Venture Capital

ISSN: 1369-1066 (Print) 1464-5343 (Online) Journal homepage: http://www.tandfonline.com/loi/tvec20

The survival of venture capital backed companies

Sophie Manigart , Katleen Baeyens & Wim Van Hyfte

To cite this article: Sophie Manigart , Katleen Baeyens & Wim Van Hyfte (2002) The survival of venture capital backed companies, Venture Capital, 4:2, 103-124, DOI: 10.1080/13691060110103233

To link to this article: http://dx.doi.org/10.1080/13691060110103233

Published online: 26 Nov 2010.

VENTURE CAPITAL, 2002, VOL. 4, NO. 2, 103 – 124

The survival of venture capital backed companies

SOPHIE MANIGART, KATLEEN BAEYENS
and WIM VAN HYFTE

(Final version accepted 20 August 2001)

This study addresses the survival of Belgian venture capital (VC) backed companies, compared to companies that did not receive VC. Survival analysis techniques are used to analyse the survival of a sample of 565 Belgian VC backed companies and 565 comparable non-VC backed companies. A distinction between different types of venture capitalists is made. Contrary to commom wisdom, VC backed companies do not have a higher probability of surviving than comparable non-VC backed companies. Companies, backed by the two oldest government venture capitalists, however, have a higher survival rate and companies, backed by other government venture capitalists have a lower survival rate and a higher probability of going bankrupt. Our results confirm previous studies in that it is shown that receiving VC from the right backer is perhaps more important than receiving VC per se.

Keywords: entrepreneurial finance; venture capital; survival

Introduction

Entrepreneurial ventures are often characterized by the imbalance between the resources needed to survive and to grow and those currently available. A lack of financial resources is often identified as an important contributing factor to company success or failure (e.g. Cooper *et al.* 1991, Bruno *et al.* 1992). Getting finance is especially difficult for companies with large information asymmetries and potential agency problems (e.g. Admati and Pfleiderer 1994), thus for young companies, for companies where growth options are the major source of value and/or for companies with few tangible assets (Amit *et al.* 1998), because of their limited access to debt and equity markets (Maier and Walker 1987). Venture capital (VC) is thought

Sophie Manigart is partner of the Vlerick Leuven Gent Management School and professor at the Department of Corporate Finance, Faculty of Economics and Business Administration, Ghent University, Kuiperskaai 55^{E}, 9000 Gent, Belgium; e-mail: sophie, manigart@rug.ac.be. She obtained the degrees of engineer and doctor in management. Her interests are mainly related to the financing of growing companies, more specifically venture capital. She is also founding partner of the Vlerick Business Angels Network. *Katleen Baeyens* is research assistant at the Department of Corporate Finance. She obtained the degree of commercial engineer at the Katholieke Universiteit Leuven. *Wim Van Hyfte* is research assistant at the Department of Financial Economics. He obtained the degree of licentiate in the Applied Economic Science at Ghent University and an MBA in Financial Management at the Vlerick Leuven Gent Management School

Venture Capital ISSN 1369-1066 print/ISSN 1464-5343 online © 2002 Taylor & Francis Ltd
http://www.tandf.co.uk/journals
DOI 10.1080/1369106011010323 3

to be an important alternative for companies that have difficulties accessing more traditional financing sources.

From the entrepreneur's perspective, a VC company may provide a wide range of benefits to a venture in addition to capital (Ehrlich *et al.* 1994) through its roles of pre-investment screening, post-investment monitoring and value-adding (Berger and Udell 1998, Manigart and Sapienza 1999). When well performed, selection, monitoring and value-adding should lead to higher returns for investors and improved performance for the portfolio companies (Manigart and Sapienza 1999). Effective selection by VCs should result in the funding of the most promising projects. Post-investment monitoring should enhance information availability for VCs, early problem detection, and effective decision making in the investee companies (Mitchell *et al.* 1997). Value adding on the part of VCs should lead to more explosive growth and more sustainable advantage for portfolio companies, translating into higher company and shareholder value. For example, it has been shown that surviving VC backed companies have higher growth rates in terms of assets, sales, revenues, and number of employees, and invest a more in R&D (Megginson and Mull 1991, Al-Suwailem 1995). Successful VC backed companies that are introduced on a stock market are, on average, larger than non-venture backed companies and experience less underpricing (Megginson and Weiss 1991, Lin and Smith 1998), especially when the VCF is a high quality company with high quality monitoring (Barry *et al.* 1990).

Studies on the impact of VC on their portfolio companies have often one major flaw: that of survival bias. As non-surviving companies disappear, foregoing studies only include survivors. For example, companies making it to an IPO are already a very select and successful group of companies. Apart from anecdotal evidence, little is known on the impact of VC on company survival. For example, Timmons (1994) assumes that VC will have a positive impact on company survival, without providing evidence for this strong assumption. This paper explicitly studies whether the presence of VC influences the chances of survival, by comparing the probabilities of survival of VC backed companies with that of comparable non-VC backed companies. This will allow understanding as to whether or not receiving VC backing has an impact on the probability of survival and thus whether or not entrepreneurs may consider VC backing as increasing the chances of survival of their company. Moreover, survival chances may differ by type of VC backer. Therefore, differentiation is made between private VC companies and government backed VC companies.

Analysing portfolio company survival will not, however, give an indication of the performance of VC funds. Because VC companies manage their investments on a portfolio basis (Bygrave and Timmons 1992), the true interest of the venture capitalist is not in the survival of an individual portfolio company. VCs are not so much in the business of reducing risk, but in that of enhancing value through increasing returns in high growth environments (Manigart and Sapienza 1999). When business activities are not developing as favourably as expected, the interests of the entrepreneur

and the venture capitalist may diverge. Gorman and Sahlman (1989: 241) argue that:

> The entrepreneur, motivated by a dream of building a company, is intent that the company survive, that the dream be kept alive. The venture capitalist, by contrast, is intent on preserving the value of his or her capital investment and maximizing the return of his or her capital investment and maximizing the return on his or her scarce resource time.

Given the potential divergence in goals when the portfolio company is not performing as well as hoped for at the time of the investment, there is no straightforward answer as to the possible impact of VC on company survival.

The potential impact of the presence of a VC on company survival is first addressed. Because private and public VC companies may have different attitudes towards the survival of their portfolio companies (Leleux *et al.* 1998, Lerner 1999), the impact of government and private VC companies on company survival is discussed. Thereafter, the survival of a sample representing half of the companies that received VC funding in Belgium between 1987 and 1997 is compared to the survival of comparable, non-VC backed companies. The Belgian VC industry is briefly described, followed by a detailed description of the sample. Univariate life table procedures and multivariate survival analysis techniques are used. Finally, the paper concludes with a discussion of the results.

Our study shows that the presence of VC in the capital of a company does not necessarily have a positive impact on the survival probability of that company, contrary to previous findings (Timmons 1994). However, the type of VC backer does impact the chances of survival. This implies that entrepreneurs, for whom the survival of their company is of vital importance, are to be very careful when choosing a certain type of financing: the type of backer is important in determining the probability of survival. Getting financing from the right backer is important.

The impact of VC

There are reasons to believe that VC backed companies have higher chances of survival than comparable non-VC backed ones (Kunkel and Hofer 1990, Timmons 1994). First, VC companies have stringent investment criteria, withholding only the most promising ventures. Second, Diamond's (1991) reputation-based theory posits that inside investors, such as venture capitalists, can transmit valuable signals to outside parties. As screening is one of the roles of VC companies and as their investment process is extremely selective, the mere fact that a VC company has invested in an unquoted company conveys positive information about that company and should lead to more financing from other, cheaper sources (Sahlman 1990, Manigart and Sapienza 1999). The reputation of some long-existing VC companies is second to none, and their presence in the capital structure sends a strong positive signal to other investors and stakeholders (Megginson and Weiss 1991). Apart from additional financing, this positive signal may make it easier

for the portfolio company to attract other resources, such as personnel, suppliers and customers.

Third, VC managers put time and effort in monitoring after the investment is made in order to overcome moral hazard problems (Barry *et al.* 1990, Admati and Pfleiderer 1994, Lerner 1995). Monitoring skills are especially valuable for entrepreneurs in sectors where assets are largely intangible and growth options and asset specificity are high (Gompers 1995) and, consequently, where informational concerns are important (Sapienza and Gupta 1994, Amit *et al.* 1998).

Finally, venture capitalists provide value-creating services to their portfolio companies (Sapienza *et al.* 1996), such as networks, moral support, general business knowledge and discipline (Fried and Hisrich 1995). If VC companies perform their distinct roles of selection, monitoring and value-adding well, and if there is a signalling and certification effect, then this should lead to:

H1a: VC backed companies have a higher probability of survival than comparable non-VC backed companies

There are, however, arguments for hypothesizing an opposite relationship. First, Amit *et al.* (1990) argue that VC companies are denied the opportunity to invest in the most promising companies, due to an adverse selection problem. VC is a costly source of finance: required rates of return in Europe vary between 15% and 45% depending on the stage of development of the investee company (Manigart *et al.* 1997). The very best projects are likely to find funding from other, less costly sources. This makes that only second best projects will apply for VC funding and VC companies will not have access to the best projects (Amit *et al.* 1998). In this line of reasoning, non-VC backed companies will not fail more often than VC backed companies.

Moreover, VC companies are not so much in the business of reducing risk, but in that of enhancing value through increasing returns in high growth environments (Manigart and Sapienza 1999, Bamford and Douthett 2000). Rewards cannot be substantial without substantial risk, thus also substantial risk of failure. In this line of reasoning, VC backed companies may well be more risky than non-VC backed ones, thereby having lower probabilities of survival, everything else equal.

Finally, an efficient allocation of the scarce time of VC managers (Gifford 1997) may incite them to liquidate so-called 'living dead' companies (i.e. ventures that are surviving but are currently unable to produce satisfactory returns to the investors) (Ruhnka *et al.* 1992). The true interest of the venture capitalist is in maximizing the return of his capital investment and in maximizing the return of his time (Gorman and Sahlman 1989), not in the survival of an individual portfolio company. It is a strategic choice of a VC either to try to turn-around the 'living dead' portfolio companies or to liquidate them and devote their time to star performers. Fredriksen *et al.* (1997) speculate that Swedish VCs are 'fire fighters' who put extra effort into poorly performing firms in order to raise them to the level of other portfolio companies. Ruhnka *et al.*'s (1992) finding that VCs are able to achieve a successful

turnaround in 56% of the 'living dead' ventures suggests that putting effort into poor performers might be a viable strategy. However, Sapienza (1992) found a strong positive correlation between US VCs' involvement and perceived performance and argued that VCs may seek to add value to their top performing portfolio companies as a 'homerun' strategy. Portfolio companies of VCs following the latter strategy will probably have lower chances of survival, leading to the opposite hypothesis:

H1b: VC backed companies have a lower probability of survival than comparable non-VC backed companies.

The impact of Government versus private VC companies

There are reasons to expect that the type of VC influences the probability of survival of their portfolio companies (Leleux *et al.* 1998, Lerner 1999). VC companies are differentiated against, funded by private funds (e.g. coming from financial institutions, institutional investors, large companies, private individuals etc.) on the one hand and VC companies funded by government. Governments have two main reasons to directly fund VC companies (OECD 1997, Lerner 1999): exploiting public benefits and diminishing perceived equity gaps. Government-backed VC companies may yield social returns greater than financial returns, emphasising more job creation potential and potential of developing technologies important to long-term economic growth, rather than merely shareholder value. Stressing these non-economic benefits may not always lead to funding those companies with highest chances of survival.

Moreover, state-fund VC managers are civil servants and as such may not be the most qualified to select and support entrepreneurial companies (Leleux *et al.* 1998). Because the incentive structure of government-backed VC companies differs markedly from that of private VC companies, the latter stressing performance-linked bonuses more aggressively, state-fund managers may also not be the best motivated to select and support entrepreneurial companies. This leads to:

H2a: Companies, backed by government VC companies, have a lower survival rate than companies, backed by independent or captive VC companies.

However, by financing at below-market required return rates (Manigart *et al.* 1997), government-backed VC companies may attract the best projects, leaving only 'lemons' for private VC companies and making the entry of new independent or captive private equity companies more difficult (Leleux *et al.* 1998). Moreover, not having shareholder wealth maximizing goals, but societal goals, may lead government backed VC companies to adhere more to a 'fire fighter' strategy and to try to turn around living dead companies, rather than to liquidate the living dead companies and concentrate on star performers. Therefore, the opposite hypothesis may be true :

H2b: Companies, backed by government VC companies, have a higher survival rate than companies, backed by independent or captive VC companies.

Controls

Observed differences in survival rates between VC backed and non-VC backed companies might not only be a result of the mere presence of VC. They may also be caused by differences in the pre-investment risk profiles of both groups. For example, Bamford and Douthett (2000) have shown that, compared to non-VC backed firms, VC backed firms have more threats to their profit margin and to their sales generation schemes. In order to take some of the pre-investment risk into account, VC backed companies will be compared to comparable non-VC backed ones, by matching them by age, size and industry sector. Moreover, pre-investment accounting ratios that predict the probability of failure in Belgian companies (Ooghe *et al.* 1995), such as cash ratio, long term debt ratio, net return of total assets before taxes and the number of employees will be included in the analyses.

Research method and style

Research setting: the Belgian venture capital industry

Foregoing hypotheses are tested in Belgium. The Belgian market is characterized by a large number of small private equity companies, and a few large investment funds, which are often considered as holding companies (European Venture Capital Association (EVCA) 2000). Over the past few years, the Belgian private equity market has shown exceptional growth (EVCA 2000): the total amount of funds raised by private equity companies in Belgium was 0.77 billion EURO in 1999, compared to 0.42 billion EURO in 1998. Between 1987 and 1999 banks and realized capital gains available for reinvestment represented each approximately 30% of the total amount of private equity funds raised. Government agencies, private individuals and corporate investors provided each 10% of the funds raised (EVCA statistics).

The level of venture capital financing, however, would need to be multiplied by 3 to 4 times its current percentage of the Gross Domestic Product (GDP) to match the equivalent ratio in the United States. Whereas the amount of venture capital that was invested in the USA in 1996 amounted to 0.13% of the GDP, in Belgium only 0.05% of the GDP was invested in venture capital (Wright *et al.* 1997, Manigart and Van Hyfte 1999a).

The Belgian venture capital industry is characterized by a dominance of government-backed VC companies. Investments made by government-backed VC companies are almost half of the total amount and of the total number of investments made in Belgium between 1989 and 1999 (EVCA statistics). Investments by captive and independent venture capitalists

account for 54% of the total amount invested and 52% of the total number of investments during the same period. Two government VC companies are dominant: GIMV in Flanders and SRIW in the Walloon region, both founded around 1980. The Investment Company for Flanders (*Gewestelijke Investeringsmaatschappij voor Vlaanderen* or GIMV) is one of the oldest and most important risk capital providers in Belgium; it has been partly privatized by introducing part of its shares on the stock market. GIMV pioneered the concept of government-backed venture captial run by private management in Belgium (OECD 1997). In its mission statement GIMV states that it aims at maximizing shareholder value by applying its policy of growth and return, building upon its leading position in Flanders, its home market (GIMV 2000). The SRIW, on the other hand, states that it has a single objective: the renewal of the Walloon region (SRIW 2000). As GIMV and SRIW are by far the largest VC companies in Belgium, we will analyse the behaviour of GIMV and SRIW backed companies separately.

The largest part of the funds invested in Belgium between 1987 and 1999 was invested in expansion investments (58%). During that period seed and start-up investments, replacement capital investments and buy-outs accounted for respectively 26%, 9% and 7%. The most important area for investments between 1987 and 1999 was high-tech (following EVCA definitions, this includes: communications, computer related, other electronics related, biotech, medical/health related), representing 47% of the total amount invested. Industrial related (industrial products and services, industrial automation, energy, chemicals and materials) and consumer related sectors accounted for 17% and 10% during the same period.

Description of the sample

Five hundred and sixty five Belgian companies in which VC companies invested between 1987 and 1997 are identified (see also Manigart and Van Hyfte 1999b) through secondary sources, such as yearly financial accounts, reports and press releases of VC companies. The total sample is composed of 859 companies, representing 56% of the total number of investments in Belgium from 1987–1997.[1] After exclusion of investee companies in the financial sector and holding companies, and companies for which the yearly accounts are not found in the files of the National Bank of Belgium, 565 companies remain. The main data for the study are the yearly accounts of the companies, up to 1998, from the year of the investment up to at most 9 years after the initial investment.[2]

Following Megginson and Weiss (1991) and Lerner (1999), each VC backed company is matched with a non-VC backed company on following criteria, measured in the year before the VC investment: activity, size (with total assets as proxy), and stage. The pre-investment situation of the VC backed companies is used, so as not to introduce a bias caused by the investment itself. A start-up company is defined as a company at most two years old at the time of investment, an early stage company is between three and five years old at the time of investment and a mature company is older than five years at the time of investment. Table 1 describes the sample.

Table 1. Description of the sample.

	Start-up	Early stage	Later stage	Total
Indepent & captive	44	30	83	157 (28%)
Government	163	70	171	404 (71%)
# GIMV	23	18	38	79 (14%)
# SRIW	22	9	29	60 (11%)
# Other Government	118	43	104	265 (46%)
Unknown	1	1	2	4 (1%)
Total	208 (37%)	101 (18%)	256 (45%)	565 (100%)

Of the 565 investments, a majority (71%) is backed by a government related VC company, the remainder by private (captive or independent) VC companies. Government-backed companies are over represented in the sample: EVCA reports that 51% of all investments in Belgium between 1989 and 1997 are done by government VC companies.[3] Independent and captive VC backed companies are thus underrepresented. Of the 565 investments in the sample 45% are later-stage investments and 18% early stage. 37% of the investments are in start-up companies, close to 30% reported for the whole Belgian VC industry during the period 1989–1997 (EVCA statistics).

Important differences exist in terms of investment stage between the different types of VC companies. More than half of the investments by independent and captive VC companies are later stage investments. Later-stage investments also represent half of the investments of GIMV and SRIW. Other government related venture capitalists, however, invest for 45% in start-ups, while early stage investments represent 16% and later-stage investments only 39% of their portfolio.

Independent variables that are likely to have an impact on firm survival are included in the multivariate analyses: age, cash ratio, long-term debt ratio, net return on total assets and number of employees (Ooghe *et al.* 1995). The cash ratio measures the amount of cash relative to the amount of fixed assets. The long-term debt ratio measures the amount of long-term debt relative to the sum of long-term debt and shareholders equity. The net return on total assets measures the net result after non-cash costs, before financial costs and before taxes, relative to the total assets of the company. All covariates are measured the year before the VC investment took place, or the year of the VC investment for start-ups. They are thus time-independent variables. These are described in table 2.

Despite the careful matching procedure, table 2 highlights that significant differences exist in accounting ratios between the sample of VC backed and non-VC backed companies in the year before the investment takes place. Companies that receive VC have a significantly lower cash ratio and a higher long term debt ratio, and thus a higher financial risk. VC backed companies also have a significantly lower net return on total assets before taxes (consistent with Bamford and Douthett 2000). In order to take some of the differences in the pre-investment risk into account, these pre-investment accounting ratios, that predict the probability of failure (Ooghe *et al.* 1995) will be included in the analyses.

Table 2. Basic statistics of independent variables.

	Median		Mean		SD		Significant difference between samples
	VC	NVC	VC	NVC	VC	NVC	
Age	5.00	5.00	9.54	10.82	13.72	14.47	****
Size (000.000)	70	56	401	231	2430	941	****
Cash ratio	0.04	0.06	0.09	0.13	0.16	0.18	**
Long term debt ratio	0.34	0.23	0.30	0.29	1.24	0.49	***
Net return of TA BT	0.04	0.05	−0.38	0.20	0.61	0.38	***
# Employees (000)	0.01	0.01	0.07	0.04	0.47	0.16	

Significance levels report differences between VC backed and non-VC backed companies (Wilcoxon signed-rank test); VC= VC backed companies & NVC= non-VC backed companies; TA: Total Assets; BT: Before Taxes. *$0.05 \leqslant p < 0.1$; **$0.01 \leqslant p < 0.05$; ***$0.001 \leqslant p < 0.01$; ****$p < 0.001$ (two sided).

Method of analysis

The yearly evolution of both VC backed and non-VC backed companies is recorded up to nine years after the investment. For each company in both samples, it is known whether it still exists as an independent entity, whether and when it has gone bankrupt, been involved in a merger or acquisition, been closed or split or whether and when it has been lost to follow-up. Cases lost to follow-up are companies that disappeared from the official yearly accounts before the end of 1998 for an unknown reason. Right censored cases, for whom the terminal event has not yet occurred at the end of 1998, are fundamentally different from cases that have been lost to follow-up. Cases lost to follow-up may have experienced the terminal event without our knowledge during a time period within the purview of the study. In order to take right-censoring problems into account, data will be analysed with univariate and multivariate 'event history' or 'survival' techniques (Allison 1990). The occurrence of three types of non-repeated events is analysed: (1) merger or acquisition; (2) bankruptcy; and (3) 'negative events', including bankruptcy, closure and 'lost to follow-up'. Hence survival is defined as the existence of the firm as an independent entity.

The survival function and the event function (or mortality function) are central concepts in event history analyses. The survival function indicates the probability that a company does not experience an event (bankruptcy, merger or acquisition, split, closure or lost to follow-up) before a certain point in time T, whereas the event function indicates the probability that a company experiences an event before or at T. The event function is thus 1 minus the survival function. More technical definitions of the survival and the event functions is given in appendix 1. The life table procedure is used to calculate the cumulative survival rate of both the VC backed and the non-VC backed companies in our sample. Statistical significance of differences in survival rates between

two groups is detected with Gehan's generalized Wilcoxon test (Lee 1992).

Because observed differences in survival rates between VC backed and non-VC backed companies may be caused by differences in the pre-investment risk profiles in both groups, it is further tested whether the survival time and the time to occurrence of an event depends on independent covariates with multivariate survival analyses. The basic model is the exponential model, that assumes that the distribution of the time to event is exponential and can be expressed as (with $l(z)$ the survival time and z the covariate vector of independent variables):

$$l(z) = \exp(a + b * z)$$

The parameters a and b are estimated with maximum likelihood estimation techniques.

Results

In this section, the survival of VC backed companies is compared to the survival of their non-VC backed counterparts. Afterwards a comparison is made between the survival of government and private VC backed and that of non-venture capital backed companies. Finally, the survival of government and private venture capital backed companies is compared.

VC backed versus non-VC backed companies

The number of events in the VC backed sample is larger than that in the non-VC backed sample during the first years after investment. This is mainly caused by the relatively large amount of bankruptcies and closures of VC backed companies. It is striking that 10 VC backed companies filed for bankruptcy in the year the venture capital investment was done!

Figure 1 depicts the survival function of VC backed and non-VC backed companies: the probability of survival—i.e. of going on as an independent entity—is higher for non-VC backed companies than for VC backed ones. At the end of the observation period, the cumulative survival rate of VC backed companies is 56.15%, whereas non-VC backed companies have a cumulative survival rate of 58.27%. This difference is marginally significant (p=0.11, Gehan's generalized Wilcoxon test). Contrary to H1a but consistent with H1b, the probability of survival of VC backed companies is (almost significantly) *lower* than that of non-VC backed companies.

Not all events considered here are negative, however: being involved in a merger or acquisition may well be positive. Therefore separate analyses are run for merger and acquisitions (M&A), for bankruptcies and for the sum of all negative events (bankruptcies, closures and lost to follow-up). The event function of M&As is shown in figure 2, that of bankruptcies in figure 3 and that of negative events in figure 4. With the exception of the

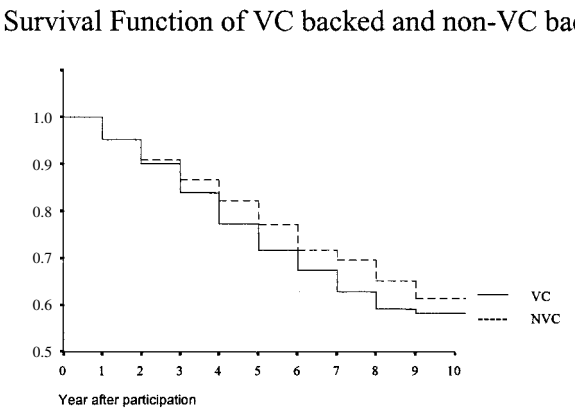

Figure 1. Survival function of VC backed and non-VC backed firms.

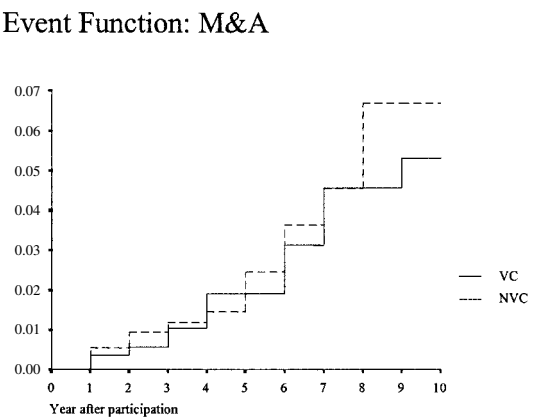

Figure 2. Event function: M&A.

third and the sixth year after participation, the cumulative M&A event rate of VC backed companies is (not significantly) *lower* than that of non-VC backed firms. The cumulative M&A event rate of the VC backed companies at the end of the ninth year is 5.30%, whereas non-VC backed companies have a cumulative M&A event rate of 6.69%. This implies that VC backed companies are not taken over more frequently than non-VC backed companies. This is somewhat surprising, as VC companies actively seek exits, thereby making trade sales and therefore acquisitions more likely at first sight. VC backed companies have a significantly *higher* bankruptcy rate ($p < 0.07$—figure 3) and negative event rate ($p < 0.05$—figure 4) than non-VC backed firms. The cumulative bankruptcy event rate of VC backed and non-VC backed companies at the end of the ninth year is respectively 19.49% and 14.84%. VC backed companies have a higher probability of not surviving, due to bankruptcies or closures, supporting H1b.

The univariate results are confirmed by multivariate survival analyses; results are given in table 3. In these analyses, VC is the

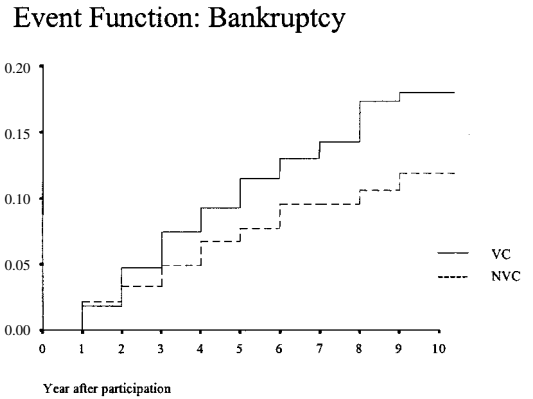

Figure 3. Event function: bankruptcy.

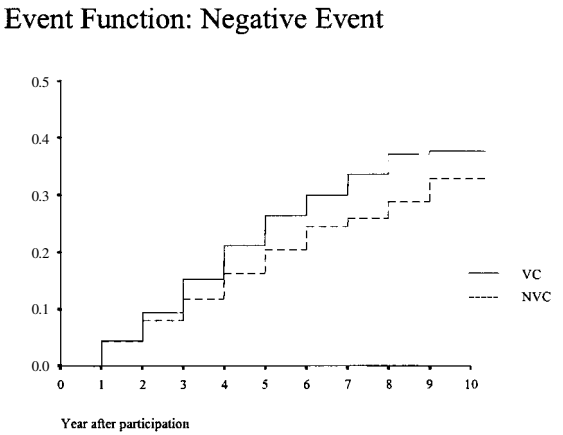

Figure 4. Event function: negative event.

independent (dummy) variable of interest, indicating whether or not a company is financed by VC. The other variables are control variables that may influence the probability of survival. A positive coefficient implies a positive impact on the survival of the company as an independent entity, everything else equal. The higher the value of the independent variable, the longer it takes for a certain event to take place. Table 3 first shows that the presence of VC does not influence the time to occurrence of a M&A, confirming the univariate findings. However, VC backed companies go bankrupt or, more generally, are subject to a negative event, earlier than comparable non-VC backed ones. The analyses moreover indicate that the younger a company is and the less cash it has before the VC investment, the faster it will be involved in a M&A. Companies with low cash ratios and high long term debt ratios, thus with a high financial risk profile file for bankruptcy faster and are prone to negative events faster than companies with a lower financial risk profile.

Table 3. Multivariate survival analyses (exponential model), total sample.

	M&A			Bankruptcy			Negative event		
	Beta	*t*	Sign.	Beta	*t*	Sign.	Beta	*t*	Sign.
Constant	3.78	9.17	****	3.94	16.91	***	2.91	21.26	****
Independent variable VC (dummy)	0.31	0.89		−0.34	−1.73	*	−0.20	−1.70	*
Control variables									
Log(age)	0.37	2.54	**	−0.03	−0.40		0.01	0.18	
Cash ratio	8.48	2.48	**	2.61	2.30	**	0.56	1.18	
LT debt ratio	0.13	0.34		−0.41	−2.60	***	−0.18	−1.51	
Net return TA	−0.55	−0.55		0.16	0.75		0.11	0.81	
# Employees ('000)	−0.30	−1.53		0.92	0.97		1.61	2.00	**
# Events	1130			1130			1130		
N	34			112			288		
p (Model)	0.024			0.003			0.023		

Contrary to H1a but supporting H1b, VC backed companies have a lower probability of survival than comparable non-VC backed companies and a higher probability of experiencing a negative event. These findings are not consistent with Kunkel and Hofer (1990) and Timmons (1994), who found a higher probability of survival for US VC backed companies. One explanation for this difference may be the longer time frame in our study (Macmillan *et al.* 1988, Gorman and Sahlman 1989). This allows the whole investment process to unfold.

Government and private venture capital backed versus non venture capital backed companies

The survival rates of firms backed by independent or captive VC companies are not significantly different from those of non-VC backed companies, as shown in table 4. No differences are found in terms of cumulative M&A, bankruptcy or negative event rates either. However, government VC backed companies experience more bankruptcies and significantly more negative events than their matched counterparts. When government VC companies are split up between GIMV, SRIW and the other government VC companies, the analyses show important differences in terms of survival between the three subcategories. GIMV and SRIW backed companies have *higher* survival rates than their non-VC backed counterparts (statistically significant at 0.09 level for GIMV backed companies). Companies backed by other government VC companies however, have significantly *lower* survival rates than comparable non-VC backed companies. The analyses indicate that the higher survival rates of GIMV backed companies are caused by *lower* bankruptcy rates, whereas SRIW and other government-backed companies experience *more* bankruptcies (statistically significant at the 0.09 level) than comparable non-VC backed companies. Finally, table 4 shows that the negative event rates of

Table 4. Cumulative survival rate (%) and cumulative event rate (%) at the end of ninth year after participation, by type of VC.

Category of VC	Cumulative survival rate			M&A cumulative event rate			Bankruptcy cumulative event rate			Negative event cumulative event rate		
	VC	NVC	Sign	VC	NVC	Sign	VC	NVC	Sign	VC	NVC	Sign
Independent & captive	57.06	56.99		5.03	7.24		18.85	12.67		37.61	36.81	
Government	55.99	58.51		5.41	6.55		19.89	15.74		40.51	36.26	*
GIMV	74.33	54.41	*	2.08	7.45		9.16	17.71		24.09	39.72	
SRIW	62.36	51.90		11.43	11.50		17.60	11.84		27.93	41.34	
Other Government	45.97	63.75	***	4.26	3.99		26.83	16.17	*	51.98	32.20	***
Total	56.15	58.27	[(a)]	5.30	6.69		19.49	14.84	*	39.91	36.25	**

Significance levels report differences between survival or event functions of VC backed companies compared to non-VC backed companies (Gehan's generalised Wilcoxon test). [(a)]: $p = 0.11$; *$0.05 \leq p < 0.1$; **$0.01 \leq p < 0.05$; ***$0.001 \leq p < 0.01$.

GIMV and SRIW backed companies are *lower* than the comparable non-VC backed companies,[4] whereas other government-backed companies have *higher* negative event rates than their counterparts. These results indicate that, whereas GIMV and to a lesser extent SRIW portfolio companies outperform their matched non-VC backed counterparts in terms of survival, other government VC portfolio companies have lower probabilities of survival in comparison with their matched counterparts.

Government versus private venture capital backed companies

In order to test whether the survival of VC backed companies depends on the type of VC company that provides financing (H2a and 2b), pairwise comparisons (Gehan generalized Wilcoxon test) are performed.[5] GIMV backed companies have a significantly higher probability of survival ($p < 0.1$) than private VC backed companies and than other government VC backed companies ($p < 0.05$). SRIW-backed companies have a significantly higher probability of survival than other government-VC backed companies ($p < 0.1$), but not than independent- or captive-VC backed companies.

Wilcoxon tests indicate that negative event rates are significantly lower for GIMV backed companies ($p < 0.02$) and for SRIW backed companies ($p < 0.02$) compared to other government-backed companies: the cumulative negative event rate for other government-backed companies at the end of the ninth year is 51.98%, compared to only 24.09% for GIMV backed companies and 27.93% for SRIW backed companies. Differences between other pairs of VC investors are not statistically significant. No significant differences are found for M&A or bankruptcy event functions.

The results of the bivariate analyses are confirmed by the multivariate analyses. Appendix 2, panels A, B, C and D report the results of multivariate survival analyses of the subsamples of VC backed companies

and their matched counterparts, split up according to who their backer is (independent and captive, GIMV, SRIW or other government VC company). Neither the presence of a private VC backer (panel A), nor that of GIMV[6] (panel B) or SRIW (panel C) significantly influences the time to occurrence of a M&A, a bankruptcy or a negative event. It is interesting to note, however, that VC has a positive coefficient for GIMV (bankruptcy and negative event) and for SRIW (negative event), while the coefficient is negative in all other subsamples. Consistent with the bivariate analyses, GIMV and to a lesser extent SRIW have a more positive impact on the survival of investee companies than other VC companies. Finally, the presence of other government VC companies (panel D) does not significantly influence the time to occurrence of a M&A, but government (non-GIMV, non-SRIW) backed companies experience bankruptcies or negative events significantly faster than their non-VC backed counterparts.

Neither H2a nor H2b are thus supported. The analyses reveal that what is going on, is more complex than hypothesized. Companies, backed by private VC companies, do not have consistently higher or lower survival rates than companies backed by government VC companies. The positive effects of VC (selection, value adding, monitoring, enhanced legitimation) are offset by the negative effects (adverse selection, higher risk profile of VC backed companies at the outset). However, there clearly exist different types of government VC companies: companies backed by GIMV and to a lesser extent SRIW clearly survive longer than those backed by other government VC companies, and (for GIMV-backed companies) than those backed by private VC companies.

The impact of the control variables is consistent across the subsamples. Older and cash rich companies are less prone to M&As, while the financial risk indicators do not influence the occurrence of M&As. The higher the financial risk is, however, the faster bankruptcy or negative events will occur: the long term debt ratio has a significantly negative impact on survival, while the cash and profitability ratios have a positive (but not always significant) impact on survival. Age, however, has no significant impact on the survival of companies, contrary to common wisdom that younger companies have lower chances of survival.

Discussion

The VC industry is an industry that is considered to be important to foster high growth entrepreneurial companies. Therefore, governments all over the world are setting up programmes to promote this type of financing. Little is known, however, on the impact of VC on the survival of the investee companies. Can the presence of a venture capitalist in the capital of a company increase its chances of survival?

Survival is defined as the existence of the firm as an independent entity. No information on follow-on finance, nor on the type of M&A is available for the present study. This longitudinal study shows that VC backed companies have a lower probability of survival and a significantly higher probability of going bankrupt than non-VC backed companies, contrary to

common wisdom and contrary to previous studies. This may either be due to the adverse selection problem, in that the best companies are likely to find funding elsewhere, or to the fact that VC companies manage risk on a portfolio basis, rather than on an individual investee company basis. VC companies may well be willing to take the risk of bankruptcy of some portfolio companies, as long as the whole portfolio produces above average returns, thanks to some star investments. Therefore, bankruptcies may be viewed as an inherent part of the investment process. Gorman and Sahlman (1989: 238) argue that 'failure is at the very least endemic to the venture capital process, an expected common place event; in some cases the process itself may even promote failure'. For VC companies it may be more efficient to liquidate their 'living dead' investments and to concentrate on their potential star investments.

There are some interesting differences, however, when considering more closely the type of VC backer. GIMV and SRIW (two large government VC companies) backed investee companies have higher chances of surviving as independent entities. For GIMV backed companies, the results are even stronger: they survive longer than companies, backed by independent or captive VC companies. Our results confirm US studies (Megginson and Weiss 1991) in that we have shown that receiving VC from the right backer is perhaps more important than receiving VC per se.

Several explanations are possible for this surprising finding. First, both GIMV and SRIW are among the oldest VC companies in Belgium. It may well be that a learning effect takes place: over the years, management of GIMV and, to a lesser extent SRIW, may have acquired expertise and may be able to better fulfil its roles of selection, value-adding and monitoring. Another explanation is that GIMV and SRIW may have a better (in the sense of less risky) deal flow, thanks to their superior reputation, as the oldest Belgian VC companies with a positive track record, and with a significantly lower proportion of bankruptcies and other negative events among their portfolio companies. Reputation is an asset in this industry, where trust and confidence are important. By building a strong reputation, a VC company is able to overcome the adverse selection problem (Amit *et al*. 1990). The superior deal flow, overcoming the adverse selection problem, may also be caused by the fact that government VC companies require lower ex ante expected returns (Manigart *et al*. 1997). In a related study preliminary evidence was found that GIMV and SRIW invest in less risky companies. It is then, of course, not surprising that the survival rates of their investee companies are higher. A final explanation may be that GIMV and SRIW pursue other strategies than other VC companies. As government-backed VC companies, they may stress more a fire fighting strategy, focusing on the recovery of living dead ventures and being reluctant to cut their losses, rather than building on the star performers. It is then, however, remarkable that other government-backed VC companies have lower probabilities of survival.

The results are especially important for *entrepreneurs*. When searching for adequate sources of finance, entrepreneurs should realize that not all money is the same (Aernoudt 2000). Certain types of financing may be

more appropriate for companies in certain stages or environments. As one of the major goals of the entrepreneur is the survival of his/her company, the effect of the type of financing on survival is important. Because VC is an expensive financing source, it is important to know whether VC backing improves the survival of the entrepreneurial company. It is shown that the type of VC backer is important in determining the probability of survival: getting financing from the right backer is important. Whereas getting finance from private VC companies has no impact on the probability of survival, getting finance from some government backed VC companies increases the probability of survival.

Our findings are important for *policy makers* as well. It is shown that government VC companies may play different roles and pursue different goals. When market-oriented like GIMV, they may act as private VC companies, leading even to higher survival of their portfolio companies. However, other government VC companies may pursue other goals, more related to subsidizing small companies. It is shown that their investee companies have lower than average chances of survival, even taking differences in pre-investment risk into account. Therefore, when setting up government-backed VC companies, authorities should be well aware that the goals they set may significantly impact the way they work. This, however, need not be negative at the outset. Is it the role of government to fund VC companies that act like private VC companies, with comparable results? Our results might well imply that the role of the government in GIMV and SRIW is over now and that private players should take over. This is not to say that government funding was not valuable and appropriate when founding GIMV and SRIW. Indeed, at that point in time little or no venture capital was available in Belgium. Both VC companies have played a pioneering and invaluable role in the emerging Belgian VC industry. However, our results indicate that the companies backed by GIMV and SRIW are not more risky than those backed by private players. It is, therefore, difficult to maintain that they still serve a niche that cannot be or is not filled by private investors.

Finally, our findings have implications for the *VC industry*. VC companies are thought to fulfil a valuable role in an economy because they reduce information asymmetries. However our results do not indicate that VC companies in general have a positive contribution in terms of the survival of their investee companies. Belgian VC companies should further professionalize their working methods and management, so that their roles of selection, monitoring and value adding can be well performed. Overall, our results do not imply that VC cannot play an important role in an economy. Indeed, in VC financing, the 'averages' are less important than the few outstanding outliers. These outliers are clearly the focus of attention and the reason for the existence of the VC industry. More research is needed on this topic.

Although some insight has been gained into failure and survival of venture capital backed companies, this study has shown that the relationship is more complex than initially thought. Although there are reasons to believe that the initial goals and the strategy of a VC company have an impact on the chances of survival of its portfolio companies, the nature of

the relationship is not clear yet. This calls for further study of the strategy and performance of VC companies: are losses, caused by bankruptcies and other negative events, set off by star performers? For the economy as a whole, it would be interesting to know what happens to companies that did not survive. Are acquisitions positive events, or are they distress sales? Did companies restructure themselves after bankruptcies or negative events and recover some of their wealth? Is holding on to 'living dead' companies value creating for a society at large? This paper is a call for further in-depth studies on these questions.

Acknowledgements

The FWO are thanked for financial support (grant no G.0253.99), Graydon Belgium for providing part of the data, Wim Neutens and Christof Beuselinck for excellent research assistance, the participants of the 4th Belgian Financial Research Forum (Mons) and the 20th Babson College-Kauffman Foundation Conference for Entrepreneurship Research (Wellesley, MA) for insightful comments, and especially Marc Deloof, Bart Clarysse, Dirk Van den Poel, Colin Mason and two anonymous reviewers.

Notes

1. This figure is obtained from information in several EVCA-yearbooks.
2. In Belgium, the financial accounts of all companies are public and distributed by the National Bank. 1987 was chosen as the first year of the study, as it is from then on that the yearly accounts are available in electronic format.
3. The overrepresentation of government-backed companies is due to the fact that government VC companies are required to provide more information than private VC companies.
4. The lack of statistical significance between VC and non-VC backed companies, despite the large difference in cumulative negative event rate for GIMV, is probably due to the small sample size (N=79).
5. The results of these analyses are not reported in the paper, but are available from the authors upon request.
6. It is not possible to estimate te M&A model, because the number of events is too low.

References

Admati, A. R. and Pfleiderer, P., 1994, Robust financial contracting and the role of venture capitalists. *Journal of Finance*, **49,** 371–402.

Aernoudt, R., 2000, Entrepreneurship in financial and political institutions: difficult circumstances. In D. Deschoolmeester, D. De Steur, K. Gillis and T. Schamp (eds) *Entrepreneurship under Difficult Circumstances. Seminar Proceedings of the 30th European Small Business Seminar*, Gent, Belgium, 20–22 September, 2000, 587–600.

Allison, P. D., 1990, *Event History Analysis: Regression for Longitudinal Event Data* (California: Sage).

Al-Suwailem, S., 1995, Does venture capital financing make a difference? Unpublished doctoral dissertation, University of Washington, St Louis.

Amit, R., Glosten, L., and Muller, E., 1990, Entrepreneurial ability, venture investments and risk sharing. *Management Science*, **36(10),** 1232–1245.

Amit, R., Brander, J. and Zott, C., 1998, Why do venture capital firms exist? Theory and Canadian evidence. *Journal of Business Venturing*, **13,** 441–466.

Bamford, C. E. and Douthett, E. B., 2000, New venture risk : systematic differences in the management of risk between VC backed and non-VC backed ventures. Paper presented at 2000 Babson-Kauffman Conference for Entrepreneurship Research, Wellesley, MA.

Barry, C. B., Muscarella, C. J., Peavy J. W. III and Vetsuypens, M. R., 1990, The role of venture capital in the creation of public companies: evidence from the going public process. *Journal of Financial Economics*, **27,** 447–471.

Berger, A. N. and Udell, G. F., 1998, The economics of small business finance: the roles of private equity and debt markets in the financial growth cycle. *Journal of Banking and Finance*, **22,** 613–673.

Bruno, A. V., McQuarrie, E. F. and Torgrimson, C. G., 1992, The evolution of new technology ventures over 20 years: patterns of failure, merger, and survival. *Journal of Business Venturing*, **7,** 291–302.

Bygrave, W. D. and Timmons, J. A., 1992, *Venture Capital at the Crossroads* (Boston: Harvard Business School Press).

Cooper, A. C., Gimeno-Gascon, F. J. and Woo, C. Y., 1991, A resource-based prediction of new venture survival and growth. *Academy of Management Best Papers Proceedings*, 68–72.

Diamond, D., 1991, Monitoring and reputation: the choice between bank loan and directly placed debt. *Journal of Political Economy,* **99(4),** 689–721.

Ehrlich, S. B., De Noble, A. F., Moore, T., and Weaver, R. R., 1994, After the cash arrives: a comparative study of venture capital and private investor involvement in entrepreneurial firms. *Journal of Business Venturing*, **9,** 67–82.

EVCA, 1987–2000, *EVCA Yearbook* (Zaventem, Belgium: European Venture Capital Association).

Fredriksen, O., Olofsson, C. and Wahlbin, C., 1997, Are venture capitalists firefighters? A study of the influence and impact of venture capital firms. *Technovation*, **17,** 133–150.

Fried, V. H., and Hisrich, R. D., 1995, The venture capitalist: a relationship investor. *California Management Review,* **37,** 101–113.

Gifford, S., 1997, Limited attention and the role of the venture capitalist. *Journal of Business Venturing*, **12,** 459–482.

GIMV, 2000, http:/www.gimv.com/site_e/profiel/wie.htm, 23 June 2000.

Gompers, P. A., 1995, Optimal investment, monitoring, and the staging of venture capital. *Journal of Finance*, **50,** 1461–1489.

Gompers, P. A., 1998, Venture capital growing pains: should the market diet? *Journal of Banking and Finance*, **22,** 1089–1104.

Gorman, M. and Sahlman, W. A., 1989, What do venture capitalists do? *Journal of Business Venturing*, **4,** 231–248.

Kunkel, S. W. and Hofer, C. W., 1990, Why study the determinants of new venture performance: a literature review and rationale. Paper presented at Academy of Management meetings, August 1990, Miami, Florida

Lee, E. ., 1992, *Statistical Methods for Survival Data Analysis* (New York: John Wiley and Sons).

Leleux, B., Surlemont, B. and Wacquier, H., 1998, State versus private venture capital: cross-spawning or crowding out? A pan-european analysis. Paper presented at 1998 Babson-Kauffman Conference for Entrepreneurship Research, Ghent.

Lerner, J., 1995, Venture capitalists and the oversight of private firms. *Journal of Finance*, **50,** 301–318.

Lerner, J., 1999, The government as venture capitalist: the long-run impact of the SBIR program. *Journal of Business*, **72,** 285–317.

Lin, T. H. and Smith, R. L., 1998, Insider reputation and selling decisions: the unwinding of venture capital investments during equity IPOs. *Journal of Corporate Finance*, **4,** 241–263.

Maier, J. B. and Walker, D. A., 1987, The role of venture capital in financing small business. *Journal of Business Venturing*, **2,** 207–214.

Manigart, S. and Sapienza, H., 1999, Venture capital and growth. In D.L. Sexton and H. Landström (eds) *International State of the Art in Entrepreneurship Research* (UK: Blackwell Publishers, Oxford), 240–258.

Manigart, S. and Van Hyfte, W., 1999a, Financiering van innovatie in Vlaanderen. De venture capital sector in internationaal perspectief. (Financing innovation in Flanders. the venture capital sector in an international perspective), IWT paper No. 24.

Manigart, S. and Van Hyfte, W., 1999b, Post investment evolution of venture backed companies. In P.Reynolds, W. Bygrave, S. Manigart, C. Mason, G. Meyer, H. Sapienza and K. Shaver (eds) *Frontiers of Entrepeneurship Research* (Wellesley, MA: Babson College), 419–432.

Manigart, S., Wright, M., Robbie, K., Desbrières, P. and De Waele, K., 1997, Venture capitalists' appraisal of investment projects: an empirical European study. *Entrepreneurship Theory and Practice*, **21,** 29–44.

Megginson, W. L. and Mull, R. H., 1991, Financial characteristics and financing decisions of venture capital backed companies. Paper presented at Small Business Finance Conference, Florida, April 1991.

Megginson, W. L. and Weiss, K. A., 1991, Venture capitalist certification in initial public offerings. *Journal of Finance*, **46,** 879–903.

Mitchell, F., Reid G. C. and Terry, N. G., 1997, Venture capital supply and accounting information system development. *Entrepreneurship Theory and Practice*, **21,** 45–62.

OECD, 1997, Government venture capital for technology-based firms, OCDE/GD(97)201, http:/www.oecd.org/dsti/sti/s_t/inte/prod/e_97-201.pdf., 19 June 2000.

Ooghe, H., Joos, P. and De Bourdeaudhuy, C., 1995, Financial distress models in Belgium: the results of a decade of empirical research. *The International Journal of Accounting*, **30,** 245–274.

Ruhnka, J. C., Feldman, H. D. and Dean, T. J., 1992, The 'living dead' phenomenon in venture capital investments. *Journal of Business Venturing,* **7,** 137–155.

Sahlman, W., 1990, The structure and governance of venture-capital organizations. *Journal of Financial Economics*, **27,** 473–521.

Sapienza, H. J., 1992, When do venture capitalists add value? *Journal of Business Venturing*, **7,** 9–27.

Sapienza, H. J. and Gupta, A. K., 1994, Impact of agency risks and task uncertainty on venture capitalist–CEO interaction. *Academy of Management Journal*, **37,** 1618–1632.

Sapienza, H. J., Manigart, S. and Vermeir, W, 1996, Venture capitalist governance and value-added in four countries. *Journal of Business Venturing*, **11,**, 439–470.

SRIW, 2000, http:/www.sriw.be/fr/published/SRIWbilanEN.zip, 23 June 2000.

Timmons, J. A., 1994, *New Venture Creation: Entrepreneurship for the 21st Century*. (Homewood, IL: Irwin).

Vermunt, J., 1997, *Log-Linear Models for Event Histories* (California: Sage), 89.

Wright, M., Robbie, K., Manigart, S., Desbrières, P. and Sapienza, H., 1997, Venture capital firms and equity investment appraisal in the US, UK, France, Belgium and Holland. *CMBOR Quarterly Review*, 19–35.

Appendix 1

Definition of survival and event function

Suppose T is a discrete random variable indicating the time of occurrence of an event (e.g. years), and t_1 is the lth discrete time point, where $0 < t_1 < t_2 < \ldots < t_{L^*}$, with L^* indicating the total number of time points ($L^* \leqslant 9$). If the event occurs at t_1, it is known that the event did not occur before t_1 (non-repeated event). The probability of experiencing an event at $T = t_1$ is defined as (Vermunt 1997):

$$f(t_1) = P(T = t_1).$$

The survival function, which indicates the probability of not having an event before or at $T = t_1$, is (Vermunt 1997):

$$S(t_1) = P(T > t_1) = \sum_{k=l+1}^{L*} f(t_k) = \sum_{k=l+1}^{L*} P(T = t_k)$$

The event function (also called mortality function) or 1 minus the survival function indicates the probability of experiencing an event before or at $T=t_1$ and is defined as:

$$E(t_1) = 1 - S(t_1) = P(T \leqslant t_1) = \sum_{k=0}^{l} f(t_k)$$

Appendix 2

Multivariate survival analyses (exponential model), subsamples

	M&A			Bankruptcy			Negative event		
	Beta	*t*	Sign.	Beta	*t*	Sign.	Beta	*t*	Sign.
Constant	2.56	3.41	****	4.53	7.88	****	3.00	10.26	****
Independent variable VC	0.52	0.79		−0.47	−1.14		−0.17	−0.72	
Control variables									
Log(age)	0.69	2.25	**	−0.15	−0.81		0.06	0.59	
Cash ratio	14.53	2.29	**	0.68	0.36		−0.50	−0.63	
LT debt ratio	0.05	0.09		−0.38	−1.84	*	−0.20	−1.20	
Net return TA	0.47	0.17		1.23	1.97	**	0.08	0.19	
# Employ. ('000)	−0.10	−0.15		0.34	0.38		0.29	0.52	
# Events	10			26			76		
N	314			314			314		
p Model	0.09			0.16			0.69		

Panel B: GIMV

	M&A			Bankruptcy			Negative event		
	Beta	*t*	Sign.	Beta	*t*	Sign.	Beta	*t*	Sign.
Constant				4.65	7.74	****	3.25	7.80	****
Independent variable VC				0.49	0.79		0.40	1.15	
Control variables									
Log(age)				0.10	0.41		0.03	0.18	
Cash ratio				5.29	0.99		1.74	0.99	
LT debt ratio				−2.81	−5.55	****	−1.71	−3.40	****
Net return TA				0.59	0.37		−0.19	−0.19	
# Employ. ('000)				−0.80	−0.49		0.86	0.49	
# Events	5			13			38		
N	158			158			158		
p Model				0.002			0.017		

Panel C: SRIW

	M&A			Bankruptcy			Negative event		
	Beta	*t*	Sign.	Beta	*t*	Sign.	Beta	*t*	Sign.
Constant	2.92	3.49	****	3.49	4.59	****	3.22	6.99	****
Independent variable VC	−0.27	−0.35		−0.24	−0.44		0.27	0.73	
Control Variable									
Log(age)	0.42	1.19		0.20	0.80		−0.09	−0.66	
Cash Ratio	10.29	0.99		12.89	1.68	*	−0.22	−0.13	
LT Debt Ratio	2.68	1.33		−1.19	−1.43		−0.57	−0.97	
Net Return TA	−1.48	−0.46		−0.24	−0.36		0.09	0.35	
# Employ. ('000)	−2.00	−1.62		0.06	0.05		1.31	0.89	
# Events	8			14			32		
N	120			120			120		
p Model	0.32			0.27			0.84		

Panel D: other government (non-GIMV and non-SRIW)

	M&A			Bankruptcy			Negative event		
	Beta	*t*	Sign.	Beta	*t*	Sign.	Beta	*t*	Sign.
Constant	4.03	4.62	****	3.67	10.43	****	2.94	13.28	****
Independent variable VC	−0.21	−0.34		−0.51	−1.91	*	−0.56	−3.21	***
Control variables									
Log(age)	0.56	1.54		−0.09	−0.79		−0.05	−0.65	
Cash ratio	11.30	1.71	*	3.06	1.79	*	0.63	0.90	
LT debt ratio	0.13	0.14		0.01	0.03		−0.01	−0.06	
Net return TA	−0.90	−0.38		0.19	0.41		0.36	1.57	
# Employ. ('000)	−2.17	−1.62		3.51	1.05		5.81	1.60	
Constant	4.03	4.62	****	3.67	10.43	****	2.94	13.28	****
# Events	11			59			141		
N	530			530			530		
p Model	0.335			0.052			0.002		

LT: long term; TA: total assets. *$0.05 \leqslant p < 0.1$; **$0.01 \leqslant p < 0.05$; ***$0.001 \leqslant p < 0.01$; ****$p < 0.001$ (two sided)