not on a continual basis, but rather through periodic funds. These funds, which are often in the form of limited partnerships, typically have a ten-year life, though extensions of several years are often possible. Eventually, however, the funds must be returned to the investors, and a new fund raised. A venture organization usually will raise a fund every two to five years. Taken collectively, the venture industry today is managing funds with a total capital, including capital that the investors have promised to provide, even if it is not all drawn down, of about \$150 billion.

Venture capitalists play a second role in the review of proposed investments, and the oversight of those that are selected for investment. The typical venture organization receives many dozens of business plans for each one it funds. Although most proposals are swiftly discarded, serious candidates are extensively scrutinized through both formal studies of the technology and market strategy and informal assessment of the management team. (It is not unusual for a venture team to complete 100 or more reference checks before deciding to invest in a firm.) The decision to invest is frequently made conditional on the identification of a syndication partner who agrees that this is an attractive investment.

Once the decision to invest is made, venture capitalists frequently disburse funds in stages. Managers of these venture-backed firms are forced to return repeatedly to their financiers for additional capital to ensure that the money is not squandered on unprofitable projects. In addition venture capitalists intensively monitor managers. These investors demand preferred stock with numerous restrictive covenants and representation on the board of directors.

The final role of venture investors is managing the exiting of these investments. Typically venture capitalists seek to take public the most successful firms in their portfolios. While a relatively modest fraction—historically between 20 and 35 percent—of portfolio firms are taken public,

they account for the bulk of the venture returns. Even among these offerings, often a small number of firms account for the bulk of the returns; the distribution is highly skewed. Other, less successful firms are liquidated, sold to corporate acquirers, or else remain operational at a modest level of activity.

Given the intensity of interest in replicating the U.S. venture model, it is easy to forget how young the formal venture industry is in this country. The first modern venture capital firm, American Research and Development (ARD), did not appear until after World War II. It was formed in 1946 by MIT President Karl Compton, Harvard Business School Professor Georges F. Doriot, and local business leaders who sought to commercialize the technologies developed for World War II, particularly innovations undertaken at MIT. The success of the investments ranged widely. Almost half of ARD's profits during its twenty-six years as an independent entity came from its \$70,000 investment in Digital Equipment Company in 1957, which grew in value to \$355 million. Because institutional investors were reluctant to invest, ARD was structured as a publicly traded closed-end fund and marketed mostly to individuals (Liles 1977).

A handful of other venture funds were established in the decade after ARD's formation. Most, like ARD, were structured as publicly traded closed-end funds (mutual funds whose shares must be sold to other investors, rather than redeemed from the issuing firm). The first venture capital limited partnership, Draper, Gaither, and Anderson, was formed in 1958. Imitators soon followed, but limited partnerships accounted for a minority of the venture pool during the 1960s and 1970s. The remainder of venture capital industry was either closed-end funds or small business investment companies (SBICs), federally guaranteed risk-capital pools that proliferated during the 1960s. The annual flow of money into new venture funds during these years never exceeded a few hundred million dollars and usually was much less.

As figure 1.1 shows, funds flowing into the venture capital industry increased dramatically during the late 1970s and early 1980s. The increase in new capital contributions outpaced growth in the number of active organizations, due to the rigidities that limit adjustments in the short-run supply of venture organizations and venture capitalists discussed above.

An important contributing factor to the increase in money flowing into the venture capital sector was the 1979 amendment to the "prudent man" rule governing pension fund investments. Prior to that date the Employee Retirement Income Security Act (ERISA) prohibited pension funds from investing substantial amounts of money in venture capital or other high-risk

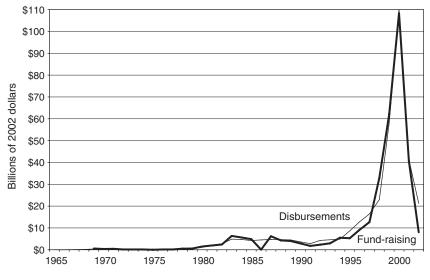


Figure 1.1

Dollar volume of venture capital disbursements and fund-raising, based on tabulations of unpublished Venture Economics databases. (Data on venture capital fund-raising not available before 1969.)

asset classes. The Department of Labor's clarification of the rule explicitly allowed pension managers to invest in high-risk assets, including venture capital. This rule change opened the door to pension funds' tremendous capital resources. Table 1.1 shows that in 1978, when \$481 million was invested in new venture capital funds,⁴ individuals accounted for the largest share (32 percent). Pension funds supplied just 15 percent. Eight years later, when more than \$4.8 billion was invested, pension funds accounted for more than half of all contributions.

An associated change during the 1980s was the increasing role of investment advisors. During the late 1970s and early 1980s, almost all pension funds invested directly in venture funds. Because venture capital was a small portion of their portfolios, few resources were devoted to monitoring and evaluating these investments. During the mid-1980s, investment advisors (often referred to as "gatekeepers") entered the market to advise institutional investors about venture investments. The gatekeepers pooled resources from their clients, monitored the progress of existing investments,

^{4.} The annual commitments represent pledges of capital to venture funds raised in a given year. This money is typically invested over three to five years starting in the year the fund is formed.

Table 1.1

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
First closing of funds											
Number of funds	23	27	57	81	98	147	150	99	86	112	78
Size (2002\$ mil)	495	560	1,444	1,984	2,420	6,319	5,608	4,856	51	6,232	4,309
Sources of funds											
Private pension funds	15%	31%	30%	23%	33%	26%	25%	23%	39%	27%	27%
Public pension funds	а	а	а	а	а	5%	9%	10%	12%	12%	20%
Corporations	10%	17%	19%	17%	12%	12%	14%	12%	11%	10%	12%
Individuals	32%	23%	16%	23%	21%	21%	15%	13%	12%	12%	8%
Endowments	9%	10%	14%	12%	7%	8%	6%	8%	6%	10%	11%
Insurance companies and banks	16%	4%	13%	15%	14%	12%	13%	11%	10%	15%	9%
Foreign investors and other	18%	15%	8%	10%	13%	16%	18%	23%	11%	14%	13%
Independent venture partnerships as a share of the total venture pool ^b			40%	44%	58%	68%	72%	73%	75%	78%	80%

Summary statistics for venture capital fund-raising by independent venture partnerships

Source: Compiled from the unpublished Venture Economics funds database and various issues of the *Venture Capital Journal*, except where noted.

a. Public pension funds are included with private pension funds in these years.

b. To calculate the value of independent venture partnerships, we utilize the *Venture Capital Journal* from 1978 to 1994, the *National Venture Capital Association Yearbook* from 1995 to 2001, and Thomson VentureXpert for 2002. This series is defined differently in different years. In some years, the *Venture Capital Journal* states that nonbank SBICs and publicly traded venture funds are included with independent venture partnerships. In other years, these funds are counted in other categories.

c. Foreign investors are not compiled separately in these years.

and evaluated potential new venture funds. By the 1990s, one-third of all pension fund commitments was made through an investment advisor, and one-fifth of all money raised by new funds came through an investment advisor.

A final change in the venture capital industry during this period was the rise of the limited partnership as the dominant organizational form, depicted schematically in figure 1.2. In a venture capital limited partnership, the venture capitalists are general partners and control the fund's activities. The investors serve as limited partners. Investors monitor the fund's progress and attend annual meetings, but they cannot become involved in the fund's day-to-day management if they are to retain limited liability. Venture partnerships have predetermined, finite life spans. The limited partnership agreement explicitly specifies the terms that govern the venture capitalists'

1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
88	50	34	31	54	105	72	97	136	281	421	614	299	125
4,007	2,905	1,771	2,331	2,949	5,524	5,283	9,185	12,676	32,904	62,053	108,382	40,648	8,005
22%	31%	25%	22%	59%	47%	38%	43%	40%	60%	43%	40%	42%	32%
14%	22%	17%	20%	а	а	а	а	а	а	а	a	а	13%
20%	7%	4%	3%	8%	9%	2%	13%	30%	12%	14%	4%	3%	10%
6%	11%	12%	11%	7%	12%	17%	9%	13%	11%	10%	12%	9%	12%
12%	13%	24%	18%	11%	21%	22%	21%	9%	6%	17%	21%	22%	11%
13%	9%	6%	14%	11%	9%	18%	5%	1%	10%	16%	23%	25%	16%
13%	7%	12%	11%	4%	2%	3%	8%	7%	с	с	с	с	6%
79%	80%	80%	81%	78%	78%	84%	84%	82%	79%	80%	82%	73%	82%

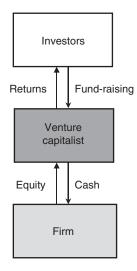


Figure 1.2 Overview of the venture capital process.

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	J.S. manufacturing industries, by industry and five-year period
l able 1.2	Number and dollar amount of venture capital disbursements for U

Industry	1965-69	1970-74	1975-79	1980-84	1985-89	1990–94	1995–99	2000-02
Panel A: Venture capital investments								
Food and kindred	1	6	6	23	80	65	136	57
Textile and apparel	4	12	6	19	27	47	106	44
Lumber and furniture	2	8	ó	24	62	40	77	41
Paper	7	2	2	2	12	14	32	21
Industrial chemicals	1	1	1	6	18	18	37	13
Drugs	1	12	34	245	554	370	551	469
Other chemicals	1	7	8	10	52	31	58	25
Petroleum refining and extraction	3	3	26	92	27	20	45	31
Rubber products	1	5	6	19	11	12	23	8
Stone, clay, and glass products	0	1	3	14	48	18	21	12
Primary metals	0	3	5	20	44	33	46	81
Fabricated metal products	0	0	0	2	1	С	8	2
Office and computing machines	39	84	108	744	641	224	393	271
Other nonelectrical machinery	12	12	32	254	280	131	213	143
Communication and electronic	23	65	60	497	736	331	968	1,027
Other electrical equipment	0	6	16	36	52	25	63	44
Transportation equipment	1	4	5	6	24	18	58	29
Aircraft and missiles	0	0	0	12	20	6	14	4
Professional and scientific instruments	13	37	70	383	549	237	433	299
Other machinery	~	14	16	62	89	83	140	67
Total	111	288	413	2,470	3,327	1,729	3,422	2,688

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Panel B: Venture capital disbursements (2002\$ mil)	\$ mil)							
Food and kindred	ß	24	6	30	261	489	1,806	507
Textile and apparel	8	18	17	34	55	377	629	228
Lumber and furniture	5	21	11	33	246	322	850	464
Paper	1	10	3	С	27	96	661	156
Industrial chemicals	0	1	1	51	42	107	431	167
Drugs	0	18	167	766	2,298	3,304	6,764	7,882
Other chemicals	1	49	5	11	191	171	363	289
Petroleum refining and extraction	15	8	113	441	135	97	166	529
Rubber products	1	3	18	35	10	26	86	61
Stone, clay and glass products	0	1	7	42	121	57	105	130
Primary metals	0	10	13	30	82	197	662	2,608
Fabricated metal products	0	0	0	1	0	10	60	4
Office and computing machines	82	496	354	3,999	3,063	1,412	4,746	4,645
Other nonelectrical machinery	79	21	46	832	822	445	1,383	1,998
Communication and electronic	54	232	101	2,146	3,253	2,407	18,823	26,670
Other electrical equipment	0	10	65	96	131	100	330	443
Transportation equipment	0	12	5	11	57	375	520	387
Aircraft and missiles	0	0	0	24	24	26	88	42
Professional and scientific instruments	16	106	140	266	1,781	1,441	4,339	4,837
Other machinery	6	35	27	139	217	865	1,463	552
Total	\$277	\$1,074	\$1,102	\$9,721	\$12,817	\$12,325	\$45,101	\$52,601
Source: Based on tabulations of unpublished Venture Economics databases. Note: The count of venture capital investments in each specified period is the sum of the number of unique firms receiving investments in that time period.	ied Venture l ments in eacl	Economics data h specified per	abases. iod is the sum	of the number	of unique firms	receiving inves	tments in that ti	me period.

compensation over the entire ten- to thirteen-year life of the fund. It is extremely rare that these terms are renegotiated. The specified compensation has a simple form. The venture capitalist typically receives an annual fixed fee, plus variable compensation that is a specified fraction of the fund's profits. The fixed portion of the specified compensation is usually between 1.5 and 3 percent of the committed capital or net asset value, and the variable portion is usually about 20 percent of fund profits. Table 1.1 shows that partnerships have grown from 40 percent of the venture pool in 1980 to 81 percent in 1992.

As a result of this growth, venture capitalists have increased their rate of investment, as figure 1.1 demonstrates. As the rate of investment has increased, venture capitalists continued to focus their investments on information technology and health care, as well as on California and Massachusetts firms. Table 1.2 presents an aggregated summary of investments by industry (in manufacturing firms only) over the past three decades, and table 1.3 provides a summary of investments in the ten states with the most venture capital activity over the past three decades. The result of this growth was intense competition for transactions among venture groups.

The steady growth of commitments to the venture capital industry was reversed in the late 1980s. Returns on venture capital funds declined because of overinvestment in various industries and the entry of inexperienced venture capitalists. As investors became disappointed with returns, they committed less capital to the industry.

The departure of many inexperienced venture capitalists from the industry—along with the robust market for initial public offerings (IPOs)—led to an increase in returns in the 1990s. (Table 1.4 summarizes the exiting of venture capital investments through IPOs as well as comparable data on nonventure capital offerings.) New capital commitments rose accordingly. The surge in fund-raising put upward pressure on prices and led to massive increases in stock distributions to venture capital investors. Additionally venture capitalists responded to greater capital in a variety of ways. First, the amount of money invested in the typical venture-backed company increased. Venture capitalists also increased their compensation and reduced the restrictiveness of the limited partnership agreements that govern their investment behavior.

Once the valuations of small-capitalization stocks began dramatically declining in 2000, these dynamics changed sharply once again. The IPO market shut down, and venture capitalists were left with extensive holdings of unprofitable companies, many of which were built on shaky foundations. These groups dramatically scaled back the pace of new investment and

Table 1.3

Number and dollar amount of venture capital disbursements for all industries in ten states with the most venture capital activity by five-year period

State	1965 69	1970 74	1975 -79	1980 84	1985 89	1990 94	1995 99	2000 02
Panel A: Venture	capital inv	estments						
California	65	179	310	1,863	2,645	1,138	3,192	3,209
Massachusetts	45	93	155	708	1,014	352	894	908
Texas	18	71	84	373	584	215	525	575
New York	28	90	73	311	324	108	531	658
New Jersey	15	35	47	171	291	102	257	261
Colorado	5	22	31	194	258	112	269	245
Pennsylvania	8	21	32	120	290	125	343	298
Illinois	16	29	31	133	214	99	242	244
Minnesota	12	34	42	170	186	79	164	159
Connecticut	3	20	37	136	217	74	200	177
Total, all states	302	847	1,253	5,365	8,154	3,376	9,202	9,257
Panel B: Venture d	capital dist	oursements ((2002\$ mil)					
California	268	672	849	8,251	11,889	9,517	54,603	76,169
Massachusetts	75	191	243	2,389	3,478	2,846	13,089	19,252
Texas	46	172	182	1,427	2,669	2,907	7,922	12,223
New York	39	190	199	846	1,726	1,072	8,223	11,294
New Jersey	40	101	94	455	1,493	1,305	3,511	7,444
Colorado	15	62	56	606	989	858	4,567	6,651
Pennsylvania	22	51	143	455	1,881	1,215	4,078	4,991
Illinois	73	165	144	353	1,485	917	3,463	4,429
Minnesota	8	111	54	332	499	379	2,034	2,542
Connecticut	1	39	104	392	1,799	755	2,473	2,976
Total, all states	\$845	\$2,379	\$2,777	\$18,762	\$37,796	\$28,281	\$143,561	\$191,974

Source: Based on tabulations of VentureXpert and unpublished Venture Economics databases.

Note: The count of venture capital investments in each specified period is the sum of the number of unique firms receiving investments in that time period.

Year	Number of venture- backed IPOs	Amount raised in venture- backed IPOs	Total number of IPOs	Total amount raised in all IPOs	Venture-backed IPOs as percent of all IPOs (number)	Venture-backed IPOs as percent of all IPOs (amount)
1978	Q	\$165	50	\$566	12.00%	29.11%
1979	4	\$76	81	\$907	4.94%	8.36%
1980	24	\$823	238	\$2,719	10.08%	30.29%
1981	50	\$962	438	\$5,667	11.42%	16.98%
1982	21	\$907	198	\$2,224	10.61%	40.77%
1983	101	\$4,243	848	\$21,117	11.91%	20.09%
1984	44	\$898	516	\$6,080	8.53%	14.77%
1985	35	\$1,007	507	\$15,664	6.90%	6.43%
1986	29	\$2,463	953	\$25,772	8.29%	9.56%
1987	69	\$1,970	630	\$19,707	10.95%	10.00%
1988	36	\$1,125	223	\$6,216	16.14%	18.09%
1989	39	\$1,365	210	\$7,589	18.57%	17.99%
1990	43	\$1,560	172	\$6,064	25.00%	25.73%
1661	119	\$4,715	365	\$19,961	32.60%	23.62%
1992	157	\$5,308	513	\$27,650	30.60%	19.20%
1993	193	\$6,031	665	\$35,924	29.02%	16.79%
1994	159	\$4,190	567	\$21,904	28.04%	19.13%
1995	205	\$7,685	571	\$33,129	35.90%	23.20%
1996	284	\$13,495	831	\$47,663	34.18%	28.31%
1997	134	\$5,249	603	\$36,849	22.22%	14.25%
1998	77	\$4,063	357	\$37,518	21.57%	10.83%
1999	257	\$20,841	543	\$69,271	47.33%	30.09%
2000	226	\$21,652	449	\$68,700	50.33%	31.52%
2001	37	\$3,118	107	\$39,364	34.58%	7.92%
2002	24	\$2,474	67	\$26,512	24.74%	9.33%

fund-raising as they focused on salvaging their investments. The behaviors associated with the late 1990s, such as the demands for greater compensation, became the focal point for resentment on the part of institutional investors, who believed their interests had been poorly served during this period.

The recent growth and subsequent difficulties of the U.S. venture industry have raised concerns among many venture capitalists and institutional investors about the future prospects of the industry domestically. In response to these changes, investors—and venture capital organizations themselves are increasingly looking abroad for investment opportunities. Table 1.5 provides an international comparison of venture capital activity. In chapter 21 we discuss some of the future developments that we believe are likely in the venture capital industry.

Limitations of This Volume

Before ending this introduction, three limitations of this book should be acknowledged. First, there are many fascinating topics relating to venture capital that are not considered in this volume. These include the relative performance of venture capital and other financial assets, the degree to which public policies affect the formation of venture capital funds, and the extent to which the U.S. model of venture capital investment can be transferred to foreign markets. Throughout this book we will highlight some of these research opportunities.

Second, we do not attempt to duplicate the guides that explain the intricacies of the venture financing process to practitioners. Numerous excellent volumes exist (especially Bartlett 1995; Halloran et al. 1995; Levin 1995) that document the legal and institutional considerations associated with raising venture financing at much greater depth than could be done in this volume.

Finally, we do not consider many interesting and related forms of financing that also deserve scrutiny. In particular, we define venture capital as independently managed, dedicated pools of capital that focus on equity or equity-linked investments in privately held, high-growth companies. A more ambitious volume might examine the entrepreneurial finance function more generally,⁵ while our focus is exclusively on venture capital. This is

^{5.} Merton (1995) has argued that the actual institution is not the important element of the financial system, it is the function. The same economic function can be performed by different institutions in different markets.

Country	Venture capital invested	Country	Venture capital invested
Australia	1,273	Malaysia	80
Austria	47	Netherlands	208
Belgium	112	New Zealand	46
Canada	3,172	Norway	74
China	1,590	Pakistan	0
Czech Republic	8	Philippines	24
Denmark	172	Poland	28
Finland	159	Portugal	18
France	635	Singapore	1,052
Germany	1,306	Slovakia	3
Greece	36	Spain	125
Hong Kong	1,864	Sri Lanka	0
Hungary	18	Sweden	270
Iceland	7	Switzerland	85
India	1,133	Taiwan	393
Indonesia	9	Thailand	22
Ireland	43	United Kingdom	1,051
Italy	330	United States	41,005
Japan	2,148	Vietnam	3
Korea	1,695		

Table 1.5

Total venture capital invested in 39 nations in 2001

Note: We utilize the Asian Venture Capital Journal's 2003 Guide to Venture Capital in Asia, 14th edition (2003) for statistics on the Asian region, Venture Economics' National Venture Capital Association Yearbook (2002) for U.S. information, and the European Private Equity and Venture Capital Association's Annual Survey of Pan-European Private Equity and Venture Capital Activity (2002) for European data. These figures include first and follow-on investments. European statistics include seed and start-up investments and exclude expansion, replacement capital, and buyout investments. All dollar figures are in millions of 2002 dollars.

partially because of the size of the venture capital market. Although evidence on the financing of these firms is imprecise, Freear and Wetzel's (1990) survey suggests that venture capital accounts for about two-thirds of the external equity financing raised by privately held technology-intensive businesses from private-sector sources.⁶

^{6.} Many more firms receive funding from individual investors than venture capitalists. Freear and Wetzel (1990) report the median financing round raised by private high-technology firms from individual investors to be about \$200,000, with 82 percent of the rounds from individuals being under \$500,000. A more recent study of high-technology initial public offerings by Fenn, Liang, and Prowse (1998) largely corroborates this survey evidence.

More generally, the venture capital market represents a particularly refined, if still evolving, solution to the difficult problems associated with financing young firms. Understanding the approaches developed by these investors—as well as the common problems that the investments face should be more generally applicable, whether to corporations seeking to encourage internal entrepreneurship or to policy-makers seeking to promote greater innovation and economic development through start-up companies.