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Corporations and the Financing of Innovation: The Corporate Venturing Experience

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This paper examines the experience of corporate venturing activity in the United States. We present a history of corporate venture programs and the motivations for such programs. We then explore a detailed history of corporate venture investments over the past twenty years. We find that the majority of corporate venture investments go to investments in related technologies. These investments are made increasingly with experienced, independent venture capital groups. While corporate venture capital investments tend to be later stage investments done at higher valuations and greater capital contributions, the success rates of these investments are surprisingly high. Even after controlling for the later stage of investment, corporate investments have higher success rates than the investments of independent venture capital organizations. The results argue that corporate investments in emerging companies can play an important role in the development of new technologies.

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I. Introduction

Corporate internal investment in innovative activities including research and development have often been maligned for their ineffectiveness [Jensen (1993)]. Over the past forty years, corporations have attempted to capture the value from waves of technology and innovation. During much of this time, corporations saw young nimble startups capitalize on opportunities that the corporations saw first. Why do corporations have difficulty bringing innovations to market? Many of the best ideas languished, unused, whether because of internal resistance (e.g., from managers of operating divisions who didn't want to see a product launched that competed with one of their offerings) or an inability to execute on the initial insight. In other cases, defecting employees started new firms that turned those ideas into blockbuster commercial successes. The achievements of fast-growing technology firms such as Microsoft and Cisco Systems—many of whom relied on acquisitions rather than internal R&D for the bulk of their new ideas—also made conventional approaches to innovation look lackluster by comparison. In response to these factors, many corporations entered the venture capital market in hopes of spurring their own innovative capacity.

Corporations have good reason to explore new ways of stimulating innovation. All too often, their investments in traditional R&D laboratories have generated paltry returns, as researchers have focused on incremental product advances or on academic ideas with little relevance to the corporation. Worse,

even when these corporate laboratories manage to come up with truly innovative ideas, other organizations—especially venture-backed startups—have sometimes seized the opportunity to commercialize them.

But how can companies best stimulate innovation in a corporate setting? The venture capital industry's success may be difficult to replicate. Though total disbursements from the venture industry during 1975-2000 proved considerably less than the R&D spending of either IBM or General Motors alone, venture-backed firms have scored remarkable successes.

This paper explores the history, structure, and performance of corporate venture programs in the United States. We chronicle the cyclical nature of the industry over the past forty years. A time during which corporate venture capital programs were often halted before the full fruits from the investment activity could be realized. We show that the corporate venture capital market in the United States has gone through three waves of activity that track the overall independent venture capital market.

We next explore the experience of corporate venture investment in a detailed micro-level data set. We find that corporate venture investments are increasingly made in related industries, i.e., over time the strategic fit between corporate venture capital investments and the parent corporations business has increased. In addition, unlike previously thought, we find that corporate venture capital investments have, on average, been more successful than independent venture capital investments.

This success is exclusively associated with strategic corporate venture investments, i.e., non-related investments have much lower success rates. We conclude that corporations appear to be learning many of the best practices from the independent venture capital sector. The fit and the success of corporate venture investing has increased over time.

II. Types of Corporate Venturing

Large corporations have long been attracted to venture capital investing. Many of these efforts have been motivated by a desire to gain access to cutting-edge technologies for strategic reasons. Sometimes, these strategic goals far outweighed any consideration of financial return for corporate investors. The strategic goals of most corporate investors, however, often made it possible for financial investors to treat these corporations as later-stage, valuation-insensitive investors, leading many independent venture capitalists to introduce early-stage technology companies to corporate investors only during later rounds of financing when portfolio companies required large amounts of cash raised at extremely high valuations to preserve the venture capitalists percentage ownership. This created situations in which corporations invested in companies that were often significantly overvalued and made it difficult for corporate investors to achieve acceptable financial returns. As a result, many corporate investors reached the

conclusion that it was not possible to achieve both financial and strategic goals in doing early-stage technology investing.

Corporations used several models to achieve their strategic and financial objectives for venture capital investments. Each of these models, however, created problems that ultimately caused corporations to fail to reach their goals.

Internal Corporate Venture Group: Some corporations created internal corporate venture groups to analyze venture capital opportunities and make investments. Problems typically arose with this strategy because it limited deal flow to those companies that wanted to be associated with that particular corporation. Entrepreneurs were limited by this structure because while they could receive excellent depth of assistance in the corporation's area of expertise, they were forced to sacrifice breadth of available resources. In addition, early stage entrepreneurs were often concerned about protecting their intellectual property and wanted to avoid alliances that could threaten their position. For example, a small high technology company in a precarious financial situation might be reluctant to approach IBM or Sony directly for funding. Therefore, the very companies in which these corporations wanted to invest were usually the ones that never made it to their doorsteps.

Dedicated External Fund: Other corporations placed investment capital in a dedicated fund that existed as a separate entity outside the corporation. This structure did not solve many entrepreneurs' concerns because they still needed to

feel comfortable with forming an alliance with the particular corporation sponsoring the fund. Since corporations were only able to use dedicated external funds to attract entrepreneurs that wanted to be aligned with them, they were not able to allocate assets across industry areas besides their own. Diversification through pooled investments may have produced better risk management and probably higher financial returns. In addition, a dedicated external fund often frustrated a corporation's desire to gain strategic leverage with start-up companies. The corporation's relationship was too distant for the corporation's employees to work closely with the entrepreneurs.

Passive Limited Partner in a Venture Fund: Existing venture funds gave corporations the opportunity to become passive limited partners and make diversified investments in entrepreneurial companies. The venture capitalists managing these funds typically had little incentive to involve corporations in early investments. Instead, they would send corporate limited partners deals at later stages for passive investment at fairly high valuations. In addition, this structure did not allow corporations to achieve strategic objectives since the corporations, as passive investors, did not have direct relationships with the entrepreneurs. The "information flow" to corporations depended on the venture capitalists' goodwill.

III. The History of Corporate Venturing Investments[1]

The first corporate venture funds emerged in the mid-1960s—about two decades after the initial institutional venture capital funds formed. Since that time, corporate venturing has undergone three boom and bust cycles that closely track the independent venture capital sector. Corporations have typically entered the corporate venture capital market after the independent sector showed signs of success. All too often, however, the corporation overbuilt capacity without carefully thinking out the implications. This invariably led to retrenchment.

A. The First Wave

As traditional venture capital funds fueled the success of corporations such as Digital Equipment Corporation, Memorex, Raychem, and Scientific Data Systems, large companies took notice. These large corporations saw these successes as new potential opportunities. As such, large companies began establishing divisions that emulated venture capitalists. During the late 1960s and early 1970s, more than 25 percent of the Fortune 500 firms set up such programs.

At one end of the spectrum, large corporations financed new firms that were already receiving venture capital from independent venture capital organizations.

[1] This history of corporate venture capital is based on Norman D. Fast, 1978, The Rise and Fall of Corporate New Venture Divisions, Ann Arbor: UMI Research Press; G. Felda Hardymon, Mark J. DeNino, and Malcolm S. Salter, 1983, "When Corporate Venture Capital Doesn't Work," Harvard Business Review, 61 (May-June), 114-120; Venture Economics, 1986, “Corporate Venture Capital Study,”

Most of these efforts, such as General Electric's Business Development Services, Inc., invested directly in startups. This strategy let managers tailor their firm's portfolio to its particular technological or business needs. In other cases, the corporations simply provided funds to a separate venture capital firm. This separate firm would in turn invest the money in entrepreneurial organizations.

At the other end of the spectrum, projects such as DuPont Corporation's Development Department and Ralston Purina's New Venture Division sought to promote new ventures internally. These programs encouraged the company's own product engineers and scientists to forge ahead with their innovations—and provided financial, legal, and marketing support. In some cases, these units were separate legal entities, which at times also had outside equity investors. More typically, however, the corporate "parent" retained ownership of the program.

In 1973, the market for new public offerings—the primary avenue through which venture capitalists exit successful investments—dried up as small technology stocks experienced very poor returns. Returns of independent venture funds shrank and commitments to the independent venture capital sector fell. Corporations, in light of the declining market, began scaling back their own venturing initiatives. The typical corporate venture program begun in the late 1960s was dissolved after just four years.

Mimeo, Venture Economics; and assorted press accounts. It is largely based on the history of corporate venture capital presented in Gompers and Lerner (1998c).

The Second Wave

The independent venture industry's prospects brightened again in the late 1970s and early 1980s. Two regulatory changes had a dramatic impact on venture capital commitments [Gompers and Lerner (1998d)]. First, the top capital gains tax rate was reduced in 1978. Second, the Department of Labor eased pension investment restrictions in 1979 allowing pension managers to invest substantial amounts into venture capital funds. In addition, several new technological innovations including personal computer hardware and software provided an opportunity for new companies to exploit new markets. The flow of funding into the venture capital industry grew and the number of active venture organizations proliferated.

Corporate venturing increased shortly thereafter. By 1986 corporate funds managed $2 billion, or nearly 12 percent of the total pool of venture capital. Whereas the earlier wave of corporate venturing had taken aim at a broad range of investment opportunities, now high-tech and pharmaceutical companies—such as Control Data, EG&G, Eli Lilly, and Monsanto—led the charge.

The boom of the early 1980s, however, was soon followed by another retrenchment. In 1987, the stock market crashed and the market for new public offerings again deflated. As in the past, returns and fundraising by independent partnerships shrank as well. Figure 1 provides a profile of this relationship. This time, corporations scaled back their commitment to venture investing even more

dramatically. By 1992, the number of corporate venture programs had fallen by one-third, and their capital under management represented only 5 percent of a much smaller venture pool.

The Third Wave

The venture capital industry expanded once again in the late 1990s fueled in large part by the highly visible successes of telecommunications and Internet–related companies. As rates of return on venture capital investments rose, corporations once again became attracted to the opportunity of corporate venturing. Figure 2 graphs the pace of venture capital fundraising through 2001 and median rates of return on venture capital investments through 2000. The graph shows the dramatic expansion in returns along with the unprecedented rise in fundraising. At this time, many corporations had decided to reevaluate the innovation process itself. For much of the century, large corporations had typically relied on central R&D laboratories to crank out new product ideas. Now, these organizations began exploring other ways to access new ideas--including joint ventures, acquisitions, and university-based collaborations. Corporate venture programs gave corporations the opportunity to capitalize on these relationships.

The rapid diffusion of the Internet and its power to enhance *or* cannibalize "bricks-and-mortar" businesses intensified this interest. Corporations everywhere realized that e-commerce presented both an opportunity and a threat. However, many organizations lacked the internal resources to explore these new

opportunities. Corporate venturing provided one solution. For example, the Tribune Company, the Sony Corporation, and United Parcel Service all instituted efforts to invest in on-line businesses.

Finally, numerous venture capital groups, looking for strategic-partnering opportunities, expressed interest in collaborating with corporations. In earlier years, traditional venture investors had approached corporate investors with a mix of caution and skepticism. The waxing and waning of corporate interest—which historically had fluctuated more wildly than cycles in the venture industry had—made many venture capitalists nervous.

But as the venture capital sector grew increasingly crowded in the late 1990s, the venture community adopted a different attitude. Venture capitalists increasingly saw corporate investments as a potential strategic advantage. And a new focus on revolutionary business strategies—such as customer-relationship management—woke venture groups up to their own limitations. A corporate partner, some venture firms surmised, just might provide the knowledge and experience that venture organizations needed to improve their own skills and professionalism. Such groups forged partnerships with corporations, not only accepting money from them as investors but also structuring unique collaborations that sought to draw upon the expertise of the large organization.

IV. Corporate Venture Activity

Corporate venture capital activity is difficult to measure, but Figure 3 provides some measure of the level of activity. Figure 3 graphs the number of corporate venture capital programs announced publicly by Fortune 100 companies. The three historical "waves" show up prominently in the graph. The number of programs established during 1962-1998 totals well above 100. Though not all corporations established venturing programs during these decades, many that did often set up more than one. In addition, a single company might abandon and revive a series of such programs.

Another indicator of the size of the corporate venturing effort can be seen in Table 1. The tables shows the 15 largest corporate venture capital programs in 2000 and their capital under management. The table shows that the types of firms engaged in corporate venturing come from a diverse set of industries. Many are high technology leaders in their fields like Intel and Siemens. Others are relatively low technology or financial companies including Comdisco, Time Warner, and Visa International.

The overall scope corporate venture activity over recent years is shown in Table 2. The table compiles the number and (in latter years) the size of venture investments made directly by corporations. These numbers do not include cases where companies committed capital to independent venture groups, who then invested the funds. Nor do they reflect instances where a financial-services

organization or a subsidiary of an operating corporation (for instance, Goldman Sachs or GE Capital) made an investment. The table demonstrates the tremendous growth of corporate venturing during the third wave. The number of corporate venture investments increased nearly twenty fold over sixteen years and the amount of corporate venture investments that could be tracked amounted to nearly $8 billion in 1999.[2]

V. Empirical Analysis

A. Data Description

We now turn to assessing the experience of corporate venture programs more systematically. Before doing so, however, we discuss the VentureOne database used in this analysis. VentureOne, established in 1987, collects data on firms that have obtained venture capital financing. The database includes firms that have received early-stage equity financing from venture capital organizations, corporate venture capital programs, and other organizations.

The companies are initially identified from a wide variety of sources, including trade publications, company Web pages, and telephone contacts with venture investors. VentureOne then collects information about the businesses through interviews with venture capitalists and entrepreneurs. Among the data

[2] Because many corporations do not report their private investments in entrepreneurial firms, these figures should be regarded as conservative estimates of the level of corporate venture capital activity. The true level would be higher.

collected are the names of the investors, the amount and valuation of the venture financings, and the industry, history, and current status of the firm. Data on the firms are updated and validated through monthly contacts with investors and firms.[3] VentureOne then markets the database to venture funds and corporate business development groups (see Gompers and Lerner [1997] for a detailed discussion of the database).

We supplemented the VentureOne data when necessary. Some firms in the VentureOne sample were missing information, such as an assignment to one of the 103 VentureOne industry classes or information on the firm's start date. We examined a variety of reference sources to determine this information, including Corporate Technology Information Service's *Corporate Technology Directory* [1996], Dun's Marketing Services' *Million Dollar Directory* [1996], Gale Research's *Ward's Business Directory of U.S. Private and Public Companies* [1996], National Register Publishing Company's *Directory of Leading Private Companies* [1996], and a considerable number of state and industry business directories in the collections of Harvard Business School's Baker Library and the Boston Public Library. We also employed several electronic databases: the

[3]Information about the financing of private firms is typically not revealed in public documents and investors and entrepreneurs may consider this to be sensitive information. VentureOne seeks to overcome this reluctance by emphasizing that its database also helps firms obtain financing. In particular, firms can alert investors whether they intend to seek further private financing or intend to go public in upcoming months.

Company Intelligence and Database America compilations available through LEXIS's COMPANY/USPRIV library and the American Business Disk CD-ROM directory.

The investors in the VentureOne database were diverse. They included individuals, institutional investors such as pension funds, traditional independent venture funds (such as Kleiner, Perkins, Caufield & Byers), and funds sponsored by corporations, financial institutions, and government bodies. In order to understand the impact of organizational structure, we concentrate in many of the analyses below on two types of funds: independent venture partnerships and corporate funds. As discussed above, we eliminated other hybrid venture funds, such as those affiliated with commercial and investment banks, because many of these closely resembled traditional venture organizations.

In order to identify independent and corporate venture capital organizations, we used an unpublished database of venture organizations assembled by Venture Economics' Investors Services Group. Venture Economics is a unit of Securities Data Company and tracks the venture capital industry. The organization was known as Capital Publishing when it was established in 1961 to prepare a newsletter on federally chartered Small Business Investment Companies (SBICs). Since 1977, the company has maintained a database on venture partnerships, which includes over two thousand venture capital funds, SBICs, and related organizations. The Investors Services Group database is used in preparation

of directories, such as the Venture Economics annual volume *Venture Capital Performance*. The database is compiled from information provided by venture capitalists and institutional investors. We excluded from either classification a variety of other organizations that make private equity investments, including individual investors, SBICs, funds sponsored by banks and other financial institutions, and funds associated with financial subsidiaries of non-financial corporations (such as General Electric Capital). In order to determine whether a company was a non-financial corporation, we consulted the firm directories noted above to determine the main lines-of-business in the year of the investment. By so doing, we sought to draw as sharp a contrast as possible between corporate and independent funds.

In some cases, it was difficult to ascertain whether an investor was a corporate venture organization. Some U.S. and several European companies invest in companies through traditional venture capital partnerships. For example, Eastman Kodak not only makes direct equity investments but also invests through a partnership called Aperture Partners, in which it is the sole limited partner. While we were able to identify many of these cases, in some cases we may have missed such affiliations. In other cases, independent venture organizations also cater to corporate investors. A prominent example is Advent, a Boston-based organization which organizes co-mingled funds for financial investors and other funds for single corporate limited partners. From the VentureOne, it is usually

difficult to determine whether the private equity group is investing its traditional partnerships or one of its corporate funds.

Finally, for the corporate venture capital investments, we characterized the degree of fit between the corporation and the portfolio firm. To do this, we examined the corporate annual reports for the 1983, 1989, and 1994 fiscal years. We classified investments as to whether there was a direct fit between one of the corporation's lines-of-business during the period and the portfolio firm, whether there was an indirect relationship, or whether there was no apparent relationship at all. In the analyses below, we denoted investments as having a strategic fit only if there was a direct relationship between a line-of-business of the corporate parent and the portfolio firm. The results are robust to expanding the definition to include indirectly related transactions as well: e.g., when a corporate fund invests in a firm that is a potential supplier to or customer of the corporate parent. Not all investments were classified. In some cases, we were not able to determine the relationship. In others, we obtain the proximate annual reports. In particular, it was difficult to obtain the 1983 and 1989 annual reports for many of the foreign firms.

We limited the analysis to investments in privately held firms between 1983 and 1994. While VentureOne has sought to "back-fill" its database with information on earlier venture investments, its coverage of the 1970s and early 1980s is poor. Furthermore, we were concerned that their methodology may have introduced selection biases. While the database does not include all venture investments

between 1983 and 1994, we believe that it provides a reasonable view of the activity in the industry during this period.[4] We did not include investments made after 1994 because we wish to assess the outcomes of the investments: it may take several years until the fate of venture-backed firms is clear. We also eliminated a variety of investments outside the scope of this analysis, such as purchases of shares of publicly traded firms and other financings.

B. Summary Statistics

We now analyze this sample empirically. After presenting an overview of the sample, we undertake analyses of the ultimate success of corporate and other venture investments.

Table 3 provides an overview of the sample by year. After the deletions noted above, the sample consists of 32,364 investments. Investments by independent venture funds represent over one-half of the total transactions in the sample. Corporate venture investments represent a much smaller share, about 6%. Because on average about four investors participate in each financing round,

[4]See Gompers and Lerner [1997] for an analysis of the comprehensiveness of the VentureOne database over time. We address concerns about selection biases by repeating the analyses below only using observations from 1988 to 1994, when VentureOne's coverage of the industry was much more comprehensive. The results are little changed.

the number of rounds, 8506, is significantly smaller. In the analyses below, we will analyze patterns on both the investment- and round-level.[5]

Table 4 provides a comparison of four categories of investments: the total sample, those by corporate and independent venture capital organizations, and corporate investments where there was a strategic fit between the parent and the portfolio firm. In general, the corporate investments closely resemble those of the other funds:

- *Status at time of investment.* Corporate funds tend to invest slightly less frequently in start-up and mature private firms. Instead, they are disproportionately represented among companies in the middle stages, such as "development" or "beta."[6]

- *Location of firm.* The sample disproportionately includes investments in firms based in California. This reflects VentureOne's greater coverage of this region, particularly in the early years [see Gompers and Lerner (1997) for a discussion]. While corporate venture investments as a whole are slightly more common in California than other venture investments, corporate investments with a strong strategic fit are more frequent elsewhere.

- *Industry of the firm.* Venture capital investments tend to focus on a few high-technology industries. This is even more true for corporate venture investments with a strategic focus.

[5]The reader may note that the dollar amounts reported here are greater in some years than the cumulative disbursements from venture capital funds reported elsewhere [e.g., Kortum and Lerner, 1998]. This reflects the fact that the VentureOne data represents total financings from all sources for privately held venture-backed firms, rather than just funds from venture capital organizations.

[6]See the Appendix for definitions of stages, regions, and industries.

- *Maturity of firm and investment characteristics*. Corporate venture funds tend to invest in later and larger financing rounds and in slightly older firms than other venture funds.

C. Trends and Determinants of Investment Relatedness

In this section we explore the trends and determinants of whether corporate venture capital investments are made in related industries or not. As the previous discussion made clear, many corporate venture capital efforts have failed when they made investments in companies in totally unrelated markets. It is often believed that large existing players in an existing market can add value to new entrants. Understanding when and how corporate venture groups choose to invest in related companies is critical to determining whether corporate investments can add value.

In Figure 5 we show the fraction of the corporate venture capital investments that are made in related industries. One surprising observation is that a large fraction of investment are in related industries. In each year of investment, at least 68% of investments made by corporate venture capital groups are in companies in a related industry. It also appears that the fraction of the investments made in related industries has increased over the sample period. By the end of the sample, between 76% and 77% of the investments were being made in related industries.

In Table 5 we undertake a regression analysis to understand the determinants of investment relatedness. The dependent variable is a dummy variable that equals one if the corporate investment is in a related industry. The independent variables include the age of the firm, a time trend to understand whether the rate of related investments have increased over time, the stage of development of the company, and a dummy variable that equals one if the company is headquartered in Massachusetts or California.

Not surprisingly, the probability of a corporate investment being made in a related industry increases over time. In fact, each year the probability of a related investment increases by 3.5%. It therefore appears that corporations were learning about the value of related investments over the decade.

It also appears that investments in early stage companies are more likely to be in a related industry than investments in later stage companies. Firms in the development stage or the beta stage are significantly more likely to be in related industries. This is also encouraging. Existing players in an industry can provide significant value to young, entrepreneurial firms. Large corporations are also likely to get the most value from investing in the younger startups.

Finally, there are interesting geographical differences in the rate of related investments. Corporate venture investments in Massachusetts are far more likely to be in related industries than are investments in California or in the rest of the country. The rate of related investments in California are no different than in the

rest of the country. Perhaps the types of venture capital firms in Massachusetts create an environment that is more accepting of corporate investments by industry leaders.

D. Success of Venture Investments

Even though these complex motives—and benefits—make it hard to compare the success of corporate versus independent venturing, a pattern does emerge if we examine the data. In fact, in making our comparison, let's look only at corporate venture investments made between 1983 and 1994, to ensure that those efforts had time to "ripen."

We determined the status of the firms in the spring of 1998 from the VentureOne database. Table 6 presents the outcomes for four classes of investors, as well as tests of the statistical significance of the differences between them. Firms backed by corporate venture groups are significantly more likely to have gone public than those financed by other organizations, and are less likely to have been liquidated. These differences are particularly strong for those investments where there was a strategic tie between the corporate parent and the portfolio firm. These comparisons may be influenced, however, by differences between the firms backed by corporate and other venture investors.

The evidence is striking: In more than 30,000 investments into entrepreneurial firms by venture capital organizations of all types, corporate

efforts appear to be at least as successful as those backed by independent venture organizations (using such criteria as the probability of a portfolio firm's going public). As Table 6 shows, 35 percent of the investments by corporate funds went to companies that had gone public by the end of the sample period, as opposed to 31 percent for independent funds. The differences persist when we use different criteria for success: For instance, firms that went public or were acquired at a valuation that was at least three times that of the original investment.

It might be thought that these results are just consequences of the fact that corporate groups often invest in later financing rounds. By this point in many investee firms' development, uncertainties have cleared up and prospects have brightened. As it turns out, even when we add controls for a portfolio firm's age and profitability at the time of the original investment, we get the same results.

The success isn't uniform, as the final column of the table reveals. The success of a venturing effort varies with the "tightness" of fit between the corporation and the portfolio firm—that is, whether the corporate parent and the investee are in the same line-of-business. To assess this fit, we can examine corporate annual reports and classified investments. The success of a corporate program depends on the presence of a direct, strategic overlap between corporate parent and investee. As just one illustration, the probability of going public by the end of the sample period is 39 percent for companies that had this kind of alignment, compared with much lower percentages for nonaligned firms.

To address this concern, we examine these patterns in a regression framework. We estimate logit regressions, alternatively using each investment and each financing round as observations. We seek to explain the probability that the investment had gone public by the spring of 1998, or the probability that the firm had gone public, filed a registration with the U.S. Securities and Exchange Commission (a preliminary step before going public), or been acquired for a valuation of at least twice the post-money valuation[7] of the financing.[8] As independent variables, we use the age of the firm at the time of the investment and the ordinal rank of the investment round. We also employ dummy variables denoting investments by corporate and independent venture capital funds, corporate venture investments where there was a strategic fit with the portfolio firm, firms based in California and Massachusetts, the status of the firm at the time of the investment, the year of the investment, the industry of firm, and a constant.

The results are consistent with the univariate comparisons above. Corporate venture investments are significantly more successful than other

[7]The post-money valuation is defined as the product of the price paid per share in the financing round and the shares outstanding after to the financing round. In calculating the valuations, VentureOne converts all preferred shares into common stock at the conversion ratios specified in the agreements. Warrants and options outstanding are included in the total, as long as their exercise price is below the price per share being paid in the financing round.

investments. (In most of the regressions, independent venture investments are also more successful, though the effect is smaller in magnitude and statistical significance.) When the dummy variable denoting corporate venture investments with a strategic fit is added to the regressions, the corporate venture dummy variable becomes insignificant (and frequently negative). Corporate venture investments in general do not perform better, only those with a strategic fit. These results seem consistent with the complementarities hypothesis above.

VI. A Clinical Look at the Corporate Venture Evidence

In addition to strategic fit, market knowledge, and resources, the way a corporation approaches its venture program influences its chances of success. In companies whose venture programs *don't* succeed, managers have made two fatal mistakes:

- They never created consensus *inside* the organization about the program's objectives and its potential benefits to the company.
- They failed to build relationships and establish credibility *outside* the corporation. (In many instances, they assumed that the corporation's name alone would ensure success.)

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[8]The results are also robust to the use of a third dependent variable, the probability that the firm has not been liquidated by the spring of 1998.

Solidifying Internal Cohesion

Many corporations plunge into corporate venturing without realizing that how they design the program matters. As a result, conflict can arise over the program's objectives—and can even force the dissolution of the effort. For instance, as we saw earlier, departments that feel threatened by or otherwise uncomfortable with the program might push to have it terminated. Or, the venture unit's interests and the corporation's goals may be unaligned—for example, venture personnel are rewarded solely on financial return, whereas the corporation makes strategic goals a priority.

Exxon Enterprises, whose venture capital effort ranks among the most spectacular failures in the field, suffered the consequences of internal dissension.[8] The oil giant (called Esso at the time), seeking to diversify its product line, had launched its venture program way back in 1964. The program began with a mandate to exploit technology in Exxon's corporate laboratories; for example, making building materials out of petroleum derivatives.

In the late 1960s, however, the fund managers decided to make minority investments in a wide variety of industries, from advanced materials to air-pollution-control equipment to medical devices. In the late 1970s, the strategy changed yet again—the program now focused solely on systems for office use. Finally, in 1985, Exxon abandoned the venture effort entirely. Each shift in

corporate strategy had brought on waves of costly write-downs. The information-systems effort alone generated an estimated $2 billion in losses for the corporation.

What explains this disaster? In part, the corporate venture team came to the project with scant investment experience and made numerous poor decisions. But equally important, senior managers at Exxon couldn't agree on the program's overarching purpose. Moreover, various divisions at Exxon insisted on detailed reviews of the program. These reviews consumed so much time that they distracted the fund managers' attention away from the selection and oversight of investments. Meanwhile, various organizations within the corporation had a hand in structuring the program. For instance, Exxon's human-resources staff complained that the venture firms' compensation schemes did not mirror those of the overall corporation. In the late 1970s, HR succeeded in replacing the venture staff's separate stock-option schemes with a standard salary-plus-bonus plan. An exodus of fund managers soon followed.

Internal consensus is particularly important in venture programs with strong strategic objectives. The $100 million Java fund, launched in 1996 by Kleiner, Perkins, Caufield, & Byers, is one example of a fund that gave a number of corporations a chance to invest primarily for strategic reasons.[9] The fund specifically invested in companies that used Java, a programming language developed by Sun Microsystems that ran on a wide variety of operating systems

and challenged Microsoft Windows. In addition to raising capital from traditional limited partners (such as the Harvard, Stanford, and Yale University endowments), the fund also tapped firms such as Cisco, IBM, Netscape, Oracle, and of course Sun. Even though these firms competed intensely with each other, they all wanted to see this programming language take root because it would "level the playing field" with their formidable competitor Microsoft.

Cultivating External Relationships

Good relationships with independent venture firms are also essential to the success of corporate programs. Why? Particularly today, the venture capital business is highly competitive. Identifying and gaining access to attractive opportunities can be difficult for new players. Meanwhile, investors have to make decisions quickly, often with scant information about an opportunity. Close ties between corporate venture efforts and traditional venture firms can

- bring promising opportunities to the corporate fund's attention,
- bring early-stage transactions—which often have lower valuations and more strategic potential—to the corporate fund's attention,
- ensure that venture capitalists deal with corporate capitalists professionally and respectfully, and
- let corporate groups tap into independent groups' knowledge.

Despite all these potential benefits, relations between corporate and independent venture groups continue to suffer from some strain. The venture

capital community is close-knit; many leading firms have syndicated transactions with each other for decades. Though these firms' skepticism about corporate venture funds has abated somewhat, a residual amount remains. Furthermore, unscrupulous venture groups have been known to exploit naive corporate investors, offering them overpriced investments or withholding bad news about potential investees.

To make relationship building even more difficult, it takes time for corporations to build credibility in the eyes of independent venture capitalists. As we've seen, many corporations launch venture programs assuming that their names alone will earn them instant respect. They then discover that their venture program isn't going anywhere without "road shows" with venture groups, conference presentations, and press releases to publicize the company's activities.

There are several important lessons from these accounts:

- form an appropriately sized fund. Too small a fund suggests a limited commitment by the corporation to the program; too substantial an effort leads to speculation that the corporation does not understand the dangers associated with growing too quickly.
- recruit one or more of the fund's investment professionals from the venture capital community.
- articulate a clear investment strategy.

- simultaneously invest in venture capital partnerships specializing in similar technologies.
- consider joint ventures (1) with a specific venture capitalist firm (for instance, Softbank and K-Mart formed a collaboration called BlueLight[9]), (2) with several other corporations and a venture capitalist firm (such as Kleiner Perkins' Java Fund), and (3) with a number of venture capitalist firms. (For instance, Sutter Hill Ventures, Technology Crossover Ventures, and buyout fund Bain Capital joined in mid-2000 with the consulting firm eloyality to establish the eLoyalty Ventures Fund.[10])

VII. Conclusions

This paper has explored the experience of corporations' investments in young, entrepreneurial firms. Historically, the media and academics have maligned corporate investments in venture capital and highlighted visible failures. This paper, however, finds quite a different result. While corporate venture investments have waxed and waned in tandem with the independent venture

[9] The BlueLight fund is discussed in Henry W. Chesbrough and Mary Teichert Rotelli, 2000, "Hotbank: Softbank's New Business Model for Early Stage Venture Incubation," Harvard Business School Case No. 9-600-100.

[10] The eLoyalty fund is documented in Alissa Leibowitz, 2000, "Bain, Sutter and TCV to Invest eLoyalty Fund," *Venture Capital Journal*, 40 (September), 16-18.

capital industry. Many of today's leading technology corporations are extremely active in the sector. In addition, we find that corporate venture capital groups have been increasingly willing to invest in startups in related industries. The probability of making investments in related companies increases with early stage company. Finally, we show that corporate investments are at least as successful as independent venture capital investments. In addition, the probability of success is substantially higher for corporate venture investments in related industries.

While corporate venture investing suffers from many of the same pathologies that have affected fads in venture capital investing as a whole, corporate venture investments have a successful track record. The experience of recent corporate programs, many of which have been initiated by companies that can trace their own history to venture capital investments, bodes well for the future of corporate venturing.

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Figure 1 Venture Fundraising and Venture Returns through 1994

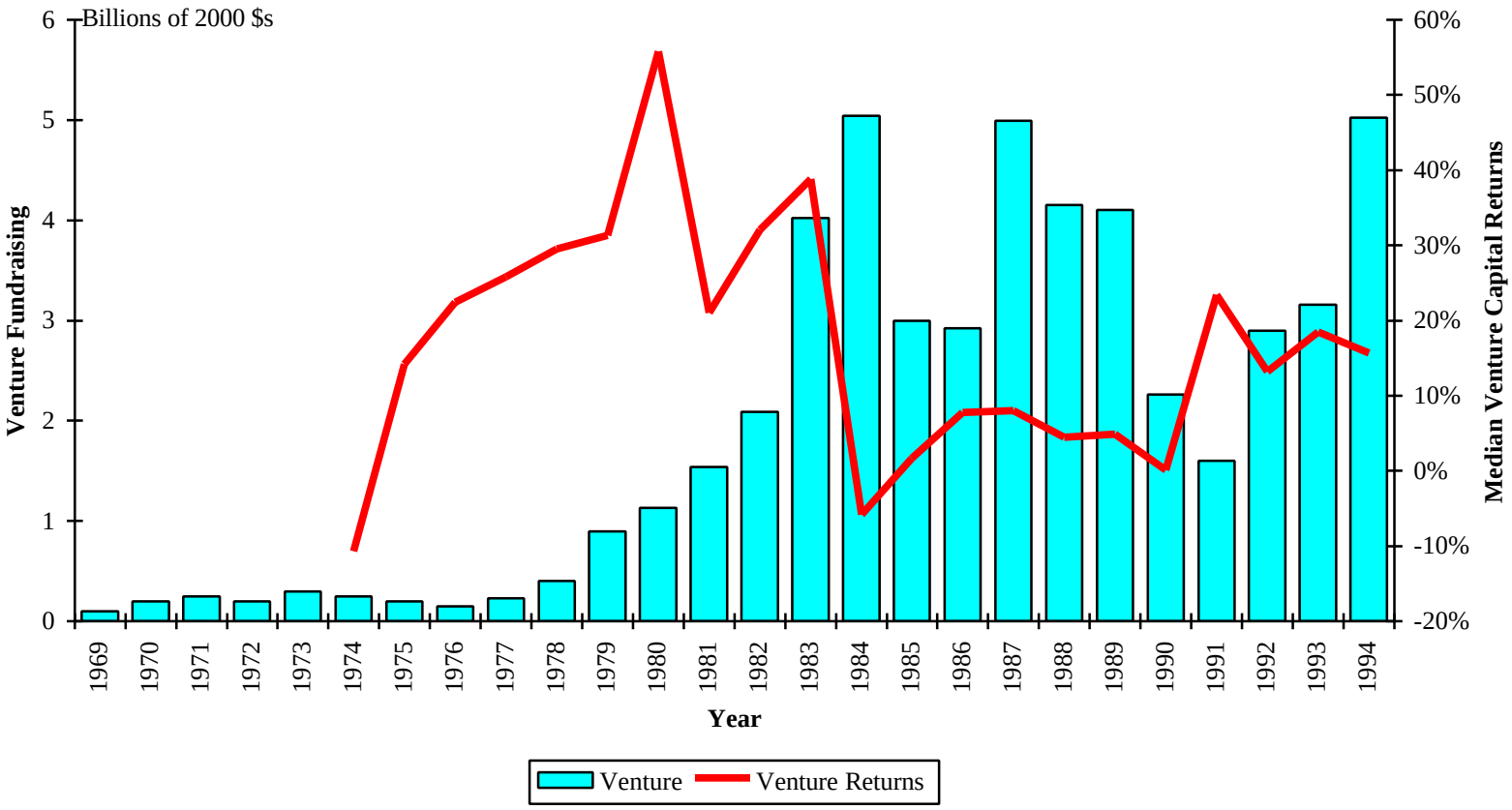

Figure 2 – Venture Capital Fundraising and Venture Capital Returns through 2000.

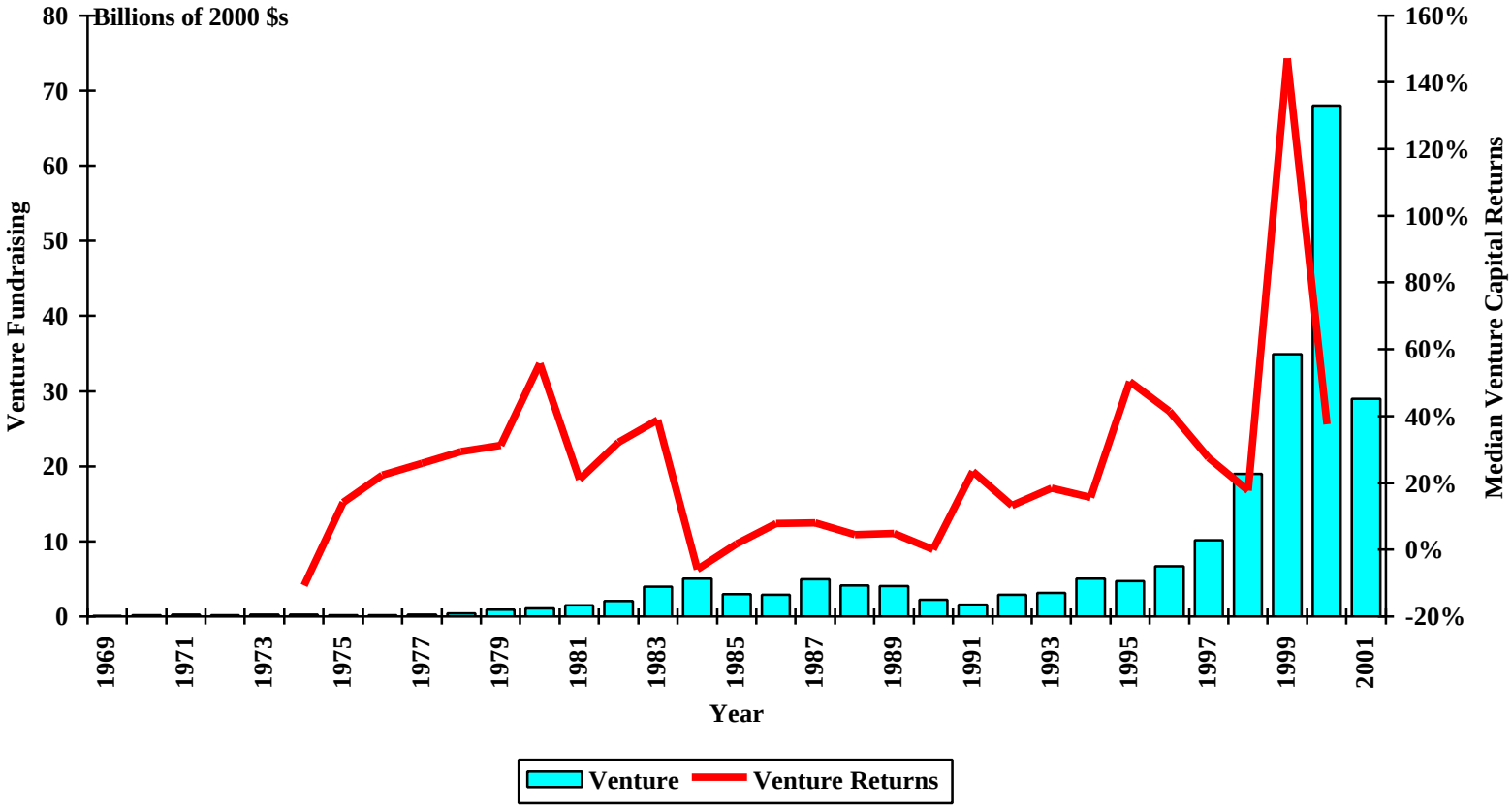

Figure 3 Number of Fortune 100 Venturing Programs Announced

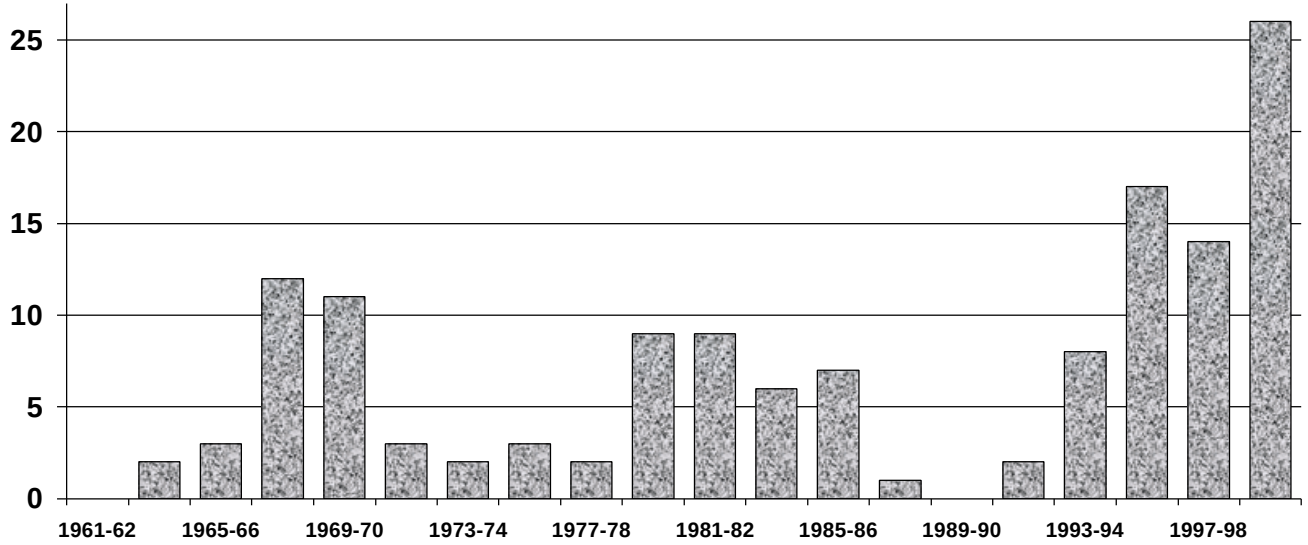

Figure 3 is based on Robert E. Gee, 1994, "Finding and Commercializing New Businesses," *Research/Technology Management*, 37 (January/February), 49-56, as updated by the authors using press accounts in the *Corporate Venturing Report* and elsewhere.

Figure 4 Fraction of All Investments that are Corporate Venture Investments

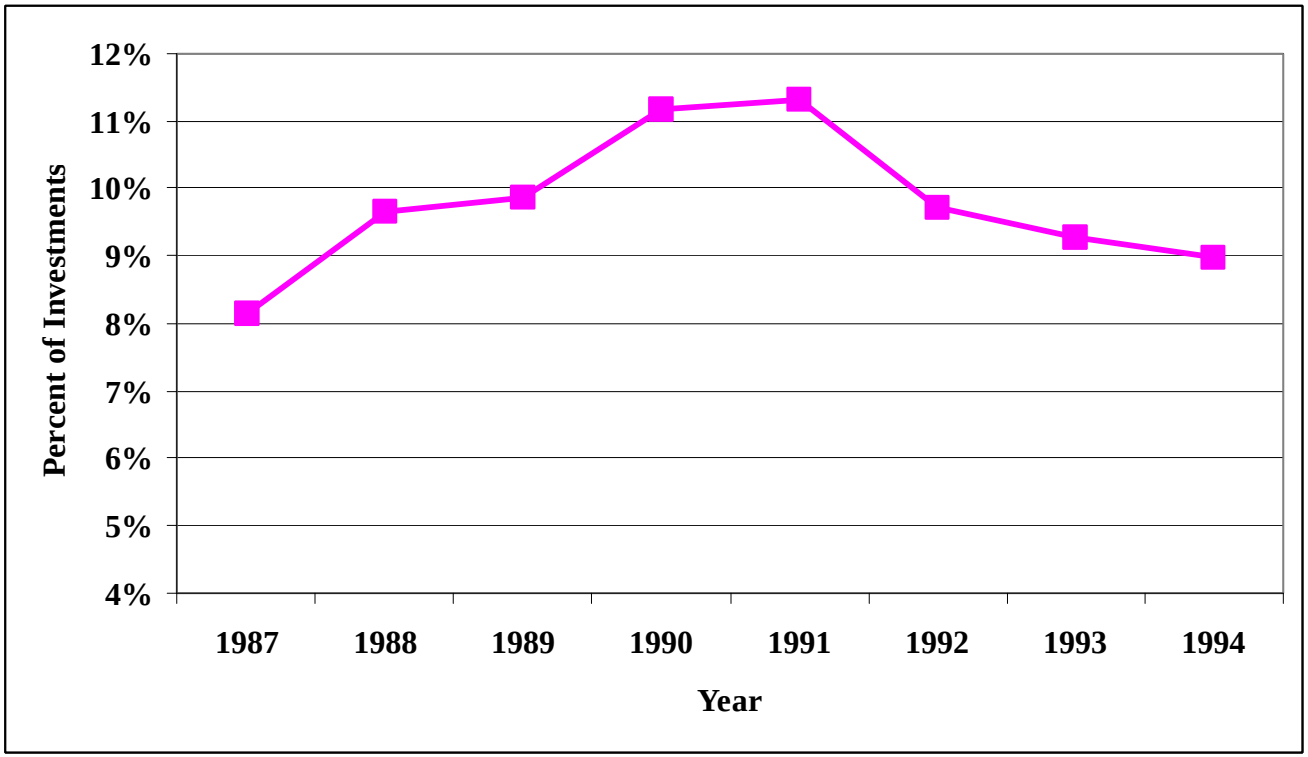

Figure 5 Fraction of Corporate Venture Capital Investments in a Related Industry

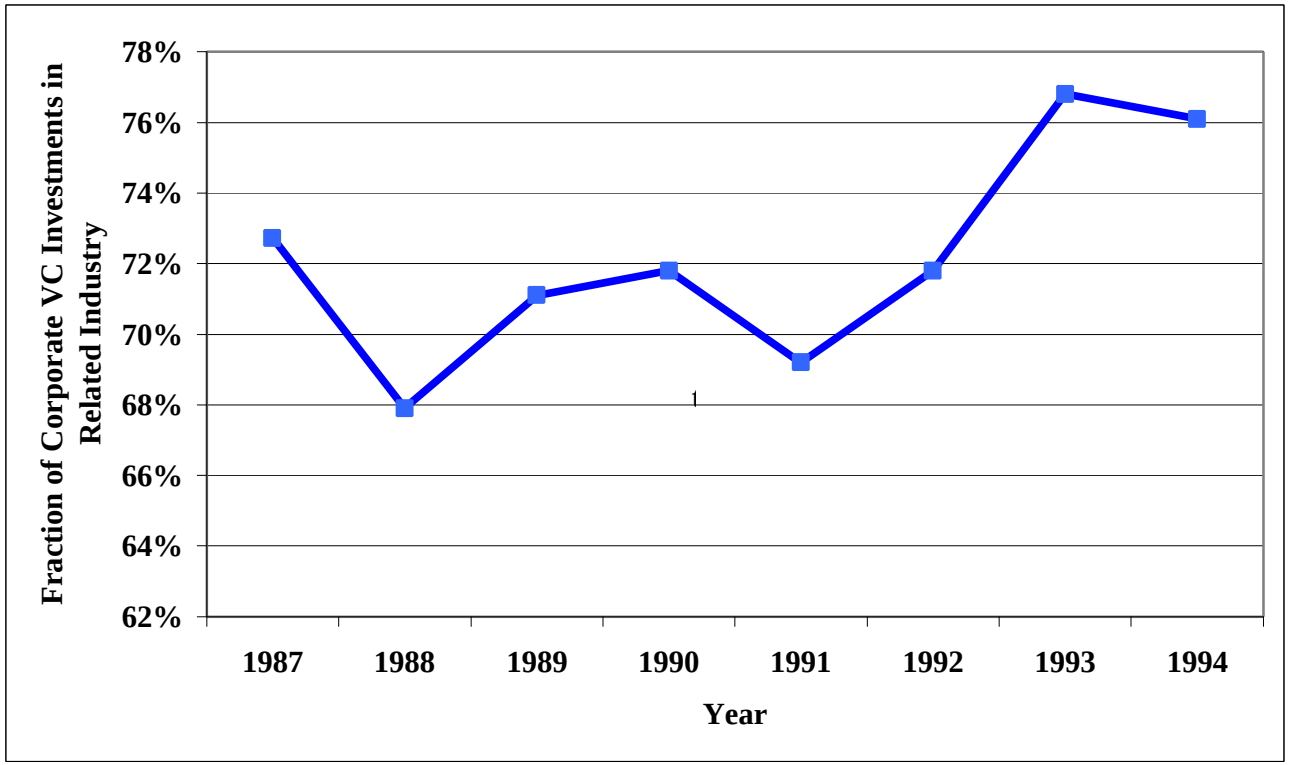

Table 1 Corporate venture capital fund.. The table indicates the name of the sponsoring corporation and the estimated capital under management (in millions of current dollars in 2000). If the corporation organizes multiple programs, these are consolidated. Some corporations do not make formal commitments in advance to their venture programs, or do not disclose the size of these commitments. These firms are not included on the list. Among the largest corporate venture capital programs falling into these categories are those of Cisco, Dell, Johnson & Johnson, and Microsoft. Table 1 is based on Asset Alternatives, 2000, *The Corporate Venturing Directory and Yearbook*, Wellesley, Massachusetts: Asset Alternatives.

Corporate Sponsor	*Capital Under Management*
Electronic Data Systems	$1,500
General Electric	1,500
Andersen Consulting	1,000
Comdisco	500
Time Warner	500
Times Mirror	500
Visa International	500
Intel Corporation	450
AT&T	348
Hikari Tsushin	332
News Corporation	300
ValueVision International	300
Comcast	250
PECO Energy	225
Siemens	210

Table 2 Number of corporate venture capital investments. The series reporting number of investments before 1995 and in and after 1995 may not be strictly comparable. For 1995 and after, the dollar volume of these investments (in millions of 2000 dollars) is also reported.

Year	*Number of Rounds*	*Dollar Volume of Rounds*
1983	53	
1984	91	
1985	139	
1986	129	
1987	152	
1988	179	
1989	202	
1990	233	
1991	249	
1992	214	
1993	198	
1994	193	
1995	65	193
1996	101	369
1997	229	708
1998	391	1,449
1999	936	7,968

Table 3 Distribution of the sample, by year. The table depicts the number of venture capital investments in the VentureOne sample by year between 1983 and 1994, as well as the number of financing rounds (a round may consist of several investments by different investors) and the aggregate amount of funding disbursed (in millions of 1994 dollars). Similar tabulations of the number of investments are presented for corporate and independent venture funds.

Year	*Number of Investments*			*Number of*	*Dollar*
	Total	*Corporate VC*	*Independent VC*	*Rounds*	*Amount*
1983	1,841	53	1,013	436	$2,219
1984	2,249	91	1,206	550	2,905
1985	2,593	139	1,382	625	2,910
1986	2,557	129	1,381	592	2,394
1987	2,675	152	1,397	642	3,065
1988	2,599	179	1,385	611	2,687
1989	2,866	202	1,490	720	3,069
1990	2,826	233	1,455	784	3,640
1991	2,890	249	1,472	757	3,207
1992	3,166	214	1,699	911	3,891
1993	3,118	198	1,586	931	4,532
1994	2,984	193	1,601	947	4,973
Total	*32,364*	*2,032*	*17,067*	*8,506*	*39,492*

Table 4 Characteristics of firms at the time of investment. The sample consists of 32,364 investments in privately held venture-backed firms between 1983 and 1994. The table presents the stage of the firm's development at the time of the investment, the geographic location of the firm, the industry of the firm, the ordinal rank of the venture round, the age of the firm at the time of the investment (in years), and the amount of the investment in the financing round (in millions of 1994 dollars). Separate tabulations are presented for investments by corporate venture firms, corporate funds where there was a strategic fit between the parent and portfolio firms, and independent venture funds.

	Entire Sample	*Corporate VC Only*	*Corporate VC and Strategic Fit*	*Independent VC Only*
Status at Time of Investment:				
Start-Up	9.8%	7.1%	6.4%	10.4%
Development	30.5	33.6	35.9	31.2
Beta	4.1	5.5	6.4	4.1
Shipping	45.5	44.4	42.9	44.8
Profitable	7.6	6.9	5.6	7.3
Re-Start	2.4	2.5	2.8	2.3
Location of Firm:				
All Western U.S.	59.7%	63.7%	59.6%	60.8%
California	51.6	53.7	51.3	52.7
All Eastern U.S.	24.1	25.2	29.1	23.4
Massachusetts	12.8	14.0	16.5	12.6
Industry of Firm:				
Medical	25.5%	25.9%	24.2%	24.2%
Computer Hardware	16.7	17.0	16.2	16.8
Communications	14.5	14.2	22.1	15.5
Computer Software/On-Line Services	15.1	15.1	14.0	16.2
Other	28.1	27.9	23.5	27.3
Round of Investment:				
Mean	2.4	2.8	2.9	2.4
Median	2	3	3	2
Age of Firm at Time of Investment:				
Mean	3.9	4.0	4.2	3.8
Median	3.0	3.3	3.4	2.8
Amount Invested in Venture Round:				
Mean	6.1	6.2	6.0	5.7
Median	4.3	4.5	4.7	4.2

Table 5 Logit regression analyses of strategic fit of Corporate Investments. The sample in the regressions consists of 2,032 corporate investments in privately held, venture-backed firms between 1983 and 1994. The dependent variable is a dummy takes the value of one if the firm is in an industry that is related to the parent of the corporation sponsoring the venture investment. Independent variables include the age of the firm at the time of the investment, a time trend, firms based in California and Massachusetts, the status of the firm at the time of the investment, the industry of firm (not reported), and a constant (not reported). All dummy variables take on the value of one if the answer to the posed question is in the affirmative. Absolute t-statistics reported in brackets.

	Was the Corporate Investment In A Related Industry?	
Age of Firm at Time of Financing	0.0105 [1.16]	0.0116 [1.28]
Time Trend	0.0351 [2.38]	0.0358 [2.42]
Firm is in Development Stage?	0.524 [2.96]	0.506 [2.86]
Firm is in Beta Stage?	0.697 [3.02]	0.6860 [2.97]
Firm is in Shipping Stage?	0.184 [1.02]	0.179 [0.99]
Firm is in Profitable Stage?	-0.180 [-0.72]	-0.176 [-0.70]
Firm is in Re-Start Stage?	0.456 [1.54]	0.463 [1.56]
Firm Based in California?		0.098 [1.05]
Firm Based in Massachusetts?		0.362 [2.92]
Log Likelihood	-2878.1	-2880.8
χ^2-statistic	67.71	70.01
p-Value	0.000	0.000
Number of Observations	2,032	2,032

Table 6 Status of corporate and independent venture investments. The sample consists of 32,364 investments in privately held venture-backed firms between 1983 and 1994. Panel A presents the eventual outcome of the firms. Separate tabulations are presented for investments by corporate venture firms, corporate funds where there was a strategic fit between the parent and portfolio firms, and independent venture funds.

	Entire Sample	*Corporate VC Only*	*Independent VC Only*	*Corporate VC and Strategic Fit*
Status at End of Analysis:				
Initial Public Offering Completed	31.1%	35.1%	30.6%	39.3%
Registration Statement Filed	0.7	0.2	0.7	0.3
Acquired	29.0	29.0	30.3	27.5
Still Privately Held	20.6	21.1	19.7	18.3
Liquidated	18.7	14.6	18.7	14.7

Table 7 Logit regression analyses of firms in the spring of 1998. The sample in the first four regressions consists of 32,364 investments in privately held, venture-backed firms between 1983 and 1994; in the fifth and sixth regressions, 8,506 financing rounds of privately held, venture-backed firms between 1983 and 1994. The dependent variable in the first, second, fifth, and sixth regressions is a dummy variable that takes on the value of one if the firm had gone public by the spring of 1998. In the third and fourth regressions, the dummy takes the value of one if the firm had gone public, filed a registration statement, or been acquired at twice (in inflation-adjusted dollars) the post-money valuation at the time of the investment by the spring of 1998. Independent variables include the age of the firm at the time of the investment, the ordinal rank of the investment round, and dummy variables denoting investments by corporate and independent venture capital funds, corporate venture investments where there was a strategic fit with the portfolio firm, firms based in California and Massachusetts, the status of the firm at the time of the investment, the year of the investment (not reported), the industry of firm (not reported), and a constant (not reported). All dummy variables take on the value of one if the answer to the posed question is in the affirmative. Absolute t-statistics reported in brackets.

	Observations are Investments			
	Did Firm Go Public?		*Did Firm Go Public, Register, Or Have Favorable Acquisition?*	
Age of Firm at Time of Financing	-0.02 [5.52]	-0.02 [0.50]	-0.02 [6.17]	-0.02 [6.13]
Round Number	0.13 [11.39]	0.13 [11.18]	0.13 [11.48]	0.13 [11.29]
Corporate Venture Investment?	0.15 [2.54]	-0.19 [1.31]	0.12 [2.15]	-0.23 [1.64]
Independent Venture Investment?	-0.003 [0.09]	-0.002 [0.07]	0.07 [2.54]	0.07 [2.56]
Corporate Investment and Strategic Fit?		0.52 [3.15]		0.57 [3.55]
Firm Based in California?	0.30 [9.29]	0.29 [8.96]	0.23 [7.44]	0.22 [6.98]
Firm Based in Massachusetts?	0.36 [7.83]	0.36 [7.75]	0.24 [5.26]	0.23 [5.04]
Firm is in Development Stage?	0.44 [7.73]	0.42 [7.27]	0.38 [6.99]	0.35 [6.41]
Firm is in Beta Stage?	0.25 [2.83]	0.22 [2.50]	0.14 [1.60]	0.11 [1.24]
Firm is in Shipping Stage?	0.38 [6.28]	0.36 [5.95]	0.30 [5.20]	0.28 [4.82]
Firm is in Profitable Stage?	1.32 [17.08]	1.30 [16.61]	1.10 [14.77]	1.08 [14.27]
Firm is in Re-Start Stage?	-0.56 [4.20]	-0.56 [4.19]	-0.43 [3.64]	-0.45 [3.71]
Log Likelihood	-14743.6	-14252.0	-15477.4	-14973.7
χ^2-statistic	2409.9	2362.4	2065.5	2025.7
p-Value	0.000	0.000	0.000	0.000
Number of Observations	24,515	23,740	24,515	23,740