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The Law and Finance of Venture Capital Financing in Europe: Findings from the RICAFE Research Project

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Abstract

This survey article summarizes the findings of four research projects on the venture capital industry in Europe and the role played by legal institutions and the legal framework. A study on patent litigation insurance argues that insurance can create a level playing field for small innovators, but that compulsory insurance can only be justified as a transitory scheme. The second study argues that intermediaries from countries with a better legal tradition will provide more governance and value added services, even when investing abroad. It also provides supportive empirical evidence based on an extensive questionnaire-study. The third project investigates the relationship between venture investments and a widely used legality index in 39 countries, finding that better laws facilitate faster deal screening and origination, lead to a higher probability of syndication, and also facilitate board representation of the investors. The final study documents a significant performance gap between the European and the US venture capital industry, but argues that the difference can not be attributed to differences in legal origin.

Key words: venture capital, patent litigation, legal system, corporate governance, legality index, performance.

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1. Introduction

This article presents recent research findings on European venture capital that are related to the discussion on legal determinants of financial development and financial performance. All of the research presented here has been undertaken in the context of the RICAFE ('Risk Capital and the Financing of European Innovative Firms') research project that has been financed under the Fifth Framework of the European Union's sponsored research projects. The project has recently concluded its wide-ranging set of analyses. We will limit the presentation in this article to a report on the findings that are of particular interest and relevance for legal studies and the intersection between finance and the law.

We start with a brief description of the project's motivation, structure, and main research activities. Information on participants, and on the research output (including all working papers) can be found at the project's website: **http://www.lse.ac.uk/ricafe**. We then present the findings of five research articles that are of particular legal interest and that address the following topics: the relevance of patent infringement litigation and mandatory insurance, the role of the legal system for the contractual relationship between venture capitalists and companies, the effect of legality on deal origination, syndication and board representation, the role of legality in explaining venture success jointly with other institutional factors, and finally legal origin as a possible explanation of the significant performance gap between European and US venture capital.

2. The RICAFE research project

The RICAFE project was conceived in 2001 as an ambitious plan to coordinate several independent research efforts on how European innovative firms finance their activities. The project was structured as a research network bringing together researchers in economics and finance from the Financial Markets Group at the London School of Economics and Political Sciences, the Department of Economics and Finance of Turin

University, the Centre for Financial Studies (CFS) in Frankfurt, and HEC School of Management Paris (Hautes Etudes Commerciales), with the collaboration of CEMFI (Centro de Estudios Monetarios y Financieros) in Madrid under the coordination of David Webb (LSE) and Marco Da Rin (Tilburg and Turin Universities).

The initiators felt that Europe needed a more informed basis for policy making. The policy debate was intense on issues such as the importance of the taxation of capital gains, the design of equity markets for innovative firms, the role of legal systems in venture capital contracting, and the relevance of accounting standards and disclosure rules, but rigorous and systematic research on the economics of innovation finance in Europe was still underdeveloped. They drew much of their inspiration from the *'Risk Capital: A Key to Job Creation in the European Union'* Communication of the European Commission, circulated in 1998, that called for more efficient and flexible risk capital markets, but its economics underpinnings were fairly vague and mostly referred to the US experience.

The collaborative research in the RICAFE network resulted in a comprehensive report to the EU on how the availability of risk capital contributes to the innovativeness of European firms and on how recent developments in the European models of provision of risk capital affect economic growth and shape policy options and priorities. The report aims at providing a well-grounded blueprint for the implementation of effective policies to foster the growth of innovative, entrepreneurial firms and therefore to increase EU-wide innovative capacity.

The results of the RICAFE research effort evolve around seven main topics. The first topic is the <u>structure of the financing of European innovative firms</u>. Its goal is to provide an empirical and comparative assessment of the structure of risk capital financing in several European countries, comparing the structure of innovative investments by established firms and by high-tech start-ups. The results show that the venture capital industry is most developed in the UK, and attributes this to the favourable legal and regulatory framework and lower taxation rate in comparison to other European countries.

The second topic analysed is the determinants of venture capital and the main factors that affect venture capital performance and its differences across European countries and in comparison to the U.S. The analysis develops in three different directions. First, it studies the effect of public funding of venture capital investment, capital gains taxation, and the existence of profitable exit markets on venture investments. Evidence is found that venture capital can profit from lower tax rates and the creation of liquid exit options for venture capital obtained by the opening of high-growth stock markets, but not from the channelling of public money into risk capital markets. Second, it analyses the role of 'optimal' (i.e., incentive compatible) financial instruments and the impact of legal regulations on the development of venture capital markets. Here more stringent accounting standards are found to be in the interest of institutional investors, venture capitalists and the economy as a whole. Third, it studies the impact of contractual relations between venture funds and institutional investors (in Europe and in the US) on the funding of the venture industry. The studies find that the performance of venture capital can be improved when investors have both the skills and the incentives to act as active monitors and not only as passive capital providers.

The third topic is an assessment of European venture capital, and it provided the first quantitative comprehensive assessment of the European venture capital industry. The European venture capital market is more heterogeneous and less institutionalised than the US market. An important research contribution consists in the analysis of a hand-collected dataset of European venture capital investments in order to determine which types of European investors also play an active role in the companies they finance. The main finding shows that active investment styles providing monitoring to the financed company are strongly related to the specialization of the financial intermediaries and the level of their human capital. Fiscal policy aiming to improve innovative firms' financing situation shall therefore target first the financial intermediaries specialised in venture capital and aim at fostering the accumulation of human capital by venture partners. The research also analyses the contractual relations between European venture capital funds and investors, and the impact of laws and institutions on venture capital governance structures in Europe and in several other countries. Our central result indicates that better legal protection and legal enforcement facilitate faster deal screening and origination of innovative firms. They also create the right environment for venture capital to be more actively engaged in the companies it supports.

The fourth topic, on innovation, business creation and the stock market, looks at the interrelation of innovation, business creation and stock markets for innovative companies. Here evidence shows the importance of liquidity in the secondary market for reducing underpricing in Initial Public Offerings (IPOs). Fostering competition among venture capitalists would similarly reduce the costs of raising funds via stock markets. The analysis also compares the effect of different types of venture capitalists on the success of newly listed innovative firms. The results confirm that private, independent venture capitalists add significantly more value to the firms they finance than other types of venture firms. Finally, concerning the supporting role of financial analysts in preparing IPOs of innovative firms, the project finds that financial analysts cannot play their role in information provision unless there is a separation of financial analysts from underwriting companies.

The fifth topic, on sources of finance and the choice of innovation activities, asks how innovation finance influences the strategic decisions of entrepreneurial firms, and addresses questions concerning the relationship between the type of venture capital firms and the amount of innovation undertaken by portfolio companies; an assessment of corporate governance in large and in small, innovative firms; an analysis of the impact of venture capitalists' exit decision on innovative behaviour. The project reveals precise evidence that corporate behaviour is affected by the existence of active investors, and that venture capitalists can greatly improve the efficiency through which funds are made available to innovative firms. This can be achieved by using contractual structures which ensure that optimal exit decisions are taken, both with respect to returns for investors and – also importantly – with respect to the incentives of entrepreneurs to engage in innovative activities. The project shows that the creation and development of an innovative business depend on different contractual and governance structures. Professional investors can take these aspects into account when devising financing contracts, and better legal protection enhances investors' abilities to exercise governance and support entrepreneurial firms.

The sixth topic explores public incentives for venture capital and asks how public provision of venture capital can play a role in encouraging the development of the venture capital industry. The analysis contains an empirical assessment on the different types of public incentives for the support of innovative firms. A cross-country comparison gives further insights on some critical elements of public programs that favour the development of the risk capital market. These include the availability of professional and independent fund management operating on a commercial basis, the existence of management incentive schemes linking remuneration to fund performance, and the design of clear investment guidelines to target investment goals. A theoretical analysis shows that some public policy programs observable in Europe may not satisfy these requirements. Interestingly, this is due to the complexity of contractual structures needed to finance entrepreneurial firms. Failure to devise proper contractual structures may result in a general reduction in welfare. Guarantee programs and unconditional grants are shown to be unsatisfactory, while public-private partnerships are potentially more beneficial measures. Grants conditional on actual performance (in the form of tax breaks) are found to be the most suitable policy instrument.

The last topic deals with intellectual property rights and firms' innovative strategies and provides a set of theoretical analyses on the relationship between financing, contracting, intellectual property rights and firms' innovative strategies. One of the questions addressed in this part of the project is how market characteristics like competition, expected profitability, entry costs and capital market transparency affect the contractual relationship between venture capital firms and their portfolio firms. The results point out that an increase in the supply of public funds may have negative effects on innovation and the successful creation of entrepreneurial firms when competition for good projects is high. In this situation, R&D incentives appear to be better policy measures. Additionally, the link between the provision of finance for entrepreneurial firms and the protection of intellectual property rights has been explored. The analysis focuses on how to finance the defense of patents which are subject to legal litigation. It shows that patent litigation insurance (PLI), currently debate at EU level, can be beneficial, and argues that making PLI compulsory may not be efficient. Instead, providing for competitive insurance markets offering tailor-made PLI solutions would be preferable.

3. Financing and the protection of intellectual property rights

Laws recognising intellectual property rights (patents, trademarks, copyrights, and even trade secrecy) are intended to reward innovators by protecting them from competition. However, the effective protection granted by those rights crucially depends on the incentives and ability of the innovators for litigating infringers. The study by Gerard Llobet and Javier Suarez on "Financing and the Protection of Innovators" (RICAFE Working Paper n. 21) focuses on the notable example of patents. Patent litigation risk is high and potentially very costly. Based on US data for the period 1978-1995, Lanjouw and Schankerman (2004) estimate an average filing rate of 19 suits per thousand patents. The median cost of a patent case in the US was two million dollars in 2003, according to the Economic Survey conducted by American Intellectual Property Law Association, while the estimates for Europe are in the range of one and a half to two million euro, according to CJA Consultants (2003). Because of the importance of legal costs, as well as the injunctions and damages (or the licensing fees agreed in the context of pre-trial settlement), patent litigation often becomes a "bet-the-business" gamble for one or both sides in the dispute.

Given the size of the legal expenses, law firms are reluctant to work on these cases on a contingent-fee basis, so innovators which arrive at the litigation stage without internal funds (or another previously arranged source of finance) must resort to financiers such as banks and venture capitalists or to more specialised, litigation investment firms. Of course, an important alternative is to make arrangements for the legal defence of the patents before the risk of infringement materialises. To this end, there exists an incipient market for patent litigation insurance (PLI).[2] Under what the PLI industry calls infringement abatement coverage, patent holders can obtain from an insurer, in exchange for a premium, the coverage of all or part of its litigation costs if an infringement of their patents occurs.

[2] The use of PLI among US innovators took off during the 1990s, although PLI is a still small, highly specialized business so far concentrated in a few insurance carriers (see Betterley, 2004). In Europe, the market for PLI is less developed and the European Commission is studying policies for its promotion - see http://europa.eu.int/comm/internal_market/en/indprop/patent/litigation.htm.

In their study, Llobet and Suarez develop a model of the interaction between a patent holder and a potential infringer of its patent.[3] It is shown that if the potential infringer expects the patent holder not to litigate an infringement, then the infringement will certainly occur, provoking what is called patent predation. It is also shown that, in such a situation, PLI can be an effective means to provide the patent holder with a tough commitment to litigate. This commitment would deter the potential infringer from violating the patent holder's rights. Under full coverage of its legal costs, however, the patent holder would not internalise ex-post the cost of going to court and, thus, would litigate in excess - that is, even when the insurer-insuree joint value of defending the patent is negative. The study shows that, in order to avoid wasteful litigation, an optimal PLI policy should incorporate a deductible or co-payment.

The commitment to litigate that PLI grants to the patent holder can also be achieved in more indirect ways using financial leverage. For example, before an infringement occurs, the patent holder can contract a credit line that covers totally (or partially) the potential legal expenses. Because of limited liability and the bet-the-business nature of litigation, in case of infringement part of the burden of paying for litigation shifts to the financier, providing the patent holder with a stronger incentive to go to court.

The analytical framework is simple but rich enough to allow for a direct comparison of legal systems that differ in their allocation of legal cost to the parties (possibly depending on the outcome of the trial) as well as to discuss the implications of pre-trial settlement. Specifically, the authors compare what they call the European-type allocation of legal costs (where the loser pays for the costs of the winner) with a US-type allocation of the costs (where each party pays for its own costs, unless a party's conduct is considered malicious). They find that patent predation is more likely to be a problem under the US-type system, explaining why PLI may have a more important role to play under such system.

From a practical perspective, the study argues that PLI constitutes a way to level the playing field between big and small innovators. Big firms with a large portfolio of

3 Patent infringement and litigation have been analyzed in the literature before (see, for example, Aoki and Hu, 1999), but without explicitly considering the financing of litigation costs.

patents are documented to actively construct a reputation of tough litigants.[4] In this sense, PLI can be understood as an alternative for small firms to avoid patent predation. In the words of US lawyer Bruce E. Burdick "PLI can turn a small dog into a big dog in a patent dogfight (...) its presence may encourage the other side to stay on the porch."

The policy debate on PLI in the European Union is currently focused on the introduction of a possibly compulsory, PLI scheme, whose final purpose would be to foster innovation. At a first approximation, our results provide no rationale for the compulsoriness of PLI, since, in principle, a competitive insurance market should be able to provide PLI policies tailored to the characteristics of each innovator (as the optimal deductible and premium should be), while compulsoriness might imply extending the same insurance policy to all patentholders. However, if start-up costs and the absence of the critical mass of PLI subscribers, or adverse selection, are the reasons behind the (inefficient) underdevelopment of the PLI market in Europe, then compulsoriness might be an acceptable, second-best, transitory solution.

4. What role for legal systems in financial intermediation?

The ‘law and finance’ paradigm has become one of the main approaches to corporate finance. This view holds that countries’ legal origin constitutes a major influence on investors’ willingness to finance companies, on which contracts are used to do so, on companies’ dividend and investment policies, and on market valuation. The work of La Porta et al. (1997, 1998, 2000) has provided the main contribution to demonstrating the importance of the legal system for economic activity. From their work, a large literature has developed to document that countries with different legal origins also systematically differ in terms of how their financial system works.

One of the RICAFE studies builds on this large literature and advances it by asking how financial intermediation is affected by the nature of the legal system. There are two ways this contribution is provided. One is by integrating into the analysis the

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4 See for example Lerner (1995). Choi (1998) was the first to formalize the role of reputation in patent defense.

consideration of both contractual and non-contractual aspects of financial intermediation. The other is by exploiting cross-country investments to econometrically identify the effect of legal origin on the behaviour of financial intermediaries. In 'What role of legal systems in financial intermediation: theory and evidence,' Laura Bottazzi, Marco Da Rin and Thomas Hellmann look at how the relationship between an investor and an entrepreneur depends on the legal system. The paper is available as RICAFE Working Paper n.22.

The theory contribution revolves around the characterization of the optimal financing contract, and the resulting investor behaviour, as a function of the legal system. The focus is on the ability of the legal system to afford protection to investors, thereby reducing the risk that the entrepreneur can divert the firm's profits to her advantage. In this context the investor can be thought of as a venture capitalist. The authors' model makes use of a standard model of entrepreneurial finance with double moral hazard – both on part of the entrepreneur and on part of the venture capitalist. In this framework, the entrepreneur provides effort which increases her firm's probability of success, and also derives private benefits from running the company. In addition, she can divert the profits to her own advantage. The venture capitalist, on his part, provides financing through a contract that may take the form of equity or debt (or a combination of the two), and also provide value-adding actions which increase the firm's probability of success. The efforts and actions of the entrepreneur and of the venture capitalist are observable but are non-contractible, in the sense that they cannot be made object of a contractual clause since their nature makes them non-enforceable in court.

The standard model of entrepreneurial finance is augmented with a parameter which measures the 'quality' of the legal system in its ability to protect investors from managerial diversion of funds. With a better legal system it is therefore more likely that the entrepreneur is detected if she diverts the firms' profits.

This framework yields three predictions. First, in a better legal system investors provide more value-adding support. Second, in a better legal system investors demand more contractual protection in bad states of the world, using securities such as debt, convertible debt, or preferred equity. This can be described as heavier recourse to ‘downside’ investor protection. Third, investors are more active in exercising their corporate governance rights when they operate in a better the legal system.

While the details of the model are rather technical in nature, the intuition behind these three predictions is much simpler. The main idea is that investing in governance and support are only worthwhile to investors if the legal system provides them with sufficient guarantees that their effort will not be wasted. This explains the reasons for the first and the third predictions.

The intuition for the second prediction is slightly more complex. In a better legal system, it is harder for the entrepreneur to divert her firms’ profits. Diverting funds has a positive effect on entrepreneurial effort: she can only divert them if the firm is successful, which in turn depends on how much effect she exerts in the first place. Therefore, a better legal system makes entrepreneurs provide less effort. To compensate for this, it is necessary to give the entrepreneur more incentives in terms of a greater equity stake. Clearly, this implies giving less equity to the investor, which in turn reduces his incentives to provide value-adding support. The venture capitalist therefore needs to obtain additional reward. In the optimal contract this can be done through stronger downside protection: he will obtain more if the firm does not succeed and is liquidated. Debt-type securities are used for this purpose.

An additional contribution of this paper is that it does not limit itself to the characterization of the optimal contract. It also studies how legal systems may affect financial intermediaries themselves. The idea is that venture capitalists can make an investment to increase their ability to provide value-adding support actions. The model then studies how legal origin affects intermediaries' incentives to develop the competencies necessary to provide value added services and to exert governance.

The prediction is that intermediaries from countries with a better legal tradition will provide more governance and value added services, even when investing abroad. There are two reasons for this. The first is that in better legal systems, venture capital firms have greater incentives to develop competencies need for value-adding support. In other words, competencies are more valuable if the legal system provides more investor protection. Developing such competencies is costly (think of hiring an experienced partner instead of an inexperienced analyst just out of college). Only when investors are reasonably sure to be able to reap the benefits of this investment they will make it. The second reason for the model prediction is that, in a given legal system, venture capitalists which have invested more in developing their competencies will provide more support and more governance.

The empirical part of the study is devoted to testing these predictions. The data come from a survey of 750 venture capital firms in seventeen European countries. These were all the full members of the European Venture Capital Association (EVCA) or of a national venture capital organization in 2001, that were actively engaged in venture capital. The information concerns the venture capital firms themselves, and focuses on the investments they made between January 1998 and December 2001. In particular, venture firms where asked about their provision of non-monetary services (like help in hiring top management) and about the use of securities in financing portfolio companies. There were 1,430 within-Europe investments reported by 124 venture firms. The response rate of 16.5% is much higher than for comparable surveys. These data have been complemented and cross-checked with information from the websites of the respondents and their portfolio companies and with commercially available databases (like Amadeus and VenturExpert). An important feature of this dataset is its close resemblance of the underlying population of European venture capital firms. Another is that it contains several measures of the provision of value-adding support actions by venture capitalists. This allows to assess not only the contractual, but also the non-contractual aspects of their relationship with entrepreneurs. The data on venture investment is complemented with data on legal systems.

To measure the quality of the legal system, the authors employ three measures. Legal scholars classify national legal systems according to the legal origins of the commercial code. La Porta et. al.(1998) propose two main categories: legal systems with common law origin and legal systems with civil law origin; the former category includes Anglo-Saxon common law, while the latter includes French civil law, German civil law and Scandinavian civil law.

An alternative kind of measure consists of evaluating the protection a legal system provides to investors through some aspects of the legal system. One index used in this study is the rule of law; another is the procedural complexity index. These two indices relate directly to the concept of the 'quality' of investors’ rights. Both indices are computed for the period under consideration. For the rule of law index, which measures the quality of enforcement in a legal system, the authors use a version which dates to the year 2000 and is published by the World Bank. The index of procedural complexity, which measures the degree of legal formalism by averaging the cost, length of time and number of steps necessary to perform two simple legal operations: recovering a bounced cheque and evicting a tenant. This index, also computed for the year 2000, is published by the World Bank's 'Doing Business' project.

The authors use these data to perform a thorough econometric analysis. The analysis provides strong support for the predictions of the model. Better legal systems are found to be associated with more investor involvement, more downside protection for the investors, and more governance. 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 the rule of law and the degree of legal procedural complexity.

For the role of value-adding support (first prediction) the authors use a measure of the amount of interaction, looking at the reported frequency with which a venture capitalist is in contact with the company. This is a summary measure of the amount of time and effort that the venture capitalist spends on the company. More specifically, a dummy variable is constructed from the responses to the survey; the variable takes the value one if the venture capital firm is reported to interact with the company on a monthly or weekly basis, and value zero if it interacts with on an annual or quarterly basis.

For the second prediction, that investors in better legal systems require more ‘downside’ protection, they consider the set of securities used to finance each individual company. It is important to recognise (see Kaplan and Strömberg (2002)) that many of the securities used in venture finance perform equivalent functions. Therefore one has to take into account the whole package of securities and the way it affects the distribution of cash flow rights it provides to investors − especially returns on the upside as compared to the downside.[5] Data on the allocation of cash flows rights are considered extremely sensitive, the authors managed to obtain substantial information. They therefore chose to limit their inquiry and not to ask for data on balance term sheets and valuations. Rather, they have collected data on all the types of securities used in each deal. In particular, they know if any of the following securities has been used: common equity; straight debt; convertible debt; preferred equity; and warrants. They also know which of these was the main security in each deal − that is the one providing the largest part of the financing.

The authors test their second prediction by observing that while the data does not allow to measure the exact values of downside protection for each deal, they allow us to construct a close and meaningful proxy measure. The authors reckon that straight debt, convertible debt and preferred equity are `downside securities,' since they all give the venture capitalist a larger stake on the downside, while common equity and warrants do not provide any downside protection. Their proxy measure is then a dummy variable that takes the value one if the deal includes at least one downside security, and zero otherwise.

It is interesting to notice that the survey documents that the securities used vary substantially across legal systems. For instance, common equity is more frequent in civil law countries; in these countries straight debt is used much less often than in common law countries.

For the third prediction, that better legal systems encourage the exercise of corporate governance rights, the authors build a dummy variable for whether a venture capitalist has secured contingent control rights that increase his control over the board if the company performs poorly and fails to meet its milestones. The variable takes the value one if the venture capital firm it reported to have the contractual right to take control over the board (contingent on failure to meet some targets); zero otherwise.

All three propositions find strong confirmation in the data. The regression analysis takes into account that several factors are likely to influence the behaviour of investors

[5] In the instructions to the survey we specified functional definitions of these different financial instruments in order to ensure consistency of responses.

besides the legal system. In particular, the authors consider factors linked to the investor itself − like its being an independent (as opposed to bank, public or corporate) venture capital firm, its experience and size − and factors linked to the company − like its sector of activity, the age of the company, and the stage of the investment.

Once they control for these factors, better investment protection, however measured, remains strongly associated with investor active involvement, with downside protection, and with the exercise of corporate governance.

The prediction that intermediaries from countries with a better legal tradition provide more governance and value added services is also supported from the data.

Using information on deals that cross legal system boundaries, the authors find that the origin of the investor matters considerably. Consistent with the model, investors from countries with stronger legal traditions provide more support, demand more downside protection, and exercise more governance, both within and outside their legal system. In other words, the findings suggest that the legal system affects financial outcomes not only directly, but also indirectly by affecting the extent to which financial intermediaries develop competencies.

One key implication of these results is that it is very important to consider the relationship between investor and entrepreneur in its entirety, accounting for the interdependence between contractual and non-contractual aspects. The authors hope that this evidence will provide useful for generating new theoretical and empirical efforts to get to a deeper comprehension of cross-country difference in financial intermediation and in financial contracting.

5. Impact of legal and institutional settings on venture governance and VC performance

While the oldest and most successful venture capital market has been in the US, venture capital activities have spread across the globe with increasing vigour since 1990. Nevertheless, massive differences remain in the size and success of venture capital markets around the world. It is therefore important to investigate the investment process of venture capitalists and their success in this process and to relate it to legal and institutional factors identified in the law and finance literature.

Two other, mainly empirically oriented RICAFE papers just address these issues by making use of a very broad international data set to analyse the attitudes of venture capitalists towards innovative firms, their relationship with their portfolio firms and the factors that govern the success of the VCs engagement in these innovative firms.

The first of these papers investigates whether and to which extent the cross-country differences in venture capital and private equity firms' investment process are due to legal and institutional differences across countries. In "*Legality and Venture Governance around the World"*, Douglas Cumming, Daniel Schmidt and Uwe Walz (available as CFS Working Paper No. 2004/17) analyse these issues with a new data set on investments in more than 3800 portfolio firms in 39 countries in the 1971-2003. This data set covers almost all European countries which overall embrace almost half of all the observations in the data set.

The authors focus in particular on three related and equally important categories of venture governance: (1) time to deal origination (which reflects screening and due diligence), (2) syndication and co-investment, and (3) board seats and particular aspects of security choice. To fully understand the structure and governance of venture capitalists vis-à-vis their entrepreneurial investees, it is useful to examine each of these complementary and interrelated aspects in unison. Further, a joint analysis of each of these governance mechanisms facilitates a fairly comprehensive picture of the source of international differences in venture capital markets.

The first main pillar of the analysis focuses on the screening process, which is of vital importance to venture capitalists. For instance, venture capitalists in the U.S. receive more than 1000 requests for financing each year, but complete at most only a couple of deals in a typical year. The first set of question hence concerns the determinants of this part of the investment process.

Syndication (i.e. the joint investment of different VC firms in the same portfolio firm) and co-investment (i.e. the joint investment of various funds of the same VC firm) display the interaction among different investors within any investment. This is the second main pillar of the analysis. Prior research has established the notion that syndication enhances venture capitalist screening, monitoring and value-added and allows the VC to build up a valuable network. By contrast, co-investment does not facilitate these governance mechanisms and may reflect an agency problem vis-à-vis the institutional investors if one VC fund is using capital to bail out the bad investments of another VC fund within the same VC organizational structure. The authors extend the literature in this paper by exploring the impact of legal and institutional factors on the propensity to undertake syndicated investments or to pursue co-investment strategies.

The third pillar invokes an analysis of the interaction between venture capitalists and their investees. The authors investigate the question of whether the venture capitalist has a seat on the board directors of the entrepreneurial firm. In this context, they are able to add to prior research by studying a broader array of data and countries compared to what had been possible previously. They also take a closer look on specific aspects of cash flow rights (as opposed to control and decision rights), by examining whether the financial contract between the VC and entrepreneur involves just upside potential for the investor, or whether or not there is both period cash flows provided to the investor prior to exit, as well as upside potential. That is, they have specific details on the contract that get beyond the form of the contract and get more closely at the substantive structure of the contract.

Based on theoretical consideration the authors derive a number of hypotheses concerning the relationship between legal and institutional factors and the categories of the VC investment process outlined above. On this bases the authors conjecture that *higher* Legality indices 1) *reduce* the costs of and time required to screen and originate a deal 2) *reduce* the potential agency costs associated with syndication and therefore facilitate the value-adding properties of syndication (Lerner, 1994); 3) *increase* the benefits to writing contracts vis-à-vis the institutional investors and venture capital fund managers which forbid co-investment, due to enhanced enforceability, and stability of the legal system to sustain a long-term contract thereby mitigating the probability of co-investment; 4) *increase* the benefit to VC board representation via enhanced information flow from the company as mandated at law in countries with better legal systems; 5) *reduce* the need to require the entrepreneur to pay periodic cash flows to the investee prior to the capital gain derived upon exit (in the form of an IPO or acquisition or worse), such that investees that do not have the ability to pay periodic cash flows will be financed (i.e., riskier ventures are more likely to be financed).

Of course, in testing these hypotheses the authors control for a variety of relevant factors pertaining to market conditions, characteristics of the venture capitalist and characteristics of the entrepreneurial firm.

The dataset which allows Cumming, Schmidt and Walz to cover not only a wide range of years and countries but also a substantial number of details of venture governance was made available to them by a large fund-in-funds investor. One of the co-authors of the paper was responsible for collecting most of the data from individual venture capital and private equity firms.

In their empirical analysis the authors use a broad index for the legal system recently developed in the corporate finance literature (Berkowitz *et al*., 2003; as based on La Porta *et al*., 1997, 1998). Each of the components of the Legality index is highly pertinent to venture finance.

The econometric analysis provides broad support for the hypotheses outlined above. The first central result indicates that better laws facilitate faster deal screening and origination. Using a concave (logarithmic) estimate to account for diminishing effects of an improvement in the quality of laws, the authors find that an increase in the Legality index significantly lowers the time until lead first investment.

Second, the authors show that better laws lead to a higher probability of syndication and a lower probability of potentially harmful co-investment. The results of the regression analysis do not only exhibit statistical but also economic significance of the impact of legality on syndication and co-investment.

Third, the authors show that better laws also facilitate board representation of the investor and reduce the probability that the investor requires periodic cash flows. In particular, an increase in legality of one percent increases probability of board seats by slightly less than one percent. In regards to periodic cash flows, the data indicate a positive correspondence between Legality and the probability of a high-tech company (i.e., in an industry with a high market/book ratio) being financed (as might be expected), which at least in part accounts for the reduced probability of the use of securities that provide periodic cash flows. Overall, the data indicate that Legality plays a crucial role in the venture capitalist's investment process that facilitates the financing of high-tech entrepreneurial ventures, and the success of a country's venture capital market.

These results provide a core understanding of the mechanisms that give rise to international differences in the size of venture capital markets. Governance is a defining attribute of venture capital as a form of financial intermediation (Gompers and Lerner, 1999, 2001). Better legal systems have deep implications on the reach of key mechanisms for the resolution of agency and control problems inherent in the financing of young, innovative firms. A sound legal framework can be regarded as an important pre-requisite (but certainly not a sufficient condition) for the development of sustained venture capital development in a country.

An open issue in this respect remains: to what extent do legal and institutional factors improve the outcome for the VC, i.e. his monetary performance. The other paper, "*Valuation and Disclosure of Private Equity Investments Around the World"*, Douglas Cumming and Uwe Walz (available as CFS working paper No. 2004/05) investigate this question by looking at the relation between performance and disclosure on the one hand and legal and institutional factors on the other hand. They use roughly the same data base as in the paper outlined before, and focus not only on the performance issue but also on the highly disputed disclosure issue which has been intensively discussed in the industry in the recent past (in the US as well as in Europe).

The authors analyse the determinants of realised internal rates of return (IRRs) based on an international sample of venture capital and private equity investments around the world. They introduce new methods for measuring venture capital and private equity IRRs, and show that these methods significantly improve the ability to explain realised returns relative to prior papers in the literature on the risk and return to venture capital.

The authors then focus their attention on the reporting of unrealised IRRs by venture capital and private equity managers to their institutional investors. They show the existence of systematic biases in reporting that are related to accounting disclosure measures across countries, and proxies for information asymmetry between the venture capital and private equity fund managers and their institutional investors.

The empirical analysis is based on testable hypotheses derived from theory in two areas. In a first step the authors build a simple model from which they derive hypotheses on the determinants of VC returns on the investment in their portfolio firm. The main argument rests on the value-added contribution of the venture capital. The authors derive various hypotheses related to this value-added approach such as the positive effect of the legal and economic environment for the success of the VC. For the second pillar of the paper, namely the reporting of valuations of unexited investments, they focus in their theoretical analysis on the trade-off between reputational concerns of the VC funds and their objective to facilitate fundraising in the next round.

In their empirical analysis, the Cumming/Schmidt/Walz look at the returns the venture capital and private equity investment from 221 venture capital and private equity funds that are part of 72 venture capital and private equity firms, 5040 entrepreneurial firms (3826 venture capital and 1214 private equity), and spanning 32 years (1971 – 2003) and 39 countries from North and South America, Europe and Asia. Once again, this sample can be seen as a good representative of the entire European VC industry. Making use of the fact that the authors have information on all the cashflows between the VC and the portfolio firm, they can calculate precisely the actual IRR from all cashflows rather than having to rely than having to rely on a proxy for returns computed from initial and final cashflows.

The analysis builds on prior work on measuring the risk and return to venture capital based on U.S. data with sample selection corrections in regards to exit versus non-exit (Cochrane, 2005). The empirical methods make use of bivariate Heckman sample selection procedures in order to account for selection effects in regards to exited versus unexited investments, as well as full versus partially exited investments. It is shown that sample selection effects are important to consider in both dimensions in measuring the determinants of venture capital and private equity IRRs.

In order to explain the determinants of VCs' success four main categories of variables to proxy for value-added activities and risks that explain venture capital and private equity returns: market and legal environment, VC characteristics, entrepreneurial firm characteristics, and the characteristics and structure of the investment are used. While prior work on topic (based on U.S. data) has been able to explain up to only 1% percent of the variation in IRRs (Cochrane, 2005), this approach is able to explain up to 36% of the variation in IRRs. The analysis reveals that the VC, entrepreneur and investment characteristics, as well as the economic environment, all attribute significantly to the success of VC investment. It is also shown that the legal framework in different countries significantly contributes to the performance of VC investment: the more sound the legal conditions, the higher the IRRs.

In the second step of the empirical investigation the analysis is then extended to consider the unexited IRRs, as reported by the venture capital and private equity fund managers to their institutional investors. While some work in the past has considered the issue of measuring the risk and return to venture capital, as discussed, no prior paper has considered the issue of reporting of unrealised returns to institutional investors. The authors compare the reported IRRs on unexited investments to what they would predict for such unrealised investments, based on our analysis of realised investments. They show that there are systematic biases in the reporting of unexited IRRs relative to what one would expect.

The sensitivity of the over-valuations to legal and accounting indices is extremely interesting. Our results indicate that valuations are overstated by VCs in countries with worse legality indices, worse disclosure indices, and in countries with higher earnings aggressiveness indices. As such, there is a strong role for the legal and accounting environment in curbing overstatement of unexited venture capital and private equity returns. This result has not only strong implications and feedbacks for the VC industry per se (and the venture capital funds therein) but also for the political agenda. The findings indicate that it is the interest of experienced and established players in the venture capital industry (and potentially for the industry as a whole) to have stringent accounting rules. More stringent accounting rules reduce significantly the incentives (and possibilities) to "lie". This, in turn, makes the valuations more informative, thereby benefiting the entire industry as a whole. In a sense, it avoids a “negative equilibrium” with overreporting. The same rationale implies that policy makers should takes this effects into account and provide a coherent legal environment for the VC industry as well as enforce rather tough accounting rules in order to improve the communication between VCs and investors which then is most likely to lead to more capital flowing into the industry and thereby into young, innovative firms.

In a nutshell, the two studies outlined in this section reveal that legal and institutional factors play an important role in shaping the venture capital market and thereby the ability of young, innovative firms to receive urgently needed financial funds as well as active and professional support by VCs. This clearly indicates that the legal and institutional factors are potentially of crucial nature for the development of the VC market, of young innovative firms but of the economy as a whole as well.

6. The performance gap between Europe and the United States: Can legal factors help to explain it?

In another paper entitled “Determinants of Venture Capital Performance: Europe and the United States”, Ulrich Hege, Frederic Palomino and Armin Schwienbacher (2005, available as RICAFE Working Paper No. 1) look at the performance of the European venture capital industry for the period from 1997 to 2003, and compare it to the much older and larger US venture capital industry. They then search for explanations for the observed differences in performance. Their study is available as RICAFE working paper n.2.

The authors consider the entire universe of European venture-backed and technology-oriented start-ups in the *Ventureconomics* data base, the broadest data base offering micro-level information on venture capital transactions. The observation period from 1997 to 2003 is not chosen arbitrarily. An active venture capital industry in Europe did not really emerge until the 1990s, with the onset of the technology founder wave that culminated in the internet bubble. Microlevel data on venture funding are not available prior to about 1997.

In fact, the advent of the internet had a dramatic impact on venture capital flows. In the United States, venture capital investments saw a fivefold increase of investments in the two years between 1998 and 2000 alone, largely driven by investments into internet companies that absorbed more than 80% of all venture capital investments in 2000. In Europe, the development has been equally dramatic, with venture capital investments in start-up companies growing from € 6.7 billion in 1998 to more than € 20 billion in 2000. After the bubble burst, a rapid decline in venture capital funding occurred on both sides of the Atlantic. Investments have remained at levels above those of the pre-bubble years though, even in Europe, and the share of internet-related investments has remained surprisingly high. To some extent, therefore, the internet revolution might still be seen as the true starting point of a genuine venture capital industry in Europe.

In their study, Hege, Palomino and Schwienbacher investigate the relative performance of the European venture capital industry compared with the US role model for the sample period 1997-2003. They identify 147 European companies with sufficient information on the valuations at different financing rounds that that makes it possible to determine internal rate of returns as their principal performance measure. Their European sample consists of 48% companies from the UK, 16 % from France and 13% from Germany, with the rest coming from 8 other countries. [6] The authors compare this sample to a randomly drawn sample of 234 similar US companies.

Their starting point is the finding of a strong and highly significant performance gap: during the entire period, the returns of venture capital investments in Europe were clearly lacking behind those in the United States. To compare internal rates of return would not be meaningful without an adjustment for the contemporaneous stock market returns, considering that venture capital returns have always been highly cyclical and in large part driven by fluctuations in exit valuations. The adjustment takes account of possible regional disparities in market returns by using the leading regional stock market indices (MSCI Europe and MSCI USA, respectively). The study finds that US venture capitalists outperformed their market benchmark by a median annualised return of 63%, whereas their European counterparts underperformed their benchmark by 20%.

[6] The study is limited to the EU-15 countries.

This difference is highly significant, and robust to alternative specifications of IRR-based performance measures.

The theoretical and empirical literature has focused on a relative small number of factors as the leading performance drivers in venture capital success. First, venture capitalists are typically active investors: they provide monitoring and advising besides capital. Second, the venture capital industry has long resorted to a wide array of specific contractual mechanisms to mitigate agency conflicts, in particular instruments of contingent control and stage financing.

Therefore, an obvious candidate to explain the performance gap between Europe and the US is that European venture capitalists use contractual and monitoring safeguards against agency conflicts less aggressively. Indeed, there is earlier evidence that European VCs still monitor less, and use tools to alleviate conflicts and to foster control, like convertible securities substantially less often (Schwienbacher, 2004, Bascha and Walz, 2001, Kaplan, Martel and Stromberg, 2003).

In a multivariate regression analysis, the authors explore whether variables that proxy for such factors and that capture differences in the investment behavior and the use of contractual instruments can explain the performance variation in the sample. They consider, among others, the size of syndicates, the continuity between syndicate participation from one round to the next, the frequency of financing rounds, the total duration of the project, its momentum in initial rounds, and the presence of corporate investors. They find that while some of those variables contribute to the explanation of the sample variance, this contribution is dwarfed by the impact of the dummy variable capturing whether a company is based in Europe or not, and which comes out significant at the 0.1% level in all regressions.

When the authors look at the interaction terms of the proxies with the EU-dummy, they find some interesting differences, however. For example, a higher financing frequency has a positive impact on performance only in the United States, consistent with theory, whereas it shows a significant negative impact in Europe.

The authors then consider several alternative explanations for the performance gap. One possibility is that European venture capitalists are simply less experienced, since venture funding is a relative newcomer in Europe, and have less know-how than their US counterparts to identify and bolster high-performing projects, in a way that is not captured by observable characteristics in investment behavior and contracting. The authors suggest the following test: if this hypothesis was true, then on average US-based venture capitalists being active in Europe should outperform Europe-based VC investors. A large number (about 60%) of the European subsample shows actually participation of US venture capitalists at some stage in the financing rounds. The authors find that US-based venture capitalists investing in Europe during the investigation period fared no better than their local counterparts, clearly suggesting that differences in experience beyond observable behavior are not the primary cause.

Another possible explanation, which is particularly interesting in the context of the current article, is the role of different legal systems. LaPorta et al. (1998) have identified four different systems of legal origin that are all present in our sample and attribute persistent differences in investor protection to these four families. Their approach has been strongly contested by many researchers both in the finance and in the law community. There is some previous evidence, however, that indices of legal origin and legality do seem relevant to explain differences in cross-country variation in venture capital contracting and performance (notably Kaplan, Martel and Strömberg, 2003, Cumming, Schmidt and Walz, 2004, and Cumming, Fleming and Schwienbacher, 2005). While all of the four legal families of LaPorta et al. (1998) are present in the sample, the subsamples for the German and the Scandinivian family would be to small to apply statistically powerful tests. In line with the Law and Finance discussion that followed LaPorta et al. (1998), the authors focus only on the two main groups, the common law origin and the civil law origin (which encompasses the German, French and Scandinivian family). In the European subsample, the common law system is represented by the UK and Ireland, and the strong presence of UK-based companies in particular is responsible for the fact that slightly more than half of the European sample belong to the common law system.

In univariate *t*-tests, the authors find no difference between the performance of common-law based and civil-law based companies. The same is true in the multivariate regressions when they add a dummy for companies based in civil-law system. In various specifications, this variable always remains insignificant. These negative results are not really surprising against the backdrop of the following observation: UK-based companies are actually showing a performance that is slightly (albeit not significantly) *below* that of the rest of Europe. In short, this study does not find any supportive evidence that legal origin matters, or could explain the large performance gap. That does not rule out that legal variables might be important determinants when the US performance is compared to emerging markets.

In conclusion, this study shows that the US and Europe seem to belong to different universes when it comes to the performance of venture capital. The fault line between a thriving venture capital sector and a fragile one seems to come down between the US and the rest of the world, and not between developed and emerging financial markets. It is well conceivable that wider differences between the economic and financial systems and their institutional and cultural environment, like a relative lack of entrepreneurial culture in Europe or a lesser acceptance of entrepreneurial failure, and a lack of potent geographic clusters that foster innovation, are important factors explaining the gap between both sides of the Atlantic.

7. Conclusion

This article has presented some recent research findings on the legal determinants of the development and performance of European venture capital. The underlying research project have been undertaken in the context of the RICAFE ('Risk Capital and the Financing of European Innovative Firms') research project that has been financed under the Fifth Framework of the European Union's sponsored research projects. The success of the project has contributed to the financing of a 'continuation' project which includes the same researchers with the addition with others from the Universities of Amsterdam, Haifa, Lugano, and Tilburg, from the Indian Business School, and the Baltic International centre for Economic Policy Studies. The focus of this new project – whose results will also be available at the RICAFE website – has been extended to look into the determinants of knowledge-based entrepreneurship and its implications for regional dynamics. We hope to be able to report new results in this respect in the near future.

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