



Does cross-border syndication affect venture capital risk and return?[☆]



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ABSTRACT

Venture capital (VC) cross-border syndication has increased significantly in recent years. This study examines the risk and returns of investments of US–European cross-border syndicates in US portfolio companies. We use a large sample of investments across four financing stages, and highlight several noteworthy differences between cross-border syndicates and previous US-only evidence. By comparison, US–European syndicates are larger than US-only syndicates, involve younger VCs, and focus more on later financing stages. Controlling for sample selection bias caused by the endogenous choices of exit route and exit timing, we examine the risk and returns of investments backed by cross-border syndicates. Consistent with evidence from US-only syndicates, alpha and beta decrease monotonically from the earliest (start-up) stage to the later stages of financing.

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1. Introduction

In recent years, cross-border venture capital (VC) investments have increased substantially in terms of the amounts of capital, numbers of deals and range of industries involved (Guler & Guillen, 2010). Typically, in an international VC syndicate, local investors team up with foreign investors in order to invest in a local entrepreneurial company (Meuleman & Wright, 2011). Cross-border syndication may provide access to more complementary skills and capabilities than domestic syndicates. VC firms may play an important role in the internationalization of their portfolio companies through their respective home-country product and capital markets (Tykvova & Schertler, 2011). During the period from 2000 to 2008, more than one third of portfolio companies globally received financing from foreign VC firms (Tykvova & Schertler, 2011). Previous studies of VC syndication focus on motives for syndication, and document that VC firms syndicate in order to spread the investment risk, including risks due to the illiquidity

of the VC investment (Lerner, 1994). Amit (2002) concludes that syndication can add value to the investment, based on his finding that the more VC firms participate in the financing, the greater are the overall benefits to backers and entrepreneurs. Recent studies on cross-border syndicates outside the US investigate why VC firms rely on cross-border syndicates when they internationalize their investments, and emphasize the importance of the legal and institutional frameworks (Lu & Huang, 2010; Tykvova & Schertler, 2011). Wright, Pruthi, and Lockett (2005) examine Asian VC markets and point out that investments syndicated between local and foreign VC firms require further study.

Dimov and Milanov (2009) find that more than 73% of VC investments in the US are syndicated. To date, little is known about the prevalence of cross-border syndicates between US VC firms and foreign VC providers. Also, to our knowledge, there are no prior studies of the performance of VC investments in US portfolio companies financed by such cross-border syndicates. Prior studies of syndication, both domestic and cross-border, examine portfolio companies located outside the US. By contrast, this study analyzes VC investments in US portfolio companies made by US VCs syndicating with VCs from outside the US (specifically Europe).

Measuring the risk and returns of VC investments is challenging. Valuations of VC investments can only be observed when a portfolio company goes public or is acquired. Those companies within a VC portfolio that manage to go public or are acquired are likely to be a select subsample of comparatively good performers. In addition, the timing of exits, and the resulting return observations, are likely to vary systematically depending on the characteristics of the investment and the portfolio company, and on the nature and success of the VC

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Table 1
Previous studies of venture capital risk and returns. The table summarizes the findings of the previous studies on venture capital investments. Only the studies by [Cochrane \(2005\)](#) and [Korteweg and Sorensen \(2010\)](#) evaluate the risk and returns of investment rounds.

Authors	Country of venture capital firm	Sample and period	Methodology	Returns (R_i)	STD (σ)	Systematic risk (β)
Seppä and Laamanen (2001)	US	VC fund level (1998–1999)	Binomial/OLS model	NR	NR	NR
Chen, Baierl, and Kaplan (2002)	US	VC fund level (1999)	Method of moments (repeated sale approach)	45% all stages	115.6%	NR
Ljungqvist and Richardson (2003)	US	VC fund level (1981–1993)	Proportional hazard model	19.81% all stages	22.29%	1.09 all stages
Woodward (2004)	US	Company data (1990–2003)	Method of moments (building an index)	NR	50%	2.0 all stages
Cochrane (2005)	US	Company data (1987–2000)	Selection bias (maximum likelihood)	71% Start-up 65% Early stage 60% Expansion 50% Later stage	96% 98% 98% 99%	1.1 Start up 0.9 Early stage 0.7 Expansion 0.5 Later stage
Hege et al. (2008)	US & Europe	Company data (1997–2003)	OLS	62% (US) 106% (EU)	NR	NR
Korteweg and Sorensen (2010)^{ab}	US	Company data (1985–2005)	Selection bias	2246% Seed 60.10% Early 10.9% Late 85.41% Mezz	117% 134% 148% 135%	0.7414 2.742 2.628 5.888

NR: not reported.

^a The returns are annualized and based on [Table 8](#).

^b The standard deviations are annualized and based on [Table 5](#).

investments. For instance, [Gompers and Lerner \(2000\)](#) highlight the tendency of VCs to delay the liquidations of poor investments and the consequent realization and reporting of negative returns. The resulting sample selection biases with regard to observed exit routes and timing is a fundamental problem in evaluating the risk and returns of VC investments, and our study seeks to address and control for these biases.

We study the risk and returns of syndicated financing rounds between US and European VC firms in US portfolio companies.¹ We focus on portfolio companies that received VC financing from two or more VC firms, where at least one VC firm is European and at least one is based in the US. We chose Europe because it is the second largest VC industry after the US. US–European cross-border syndicates are an interesting case whose study minimizes the impact of differences in legal and institutional settings on cross-border risk and returns. This facilitates the comparison of our results with those of prior studies of the risk-return trade-off of VC investments by US-only VCs and VC syndicates ([Cochrane, 2005](#); [Korteweg & Sorensen, 2010](#)).

We document some interesting similarities and differences between US VCs and US–European cross-border syndicates, in terms of the investment behavior and performance. Comparable to studies of US VCs, we find that US–European cross-border syndicates face a monotonically decreasing relationship between both abnormal performance (alpha) and systematic risk (beta), on the one hand, and the stage of VC financing, on the other hand. That is, VC investments in earlier financing stages have higher abnormal returns and higher systematic risk than corresponding investments in later stages. We document significant evidence of sample selection bias. Nevertheless, our findings on the risk and returns of VC investments are remarkably robust across alternative methods of dealing with selection bias.

The rest of the paper is organized as follows: [Section 2](#) reviews the literature on the returns of VC investments; [Section 3](#) describes the motivation, data sources and the methodology employed; [Section 4](#) discusses the empirical findings; [Section 5](#) presents the conclusion.

¹ There are a handful of studies of VC returns that analyze the returns at the fund level rather than the returns of each investment round ([Chen et al., 2002](#); [Hege et al., 2008](#); [Ljungqvist & Richardson, 2003](#); [Woodward, 2004](#)). Typically, there are more financing rounds than VC funds.

2. Literature review

[Sahlman \(1990\)](#) is a seminal study of the structure of the US VC industry and the relationship between investors and VC firms. [Gompers \(1995\)](#) investigates the structure of staged VC investments in the presence of agency and monitoring costs. [Hellmann and Puri \(2002\)](#) investigate the contributions of VC firms to start-up companies located in Silicon Valley.

[Lerner \(1994\)](#) studies (US-only) VC syndication in biotechnology entrepreneurial companies and investigates the rationales for syndication. He finds that experienced VCs syndicate with other experienced backers in early-stage investments, while in later-stage investments experienced VCs syndicate with both experienced and inexperienced ones. [Lockett and Wright \(2001\)](#) report that small VC firms have difficulty achieving optimal portfolio diversification, and syndication allows them to achieve a well diversified portfolio. According to [Arberk, Filatotchev, and Wright \(2006\)](#), the fact that VC investments are illiquid and syndication is used as a risk-sharing mechanism means that studying VC syndication is crucial to understanding the activities of VC firms.

The aim of this study is not to contribute to our understanding of the motives for syndication ([Bent, Williams, & Gilber, 2004](#); [Brander, Amit, & Antweiler, 2002](#); [Casamatta & Haritchabalet, 2007](#); [Fleming, 2004](#); [Lockett & Wright, 2003](#)). Rather we aim to investigate the risk and returns of US–European cross-border syndicated investments (taking the composition of these syndicates as given).

There are a number of studies that examine the risk and returns of VC investments (see [Cochrane, 2005](#); [Korteweg & Sorensen, 2010](#); [Woodward, 2004](#)), but these studies focus on investments by US-only VCs and VC syndicates. As we document below, US VC firms have been co-investing with European VCs since the late 1980s. Yet, little is known about the syndicates. To our knowledge, the risk and returns of European VCs co-investing with US players is as yet unexplored. [Table 1](#) summarizes the results of previous studies of VC risk and returns. Only [Cochrane \(2005\)](#) and [Korteweg and Sorensen \(2010\)](#) investigate the risk and returns of VC investments at the level of the individual portfolio company as opposed to the performance of the VC fund overall.

[Seppä and Laamanen \(2001\)](#) investigate the risk and return profiles of investments at the VC fund level (correcting for sample selection bias using a binomial model). For a sample of 597 investment rounds between 1998 and 1999, they find that early-stage investments have higher returns and implied volatility than other investment rounds. [Manigart et al. \(2002\)](#) examine the determinants of VC returns in five

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