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**Article**

## The role of venture capital in alleviating financial constraints of innovative firms

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## ABSTRACT

*Venture capital is considered to be the most appropriate form of financing for innovative firms in high-tech sectors. We provide an assessment of venture capital looking at the involvement of venture capital with some of Europe's most innovative and successful companies: those listed on Europe's 'new' stock markets. Venture capital is effective in helping these firms overcome credit constraints but has a limited effect on their ability to grow and create jobs. This result clashes with the evidence on the role of VC for US companies. Yet, VC is not only about money but also about steering and supporting portfolio companies, activities which depend on venture capitalists' educational and organizational background as well as on the legal and cultural environment in which they operate.*

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# The role of venture capital in alleviating financial constraints of innovative firms

## 1. Introduction

It has long been discussed in academia and among policy makers whether firms are hindered in their performance by the lack of finance. Researchers have documented through surveys that firms report the lack of provision of risk capital and the inefficient functioning of the financial markets as important obstacles to their growth, investment and innovation, justifying government intervention to alleviate financial constraints.

The success of US venture capital (VC) funds in supporting dynamic companies, which create jobs and wealth, brought many governments to look for ways to nurture a national venture capital industry. Several official documents of European governments and institutions suggest bolstering venture capital and revamping the regulation of stock markets as remedies to Europe's economic sluggishness and dismal unemployment (e.g. European Commission 1998 and Committee of Wise Men 2001). At the same time, the high returns enjoyed by US venture capital firms induced venture capitalists to become active in other countries, too.

The aim of this article is to provide an overview of the role of venture capital in affecting innovative firm performance, thereby answering two relevant questions: firstly, how important is venture capital in alleviating financial constraints of innovative firms; secondly, what is the role that venture capital really plays in the financing of firms. To obtain a convincing answer we turn to firm-level data. In particular, we use evidence derived from two datasets that we have gathered and which are to some extent complementary: a dataset on VC-backed firms (Bottazzi and Da Rin 2002) and a dataset on European venture capitalists (VCs) for the period 1997-2001. Although rather comprehensive the data can not capture the more recent development of the VC industry.

The article is organized in six more sections. Section 2 discusses the extant literature and evidence on firm credit constraints. Sections 3 to 6 analyse the role of venture capitalists, in the financing of innovative firms, as well as the determinants of their investment style. Section 7 examines evidence on the role of VCs across firms in Europe and discusses the relationship between investor activities and performance. Section 8 presents conclusions and policy implications.

## 2. The evidence on credit constraints

Understanding the obstacles to firm growth has been a challenging aspiration of researchers in finance and economics. Researchers have documented that low government quality, macroeconomic instability as well as many features of the business environment are important impediments to firms' growth. In particular, several papers have identified the important role of financing obstacles. Rajan and Zingales (1998) show that industries that are more dependent on external finance grow faster in countries which have been able to develop a better financial system. Demirgüç-Kunt and Maksimovic (1998) and Beck, Demirgüç-Kunt and Maksimovic (2005) (hereafter BDM) provide evidence that firms consider the quality of the financial system and of the legal enforcement, as well as the level of corruption, as the three most important factors affecting firm's external financing constraints.

More recently, Ayyagari, Demirgüç-Kunt and Maksimovic (2008) (hereafter ADM) use evidence from the World Business Environment Survey (WBES), a major firm level survey conducted by the World Bank in 1999

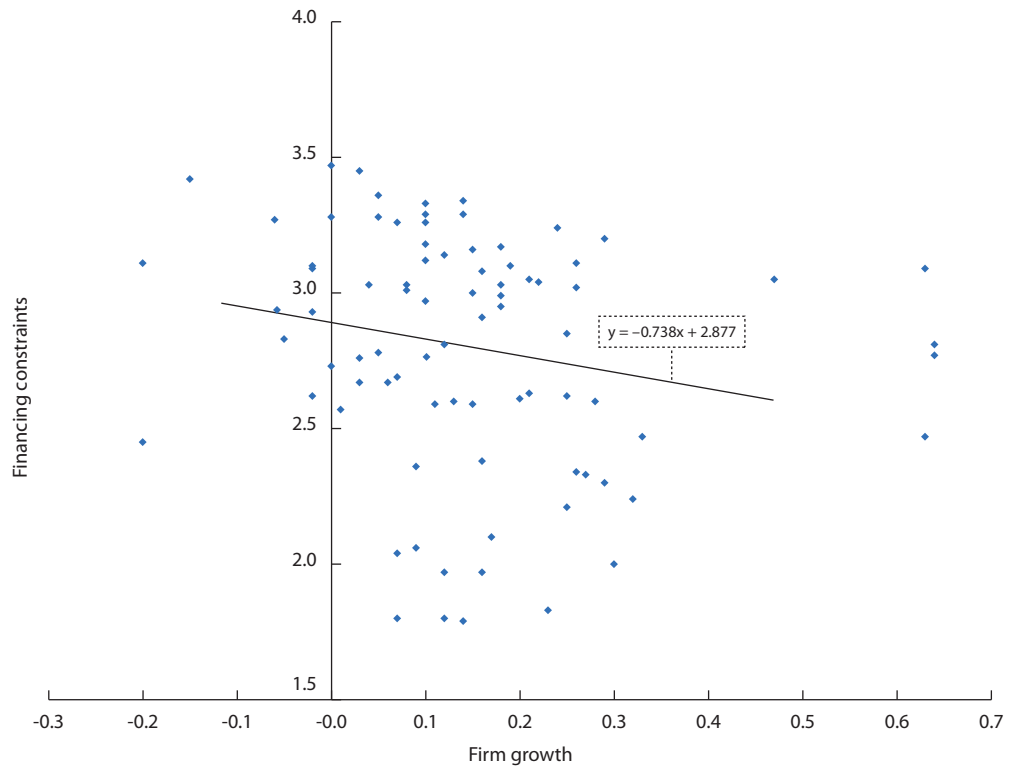


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and 2000 in 80 developed and developing countries around the world.<sup>1</sup> By comparing the economic relevance of the reported obstacles they find that finance, crime and policy instability are the most significant.

**Stronger financing constraints are associated with slower firm growth.**

Figure 1. Growth and financial constraints



Source: ADM (2008)

Note: "Firm growth" is the percentage change in firm sales over the period 1996-99. "Financing" is an index of financial constraints which takes the value 1 to 4, with higher values indicating higher obstacles.

Figure 1 reports average firms' growth (of sales) over the years 1996-99 in the 80 countries considered and the index of financing obstacles, which takes values from 1 to 4, with higher values indicating greater obstacles, averaged over all the firms in each country. The graph shows a significant negative correlation between firm growth and financing constraints. ADM discern which components of the financing obstacles can be deemed the most significant. They find that collateral requirements of banks and financial institutions, the need of a special connection with banks and financial institutions, the lack of money to lend by banks and the difficult access to financing for leasing equipment are all elements which significantly influence firms' growth. Interestingly, the finance obstacle is binding regardless of which country or firms are included in the sample although larger firms are affected to a significantly lesser extent.

There exists also a more direct effect of the lack of finance. As documented by Hausman *et al.* (2004), the population of firms is itself endogenous, as financing constraints affect the creation of new entrepreneurial firms, while, as shown by BDM, firms' size distribution adapt to the business environment. A large proportion of the literature in this area has concentrated on analysing the effect of financial variables (cash flow) on fixed capital investment. Fazzari, Hubbard and Petersen (1988) (hereafter FHP) use firm-level panel data on 427 US manufacturing firms from 1970 to 1984. They divide firms into three fixed categories (low,

<sup>1</sup> See Dollar *et al.* (2004), Gelb *et al.* (2007), Carlin *et al.* (2005) and Svejnar and Commander (2007).

medium, high) by the level of dividend payout, which is assumed to be a proxy of the financial constraints and estimate investment functions with cash flow and Tobin's Q (where 'Q' represents the ratio of the market value of a firm's existing shares (share capital) to the replacement cost of the firm's physical assets) as explanatory variables. As long as Q reflects firm's investment opportunities adequately, sensitivity of investment to cash flow could suggest that capital markets are not perfect and financial constraints matter. They find significantly larger estimated coefficients of cash flow for the low-dividend-payout firms than the high-dividend-firms. The correlation of investment with cash flow in "financially-constrained" firms has also been confirmed by several other studies with different cross-sectional criteria or with different countries' panel data (Hoshi *et al.* 1991; Schaller 1993).

**Investment is more sensitive to cash-flow variations in low-dividend than in high-dividend firms.**

Subsequent research has addressed several problems involved in this empirical literature. There are some important issues. First of all, several researchers consider that a sufficient indicator for representing investment opportunities is marginal Q, which is the present value of expected future marginal returns to capital, and not average Q as in FHP (Whited 1992; Hubbard *et al.* 1995). Gilchrist and Himmelberg (1995) construct the expected value of marginal q conditional on observed fundamentals including cash flow ("fundamental Q"), by estimating a set of VAR forecasting equations. Gilchrist and Himmelberg (1998) introduce financial friction into their model and consider two variables that affect investment, "fundamental Q", the expected present value of future marginal productivity of capital, and "financial Q", the expected present value of a future financial state variable of the firm. They find that investment is significantly correlated to both measures for the average firm in their sample and detect no sensitiveness of investment to liquidity for bond rating firms but find liquidity effects for unrated firms, small firms or low-dividend-payout firms. Cummins *et al.* (2006), by using earning forecasts from securities analysts, construct more direct measures of the fundamentals that represent future profitability. Their surprising result is that internal funds are not correlated to investment spending even for selected firms, for example, those without bond rating or dividend payout, which have been found to be "financially constrained" in other studies.

Kaplan and Zingales (1997) question the relevance of the country grouping implemented by FHP as well as their results. They re-examine 49 firms that are grouped as low-dividend-payout firms in FHP and further divide those firms into five categories, by their own operational classification criteria, based on statements contained in annual reports of these firms. They assume that a firm does not face "financing constraints" if it can invest more at a given point in time. Using this definition, they find that in 85 percent of all observations (firm-year pairs) of FHP's sample, the firms are not financially constrained, since they could have increased their investment.

Bond *et al.* (2003) construct firm panel data sets for manufacturing firms in Belgium, France, Germany and the United Kingdom for the period 1978-1989 and estimate a range of investment equations (accelerator, error correction and Euler equation specifications) including additional financial variables (cash flow and profits) by using General-method-of-moment (GMM) techniques which control for biases due to both correlated effects and lagged dependent variables. Their main aim is to compare results for the same investment model across different countries. They find that financial variables play an important role in France, Germany and the United Kingdom. More robustly, cash flow and profit terms are found to be both statistically and quantitatively more significant in the United Kingdom than in other European countries, implying that financial constraints may be more severe in the more market-oriented UK financial system.

The issue of financing constraints is even more pertinent for innovative firms, given the nature of their products. Funding projects with external finance is costly to these firms due to the strong information asymmetry associated with innovative investments. R&D results cannot be easily used as collateral<sup>2</sup> and most inputs to the innovative process are firm-specific or specific to the product developed. As a

<sup>2</sup> See Hall (1992).

**R&D tends to be more reliant on cash-flow in the US and the UK with their market-based financial systems than in other developed countries.**

consequence an external financier cannot expect to recover a significant share of the investment in case of an unsuccessful project. In addition, given the innovativeness of the projects, firms are unwilling to reveal the detail of the project. As a result, they may find it difficult and costly to raise external funds for their investment financing (Myers and Majluf 1984).

Hall *et al.* (1999) construct more comparable panel data of firms in the high-tech sectors in the United States, Japan and France. Using a VAR methodology, they test for causal relationship between liquidity variables (sales and cash flow) and investment variables (capital investment and R&D), and find that both capital investment and R&D are more sensitive to cash-flow and sales in the United States than in Japan and France. This result is quite comparable to that of Bond *et al.* (2003) and hints at financial constraints possibly being more severe in the United States or the United Kingdom with their market-based financial systems.

Empirically, the existence of financial constraints for innovative firms is most frequently investigated by examining the sensitivity of R&D investment to financial factors (Himmelberg and Petersen 1994; Harhoff 1998; Mulkay *et al.* 2001). Most of these studies find a large and significant relationship between R&D and internal finance for small US firms in high-tech industries. The results for Europe are less conclusive (Harhoff 1998).

Could venture capital alleviate financial constraints of innovative firms?

### **3. The role of venture capital**

There exists a wide consensus among economists, business leaders and policy-makers that a vibrant venture capital industry is a cornerstone of America's leadership in the commercialisation of technological innovation. A related and widely held belief is that the lack of VC hinders European firms from competing on an equal footing (European Commission 1994), although the lack of data has limited the analysis of European VCs for a long time.

The maturation of the VC industry in the US has not been smooth (Gompers 1994). During the 1980s, VC firms were in large part publicly funded Small Business Investment Companies (SBICs). While SBICs trained many venture capitalists and helped the industry reach a critical mass by channelling large sums to start-ups, their ability to perform was limited by bureaucratic constraints, lack of professional expertise, a faulty design of capital structure and incentives (Lerner 1994a). The big change for VC came in 1979 when the relaxation of investment rules for US pension funds led to historically large inflows from these investors.

Until the early 1990s, venture capital remained essentially an American phenomenon. In 1998, the United States and then Europe woke up to the Internet and VC started looking also at Europe, opening up London offices or establishing joint ventures. In Europe, because of the poor exit alternatives offered by the stock markets, funds developed mainly from banks and financial institutions, supported by their own limited resources.

The development of the VC industry has experienced periods of boom and bust because it is a highly pro-cyclical activity. Many funds had been raised, which were invested at the peak of the dot-com boom, and quite a few were managed by self-assured people new to VC. After the dot-com bubble burst, in 2000, funds stopped making new investments in order to concentrate on their existing portfolios, reduce headcounts, and reevaluate their investment.

Table 1 shows the evolution of VC fund-raising and investment from 1996 to 2007 in the US and in Europe. Although fund-raising had increased at a similar pace in the two economies until 2000, when it was about five times as large as in 1996, it diverged in 2002, when venture investment came close to a halt in the United States, going below its 1995 level. Europe, by contrast, shows more resilience and its investment was still substantially higher in 2002 than in 1996.

**Table 1. Funds raised and invested in VC in Europe and the US**

	Funds raised		Funds invested	
	Europe	US	Europe	US
1996	5,546	9,891	4,009	9,676
1997	9,537	22,360	4,625	14,931
1998	9,432	22,031	6,738	19,190
1999	11,526	25,919	11,390	54,111
2000	24,948	106,181	18,192	100,622
2001	17,940	37,961	10,898	39,030
2002	9,204	3,774	9,236	21,300
2003	8,834	10,641	9,520	19,300
2004	11,335	19,156	15,239	22,100
2005	26,368	28,767	17,297	22,900
2006	14,300	31,925	9,506	20,300
2007	51,017	36,065	48,046	30,600

Source: EVCA (2007)

Notes: Data in million of current dollars. The funds raised and invested each year may diverge, since VC firms invest the money they raise over a three-to-five-year time span, accumulating resources when good investment opportunities are scarce.

Venture capital has become, by now, a sizeable industry also in Europe, as Table 2 shows, and the form of financial intermediation most closely associated with dynamic entrepreneurial start-ups, especially in high-tech industries like biotechnology, information technology (IT), and e-commerce. Many of today's most dynamic and successful corporations received venture capital at the initial stages of their lives: Amazon, Apple, Cisco, e-Bay, Genentech, Genetic Systems, Intel, Microsoft, Netscape, and Sun Microsystems, to name just a few. Venture capital also works in more traditional areas; Federal Express, Staples, and Starbucks, all received venture financing.

***Venture capital is the form of financial intermediation most closely associated with dynamic start-ups in high-tech industries.***

**Table 2. Venture capital in the US and in Europe**  
VC invested (percent of GDP)

Year	Europe	USA
2000	0.22	1.01
2001	0.13	0.38
2002	0.10	0.20
2003	0.08	0.17
2004	0.10	0.18
2005	0.11	0.18
2006	0.07	0.15

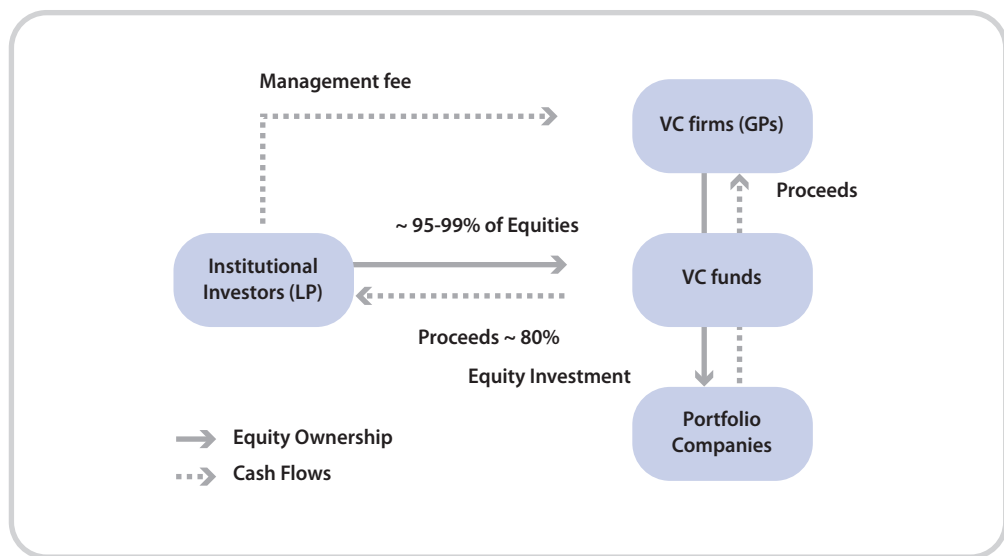
Source: EVCA (2007) and Eurostat

#### 4. Venture capital governance structure

**Venture capitalists are financial intermediaries who collect funds from limited partners and invest them in firms with a 5- to 10-year horizon.**

Venture capitalists are financial intermediaries who organize limited partnerships to finance their activity by raising funds from institutional investors, such as pension funds, insurance companies, or endowments that are passive *limited partners* (LPs) (Figure 2). Typically, these funds raise equity at the time they are formed, and raise additional capital when investments are made. This additional capital usually takes the form of debt when the investment is collateralizable, such as in buyouts, or it may be equity from syndication partners, as in a start-up. Gaining a reputation for having produced good returns is a key determinant of future successful fund-raising.

Figure 2. Venture capital governance structure



Professional private-equity fund managers, who serve as general partners (GPs), invest each “fund” in a number of firms with a five- to ten-year horizon. As long as the basic covenants of the fund agreement are followed, LPs do not intervene in the GPs’ investment decisions. Common covenants include restrictions on how much fund capital can be invested in a single company, the types of securities a fund can invest in, and restrictions on debt at the fund level (as opposed to borrowing at the portfolio company level, which is unrestricted). Once a “fund” is ended – by sale to another company, an Initial Public Offering (IPO), or recapitalization – its cash proceedings are distributed to investors together with any remaining equity holdings.

Some VC funds are publicly quoted. In this case they do not return capital to investors after realization but they pay dividends, as any other public company. In the United Kingdom (Jenkinson 2008), there are currently over 100 venture capital trusts (VCTs), which are quoted investment vehicles focussing on smaller companies and whose development was encouraged by government providing generous tax-relief to individual investors.

The compensation structure of VCs implies LPs paying an annual management fee of 1 to 3 percent and a carried interest representing up to 20 percent of the profits of the partnership. Generally, only capital gains above a certain annual percentage return, the so-called hurdle rate, are considered for the carried-interest calculation.



## 5. What do venture capitalists do?

Venture capital is a specialized form of financial intermediation. Its success in supporting innovative companies, through the provision of finance and expert advice together with stringent incentives to perform, has generated much research interest. Venture capitalists' expertise and their network of contacts with potential suppliers and customers (Hochberg *et al.* 2007) allow entrepreneurs to focus on what they are best at: technical development.

***Venture capitalists also provide portfolio firms with expert advice and stringent performance incentives.***

VCs concentrate on start-up firms and use their knowledge of industries and markets to evaluate and mentor entrepreneurs. The role of venture capital in this context is potentially very important. Their strong commitment to generate high returns in the medium term makes them active investors in portfolio companies (*e.g.* Bottazzi *et al.* 2008; Gorman and Sahlman 1989; Lerner 1995). In particular, VCs speed up product commercialization (Hellmann and Puri 2000), the adoption of human-resource policies (Hellmann and Puri 2002) and they strengthen companies' commercialization strategies (Gans *et al.* 2002; Hsu 2006). They can therefore "make the difference" by effectively directing portfolio companies' strategies towards commercial success. VCs also provide 'reputation capital' (Meggison and Weiss 1991) so as to attract top-fly executives or to obtain new contracts.

But venture capitalists are also demanding investors. For instance, they do not provide full financing upfront, but disburse money in instalments at different stages of a firm's development, contingent on the achievement of milestones such as a certain amount of sales, or the hiring of key management figures. Financing at different stages allows VCs to gather information over time, thus keeping the option of abandoning firms whose hopes of success have dwindled. VCs are also found to closely oversee investee firms, and to be active board members who step in and take control when times get difficult. The combination of the "soft" and "hard" components of VCs' activity is widely seen to provide venture-backed start-ups with an advantage over others firms, since it should increase the chances of their survival.

Some recent analyses of the influence of venture capital on corporate strategy and performance provide even stronger evidence that non-financial aspects are crucial to define the activity of VCs. Venture investors are "company builders" who influence innovation as much as professionalization and commercialization strategies. This view, based on the double-moral-hazard model of VC of Holmstrom and Tirole (1997),<sup>3</sup> stresses the active role of venture capitalists as mentors and monitors of inexperienced entrepreneurs (Baker and Gompers 2003; Gorman and Sahlman 1989; Lerner 1995).

There is also another possible, though opposite, view of the role of venture capitalists'. They attract companies which already have good growth opportunities (Sørensen 2007), so that venture investors would mainly need to bring them to a successful exit. According to this view, venture investors are particularly good at timing market conditions (see Gompers *et al.* 2008). They invest in companies at the "right" time with the goal to take them public (or sell them) at the "right" moment (Michelacci and Suarez 2004). Therefore, they finance companies whose innovation strategies are already well developed, with the perspective of turning them soon into "cash cows" (Bottazzi and Da Rin 2002). Verifying which of these two views is closer to reality is important both from a management and from a policy point of view.

Finally, venture capitalists also play an important role in the process of going public. Their experience helps companies choose the most favourable time for their IPOs and experience lower under-pricing (Meggison and Weiss 1991; Lee and Wahal 2003). Venture-backed companies that went public in the

<sup>3</sup> See also Casamatta (2003), Hellmann (2006) and Schmidt (2003).

US in the 1970s and 1980s are also found to perform better subsequently than non venture-backed companies. VCs shield companies from the need to rush to markets, thus prematurely disclosing strategic information to competitors. They also allow firms to wait for the most favourable market conditions before going public.

However, whether venture firms affect strategies at the innovation stage remains an open question. This is an important question since it goes to the heart of how venture financing might contribute to the innovation process. Some studies consider how VC stimulates innovation or start-ups. Kortum and Lerner (2002) examine the impact of the provision of VC funds on the rate of patenting for 20 US manufacturing industries over a three-decade period and find a 5-18 percent increase in the rate of patents caused by venture disbursements.

Recent studies have started examining how VC investors contribute to the formation of cooperative alliances for the commercial exploitation of innovations (Gans *et al.* 2002 and Hsu 2006, using US data), and of “explorative” formal R&D alliances (Colombo *et al.* 2006, using Italian data)

## 6. How do venture capitalists finance companies?

**Moral hazard in the relationship between entrepreneurs and venture capitalists can be overcome by a careful allocation of rights.**

Start-ups rely on the talent and skills of its founder, making it particularly difficult for financiers to evaluate performance. In addition, the right to control future strategic decisions is even more important in determining success for start-ups than for mature firms. These characteristics of start-ups provide good economic reasons for the coexistence of the ‘hard’ and ‘soft’ sides of venture capital. Unlike in standard financial contracting, neither the entrepreneur’s effort nor the venture capitalist’s mentoring and monitoring are verifiable by a court, and therefore cannot be contracted upon. A start-up therefore creates a situation where both sides have special skills to contribute for which they experience a problem of moral hazard. This situation is fundamentally different from that of a bank loan, and in the context of start-up finance a standard debt contract simply does not work. One of the first decisions in contract negotiations is the type of security issued to the VCs. Separate securities are used for VCs and entrepreneurs in order to give VCs different rights. Rights regarding board control and liquidation, for example, are tied to the VC’s stock.

Kaplan and Stromberg (2003) find that convertible preferred stock is the most common security, used in 204 of the 213 financing rounds existing in their study.<sup>4</sup> The “convertible preferred” aspect of the stock allows the VC to convert the stock into a common stock if the company does well, and to use the stock like a bond if the company does poorly. Even in cases where common stock is used, VCs get a different class of common stock with different rights from those of the founders. Similarly, contracts allow for different cash flow rights for venture capitalists and founders. Cash flow rights determine how the pie will be split between VCs and entrepreneurs once the company goes public, and the split is often contingent on performance measures. In the sample contracts, the VC usually controls approximately 50 percent of the cash flow rights on average, the founders control 30 percent, and others control 20 percent, indicating that founders give up a large fraction of ownership. Liquidation cash-flow rights and redemption rights work together to protect the venture capitalist’s investment if the company is sold or performs poorly. In nearly all cases, VCs have claims in liquidation that are senior to the common stock claims of founders. In 98 percent of the cases, VC claims are at least as large as their investment. Board and voting rights allow VCs to have input in decisions on top

<sup>4</sup> Kaplan and Stromberg base their study on a sample of 213 investments in 119 companies by 14 VC firms. Each firm provided the contractual agreements governing each financing round in which the firm participated. When available, the VC firm also provided the company’s business plan, internal evaluations of the investment, and information on subsequent performance.

management, corporate strategies and any other action not already specified in the original contract. In some cases, provisions are made so that VCs will get full control of the board if the company performs poorly. In first venture capital rounds, almost half of the cases allow VCs to have voting majority.

Kaplan and Stromberg find that VC financings include a number of additional terms and conditions beyond the basic rights. For example, VC financings often include automatic-conversion provisions under which the security held by the venture capitalist automatically converts into common stock under certain conditions. These conditions require that certain financial targets be met, and almost exclusively depend on an initial public offering that exceeds a designated common stock price. If the company goes public for a high value, the VCs only keep their cash flow rights, ceding the majority of control to the entrepreneurs. At some point after VCs give up control, they sell their stock and move on to new investments. An automatic-conversion provision is present in 95 percent of the financing rounds. Financings that include this provision also require that the stock price of the initial public offering be on average three times higher than the stock price of the financing round. The VCs are therefore not willing to give up control unless they triple their money. Many contracts also utilize vesting and non-compete clauses to make it costly for the entrepreneur to leave the firm. Tying the entrepreneur to the firm is particularly important in cases where most of the value of the venture lies in the entrepreneur's unique skills. Vesting clauses also give the VCs a way to remove a badly performing Chief Executive Officer (CEO) without having to keep him or her as a potentially obstructing minority investor down the road. The vesting provision requires that the entrepreneur's shares vest over time, and thus if the entrepreneur leaves before the end of the vesting period, they will lose all of their stock.

***VC financings often feature the automatic conversion of the venture capitalist's security into common stock.***

Most of the contracts contain at least one contingency clause. Additional funding is contingent on subsequent performance and actions. Along with financial performance, VCs may also consider such indicators as product performance, approvals by the Federal Drug Administration (FDA) or patent approvals. VCs can and do write contracts with a variety of contingencies, indicating managerial actions that the VC is trying to induce or avoid.

## **7. The European venture capital industry**

How effective is European venture capital in nurturing fast-growing companies? Has the growth in the size of the industry corresponded to a growing ability to support the creation of innovative companies? The only way to obtain a convincing answer is to turn to firm-level data. In particular, we use evidence derived from two datasets that we have gathered and which are to some extent complementary: a dataset on VC-backed firms (Bottazzi and Da Rin 2002) and a dataset on European VCs for the period 1997-2001 (Bottazzi *et al.* 2004).

### **7.1 Evidence on corporate growth**

The first dataset tries to infer the effect of VCs on companies that went public on Euro.nm, the alliance of Europe's 'new' stock markets for innovative companies in high-growth industries, from its inception in 1996 to December 2000. The companies' data are collected from listing prospectuses which contain detailed balance sheet information. Such information is not confined to the IPO year, but extends back in time, up to the three previous years. We use prospectuses and annual reports to derive quantitative information on several financial and business variables. We also collect data for all the available post-IPO years from annual reports. The final data set consists of 511 companies<sup>5</sup> together with data about

<sup>5</sup> Companies in the financial services sector are excluded because their financial structure, funding requirements and strategic behaviour differ substantially from those of industrial and (non-financial) services companies (see Bottazzi *et al.* 2007).

the financing from VCs and their involvement with these companies. We were able to collect data on the extent of ownership and on the timing of VC financing while the exact amount of funding generally remains undisclosed. An advantage of looking at Euro.nm listed companies is that they belong to a small number of high-tech industries, are of fairly similar age, and come from a small number of countries. This makes them a relatively homogeneous group of 'venturable' companies where we naturally find a reliable control sample, avoiding sample design problems. Focusing on Euro.nm listed companies also gives an advantage: Companies which make it to the stock market are among the most dynamic ones, and therefore we expect VC to be involved with them. Indeed nearly a third of Europe's VCs finance companies listed on Euro.nm.

**Higher sales and profitability tend to decrease the probability of VC financing, underlining the role of VC at early stages of firm development.**

Theory predicts VC to be associated with young innovative companies that, being at an early stage of development are characterised by low profitability and a small amount of sales. We create a dummy that takes a value of one if a company has obtained VC financing and we estimate the probability of being VC-backed. To avoid endogeneity the independent variables are measured before the arrival of the first venture capitalist. Controlling for sectors and national market effects, we do find that higher sales and profitability decrease the probability of obtaining VC financing.<sup>6</sup> These findings are consistent with the view of venture capital getting involved with firms that are at a very early stage of development and not yet able to sell.

We then turn to look at how VCs affect corporate growth by looking at differences in several key variables pre and post-IPO, thereby distinguishing between venture-backed and non venture-backed companies. The results are shown in Table 3. The figures are obtained by taking the median over time of firm-level observations and then averaging these medians across firms. We investigate whether differences between VC-backed and non VC-backed companies are statistically significant. Stars indicate significant differences between the two groups of companies within each period (pre- and post-IPO). By contrast, bold figures show those values which differ significantly across time within each group of companies.

The table shows that virtually all variables differ across time, with the exception of profitability for venture-backed companies and R&D intensity for independent companies. Notably, when we look at the data within periods, we see that before the IPO, venture and non venture-backed companies do not differ systematically. We find statistically significant differences only in four variables: profitability, sales and employment, which are lower for VC-backed companies, and R&D intensity, which is higher. After the IPO, non VC-backed firms become significantly bigger in terms of intangible assets, sales (which we interpret as a sign of maturity) and capital expenditure. Both types of companies show the same level of leverage while the percentage of foreign sales abroad is higher for VC-backed companies. We do not find a significant difference between venture-backed companies in terms of post-IPO employment or equities.

Although the analysis of Table 3 is suggestive, it can not be considered conclusive. We need to control for the characteristics of the firms in order to ascertain the impact on venture financing on corporate growth. We thus turn to a regression analyses (not reported) but the results we obtain are similar. In Bottazzi and Da Rin (2002) we estimate the determinants of the average growth rate of employment and sales in the period up to three years after the IPO.<sup>7</sup> VC itself plays no role: if anything, it brings about a decrease in the employment growth, which is however statistically insignificant. By contrast,

6 By contrast, being a French firm or a firm in the biomedical sector increases the probability of VC backing.

7 The model we have in mind is very simple: the capacity of an innovative firm to grow is a function of its ability to invest, which can be financed either from revenues or from external finance (debt or equity). Age is an indicator of the stage of corporate development and is also relevant because we expect younger companies to grow faster.

leverage, age and country are relevant explanatory variables. For example, German companies have a 31 percent higher employment growth rate.

**Table 3. The effects of venture financing: VC-backed and non VC-backed companies before and after going public**

Company indicator	Venture capital involvement	Pre-IPO	Post-IPO
Assets	non-VC-backed	14.3	55.3*
	VC-backed	10.7	45.5*
Debt	non-VC-backed	4.3	16.6*
	VC-backed	3.8	11.4*
Equity	non-VC-backed	1.7	34.9
	VC-backed	1.4	28.1
EBITDA	non-VC-backed	1.1*	2.4
	VC-backed	0.2*	0.7
Leverage	non-VC-backed	0.8	0.33
	VC-backed	0.8	0.31
ROA	non-VC-backed	0.13*	0.05*
	VC-backed	0.05*	0.02*
Sales	non-VC-backed	13.2*	33.5*
	VC-backed	9.8*	21.9*
Employees	non-VC-backed	85*	210
	VC-backed	62*	175
Capital expenditure	non-VC-backed	0.7	6.8*
	VC-backed	0.5	4.8*
Foreign sales (percent)	non-VC-backed	0.27	0.02*
	VC-backed	0.35	0.19*
Intangible assets	non-VC-backed	0.21	7.7*
	VC-backed	0.24	3.6*
R&D intensity	non-VC-backed	0.07*	0.09
	VC-backed	0.13*	0.11

Source: Bottazzi and Da Rin (2002)

Notes: Variables are in levels. For each variable we report the average values of the medians for the (up to) three years before the IPO or after the IPO, separately for non-venture-backed and for venture-backed companies. Bold figures indicate statistically significant differences across time (5-percent significance level) as diagnosed by a Wilcoxon test. Stars (\*) indicate statistically significant differences between VC-backed and non-VC-backed companies within a given time period (5-percent significance level, using Kruskal-Wallis sign-rank test). Financial data are in millions of euro. Debt is the sum of book value of short and long-term liabilities. Equity is total shareholders' equity. Leverage is debt over debt plus equity. Capital expenditure equals investment in property, plants and equipment. ROA is return on assets computed as operating margin over assets, and operating margin equals EBITDA (earnings before interest, taxes, depreciation, and amortization), an accounting measure of profitability. R&D intensity equals R&D expenditure over sales.

When we restrict our sample to the more innovative (*i.e.* R&D-performing) companies, we finally find that VC does play a role: venture-backed companies decrease their sales after the IPO. Age and leverage retain their negative effect on sales, while profitability and country become insignificant. All in all, the results show that VC-backed firms are not the “superstars” among those listed on the New Markets.

**All in all, European VC-backed firms are not the superstars among the firms listed on the New Markets.**

***VC involvement has little influence on the time to listing but is positively related to the amount raised at IPOs.***

Finally, we look at two other dimensions on which VCs might play a role: the time to listing (TTL) – defined as the period of time between the birth of the firm and the IPO – and the amount of capital raised at IPO. VC turns out to have little effect on the TTL of European companies listed on the “New Markets” but it has a positive and significant effect on the amount raised at IPO. By contrast, for the US the National Venture Capital Association claims US venture-backed companies were 70 percent more likely to become listed than other start-ups that within the same period of time (NVCA 1998).

We interpret these findings as suggesting that the role of VC in Europe is somewhat different from that in the United States. The provision of early-stage financing, which has grown very fast in the past three years, seems to be crucial to allow innovative start-ups to overcome credit constraints, which are arguably tighter on the old continent. These companies then go public to raise capital, invest, and grow, consistently with the relaxation of credit constraints *via* the IPO. But we cannot say at this stage whether the lack of a systematic association with the most successful innovative companies is due to the immaturity of European VC or to a lack of “superstars” among young European firms.<sup>8</sup>

## **7.2 Evidence on venture capitalists in Europe**

A tentative answer to the question left open in the previous sub-section can be found by looking at our second dataset which helps understand the peculiarity of the European VC industry. Through a questionnaire sent to 780 VC firms in the 15 EU countries, Switzerland and Norway, we have obtained information on more than 150 funds, 480 GPs, 600 LPs (investors), and 1,300 portfolio companies in Europe. This information is relative to funds raised and investments made between January 1998 and December 2001, and to the partners active at the end of that year focussing on the pure VC financing, excluding firms which operate solely in leveraged buy-outs (LBOs) and management buy-outs (MBOs).<sup>9</sup> Not surprisingly, the big three European private equity markets – France, Germany, and the U.K. – show the largest number of firms financed.

Our sample is quite representative of the entire population of European venture firms. As Table 4 shows, the respondents are fairly evenly distributed among countries with most national response rates close to the overall rate of 15 percent.

Information gathered shows that venture capitalists’ partners range widely in age, but most of them with an average work experience as VCs of seven years, ranging from zero to 32 years. There is a large share of partners with less than five years of experience which indicates that nearly half of them must come from other occupations; nearly half of all partners have professional experience in the financial sector, and about 40 percent have professional experience in the corporate sector.

<sup>8</sup> A sensible objection to our interpretation is that, since all companies listed on Euro.nm received a high valuation, the true value of being venture-backed had been masked.

<sup>9</sup> We contacted only those venture firms which, in 2001, (i) were members of the European Venture Capital Association (EVCA) or of a national VC organization, (ii) were actively engaged in VC and (iii) were still in operation in 2002. We thus deliberately excluded pure MBO management buy-out firms. The overall response rate was 15 percent. We received 118 responses with various degrees of completeness. We then spent considerable time augmenting the data with information from a variety of sources, such as the websites of the respondents and commercially available databases like Amadeus or Zephyr.

**Table 4. Country composition and response rate**

	Population	Sample	Response Rate (percent)
Austria	23	8	34.8
Belgium	34	4	11.8
Denmark	29	4	13.8
Finland	33	6	18.2
France	101	14	13.9
Germany	146	19	13.0
Greece	8	4	50.0
Ireland	15	3	20.0
Italy	37	5	13.5
Luxembourg	3	1	33.3
The Netherlands	52	4	7.7
Norway	22	2	9.1
Portugal	10	2	20.0
Spain	38	10	26.3
Sweden	17	6	35.3
Switzerland	43	6	14.0
UK	139	21	15.1
Total	750	119	15.8

Source: Bottazzi *et al.* (2004)

Another intriguing finding concerns the educational attainment of European venture capitalists. More than three-quarters of venture capitalists have a graduate degree. Business degree is common. Graduate scientific education, while less common, is far from negligible: 11 percent have a Master in engineering or sciences, and over 16 percent a Ph.D. Most of the Ph.D.s are in natural sciences. It is surprising that less than a third have an engineering or science education. However, we have seen that a scientific background is most popular among Ph.D.s. This suggests that while relatively few in number, partners educated in science have a strong background.

Although VC is considered a local phenomenon we note that a significant number of VC firms have secondary offices: one out of four opened a secondary office, most of them in France and in the U.K. It also shows the countries where these are located. Within Europe, the Netherlands and Germany registered the most secondary offices. We also find a considerable amount of cross-border integration at the partnership level. Overall, nearly a quarter of all partners come from another country, suggesting that the largest markets for venture capital are “exporting” venture expertise.

Surprisingly, the data show a high level of cross-border investments. We find 314 foreign venture deals in our survey, which constitutes nearly a quarter of our sample investments. The most active cross-border investors are Germany, Switzerland and the U.K. Within Europe, the U.K. and France attracts the most foreign investments.

Overall, our data show a surprisingly high integration of the European VC industry at all levels. This changes the common perception of VC as a purely local business and of European VCs limiting themselves to investing in the domestic economy. Naturally, the US also has an influence on the

***There is considerable cross-border integration at the partnership level and a high level of cross-border investment.***



European VC market. While we find that only 8 percent of all European venture capitalists are originally from the US, 34 percent of all European partners have some work experience in the US. Yet the number of partners with specific VC experience in the US is lower, at about 7 percent.

**Some types of investors are more widely represented across funds than others, and the share held in each fund also differs across investor types.**

A last word is about the investors in VC firms. We look into the types of investor which supply these funds. Table 5 provides a detailed breakdown of these investors. The table shows the average percentage of funds held by each investor type and the percentage of funds that have at least one investor of each type. Bank and institutional investors are the investors which are present in most funds, while corporate venture capitalists invest very selectively. Public investors, who are present in relatively few funds, typically provide a majority of the capital, while corporate investors invest the smallest share. These data thus suggest that different investor types behave quite differently.

**Table 5. Investor types**

Investor type	Average holding of investor (percent)	Percent of funds in which this investor type is present (percent)
Bank investors	40	44
Corporate investors	25	23
Financial investors	30	31
Institutional investors	44	40
Public investors	53	28
Individual investors	45	24

Source: Bottazzi *et al.* (2004)

Note: Average holding of investor is the average percentage of funds held by each type of investor.

### 7.3 Education, experience and venture capitalists' activism

Compared with their US colleagues, European venture capitalists have the reputation of being conservative and non-interfering ("hands-off"). Our dataset points to the presence of an increasing variety of investment styles across the continent. Sixty percent of all deals are seed or early-stage investments, indicating a healthy level of risk tolerance. In terms of getting involved with their companies, 68 percent of venture capitalists sit on the board of directors, 69 percent monitor their company on a monthly or weekly basis, and 42 percent help to recruit key managers for their investment companies. The industry is undergoing changes: new entrant firms invest more at the seed stage and monitor their investments more closely. Interestingly, partners in new entrant firms have more prior professional experience and are more likely to have a business education and a Master's degree. All of these characteristics help to explain why the new entrant firms adopt investment styles that more closely resemble those of US VC firms.

A unique feature of the European market is that a significant number of venture capital firms are owned and managed by banks and corporations. Corporate VC firms, which may also have strategic objectives (Hellmann 2002), invest more in early-stage companies. Partners in these firms have relatively less VC experience although they are more likely to have Master's degrees and/or a science education. By contrast, partners in bank-owned VC firms are more likely to have a business education. Most strikingly, bank VC firms also invest much less in early-stage deals and are less likely to monitor their firms frequently or to sit on the board of directors.



One possible question is whether these investor characteristics influence investor activism and whether an active investment style matters for the success of portfolio companies. In Bottazzi *et al.* (2008) we have examined how human capital and organizational characteristics affect the activity level of VC firms by distinguishing between three types of human capital effects: (i) the accumulation of job-specific knowledge enabling VCs to become better over time at providing services (measured by a partner's years of experience as a venture capitalist); (ii) the partner's knowledge of what it takes to create and run a company (measured by a partner's earlier business experience); and (iii) the partner's formal knowledge (measured by a partner's scientific education). For each of these measures, we construct the average human capital profile of the venture firm. This allows us to examine what kind of human capital is conducive to an active investment style. In terms of organizational structure, we emphasize the distinction between private, independent VC firms and so-called captive firms, which are affiliated with corporations, banks or the government.

Our first central finding is that human capital and organizational structure are significantly related to investor activism. Venture firms whose partners have prior business experience are significantly more active in the companies they finance. Interestingly, the partner's VC experience itself does not have a significant effect on this, and science education has only little effect. In terms of organizational structure, we find that private independent VC firms are significantly more involved with their portfolio companies than captive firms.

Information about different partner roles inside VC firms allows us to examine the allocation of tasks within venture firms. We find that having more venture experience or business experience increases the likelihood that a partner is put in charge of supervising portfolio companies. Within VC firms, greater venture experience has a positive and significant effect on the level of activism.

The next important step is to examine whether these activities affect performance. We are faced with two main challenges: measurement and identification. Concerning the first, ideally one would like to measure investor returns but VC returns are not publicly available. We therefore follow the extant literature and adopt an approach similar to Gompers *et al.* (2008) and Sørensen (2007) of measuring performance by whether the invested companies experience a successful exit, defined either as an IPO or an acquisition.

We examine the influence of investor activism on exits, controlling for a possible endogeneity effect, since investors might be more active with companies that are facing performance challenges. We find that a positive relationship exists between investor activism and exit performance, and that this relationship is both statistically and economically significant.

These results provide some important answers to the question about what makes venture capital firms effective investors. The strongest predictor of whether a VC firm adopts an active investment style is whether the partners have prior industry experience. Moreover, activism seems to improve performance. These findings are interesting since in many countries venture capitalists have more financial than industry backgrounds. However, one should not simply conclude that hiring partners with prior industry experience will always increase activism and improve performance.

Our study is not the only one that analyses the effect of experience on VC. In a concurrent research project, Gompers *et al.* (2008) examine the role of experience on the investment behaviour of VC firms. They provide evidence that prior deal flow experience helps VC firms to take advantage of deal opportunities by ramping up investments when opportunities improve, and that ramp-up often leads to a better exit performance.<sup>10</sup>

10 Gompers *et al.* use US data from Thompson VentureXpert. This has the advantage of providing a long history of VC deals, but also the disadvantage of containing little deal-specific information while in our study we can build direct measures of VCs' human capital.

**Experienced partners of independent VC firms are more activist investors, which tends to boost exit performance.**

#### 7.4 Which companies do European venture capitalists finance?

**The European venture capital industry is well-diversified.**

Contrary to a common perception, and differently from the US, the European venture capital industry did not invest only in fashionable Internet projects. In fact, the industry is surprisingly well diversified across several high-technology industries, with the majority of companies receiving only a single round of financing over the sample period.<sup>11</sup>

Traditionally, it has been argued that European VC favours already existing firms with a track record. But the contrary holds since venture financing at early stages, which typically requires relatively small sums, is becoming more common in Europe: more than half of the financing rounds are at the seed or start-up stage.

Another myth we can debunk is that European venture capitalists do not know how to cooperate. Instead we find that almost half of all deals are syndicated. In fact, more than 75 percent of our venture firms took part in a syndicated deal, and about half took on the role of lead at least once.

An interesting question regards the dynamic evolution of VCs' characteristics as Europe has experienced new entrants in the industry. While partners of new entrants are not younger than the older ones, they differ in other respects such as educational background: they show a higher proportion of Master's degrees and greater emphasis on business education. Also, their overall educational attainment is higher than for the incumbents.

By contrast, analysis of professional backgrounds reveals milder differences. Partners in the younger firms tend to have only slightly more of a consulting, and less of a finance background than their incumbent colleagues.

An intriguing result of our study is that over and above being different from incumbents, new entrants also specialize in different sectors, emphasizing software and Internet deals. Both partners' backgrounds and investment patterns are consistent with the notion that the VC boom of the late nineties was largely driven by business opportunities (in particular the Internet) rather than more technological opportunities. Note, however, that the difference with the old guard is not enormous, mainly because the old guard itself invested heavily in that sector and remains strongest in the biotechnology and medical sectors.

Interestingly, new entrants focus much more on investing in early-stage companies, especially at the seed stage, and tend to be more closely involved with their companies, in terms of a higher monitoring intensity: they are 10 percent more likely to monitor their companies intensively.

Overall we see that the new entrants have adopted an investment style that by and large can be characterized as more risk-tolerant and more hands-on than the older generation of European VC firms.

#### 7.5 The degree of contractual sophistication

Our dataset allows us to study the degree of contractual sophistication of European VCs and to study whether the marked differences which exist across countries in legal and tax environments influence the appeal of different financial instruments.

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<sup>11</sup> This is likely to be due to the relatively short time horizon covered in the data.

We define four broad classes of financial instruments: pure debt, convertible debt, pure equity, and preferred equity. The result is that pure equity is the true workhorse of European VC but European venture capitalists are certainly no strangers to more sophisticated contracts such as preferred equity or convertible debt or contingent clauses in their contracts. A contingent clause specifies the circumstances under which a venture capitalist can take certain actions such as liquidating the company, taking control of the board, or firing the CEO. We find that the right to force a trade sale is used in more than half of the cases. Other contingent clauses are less common but they are typically used in at least a third of the deals. On average, each deal entails the use of more than two contingent clauses and more than two-thirds of the deals make use of at least one contingent clause.

**Pure equity is the workhorse of European VC but more sophisticated contracts are also used.**

In addition to crafting financial deals, VCs can play an important role in terms of monitoring and supporting their companies. More than a third of VCs state that they visit their portfolio companies at least monthly, reflecting an active attitude regarding the management. Moreover, for 66 percent of companies we find that VCs monitor them by taking a board seat, thus contributing directly to honing strategies.

In Bottazzi *et al.* (2009), we examine how optimal contracts, and the resulting investor behaviour, depend on the legal system. We propose a simple theory that makes three predictions. First, the better the legal system the more investors provide value-adding support. The underlying intuition is that investing in support activities is only worthwhile if the legal system provides investors with sufficient guarantees that these efforts will not be wasted. Second, the better the legal system, the higher is investors' demand for contractual downside protection using securities such as debt, convertible debt or preferred equity. The main intuition is that in a better legal system it is optimal to give the entrepreneur stronger upside incentives. In order to satisfy their participation constraint, investors thus require additional cash flow rights on the downside. Third, we consider the influence of the legal system on intermediaries' incentives to develop the competencies necessary to provide value-adding services, predicting that intermediaries from countries with a better legal system will provide more value-adding services, even when investing abroad.

We find clear empirical support for our theoretical predictions. Better legal systems are associated with more investor involvement and more downside protection for the investors. The results hold for legal origin, using the standard interpretation that the Anglo-Saxon common law system is better for investors than systems based on civil law. They also hold for two widely used index measures of the quality of the legal system: the rule of law and the degree of legal procedural complexity.<sup>12</sup>

Furthermore, the data allow us to examine whether the effects of legal systems come through the company or the investor, an issue that has not yet been fully answered in the earlier literature. We introduce a novel empirical approach of determining the relative importance of company and investor legal-system effects comparing two sets of regressions: one with company legal-system variables and investor country fixed effects, the other with investor legal system variables and company country fixed effects.

We find robust investor legal-system effects, that is, such effects are present whether our equations do or do not control for company country fixed effects. However, company legal-system effects are not robust: they cease to be found when the analysis takes into account investor country fixed effects.

<sup>12</sup> Legal scholars classify national legal systems according to the legal origins of the commercial code: legal systems with common-law origin and legal systems with civil-law origin. The rule of law index measures the quality of legal enforcement while the index of procedural complexity measures the degree of legal formalism by averaging the cost, length of time and number of steps necessary to perform two simple legal operations, like recovering a bounced check and evicting a tenant.

These results are consistent with the theoretical model prediction that investors from countries with stronger legal protection provide more support and demand more downside protection. They suggest that the legal system affects financial transactions not only directly, but also indirectly by affecting the practices adopted by financial intermediaries. In particular, they point to the importance of considering the relationship between investor and entrepreneur in its entirety, accounting both for contractual and non-contractual aspects. Moreover, the analysis shows how the legal system affects not only contracts, but also investors' actions and their investment styles. These findings also have implications for our understanding of cross country differences.

## **7.6 Do different types of venture capital firms behave differently?**

The last question we ask is whether different types of venture capitalists – independent, bank, public and corporate VC firms – behave differently.

There is a debate about whether we should expect each of these firm types to invest differently. For instance, one may ask whether banks are well positioned to take a leadership role in the origination of early-stage venture deals, or whether a strategic motivation precludes corporate investors from investing in lower-technology companies.

### ***Independent, corporate, public and Bank VC firms differ with respect to partner profiles, sector of activity and investment stage.***

The results are interesting. First, in terms of age and experience of partners across the four different types of venture firms, independent VCs have twice as much experience as corporate or public VCs. Regarding education, while the percentage of partners with a Master's degree is particularly high among corporate VCs, who also have the highest percentage of partners with a graduate degree, public VCs show distinctly lower average educational attainment. Independent and corporate VCs are very similar in this respect, preferring people with an engineering or science education. By contrast, bank VCs show a particularly strong preference for people with a business education and public VCs for those with a background in humanities or social sciences. Strikingly, no partner of a public VC firm has a science background.

Not only do different types of venture capital firms hire different kinds of partners, they also make different types of investments. We see that public venture capitalists stayed away from software and Internet investments. Unlike other venture firms, they also concentrated most of their investments on industrial products, biotech and the media. They are, therefore, much less diversified, as a category, than the others. Interestingly, corporate investors chose to stick to their industrial expertise, contributing a large share of investments in medical products and industrial services, while investing relatively little in software, the Internet and the media. Bank-backed venture firms were the most aggressive investors in Internet deals as well as in industrial products.

Different types of VC firms also emphasize different stages of investment. Independent and corporate VCs are similar in their focus on earlier investment stages, which is definitely more pronounced than that of bank or public venture firms. The commitment to monitor or take a board seat is also quite different across types of venture firms. We say that VCs have a high monitoring intensity if they personally interact with a company at least on a monthly basis. Independent VCs have the highest monitoring intensity, closely followed by corporate investors. Once again, bank and public VCs behave differently and interact less frequently with the firms they invest in.

Overall, we find considerable differences in the investment styles between independent, public, corporate, and bank venture capitalists.

## 8. Conclusions

Does venture capital alleviate financial constraints of innovative firms? Preliminary analyses of the role of venture capitalists in Europe shows that, in the period 1997-2000, VC is not associated with particularly dynamic or successful companies, whether we look at sales growth or employment. This result clashes with the evidence of the role of VC on US companies.

Yet, VC is not only about money. It is also about steering and supporting portfolio companies. This is done in a number of ways which differ depending on VCs' educational and organizational background as well as on the legal and cultural environment in which they operate.

Human capital is a key driver of the investment activities of venture capital firms since it affects the level of activism of VCs and, ultimately, the success of portfolio companies. Improving the availability of postgraduate education, including executive education or other professional training, is likely to have a very positive effect on the level of professionalism in the industry. Interestingly, Europe has experienced new entrants in the industry during the tech-bubble 1999-2000. Overall we see that Europe's new entrants to the VC industry have adopted an investment style that, by and large, can be characterized as more risk-tolerant and more hands-on than that of the older generation of VC firms, closer to the US investment style.

Cross-country activity within Europe – and across the Atlantic – shows promising signs of an integrating market. European venture capitalists clearly consider it important to be able to invest outside their own country. Simplifications of tax rules and cross-border investment regulations are likely to have a strong beneficial impact on the integration of the European VC industry.

Finally, the data document a wide variety of behaviours by different types of venture firms. It is important to encourage healthy competition among these different approaches to venture financing. Reducing red tape and increasing limited partners' ability to invest in all types of venture firms, as well as across borders, are likely to serve this purpose.

More generally, as other researchers have suggested, the greatest assistance to venture capital may be provided by government programs that seek to enhance the demand for these funds rather than the supply of capital.

***Lower regulatory barriers and simpler tax rules would foster the internationalization of VC and the demand for VC funds.***

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