

How Do Venture Capitalists Choose Investments?

by

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Abstract

In this paper, we consider how venture capitalists (VCs) choose or screen their investments by studying the contemporaneous investment analyses produced by 10 venture capital firms for investments in 42 portfolio companies. Consistent with most academic and anecdotal accounts, we find that it is common for VCs to consider explicitly the attractiveness of the opportunity – the market size, the strategy, the technology, customer adoption, and competition – the management team, and the deal terms. We also provide evidence on how the venture capitalists expect to monitor those investments. In at least half of the investments, the VC expects to play an important role in recruiting management. Finally, we complement the investment analyses with information from the financial contracts for the investments and consider the relation of the analyses with the contractual terms and with subsequent performance. In both analyses, the evidence suggests that the VC's initial appraisal of the management team is important. Stronger management teams obtain more attractive contracts and are more likely to take their companies public.

G24: Investment banking; Venture Capital; Brokerage
G32: Financing policy; Capital and ownership structure

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1. *Introduction.*

There is a large academic literature on the principal agent problem in financial contracting. This literature focuses on the conflicts of interest between an agent, who is an entrepreneur with a venture that needs financing, and a principal, who is the investor providing the funds for the venture. Theory has identified a number of ways that the investor / principal can mitigate these conflicts. First, the investor can engage in information collection before deciding whether to invest, in order to screen out ex ante unprofitable projects and bad entrepreneurs. Second, the investor can engage in information collection and monitoring once the project is under way. Third, the financial contracts, i.e. the allocation of cash flow and control rights, between the entrepreneur and investor can be designed to provide incentives for the entrepreneur to behave optimally.

In this paper, we focus empirically on the information collection and screening process. We do so by studying a sample of venture capital (VC) investments in portfolio companies. To help the VC partnership evaluate an investment in a company, it is common for the individual venture capitalist who is sponsoring the investment to prepare a detailed investment analysis or memorandum for the other partners. In this paper, we analyze the investment memoranda from ten VC partnerships for 58 investments in 42 portfolio companies. We complement our analysis with information from the company business plans, data on the financial contracts from Kaplan and Strömberg (2000), and data on the subsequent performance of the companies.

There has been great interest – both from academics and practitioners – in understanding exactly what venture capital partnerships (VCs) do and how they add value. For example, Gorman and Sahlman (1989), Hellman and Puri (1998 and 2000), and Lerner (1995) focus primarily on what VCs do after they have invested in a company. Kaplan and Strömberg (2000)

and Gompers (1995) focus on the nature of the financial contracts. As far as we know, we are the first to focus systematically on screening and investment choice.

First, we consider how venture capitalist screening actually works. The VC analyses invariably include a set of investment theses or rationales for making the investment. We find evidence consistent with academic and practitioner accounts that VCs explicitly consider the attractiveness of the opportunity – the market size, the strategy, the technology, customer adoption, and competition – the management team, and the deal terms.¹ The analyses also typically describe the risks in the investment theses. We then consider the investment evaluation process in more detail by describing and summarizing individual analyses: market, technology, customer adoption, competition, and management.

Next, we present direct evidence on VC actions or monitoring. We rely on the investment analyses at the time of the initial investment that describe actions that the VC took before investing and that the VC expects to undertake conditional on investing. In addition, for a subset of the portfolio companies, we describe subsequent status reports on the investments. These reports summarize undertaken and anticipated monitoring actions.

Our primary finding is to confirm that VCs play a large role in shaping and recruiting the senior management team. In 14% of the investments, the VC plays a role in shaping the management team before investing. In 50% of the investments, the VC explicitly expects to play a role after investing. Because the investment memoranda vary in the amount of detail they provide, this almost certainly understates the VCs' activities in this area. These results provide a strong support and complement to the results in Hellman and Puri (2000).

Third, we consider whether and how the screening analyses interact with the design of the financial contracts. We consider whether and how the VCs adjust the contracts to reflect

differences in perceived quality and perceived risks. For example, if the screening process identifies a particular source of uncertainty about which the entrepreneur might have an incentive not to reveal information, the investor might design a contract giving the entrepreneur a higher payoff from telling the truth and a greater penalty for failing to do so. We find some evidence that the financial contracts are related to the VC's initial appraisal of management.

Finally, we examine the relation between the ultimate investment outcome / performance and the VC's initial analysis of the company. In a competitive equilibrium, one might expect there to be no relation because the contracts (and valuations) would adjust to differences in quality and risk. However, if VCs have some monopoly power or if they, too, are learning, a relation could exist.

We find evidence suggesting that the VC's initial appraisal of the management team is related to subsequent performance. Portfolio companies with strong management teams are more likely to go public.

The paper proceeds as follows. In section 2, we describe our sample. In section 3, we present our analyses and results. In section 4, we summarize our results and discuss their implications.

2. *Sample*

In this version of the paper, we analyze 58 VC investments in 42 portfolio companies by ten venture capital partnerships. We have data on roughly 40 more VC investments in another 30 portfolio companies. This represents a subsample of the investments described and analyzed in Kaplan and Strömberg (2000).

¹ See Bygrave and Timmons (1992) or Quindlen (2000).

2.1 Description

The initial sample was obtained by asking VCs in fourteen VC partnerships to give us detailed information on as many of their portfolio company investments as they were willing to provide. For each of these companies, we asked the VC to provide the term sheet as well as the stock purchase and security purchase agreements for each financing round in which they participated. We also asked the VC to provide (if available) the portfolio company's business plan at the time of the financing, the VC's internal analysis of the investment, and the subsequent portfolio company financial performance.

Most VC partnerships have an investment process in which the partner (or partners) responsible for the investment writes up an investment analysis or memorandum describing a potential investment. The entire partnership group uses the memorandum as a guide in deciding whether or not to make the investment. If the VC does in fact make the investment in a company, the memorandum then serves as a guide for post-investment monitoring.

VCs at eleven of the fourteen VC partnerships provided an investment memorandum / VC analysis for at least one of their portfolio company investments. It is worth noting that the investment memoranda have varying degrees of detail. Some are brief two page write-ups while others are in-depth descriptions and discussions exceeding twenty pages. A consequence of this is that our results are certain to understate the extent of analyses and screening that the VCs perform.

Table 1 presents summary information for our sample. As mentioned above, panel A indicates that we have 58 investments in 42 portfolio companies by ten VC firms. 18 of these investments are pre-revenue (which we refer to as early stage) rounds. I.e., the firms receiving

financing either did not have revenues or were not yet operating. The remaining investments are rounds in which the firms had revenues and were already operating.

Panel B shows that the sample companies / investments are relatively recent. All but four of the 42 companies were initially funded by the VCs between 1996 and 1999.

Panel C shows that the portfolio companies were funded by ten venture capital firms with no more than 8 companies from any one VC. (We have internal memoranda from one additional VC firm that we have not yet coded.)

Panel D indicates the amounts of the sample financings. The VCs committed a median of \$7.9 million in equity in each financing round. A median of \$5.0 million was disbursed on closing with the rest contingent on milestones. Pre-revenue rounds in our sample tended to make greater use of contingent funding.

Finally, Panel E indicates that 10 of the 42 companies have subsequently gone public, 3 have been sold, and one has been liquidated. The remaining 28 companies are still private.

2.2 *Sample selection issues*

In this section, we discuss potential selection issues concerning our sample. Our sample of portfolio companies and financings is not a random sample in that we obtained the data from venture capital firms with whom we have a relationship.

One possible bias is that the VCs provided us with deals they thought were their better investments. We do not think this is particularly likely for two reasons. First, many of the investments the VCs provided us were their most recent (as evidenced by the years in which the financings were completed). Second, six of the ten individual venture capitalists who provided investment analyses provided all of their personal investments in the relevant sample period.

A more likely bias in our sample is that the VCs we study have an above average ability to manage information problems or screen. This is true because we contacted only successful venture capitalists.

We do not think either bias (if it exists) is of much concern for many of our analyses because we are interested in understanding how VCs choose and screen investments rather than how well they perform on average. If anything, the bias towards more successful VCs is helpful because we are more likely to have identified the methods used by sophisticated, value maximizing principals.

3. *Results*

3.1 *Investment Theses*

As mentioned earlier, the VC analyses invariably include a set of investment theses or rationales for making the investment. Such theses or arguments were present for all 42 portfolio company investments in our sample.

Table 2 summarizes the information in the investment theses. We distinguish among factors that relate to the opportunity (the company's market, product / service / technology, strategy, and competition), to the management team separate from the opportunity, to the deal terms, and to the financing environment.

Panel A shows that factors relating to the opportunity are important considerations in a VC investment. All but one of the investments included investment rationales based on such factors. Consistent with academic and practitioner accounts, VCs are attracted to large and growing markets. This was mentioned explicitly in 30 of the 42 portfolio company investments. In at least one-third of the investments, VCs were attracted by the product / technology; by the

strategy / business model; by high likelihood of customer adoption; and by a favorable competitive position.

Panel B considers factors related to management. In over 64% of the investments, the VCs explicitly cited the quality of management as a reason for investing. In 26% of the investments, the VCs cited favorable performance to date.

Panel C shows that the terms of the investment or deal are also important. In particular, a low valuation or an attractive contractual structure is each attractive in roughly 20% of the investments. Among other things, VCs value contractual structures that limit the amount of funds that are at put at risk, for example through the use of staging or the ability to draw on alternative sources of financing. Also, the VCs also consider whether the investment fits their overall investment strategy, and this is stated as a reason for investing in around 20% of the cases.

Finally, another important consideration of the VC is to ensure a limited investment horizon and to be able to sell their stake in the portfolio company in the public markets or to a strategic buyer. Panel D shows that particularly favorable financial conditions and exit opportunities are important factors for investing in 21% of the investments.

3.2 Investment Risks

While the VC investments always include a number of positive elements, they also typically involve risks. The VCs described these risks in 40 of the 42 portfolio companies in our sample.

Table 3 summarizes these risks. Panel A indicates that the VCs viewed the opportunity as having significant uncertainties in 38 of 42 investments. In order of frequency, these uncertainties included business model / strategy risks, competitive risks, market size risks,

product / technology risks, and adoption risks. Thus, while the VCs believed these opportunities were attractive investments, the VCs did not believe the investments were without risk. These risks are a result of the fact that VCs typically invest in early stage ventures, often trying to enter new markets with unproven products, technologies and business models.

Panel B indicates that the VCs viewed some aspect of management as risky in 62% of the analyses. For example, one CEO was “difficult” while several management teams were incomplete. Interestingly, this is roughly the same percentage as the 64% for which the quality of management was one of the reasons for making the investment. It is easy to reconcile this by observing that a VC might think very highly of a CEO or some members of management, but not others. In addition, the VC may be uncertain as to whether the CEO can hire or build the rest of the management team.

Panel C shows that VCs view deal terms as important risks in more than 50% of the investments. These risks include high valuation (i.e., paying too much) in 21% of the investments, contractual structure in 19%, and high monitoring costs in 21%.

The risks of high monitoring costs or involvement costs are particularly interesting. In several investments, the VC was worried that the investment might require too much time. In two cases, this involved the VC becoming chairman of the company. This indicates that while VCs regularly play a monitoring and advisory role, they do not intend to become too involved in the company. A plausible interpretation is that VCs do not want to be involved in the day-to-day details of too many of their portfolio companies.

3.3 Individual or Detailed Analyses

In this section, we describe the individual components of the VC analyses in more detail. This grouping is based on our reading of the 42 memoranda. Table 4 reports that at least 88% of the memoranda included analyses or discussion of the market, competition, and management. Many of the memoranda also included analyses of technology and the likelihood of customer adoption.

3.3.1 Market Analyses

Table 5 summarizes the 39 cases in which the VC analyzes the portfolio company market. Not surprisingly, the table indicates that these companies attacked large markets. The median market size is \$6.5 billion (the average is \$25.1 billion) in the 32 instances in which the VC presents an explicit estimate.

For roughly 40% of the memoranda, the VCs reported due diligence sources for their market analysis. As the table reports, these sources included other portfolio companies, independent consulting / research firms, surveys, and interviews of potential customers, industry participants, and investment banking analysts.

We also attempted to ascertain the VC's optimism toward the market. While this is necessarily qualitative, we did notice explicit differences. In almost 2/3 of the companies, the VC was very optimistic or favorable about the market size and growth characteristics. In 29% of the companies, the VC expressed some reservation or uncertainty.

3.3.2 Technology Analyses

Table 6 reports that the VCs analyzed technology for 18 of the 42 companies in our sample. This is misleading, however, because 22 of those companies were not technology based. (Such non-technology companies included service providers, retailers, and healthcare providers.)

The VCs, therefore, provided a technology analysis for 18 of the 20 technology-based companies. Interestingly, the VCs expressed a strong degree of optimism for the technology in only 7 of those 18. We classified a VC as strongly optimistic if the VC believed there was little or no risk to the technology.

3.3.3 Customer / Adoption Analyses

It also is common for VCs to consider the likelihood that the portfolio companies will be able to attract customers. Table 7 summarizes these analyses. VCs performed some type of customer or adoption analysis in 26 of the analyses. Interestingly, in 11 of these analyses, the VCs expressed some degree of concern that customers would not demand the company's service or product. The table also shows that the VCs analyze customer adoption using a variety of due diligence sources. Some VCs went so far as to go on sales calls with the portfolio company to gauge the interest of potential customers.

3.3.4. Competitor Analyses

All but 5 of the VC memoranda include a discussion or analysis of existing or potential competitors. Twenty of the 37 explicitly mention that competitors are a source of strong or some concern. The analyses are summarized in table 8.

3.3.5. Management Team Analyses

Table 9 summarizes the analyses of the management team. All but one of the VC memoranda included a discussion of management quality. Management was viewed as unequivocally strong in 17 of the 41 analyses. In 21, the VCs viewed that management team as

having both strengths and weaknesses. Finally, in three portfolio company investments, the VCs viewed the management team as weak.

3.3.6. Financial Projections and Exit Strategies

Table 10 summarizes the financial projections made by the VC. Compared to market and management team analyses, explicit financial forecasts are relatively uncommon. Only 20 of the 42 VC memoranda include sales and earnings forecasts for the venture, out of which only 14 contain both sales and EBIT projections for at least 4 years. One obvious explanation for this is that cash flows are extremely difficult to forecast for early-stage ventures. Hence, the analyses we do have might be biased towards firms that are expected to make sales and profits relatively early, and possibly grow at a faster rate than the average firm in the sample. Moreover, rather than capturing truly expected performance, these financial forecasts typically assume that the progress of the venture is “according to plan”, i.e. that the venture does not fail completely.

Despite these biases, the results show that VCs invest in companies that at least have the potential (if all goes well) to grow extremely fast. The median firm is projected to grow from sales of \$0.2M and EBIT of $-\$0.2M$ to sales of \$63M and EBIT of \$6M in only 4 years.

We find a similar result in Table 11, where VC exit strategies are summarized. In our sample, 27 of the 42 investment memoranda explicitly mentions the exit strategy of the VC. Not surprisingly, IPO is typically the VCs preferred exit venue. An IPO is stated as the main exit alternative in 21 of the 27 cases (78%) and the median firm is expected to go public in 3 years from the date of the investment. Given that these small firms at the time of the investment, this confirms that VCs invest in companies with a very high growth potential. IPO is not the VCs only exit venue, however, and it is well known that VC-backed companies sometimes end up

being sold to strategic buyers. In our sample, a trade sale is anticipated to be the main exit alternative in 6 of the 27 cases, and the median exit horizon is 3 years, similar to the IPO.

3.4. VC Actions

A number of papers have studied the role of venture capitalists in assisting and monitoring their portfolio companies. Gorman and Sahlman (1989) report the results of a survey of venture capitalists. Using data provided by start-up companies, Hellman and Puri (1998 and 2000) find that firms financed by venture capitalists bring products to market more quickly and are more likely to professionalize their human resource functions. Lerner (1995) finds that venture capitalists affect board composition and CEO turnover in the companies they finance. These papers suggest that venture capitalists both assist / advise and monitor their portfolio companies. The results, however, are either survey-based or indirect.

In this section, we use the VC investment analyses to complement and corroborate that previous work by reporting the actions that the VC took before investing and those actions the VC expected to undertake conditional on investing.

Table 12 confirms that VCs play a large role in shaping and recruiting the senior management team. In 14% of the investments, the VC plays a role in shaping the management team before investing. In 50% of the investments, the VC explicitly expects to play a role after investing. The investment memoranda provide less evidence of other potential roles played by the VCs. For example, there are relatively few mentions of plans to provide introductions, help with alliances, or refine / change the strategy.

These results almost certainly understate the actions the VCs take because these are only actions that the VC (a) decided to include in the report as important; and (b) had done or planned

at the time of the investment. Even so, they provide strong support for and complement the results in Hellman and Puri (2000).

3.5 Relation Between Venture Capitalist Analyses and Contractual Terms

In this section, we consider whether and how the screening analyses interact with the design of the financial contracts. In particular, we consider whether and how the VCs adjust the contracts to reflect differences in perceived quality and perceived risks.

We address a number of different aspects of contract design, including valuation, staging and contingent contracting, pay-performance incentives, and control. Table 13 presents univariate analyses and Table 14 multivariate regression results.

3.5.1 Valuation and VC cash-flow rights

First, the VC is obviously concerned with getting a satisfactory return on the investment. To address this we look at the valuation of the venture at the time of the investment and the fraction of the company's cash-flow rights that is allocated to the VC. We would expect that when the uncertainty and the risk of the investment increases, the VC will value the venture lower and demand a higher fraction of the cash-flow rights as a compensation for the investment. To measure the valuation, we use pre-investment company value, calculated as post-investment company value minus the total funds committed in the round. The post-investment company value is equal to the amount of funds committed by the VC divided by the fraction of the cash-flow rights purchased by the VC in the round. As shown in Kaplan and Strömberg (1990), measuring cash flow rights is not trivial, however, because many of the cash flow rights accorded to founders and management are contingent either on subsequent performance or on remaining with the firm. We choose to measure the allocation of VC cash-flow rights in the best

case of the world from the entrepreneurs perspective, and calculate it as the VC's fraction of the firm's equity when management meets all performance and time vesting milestones or contingencies.

The mean pre-money valuation in our sample is \$14.2 million with a median of \$8.7 million. The relationship with the assessed risk factors is quite weak, both for the univariate as well as for the regression results. Surprisingly, the valuation is significantly higher for investments in which competition was perceived as weak (median of \$11.5M). A possible explanation of this result is that strong competition is correlated with and a proxy for an attractive investment opportunity.

The relationship with VC cash-flow rights is somewhat stronger. Management risk and uncertainty about the market size lead the VC to take a higher fraction of cash-flow rights in the venture (although market risk is only significant in the univariate analysis). Again, competition risk goes the opposite way to what was expected, and strong competition leads to lower rather than higher VC cash-flow rights.

3.5.2 Ex Ante Staged Investment Commitment

The second measure of contract design we use is whether the VC investment commitment was contingent or staged in any way. As discussed in Kaplan and Stromberg (2000), it is common for a VC to make a portion of its financing commitment contingent on subsequent portfolio company actions or performance. This reduces the amount of funds that the VC has to put at risk for a given investment and gives a greater ability to the VC to liquidate the venture by not providing funds if performance is unsatisfactory. This is true for 16 of the 41 portfolio companies in our sample.

The two main risk factors leading the VC to stage the investment commitment seem to be uncertainty about the market size and management risk (although management risk is only significant in the univariate analysis). Again, we get the surprising relationship with respect to competition, where stronger competition in the market actually leads to less staging.

3.5.3 Pay-performance Incentives and Control

Finally, we look at two important mechanisms to overcome conflicts of interest between the entrepreneur and the VC, namely pay-performance compensation and control.

The classical principal agent theories following Holmström (1979), as well as screening theories such as Lazear (1986), focus on performance contingent compensation as a way of overcoming conflicts of interest between principals and agents when actions are unobservable. In contrast, the incomplete contracting theories of Aghion and Bolton (1992) show that when the agent's actions are observable but not verifiable, conflicts of interest can be overcome by allocating control rights to the principal. Aghion and Bolton also show that it is often optimal to let control be state-contingent, where the principal is allocated control only in the worst state of the world. . Here we address which of the different risk factors that lead to a greater use of pay performance sensitive compensation and VC control rights.

We first address the use of state-contingent allocations of cash-flow and control rights in general. As in Kaplan and Strömberg (2000) we form a dummy variable taking the value of one if the financial contract is written contingent on financial or non-financial measures of firm performance, or explicitly on management actions. The results show that higher market risk and management risk lead to a greater use of state-contingent contracting (although only management risk is significant in the regressions).

We then look at cash flow incentives and control separately. Following Kaplan and Strömberg (2000) we measure the degree to which the founder's monetary compensation is sensitive to performance by the difference in the the founder's percentage of cash flow rights between the best (minimum VC ownership) and the worst (maximum VC ownership) state of the world. We measure VC control rights using two measures: whether the VCs hold a majority of the votes and whether the VC has the right to choose at least half of the board members in the company.

Surprisingly, pay performance sensitivity in cash flow rights actually seems higher for stronger management teams. Ventures where management risk is perceived to be a particular concern have a significantly lower difference between founder best and worst case cash-flow rights. Instead, founder compensation is more high-powered when market size uncertainty is high and when competition is a larger threat. In contrast, when management risk is high, the VCs are significantly more likely to have voting and board control, while competitive risk is correlated with less VC control. These results suggest that performance sensitive compensation and VC control in some sense are substitute mechanisms that are used to address different types of risks.

Overall, then, it appears that the financial contracts are somewhat related to VC perceptions of the investment. Investments with stronger perceived markets and management teams have contracts that are more attractive to the entrepreneurs.

3.6. Relation Between Venture Capitalist Analyses and Subsequent Performance

In this section, we examine the relation between the ultimate investment outcome / performance and the VC's initial analysis of the company. In a competitive equilibrium, one

might expect there to be no relation because the contracts (and valuations) would adjust to differences in quality and risk. However, if VCs have some monopoly power or if they, too, are learning, a relation could exist.

In this version of the paper, we measure performance by firm status as of July 31, 2000. We classify firms as (a) having gone public in an IPO, (b) having been sold, (c) still private, and (d) having been liquidated in bankruptcy. In our sample, 10 firms (24%) have gone public, 3 (7%) have been sold, 18 (43%) remain private, and 1 (2%) has been liquidated. It is worth stressing that this is an extremely noisy measure of performance because it is possible that some of the investments that are still private will ultimately be successful. This is particularly plausible given that one-half of the investments in the sample were made in 1998 and 1999.

Table 15 indicates that portfolio companies with management teams perceived to be strong are almost three times more likely to have gone public than companies with management teams perceived to be neutral or weak. On the other hand, there is no difference in IPO likelihood for firms with markets perceived to be attractive from those perceived to be neutral. This is supportive of the views of some VCs that management is the most important ingredient in evaluating an investment.

As in the analysis in the previous section, we find an anomalous result for competition. Only 6% of the companies with weak perceived competition at the time of the investment have gone public (and an additional 11% have been sold). This compares to 38% of the companies with strong or some competition (with an additional 5% having been sold).

The table also indicates that firms with strategies perceived as risky are less likely to have gone public, at 5% and 11% respectively, than the typical firm in the sample.

The importance of management and strategy is confirmed when we turn to the regression results in Table 16. A strong assessment of the management team is correlated with a higher IPO probability, while strategy risk leads to a significantly lower likelihood of going public. The relationship with competition is somewhat less robust and goes away once factors such as strategy risk is controlled for.

Overall, then, we find evidence suggesting that the VC's initial appraisal of the management team, competition, and strategy are related to subsequent performance. Market attractiveness and market size risk are unrelated to that performance.

Taken together, the results in this section and the previous one indicate a strong emphasis and importance on the appraisal of the management teams. Strong management teams obtain more attractive contracts and perform better (at least as measured by the likelihood of going public). The results also indicate a counterintuitive result for competition. Companies with weak competition receive less attractive contracts and are less likely to go public.

4. Summary and Discussion

In this paper, we have studied how venture capitalists choose or screen their investments by studying the contemporaneous investment analyses produced by 10 venture capital firms for investments in 42 portfolio companies. Consistent with most academic and anecdotal accounts, we find that it is common for VCs to consider explicitly the attractiveness of the opportunity, the management team, and the deal terms.

We also provide evidence on how the venture capitalists expect to monitor those investments. In at least half of the investments, the VC expects to play an important role in recruiting management.

Finally, we complement the investment analyses with information from the financial contracts for the investments and consider the relation of the analyses with the contractual terms and with subsequent performance. In both analyses, the evidence suggests that the VC's initial appraisal of the management team is important. Stronger management teams obtain more attractive contracts and are more likely to take their companies public.

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**Table 1
Summary Information**

Summary information for 58 investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999. Pre-revenue stage rounds are financing rounds for companies that had no revenues before the financing. Pre-profit stage rounds are financing rounds for companies that did not have positive profits before the financing. Total financing committed is the total amount of equity financing committed to by the venture capitalists at the time of the financing round.

<u>A.:</u>	<u>Portfolio Companies</u>	<u>Financing Rounds</u>
Number of observations	42	58
Pre-revenue	18	18

B.: By year initial round financed:

	<u>Pre-1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>Total</u>
# companies	4	9	8	20	1	42

<u>C.:</u> By VC Partnership	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>Total</u>
# portfolio companies in current draft	6	2	2	8	3	4	5	1	8	3	42

<u>D.:</u> Financing Amounts	<u>Mean</u>	<u>Median</u>	<u>N</u>
Total financing committed (\$ millions)	12.1	7.9	41
Total financing committed pre-revenue rounds (\$ millions)	17.0	9.5	17
Total financing provided (\$ millions)	6.0	5.0	41
Total financing provided pre-revenue rounds (\$ millions)	5.2	4.0	17

<u>E.:</u> Outcomes as of 7/31/00	<u>Private</u>	<u>Public</u>	<u>Sold</u>	<u>Liquidated</u>
# of companies	28	10	3	1

Table 2
Investment Theses in Venture Capitalist Analyses

Explicitly mentioned reasons for investing according to venture capitalist analyses for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

A. Opportunity: Market conditions, product, strategy, and competition.

Explicit reason	N	%	Examples
Large market size and growth	30	71.4%	<ul style="list-style-type: none"> • Two very important and visible market opportunities, which should both be over \$1B within a few years. • Large market amenable to rapid growth • Very large market in which incumbents earn high profit margins • Virtually unlimited market potential in the long term • Large and growing market with favorable demographic and privatization trends. • Company could dramatically impact the evolution of the computer industry • Dramatic shifts in business favor company's market
Attractive product and/or technology	15	35.7%	<ul style="list-style-type: none"> • Late stages of product development (first product launch planned in 15-18 months) • Superior technology with large market potential • Revolutionary new technology • Has developed excellent product • Has built a robust, scalable system that can meet the current market demands. • Best product on the market. • Well tested technology/product. • Early stage company with post-beta product with competent/experienced technology team
Attractive business strategy/ model	21	50.0%	<ul style="list-style-type: none"> • Company significantly reduces costs while maintaining quality • Compelling business strategy. Presence or likelihood of validating corporate alliances • Outsourcing means less for company to manage • Attractive and demonstrated profitability of business model • Excellent new concept • Favorable acquisition opportunities, which will be driver of growth. • Distinctive strategy • High value-added, high margin strategy for very little capital upfront. • "Lean and mean" operation with few employees and good customer focus • Pure play / focused
High likelihood of customer adoption	16	38.1%	<ul style="list-style-type: none"> • Conceptual acceptance by professional community • Beta arrangements with large customers • Solid base of customers who regularly renew • Increasing popularity of approach among customers • Company has very interesting beta sites, who have been enthusiastic about product. • Major corporations are customers and are positive regarding the capabilities of the product and the management team • Attractive customer value proposition.
Favorable competitive position	20	47.6%	<ul style="list-style-type: none"> • Company has intellectual property rights to all significant research findings using this technology, not very threatening competitors. • Company is targeting a significant market segment that is underserved by incumbents • Early mover advantages from being pioneer of this concept and largest player • Highly fragmented industry, which makes the industry ripe for consolidation • No competitors. • Early entrant • Very few effective alternatives available, and none currently targeting all three target segments • First-mover advantage, similar to Amazon and AOL • Given the large market, there is more than enough room for several competitors. • Strong proprietary and patent position • Potential for large market share with early penetration - meeting clearly unaddressed needs
Any of the above	41	97.6%	

B. Management: Quality and previous performance.

Explicit reason	N	%	Examples
Quality of management	27	64.3%	<ul style="list-style-type: none"> • Comfortable with the management team. • Management team is of the highest quality in the industry • Experienced management team which is critical driver of success • VC is investing because of quality of management team, who is believed to be good in science, and at raising and conserving money. • Experienced, proven and high-profile CEO competing in a market where execution is key • Very good CFO just hired • Known CEO for a long time. • CEO/founder is one of the few managers in the industry capable of attracting necessary employees. Has developed excellent product while consuming only modest amounts of capital • Experienced managers out of successful venture backed company • Strong CEO/founder with very high marks from existing investors • Current management team has executed well so far. • Management team has extensive internet and website management experience. . • Key members of management team has industry experience. Team is well-balanced, young and aggressive. • Highly sought-after entrepreneur/founder, who co-founded successful company that subsequently went public. Strong board. • Excellent CEO joining company. • CEO is very frugal and will not spend capital unwisely • Executive team has acquired a significant level of penetration and relationships in a fairly short time
Favorable performance to date	11	26.2%	<ul style="list-style-type: none"> • Attractive and demonstrated profitability of business model • Rapid growth: over 40% last four years • Company has a manageable cash burn rate and is expected to be cash-flow break-even within 12 months • Company has good reputation in industry • Company has been successful to date and has made substantial improvements during last two years • Significant sales growth and momentum. • Has developed product, well positioned to achieve revenue target. • Company is operationally break-even. • Year one sales of \$3.2M, profitable so far • Cash flow positive.
Any of the above	31	73.8%	

C. Deal terms: Valuation, contractual structure, syndicate and portfolio considerations.

Explicit reason	N	%	Examples
Low valuation	8	19.0%	<ul style="list-style-type: none"> • Low valuation 5-year IRR of 46% in conservative case. • Very profitable unit model (60% IRR over 10 years) • Valuation is attractive and should give high returns if successful • Exit multiples are shooting up • VC only has to invest \$1 million at a \$2 million pre-money valuation
Contractual structure that limits risk	10	23.8%	<ul style="list-style-type: none"> • The participating preferred should protect VC in case of mediocre performances. • Unique investment structure: only have to put in money if milestones are met; combination of cumulative non-convertible preferred stock and regular convertible preferred has benefit that VC will be paid back most of investment out of IPO proceeds. • Equipment can be funded with debt • Gives investors ability of investors to control growth • Successfully structured investment to minimize downside, by only providing limited funds until milestones met • VC commitment will be invested over time. If initial (Chicago) launch not successful, VC has option to cut back. • Cash-efficient early stage thanks to future company acquisitions with stock • New investor has the benefit of reduction in VC pro rata investment if more funds needed • Limited risk for VC: will only own 4.4% of company. • Can take company to leading industry position with a minimum of capital.
Positive influence of other investors	3	7.1%	<ul style="list-style-type: none"> • Investing partners include investors who previously invested early in some extremely successful companies • Former COO of US industry leader involved as active chairman and interim CEO, as well as investor. • Main reason that VC is investing is that it is required to get a new individual investor which has the benefit of (1) reduction in VC pro rata investment if more funds needed, and (2) the skills of the investor and the interim "turnaround" COO that he is getting company"
Good fit in VC investment portfolio	9	21.4%	<ul style="list-style-type: none"> • Adds additional breath to VC portfolio within this market segment • VC is strong in this geographic region • Participation in the rapidly growing market • Good strategic fit with VC. • VC has board seat on company in complementary business, with which VC could facilitate marketing partnership. • Represents new market segment for the funds, which should stimulate some additional opportunities (assuming a positive outcome) • Potential for (Non-California) VC to lead a Silicon Valley deal.
Any of the above	22	52.4%	

D. Financial and exit conditions.

Explicit reason	N	%	Examples
Financial market conditions and exit opportunities	9	21.4%	<ul style="list-style-type: none"> • If successful, possibility for early exit or acquisition • Expect to have access to both debt and equity in public markets on attractive terms • Quick flip potential for the investment • Many strategic buyers available • Recent public market enthusiasm for e-commerce companies might enable public equity financing to mitigate future financing risks • Given the size of the market opportunity and company's strategy, capital markets will be receptive given that company achieves business plan. Also, a consolidation trend should emerge in industry as more companies enter market.

Table 3
Risks and Uncertainties in Venture Capitalist Analyses

Explicitly mentioned risks in investing according to venture capitalist analyses for 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

A. Opportunity: Market conditions, product, strategy, and competition

Explicit reason	N	%	Examples
Uncertain market size and growth	15	35.7%	<ul style="list-style-type: none"> • Regulatory uncertainty • Sensitive to a substantial increase in interest rates • Country risk. Regulations changing • Currency risk • New, largely unproven, marketplace • General downturn in industry • Uncertain demand / market size
Uncertainty about product and/or technology	13	31.0%	<ul style="list-style-type: none"> • Outcome of clinical tests and development: Must prove that technology is superior to other marketed alternatives, in terms of efficiency and side effects. • Early stage research project: Project is elegant, ambitious and, consequently, difficult. • Ability to make technology work at target cost point • No guarantee product will work in a full production environment • Identification and development of a more compelling product.. • Product scalability is to be fully tested.
Risks in business strategy/ model	21	50.0%	<ul style="list-style-type: none"> • Real sales effort needs to be mounted, which is very reliant on management team's experience to manage profitably. Transferability of business model to other markets? • Are there enough candidates available for acquisition? • Will company be able to ensure quality while pursuing a growth-through-acquisition strategy?" • How scalable is the business? Is there any operating leverage in the business model? • Lack of focus? • Vulnerable strategy • Execution of business model has yet to be proven. • Will company be able to attract employees? • VC due diligence showed that margins and expense percentages of existing stores have to be brought into line with prototype model • Key partnerships not nailed down. • Geographical risk – US corporate and foreign R&D
Uncertain customer adoption	10	23.8%	<ul style="list-style-type: none"> • Ability to convince customers to bet on an unproven technology • Customers may not want to pay enough of a premium for product • Customer reaction is unknown • Speed of adoption. Target customers have not historically been speedy adopters. • Financial viability of customers and existing contracts • Significant risk that product will not work in new geographical areas • Challenge is to broaden the product beyond the initial customer segment, which requires an identity creation. Customer sensitivity on pricing at a broader is yet to be tested
Risky competitive position	17	40.5%	<ul style="list-style-type: none"> • Customers might become competitors once they learn company's business model • Strong competition may exist. Patent protection alone might not provide enough barriers to entry. • Many new entrants - price competition could drive down margins • Early, but not first competitor. • Competition and pricing pressures • Competitive and tight labor market, competing with larger established competitors for employees. • New alternative technology might be a long-term threat. • Uncertainty about market share and pricing. • Low barriers to entry. Low switching costs. • Product can be copied. Competitors are large entrenched companies with superior distribution channels.
Any of the above	38	90.5%	

B. Management: Quality and previous performance

Explicit reason	N	%	Examples
Quality of management	26	61.9%	<ul style="list-style-type: none"> • CEO is a "rather difficult person". Active involvement of Chairman will be crucial. • Unproven management team • Management team is still incomplete • CEO/founder has a strong desire for acquisitions. VCs have to devote substantial time evaluate • Company is highly reliant on one individual (the founder/CEO) • Management has not shown in the past that it can effectively forecast financial progress • Management group has no real company building experience • Company still needs management (CEO, CFO, COO) and control (operating, reporting and billing) systems. • Is the fact that company is in so many seemingly disparate businesses a reflection of management's lack of focus? • Good but not great management team • Management team is incomplete. Need seasoned industry executive. • Incomplete management team. One of the milestones for further funding is the ability to attract an appropriate VP of sales and marketing to complete the management team • Involvement of one of the investors as chairman and interrim CEO, (replacing founder) is critical to success. Need to find new permanent CEO. • Will the management team be able to integrate acquisitions?" • Incomplete junior management team. • Founder/Chief Development Officer has only limited operating experience. Newly recruited CEO is unproven. Key executives in operations and marketing are yet to be recruited. • Management is young and relatively inexperienced • Will need to strengthen management team. Have to ensure involvement of VC investor as chairman. Will have to hire CEO eventually. • Youth and lack of executive experience of management team • The CEO's choice of past companies has been questioned. • Management team still needs to be completed with COO, VP marketing, and CFO. • Need of new COO to turn company around • Management seems to lack sufficient resources in the area of business development. Need senior business development executive. • Weak management. Will get great management with new hires, investment conditional on this.
Questionable performance to date	2	4.8%	<ul style="list-style-type: none"> • Company is making losses and performing below plan • Bad debt problem, which significantly changed the profitability of the company, because of past business procedures.
Any of the above	26	61.9%	

C. Deal Terms: Valuation, contractual structure, syndicate and portfolio considerations

Explicit reason	N	%	Examples
High valuation	9	21.4%	<ul style="list-style-type: none"> • Even if price lower than some of competitors price still rather high, "reflecting the size and visibility of the markets company is addressing". • Are the financial model assumptions valid? • Is the valuation realistic? Price seems high. Are the financial projections realistic? • Relatively high valuation compared to past VC deals. • Valuation is on the high side for a start-up. VCs still believe it is reasonable due to the high calibre of the four founders. • High valuation because of competition between VCs to invest in deal.
Contractual structure and downside risk	8	19.0%	<ul style="list-style-type: none"> • Uncertainty about what the proper milestones should be. • Large amount of capital for a start-up enterprise. Will require strong management oversight. • Aggressive bank loan assumptions. Might require either slower expansion or more equity capital • What will the leverage be and what happens to leverage if the IPO is delayed? • Company has little in the way of underlying asset value and thus offers limited downside protection. VC will have to commit to deal without assurance that corporate partnership will materialize. • Company expects to need an additional \$3m in financing next year. No assets of value except for employees. • Need sufficient checks and balances regarding drawdown of funds
Negative influence of other investors	3	7.1%	<ul style="list-style-type: none"> • Lead VC will not have unilateral control, but have to reach agreement with 3 other VCs. • Previous investor (who is selling all shares to VCs) is anxious to get out at a deep discount • Company had discussions with other VC previously that decided not to finance deal (stated reason: the deal was too small for them – wanted to put in at least \$20m)
Costly to monitor investment	9	21.4%	<ul style="list-style-type: none"> • Long distance relationship risk in high-tech/engineering development project (R&D is done in Israel) • Complicated legal and financial due diligence • Need sufficient checks and balances regarding drawdown of funds • May require too much time from VC. • Geographical risk – California corporate and overseas R&D • CEO/founder has a strong desire for acquisitions. VCs have to devote substantial time to evaluate these. • Involvement of one of the investors as chairman and interim CEO, (replacing founder) is critical to success. • Have to ensure active involvement of one of VC investors as chairman.
Any of the above	22	52.4%	

D. Financial and exit conditions.

Explicit reason	N	%	Examples
Financial market conditions and exit opportunities	3	7.1%	<ul style="list-style-type: none"> • What will the leverage be and what happens to leverage if the IPO is delayed? • Would maybe be better to sell company • Financial market and political fluctuations.

Table 4
Types of Venture Capitalist Analyses

Types of analyses made by venture capitalists for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

	<u>Number of obs.</u>	<u>% of obs.</u>
Investment thesis	42	100.0
Risks / Uncertainties	40	95.2%
Market	39	92.9%
Technology	18	42.9%
Customers / Adoption	26	61.9%
Competition	37	88.1%
Management	41	97.6%
Financial projections	20	47.6%
Exit	27	64.3%

Table 5
Market Analyses

Description of portfolio company target market for analyses of investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

	<u>Mean</u>	<u>Median</u>	<u>Min</u>	<u>Max</u>	<u>N</u>
Market Size (\$ billions)	25.1	6.5	0.06	151.3	32
	<u>N</u>	<u>%</u>			
Degree of Optimism Concerning Market					
Strong	27	64.2%			
Not Strong	12	28.6%			
No analysis	3	7.1%			
Due Diligence Sources					
Sources known	17	40.5%			
Types of sources:					
Other VC portfolio companies					
Hired independent research/consulting firms					
Existing industry surveys, academic studies					
Conducted own market surveys					
Interviewed potential customers and industry participants.					
Interviewed investment bank analysts					
Company estimates					

Table 6
Technology Analyses

Description of portfolio company technology analyses of investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

	<u>N</u>	<u>%</u>
Degree of Optimism Concerning Technology		
Strong (no or low risk)	7	16.7%
Not Strong (medium or high risk)	11	26.2%
No analysis	24	57.1%
Out of which:		
Not technology based venture	22	52.4%
Technology based venture	2	4.8%
Due Diligence Sources		
Sources known	6	14.3%
Types of sources:		
Other VC portfolio companies		
Hired independent research firm		
Industry/technical reports		
Interviewed potential customers		
Interviewed various experts/analysts		

Table 7
Customer / Adoption Analyses

Description of portfolio company customer / adoption analyses for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

	<u>N</u>	<u>%</u>
Degree of Adoption Concern		
Small	15	35.7%
Strong/Some	11	26.2%
No analysis	16	38.1%
Due Diligence Sources		
Sources known	12	37.5%
Types of sources:		
Other VC portfolio companies		
Hired independent research firm		
Industry/technical reports		
Interviewed potential customers, own sales calls		
Interviewed various experts/analysts		
Own law firm		

Table 8
Competitor Analyses

Description of portfolio company technology competitors for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

	<u>N</u>	<u>%</u>
Degree of Competitive Concern		
Small	17	40.5%
Strong/Some	20	47.6%
No analysis	5	11.9%
Due Diligence Sources		
Sources known	10	23.8%
Types of sources:		
Due diligence calls with competitors, industry participants		
Technical and marketing materials from competitors		
Articles/reports		
Interviews with industry experts		
Articles/reports		
Hired consulting firm		
Research of intellectual property rights		
Other VC portfolio companies		

Table 9
Management Team Analyses

Description of management team analyses for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

	<u>N</u>	<u>%</u>
Quality of Management Team		
Strong	17	40.5%
Neutral	21	50.0%
Weak	3	7.1%
No analysis	1	2.4%
Sources known	16	38.1%
Types of sources:		
Customer interviews		
Interviews with previous business acquaintances of management.		
Interviews with industry experts		
VC knows founder from before		
Other VC portfolio companies		

Table 10
Company financial forecasts

Description of VC and management financial forecasts at the time of investment for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

	1 year before inv.			1 st year after inv.			2 nd year after inv.			3 rd year after inv.			4 th year after inv.		
	mean	median	(N)	mean	median	(N)	mean	median	(N)	mean	median	(N)	mean	median	(N)
<u>All VC projections</u>															
Expected Sales (\$MM)	4.8	0.2	(26)	12.5	6.8	(20)	29.9	23.3	(19)	54.9	40.5	(19)	68.4	62.6	(18)
Expected EBIT (\$MM)	-1.0	-0.2	(24)	-1.9	-0.7	(14)	-0.3	0.6	(14)	3.2	2.6	(14)	8.6	6.3	(14)
<u>All Management projections</u>															
Expected sales (\$MM)	4.8	0.2	(26)	12.8	5.0	(27)	26.1	16.8	(24)	51.5	38.9	(23)	92.3	79.3	(21)
Expected EBIT (\$MM)	-1.0	-0.2	(24)	-2.0	-1.3	(26)	0.1	0.4	(23)	5.9	4.1	(22)	15.0	10.4	(19)
<u>Observations with both Management and VC projections</u>															
<u>(A) VC projections</u>															
Expected Sales (\$MM)	1.4	0.0	(12)	12.7	6.8	(12)	31.0	22.7	(12)	60.1	39.3	(12)	70.9	60.2	(9)
Expected EBIT (\$MM)	-0.5	0.0	(11)	-2.5	-1.5	(10)	-0.9	-0.5	(10)	3.5	3.1	(10)	7.1	6.0	(9)
<u>(B) Management projections</u>															
Expected Sales (\$MM)	1.4	0.0	(12)	8.8	4.0	(12)	29.4	22.4	(12)	55.4	46.4	(12)	102.7	79.3	(9)
Expected EBIT (\$MM)	-0.5	-0.0	(11)	-2.5	-2.8	(10)	-0.1	0.6	(10)	5.6	3.1	(10)	17.6	21.7	(9)

Table 11
Exit strategies

Venture capitalist (VC) holding periods and exit strategies anticipated at the time of investment for for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

Anticipated exit strategy	Number (%) of observations		Anticipated time to exit			
			Mean	Median	Min	Max
Sale main alternative	6	(22.2%)	3.0	3.0	1.0	4.0
IPO main alternative	21	(77.7%)	3.5	3.0	2.0	5.0
Total	27	(100.0%)	3.4	3.0	1.0	5.0

Table 12
Venture Capitalist Actions

Venture capitalist (VC) actions before investment and anticipated at the time of investment for for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999.

	<u>% of companies (N)</u>
<u>Management</u>	
VC active in recruiting or changing management team before investing	14%
VC expects to be active in recruiting or changing management team after investing	50%
<u>Strategy / Business Model</u>	
VC explicitly active in shaping strategy / business model before investing	%
VC explicitly expects to be active in shaping strategy / business model after investing	%

Table 13
Relation Between Venture Capitalist Analyses and Contractual Terms

Relationship between venture capitalist (VC) analyses and contractual terms for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999. Contractual terms include pre-investment company value, ratio of automatic conversion value to round value, use of staged investment commitment, use of contracts contingent on performance, VC percentage of company cash flow rights, difference between founder best and worst case equity stake, VC voting control, and VC board control. Venture capitalist analyses include VCs' appraisal of market, management, competition, customer adoption, and key risks. Asterisks indicate significant differences using a Mann-Whitney test at: 1% ***; 5% **, and 10% * levels.

	Pre-investment Company value, \$MM			Automatic Conversion / Round Price			Staged Investment Commitment			Contingent contracting on cash flow or control		
	Mean	Median	N	Mean	Median	N	% Yes	% No	N	% Yes	% No	N
Overall	14.2	8.7	41	4.1	3.0	34	39.0	61.0	41	41.5	58.5	41
Appraisal of Market												
Market Attractive	13.3	8.7	27	3.5	3.0	23	37.0	63.0	27	40.7	59.3	27
Market Neutral	16.2	10.2	11	5.1	3.7	8	45.5	54.5	11	54.5	45.5	11
Appraisal of Management												
Management Strong	15.8	10.3	17	3.4	3.0*	12	41.2	52.8	17	23.5	76.5*	17
Management Neutral / Weak	13.6	7.6	23	5.6	4.6*	10	39.1	60.9	23	56.5	43.5*	23
Appraisal of Competition												
Weak	9.7	6.4**	16	3.8	3.0	12	25.0	75.0	16	43.8	56.2	16
Strong / Some	18.0	11.5**	20	4.0	3.0	18	56.2	43.8	20	45.0	55.0	20
Key Risks												
Market Size	18.4	10.8	14	4.7	3.0	11	78.6	21.4***	14	64.3	35.7*	14
Technology	11.9	5.4	13	4.1	3.0	10	15.4	84.6*	13	23.1	76.9	13
Strategy	13.7	10.3	20	4.6	3.6	17	45.0	55.0	20	50.0	50.0	20
Customer Adoption	11.1	9.2	10	5.5	3.0	9	20.0	80.0	10	20.0	80.0	10
Competition	16.1	11.1	16	4.4	3.5	14	37.5	62.5	16	50.0	50.0	16
Management	15.2	11.0	25	4.3	3.5	21	56.0	44.0**	25	60.0	40.0***	25
Valuation	16.6	11.0	9	3.5	3.1	8	44.4	63.5	9	55.6	44.4	9
Investment structure	16.4	11.0	8	4.0	4.0	7	75.0	25.0*	8	62.5	37.5	8

Table 13, Continued
Relation Between Venture Capitalist Analyses and Contractual Terms

	VC cash flow rights, %			Founder (best case - worst case) equity %			VC voting control			VC board control		
	Mean	Median	N	Mean	Median	N	% Yes	% No	N	% Yes	% No	N
Overall	50.1	49.2	41	7.3	1.4	41	61.9	35.7	41	37.5	62.5	40
Appraisal of Market												
Market Attractive	48.4	46.5	27	6.8	2.4	27	63.0	37.0	27	33.3	66.7	27
Market Neutral	55.5	63.2	11	7.6	0.0	11	63.6	36.4	11	40.0	60.0	10
Appraisal of Management												
Management Strong	51.4	58.6	17	11.6	2.7	17	64.7	35.3	17	41.2	58.8	17
Management Neutral / Weak	49.4	46.9	23	4.6	1.4	23	60.9	39.1	23	36.4	63.6	22
Appraisal of Competition												
Weak	52.2	52.4	16	6.4	0.1	16	62.5	37.5	16	30.0	70.0	15
Strong / Some	47.8	47.8	20	7.1	2.8	20	60.0	40.0	20	33.3	66.7	20
Key Risks												
Market Size	58.4	63.8**	14	13.4	10.0**	14	71.4	28.6	14	53.8	46.2	13
Technology	40.9	35.3**	13	7.6	2.4	13	46.2	53.8	13	30.8	69.2	13
Strategy	51.3	59.1	20	8.9	3.6	20	65.0	35.0	20	30.0	70.0	20
Customer Adoption	50.8	46.7	10	6.1	2.6	10	60.0	40.0	10	30.0	70.0	10
Competition	48.1	46.7	16	11.8	6.9	16	56.2	43.8	16	31.2	68.8	16
Management	55.9	60.2***	25	6.3	1.4	25	76.0	24.0*	25	50.0	50.0*	24
Valuation	55.7	61.1	9	4.5	1.4	9	77.8	22.2	9	22.2	77.8	9
Investment structure	60.5	64.6*	8	12.5	14.5*	8	87.5	12.5	8	62.5	37.5	8

Table 14
Relation Between Venture Capitalist Analyses and Contractual Terms: Regression analyses

Relationship between venture capitalist (VC) analyses and contractual terms for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999. Contractual terms include pre-investment company value, ratio of automatic conversion value to round value, use of staged investment commitment, use of contracts contingent on performance, VC percentage of company cash flow rights, difference between founder best and worst case equity stake, VC voting control, and VC board control. Venture capitalist analyses include VCs' appraisal of market, management, competition, customer adoption, and key risks. Asterisks indicate significant regression coefficients at: 1% ***; 5% **, and 10% * levels.

	Pre-investment Company Value (OLS)				Automatic Conversion / Round Price (OLS)				Staged Investment Commitment (Probit)				Contingent contracting on cash flow or control (Probit)			
	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.
Constant	37.18	2.60**	15.48	2.59**	8.83	3.08***	3.82	3.71***	-1.05	-0.77	-0.97	-1.58	2.58	1.77*	-1.17	-1.91*
Market Assessment Strong	-5.81	-1.10			-1.81	-1.70			-0.14	-0.28			-0.59	-1.15		
Management Assessment Strong	1.28	0.26			-0.70	-0.72			-0.13	-0.29			-1.10	-2.24**		
Weak Competition Assessment	-9.75	-2.02**			-0.54	-0.57			0.86	1.88*			-0.11	-0.23		
Market Size Risk			8.49	1.51			1.37	1.36			1.67	2.66***			0.53	1.00
Technology Risk			-1.60	-0.27			-0.66	-0.62			-0.37	-0.59			0.08	0.13
Strategy Risk			-6.99	-1.27			-1.42	-1.39			-0.68	-1.04			-0.05	-0.09
Customer Risk			-5.78	-0.97			2.01	1.89*			-0.24	-0.36			-0.93	-1.37
Competition Risk			4.48	0.86			0.06	0.06			-0.32	-0.58			0.30	0.59
Management Risk			-2.70	-0.47			0.30	0.31			0.80	1.40			1.14	1.98*
Valuation Risk			6.19	0.96			-0.21	-0.18			0.28	0.38			0.41	0.64
Investment Structure Risk			-1.41	-0.22			0.17	0.14			0.66	0.93			-0.02	-0.04
Adjusted R-squared	0.05		-0.09		0.02		0.03									
Number of observations	34		41		27		33		34		41		34		41	

Table 14, Continued
Relation Between Venture Capitalist Analyses and Contractual Terms: Regression analyses

	VC cash flow rights, % in best case (OLS)				Founder (best case - worst case) equity % (OLS)				VC voting control (Probit)				VC board control (Probit)			
	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.
Constant	0.514	2.416**	0.44	6.28***	0.04	0.28	0.05	1.14	0.33	0.25	-0.02	-0.04	-0.46	-0.33	-0.59	-0.97
Market Assessment Strong	-0.05	-0.60			-0.02	-0.35			0.05	0.10			0.02	0.03		
Management Assessment Strong	0.02	0.32			0.06	1.30			-0.00	-0.01			-0.12	-0.26		
Weak Competition Assessment	0.03	0.39			-0.02	-0.24			-0.07	-0.16			0.12	0.26		
Market Size Risk			0.08	1.22			0.11	2.65**			-0.38	-0.56			0.44	0.71
Technology Risk			-0.07	-1.00			0.02	0.39			-0.27	-0.47			-0.14	-0.22
Strategy Risk			-0.05	-0.82			0.02	0.43			-0.28	-0.52			-1.05	-1.53
Customer Risk			0.10	1.46			-0.03	-0.72			0.56	0.97			0.29	0.49
Competition Risk			-0.12	-1.94**			0.11	2.81***			-1.32	-1.90*			-1.23	-1.76*
Management Risk			0.13	1.89*			-0.11	-2.56**			1.38	1.97*			1.63	2.01**
Valuation Risk			0.05	0.69			-0.02	-0.50			0.49	0.73			-0.53	-0.74
Investment Structure Risk			0.09	1.14			0.04	0.88			1.43	1.50			0.54	0.75
(Pseudo) R-squared	0.02		0.19		-0.04		0.24									
Number of obs.	34		41		34		41		34		41		34		41	

Table 15
Relation Between Venture Capitalist Analyses and Subsequent Performance

Relationship between venture capitalist analyses and subsequent performance for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999. Performance is measured as of July 31, 2000. Venture capitalist analyses include VCs' appraisal of market, management, competition, customer adoption, and key risks. Asterisks indicate significant differences between groups at: 1% ***; 5% **, and 10% * levels.

	IPO	Sale	Private	Liquidated	N	All outcomes: (Kruskal-Wallis χ^2 -test) χ^2 -stat. P-val.		IPO vs. no IPO: (Mann-Whitney test) Z-test P-val.	
Overall	10 (24%)	3 (7%)	28 (67%)	1 (2%)	42				
Appraisal of Market									
Market Attractive	7 (26%)	1 (4%)	19 (70%)	0 (0%)	27	4.49	0.21	0.29	0.82
Market Neutral	3 (25%)	2 (17%)	6 (50%)	1 (8%)	12				
Appraisal of Management									
Management Strong	6 (35%)	1 (6%)	10 (59%)	0 (0%)	17	3.44	0.32	2.43	0.02**
Management Neutral / Weak	3 (13%)	2 (8%)	18 (75%)	1 (4%)	24				
Appraisal of Competition									
Weak	1 (6%)	2 (12%)	14 (82%)	0 (0%)	17	5.77	0.06*	1.90	0.15
Strong / Some	8 (40%)	1 (5%)	11 (55%)	0 (0%)	21				
Key Risks									
Market Size	3 (20%)	2 (13%)	10 (67%)	0 (0%)	15	1.90	0.59	0.20	0.84
Technology	1 (8%)	1 (8%)	11 (85%)	0 (0%)	13	3.34	0.34	0.52	0.69
Strategy	1 (5%)	3 (14%)	17 (81%)	0 (0%)	21	11.41	0.01***	2.70	0.01***
Customer Adoption	3 (30%)	1 (10%)	6 (60%)	0 (0%)	10	0.74	0.86	0.11	0.94
Competition	5 (29%)	2 (12%)	10 (59%)	0 (0%)	17	2.12	0.55	0.10	0.92
Management	6 (23%)	2 (8%)	17 (65%)	1 (4%)	26	0.66	0.88	0.30	0.77
Valuation	1 (11%)	1 (11%)	7 (78%)	0 (0%)	9	1.48	0.69	1.29	0.32
Investment Structure	2 (25%)	0 (0%)	5 (62%)	1 (12%)	8	4.87	0.18	0.25	0.86

Table 16
Relation Between Venture Capitalist Analyses and Subsequent Performance:
Multivariate Analysis

Probit regressions of variables from venture capitalist analyses on the probability of company going public by 7/31/2000 for investments in 42 portfolio companies by 10 venture capital partnerships. Investments were made between 1987 and 1999. Performance is measured as of July 31, 2000. Venture capitalist analyses include VCs' appraisal of market, management, competition, customer adoption, and key risks. Asterisks indicate significant regression coefficients at: 1% ***; 5% **, and 10% * levels.

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.
Constant	0.54	0.34	0.57	1.03	0.49	0.29	0.94	1.44	-2.13	-1.67	3.10	2.12	-2.14	-1.78		
Market Assessment Strong	-0.47	-0.73			-0.47	-0.72										
Management Assessment Strong	1.35	2.28**			1.36	2.27**			1.88	2.38**			1.82	2.61***		
Weak Competition Assessment	-1.76	-2.51**			-1.77	-2.49**					-1.16	-1.34				
Market Size Risk			0.47	0.76			0.47	0.75	0.48	0.71	-0.32	-0.24	0.38	0.57		
Technology Risk			-0.89	-1.57			-0.81	-1.42	-0.58	-0.85	-2.03	-1.95*	-0.84	-1.26		
Strategy Risk			-1.53	-2.67***			-1.49	-2.49**	-2.08	-2.42**	-2.57	-2.69***	-2.11	-2.66***		
Customer Risk			-0.23	-0.38			-0.19	-0.32	-0.52	-0.75	0.85	1.00	-0.47	-0.59		
Competition Risk			0.09	0.15			0.53	0.75	1.55	1.41			0.79	1.08		
Management Risk			-0.30	-0.50			-0.46	-0.73			-1.27	-1.47				
Valuation Risk			-0.57	-0.72			-0.85	-0.96	-0.65	-0.57	-1.22	-0.90	-0.58	-0.52		
Investment Structure Risk			-0.55	-0.73			-0.44	-0.56	-0.91	-0.79	0.91	0.64	-0.46	-0.42		
First VC financing round					0.06	0.09	-0.77	-1.19	-1.33	-1.40	0.01	0.01				
Investment made 1998 or later													-0.18	-0.25		
Investment made 1997													-1.63	-1.40		
Number of obs.	35		42		35		42		41		37		41			