

Europe's Venture Capital Institutions are Good Enough¹

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I. Introduction

According to popular legend, economic innovation begins when an entrepreneur comes up with a bold experimental idea. The entrepreneur takes the idea a certain distance by herself, frequently with seed capital from angel investors. Then she pitches the business plan to venture capitalists (VCs). Eventually she matches up with the VC that offers the best fit in terms of personal chemistry, industry experience and risk appetite. She deploys the VC's capital to grow the business, while the VC transmits financial and business knowledge that the relatively-inexperienced entrepreneur lacks. If all goes well, the entrepreneur comes back to the VC for subsequent rounds to fund further growth. When the time comes, the firm's investors exit via an IPO or a sale to another company. All along the way, the firm spawns employment, innovation and spreads vitality throughout the economy. If we believe this legend, we have a ready explanation and a policy response for the seemingly short supply of innovation in European economies: VCs invest less in Europe than the U.S., at least partly due to tax and regulatory burdens that European countries impose on domestic VC funds and cross border investing; if policymakers reduce these barriers, VC should become more plentiful, European entrepreneurs will be able to fund their projects more easily, and innovation in Europe will catch up with the U.S.

The European Commission offers advice along these lines: "Venture capital funds face obstacles when investing across borders at the same time when innovative firms with high growth potential in Europe face difficulties to access equity because of the fragmented market. Further development of the venture capital industry in Europe requires actions to take in order to reduce the existing market fragmentation for the PE and VC industry and the support of various industry players is necessary." ^{3, 4}

¹I am indebted to Amar Bhidé and particularly to Edmund Phelps for many stimulating discussions on entrepreneurship, innovation and finance.

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³"Merits and Possibilities of a European structure for venture capital funds"

http://ec.europa.eu/enterprise/entrepreneurship/financing/publications_documents.htm

⁴Identical recommendations appear in the report "Best practices of public support for early-stage equity finance," Directorate-General for Enterprise and Industry, European Commission, September 2005: "Since the early 1990s, policy recommendations at global, European and national level have urged coherent approach to improving SMEs' access to finance, in particular equity finance. For its part, the Community Lisbon Programme emphasized that in order to attract more investment, generate employment and accelerate growth, it is important to facilitate market entry within sectors and between Member States. The plan noted that full integration of financial markets will contribute to raising output and employment by

This paper, however, challenges the conventional view of venture capital and argues that the standard policy solutions would have little effect:

- (1) The data show that institutional venture capitalists finance very little innovation in the United States, Europe or anywhere else. Even in the U.S., the amounts that professional venture capitalists invest in seed and first round deals are miniscule compared with the size of the economy while few recent VC-backed projects would qualify as bold experiments. In most cases, VCs keep entrepreneurs on a short leash. The VCs hew closely to a business plan with a three-year to five-year exit strategy and the VC can shut the project down at the first sign of serious trouble. Almost all VC projects in the U.S. are in the information technology and life sciences sectors which, as Bhidé (2005) observes, account for less than 20% of U.S. GDP.
- (2) European VCs and international investors have already devised practical structures to cope with tax obstacles that appear on the surface to be formidable. It is unlikely that a friendlier tax regime would make much difference.
- (3) Integration of Europe's financial markets would not change existing behavior. European start-ups obtain a portion of their capital from VC funds in their home country and the remainder comes from overseas funds that co-invest with the local fund. This is similar to the U.S. where the lead investor in a start-up round typically comes from the entrepreneur's region of the country. Although several theories could explain this phenomenon, this paper argues that adverse signaling is most important. An entrepreneur who seeks 100% of its capital from a VC that is far away will signal that the entrepreneur has exhausted the VCs in its home region. Foreign VCs will refuse to spend resources on due diligence for a project that has been heavily "shopped" and is unlikely to result in a transaction.

We can deduce from (2) and (3) that the relative lack of VC investing in Europe derives from the low supply of projects that VCs like to fund, rather than the other way around. However, from (1) we do not need to despair. Despite a few dazzling success stories, institutional VC does not contribute meaningfully to innovation in the United States. The paper concludes by arguing briefly that established companies may be an underappreciated source of dynamism.

allowing more efficient allocation of capital and creating better conditions for business finance.”
http://ec.europa.eu/enterprise/entrepreneurship/financing/docs/report_early-stage_equity_finance.pdf.

II. Overview of VC Investments in the U.S.

Several observations support the claim that institutional VC cannot take much credit for fostering innovation in the U.S.:

- (i) Investment in early-stage U.S. companies is about 0.02% of GDP.
- (ii) Almost all investments are in two industries.
- (iii) Investee companies are usually more mature than the term “start-up” implies.
- (iv) VC’s reputation for risk-taking during the internet boom is overblown.
- (v) Business plans are geared towards early exits.
- (vi) VC’s protective rights limit risk if the business departs from plan.

(i) Investment in early-stage U.S. companies is about 0.02% of GDP

According to TheDeal.com database, institutional investors participated in 337 seed capital or first round fundings for U.S. companies between January 1, 2005 and June 30, 2006⁵. The amount invested was not disclosed in 38 of these transactions. Median investment for the 299 deals where size was disclosed was \$6 m and the average was \$9.7 m. The total amount invested in these deals was \$2.9 billion. This equals 0.02% of U.S. GDP over the same interval. If we include later-stage rounds of VC funding, which tend to be much larger, the total rises to \$18.85 billion or 0.1% of GDP over 18 months. The market size computed from TheDeal.com database are basically consistent with statistics reported by National Venture Capital Association (www.nvca.org). According to the industry trade group, VCs invested a total of \$22.2 billion in U.S. companies or 0.19% of GDP for the calendar year in all rounds combined. We can reconcile the two figures by noting that the National Venture Capital Association includes investments by the SBIC, venture arms of corporations and investment banks. The Ernst & Young/VentureOne Venture Capital Report for Q4 2005 defines VC as “all investments made by venture capitalists or venture capital-type investors” and arrives at a similar result, finding that total VC investment in 2005 was \$21.6 billion.

Even the figures derived from TheDeal.com may overestimate institutional VC funding of early-stage companies. First of all, they include angel investors and corporate investors who participated in a round that included an institutional VC. Secondly, as discussed below, VCs do not inject the entire funded amount at the time they announce a deal. Funding generally comes in several tranches that are contingent upon the company meeting pre-agreed milestones.

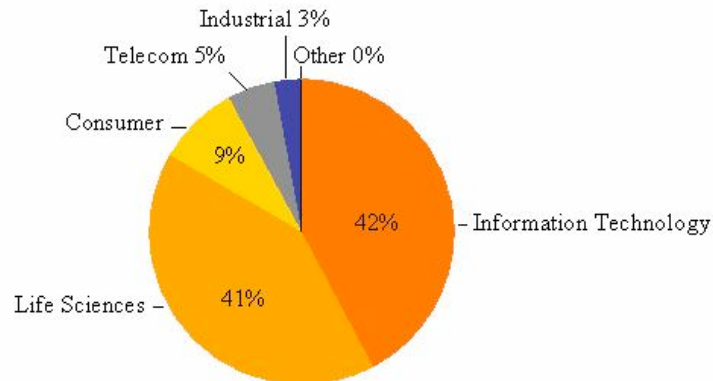
(ii) Almost all investments are in two industries

As the chart below shows, 90% of early-stage VC investments in the U.S. are in information technology/telecom or life sciences. (Life sciences are split into biotech, medical devices and health care services.) The next largest category at 9% is consumer.

⁵This data is not publicly available. Readers can find the data underlying the analysis on a transaction-by-transaction level at the website: www.robb-cespaper.com.

Consumer deals, however, are largely technology projects geared towards consumers and could easily be classified as information technology. For instance, by far the largest funding for a “consumer” company over the sample period was \$48.5 m for MovieBeam in what was technically a first round. MovieBeam sells video on demand via set-top boxes that receive broadcasts over conventional airwaves.

**Composition of Early Stage U.S. VC Deals
January 1, 2005 – June 30, 2006**



Source: TheDeal.com, VC Deal Database

(iii) Investee companies are more mature than the term “start-up” implies

In 1996, National Venture Capital Association’s annual report stated that 77% of companies that received VC funding were at least three years old (Bhidé 2005, p. 11). Since then, the NVCA discontinued reporting age of deals and merely breaks down transaction volume into “early-stage”, “expansion-stage” and “later-stage” where “early-stage” is defined as a seed or first round. In Q1 2006, the composition was 16% for early-stage, 41% for expansion-stage and 43% for later-stage. A conspiracy theorist might speculate that the industry’s trade association found that the advanced age of investee companies conflicts with the image that venture capital would like to project.

A great deal can be learned about the character of VC investments by looking at a few deals. The three largest “early-stage” deals in our data set were all remarkably well-established companies:

Three Largest First Round VC Investments January 1, 2005 – June 30, 2006	
1.	<p>Company: Webroot, Inc. Investors: Accel Partners, Mayfield, Technology Crossover Ventures Invest. Date: Feb 2005. Amount: \$108 m Description: Webroot has been profitable since it was founded in 1998. The company sells “security products that block and eliminate programs that invade personal computers... The new funding will be used to broaden the international expansion of the company's anti-spyware business.”</p>
2.	<p>Company: ITA Software, Inc. Investors: Battery Ventures Invest. Date: January 2006 Amount: \$100 m Description: Computer scientists from MIT's Artificial Intelligence Laboratory founded ITA in 1996. According to the company's website, “ITA Software's QPX system is the world's leading airfare pricing and shopping system. QPX has been proven by some of the most demanding customers in the industry, including Orbitz, Alaska Airlines , Alitalia, America West Airlines, Continental Airlines, Galileo, Cheap Tickets, Kayak, Accovia, NLG and others.” The company plans to use its first round funding to expand from 175 to 300 people.</p>
3.	<p>Company: Verus Pharmaceuticals, Inc. Investors: 7 venture capital funds Invest. Date: June 2005 Amount: \$78 m Description: Verus was founded in 2002. From a press release on July 6, 2005, the company “acquired exclusive, worldwide rights to Twinject.... Twinject, a novel epinephrine auto-injector indicated for the emergency treatment of severe allergic reactions (anaphylaxis), was approved by the U.S. Food and Drug Administration (FDA) in 2003.”</p>

Since focusing on the large deals may bias the sample in favor of mature companies, we can see that three randomly selected deals tell the same story. Of the three transactions below, the closest to a start-up is probably A&G Pharmaceuticals, which plans to use the money for clinical trials of a new product, although it should be noted that diagnostics require a much less arduous FDA approval process than therapeutics.

**First Round VC Investments – First Three in Alphabetical Order
January 1, 2005 – June 30, 2006**

1. Company: A Place for Mom, Inc.
 Investors: Battery Ventures
 Invest. Date: Feb 2006.
 Amount: \$9.5 m
 Description: According to the company's website, "A Place for Mom is the nation's largest Eldercare Referral Service... A Place for Mom has over 10,000 long-term care communities participating in its referral network. This includes all of the top twenty largest assisted living companies in the United States." The company will use the money to expand and to provide liquidity to angel investors and employees.

2. Company: A&G Pharmaceuticals, Inc.
 Investors: Round was led by New England Partners and included a fund sponsored by Maryland Department of Business and Economic Development
 Invest. Date: Sep 2005.
 Amount: \$2 m
 Description: Founded in 2000. From the website, "Over the last four years, A&G has become the preferred partner for more than 14 biotech and pharmaceutical organizations in monoclonal antibody development." Obtained funding to complete clinical trials of breast cancer test kit.

3. Company: Accordent Technologies.
 Investors: TVC Ventures
 Invest. Date: March 2006.
 Amount: \$4 m
 Description: Founded in 1999. From the website, "More than 1500 organizations worldwide, including Unisys, the United Nations, National Institutes of Health, and Oracle, rely on Accordent for their online communications."

(iv) VC's reputation for risk-taking during the internet bubble is overblown

During the so-called "internet bubble, start-up entrepreneurs would frequently claim that they had attained vast wealth by inking a deal with an aggressive VC. For example, an entrepreneur might say he had sold 10% of the company for \$5 m, implying a valuation of \$45 m for the stock that was retained. When journalists repeated these claims, the public formed the impression that VCs behaved recklessly. This impression still lingers today. However, a look at elements of the structure of VC investments will reveal that the entrepreneurs' claims were delusional – the entrepreneur who obtains VC funding has merely taken one step towards realizing the riches in the implied valuation. The entrepreneur still must build a company that achieves a "liquidity event" (sale to another company or IPO). Following an IPO, the founder's shares will be locked up for a period of time, so the company must continue to perform well in the public markets before the founders can exit. By the time all this happens, the shares the founder has retained will

almost certainly be diluted down to a far smaller percentage of the company. In the absence of a profitable liquidity event, the entrepreneur typically ends up with nothing to show for a decade of hard work other than a below-market salary.

This is not the case for VCs. Institutional VCs never invest in common shares alongside the founders but rather bargain for preferred stock that confers many rights and mechanisms for protecting those rights. A few such provisions in nearly every preferred stock agreement are:

Dividend payments: VCs receive a preferred return of approximately 8% p.a. This is usually expressed as a cumulative dividend. The dividends are not paid periodically, but at the time of any exit.

Liquidation preference: In the event of liquidation, sale or winding-up of the company, the preferred investors receive a multiple of their investment plus the preferred return before any money is distributed to the common shareholders. Liquidation multiples can range up to 6×, so the VCs in our example would receive the first \$30 m plus the preferred return following any liquidity event.

Anti-dilution: If the business stumbles at any point and the entrepreneur is forced to raise money at a lower implied valuation, anti-dilution provisions quickly shrink the entrepreneur's share of the company. For example, in the case of full ratcheting anti-dilution in our example, \$1 raised at a \$25 m valuation would mean that the VC's preferred shares convert into 20% of the company rather than 10% as specified in the initial terms. The extra shares come at the expense of the shareholders who entered prior to the VC.

Vesting of founders' shares: At the time a VC invests, the common shares the entrepreneur had previously owned will start to vest according to a schedule.

(v) Business plans are geared towards early exits

VC funds are typically structured with five-year investment periods and ten-year final lives. During the investment period, the VC manager can draw down capital that its limited partners have committed. Early transactions that generate liquidity during the investment period may be recycled into new investments. After the investment period, the fund manager focuses on realizing liquidity from the portfolio it has assembled. To the extent it succeeds in converting portfolio investments to cash over the predetermined time frame, the manager receives an incentive fee and will be able to raise new funds.

The most important ways to ensure timely exits are to pick the right companies and to guide these companies in the desired direction after the investment takes place. Additionally, the standard preferred stock agreement contains two provisions that strengthen the VC's hand:

Redemption: The preferred shareholder can force the company to redeem the preferred shares in three to five years at the purchase price plus the preferred return. The threat of a redemption that would deprive the company of its financial resources can motivate the company to pursue a liquidity event.

Registration Rights: The preferred shareholder can demand that the company register for an IPO at the company's expense at any time.

(vi) VC's protective rights limit risk if business departs from plan

Funding based on milestones: VCs fund preferred stock in several tranches. In the example above, the VCs may agree to inject \$1 million every six months contingent on milestones, such as signing up a certain number of customers or completing Phase II trials of a drug.

Negative Covenants: The entrepreneur must seek the preferred shareholders' approval before fundamentally changing the business relative to the plan, issuing new securities, merging or acquiring another business. The VCs can use this leverage to replace the CEO when the company is struggling.

Board Representation: VCs stay closely involved with a company in order to transfer expertise, but also to gather information so they can enforce their rights. The preferred stock agreement usually guarantees one or more board seats to the VCs. Additionally, the preferred shareholders are guaranteed "information rights" such as regular financial reports or other information they reasonably request.

How can it be that U.S. VCs are so careful and invest so little in genuine start-ups yet a dozen or more household names follow the arc of entrepreneur-with-an-idea → VC fund → hugely-profitable IPO? To indulge in a psychological explanation, the VC success stories are romantic and well known. They include Compaq, Netscape, Symantec, Sun Microsystems, Amazon, Google and eBay. Frequently, their histories are embellished by imaginative foundation myths (e.g., Pierre Omidyar has confessed that he made up the story about inventing eBay so his wife could trade Pez dispensers online). Even the name "venture capital" – with the same root as "adventure" – sounds exciting. We may suppose that for every one we know about, hundreds fall below the popular radar. For every uber-VC investor like John Doerr, thousands toil in relative obscurity. But the data suggest otherwise. While the public doesn't care to know about every inverter duty motor that Emerson Electric develops and markets for hundreds of millions, entrepreneurs who beat the odds tell a tale that everyone wants to hear.

III. European VC

The institutional VC market in Europe is somewhat smaller than the U.S. Every single early-stage round for a European company in our data set contains at least one European VC and usually the VC comes from the same country as the investee company. Most of the larger deals include at least one U.S. VC fund.

TheDeal.com database lists 47 seed or first-round deals for European companies that closed between January 1, 2005 and June 30, 2006. The median deal size was \$5.3 million, only slightly smaller than the U.S. The investee companies were located in 13 countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Norway, Spain, Sweden, Switzerland and United Kingdom. In a similar pattern to the U.S., 46 of the 47 deals were classified as information technology, life sciences or telecom.⁶

The Ernst & Young/VentureOne Venture Capital Report pegs Europe's VC market at €3.6 billion (approximately \$4.5 billion) for 2005 for all rounds combined. This equates to 0.04% of GDP or roughly ¼ of the ratio in the U.S. The E&Y report estimates that "early-stage" deals make up 31% of all VC investments which would bring the early-stage total to \$1.4 billion or half of the U.S. (TheDeal.com database is not reliable for measuring the market's size. TheDeal.com believes it captures nearly every transaction in the U.S. and about half in Europe⁷.) The European Private Equity Survey published by the European Venture Capital Association estimates from a survey of VCs that European venture capital investment in 2005 was €10.8 billion or 0.11% of GDP. This seems implausibly high, since it would mean that Europe's VC market was approximately the same size as the U.S.⁸

According to TheDeal.com data, European start-ups, like their American counterparty, generally raise a portion of their capital from investors close to home. Investors' identities were disclosed in 42 of the 47 European deals over the sample period in TheDeal.com database. Like the U.S., the median number of investors in these deals was 2. All 42 such deals contained at least one European investor in the round. Out of the 14 deals larger than \$10 million, 9 contained at least one U.S. VC and 7 out of 28 of the deals smaller than \$10 million contained at least one U.S. VC. In 35 cases out of 42, the round contained at least one VC from the investee's country. Most of the exceptions

⁶ See robb-cespaper.com for raw data.

⁷ Personal conversation with TheDeal.com staff.

⁸ The European Commission uncritically cites this measure of industry size in numerous documents including a June 30, 2006 press release: "The risk capital markets in Europe: still too small... VC investments were €10.8 billion in the EU versus €16.5 billion in the US (EVCA; NVCA)." If this were true, one wonders why the Commission would be alarmed by a differential of €5.7 billion p.a. considering the GDP of both economies exceed €10 trillion. The U.S. data seems far more trustworthy, since the NVCA data is checked with public sources and portfolio companies while the EVCA data relies on surveys sent to "private equity firms." Also, the NVCA measures of industry size correspond to The Ernst & Young/VentureOne Venture Capital Report and TheDeal.com micro data, while the EVCA statistics do not. For the European Commission press release, see <http://europa.eu.int/rapid/pressReleasesAction.do?reference=MEMO/06/259&type=HTML&aged=0&language=EN&guiLanguage=en>.

included a VC from a neighboring country, such as Affiris, the Austrian pharmaceutical company, that closed a €8.5 m round with MIG Funds from Germany.

Interestingly, it is hard to find a single Italian start-up funded with VC capital in the past several years. It is equally hard to explain the phenomenon by a lack of Italian VC funds with the requisite skills. Consider, for example, CDB WebTech. CDB WebTech is a publicly traded fund that invests in other VC funds and makes direct VC investments. It is chaired by one of Italy's leading tycoons, Carlo de Benedetti. The other senior managers are Vittorio Moscatelli (CEO), Giuseppe Pasetti (Vice President Investments), Paolo Bonetti (Chief Financial Officer) and Cristina Tolentino (Senior Accountant), all Italians working out of CDB WebTech's Milan office. Yet CDB WebTech's direct portfolio does not contain a single Italian company. Apax is one of Europe's two or three most active VCs and has an office in Milan, yet only 3 out of its 500 portfolio companies are Italian: Newron Pharmaceuticals (2002), HAL Knowledge Solutions (2003) and Keylan SpA (2002). Another major European VC investor, 3i, has participated in 10 leveraged buyouts of mature Italian companies since 1997 but made only a single Italian VC investment when it co-invested in Newron along with Apax. Thus we can point to three well-heeled institutions in Italy that are set up to invest in Italian start-ups. The absence of many transactions suggests that Italian entrepreneurs are to blame. Evidently, they do not start biotech, information technology or telecom companies, or if they do, they do not turn to VCs for funding.⁹

IV. Tax Structures

The literature on entrepreneurship routinely cites tax as a partial explanation for the failure of European venture capital to flourish. For instance, the OECD's "Going for Growth 2006" lists the four main "policy determinants that influence the supply and demand for venture capital" and reason number one is "[e]xcessive taxation of capital income and capital gains that reduces ... the willingness of individuals to commit savings to venture funds." It is understandable why the OECD analysts would arrive at this conclusion. If a VC were to march into a continental European country and mechanically set up a fund, the tax burden would be overwhelming. To take an extreme example, a German company would pay its own income tax on profits that it earned, the fund that invested in the company could pay tax on dividends received or capital gains on selling the company, and investors in the fund might have to pay a third round of tax on any profits that were left. The manager's fees could be subject to VAT and then a layer of income tax. Even worse, a venture capitalist opening an office on the ground in Germany to make direct investments in Germany on behalf of a non-German fund might create a "permanent establishment" and trigger German tax on a portion of the fund's global income.

The obvious policy prescription for promoting European VC funds is to ease the tax burden. However, a closer look at existing practice suggests that such policies may not be needed: fund managers have already figured out ways to cope with the status quo.

⁹ See the companies' websites for details: www.cdbwebtech.com, www.apax.com and www.3i.com.

With a bit of structuring, managers routinely invest from overseas or set up offices in European countries without attracting double or triple tax, capital gains tax for non-resident investors, withholding tax or substantial VAT on management fees. These structures are commonplace, legal and practical.

One example will illustrate the point. The German biotech company Elbion AG, raised \$33m from VCs when it was spun-off from a German chemical manufacturer in the largest European VC first round funding of 2005. The round attracted seven institutional investors including five venture capital funds. As shown in the chart below, two VC fund managers are based in Germany, two come from outside Germany, and one is headquartered in London but sources its German investments from its offices in Munich, Stuttgart and Frankfurt. None of these investors would subject their funds to tax at the fund level.

Investors in Elbion AG First Round Funding, January 2005		
Investor	Location	Investor Type
3i Group plc	Headquartered in London; offices in 14 countries in Europe, U.S. and Asia; 3 offices in Germany	VC Fund Manager
AGF Private Equity	France	VC Fund Manager
BayTech Venture Capital	Germany	VC Fund Manager
Burrill & Co. LLC	U.S. (northern California)	VC Fund Manager
DVC Deutsche Venture Capital GmbH	Germany	VC Fund Manager
Marubeni Corp.	Headquartered in Japan, with offices in 74 countries	Giant trading company, service provider to Elbion
Quintiles PharmaBio Development Group	Headquartered in U.S. with offices in 50 countries	Biotech consultant, service provider to Elbion

How do they do it? It is worth reviewing the funds' techniques in a bit of detail,¹⁰ since the policy implications are important. We will consider two countries that more or less span the space of tax regimes: UK and France. France, in particular, proxies for Spain, Germany, Italy, Portugal and Austria.

United Kingdom

The UK is the most favorable European jurisdiction for an asset manager. The UK's Inland Revenue will not impose tax on a fund managed by a UK-resident manager investing in UK or non-UK assets if three tests are satisfied:

- (i) the fund, itself, is not UK-resident
- (ii) the investment manager is not a branch of the fund
- (iii) the fund is not controlled by a UK corporation.

¹⁰The discussion in this section is not intended to be used for the purpose of providing tax advice.

The first test can be satisfied by incorporating the fund offshore, such as in the Cayman Islands. While the fund should be controlled at the highest level outside the UK, the UK asset manager can be delegated broad decision making powers under the asset management contract. The UK offers an Investment Management Exemption that enables managers resident in the UK to establish that they are not a branch of the offshore fund. To qualify, the manager must carry out the business of providing management services (not conduct a trade or business); not be entitled to more than 20% of the gains and profits of the fund; and not carry out any other business besides investment management. The Investment Management Exemption does not exist in continental European countries and may partly explain the appeal of London as a center for fund management. Finally, the third test will be satisfied as long as the fund is not owned more than 50% by a UK corporation. A UK resident asset manager organized to meet these three tests will have a free hand to invest on behalf of an offshore fund without risk that Inland Revenue will impose tax at the level of the fund. Management fees paid to a UK manager will not be subject to VAT if the UK manager acts as a sub-advisor to a non-EU manager that in turn manages the fund.

The provisions above are enough to ensure that the fund, itself, will not incur UK tax. If the fund invests in European portfolio companies, such as in France, it needs to take additional measures so that French revenue authorities will not impose withholding or capital gains tax when the fund sells its portfolio investments. We now turn to the structuring that will solve this issue.

French VC for non-residents

We will consider the case of an offshore fund, say resident in the Cayman Islands, for international investors. These investors will, of course, be responsible for any tax due in their home country, as are foreign or domestic investors in a U.S. VC fund. The key is to show that dividends or capital gains can make their way to the end investors free of tax at the fund level.

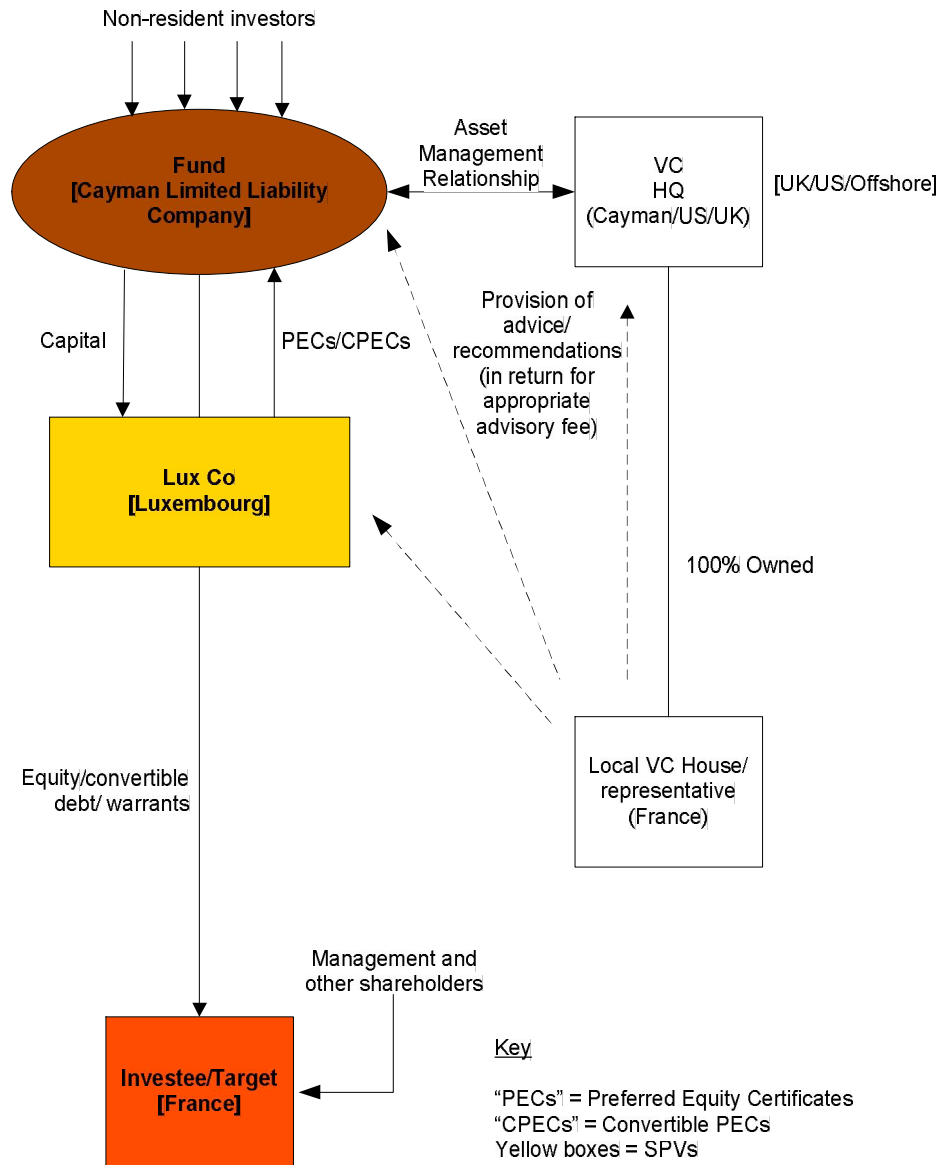
The most common structure involves interposing a Luxembourg holding company (“Luxco”). Luxco invests in securities issued by the French start-up company (“investee”). As in the U.S., the usual form of investment would be preferred stock that is convertible into common equity. Under French domestic rules, capital gains on shares are taxed at 16% if derived by non-residents, but under French-Luxembourg treaty, capital gains on shares derived by a Luxembourg tax resident are taxable only in Luxembourg. The EU’s Parent/Subsidiary Directive ensures that a dividend paid by the investee company would not be subject to French withholding tax provided Luxco holds at least 20% of the Investee (15% from January 1st 2007) and provided, further, that Luxco has not been interposed for the only purpose to take the advantage of this exemption. The last condition means that Luxco needs some substance. In particular, all board and shareholders meetings have to be held in Luxembourg. Moreover, such capital gains and dividends are exempt in Luxembourg due to Luxembourg’s “participation exemption” for parent companies that participate on more than 25% of a subordinate company. The final step is shifting these gains up to the Cayman fund. This is

accomplished by issuing “convertible preferred equity certificates” or CPECs that the Cayman fund buys. The Cayman fund obtains payments made by reimbursement of principal and accrued interest on the CPECs, and the excess profits in the form of partial or total liquidation of Luxco. (A regular dividend is subject to withholding tax in Luxembourg while liquidation proceeds from either total or partial liquidation are exempt from withholding tax.)

Why does Luxco issue a CPEC rather than a security with identical characteristics to the security Luxco buys from the French investee? The key is that CPECs are treated as debt for Luxembourg corporate income tax, withholding tax and capital duty purposes, and so will be exempt. At the same time, CPECs are treated as equity from a legal perspective. Importantly, this allows Luxco to comply with Luxembourg’s thin capitalization rules that will impose duties if a company’s capital structure comprises less than 15% equity.

This structure will work for a domestic French fund manager, a foreign manager that sets up an office in France or a fund manager that manages a fund entirely from outside of France. A French office of a non-French manager should not execute or implement transactions, but merely advise either of the investing entities (i.e. the Cayman fund or Luxco) or the parent fund manager (offshore from France), so as to avoid creating a taxable French permanent establishment.

If the target business is not in the real estate area, typically there will be no French wealth tax issues for non-resident investors in the Cayman fund.



Sample French VC Fund Managers

- A Plus Finance
- Access Capital Partners
- Ace Management
- Acland Capital Investissement
- Activa Ventures
- Alven Capital
- Angel Invest
- Astorg Partners
- Atria Capital Partners
- Aurel Leven NextStage
- Auriga Partners

Sample Non-French Managers w/Paris Offices

- Apax
- 3i

Sample French VC Fund Managers (cont)

- AurInvest
- Avenir FinanceGestion

V. Geographic Matching of VCs and Entrepreneurs

Even though funds can overcome tax obstacles to cross border investing, European VC nevertheless has a local component, as we saw in Section III. Several theories could explain why each round includes at least one European investor, usually from the entrepreneur's home country: (a) The tax structuring described in the previous section is prohibitively expensive. (b) The VC and entrepreneur need to share a common culture and language. Proximity will facilitate due diligence, knowledge transfer and monitoring. (c) After an entrepreneur solicits an investment from a VC and the VC decides to proceed with due diligence, they embark on a process that imposes costs on both sides. A project that has already been rejected by many of the VC's rivals is probably a waste of time. Entrepreneurs can conceal past rejections but they cannot hide their country. So an entrepreneur coming from far away signals that VCs closer to home have already said "no" – the San Francisco internet start-up seeking funding in Spain, for example, will arouse every suspicion. It would be unlikely to command attention in the absence of a strong explanation about why it has strayed so far from the United States.¹¹ It is important to distinguish between these theories from a policy perspective. If we find that (a) explains the localization of VC investing, then opening up the financial markets to ease cross-border investing could have an impact. If (b) or (c) are more important, then entrepreneurs will continue to obtain capital from local funds after the market is integrated and little will change. In this section, we develop a model to make (c) more precise and then test the model informally by analyzing data from the U.S. We find that localization persists in the absence of tax or cultural barriers, since West Coast VCs tend to fund West Coast entrepreneurs and East Coast VCs tend to fund East Coast entrepreneurs.

Consider entrepreneurs who arrive at domestic VCs sequentially to present their projects. The number of VCs in the entrepreneur's home country is exogenously fixed at n . Given the entrepreneur's information, the VCs are homogeneous. For simplicity, a VC can either accept or reject a project and, if accepted, the deal's terms follow the market standard. The probability an entrepreneur's project will be accepted by a VC after the VC performs due diligence is the outcome of a random variable Θ that is fixed for each entrepreneur. The entrepreneurs do not know their own value of θ , but entrepreneurs and VCs do know the probability density function, $f(\theta)$. An entrepreneur's value of θ can be interpreted as the chance a VC will identify the merits of the project; VCs differ with regard to their judgment as well as their ability to contribute to a project through business contacts and active participation. This set-up would be identical to an academic who submits a paper to journals – after striking out many times, it is possible that a journal will see virtues that others missed or appoint an editor who can bring the paper up to acceptable standards.

¹¹The entrepreneur may try to overcome adverse signaling by arguing that its project fits naturally with a foreign VC and hence imply that the entrepreneur skipped due diligence in its home country. The entrepreneur might appeal to a compelling personal connection with the VC, a similarity between one of the VC's portfolio companies and the entrepreneur's project, or a desire to establish contacts in the VC's country where it sees a market for its products. We will see a few examples later in this section where this tactic seems to have worked.

Entrepreneurs differ with regard to the costs of presenting to a VC. We assume the j th entrepreneur's cost of finding a domestic VC and undergoing due diligence is a fixed amount. After being rejected, the entrepreneur has to decide whether to quit or to pay the cost of presenting to the next VC. Denote the j th entrepreneur's cost by c_j with probability distribution function $F_c(c)$. In practice, an entrepreneur's cost might decline with each subsequent approach to a VC if, for example, she can re-use presentation materials. This efficiency might be offset by higher marginal cost of contacting VCs (the entrepreneur will start by contacting the one who is easiest to find) or fatigue. In any case, a declining cost function would not change the basic result of our model and would needlessly complicate the entrepreneur's stopping rule.

The probability a random entrepreneur will succeed on the first visit to a VC is simply $E[\Theta]$. The probability of success on the second visit is lower, since rejection the first time will convey a lower value of θ . Applying Bayes Law,

$$P[\text{success on the second trial}] = \frac{\int \theta(1-\theta)f(\theta)d\theta}{\int (1-\theta)f(\theta)d\theta},$$

and

$$P[\text{success on the } i\text{th trial}] = \frac{\int \theta(1-\theta)^{i-1} f(\theta)d\theta}{\int (1-\theta)^{i-1} f(\theta)d\theta} \equiv p_i.$$

In the special case that Θ is uniformly distributed on the unit interval, the probability of success on the i th trial reduces to $p_i = \frac{1}{1+i}$.

Assuming risk neutrality, an entrepreneur quits immediately before the i th trial if $c_j > p_i V$ and $c_j \leq p_{i-1} V$ where V is the value the entrepreneur places on persuading a VC to fund his project. For $i=2, \dots, n$, the probability a randomly selected entrepreneur will choose to undergo the i th trial given rejection on trial $i-1$ is $P[c > p_i V] = F_c(p_i V)$. Without altering any of the analysis, we could allow V to vary across entrepreneurs by defining c_j as the ratio of the cost to the entrepreneur's private value of success.

The VC, too, incurs a cost of evaluating a potential investment. VCs cannot observe θ and entrepreneurs are able to conceal whether or not they have undergone due diligence. Thus VCs cannot distinguish between entrepreneurs a priori, so any VC that is set-up for business will evaluate each entrepreneur that arrives. (Some projects will be unworthy on the surface and never receive a hearing. We can assume that these are excluded from the analysis, so that $f(\theta)$ represents the distribution of entrepreneurs that VCs are willing to consider.) From a VC's point of view, the probability of success of any evaluation is

$$P[\text{VC succeeds}] = \sum_{i=1}^n P[\text{entrepreneur is arriving for its } i\text{th trial}] \times P[\text{success} \mid \text{the } i\text{th trial}] =$$

$$\frac{p_1 + (1-p_1)p_2 \times F_c(p_1V) + (1-p_1)(1-p_2)p_3 \times F_c(p_2V) + \dots + (1-p_1)(1-p_2)\dots(1-p_{n-1})p_n F_c(p_{n-1}V)}{1 + (1-p_1) \times F_c(p_1V) + (1-p_1)(1-p_2) \times F_c(p_2V) + \dots + (1-p_1)(1-p_2)\dots(1-p_{n-1})F_c(p_{n-1}V)}$$

The table below shows the probability a VC succeeds on each trial taking the special case $f(\theta) = 1$ for $0 \leq \theta \leq 1$. The first column is the total number of VCs in the market. The second column gives the probability of success assuming $F_c(p_{n-1}V)$ so entrepreneurs never become discouraged. The last column gives the probability of success assuming $F_c(p_iV) = 0.5$ for $i = 1, \dots, n-1$ (i.e., there is a 50% chance the entrepreneur will give up after one rejection and a 50% chance he will not give up until he has exhausted all n VCs.)

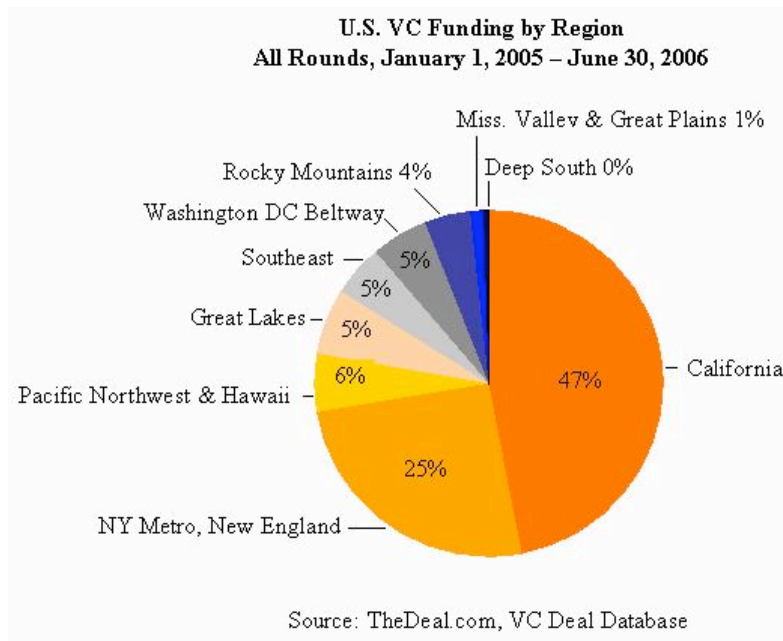
Probability VC Succeeds Assuming $f(\theta) = 1$ for $0 \leq \theta \leq 1$		
Number of VCs in the Market	Probability VC Succeeds on Each Trial	
	Entrepreneur is never discouraged	50% Chance Entrepreneur is discouraged after first rejection
1	0.500	0.500
2	0.444	0.467
3	0.409	0.441
4	0.384	0.422
5	0.365	0.406
6	0.350	0.393
7	0.337	0.383
8	0.327	0.374
9	0.318	0.366
10	0.310	0.359

Not surprisingly, the chance a VC will succeed declines as the market grows more crowded. The situation is worse if entrepreneurs are not easily discouraged.

Imagine an entrepreneur who has been rejected by all ten domestic VCs and would like to try her luck overseas. We will assume that her cost of going abroad is higher, but not so high that she would be unwilling to incur $c_j + \varepsilon$ in exchange for a probability θ of success. Consider this meeting from the perspective of the foreign VC. The VC can deduce from the entrepreneur's location that all ten domestic VCs must have rejected the entrepreneur's project. If $f(\theta) = 1$ for $0 \leq \theta \leq 1$ as in the table above, the chance of success on the eleventh trial is $p_{11} = 1/11 = 9.1\%$. (With more than one VC in the foreign market, p_{11} will be even lower since there is a chance the entrepreneur may have been rejected by a foreign VC.) If risk-neutral VCs face the same cost function in each of two countries with free entry, firms will enter the market as long as the probability of success

multiplied by the value of projects given success is equal to the cost of due diligence. In the case where entrepreneurs are never discouraged, a VC could evaluate a random domestic project with 31% chance of success rather than a foreign entrepreneur with a chance of success equal to 9.1%. The structure where local entrepreneurs present to local VCs is a stable equilibrium: if the VCs expect entrepreneurs to begin with the home country VCs, then VCs will refuse to evaluate foreign entrepreneurs. Note that the result holds even if ϵ is a small positive number. As long as the cost differential is greater than zero, the entrepreneur traveling abroad will signal to VCs that she cannot raise money back home.

Costs or taxes offer alternative explanations for localization of VC investing. Perhaps it is much more costly for VCs to identify and monitor entrepreneurs who are far away due to travel costs, cultural or language barriers. Structuring to avoid cross-border tax may be expensive and risky. A simple, informal test can distinguish between these theories. The test relies on a natural experiment in the United States. In the U.S., entrepreneurs who fund from VCs lie principally on the two coasts:



VCs, too, are principally lined up on the coasts. Clearly, VCs from New York can invest in California companies without encountering material language barriers, risk of withholding tax or most of the costs we associate with cross-border investing. Thus the test relies on examining the extent to which entrepreneurs from the each coast outside start-up funding from VCs outside of their home state or region. If entrepreneurs and VCs match up outside of their home region, this data should support the cost or tax theory. If, on the other hand, in the absence of substantial language or tax barriers, entrepreneurs and VCs continue to stay in the same region, signaling may be the most plausible explanation.

The analysis will be restricted to seed and first round investments, since our interest focuses on funding of start-ups. We will only consider deals with at least one professional venture capital investor, so deals that are funded entirely by angels or companies such as Cisco Systems will be excluded. Further, we ignore rounds less than \$1,000,000 or rounds where the amount invested was not disclosed. The data comes from the TheDeal.com venture capital database¹² for the period from January 1, 2005 to June 30, 2006.

First, consider California start-ups. During the 18 months ended June 30, 2006, 106 California based companies obtained seed or first round funding of at least \$1 m from a round that contained at least one institutional investor. The median number of institutional investors was 2. The largest deal size was \$78 m and the average was \$10.5 m.

The results are unambiguous. The 31 largest deals for California start-ups each contained at least one California-based VC. Altogether, 7 out of the 106 deals were funded from managers outside of California. Of the smaller deals where non-California VCs provided all the capital to California companies, we can see a natural connection. For example, the largest deal that did not include a California VC was the \$9.2 m round in May 2006 for Imagine Communications. The lead investor was Israel-based Carmel Ventures which was joined by the East Coast firm, Columbia Capital. However, this is hardly a case of Imagine wandering off to find VCs in far-flung lands: while Imagine is headquartered in San Diego, it operates its R&D lab in Israel and both of Imagine's founders are Israeli. The second largest California deal funded by non-California VCs was Lala.com. The VC was Ignition Partners, just over the border in Oregon. Mountain View California-based LignUp.com raised \$5.9 m from three Utah based funds and one Japanese; LignUp's founder grew up in Utah, lived in Japan and speaks Japanese. Two out of these seven deals funded from outside California involved VCs from Washington and Oregon and two more involved VCs in states that border California.

If we look at New England and NY Metro Area firms, we find a similar pattern. During the same time period, 50 companies in New England and the NY Metro Area received seed or first round VC funding. Forty-six out of 50 including the 19 largest deals contained at least one VC fund located in the same region. Like the California deals, the median number of investors was 2.¹³

In summary, California entrepreneurs include at least one California-based VC in nearly every start-up round while East Coast firms include at least one East Coast VC in nearly every start-up round. This observation, together with the finding in Section III that European start-ups always contain at least one European VC in every round, fits with the signaling model. Signaling, rather than cross-border tax, language and cultural barriers

¹²See www.robb-cespaper.com for transaction level data including every deal, its industry, sub-industry, location and the number of institutional investors. If I determine that the investor lies in the state, I show the investor's name.

¹³ See www.robb-cespaper.com.

may best explain the tendency for entrepreneurs to attract a portion of their funding from VCs in their home country. If this is indeed the case, integrating Europe's financial market as the European Commission recommends will not change behavior. Local institutions (including foreign outposts of international funds who are currently free to enter European countries as long as they take care to avoid becoming permanent establishments) will fund the local projects and draw on co-investment from foreign firms to the extent that local funds do not have sufficient capital.

VI. Innovation in established firms vs. VC backed start-ups

As stereotypes may overstate the amount of innovation that takes place in VC-backed start-ups, so may stereotypes understate the innovation at established companies. Schumpeter, himself, identified the conditions that enable large, profitable firms to gamble on new ideas: "Innovation is, in this case ['trustified capitalism'], not any more embodied *typically* in new firms, but goes on, within the big units now existing, largely independently of individual persons. It meets with much less friction, as failure in any particular case loses its dangers... taking a long-term view towards investment becomes possible." Scherer (1998) and many others take the opposite view fearing "abominable no-men" that lurk within giant corporations to oppose creativity. Jovanovic (2001) argues that large firms may have had held advantages during the last two-thirds of the 20th century, but times are changing too quickly for bureaucracies to keep up and so we have "entered the era of the young firm."

This is, of course, a long-standing debate with scholars on both sides and beyond the scope of this paper to weigh in comprehensively. But it may be worth briefly examining an industry characterized by radical innovation over the past 25 years: international capital markets. A trader from a generation ago would not recognize a modern dealing room or the products banks and dealers offer their customers. We have seen the growth of derivatives in every flavor with notional principal in excess of \$240 trillion¹⁴. The volume of asset-backed securities now surpasses the corporate bond market. International banks, on the whole, no longer act as repositories of interest rate and credit risk, but as financial intermediaries that shift risk to the capital markets. As a result, during the past 25 years, companies and governments have achieved greater access to capital; mortgage debt to GDP has doubled in both Europe and the United States; we have witnessed institutionalization of commercial real estate, consumer finance and countless other examples that are well-known and not necessary to recount. Along the way, this industry has provided fulfilling jobs for millions.

Who was behind the innovation? Big banks and dealers, rating agencies, law firms, futures and stock exchanges, industry groups such as the International Swaps Dealers Association and the BIS have led the way. With the exception of Bloomberg LP that started up in the early 1980s (and without VC backing) and not counting hedge funds, it is hard to find a significant contributor to financial innovation that fits the traditional definition of an entrepreneurial firm. (Some minor exceptions include a handful of start-

¹⁴ <http://www.isda.org/statistics/pdf/ISDA-Market-Survey-historical-data.pdf>

ups that provide accounting software, pricing models, trading platforms and other bits of technology. eTrade and Softbank remain purveyors of online retail brokerage.)

How can we quantify the innovation that goes on at big companies? A useful definition comes from Schumpeter: “the entrepreneur ‘gets things done’.” Entrepreneurs can “see the new possibility and are able to cope with the resistances and difficulties which action always meets with outside of the ruts of established practice.” (p. 224). Merrill Lynch spent \$12.44 billion in 2005 on compensation and benefits, averaging \$227,000 for each of its 54,600 employees. Assuming that \$50,000 is the wage for “routine work”, Merrill pays \$9.7 billion for “non-routine work” – one would assume that this compensation goes towards solving problems, figuring how to sell securities (i.e., overcoming resistance,), devising new financial products or a profitable new uses for old ones, improving on organizational structure – getting all sorts of things done. Employees try out new ideas within the structure of the firm, reap rewards if they work, and lose income or their jobs if they don’t. Merrill Lynch’s \$9.7 billion of “excess compensation” equals four times the amount that VCs invested globally during 2005 in seed and first-round transactions.

Again, that large firms innovate is hardly an original idea. Phelps (2006) observes, “the heavy research and development expenditure in the sector of established firms is circumstantial evidence that many large firms are oriented towards innovation.” However, it may be worthwhile to speculate that entrepreneurial activity within institutionally backed start-ups is orders of magnitude smaller than the entrepreneurial activity within large firms. This suggests we might learn more about why corporatist Europe lags in terms of innovation by examining the behavior of established companies. The compressed wage scales, job security and close ties between government and industry indicate that a larger share of big European firms’ profits derives from rent seeking rather than from problem solving.

VII. Conclusion

This paper seeks to make a modest contribution to the debate on the presumed innovation deficit in European economies relative to the United States. Among possible causes such as high taxes that discourage effort and risk taking, education, culture, government regulation of business and labor, inadequate bankruptcy laws, and underdeveloped financial institutions for channeling capital to start-up companies, I would argue in favor of striking the last item from the list. Europe’s VC markets are perfectly fine. Through careful structuring, European VCs have set up domestic funds and U.S. investors have figured out efficient ways to invest from overseas. We observe less institutional VC in Europe than the U.S. because European entrepreneurs generate fewer life sciences and information technology projects that fit with the VCs’ investment strategy. Even if European VC were to catch up fully with the U.S., Europe’s economy would not become noticeably more dynamic, since the impact of VC in the U.S. has been exaggerated. Thus, policies to promote institutional European VC, including “full integration of financial markets,” are unlikely to have much of an effect.

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