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The Performance of Publicly Traded European Venture Capital Companies

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The stock market return and the risk of 33 quoted European venture capital companies during the period 1977–1991 are studied. The return is negative on average with eight of the 33 companies having a return that is higher than the market return. However, the systematic risk (measured by the beta of the stock) is lower than the market risk. When taking the risk into account, no company has a return that is significantly higher than zero, but four companies have a return that is significantly lower than zero. When interpreting these results, one has to take into account that most shares of venture capital companies trade at a significant discount relative to their net asset value, indicating that the long-term return that investors can expect in the future, may be higher than in the past. Venture capital companies that are specialized in a specific investment stage have a higher return, while the regional companies have a lower return than general companies. The systematic risk of specialized companies is higher than that of general companies.

I. INTRODUCTION

As the venture capital industry matured in the eighties in the United States, the performance of the venture capital (VC) funds became an important issue for the investors in the industry and for the fund managers. This interest led to three types of studies on the performance of the venture capital industry in the US. Due to the difficulty of data gathering in the private sector, the first type of study focuses on the performance of individual investments in the venture capital portfolios, while the second type measures the performance of publicly traded venture capital funds. The third type of study looks at the performance of private venture capital funds. Table 1 gives an overview

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Table 1
Overview of Studies on Venture Capital Performance

Authors	*Period*	*Sample*	*Fund Return*	*Market Return*	*Risk Measure*	*Fund Risk*	*Market Risk*
USA							
Martin, Petty (1983)	'74–'79	11 public VC funds	27.0%	8.6%	Stand. Dev.	38.5%	21%
Brophy, Guthner (1988)	'81–'85	12 public VC funds	18.5%	14.3%	Beta	0.73	1
Bygrave (1988)	'78–'85	131 VC companies	10–32%	—	—	—	—
Kleiman, Shulman (1992)	'80–'86	26 public VC funds	19.4%	16.1%	Beta	0.735	1
	'86–'90	12 public VC funds	–0.8%	3.4%	—	—	-
Europe							
Soulignac (1991)	'81–'89	20 VC funds in France	18.7%	—	—	—	—
NVP (1991)	'86–'90	296 individual investments in the Netherlands	13.0%	4.0%	—	—	—

of some interesting studies in the US and in Europe. Depending on the time period of the study and of the sample, the total yearly return in the US varies from –0.8 percent during '86–'90 (Kleiman & Shulman, 1992) to 32 percent for some private funds in the period '78–'85 (Bygrave, 1988). The return of venture capital funds always exceeds the average market return, except in the period 1986–1990 (Kleiman & Shulman, 1992).

It is, however, difficult to compare the performance measures reported in the studies, because of different methodologies and of different definitions of "return". A major problem when computing the return of venture capital funds is that the return to the investors at the end of the fund life may be completely different from the interim return after a few years, due to the fact that the major sources of return are the capital gains, realized when selling a portfolio company. When computing the interim return of a venture capital fund, the unrealized capital gains have to be estimated as accurately as possible, in order to be able to asses the net asset value of the portfolio. The sum of the net asset value of all portfolio companies gives the value of the venture capital fund at that point in time. The valuation of each portfolio company is done by the fund managers (and often screened by a screening committee). This may cause inconsistencies, but the law of the large numbers will tend to average out the upward and downward valuation biases (Bygrave, 1988). Objective measures to value a portfolio company are the initial price paid for the shares, the stock market value (when the portfolio company is quoted) and the price that was paid for the shares in a recent transaction that involved an independent third party; subjective measures that are often used are the value obtained by applying a "suitable" price/earnings ratio or price/cash-flow ratio and the estimated value of the company if sold at that moment (Vincent, 1992).

When *private* venture capital companies are studied, the "return" measure reported is the return to the investors in the funds, with or without taking into account unrealized capital gains and management fees. Data are collected from fund managers and/or investors in funds. When *quoted* venture capital companies or funds are studied, the return implied is the return before taxes to an investor on the Stock Exchange, including dividends and capital gains. As shares of investment funds are generally traded at a discount with respect to their net asset value (see Brophy and Guthner (1988) for the situation in the US, Venture Capital Trust Service (VCTS, 1991) for the UK and Vincent (1992) for France), this measure often underestimates the return that the investor may expect in the future.

One cannot study the return of an investment without taking into account its riskiness. In the study of Martin and Petty (1983), mentioned in Table 1, the standard deviation of the return of the company is higher than that of

the market; the systematic risk of the quoted companies, measured by beta,[1] however, is lower than one in two other studies. This implies that although the total risk is higher than the market risk, the systematic risk is lower; the total risk of investing in venture capital can thus be lowered by diversifying or by investing in a portfolio of funds.

The venture capital industry developed only in the late seventies in the UK and in the early eighties in continental Europe (Ooghe, Manigart, & Fassin, 1991). This explains why its return has only recently been studied—it is not relevant to measure the return of a venture capital fund in its early life before the portfolio companies have had the opportunity to grow... or to die. The two studies that have been done so far show the same pattern as the studies in the US (Table 1): the Nederlandse Vereniging voor Participatie-maatschappijen (NVP, 1991) studied the performance of individual venture capital investments in the Netherlands, while Soulignac (1991) studied the 20 French venture capital funds in which CDC Participations, an institutional investor in funds, holds a participation. Returns mentioned in both studies are thus not comparable; the Dutch return is a gross measure, before taking into account the management fees, while the French return is the net return to the investor after taking into account management fees and latent plus-values. It is striking to see that the French net return is higher than the Dutch gross return. This may be due to the fact that the overall investment climate in France was better than in the Netherlands in the eighties or that the French funds studied are not representative and reflect the superiority of CDC Participations to select the funds it invests in.

The present study is situated in the second group of studies on the return of venture capital companies—the stock market return of quoted venture capital companies throughout Europe. A first goal of the study is to determine how well the venture capital industry performed in the eighties, in terms of return and risk. We hypothesize furthermore that there is a difference between venture capital companies with broad and narrow investment scopes.

Some venture capital funds are very specialized—their strategy being to invest in early stage biotechnology companies. The venture capital managers recruited to manage this kind of fund have to know the technology, the industry, and the people working in it. They have to follow the evolutions and the innovations in the technology by attending scientific conferences and trade shows. This allows them to build a deep and specific knowledge. When a biotechnology company seeks venture capital finance, the managers of the specialized fund are better able to assess the potential of the company than those of a nonspecialized fund. Thus, a narrowly focused venture capital company is better able to pick the potential winners and thus realize a higher

return than a general venture capital company. Possible areas of specialization are investment sectors and investment stages. Companies that are specialized in a small geographical region also have a narrow investment scope, but it is unlikely that this specialization leads to a competitive advantage. This leads to the following hypothesis:

H1: Venture capital companies specialized in a specific investment sector or investment stage have a higher return than general or geographically specialized venture capital companies.

However, due to the narrow investment window of specialized venture capital companies, fewer investment opportunities are likely to come up. For example, regional venture capital companies will only get investment proposals from regional companies. This more restricted deal flow will lead to a higher risk for the specialized venture capital company. Furthermore, the fact that the company is specialized will lead to a more homogeneous and less diversified investment portfolio; this in turn will lead to a higher risk. Indeed, when for example the biotechnology sector or a specific geographical region ends up in a recession, then the whole portfolio of the specialized venture capital company will perform badly. Due to the lack of diversification, the bad performance of one portfolio company will not be offset by the good performance of another one, as is the case in a general venture captial company. This leads to Hypothesis 2:

H2: Venture capital companies specialized in a specific investment sector, investment stage or geographical region will have a higher risk than general venture capital companies.

II. THE SAMPLE

Different data sources are used to identify the quoted European venture capital funds, such as the membership lists of the European Venture Capital Association and of national venture capital associations, Venture Economics' Second Guide to European Venture Capital Sources (1988), publications of the Venture Capital Trust Service of County Natwest WoodMac (VCTS, 1991) for the UK and Le Journal des Finances (Etienne & Dupuy, 1991) for France. In order to be included in the sample, the venture capital companies have to

invest at least 50 percent of their funds in unquoted companies.[2] Fifty-four companies are identified this way. Due to the fact that stock market data are available for companies that were listed on the main European stock markets on December 24, 1991, the sample is reduced to 33 venture capital companies. Of those companies, 18 are located in France, 11 in the UK and Ireland (but listed in London), two in the Netherlands, one in Belgium and one in Spain.

The appendix gives an overview of important characteristics of the companies in the sample. One should be prudent when comparing venture capital companies from the different countries. The major difference between the UK and the continental venture capital companies in this sample relates to the type of organization. All UK companies are organized as investment trusts. The investment funds, often set up for a limited time span, are the entities that are quoted on the Stock Exchanges. They are managed by an independent and unquoted management company. The continental companies in the sample do not have the same dual structure for there is no separate entity for the investment vehicle and the management company. Moreover, their life span is unlimited at the onset.

A second difference concerns the time span of available stock data. While the stock data for most UK venture capital companies are available since the late seventies or the early eighties, stock data are only available since 1987 or later for the continental venture capital companies.

The French "Société de Capital Risque" (SCR, venture capital organization, created in 1985), is an organization which has some tax advantages, when specific investment criteria are met (Soulignac, 1991). The "Sociétés de Développement Régional" (SDR, regional economic development organizations) were set up in the late fifties by the French government in order to promote regional development. During the first decades of their existence they provided mainly loans to established companies. However, when venture capital became more legitimized in France in the eighties, their focus shifted towards the provision of equity to young and developing companies. Although local governments are still important stockholders in the SDRs, a lot of regional, national, and even international investors have a participation in these companies nowadays. Despite the fact that their current portfolio still mainly consists of loans, they are included in the sample because of the fact that the provision of equity became a very important part of their overall activity in the last decade.[3] To enhance their regional character, most SDRs are quoted on regional stock markets. This made it impossible to retrieve necessary data on all SDRs. The activities of the Dutch and Spanish companies and of OFP (France) are not solely focused on the provision of venture capital, but also include merchant banking services.

Most companies in the sample have a broad investment scope with respect to both the investment stage and the investment sector. Of the 33 companies in the sample, only seven have a sectorial specialization and three have a preference for early stage investments. A major difference between the UK and the continental companies is that the geographical scope of investments is much broader for the UK funds. Whereas the UK funds all look for investment opportunities abroad, that is, on the continent or in the United States, most continental companies focus on their own country and seven of them only have a regional perspective. When the continental companies go international, they often limit themselves to the neighboring countries.

The sample thus includes a broad spectrum of funds specialized per stage, investment sector or geographical scope as well as general funds. The most striking differences are observed between the UK and the continental companies. The UK companies are organized as investment trusts, furthermore, they have a more global investment perspective.

III. METHODS OF ANALYSIS

Two return measures are used: the total yearly return of the shares, taking into account dividends, stock splits, etc., and the excess return, that is, the total yearly return diminished with the average market return over the same period. It is impossible to compare yearly returns as such, because of the fact that the market returns behave differently in the different European countries; moreover, a different time period is used for each share (see Appendix). Therefore, the excess return is computed as the individual difference between the yearly stock return and the market return in the home country, taken over a matching time period. Excess returns of different shares are comparable with each other.

The total risk of the shares is calculated as the standard deviation of the weekly stock returns, while the systematic risk of the shares is estimated using the β of the market model given by Fama (1976). This model is operationalized by the simple OLS regression:

$$\text{Stock return} = \alpha + \beta \text{ Market return} + \varepsilon.$$

Scholes and Williams (1977), Dimson (1979) and Fowler and Rorke (1983) discuss the problems encountered with this simple model in the presence of infrequent trading, observed in our data. The β is therefore estimated as the sum of the slopes (Dimson, 1979) in the regression of the weekly return of the share on the current week, the one period and two periods lagged and the one period and two periods leading week market returns. Since signifi-

cant first and second order autocorrelations appear in most cases, the Fowler and Rorke correction for two leads and lags is used (Fowler & Rorke, 1983, p. 282). In this way, the computed sum β is consistent with the estimator developed by Scholes and Williams (1977) and better adapted to the sample.[4]

As the sample is too small to use parametric statistical tests, nonparametric Wilcoxon Rank-Sum tests are used to test the differences between groups and, when significant, the Hodges-Lehmann estimator is computed to estimate the difference between the groups (Lehmann, 1975).

IV. THE RESULTS

The Return of Investing in Quoted Venture Capital Companies

Table 2 gives an overview of the most important findings in this study. The median yearly return of the venture capital companies in the sample is –1.51 percent; the median standard deviation of the weekly returns is 32.3 percent. One-half of the companies have a positive return. The median excess return (see "Method of Analysis") is –9.74 percent, indicating that the return of an "average" venture capital company is 9.74 percent lower than the return on the stock market in the same period. The high standard deviation of the excess return shows that the variation in the excess return is important. Indeed, the lowest excess return is –78.04 percent and the highest is 20.43 percent. Only eight of the 33 companies in the sample have a yearly return that is higher than the corresponding market return, which is in striking contrast to the US studies, that all but one report a fund return that is substantially higher than the market return (Table 1). As the time periods in this study are mostly situated in the '86 to '91 period, our result is in line with the only US study in this period.

The nonparametric Wilcoxon Rank-Sum test for differences between two groups indicates that there is a significant difference between the excess return of the UK companies and the Continental companies. The Hodges-Lehmann estimator of the difference between both groups is 4.76 percent; the excess return of a UK company is thus expected to be 4.76 percent higher than the excess return of a Continental company.

When differentiating between companies that focus on some specific investment stage and those without a stage investment specialization, the Wilcoxon test indicates that there is a statistically significant difference between both groups: the yearly excess return of the stage specialists is estimated to be 15.73 percent higher than that of the stage generalists,

Table 2
Results

		Yearly Stock Return	*SD Weekly Stock Return*	*Excess Return*	*a*	*β*
Total sample	Median	–1.51%	32.3%	–9.74%	–0.063	0.554
	Mean	–3.92%	34.0%	–11.08%	–0.131	0.574
	SD (mean)	20.24%	13.1%	22.56%	0.348	0.364
UK	Median	7.51%	29.7%	–4.42%	—	0.827
	Mean	5.90%	32.6%	–8.75%	—	0.743
	SD(mean)	14.13%	16.9%	24.60%	—	0.301
Continental	Median	–6.48%	34.5%	–12.66%	—	0.418
	Mean	–8.79%	34.8%	–12.18%	—	0.490
	SD (mean)	21.30%	11.1%	21.98%	—	0.369
Estimated difference between nonspecialized and [a,b]						
Sectorially specialized		—	—	—	—	0.338*
Specialized per stage		—	—	–15.73%**	—	—
Regionally specialized		—	—	16.18%**	—	0.316*

Notes: [a]Only reported if meaningful and statistically significant
[b]A positive sign indicates that the value for non-specialized companies is higher than for specialized companies
Significance level: *0.05; **0.01

confirming the first hypothesis. There is no statistically significant difference between the yearly excess return of sectorially specialized companies and nonsectorially specialized companies. It would be premature to reject the first hypothesis, however, because the lack of statistical significance may be due to the low number (7) of sectorially specialized venture capital companies in the sample.

Companies that are geographically specialized, have a yearly excess return that is (statistically significant) 16.18 percent lower (Hodges-Lehmann estimator) than companies with a broader investment scope. This result may be contaminated by all regionally specialized companies being located in France and as indicated above, Continental companies have a lower yearly excess return than UK companies. Therefore, it is tested whether the regional (French) companies have a lower yearly excess return than the other Continental companies. The result is even more pronounced. The French regional companies have a yearly excess return that is estimated to be 16.90 percent lower than the yearly excess return of the other Continental companies. Having a geographical investment specialization does not give a competitive

advantage—this result is as expected—but even worse, it seems to be a handicap.

In the market model, α is a measure of the performance of a stock, taking its systematic risk into account. The median α in the sample is –0.063—it varies between –1.39 and 0.34. This confirms the earlier findings of the excess return—the average performance of quoted European venture capital companies is lower than the market return. The Spearman Rank Correlation between α and the excess return is 0.95, indicating that both variables measure the same concept, that is, the return of a venture capital fund, corrected for the market return and the systematic risk. We did not perform more sophisticated analyses on α, because only four individual αs (all negative) are statistically significant (0.1 level) different from zero.

The Risk of Investing in Quoted Venture Capital Funds

A measure of the total risk is the standard deviation of the weekly returns of the stock. This varies between 27.4 percent and 64.1 percent, with a median value of 32.3 percent. There is no significant difference between the standard deviation of the UK and the Continental stocks. The median standard deviation has the same order of magnitude as the one reported in the Martin and Petty (1983) study, indicating that investing in European venture capital companies is no riskier than investing in US ones. If risk is appropriately measured by the standard deviation of the weekly returns, then the Spearman Rank Correlation of –0.05 between the standard deviations and the excess returns indicates that riskier investments are not rewarded with a higher excess return.

A more sophisticated measure of the risk is given by β, the systematic risk in the market model. In this sample, the median β is 0.55. This is lower than the β of 0.73 reported in the US samples. This implies that the European venture capital companies follow the movements of the market less than the US venture capital companies. When differentiating between the UK and the Continental companies, it is found that the median UK β equals 0.83 and the median Continental β equals 0.42. The difference between both groups is statistically significant and estimated to be 0.35. Thus, while the systematic risk of the UK companies closely matches the risk of US companies, the Continental companies seem to have a much lower systematic risk. A median β of 0.42 implies that the shares of Continental venture capital companies do not follow the aggregate stock market movements. They are thus well suited to lower the overall risk of a portfolio of stocks.

Contrary to the expectation that the more specialized companies have a higher risk, the sectorially specialized companies in this sample have a β that is statistically significantly lower than companies with broad investment preferences. The difference is estimated to be 0.34. Moreover, companies that are regionally specialized have a β that is estimated to be 0.32 lower than companies that cover a bigger geographical region. When comparing the regionally specialized companies with only the Continental nonregionally specialized companies, the former have again a β that is statistically significantly lower than the β of the latter. The difference between both is now 0.18. There is no statistically significant difference between companies that are specialized in a particular investment stage and those that are not. Hypothesis 2 has to be rejected in this sample.

V. CONCLUSION

In the sample of 33 quoted European venture capital companies, studied over the period 1977–1991, the average yearly stock return is negative. When compared to the market return during the matching period, the "excess" return is even lower. Only eight of the 33 companies have a return that is higher than the market return. UK companies have a significantly higher return than Continental companies. This result, that is in striking contrast to comparable studies in the US, which show returns higher than the market return, might be explained by the fact that most of the stock returns in our study are taken during the period 1986–1991. The only US study covering the same period also shows a negative fund return, lower than the market return. The return in our study is also much lower than the returns reported in two earlier studies in France and the Netherlands. It is, however, difficult to compare these studies to ours, because the Dutch study reports gross returns from individual investments, while the French study reports the return to the investors in the funds, taking unrealized capital gains into account. As our study reports, the net return to investors is often highly discounted compared to its actual value. This is expected since the stock market valuation of a venture capital company is often highly discounted compared to its actual value.

In accordance with the UK studies, we find an average systematic risk β that is lower than the market risk. The median UK β has the same order of magnitude as the median US β. The median Continental β, however, is 0.35

lower. The lower median yearly excess return of the Continental stocks could thus be partially explained by their lower systematic risk.

Specialized companies have a deeper knowledge of the market in which they operate. This we expected to lead to a higher return. However, the number of opportunities that arise will be much lower, thus leading to a higher risk. This hypothesis is tested by differentiating between sectorially specialized companies and companies specialized per investment stage. It is found that companies that focus on a specific investment stage have a significantly higher return, but no difference is found between sectorially specialized and general funds. Companies that focus on a restricted geographical region have a significantly lower return than general funds. Hypothesis 1 is thus weakly confirmed. The systematic risk of specialized funds is significantly lower than that of general funds. There is no difference in risk between general funds and funds that invest in specific sectors. Hypothesis 2 is not confirmed—although there are differences in the riskiness of general and specialized companies, they are in the wrong direction.

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NOTES

1. The beta of a share indicates how the share fluctuates relative to the market. A beta higher than one indicates that the share fluctuates more than the market and vice versa. This is the systematic risk of the share.
2. The quoted content of the net asset value of the portfolio of some companies in the sample may be larger than 50 percent at some point in time. The important factor, however, is the proportion that is initially *invested* in unquoted companies.
3. Source: the yearly accounts of the SDRs.
4. The Scholes and William (1977) method requires that the researchers know in which interval trading took place. Our data do not allow us to determine this.

APPENDIX : THE SAMPLE

Name	*Period in Study*	*Stock Market*	*Discount*	*Investment Stage*	*Investment Sector*	*Investment Region*
France						
(Société de Capital Risque)						
Astorg	4/89–12/91	Comptant	34% (Jun91)	Development	All	France
Auxitex	6/88–12/91	Second Marché	50% (Nov91)	Development, MBO	All	Regional
Centrale pour l'Industrie	4/89–12/91	Comptant	61% (Nov91)		All	France
Saint-Dominique	6/90–12/91	Comptant	50% (Jun91)	All, Funds	All	Europe
IDI	6/91–12/91	Second Marché	41% (Dec90)	All	All	France
IDIA	4/89–12/91	Second Marché	30%(Dec91)	All	Agriculture, Food	France, Belgium, Spain
Idianova	5/89–12/91	Second Marché	30%(Dec91)	Early	Agriculture, Food	France
IPBM	4/90–12/91	Second Marché	52%(Jun91)	All	Wood, Furniture	France
IPO	9/90–12/91	Second Marché	44%(Jun91)	All	All	Regional
OFP[1]	4/89–12/90	Règlement Mensuel	16%(Apr91)	Development, Funds	All	France
Sofinnova	4/89–12/91	Second Marché	33%(Dec91)	Early, Funds	Electronics, Health	France, US
Sopagri	4/89–12/91	Comptant	50%(Nov91)	All	Agric., Food, Biotech	Europe
Unidev	6/90–12/91	Second Marché	15%(Dec91)	Development, MBO	All	France
France						
(Société de Développement Régional (SDR))						
Centrest	7/89–12/91			All	All	Regional
Champex	9/90–12/91	Bourse de l'Est		All	All	Regional
Lordex	9/90–12/91	Bourse de Nancy		All	All	Regional
SDR Bretagne	9/90–12/91			All	All	Regional
SDR Picardie	9/90–12/91			All	All	Regional

Name	*Period in Study*	*Stock Market*	*Discount*	*Investment Stage*	*Investment Sector*	*Investment Region*
UK						
Candover	12/85–12/91	London	–4.5%(Jun91)	MBO/MBI	All	Worldwide
Electra	2/76–12/91	London	32%(Mar91)	Development, MBO	All	Europe, US
F&C Enterprise	7/81–12/91	London	33%(Jun91)	Development, MBO	All	Europe
GT Venture	9/87–12/91	London	31%(Sep91)	Funds	All	Worldwide
Kleinwort Development Fund	7/86–12/91	London	24%(Jul91)	Development, MBO	All	Europe
Manakin Holdings	5/83–12/91	London	12%(Jun91)	Early	All	UK, USA
Melville Street	4/87–12/91	London	41%(Apr91)	Development, MBO		
Murray Ventures	7/77–12/91	London	24%(Jul91)	Development, MBO	All	Europe
Newmarket Venture Capital	6/88–12/91	London	58%(Sep91)	Early, Development	High tech	US, UK
Silvermines[3]	4/79–12/91	London		All	All	Europe, US
United Technologies	7/77–12/91	London		All	High tech	Europe, US
Other countries						
NIB	3/87–12/91	Amsterdam		Development, MBO	All	The Netherlands
NPM	1/87–12/91	Amsterdam	–5%(Dec89)	All	All	The Netherlands, Belgium, Germany
Prominvest[4]	6/87–2/90	Brussels		All	All	Belgium
Bankinter	3/87–12/91	Madrid				

Notes: [1] Acquired by Total-CFP on 1/1/1991.

[2] Due to imminent liquidation, 50 percent of all assets are held in liquid investments in 1991. During normal operations, the unquoted content of the portfolio was 60 percent.

[3] Irish venture capital company, quoted on the London Stock Exchange.

[4] Acquired by a private investors group on 4/2/1990 ; does not take venture capital participations any more.

Sources : *Le Journal des Finances,* 14/12/1991 ; Venture Capital Trust Service CNWM ; Yearly Accounts of the companies.

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