

**More than Just Money: The Impact of Traditional and Corporate Venture Capital Firms  
on Portfolio Company Performance**

A Thesis

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## **Abstract**

In addition to initial financing, venture capital (VC) firms also provide other value-added contributions. Many VC firms and their portfolio companies consider these value-added contributions the most significant contributions VC firms make. The value-added contributions have been found to be different depending on whether the VC firm is a “traditional” VC firm or “corporate” venture capital (CVC) firm. Traditional VC and CVC firms have different investment objectives and possess different areas of expertise, leading to differences in the value-added contributions provided. The differences in the value-added contributions raise the question of whether the performance of portfolio firms is affected by the type of venture capital backer. This study seeks to 1) quantify the impact of VC-affiliation on portfolio firm performance, and 2) compare the differences in performance of VC and CVC firms’ portfolio companies.

The paper examines the financial performance, IPO valuation, and stock performance of VC-backed, CVC-backed, and independent companies in the 3-year period following an IPO. The years 1998, 1999, and 2002 (representing the height of the tech bubble and bear market of the early 2000s recession) were chosen as the sample period.

The results of the analysis indicate that VC-backed companies as a whole outperform independent companies in every aspect, confirming that the value-added contributions of VC firms help the performance of their portfolio companies. The performance of portfolio companies also differed depending on the type of their VC-backer. Traditional VC-backed portfolio companies had higher revenue growth and IPO valuations, while CVC-backed portfolio companies had higher net income growth and slightly better stock performance. Ultimately, the results confirm that VC firms improve portfolio company performance, and the impact of the VC firm’s value-added contributions differs depending on the type of VC-backing.

## **Table of Contents:**

<b>I.</b>	Introduction	<b>1</b>
<b>II.</b>	Literature Review	<b>2</b>
<b>III.</b>	Hypotheses	<b>7</b>
<b>IV.</b>	Methodology and Results	<b>9</b>
<b>V.</b>	Discussion	<b>13</b>
<b>VI.</b>	Implications for Entrepreneurs	<b>17</b>
<b>VII.</b>	Implications for Investors	<b>18</b>
<b>VIII.</b>	Limitations of Study and Implications for Future Research	<b>18</b>
<b>IX.</b>	Conclusion	<b>19</b>
<b>X.</b>	Appendix	<b>20</b>
<b>X.</b>	References	<b>25</b>

## **Introduction**

The venture capital industry is a significant driver of growth and innovation in the United States' economy. Many of today's largest and most admired companies were once funded by venture capitalists, such as Apple Inc, Cisco Systems, Google, and Yahoo. Many more smaller, lesser known companies were also once part of a venture capital firm's portfolio. Venture capital firms contribute to these companies' success not only through providing capital, but also through providing other services to ensure the new venture's survival and success (Hellman & Puri 2002; Barney et al 1996; Sapienza & Manigart 1996). These additional value-added contributions are considered to be most significant contributions by both the VC firms as well as entrepreneurs of new ventures.

The venture capital industry can be segmented into two distinct areas: "traditional" venture capital (VC) and "corporate" venture capital (CVC) (Gompers & Lerner 1999). Traditional venture capital firms are typically organized as private partnerships, seek to maximize financial returns, and obtain funds from third party investors. Corporate venture capital firms are typically subsidiaries of corporations, seek to meet strategic as well as financial goals, and invest funds from the corporate parent (National Venture Capital Association).

Based on the distinction between VC and CVC firms, recent research has focused on developing theoretical bases for determining the sources of value-added contributions to portfolio firms (Maula 2001), as well quantitatively assessing different metrics of VC firms and portfolio companies, such the resource-bases, value-added contributions, objectives, investment areas, and firm performance (Maula et al 2001; Maula et al 2005; Markham 2005; Gompers & Lerner 1999; Bygrave & Timmons 1992). Such prior research has indicated that the two types of firms differ in the types of resources available to portfolio companies, the effectiveness at

different value-added contributions, and success in liquidation events.

This study will build upon the existing research in the field through two areas. First, the study seeks to quantify the value-added contributions of venture capital firms on the performance of portfolio companies. Second, the study seeks to examine if there is a difference in the impact on the performance of portfolio companies depending on whether the VC firm is a traditional VC firm or CVC firm. The prior literature in this area will be reviewed to develop a theoretical basis, and a quantitative approach will then be developed to assess portfolio company performance, utilizing post-IPO financial performance, IPO valuation, and stock performance as comparison metrics. Finally, the implications of the results will be discussed.

### ***Distinguishing Features between Venture Capital and Corporate Venture Capital***

	<u>Venture Capital</u>	<u>Corporate Venture Capital</u>
Organization	Private partnerships; VC as general partner, investors as limited partners	Subsidiaries of larger corporations
Investment objective	Primarily financial return	Primarily strategic objectives
Source of funds	Investors	Corporate parent

## **Literature Review**

### *Value-Added Contributions of Venture Capitalists*

Given the impact a venture capitalist can have on the growth and development of new ventures, significant amounts of research on the venture capital industry has focused on identifying and understanding the value-added contributions of venture capitalists beyond pure financial support.

The key contribution of venture capitalists is typically thought to be the financial resources invested in the new venture (Gompers & Lerner 1999). Although it is true that venture capitalists play a key role as the agent transferring capital from institutions with capital to entrepreneurs in search of capital, venture capitalists also provide additional value-added

contributions in addition to purely financial support (Hsu 2004, Bygraves & Timmons 1992).

Venture capitalists are often actively involved in the enterprises in which they invest, offering guidance, know-how, industry contacts, and other such support. Serving as advisors to the new venture enables the venture capitalist to play the role of sounding board, marketing expert, management recruiter, and industry contact, among others. Lee et al (2004) found that linkage to venture capital firms had a significant positive effect on startup performance. Lindsey (2002) found that portfolio companies with a shared venture capital investor were more likely to form strategic partnerships and exchange technical and market information, highlighting the role of the venture capitalist as an information mediator. Bygraves & Timmons (1992) noted that entrepreneurs often saw their venture capital investors as objective outsiders with a depth of knowledge and experience in the industry and market, and utilized this role to test the reality of their business plans and ideas. Sapienza & Manigart (1996) found that VC firms typically believed their strategic involvement and networking center as the most important roles they served. Both Bygraves & Timmons (1992) and Hellman & Puri (2002) noted the role of the venture capitalist in recruiting knowledgeable management.

However, the effectiveness of VC firms was found to be different depending on industry, as Lee et al (2001) found a positive effect on technology companies while Brau et al (2004) failed to find significant differences between VC and non-VC backed manufacturing companies. Barney et al (1996) found that the optimal level of VC activity depended upon the extent to which a portfolio company valued the VC's input. Stuart et al (1999) documented the certification effect of venture capitalists, noting that affiliation with a VC firm provided legitimacy to the products of relatively unknown new ventures. Hsu (2004) sought to quantify the value of this type of venture capital support, finding that entrepreneurs were willing to accept

lower valuations of their startup in order to become affiliated with more reputable VC firms in order to access their resources and certification from being affiliated with them.

### *Corporate Venture Capital versus Traditional Venture Capital*

With the growing influence of corporate venture capital, more research in the venture capital field has begun to examine this segment of the industry. Research in the field has covered the structure of the industry, the objectives and effectiveness of CVC activity, and the value-added contributions of CVC. Hardyman et al (1983) wrote of the early cases of CVC failure. Gompers & Lerner (1999) examined the firm structure of different periods of CVC investment activity, finding that high failure rates among original CVC firms were due to a lack of well-defined missions, inadequate corporate commitment, and poor compensation schemes. Newer CVC firms have tended to be more focused in their investment area, mainly firms in the high-tech industries in the development stage.

Markham et al (2005) discussed the role that external investments play in bringing new technologies into the parent corporation. Markham et al (2005) argued that such investments were mainly strategic moves to acquire new technologies, support the growth of business, and acquire greater financial and market information. Alvarez & Barney (2001) examined the relationship between entrepreneurs and CVC firms from the perspective of the entrepreneur, arguing that such alliances can create economic value for both parties, but in the long run such value can become appropriated by the larger firm. The most value-creation exists when there are complementary resources between the entrepreneur and corporation. Knyphausen-Aufseß (2002) argued that different types of CVC firms relied on different resource bases, finding that technology-based CVC firms provided the most value due to the significant resources invested in R&D and expertise in their respective technological fields. Maula (2001) examined the value-

added contributions of CVC firms to technology start-ups, identifying resource acquisition, knowledge-acquisition, and endorsement benefits as the primary value-adding mechanisms.

Maula (2001) also argued that CVCs possessed greater R&D resources, technological knowledge and expertise, and credibility in endorsing the technological and commercial quality of technology ventures than traditional venture capital firms.

#### *Differences in Value-Added Contributions*

Given the previous literature on the venture capital industry and the recent research on corporate venture capital, a natural progression is to draw comparisons between the two segments, their performance, and the performance of their portfolio companies. Maula et al (2005) sought to compare the value-added contributions of VC and CVC investors, theorizing that the financial, social, and knowledge resources of the firms influenced the nature and quality of value-added contributions. Maula et al (2005) found that the resources possessed by the venture capital firms were different but complementary, resulting in better quality of value-added effectiveness when both types were present in a portfolio company.

VC firms were found to be superior in many of the traditional services provided by venture capitalists, such as arranging financing, recruiting key employees, advising on competition, and developing the organizational resources of the firm. Such contributions were termed “enterprise nurturing,” or helping a new venture avoid mistakes to which new businesses are vulnerable. Corporate venture capital firms were found to be better at “commerce building” activities, focusing on revenue generating activities such as attracting foreign customers, developing distribution channels, stimulation of business from initial orders, as well as technological support through the support of the parent corporation’s R&D resources as well as certification from an established market player (Maula et al 2005, Knyphausen-Aufseb 2002).



### *Literature Summary*

The literature on the venture capital industry shows that there are significant value-added contributions made by venture firms outside of mere financing, and there are also differences between traditional venture capital and corporate venture capital firms. Three key aspects where traditional venture capital and corporate venture capital firms differ are: 1) investment objectives, 2) firm resources, and 3) value-added contributions. The differences in venture capital and corporate venture capital firms in these areas are summarized in following table.

#### ***Summary of Differences in Resources and Value-Added Contributions***

	<u>Venture Capital</u>	<u>Corporate Venture Capital</u>
Investment Objective	Primarily financial return	Primarily strategic objectives
Firm Resources	1. Strong network within financial markets 2. Broad network in multiple industries 3. Contacts with similar or complementary ventures with VC firm's portfolio 4. Extensive experience in developing competitive position in new market	1. Support of parent corporation's R&D capabilities 2. Specific industry and technological expertise 3. Strong network within industry 4. Recognized reputation within industry
Value-added Contributions	1. Better at strategic planning and advising on competition 2. More effective at management recruiting 3. More effective at obtaining additional financing 4. Developing the organizational resources of the firm	1. Reputation effects resulting from cooperation with an established player 2. Stimulation of business by initial orders 3. Access to distribution channels 4. Development of products/services 5. Arrangement of industry relationships

Given the evidence of the value-added contributions of VC firms, and the differences in investment objectives, firm resources, and value-added contributions between traditional VC and CVC firms, how does this affect the performance of portfolio companies? Thus, this study will examine two main issues:

1. Quantifying the impact of a VC firm's value-added contributions on portfolio company performance
2. Quantifying the differences of traditional VC and CVC firm's valued-added contributions on portfolio company performance

Three metrics were chosen to measure the impact of venture capital firms. Financial performance post-IPO, i.e. revenues and net income, examine the business performance and success of a portfolio company. IPO valuations examine the market's evaluation of the new venture. Stock returns measure the market performance of portfolio companies.

## **Hypotheses**

There are two general hypotheses that were formed regarding the performance of VC-backed portfolio companies. First, as the venture capitalist's role is not solely limited to providing financing to a new venture, but also to help the new venture grow and succeed as a company, the value-added contributions of a VC firm should enable a portfolio company to perform better than independent companies without VC-backing. Second, given the differing investment objectives, firm resources, and value-added contributions of VC and CVC firms, such differences should be reflected in the performance of their portfolio companies. Based on these two general hypotheses, two sets of hypotheses have been developed, comparing VC-backed portfolio companies to independent companies, and comparing traditional VC-backed portfolio companies to CVC-backed portfolio companies.

The first set of hypotheses examines the performance of VC-backed portfolio companies compared to independent companies. Because of the value-added contributions of the venture capital firms, and the resources that portfolio companies can draw upon, the performance of VC-backed portfolio companies should exceed that of independent companies in all aspects. Thus:

***H1:** VC-backed portfolio companies will have higher revenue growth post-IPO than independent portfolio companies.*

***H2:** VC-backed portfolio companies will have higher net income growth post-IPO than independent portfolio companies.*

*H3: VC-backed portfolio companies will have a higher IPO valuation, based on price-to-sales valuation ratio.*

*H4: VC-backed portfolio companies will have higher stock returns post-IPO than the overall market.*

The second set of hypotheses compares the performance of VC-backed portfolio companies and CVC-backed portfolio companies. In examining a CVC firm's investment objectives, the CVC firm is primarily concerned with strategic objectives, and will concentrate resources to activities that help achieve those objectives, such as R&D, developing customer bases, or distribution channels. The resources controlled by CVC firms contribute to activities that enable commerce-building, or the ability to develop revenue streams. The value-added contributions of CVC firms further enable revenue growth, as CVC firms can provide technical advice, access to distribution channels, and certification of portfolio companies from an established industry player. Thus, the focus on commerce-building activities should enable CVC-backed portfolio companies to achieve faster revenue and net income growth than VC-backed portfolio companies.

*H5: CVC-backed portfolio companies will have higher revenue growth post-IPO than traditional VC-backed portfolio companies.*

*H6: CVC-backed portfolio companies will have higher net income growth post-IPO than traditional VC-backed portfolio companies.*

VC firms have a different set of investment objectives. VC firms seek to achieve the highest financial return, usually through an IPO or sale of the portfolio company. Thus, a VC firm's resources and contributions are geared towards this particular goal. Such resources include a VC firm's strong connection to the financial markets, and contributions include the nurturing

of new ventures to a liquidation event. Thus, this focus on achieving financial returns should enable VC-backed portfolio companies to achieve higher IPO valuations and P/S valuation ratios than CVC-backed portfolio companies.

*H7: Traditional VC-backed portfolio companies will have better IPO valuations as shown by IPO P/S ratio than CVC-backed portfolio companies.*

As CVC-backed portfolio companies are expected to have greater sales and net income growth, as well as relationships with established corporations, a portfolio of CVC-backed portfolio companies should have lower volatility in stock price than a portfolio of VC-backed portfolio companies. Consequently, a portfolio of VC-backed portfolio companies should have higher risk (beta) and returns (alpha) than a portfolio of CVC-backed portfolio companies.

*H8: A portfolio of traditional VC-backed portfolio companies will have higher risk (beta) and higher returns above market (alpha) than a portfolio of CVC-backed portfolio companies.*

## **Methodology and Results**

### *Methodology*

In order to test the proposed hypotheses, a quantitative approach was utilized. First, a sample of companies that went public in a specified time period was built, and revenue, net income, IPO valuation, and stock data was collected for each sample. Three different sources were used to obtain the data: 1) Hoover's Online database for IPO and financial data, 2) SEC filings for pre-IPO shareholder information, and 3) Yahoo! Finance for historical stock prices. The years 1998, 1999, and 2002 were chosen as the time period to obtain samples from the technology bubble period of the late 1990s as well as the bear market in the early 2000s. For each sample, the company's IPO offer and closing prices, 3-year revenues, 3-year net income,

principal pre-IPO stockholder, industry, and 3-year weekly stock prices were recorded. The 3-year time horizon was chosen to try to capture company performance while the venture capitalist's influence was still present in the company.

In order to identify companies as either VC-backed or CVC-backed, the pre-IPO stockholder data in the prospectus filed with the SEC was examined. VC-backed companies were defined as having a private partnership investment firm that focused on seed or early stage investments as the largest pre-IPO shareholder. CVC-backed companies were defined as either having the venture capital arm of a corporation as the largest pre-IPO shareholder, or having a corporation as the largest pre-IPO shareholder and a VC-firm as the second-largest pre-IPO shareholder. Companies that did not fall under one of the above categories were classified as either independent (independent company IPO without venture capital affiliation) or other (subsidiary spinoff, foreign company listing in the US, etc).

The time frame of 1998, 1999, and 2002 yielded 600 total observations. Of the total sample, 131 companies were identified as VC-backed, 46 companies were identified as CVC-backed, 251 companies were identified as independent, and 172 companies were identified as other. Computer software companies composed the largest percentage of both VC and CVC-backed companies, at 32% and 17%, respectively. The computer hardware, telecommunications, and pharmaceutical/biotech sectors were also heavily represented. Tables 1 and 2 provide a summary of the data.

### *Results*

Four measures were calculated to test the hypotheses: 1) 3-year revenue growth, 2) 3-year net income growth, 3) IPO price/sales valuation at the first day closing price, and 4) 3-year stock

performance.

Three-year revenue growth was measured as the compound average growth rate of revenues in the three years following the IPO. Similarly, three-year net income was calculated as the compound average growth rate following the IPO. The price-to-sales ratio is a measurement of how highly the company was valued at the IPO event, calculated by dividing the closing price on the date of the IPO by revenue/share. Weekly stock returns were calculated using the adjusted weekly closing price for the three year period following the IPO.

For each portfolio of companies in the entire VC-backed, traditional VC-backed, CVC-backed, or independent categories, a 95% confidence interval was used to remove outliers from each of the measurements. The remaining samples were used to calculate the mean, median, and standard deviation for each measure. The stock information for the independent portfolio was not calculated, as stock performance is being compared to the market. Table 3 summarizes the results of the analysis.

In order to compare performance across the different portfolios, a parametric t-test was utilized to compare the difference in means. The first set of comparisons created examined the difference between the entire VC-backed portfolio versus the independent company portfolio for 3-year revenue growth, 3-year net income growth, and P/S ratio.

The resulting analysis indicated that there is a significant difference in performance between VC-backed portfolio companies and independent companies. VC-backed companies experienced over double the revenue growth of independent companies, at 56.6% CAGR compared to 25.9% CAGR, respectively. Additionally, VC-backed companies also grew profits quicker than independent companies, averaging 6% CAGR compared to -26.5% CAGR. VC-backed companies were valued much higher in an IPO event, with a 42.3x P/S multiple

compared to 14.5 P/S multiple. The analysis is presented in Table 4.

The stock returns of the VC-backed portfolio were also higher than the S&P 500. In the three periods of 1998, 1999, and 2002, investing in a portfolio of venture-backed companies would have outperformed the market by over 5%, though at significantly higher risk (1.59 beta vs. 1.00 beta). Table 5 summarizes the stock analysis.

Each of the first four proposed hypotheses was confirmed by the results of the analysis. In terms of post-IPO financial performance, IPO valuation, and stock performance, venture capital-backing increases the performance of the portfolio company, outperforming independent companies that did not have venture capital backing. Thus, this analysis confirmed the belief that VC-firms add value to their portfolio companies.

Consequently, the next step was to examine the differences within the venture capital portfolio, between traditional VC-firms and CVC-firms. The next set of comparisons examines 3-year revenue growth, 3-year net income growth, IPO price/sales ratio, and stock return measures of the traditional VC-portfolio companies to CVC-portfolio companies.

The resulting analysis of the VC-backed portfolio and CVC-backed portfolio both supported and refuted the original hypotheses. The revenue growth of VC-backed portfolio companies was found to be significantly higher than CVC-backed portfolio companies, at 62.5% CAGR compared to 40.9% CAGR, respectively. However, CVC-backed portfolio companies did have significantly higher net income growth compared to VC-backed portfolio companies, at 46.5% CAGR compared to -0.5% CAGR. Additionally, the VC-backed portfolio had nearly twice the IPO P/S valuation than the CVC-backed portfolio, at 47.9x P/S multiple compared to 15.9x P/S multiple. This valuation is supported by the faster growth of the VC-backed portfolio's revenue growth, suggesting that the market is correct in assigning a higher P/S valuation to VC-

backed portfolio companies. Table 6 summarizes the comparison of VC-backed to CVC-backed portfolios.

In order to analyze the stock performance of the VC-backed and CVC-backed portfolios, two different methods were used. First, the VC-backed and CVC-backed portfolios were further segmented by year of IPO, creating two sub-portfolios in each category. Then, utilizing the weekly adjusted returns of each company and the weekly adjusted return of the S&P 500 in the same period, the beta and alpha of each stock was calculated. The average return, alpha, and beta for each portfolio were calculated, for both the overall portfolios and sub-portfolios. The results of this analysis are presented in Table 9.

Based on the analysis, there was no significant difference found in the stock performance between the VC-backed and CVC-backed portfolios. However, the analysis does not support the initial hypothesis that VC-backed companies have better stock performance, as the VC-backed portfolio actually had lower alpha and beta measurements than the CVC-backed portfolio. The year-to-year analysis indicated that there was a significant level of variance between the performance in the different years, and does not provide any conclusive evidence.

## **Discussion**

This paper sought to compare the differences in the performance in the portfolio companies of VC and CVC firms. Based on the differences between VC and CVC firms in their investment objectives, resources, and value-added contributions, it was hypothesized that these differences would translate into differences in the performance of portfolio companies. Thus, these hypotheses were tested by comparing performance in three areas: post-IPO financial performance, IPO valuation, and stock performance.

In general, the results of the analysis provide evidence both supporting and refuting the



original hypotheses. The analysis of the total VC-backed portfolio versus independent companies strongly supported the first set of hypotheses that venture-backed companies perform better than independent companies after becoming public and are valued higher at the IPO. The stock performance of the VC-backed portfolio also outperformed the market as a whole, though at a much greater risk level.

This suggests that venture capitalists do add value to their portfolio companies. The additional resources and other value-added contributions that venture capitalists provide enable their portfolio companies to develop revenue growth and net income faster than independent companies post-IPO. Venture capital backing also leads to significantly higher IPO valuations, nearly three times as high. This helps contribute to the stronger stock performance of the venture-capital backed portfolio.

This led to the comparison of the VC-backed and CVC-backed portfolios, seeking to determine if VC firms or CVC firms had different effects on their portfolio companies. It was hypothesized that the differences in each type of firms' investment objectives, available resources, and value-added contributions would lead to different levels of performance in their portfolio. The analysis resulted in evidence that supported two of the original hypotheses, while refuted the third.

Hypothesis 5 stated that CVC-backed portfolio companies would have faster revenue growth than VC-backed portfolio companies. However, the data did not support this hypothesis, as VC-backed companies had higher revenue growth than CVC-backed companies. There are a few possible explanations for this occurrence. One possible explanation is that the resources and value-added contributions that VC firms possess are more effective at generating revenue growth. VC firms typically have extensive experience in advising on developing competitive position in

a new market and are adept at strategic planning, as well as in the recruitment of management. It is likely that these contributions may help generate faster revenue growth than the contributions of CVC firms, the initial orders by the parent corporation and access to distribution channels. Another possible explanation is based on the firm's investment objective. As VC-firms' investment objective is to achieve financial returns, stronger revenue growth helps drive a higher valuation of a new company. Thus, VC firms may push revenue growth to achieve higher IPO valuations, whereas CVC firms may have more controlled growth to manage the bottom line.

This speculation was tested in hypothesis 6, that CVC-backed portfolio companies would have higher net income growth than VC-backed companies. The analysis presented very strong evidence supporting this hypothesis, with CVC-backed portfolio companies having much higher net income growth compared to VC-backed portfolio firms. This result suggests that CVC firms are more effective at managing and cutting operating costs than VC firms. This would make sense, as cost cutting is a more common activity in corporate settings, and the experience of cost cutting initiatives in the corporate parent could carry-over into the portfolio company.

Investment objective is again another possible contributing factor. As CVC firms invest for strategic purposes, the CVC firm would want to see a portfolio company reach a self-sufficiency point, where it can be either absorbed into the parent corporation, or serve as a supplier or customer in the future.

The results of the analysis of revenue and net income suggest that VC firms are more concerned with and more effective at growing the top line of a new venture. Conversely, the CVC firm is more concerned with and more effective at growing the bottom line.

The data also supported hypothesis 7, which stated that the VC-backed portfolio would have a higher IPO valuation. The price-to-sales ratio of the IPO closing price for each portfolio

showed a significant difference in the market valuation of the portfolio companies. The VC-backed portfolio had a P/S multiple of nearly 48x, while the CVC-backed portfolio had a multiple of 16x. The market's valuation of VC-backed companies was consequently much higher than CVC-backed companies. This valuation is supported by both theoretical and empirical evidence. It was hypothesized that VC firms would have more success at achieving a high IPO valuation due to their strong network in the financial market and investment goal of achieving the highest financial return. Additionally, the previous analysis of revenue growth also suggested that VC-backed companies have much faster revenue growth, and the P/S ratio would consequently be adjusted higher for the future growth. It is also interesting to note that the P/S multiple of independent companies was 14.5x, only slightly lower than the CVC portfolio, and the difference was not statistically significant. Thus, there is some evidence that CVC portfolio companies may be valued lower, closer to independent companies than traditional VC-firm portfolio companies.

Another possibility is the time period and industry groups that composed the samples had an effect on the data sample. As a large number of the data points were obtained from the year 1999, the excessive IPO valuation of the tech bubble could have affected the analysis. Similarly, a large number of the data samples were from the technology sector, which typically has higher multiples. This also could have affected the data analysis.

The results of the stock analysis were more inconclusive. While the average return, alpha, and beta for the CVC portfolio were higher than the VC portfolio, the difference was found to be insignificant. In examining the portfolio year by year, the CVC portfolio had greater returns than both the VC portfolio and market, but also greater losses than both the VC portfolio and the market in the down year. Given the results of the data analysis, no conclusive observation can be

made on the stock performance of the different portfolios.

### **Implications for Entrepreneurs**

For the entrepreneur, what do the results of this study mean? The resulting analysis suggests that having venture capital funding enables a new venture that goes public to have significantly enhanced financial performance and valuation. However, the analysis also suggested that the type of venture capital backing is significant as well. Choosing a traditional venture capital firm or a corporate venture capital firm can have a significant effect on how well the company performs operationally and in an initial public offering.

For entrepreneurs looking to achieve the highest financial return on their venture, accepting venture capital financing would enable the new venture to achieve the highest IPO valuation, especially with traditional venture capital firms. Although an entrepreneur's stake in the company would be diluted by having to sell part of the company to the venture capitalist, the increased valuation would still provide the entrepreneur with a higher return. A quick analysis using the average valuation of the data sample suggests that as long as the entrepreneur retains at least 35% of the venture, the increased P/S valuation will create a greater return in an IPO. (See Figure 1.) However, the increased valuation is achieved primarily by having traditional VC backing, as opposed to CVC backing.

However, entrepreneurs that are seeking to run the company long-term may be better served to seek corporate venture capital financing. Given that CVC-backed companies have lower IPO valuations, but higher net income growth, it is more likely that CVC-backed companies will have more successful long-term operational success.

## **Implications for Investors**

The stock analysis of VC-backed and CVC-backed portfolio companies indicate that investing in a VC-backed portfolio can possibly provide higher returns than the market as a whole. However, this additional gain is achieved through undertaking significantly more risk. As seen in the stock analysis, the VC-backed portfolio is sensitive to market conditions, and is much more volatile than the market. Similarly, further segmenting the portfolio by VC firms and CVC firms does not provide any additional returns or other advantages

Consequently, investing solely in VC-backed portfolio is not a sound investment strategy for individual investors. Instead, careful fundamental analysis of the companies provide a better indicator of success in the marketplace.

## **Limitations of Study and Implications for Future Research**

There are several limitations in the study that could have affected the results of the analysis. The chosen years for the analysis, 1998, 1999, and 2002, represent a fairly limited set of data available. Given that this paper only utilized data from the years 1998, 1999, and 2002, expanding the analysis to include a longer time period would normalize the data and provide a better picture into performance over the longer period of time.

Another limitation of the study was the decision to examine only four areas of performance: revenues, net income, IPO valuation, and stock price performance. There are other factors that can measure the success of a new venture. One possibility is the survival percentage of VC and CVC portfolio companies. This study only examined companies that went public in the three years of the time frame. Another measure of success would be to examine how many companies in VC and CVC firms' portfolio reach the IPO stage. Similarly, the data set only included public offerings as an exit event. Acquisition of a portfolio firm is another way for a VC

firm to exit a venture, and plays a more significant role in the current environment.

Another area for future examination is a more qualitative study of the value-added contributions of venture capitalists. This study has quantitatively documented the difference in performance of VC and CVC-backed portfolio companies, but the methodology cannot provide a conclusive insight into what is the key driver of enhanced performance. A survey of management or case-study approach might be appropriate to examine this issue in depth.

## **Conclusion**

This study makes two contributions to the literature on the venture capital industry, and the difference between venture capital and corporate venture capital firms. The study presented a quantitative comparison of the performance of new companies based on venture capital backing, focusing on financial performance, IPO valuation, and stock performance.

The results of the study provides additional evidence that venture capitalists do provide value to their portfolio firms, generating higher revenue and net income growth and better valuations than independent companies. Additionally, significant differences between traditional venture capital and corporate venture capital firms were also documented, with each providing more contributions in different areas.

For future research, several additional analyses and recommendations were suggested. Expanding the study in both time period and scope would provide additional insight into the particular characteristics and contributions of the venture capital industry.

### Appendix: Tables

Table 1: Summary Description of Data Sample

<u>Type/Year</u>	<u>1998</u>	<u>1999</u>	<u>2002</u>	<u>Total</u>
CVC	10	28	8	46
VC	31	83	17	131
Independent	92	141	18	251
Other	75	75	22	172
Total	208	327	65	600

Table 2: Industry Breakdown of Data Sample

<u>Industry</u>	<u>CVC</u>	<u>%Total</u>	<u>VC</u>	<u>%Total</u>
Other	2	4.35%	3	2.29%
Aerospace & Defense	1	2.17%	0	0.00%
Airline	0	0.00%	1	0.76%
Business Services	1	2.17%	7	5.34%
Business Software	0	0.00%	1	0.76%
Computer Hardware	6	13.04%	7	5.34%
Computer Services	0	0.00%	4	3.05%
Computer Software	8	17.39%	42	32.06%
Construction	0	0.00%	2	1.53%
Consumer Product Manufacturing	0	0.00%	3	2.29%
Consumer Products	1	2.17%	0	0.00%
Education	0	0.00%	1	0.76%
Electronics	4	8.70%	4	3.05%
Financial Services	1	2.17%	3	2.29%
Healthcare	1	2.17%	5	3.82%
Insurance	0	0.00%	2	1.53%
Internet Search	0	0.00%	1	0.76%
Leisure	0	0.00%	3	2.29%
Media	5	10.87%	8	6.11%
Movie Theater	0	0.00%	1	0.76%
Pharmaceuticals	5	10.87%	10	7.63%
Restaurant	0	0.00%	1	0.76%
Retail	4	8.70%	10	7.63%
Telecommunications	0	0.00%	1	0.76%
Telecommunications Equipment	1	2.17%	2	1.53%
Telecommunications Services	4	8.70%	8	6.11%
Telecommunications Systems	1	2.17%	0	0.00%
Transportation Services	1	2.17%	1	0.76%
Total	46		131	

Table 3: Summary Statistics for Constructed Portfolios

<b>Independent Portfolio</b>						
Total Sample Size	251					
	<u>n</u>	<u>Mean</u>	<u>Median</u>	<u>Deviation</u>	<u>Min</u>	<u>Max</u>
3Yr Revenue Growth	210	26%	37%	-76%	179%	182%
3Yr Income Growth	209	-27%	114%	-325%	242%	260%
P/S Ratio	153	14.5	2.1	65.5	-256.9	430.8
<b>Entire VC Portfolio</b>						
Total Sample Size	177					
	<u>n</u>	<u>Mean</u>	<u>Median</u>	<u>Deviation</u>	<u>Min</u>	<u>Max</u>
3Yr Revenue Growth	143	56.6%	40.9%	65.7%	-42.8%	276.6%
3Yr Income Growth	140	6.6%	28.7%	145.2%	-362.6%	366.9%
P/S Ratio	142	42.3	15.2	121.6	-17.8	1055.9
Weekly Stock Return	140	0.1%	0.1%	0.9%	-2.3%	2.5%
Annualized Return		5.2%	4.0%		-70.7%	263.5%
<b>VC Portfolio</b>						
Total Sample Size	131					
	<u>n</u>	<u>Mean</u>	<u>Median</u>	<u>Deviation</u>	<u>Min</u>	<u>Max</u>
3Yr Revenue Growth	105	60.6%	71.3%	295.1%	-42.8%	290.7%
3Yr Income Growth	103	-0.5%	154.3%	394.8%	-362.6%	366.9%
P/S Ratio	105	47.9	132.5	1728.9	0.05	1055.9
Weekly Stock Return	99	0.1%	0.1%	0.8%	-2.3%	2.3%
Annualized Return		2.7%	3.9%		-70.7%	220.3%
<b>CVC Portfolio</b>						
Total Sample Size	46					
	<u>n</u>	<u>Mean</u>	<u>Median</u>	<u>Deviation</u>	<u>Min</u>	<u>Max</u>
3Yr Revenue Growth	31	43.4%	39.4%	223.9%	-19.7%	130.2%
3Yr Income Growth	30	46.5%	131.6%	443.6%	-256.2%	440.8%
P/S Ratio	29	15.9	19.4	1030.5	2.1	74.8
Weekly Stock Return	41	0.2%	0.1%	1.1%	-2.1%	2.5%
Annualized Return		11.4%	3.9%		-67.1%	263.5%



Table 4: Difference Test for Entire VC-backed Portfolio vs Independent Portfolio

	<u>VC</u>	<u>Independent</u>			
	<u>Mean</u>	<u>Mean</u>	<u>t-stat</u>	<u>p-value</u>	<u>Significant Difference?</u>
3Yr Revenue Growth	56.6%	25.9%	5.05	0.0000	Strong evidence for significant difference
3Yr Income Growth	6.6%	-26.5%	2.27	0.0240	Strong evidence for significant difference
P/S Ratio	42.3	14.5	-2.42	0.0164	Strong evidence for significant difference

Table 5: Summary Stock Return Statistics for S&amp;P and Entire VC Portfolios

	<u>STDEV</u>	<u>AVG Wkly Return</u>	<u>Annual Return</u>	<u>Alpha</u>	<u>Beta</u>
S&P	2.53%	0.00%	0.06%	0.0000	1.0000
VC Portfolio	15.04%	0.10%	5.20%	0.0033	1.5964

Table 6: Difference Test for VC-backed vs CVC-backed Portfolio Companies

	<u>VC Mean</u>	<u>CVC Mean</u>	<u>t-stat</u>	<u>p-value</u>	<u>Significant Difference?</u>
3Yr Revenue Growth	60.6%	43.4%	2.29	0.0237	Strong evidence for significant difference
3Yr Income Growth	-0.5%	46.5%	-1.28	0.2053	No significant difference
P/S Ratio	47.9	15.9	2.40	0.0179	Strong evidence for significant difference

Table 7: Difference Test for VC-backed vs Independent Companies

	<u>VC Mean</u>	<u>Independent</u>			
	<u>Mean</u>	<u>Mean</u>	<u>t-stat</u>	<u>p-value</u>	<u>Significant Difference?</u>
3Yr Revenue Growth	60.6%	25.9%	4.81	0.0000	Strong evidence for significant difference
3Yr Income Growth	-0.5%	-26.5%	1.60	0.1113	No significant difference
P/S Ratio	47.9	14.5	-2.32	0.0218	Strong evidence for significant difference

Table 8: Difference Test for CVC-backed vs Independent Companies

	<u>CVC Mean</u>	<u>Independent</u>			
	<u>Mean</u>	<u>Mean</u>	<u>t-stat</u>	<u>p-value</u>	<u>Significant Difference?</u>
3Yr Revenue Growth	43.4%	25.9%	2.23	0.0300	Strong evidence for significant difference
3Yr Income Growth	46.5%	-26.5%	2.63	0.0116	Strong evidence for significant difference
P/S Ratio	15.9	14.5	-1.00	0.3214	No significant difference

Table 9: Stock Statistics of VC and CVC-backed Companies

<b><u>Average</u></b>							
Measure	S&P	VC Portfolio	CVC Portfolio	Difference	t-stat	p-value	VC/CVC Significant?
Std. Dev.	2.53%	14.97%	15.22%	-0.25%			
Avg Wk Return	0.00%	0.05%	0.21%	-0.16%	0.80	0.4245	No significant difference
Alpha	0.0000	0.0029	0.0041	-0.0012	0.75	0.4552	No significant difference
Beta	1.0000	1.5849	1.6240	-0.0391	0.30	0.7670	No significant difference

<b><u>1998-2001</u></b>							
Measure	S&P	VC Portfolio	CVC Portfolio	Difference	t-stat	p-value	VC/CVC Significant?
Std. Dev.	2.93%	5.46%	8.34%	-2.88%			
Avg Wk Return	0.02%	0.55%	1.30%	-0.75%	2.50	0.0222	Strong evidence for significant difference
Alpha	0.0000	0.0052	0.0123	-0.0070			
Beta	1.0000	1.1441	1.7597	-0.6157			

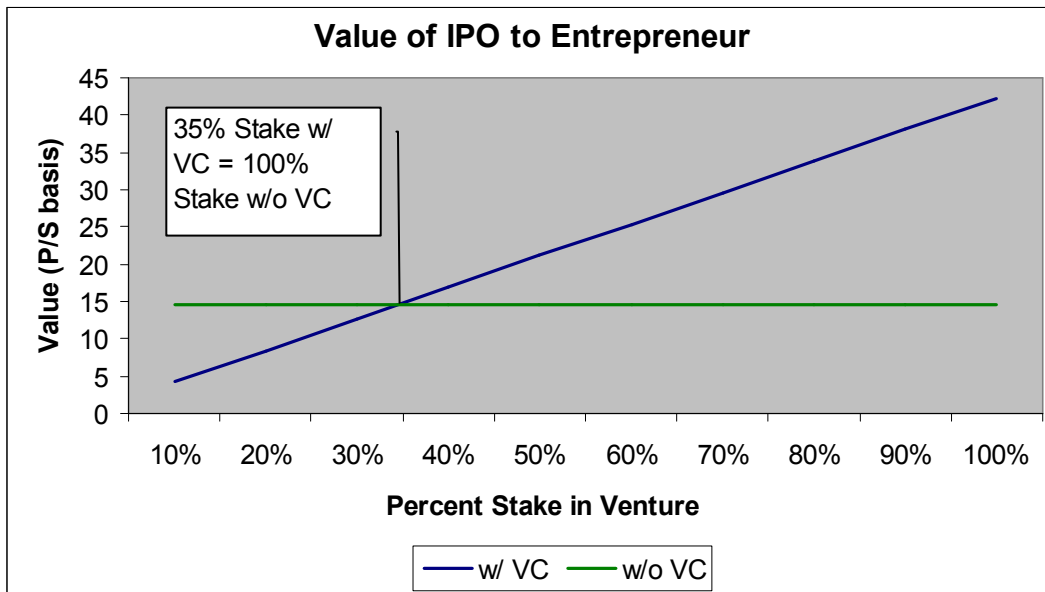
  

<b><u>1999-2002</u></b>							
Measure	S&P	VC Portfolio	CVC Portfolio	Difference	t-stat	p-value	VC/CVC Significant?
Std. Dev.	2.98%	9.01%	8.27%	0.74%			
Avg Wk Return	-0.26%	-0.32%	-0.49%	0.17%	-0.85	0.4007	Some evidence for significant difference
Alpha	0.0000	0.0017	-0.0001	0.0017			
Beta	1.0000	1.8816	1.7435	0.1381			

<b><u>2002-2005</u></b>							
Measure	S&P	VC Portfolio	CVC Portfolio	Difference	t-stat	p-value	VC/CVC Significant?
Std. Dev.	1.67%	2.89%	4.17%	-1.28%			
Avg Wk Return	0.24%	0.63%	0.85%	-0.21%	0.94	0.3671	No significant difference
Alpha	0.0000	0.0034	0.0060	-0.0026			
Beta	1.0000	1.2129	1.1111	0.1017			

Figure 1: Value of IPO Event to Entrepreneur



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