European Commission

Boosting Open Innovation and Knowledge Transfer

in the European Union

Appendix

Independent Expert Group Report on Open Innovation and Knowledge Transfer

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Link Between Corporate Strategy and Open or Closed Innovation Activities

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The Emergence of Collaborative Funding Models and Platforms

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2014 Directorate-General for Research and Innovation

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APPENDIX 1

Link between corporate strategy and open or closed innovation activities

For Action 1: Background material prepared by Ellen Enkel

Opening up the innovation process in order to allow external knowledge to enrich internal knowledge and capabilities has already been established as a dominant design in Europe. As identified with previous innovation studies, external knowledge or resources help companies with both, increasing their effectiveness and their efficiency in innovation[1]. But we already know that the balance between internal (closed) and external (open) innovation is determined by industry speed, corporate strategy as well as by the existing culture of the company.

Where high industry speed, such as in the information and communication industry or fast moving consumer goods industry, forces companies to enrich their own knowledge base and resources with external ones to gain development speed, slower industries such as energy, textiles or raw material producers collaborate only in selected projects (e.g. when new technologies are required or new customer demands need to be met).

Recent studies show that corporate strategy determines how much open or closed innovation is necessary to create corporate performance impact in terms of radical and incremental innovation[2]. Additionally, we now know which activities companies should undertake in order to best support their strategic decision. Since the Defenders strive either for cost leadership or quality leadership, these firms do not have to open up as much and can still be equally successful. This is true, as companies sometimes lose focus and over-search, or they might rely too heavily on external resources[3]. Just as companies with a market defender strategy should focus mainly on internal resources for their innovation, enriched by frequent customer and supplier integration activities to increase market orientation and optimize their resource management, companies with a prospector strategy should focus heavily on external knowledge and resources in order to gain technology leadership. Prospectors strive for a higher degree of firm openness. Since these companies regularly integrate external knowledge in their innovation processes, they often set new trends and are able to discover a variety of opportunities. These companies should possess a large portfolio of different collaborative activities to identify the next technology change and the best partners to develop products and services based on new technologies. In particular, large corporations with several business units acting under the one or the other corporate strategy, called analyzer companies, should decide on open and closed innovation activities at business unit level instead of at corporate level. As a result, one cannot argue that companies with a higher degree of firm openness are more successful. If companies do not adapt their innovation strategies – including the application of open innovation formats – to their strategic goals and vision, these companies are likely to be less successful in the markets[4].

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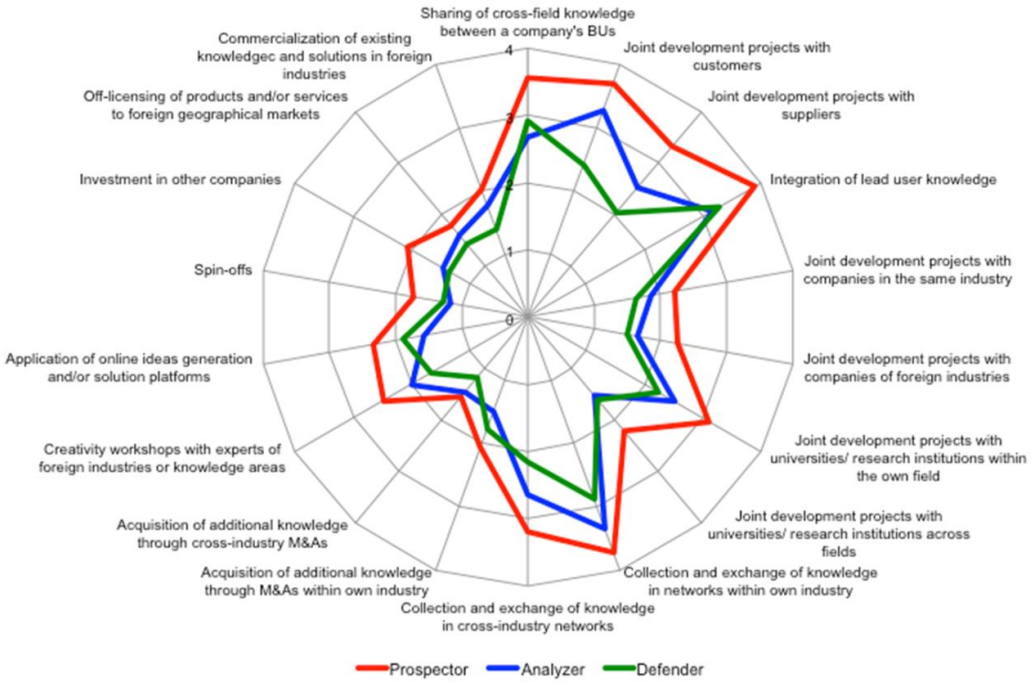
[1] Laursen, K. and Salter, A. (2006): Open for innovation: The role of openness in explaining innovation performance among U.K. manufacturing firms. Strategic Management Journal, 27(2), 131–150.
[2] Bader, K. and Enkel, E. (2014): Understanding a firm's choice for openness: Strategy as determinant. International Journal of Technology Management (forthcoming).
3 Dahlander, L. and Gann, D.M. (2010): How open is innovation? Research Policy, 39(6), 699–709.
[4] Gianiodis, P. T., Ellis, S. C. and Secchi, E. (2010): Advancing a typology of open innovation. International Journal of Innovation Management, 14(4), 531–572; Laursen and Salter, 2006 see above.

Appendix 1 – Figure 1: Different open innovation activities according to the strategic orientation of companies[5]



In order to excel in open innovation, corporate culture plays a significant role. Culture can be supportive or disruptive when adopting an open innovation approach. Yet, there no evidence if strategy follows culture or the other way around. However, opening up the innovation process requires a whole set of new or adapted processes and skills at nearly every level of the company. Therefore, recent research tries to explore what capabilities technology managers need, dependent on technology strategy, to successfully identify, adapt and integrate external knowledge and resources[6]. One other aspect very new to our research agenda is how management and researchers need to communicate innovation in order to create awareness of being an innovative partner for other companies. Appropriate communication of innovativeness has an impact on consumers, potential and existing partners as well as on financial analysts[7].

[5] Based on an online survey with 424 companies in 2010–2012 in Bader, K. and Enkel, E. (2014): Understanding a firm's choice for openness: Strategy as determinant. International Journal of Technology Management (forthcoming).
[6] Enkel, E. and Heil, S. (2014): Preparing for distant collaboration: Antecedents to potential absorptive capacity in cross-industry innovation. Technovation (forthcoming).
[7] Trautmann, K. and Enkel, E. (2013): Success factors of strategic communication of corporate innovativeness towards financial analysts. International Journal of Innovation Management (forthcoming).

APPENDIX 2

The "New" Venture Capital Cycle and the Role of Governments: The Emergence of Collaborative Funding Models and Platforms

For Action 4: Background document prepared by J. Dittmer, J.A. McCahery and E.P.M. Vermeulen[8]

1. Introduction

What should governments and policymakers do to create an ecosystem in which small and medium-sized enterprises (SMEs) can thrive? There is long-standing evidence on how governments can encourage entrepreneurship and the launch of start-up companies. Governments may influence the development of SMEs by providing financial support and promoting external funding of SMEs. More recently, however, researchers have argued that governments can only play a very limited role in the emergence and development of high growth and innovative companies (Lerner, 2009). What this research shows is that government initiatives are usually characterized by poor design and a lack of understanding of 'entrepreneurial ecosystems' (Hwang and Horowitt, 2012), resulting in bureaucratic, cumbersome and inefficient practices.

There is also a related, but largely unexplored, idea in the literature, that addresses why disruptive innovations and technologies require government support (Mazzucato, 2013). In fact, it could be argued that with the financial crisis and the subsequent economic downturn having taken its toll, there is a crucial role for governments in funding and facilitating innovation and entrepreneurship. We observe that governments, aware of new opportunities that the financial crisis offers, have sought to reduce entry barriers for start-up firms. Two distinct approaches aimed at stimulating entrepreneurship are relevant to this discussion. First, governments have modernized and simplified corporate law statutes in order to offer business forms in which small and medium-sized enterprises (SMEs) can be simply started and nurtured into bigger ones (Reyes and Vermeulen, 2013). Second, programs have been launched under which smaller businesses are provided with certain registration exemptions and tax benefits. Consider the Auto-Entrepreneur program in France, which reduces red tape for smaller firms in the areas of business registration and social security and tax payments. Evidently (and despite being prone to misuse), the French initiative had a positive impact on the total number of French start-up companies (Perman, 2009). In 2013, it was assumed that approximately half of all the new businesses in France were set up under the Auto-Entrepreneur regime. At the end of 2012 the count was about 870,000 businesses (Carnegy, 2013). One may suspect that while most of these companies disappear or remain micro-businesses, some of them may actually become market leaders.

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In the aftermath of the financial crisis, policymakers, measures have been unveiled to relax rules and regulations governing initial public offerings (IPOs), and the organization of listed high growth companies. This is reflected by the signing of the Jumpstart Our Business Start-ups Act (JOBS Act) in the United States on 5 April 2012. The Act introduced, among other things, the 'Emerging Growth Company' (EGC) status.[9] Companies that are able to avail themselves of the EGC-status are offered a transition period – or 'on-ramp' period – during which they are exempted from a number of regulatory requirements associated with going public. We see similar initiatives in other parts of the world. In Europe, for instance, NYSE Euronext has introduced ENTERNEXT, the new pan-European Entrepreneurial Exchange with lighter rules and regulations tailored to the needs of small and medium-sized enterprises (SMEs), particularly high growth companies. According to UK policymakers, relaxation of listing rules can more effectively induce emerging growth companies to overcome their reluctance to enter the bureaucratic and overregulated world of listed companies.

Besides deregulatory initiatives and fiscal incentives, governments have provided direct funding to entrepreneurial and innovative companies. In this context, government funding is considered to be the main driver behind both 'sustaining and disruptive innovations' (Mazzucato, 2013), particularly in the areas of biotechnology and clean technology. The reason for this is simple: governments have generally been more inclined than private actors to make highly risky and long-term investments in early stage proof of concept and early stage projects. Recently, governments have also introduced incubator and accelerator programs (Economist, 2012). Start-Up Chile is an example of an incubator. This government initiative is successful in luring foreign entrepreneurs to Chile by offering them a relatively small amount of cash of USD 40,000, a temporary working visa and local support (Van Edwards, 2013). During the application round in 2013, the program selected 100 start-up companies (from 28 different countries) out of more than 1,570 applications.[10]

While most empirical work has focused on the creation of new high growth start-ups and the funding of early stage projects, the real challenge is tapping the growth potential of the most promising start-ups (Pierrakis and Westlake, 2009). Private investments, in the form of venture capital, are usually needed to bring innovative ideas to the market and support the further growth and development of high growth companies (Gompers and Lerner, 2001). In other words, venture capital is needed to get the start-up companies through the 'valley of death' (which can be defined as the period between the initial capital contribution and the time the company starts generating a steady stream of revenue). Unfortunately, however, the economic downturn had (and still has) a severe impact on the venture capital industry. Yet, despite its focus on the creation of new business start-ups, venture capital has become another important policy focus that has recently gained momentum due to it becoming a less accessible source of capital (creating funding and investment gaps in the ecosystem). For example, governments, in their efforts to establish a sustainable venture capital ecosystem – and largely because institutional investors, such as banks, insurance companies and pension funds, remain skeptical about the industry – have become the main post-financial crisis investors in Europe. Data from the European Venture Capital Association show that 39.1% of the €4.1 billion that was raised by European venture capitalists in 2011 came from government agencies. In 2007, this figure was 9.9% (of €8.2 billion). Investments by the European Investment Bank, the European Investment Fund and other European Commission resources account for approximately 23% of the total capital raised in 2011.

[9] Jumpstart Our Business Start-ups Act, H.R. 3606.
[10] In comparison, the program provided "start-up" capital to 87 companies from more than 30 countries to Chile in 2011 (after having received 330 applications). See www.start-upchile.org.

Note, however, that governments cannot substitute for the lack of institutional investors' commitments. Several reasons have been proposed to explain why governments are prevented from funding a greater share of the private sector's investments. First, government-backed venture capital funds are still relatively small in number and often have a regional focus. This regional focus does not seem to change if a fund's capital is committed by European government agencies. In this respect, it is interesting to see that in 2011 more than 50% of the 42 funds that attracted investments from EU resources, such as the European Investment Fund, had a domestic focus. Second, government funds tend to underperform if non-financial objectives, such as contributing to structural/regional/sectorial development policies, prevail (Kelly, 2011). We can extend the previous hypothesis by considering what can be done to create a robust venture capital ecosystem in which venture capital is more accessible for emerging growth companies? Is there a role for governments in the venture capital finance of these companies? As noted above, empirical research suggests that a mix of government and private investors is crucial to the realization of a sustainable venture capital ecosystem in which funds are available and accessible in terms of speed, clarity, transparency and connectivity to other stakeholders in the industry (Brander, Du and Hellmann, 2010). These findings suggest a related question: What can governments and policymakers do to unleash private sector investments?

In this context, it should be noted that an array of policy and regulatory measures has been introduced over the last two decades in an effort to replicate the success of the world's most successful venture capital ecosystem, Silicon Valley. We are all aware of the success stories of entrepreneurs that started their businesses – and developed their innovative ideas – in garages and basements and built them into global market leaders. The Silicon Valley model, however, is not easily replicated (Hwang and Horowitt, 2012). Indeed, an account that focuses on the measures that were introduced by governments around the world does not examine how the specific characteristics of Silicon Valley – the interactions among both public and private capital providers – can help turn innovative ideas into vibrant companies. For instance, policy initiatives that only focus on early stage venture capitalists could crowd out the supply of risk capital in the later stages of a start-up company's development. Consider the case studies and empirical research that show that tax incentives encourage individual investors to pour money into special venture capital vehicles reduce the supply of other, relatively more informed venture capital investments (Cumming and MacIntosh, 2006). This phenomenon is particularly strong if not all players in the ecosystem are likely to benefit from the regulation (or are exempted from strict regulations).

This paper argues that the funding or investment gaps in the venture capital cycle are likely to be filled partially by alternative investment options and new types of investors, such as super-angels (or micro-venture capital funds) and 'crowdfunding' platforms (if used by traditional angel investors and venture capital funds). To support this position, we look at trading platforms and discuss how they can bridge the liquidity gap in the venture capital cycle and reduce the fragmentation of the venture capital industry. Indeed, profound changes in the venture capital ecosystem, particularly the increase in the time that elapses between the inception of the start-up company, its first equity investment and the eventual exit, have arguably led to a liquidity gap in the cycle.

In the context of the gaps in the venture capital cycle, the paper also shows the extent to which corporate venture capital increasingly has the potential to significantly contribute to the growth of small and medium-sized companies and also create more liquidity in the cycle. The paper proposes that the new collaborative venture capital models may provide an effective basis for funding innovative firms. One of the features of these new models is that corporations have increasingly become anchor

investors in early stage venture capital funds that invest in both related and apparently unrelated industries.

The final claim advanced is that government involvement in the venture capital cycle can provide important support for start-up companies. We show that the experience with successful government-sponsored funds, such as the German High Tech Gründerfonds, confirms that the network creating capabilities of these initiatives has the anticipated productivity effects for large corporations, venture capitalists as well as the entrepreneurs.

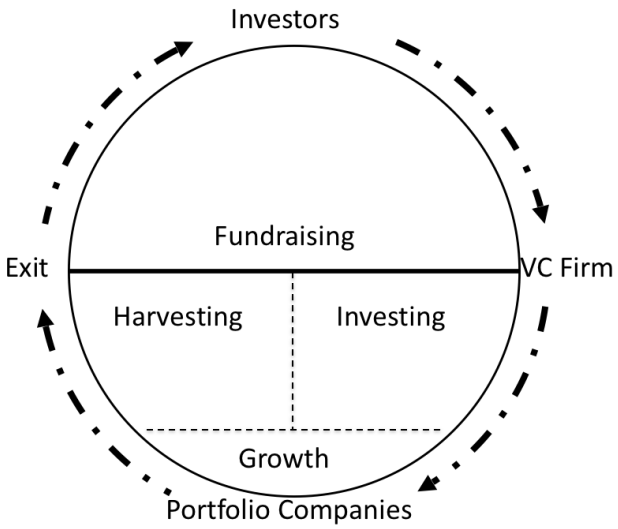
This paper proceeds as follows. Section 2 describes and analyzes the traditional venture capital cycle. More importantly, it gives an overview of the funding, investment and liquidity gaps in this cycle (an understanding of the gaps is necessary for governments and policymakers to come up with well-considered and targeted measures). Section 3 discusses the recent trends and developments in the venture capital industry, which arguably create a 'new' venture capital cycle. As we will show, some of the developments (that were recently introduced in practice) have proven to be an effective first step in bridging the gaps in this cycle. The goal of our analysis is to show that government measures should accommodate and not interfere with these developments. Section 4 concludes.

2. The Venture Capital Cycle and its Challenges

2.1 The Traditional Venture Capital Cycle

What makes an ecosystem for venture capital spur innovation and rapid growth? Economists have asked this question for more than five decades. Policymakers have emphasized that policy and regulatory interventions should be aimed at creating a virtuous 'venture capital cycle' (Gompers and Lerner, 2000) (see Figure 1). For this reason, they focus on (1) boosting venture capital fundraising (particularly from institutional investors), (2) making government venture capital available to invest in promising, mostly early-stage companies, and (3) encouraging access to capital markets/stock exchanges in order to support the continued growth of these companies, while at the same time improving liquidity and exit opportunities that enable venture capital funds to return capital to their investors.

Appendix 2 - Figure 1: The Venture Capital Cycle

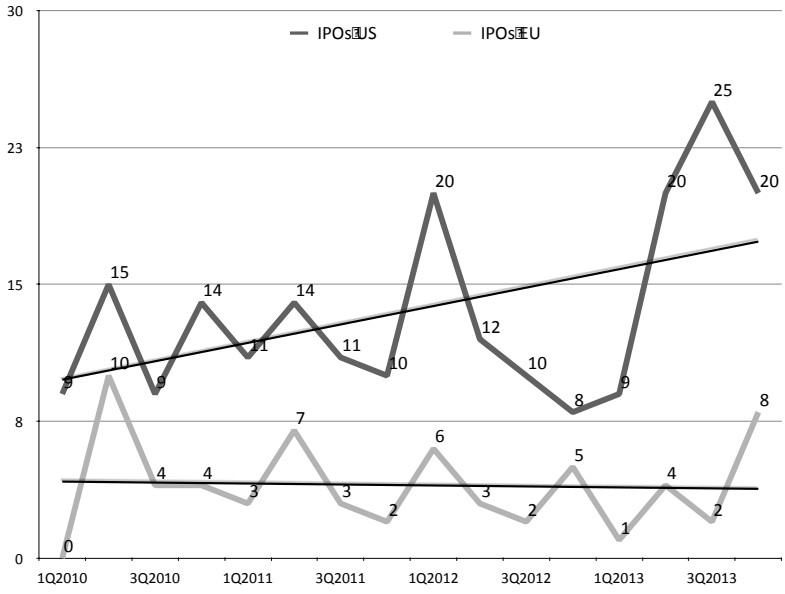


Starting with the European Union, a number of lawmakers have proposed reforms that promote the development of a venture capital market. Consider the Regulation on European Venture Capital Funds that seeks to make it possible for venture capital fund managers to obtain a European passport if their assets under management do not exceed EUR 500 million. More specifically, this passport would be available to venture capital funds that (1) invest at least 70% of their committed capital as equity or quasi-equity in non-listed SMEs, and (2) are unleveraged in the sense that they do not invest more capital than that committed by their investors. In order to be able to use the 'European Venture Capital Fund' label and obtain the EU passport for marketing venture capital fund investments across the European Union, managers must inform the competent authorities of their home member state. After the registration has been granted, the manager may start marketing its funds' interests to professional investors in other member states. The passport system would in turn help defragment the venture capital market in Europe (particularly in the area of fundraising), thereby resulting in more, bigger and cross-border oriented venture capital funds. This implies that if 'European Venture Capital Funds' were big enough to meet a start-up's capital needs in all (both early and later) stages of its development, more promising start-up

companies would be able to receive financing. Moreover, a passport regime would arguably lead to an increase in the number of venture capital funds, making it easier for these funds to engage in risk-sharing through the well-developed practice of syndicating with other risk capital investors.

To sustain the venture capital cycle, the European Commission, in its draft revision to the Markets in Financial Instruments Directive (MiFID II), also offers stock exchanges the possibility to apply for a specialized SME Growth Market label. The reason is that the Commission hopes to strengthen the IPO market in Europe, but also to encourage later stage investments in high growth companies by investors who have a low risk-appetite and seek transactions on a listed and regulated market. The recent decline in the IPO activity has again pointed to the key role of robust securities markets and deregulatory measures in the development of a venture capital market Figures 2 and 3 depict why the sluggish IPO market is particularly worrisome in Europe. When we compare the ranking of the world's largest companies in the Financial Times Global 500 2012 (excluding companies that operate in the oil and gas industry and financial industry), it can be observed that the relatively 'young' companies (that were established after 1950, such as Google, Apple and Amazon) were founded and are listed in the United States or China.

Appendix 2 - Figure 2: IPOs in Europe and the United States

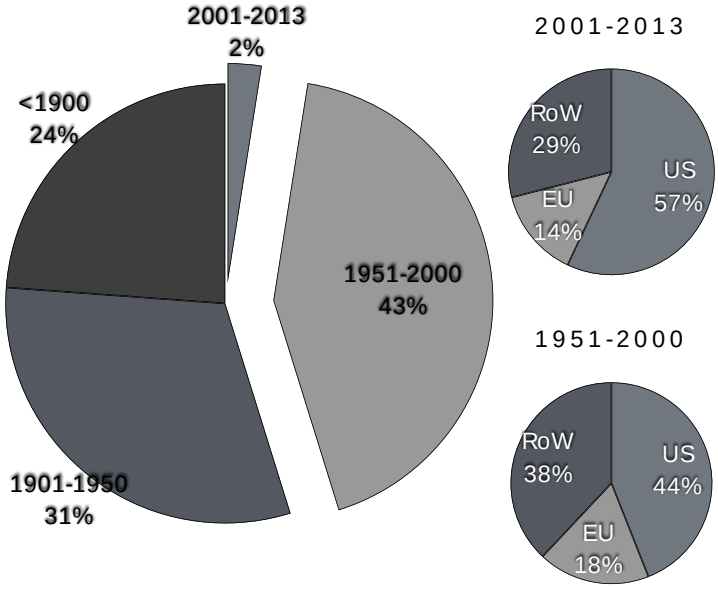


Source: Dow Jones VentureSource

Overall, the rationale behind the regulatory initiatives is simple: stimulating a rapid and smooth process of fundraising, investing and exiting is crucial to develop a sustainable and robust venture capital industry. So, what can we expect from the 'post-financial crisis' legal and regulatory interventions? Unsurprisingly, we do not foresee a quick turnaround in the venture capital industry or return to pre-crisis levels of funding (solely on the merit of the regulatory interventions). The measures run into three problems. First, they overemphasize the importance of the traditional 'venture capital cycle' (Martin, 2013). This cycle served as a good description of the venture capital ecosystem as it existed in Silicon Valley in the late 1980s and 1990s. For example, during this period there was an almost perfect balance between the supply

and demand of venture capital. Venture capital fund investments were typically made across a wide range of investment stages, from seed/start-up to early-stage, expansion and finally later stage investments.

Appendix 2 - Figure 3: The Location of the FT Global 500 Companies



Source: Data derived from www.ft.com

A second, and related, problem is that policymakers and governments put too much emphasis on the ingredients (institutional investors, venture capitalists, entrepreneurs and exit venues) that make the 'venture capital cycle' work effectively. As a result, they largely ignore the collaborative culture, the people and interactive networks that tend to make the cycle self-propelling (Hwang 2012, 2013).

The third, and perhaps most important, problem is that policymakers often assume that the venture capital industry can stand the test of time and location (McCahery and Vermeulen, 2014). Policy measures for venture capital should focus on incentives that are appropriate for the venture capital industry that is currently evolving outside of Silicon Valley. In other words, governmental measures that are appropriate for one location may not be necessarily good for another. An understanding of the specific characteristics and recent trends in the industry is extremely important and can help avoid miscalculations and unrealistic optimism (Vermeulen and Nunes, 2012).

To illustrate, consider some recent developments such as institutional investors taking a more active approach towards fund managers, hedge funds become more active in making investments in high tech start-ups, the revival of corporate venture capital, the move of venture capital investments to later stage start-up companies and the emergence and development of micro-venture capital funds/super-angels, the increasing role of family offices and the introduction of crowdfunding platforms. These developments appear to reduce the importance and the 'recovery' impact of the proposed regulatory initiatives on the workings of the 'venture capital cycle'. Accordingly, the popular judgment that the 'venture capital cycle' is broken has not been satisfactorily explained. The next Section, however, shows that the cycle is not broken, but suggests it is evolving and public policy should evolve along with it. Most

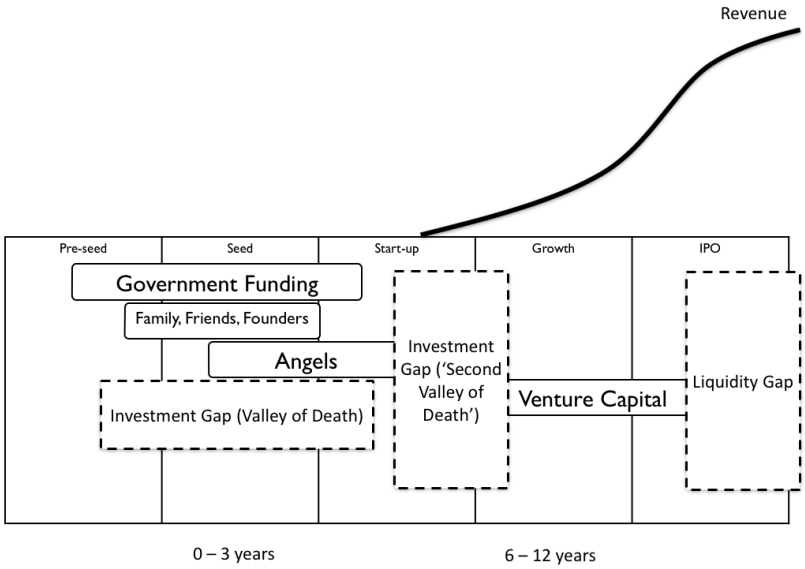
important, a clear understanding of the evolution of the industry not only holds important lessons for policymakers and regulators, but also for investors, venture capitalists, entrepreneurs and their advisors.

2.2 The Gaps in the Venture Capital Cycle

2.2.1 The Funding Gap

An analysis of venture capital over the last decade highlights how the industry has generally failed to live up to the expectations of entrepreneurs, investors and policymakers, given its risk profile. For instance, most traditionally structured venture capital firms have, with a few notable exceptions, delivered uninspiring returns (Mulcahy, 2013). This has not only led to a significant decrease in the number of venture capital funds, but has led many funds toward the less risky financing of later and growth stage companies. As expectations declined, it stimulated remaining funds to focus on companies founded by 'serial entrepreneurs' with considerable track records. It is encouraging to see how this trend has not only resulted in a significant increase in the returns to investors in venture capital funds since 2012, but also created a 'funding gap' (or investment gap) in the development of early to mid-stage companies (see Figure 4).

Appendix 2 - Figure 4: The Gaps in the Venture Capital Cycle



However, whilst we see more conservative investments in the form of expansion and later stage venture capital rounds, we hypothesize that new categories of investors, such as crowdfunding platforms, super-angels and multinational corporations have stepped up to fill the 'funding'/investment gap in the earlier stages of the corporate life cycle (EVCA 2013). Consider crowdfunding. Accessibility and speed are the key drivers behind the emergence and development of crowdfunding platforms. Crowdfunding has evolved from a way to finance creative projects, such as books, films and games, into a new type of entrepreneurial finance which has the potential to dramatically change the venture capital ecosystem. It makes it possible for early-stage start-up companies to raise 'venture capital' from a large group of individuals, sidestepping the traditional fundraising process that includes lengthy due diligence periods and tough negotiations

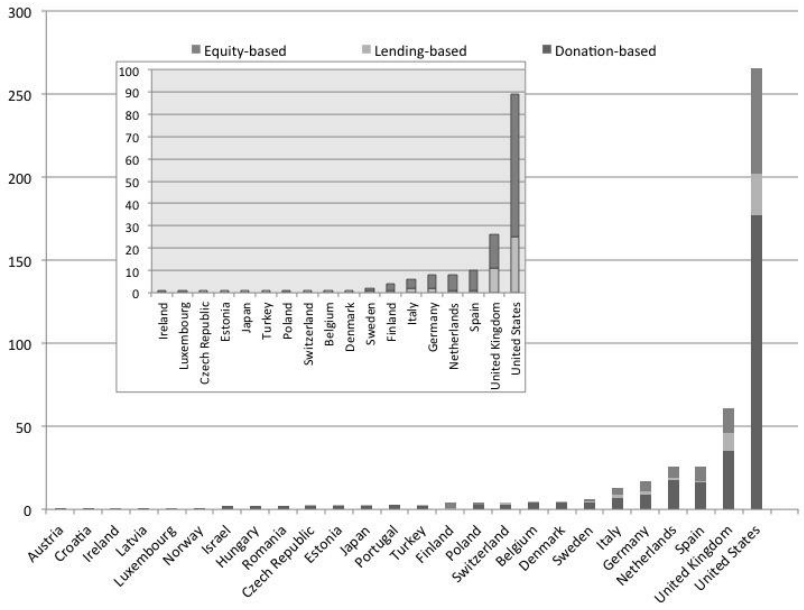
over the pre-money valuation and contractual terms. Clearly, the 'crowd' investors, who invest relatively small amounts through internet-based platforms – the crowdfunding websites – and/or through social networks – such as Facebook, Twitter and LinkedIn, needless contractual protection (the small investment amounts do not justify close involvement in the growth process of the start-up companies).

We can roughly distinguish between four categories of crowdfunding platforms: (i) donation-based crowdfunding; (2) reward-based crowdfunding; (3) lending-based crowdfunding; and (4) equity-based crowdfunding. If investors follow the donation-based crowdfunding model, they generally contribute to a charitable, creative or social project without the expectation of being compensated. This stands in contrast to the reward-based model where the 'crowd' that decides to donate receives a reward, such as a finished product, perks or recognition in the credits of a movie, in return. Given the apparent benefits, start-up companies and entrepreneurs typically use lending-based crowdfunding and equity-based crowdfunding to attract investments from the general public. Lending-based crowdfunding and equity-based crowdfunding are jointly called 'investment crowdfunding'. If the companies grow and prosper, the investors usually receive a financial return. For example, in the lending-based model, they will receive their investment back including interest (the rate of which is dependent on the risk level). Investors that contribute cash through equity-based crowdfunding platforms indirectly or directly become beneficial owners or shareholders of the start-up company. Equity-based crowdfunding increasingly attracts attention from start-up companies, investors and the media. Evidence from data collected by crowdsourcing.org show that approximately 26% of the crowdfunding platforms have adopted the equity-based model (see Figure 5).

Despite its popularity and growth, equity crowdfunding poses several challenges. First, it requires some experience in making a pitch to smaller investors (Lewis, 2013). And, moreover, there are usually no one-to-one conversations with interested investors. All the relevant information should be made available upfront, which in turn could easily lead to confidentiality and transparency issues. Second, unlike business angels and venture capitalists, crowdfunding investors typically do not intensively monitor and support the business in the post-investment era. Current research suggests that, in order for the start-up to succeed, risk investors must be willing to provide the entrepreneur with 'value-added' services. These services include identifying and evaluating business opportunities, including management, entry or growth strategies, negotiating further investments, tracking the portfolio firm and coaching the firm participants, providing technical and management assistance, and attracting additional capital. When assessing the potential of crowdfunding, the absence of real value added services could become significant and may have the potential to retard growth.

The third challenge is that crowdfunding may lack connectivity to follow on investors, key stakeholders and other advisors. High potential growth companies, particularly in highly capital-intensive sectors (such as biotechnology and medical), must be able to attract follow on funding from later stage investors. The connectedness between early stage investors and the venture capital community provides companies with improved access to external financing. Clearly, crowdfunding investors that typically follow a 'spray and pray' strategy when it comes to making investment decisions have less resources and/or incentives to assist portfolio companies in securing the next stage of finance. Such a disincentive is likely exacerbated by the fact the companies that pitch for crowdfunding investors may end up with a multitude of investors. As such, these circumstances not only enhance the free-rider problem amongst investors, but also add an additional 'negotiation challenge' to potential follow-on investor, as it is easier to negotiate the funding with only a few investors (Kolodny, 2013).

Appendix 2 - Figure 5: The Evolution of Crowdfunding Platforms

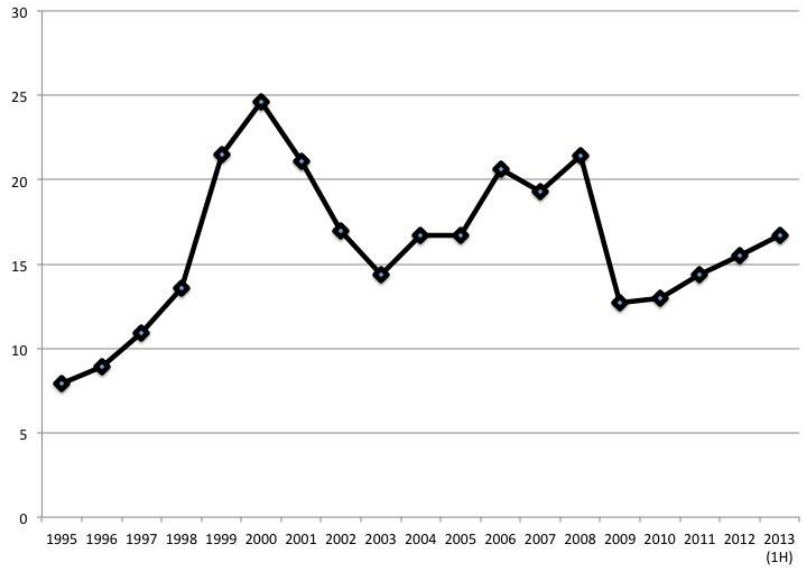


Source: Derived from www.crowdsourcing.org

If one adds to these challenges to the legislative and regulatory issues that surround crowdfunding, the jury is still out whether this source of capital will have a significant impact on the new venture capital industry in the near future.[11] In this respect, more is expected from the corporate venture capital initiatives. Many mature corporations have established dedicated corporate venture capital arms or structures, seeking competitively advantageous innovations, whilst capitalizing on their own ability to provide a broad range of strategic benefits from industry partnerships, distribution opportunities and product development insights. Yet, these corporations also experience challenges with tenure (and can exist at the whim of prevailing executive sentiment), access to appropriate deal flow, and a perception that their focus on 'strategic' benefits is not completely in line with the entrepreneur's own aspirations for financial returns. In theory, corporations are a sustainable source of venture capital. The question is whether this is a reasonable way to read the evidence on the deal capacity of corporate venture capital.

[11] We can already observe several regulatory initiatives that should give a boost to equity crowdfunding. An example of a self-regulatory initiative can be found in the United Kingdom where a self-regulatory body has been established under the UK Crowdfunding Association (UKCFA). These initiatives have also appeared at the European level. Consider the European Crowdfunding Network (ECN). The goal of the self-regulatory bodies is clear: To provide transparency and ensure that members operate to minimum standards without sacrificing the accessibility and speed that made crowdfunding a success. The question, however, remains whether the venture capital ecosystem can fully rely on self-regulation? Presumptively, the payoff for ensuring the compliance with and wide diffusion of self-regulatory standards is significant. It should therefore come as no surprise that other regulators, such as the Italian market regulator, have recently taken the first regulatory steps regarding on-line fundraising platforms. The main purpose of the regulatory approach is to provide a measure of legal certainty for market participants. In Italy, this is accomplished through a simple registration procedure for crowdfunding venues, designed to distinguish them from other market participants such as Regulated Markets or Multilateral Trading Facilities, both of which are subject to more stringent rules under MiFID. In addition, the new Italian rules set out a code of conduct. In view of the examples discussed above, the challenge is to find the right mix of self-regulatory and government measures that encourage transparency and investor protection.

Appendix 2 - Figure 6: Corporate Involvement in Venture Capital Deals



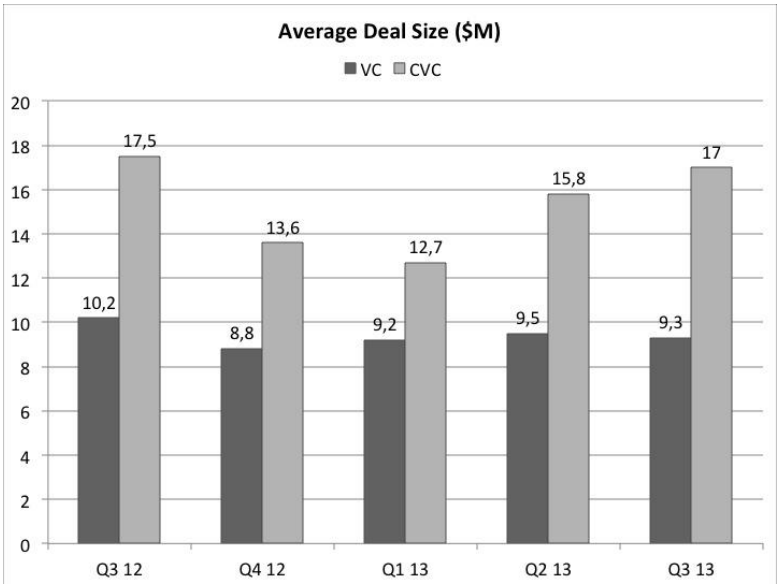
Source: PricewaterhouseCoopers/National Venture Capital Association MoneyTree™ Report, Data: Thomson Reuters

The move toward greater corporate involvement seems to provide part of the answer (Figure 6). To be sure, conflicting aims shape corporate venture capital. Historically, corporate venturing units have been reliant on the ongoing sponsorship of their corporate owners and can be abandoned without due cause, for reasons entirely disconnected with the operations of the units themselves. This arguably makes corporate venture capital volatile. In these circumstances, it should come as no surprise that the corporate venture capital share of the total venture capital investments declined from 24.6 per cent to 14.4% per cent immediately after the Internet Bubble burst in 2000 and again from 21.4 per cent to 12.7 per cent after the recent financial crisis in 2007-2008. Still corporate venture capital persisted after the crisis and many units have become profitable (see Figure 6).

These developments have reopened the debate about corporate venture capital. There are many explanations for the 'revival' of corporate venture capital initiatives. For instance, setting up corporate venture capital units provides the corporations with a window to the fast-moving and innovative start-up market. Some argue that they need this window in order to find the 'next big thing' in other companies/markets. To varying degrees, listed technology companies with strong balance sheets and cash positions are particularly active venture capital investors. Thus it should come as no surprise that the average deal size with corporate venture capital involvement is significantly larger than deals without corporate funding (see Figure 7) (Economist, 2010). This suggests a second possible volatility problem with corporate venture capital. Cash-rich and tech-savvy corporations appear to care less about value for money than the possibility to acquire the 'next big thing', possibly creating a new bubble in the venture capital industry. A third problem is that the most active corporate venture capital units are often affiliated to relatively young listed companies (such as Google, Intel, Cisco, Comcast, SAP and Qualcomm). Timely action is important to boost the revival of the venture capital-backed IPO market. Strengthening the IPO market would also be an effective way to address the second gap in the venture capital cycle: The liquidity gap. The argument starts by noting that

more 'young' venture capital-backed companies will increase the level and quality of corporate venture capital initiatives (because these companies are more accepted by the venture capital industry) (Lacy, 2013).

Appendix 2 - Figure 7: Average Deal Size With and Without Corporate Investors

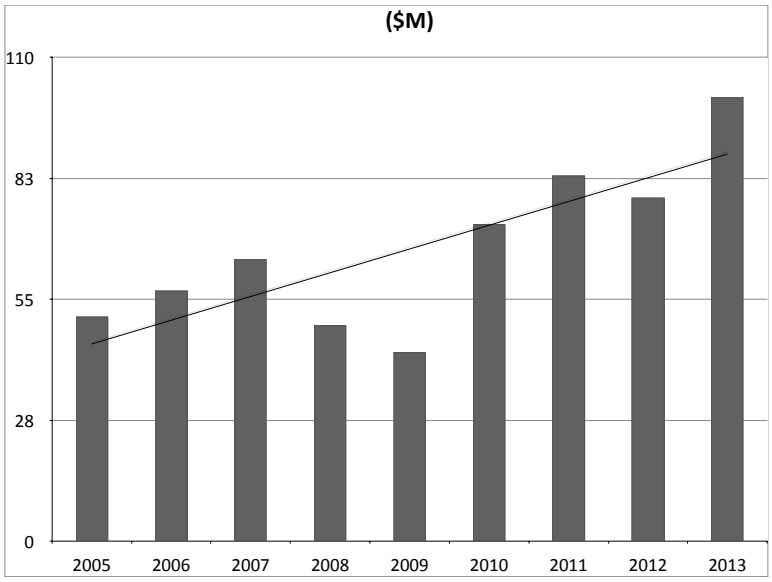


Source: Data derived from CBInsights

2.2.2 The Liquidity Gap

The results of empirical research indicate that the dream of a successful IPO is still one of the most important drivers for high-tech entrepreneurs to start their own companies. That said, the question is whether there will be a revival in IPO activity particularly after the measures to relax the rules and regulations governing listings have been implemented? The evidence is mixed. Recent studies have shown the increase of the number of venture capital-backed IPOs in the United States in 2013. It is argued that the possibility of a firm to qualify as an 'emerging growth company' (EGC) under the JOBS-Act could be viewed as a stimulus for the revival of financial markets. The EGC label offers several benefits to high growth companies in the pre- and post-IPO period. In the pre-IPO period, an EGC will only be required to include two years – instead of the usually required three years – of audited statements in its IPO registration. More importantly, the special status introduces 'testing-the-waters' provisions, which allow EGCs to communicate with professional investors (qualified institutional buyers or institutional accredited investors) to determine investors' interest in the company prior to or following the date of the IPO registration statement. Moreover, the JOBS Act provides these companies with the possibility to confidentially submit a draft of its IPO registration statement for review to the SEC.

Appendix 2 - Figure 8: Median Amount Raised Prior to IPO in the United States



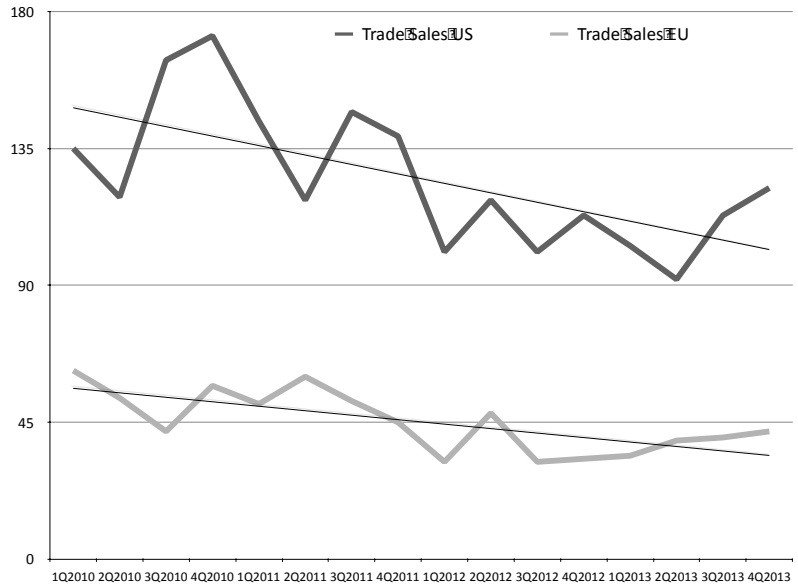
Source: Dow Jones VentureSource

Also, the 'on-ramp' provisions grant important reliefs in the post-IPO period. For example, EGCs are exempted from the obligations under SOX Section 404(b) to provide an auditor attestation of internal control. Furthermore, the Act excludes EGCs from (1) complying with the full range of executive compensation disclosures and (2) say-on-pay votes on executive compensation arrangements. Finally, EGCs need not comply with any new or revised accounting standards until the date on which private companies are required to apply these standards to their organization. To see the success of the JOBS Act, consider the significant increase in the number of EGCs that have pursued a listing after having used the option to confidentially file their registration statements. According to data provider Renaissance Capital, approximately two-thirds of the 131 IPO companies (including non-venture capital backed companies) in 2013 have availed themselves of the JOBS Act's confidential filing provision. Twitter is a recent example of an EGC that listed its shares on the New York Stock Exchange on 7 November 2013. Apparently, companies such as Twitter value having more control over the timing of the IPO, which is arguably provided by a confidential filing, higher than the likely discount in the stock price due to the reduced disclosure and reporting requirements for EGCs.

Still, what is remarkable is that even if venture capitalists and high tech entrepreneurs decide to float the company's shares on a stock exchange, the IPO is completed with a relatively low median free float (which was 23% in the United States and 27% in Europe for IPOs that were conducted in 2011 and the first half of 2012) (Salmon, 2012), indicating that they only gradually give up their 'private company' status. This result is due to the typically high insider participation at an IPO combined with onerous lock-up provisions which prevent venture capitalists to sell their stock immediately. As a consequence, the effective free float is even smaller. More generally, the pace with which newly listed companies are giving up their 'private company' status depends on the hype surrounding the IPO. Besides, most stock exchanges don't offer the liquidity for venture capitalists to actually exit their shareholding leaving them stuck with the disadvantage of a publicly quoted company. As noted above, the decreasing number of venture capital funds and their propensity to move to later stages of funding has only

further contributed to the emergence of this trend. This is reflected in Figure 8 which shows that the median equity raised prior to the IPO increases (indicating that IPOs are conducted by older companies).

Appendix 2 - Figure 9: Trade Sale Exits in Europe and the United States

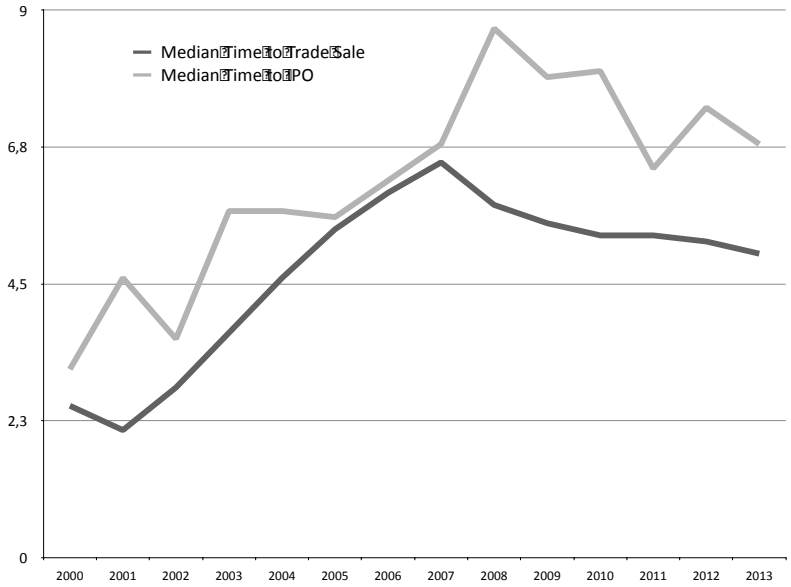


Source: DowJones VentureSource

Prior work reveals that venture capitalists do not always perceive IPOs as being in the best interest of their portfolio companies. Indeed, venture capitalists increasingly induce entrepreneurs to sell their companies to a strategic investor (Broughman and Fried, 2013). The dominant role of mature corporations in the venture capital industry has undoubtedly contributed to trade sales (although declining) having become the most important and often even preferable exit route for entrepreneurs and investors (see Figure 9). Yet, the new 'liquidity model' also seems to work for entrepreneurs and key employees, who are usually able to co-sell their shares in lucrative and strategically valued trade sales to the wealthy corporate acquirers.

We have witnessed a remarkable revival in the venture capitaI-backed IPO market in 2013 (see Figure 2). Nevertheless scholars seem to emphasize that the going public decision is unlikely to recover its traditional allure. It is important to note that 64 per cent of the IPOs are conducted by companies that operate in the life sciences sector. Moreover, it has been argued that the sudden paucity of venture capital-backed IPOs ushered in a new era of venture capital financing. In this altered world, trade sales are the most important and even preferable exit vehicles for venture capitalists. However, even though venture capitalists have been able to design new preferable exit strategies, the decline in exit options leads to liquidity gaps in the traditional venture capital model.

Appendix 2 - Figure 10: Time to Exit (Trade Sales versus IPOs in the United States)



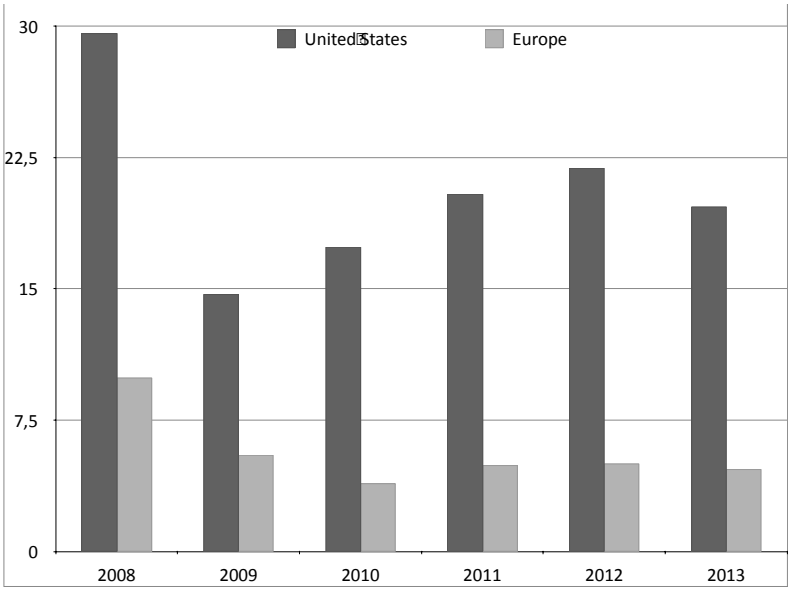
Source: DowJones VentureSource

This gap is mainly linked to the time that elapses between the first involvement of risk capital providers and their ultimate exit. A growing body of literature reveals that this gap may discourage early stage investors from making the necessary investments in start-ups. More importantly, the 'liquidity gap' negatively affects the supply of entrepreneurs' and start-up companies' ability to attract and retain talented employees (who often have accepted a lower salary and additional payments in restricted shares and options) (Economist, 2013). Although, it could be argued that by focusing on a trade sale exit, portfolio companies will be ready for an exit scenario earlier than in the event of an IPO, which currently takes close to seven years in the United States (McCahery and Vermeulen, 2013) (see Figure 10). However, in order to ensure a steady flow of top talent and capital support, new liquidity options would seem to be required. In the next Section, we discuss possible solutions and the role of governments in developing and growing a venture capital ecosystem in more detail.

3. The New Venture Capital Cycle

We have seen that there are multiple gaps in the venture capital ecosystem and it is unlikely that they can be easily bridged. This development is confirmed by the evidence that the financial crisis has led to profound changes in the fundraising landscape. According to data provider Preqin, we observe a significant drop in fundraising on a global scale with 133 funds raising an aggregate amount of $32.3bn (and holding a final close) in 2011, down from $63.6bn across 259 funds holding a final close in 2007. At the same time, raising the desired fund size has taken considerably longer for venture capital funds that closed in 2011. In 2007, the average time to the final closing of a fund was approximately 12 months. In 2011 it took approximately 18.5 months to reach a final closing.

Appendix 2 - Figure 11: Fundraising in Europe and the United States



Source: DowJones VentureSource

The dramatic transformation in post-financial crisis fundraising levels is linked to institutional investors reorientation away from venture capital funds. For instance, the most dramatic reductions were seen in the venture capital allocations of banks and pension funds. Figure 11 depicts that the post-financial crisis fundraising is particularly challenging for venture capital funds in Europe.

The discussion above indicates there are several reasons for the change of direction in venture capital fundraising. First, since the burst of the dot-com bubble in 2000-01 to 2012, more venture capital has been invested in start-up companies than returned to the investors in venture capital funds, making it a relatively unattractive asset class for institutional investors (Mulcahy, Weeks and Bradley (2012). Naturally, there are funds that significantly outperform the public market, creating high-profile growth and exit opportunities in very successful start-up companies. However, selecting the best-performing funds (with proven expertise and successful track records) is often a challenging task for investors. This brings us to the second reason that explains why institutional investors have become reluctant to invest in venture capital funds. Institutional investors, in particular banks and pension funds, are sometimes

prohibited to make risky investments as a result of increased regulation coming into effect in the wake of the financial crisis. One could argue that the over-regulated and fragmented environment explains why venture capital fundraising is at a historical low in Europe. In this respect, the prospects are not very encouraging. Investors' anticipation of several 'forthcoming' regulations, such as Basel III and Solvency II, which contain restrictions on the ability of banks and insurance companies to make investments in the risky venture capital business, already have a hampering effect on the industry's development.

Appendix 2 - Table 1: Most Active Venture Capital Firm (2008-2012)

Venture Capital Firm	Type of Firm	No. of Investments	Aggregate Deal Value (USD mn)
New Enterprise Associates	VC	392	8,481.67
Sequoia Capital	VC	384	5,670.21
Kleiner Perkins Caufeld & Beyers	VC	382	10,340.06
Accel Partners	VC	360	5,883.05
Intel Capital	Corporate VC	336	3,415.95
First Round Capital	VC	328	1,938.78
Draper Jurvetson	VC	269	353.73
500 Startups	Micro-VC	274	3,642.88
Greylock Partners	VC	252	5,250.47
SV Angel	Micro-VC	240	776.21
High Tech Gründerfonds	*VC (Public-Private Partnership)*	*176*	*263.82*

Source: Data derived from Preqin – Venture Deals Analyst

Thus, concerns about the over-regulated environment, together with the ongoing financial crisis, are influential factors in deterring or slowing down the fundraising process. The calculated consequences of these changes are quite dramatic. Besides the drop in fundraising, Europe also experiences a shakeout in the number of active venture capital firms. Approximately 1600 venture capital firms were active in Europe in 1999 (Brandis and Whitmire, 2011). In contrast, there were 558 EU firms that have participated – through one or more venture capital funds – in investment rounds in high growth companies in the period 2010 to the first half of 2012 (data derived from Preqin Venture Deals Analyst). While the evidence of this sort may not prove that the European venture capital industry is in crisis, the devastating effects of the European economic downturn become (even more) evident when we consider that only 4% of these firms participated in more than 20 financing rounds in the period 2010 to the first half of 2012. According to data provider Preqin Venture Deals Analyst, the High-Tech Gründerfonds was the most active venture capital firm in the European Union. The public-private partnership that was established to foster entrepreneurship in Germany invested in 176 start-up companies in the period between 2008 and 2012. This number is relatively small compared to the ten most active venture capital investors in the United States (see Table 1). It is interesting to mention here that among the highest-ranked investors we not only find traditional venture capital funds, but also 'new' types of investors, such as super-angels and corporate venture capital funds. To support this position, the differences between the venture capital industries in Europe and the United States are even more significant when we compare the aggregate deal value.

Appendix 2 - Table 2: Exit Value (IPOs and Trade Sales of 100+M) (USD mn)

United States	Average	Minimum	Maximum	Median
2010	333	100	2,250	216
2011	308	100	1,700	234
2012 (1H)	608	100	16,000	203
2012 (1H) Excluding Facebook	294	100	1,200	200
Europe	Average	Minimum	Maximum	Median
2010	262	172	330	255
2011	196	100	401	140
2012 (1H)	263	100	650	155

Source: Data derived from Preqin – Venture Deals Analyst

It should be noted, however, that despite the persistent gap between the venture capital industries in Europe and the United States (which is mainly due to the lack of private investors in venture capital funds), there are signs of recovery in Europe. Some scholars even argue that the state of the 'post-financial crisis' venture capital industry in Europe appears to be more optimistic and attractive than the environment in the United States (Cumming and Johan, 2012a). According to data provider Dow Jones VentureSource, the median fund size for funds greater than $20 million has increased from almost $52 million in 2006 to $100 million in 2011. Due to their increasing size, Europe's top venture capital firms, which are also fewer in number, are arguably in a better position to find high quality investment opportunities at relatively low pre-money valuations. This explains why, if we use exit values as a measure of success, the top European venture capitalists can match with the best performing firms in the United States. Table 2 shows that the average exit value in Europe and the United States for deals that have an exit value of at least $100 million are converging in 2012. This can partly be explained by the fact that US corporations have large sums of cash trapped in Europe (in the sense that they are not able to repatriate the cash without paying taxes in the US), making European M&A transactions very attractive. In addition to top-quartile venture capital funds and an abundance of investment opportunities, we not only see different types of investors playing an increasingly important role in the venture capital ecosystem in both Europe and the United States, but also (and more importantly) new collaborative funding models.

3.1 Collaborative Funding Models

3.1.1 The Emergence of Micro Venture Capital Funds (or Super-Angels)

According to a recent report by the European Venture Capital Association (EVCA, 2013), micro-venture capital funds (or super angel funds), which first emerged in the United States, are becoming more and more established in the venture capital industry in Europe. In general, these funds are managed by former entrepreneurs. In contrast to traditional angel investors operating alone or in concert with other angels, micro venture capital fun]ds also attract other investing interests from wealthy individuals, family offices, foundations and corporate investors that are often looking for innovative investment opportunities. The managers of micro venture capital funds typically contribute a significant amount of capital to the fund, making the organization of the fund more of a collaborative nature than a typical 'general partner – limited partner' relationship.[12] Table 3, which gives an overview of the most notable micro-venture

[12] It should be noted that investors in venture capital funds take an increasingly active approach in the negotiations about the compensation terms of the limited partnership agreement. But there is more. Besides demanding 'improvements' to the limited partnership agreement, we observe that investors want to see more skin in the game from the managers/general partners. Recall that the industry norm is 1% to 3% of the committed capital. By requiring the general partners to make significant capital contributions to their own fund,

capital funds in Europe, shows that these funds are currently able to secure capital commitments in the amount of $20 million to $100 million, an amount that is rapidly growing. Indeed, investing with proven entrepreneurs is very appealing. Since they are extremely well connected in their former line of business, micro funds are often better positioned than traditional venture capitalists to pick out winners at a seed or early stage. Also they are able to mentor them through the very early start-up phases, increasing the possibility of follow-on investments from 'traditional' venture capital funds and corporate venture funds. Their position between the traditional angel investors and venture capital funds arguable make these micro venture capital funds a perfect collaborator (as a co-investor and a follow-on investor).

Appendix 2 - Table 3: Mirco-Venture Capital Funds in Europe (2008-2012)

Micro-Venture Capital Firm	Country	No. of Investments	Aggregate Deal Value (USD mn)
Atomico	UK	53	505.01
ISAI	France	9	25.42
Jaina Capital	France	2	4
Notion Capital	UK	13	56.57
Passion Capital	UK	12	8,4
Seedcamp	UK	14	13,88

Source: Data derived from Preqin – Venture Deals Analyst

3.1.2 Collaborative Corporate Venture Capital Models

The EVCA (2013) also identified a new breed of corporate venture capital players that have an interest in investing across all start-up stages and sectors. This is an interesting development, since, as we have seen above, corporate involvement in the venture capital industry significantly declined after the Internet bubble in 2000. However, a number of corporate venture capital funds persisted and even weathered the 2007-2008 financial crisis much better than their traditional venture capital counterparts (Lerner, 2013). As we have seen in Figure 6, corporations have, in the wake of the financial crisis, stepped up their involvement and investments in innovative technology companies, thereby slowly but surely regaining market share.

Nevertheless, despite the prospect of real gains, there are several reasons to be skeptical about the merits of corporate venture capital. Indeed, there are a number of challenges on the path to success. First, the mission and scope of corporate venture capital divisions are often unclear making it difficult to assess results objectively. Second, corporations often lack the experience and expertise that is needed to succeed in the venture capital industry. Third, it is difficult to establish effective governance and compensation systems within a corporate environment. Fourth, the venture capital industry is highly networked based on deep interpersonal relationships and it is difficult for corporate venture capital staff to penetrate these networks to identify the right investment opportunities. Fifth, managing minority interests in portfolio companies is often daunting from an accounting point of view and sometimes even from an antitrust perspective. Sixth, many start-ups fear that accepting investments from a corporate venture fund will restrict their exit opportunities and bring about the risk of 'negative signaling' should the corporate venture fund decide not to support the investment in the future.

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the investors can reasonably expect that the managers' interests be better aligned. It appears that 'higher-than-average' capital commitments (ranging from 5% to 10%) are gradually becoming the norm in the private equity industry (Witkowsky, 2012).

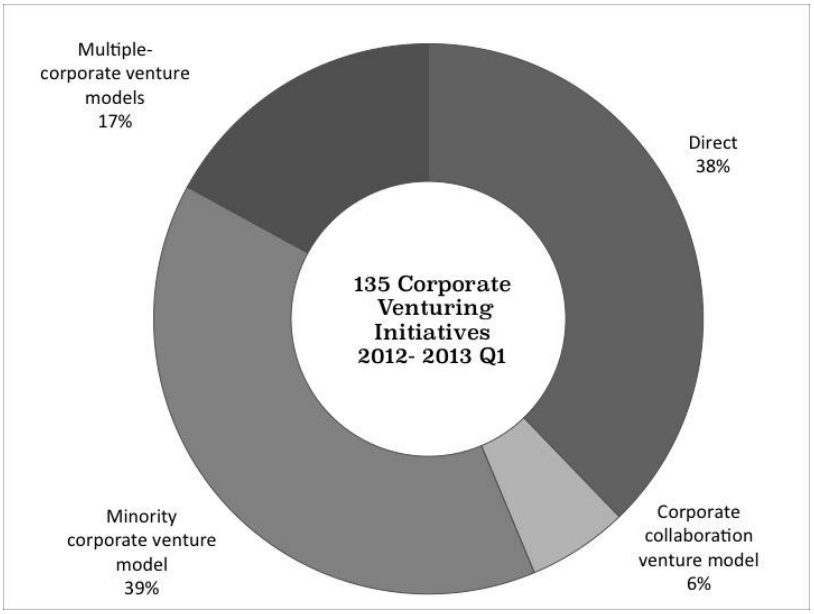
At the same time, new models are beginning to emerge.[13] In particular, venture capitalists are increasingly establishing partnerships with mature corporations. Empirical research shows that 62 per cent of the 135 reported announcements of corporate venture capital initiatives in 2012 and the first quarter of 2013 can be characterized as a 'collaborative venture capital models' (data derived from www.globalcorporateventuring) (see Figure 12).

Unilever is an example of a European corporation that has already a longer experience with the 'collaborative venture capital model.' Note that this multinational divested one of its 'independent' corporate venture capital arms, Unilever Technology Ventures, which was at that time structured as a limited partnership with Unilever as its sole limited partner in 2007. It replaced this structure by a collaborative model in which Unilever became an anchor investor in Physic Ventures, an early stage venture capital fund based in San Francisco, which was set up by Unilever to invest in consumer-driven health, wellness and sustainable living. While Unilever is still the largest investor, Physic attracted a number of financial as well as strategic investors including PepsiCo and health insurance company Humana.

In the marketplace, collaborative venture capital models between corporations and venture capitalists have the potential to lead to 'win-win' situations. On the one hand, the corporation can benefit from the experience and expertise of the fund managers, whereas on the other hand the venture capital firm can profit from an active corporate investor that may not only prove helpful in selecting the right portfolio companies, but may also provide the necessary support to the development of these start-up businesses. Perhaps more importantly, the corporation provides a possible exit opportunity in the event of it being interested in acquiring the venture capital backed technology. Moreover, working closely with multinationals could also create real investment options to the multinational's spin-out or spin-off companies. Finally, this strategy is targeted to opening doors to innovative technology companies in emerging markets with strong growth potential.

[13] We can distinguish among four collaborative models: (1) the outsourced venture model), (2) the minority corporate venture model, (3) the multi-corporate venture model and (4) the corporate collaboration venture model. The categorization of the models is derived from Claudia Iannazzo, Pereg Ventures CEO and partner.

Appendix 2 - Figure 12: Collaborative Corporate Venture Capital Models



Source: Data derives from www.globalcorporateventuring.com

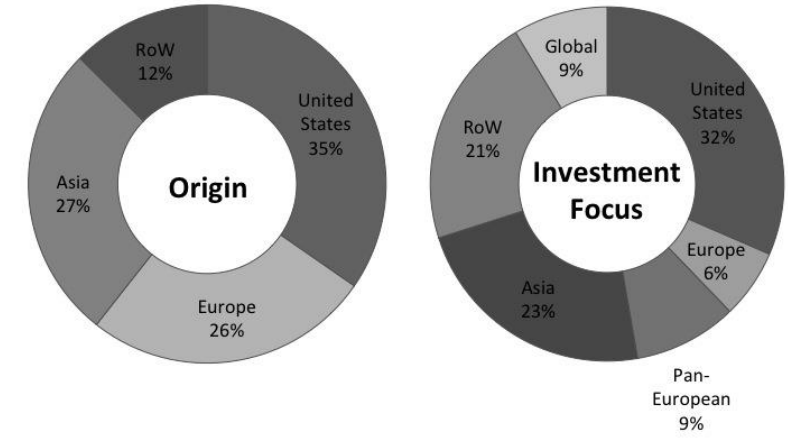
The Unilever-Physic model is a notable example of an 'outsourced venture model'. Presently, the outsourced model often evolves toward a 'minority corporate venture model' in which these corporation makes a minority investment in a venture capital fund in return for a strategic collaboration. Under certain circumstances, this allows corporates to leverage investments from other strategic or financial investors without having to consolidate their own investment in their profit and loss statements. Depending on the cash situation of the corporate, this can make a minority investment more attractive than in house research and development.

We also observe a range of competing collaborative models. For instance, the partnership between Index Ventures and two competing pharmaceutical companies, GlaxoSmithKline and Johnson & Johnson, could be categorized as a 'multi-corporate venture model'. The €150 million fund mainly invests in single assets that have the potential to become leading products in the future, the so-called asset-centric investment model. The corporate investors provide advice to Index Ventures by appointing in-house experts on a scientific advisory committee. In order to avoid potential conflicts of interest, however, the two multinationals have not obtained any preferential rights (of first refusal) to promising drugs that could emerge from this partnership. If either of them is interested in acquiring an 'asset', they will have to engage in an open competitive bidding process. Index Ventures hopes through a supportive, but at the same time independent attitude of its corporate investors to establish a partnership that can lead to a joint development of new drugs and medicines.

Finally, the Glass Collective, a program established by venture capitalists Kleiner Perkins Caufield & Byers, and Andreessen Horowitz in conjunction with Google Ventures in 2013, involves a new twist on the collaborative venture capital model. Although the venture capitalists (and Google Ventures) make independent investments (without setting up a new fund), they leverage their relationships to identify and

accelerate the emerging glass technologies. We shall refer to this model as a 'corporate collaboration venture model'.

Appendix 2 - Figure 13: The Focus on Corporate Venture Capital Initiatives



Source: Data derived from www.globalcorporateventurering.com

If we look again at the 135 corporate venture capital announcements in 2012 and the first quarter of 2013, we see that US corporations are the most active corporate venture capital investors. Figure 13 also shows that 25 per cent of the corporate venturing announcements originated from corporations with their headquarters in Europe. Thus, in order to remain competitive in an increasingly global marketplace, a clear window to the venture capital industry is also of paramount importance to European corporations. Remarkably, the general focus of corporate venture capital investments is not always global but rather regional. Corporations are more often interested in locating investment opportunities in emerging economies. Still, the United States is attractive because of its mature venture capital culture and interactive networks among institutional investors, venture capitalists, entrepreneurs and their respective advisors. A question remains whether policymakers in Europe can play a role in encouraging collaborative funding models with a European focus.

3.1.3 The Role of Governments in Collaborative Funding Models

This Section will discuss government interventions that have the potential to significantly contribute to the emergence of collaborative funding models in Europe. Earlier we described how government interventions do not always have their intended effect. One reason offered is that government venture capital initiatives are often targeted toward the funding gaps in specific industries and development stages in the venture's life cycle. Australia provides a number of good examples including the Renewable Energy Equity Fund, the Pre-Seed Fund and the Innovation Investment Follow-on Fund that were established respectively in 2000, 2002 and 2009. What then determines the success or failure of government interventions? Whilst there is no single answer, incentive design and the connectivity to other stakeholders in the venture capital ecosystem appear to play an important role.

Let's have a closer look at several features of the Australian government funds that have arguably contributed to the success of these funds. Indeed, recent research indicates that the Australian initiatives were successful in spurring innovation and entrepreneurship (Cumming and Johan, 2012b). What is probably most suggestive here is that the funds operate as 'public-private partnerships' in which public funds are pooled with capital from private investors. The funds are managed by private sector fund managers who are not only in a better position to pick 'winners', but also ensure that the funds are connected to the existing venture capital industry. Venture capital fund managers and private investors are thus essential for the success of the government programs. In essence, the government acts as a strategic investor. Its main objective and interest is the development of a robust venture capital ecosystem. In order to continue to make investments in the future, the government initiatives are organized as 'revolving programs', which means that the government needs to participate in the distributions of returns and interests from initial investments in order to be able to reinvest the proceeds and ensure the long term sustainability of the government program. Indeed, profit distribution arrangements require the fund managers to first return the invested capital to the government and private investors before venture capital fund managers participate in the upside. Often there is even an additional hurdle rate in place to ensure that the investors first receive their paid-in capital and their cost of capital. However, unlike most government support programs, the Australian program is designed to attract and incentivize private investors. The remaining profits (if and when realized) are split disproportionally with the government receiving 10 per cent and 90 per cent going to the private investors.

Arguably, the idea that a capped upside for the government is attractive to the private sector investors is not new in the venture capital industry. The Yozma program – viewed by many as one of the prime examples of how government initiatives should be organized – introduced this incentive mechanism to attract experienced international venture capitalists and investors to Israel. By doing so, the Yozma program fostered the relationship between Israeli start-up companies and experienced American venture capitalists, leading to an impressive and low-cost development of Israel's venture capital ecosystem in the late 1990s. Evidence from Israel's IT sector, for instance, suggests that the connection to the US venture capital industry not only increased the possibility of receiving follow-on investments, but also made it possible for Israeli start-up companies to piggyback on US institutions, such as the stock exchange NASDAQ.

European policymakers also show a mounting interest in public-private partnerships. Consider again, the High-Tech Gründerfonds in Germany. Interestingly, the fund is designed to meet two key components: access to venture capital and connectivity to other advisors and investors. First, the German public-private partnership currently manages in excess of €550 million of committed capital over two fund generations (€272 million in Fund I and €301.5 million in Fund II) and invests mainly in emerging SMEs in Germany. The German Federal Ministry of Economics and Technology as well as KfW Banking Group are the 'strategic' anchor investors in the two funds. As for the connectivity, the High-Tech Gründerfonds gives access to an impressive network of coaches, such as university professors, angel investors and venture capital funds. These coaches do not only offer value-added services to existing portfolio companies, but are also responsible for providing investment opportunities (Brandkamp, 2011). But there is more. Both funds have been able to attract a significant number of corporate investors. Corporate investors in Fund I (which started to make investments in 2005) include BASF, Robert Bosch, Daimler, Siemens, Deutsche Telekom, and Carl Zeiss. Fund II, which commenced investing on 27 October 2011 and had a second close of EUR 301.5 million in December 2012, was able to attract even more corporate interest with commitments from ALTANA, BASF, B.Braun, Robert Bosch, CEWE Color, Daimler, Deutsche Post DHL, Deutsche Telekom, Evonik, LANXESS, m+mv, Metrogroup, Qiagen, RWE Innogy, SAP, Tengelmann, and Carl Zeiss. Together, the

involvement of these companies is important to supply key technical and market support to the entrepreneurial businesses. As mentioned, the High-Tech Gründerfonds is one of Europe's most active venture capital funds.

It follows from the above discussion that properly structured public-private partnerships that build on ingredients that are already available in the market are probably the strongest tool to develop a sustainable venture capital industry. However, one challenge remains in Europe: the local or regional focus of both the government programs and the venture capital funds (or to put it differently: the lack of pan-European/cross-border focus). It would be beneficial to expand the reach of successful models (such as the High-Tech Gründerfonds) to other European countries and target interested investors, such as family offices and cash rich investors from the United States that are already showing their willingness to invest more and more in European start-up companies. It could also be argued that a vibrant European-wide venture capital industry needs access to an online marketplace where the fragmented and disorganized stakeholders of the venture capital ecosystem, such as entrepreneurs, venture capital funds, angel investors and other investors and stakeholders, could connect and exchange investment and exit opportunities.

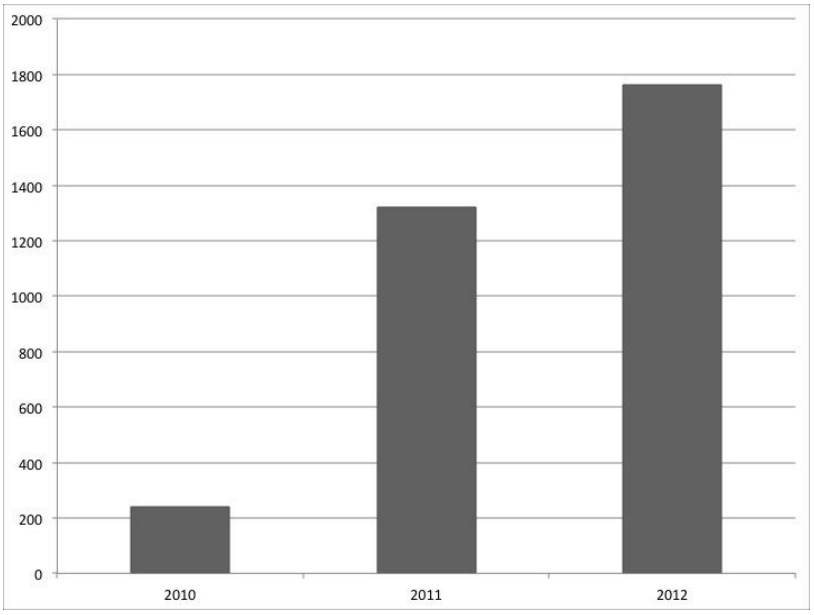
3.2 Online Platforms

Online platforms that offer equity-based crowdfunding are increasingly attracting attention, becoming also more and more popular as a source of funding. We conjecture that if angel investors and venture capitalists start working through these crowdfunding platforms they have the potential to become a serious alternative to start up funding (Calao, 2012). Consider AngelList, an online platform in the United States that streamlines the fundraising process by matching start-ups with investors. The platform, which started in January 2010, is increasingly used by start-up companies to get easy and speedy access to a 'social network' of qualifying and sophisticated angel investors (with over US$ 1 million in personal wealth, see Figure 14). Besides the fact that AngelList offers a platform for start-up companies to quickly connect and negotiate seed and early stage financing, it also provides transparency to the ecosystem by making it possible for investors to 'follow' companies and track their growth and development.

As noted, the soaring popularity of AngelList among start-up companies has gradually drawn venture capital firms, corporate venture capital units and other institutional investors (that are eager to find early stage winners) to its network (Hindman, 2011). According to data collected by AngelList, 3,325 start-up companies were able to raise seed financing – ranging from US$ 50,000 to US$ 1 million – in the period 2010-2012 (in reality these numbers are probably much higher since not all deals are reported). Moreover, companies that are 'listed' on AngelList have also been successful in attracting follow on rounds of finance: They have raised 230 series A rounds of financing, 49 series B, 5 series C and 60 companies were acquired. It is only to be expected that this number will rise significantly as AngelList has recently introduced several 'crowdfunding type' services. For instance, it became possible for accredited investors to pour small amounts of at least US$ 1,000 alongside other (angel) investors. AngelList would notify the start-up company as soon as a minimum of US$ 200,000 has been 'committed'. The start-up company would then have two options: (1) it closes the deal or (2) continues fundraising. In order to prevent that companies have to deal with a large number of small investors (which, as we have seen, complicates follow-on investment rounds) and comply with the existing securities rules and regulations, AngelList's crowdfunding service was set up in partnership with SecondMarket. SecondMarket (a company that provides liquidity to start-up companies and their investors) would act as the broker-dealer. The idea is that SecondMarket sets up and manages a separate fund that pools the contributed 'crowdfunding'

investments. The fund would become the shareholder in the start-up company. The service became only available to accredited investors who are expected to understand the risks involved in early stage finance transactions.

Appendix 2 - Figure 14: The Increasing Popularity of AngelList



Source: www.angel.co

Another, more recent, initiative is the 'syndicates' service, which offers investors (backers) the opportunity to invest alongside notable angels or venture capital funds (syndicate leads) in promising portfolio companies. This service has several benefits that stimulate collaborations. First, there are no management fees (backers pay a carry – percentage of the syndicate's profits – of 5-10 per cent).[14] Second, AngelList's syndicates provide flexibility to the backers in that they can exit the syndicate at any time or they can opt-out of specific deals. Interestingly, it is expected that similar developments will emerge in Europe. First, equity-based crowdfunding grows in popularity (see Figure 4). Second, Europe has its 'own' version of AngelList since November 2012. Dealroom (previously known as NOAH Insider) markets itself as a Pan-European tech-focused network that operates as a matchmaker. On 31 August 2013, 4,264 technology businesses and 407 investors were registered. On 1 April 2014, more than 10,000 companies connect with investors through the Dealroom platform. Clearly, these developments cannot be ignored, but warrant further research/support at a EU level.

The obvious question is what is needed for these initiatives to become the marketplace for early stage companies and investors to arrange financings. Arguably, the public-private partnership model could be used for the setup of European-wide online marketplaces for fundraising and trading. Consider the India Venture Board (IVB) that was launched in India in February 2011. The IVB is an online marketplace/platform with some interesting features. First, the IVB provides investors with a "Deal Corner" where they can post investment interests and initiate transactions. Second, the IVB gives entrepreneurs the possibility to make investment pitches. Third, companies and

[14] AngelList receives a 5 per cent carry from the syndicate lead.

investors can upload information about important developments, investments and deals to the IVB Announcement Board. The founders of the IVB are the Indian Private Equity & Venture Capital Association (IVCA), the Indian Angel Network, Mumbai Angels, the National Stock Exchange of India (NSE) and the state-owned Small Industries Development Bank of India (SIDBI). The public-private partnership element arguably adds to the credibility and reputation of the board. The next Section shows that online platforms can also be used to address the liquidity gap in the venture capital cycle.

3.3 Liquidity Options

Even if governments are able to encourage or kick start collaborative funding models, investors and entrepreneurs face another obstacle tied to the decreasing number of venture capital firms and their propensity to move to the later stages of funding: the liquidity gap. Obviously, the extended exit horizon - and its delayed cash out event - potentially discourages entrepreneurship. One important effect of the sluggish IPO market and the liquidity gap is the focus on deregulation and the emergence of a new generation of securities markets. We earlier mentioned the importance of the JOBS-Act in the United States.

Deregulated markets are considered important to stimulate entrepreneurial activity and attract venture capital. To be sure, the confidential filing feature of the JOBS-Act appears to have a positive effect on the number of venture capital backed listings in the United States. In general, however, the introduction of these new markets and accompanying deregulatory measures exhibits a surprisingly low success rate. One of the reasons is that founders of (and investors in) emerging growth companies increasingly believe that it is in the best interest of the company to remain private as long as possible (mainly in order to avoid the cost of going and being public and to prevent interference of short-term investors) (McCahery, Vermeulen and Hisatake, 2013). This trend is confirmed by 2012 articles in the Economist that indicated that 'going public' is not the executives' dream anymore.

In order to bridge the liquidity gap, there is arguably a growing need to develop online private secondary exchanges that can facilitate pre-IPO trading in the shares of non-listed venture capital-backed firms (Mendoza and Vermeulen, 2010). These trading platforms have the potential to become a critical component of the venture capital ecosystem, as they can bridge the liquidity gap in the ecosystem and reduce the fragmentation of the venture capital industry. The fact that the former Facebook employee who approached SecondMarket to assist him in selling his stock options is indicative of the lack of liquidity options in 2008.

Naturally, the post-IPO fall in Facebook shares have dampened the excitement for the private start-up stock platforms among private investors in the United States. Here it should be noted that the use of online exchanges as an outlet for trading shares in non-listed firms is not free from controversy. As we have seen, concerns have been raised about the lack of sufficient information regarding the companies whose stock is negotiated through these venues. As private firms have no obligation to make public disclosures under US law, many doubt the accuracy of the valuations used to determine the price of transactions in online exit platforms, such SecondMarket and SharesPost (Pollman, 2012).[15]

However, governments and stock exchanges in Europe should not ignore the development of these platforms. For instance, stock exchanges that integrate

[15] This is the reason why start-up companies in the United States collaborate with private equity firms (e.g., Twitter and Blackrock) to provide pre-IPO liquidity to employees and other shareholders.

platforms for secondary trading in shares of non-listed companies into their existing venues may gain an edge in the increasingly fierce competition to dominate the market for IPOs of high-growth firms. In fact, a segmented venue of this nature would allow stock exchanges to create bonds with these firms early on in their life cycles. This may make it more likely for firms with high growth potential to undergo their IPOs in the same venue that supplied their investors with pre-IPO liquidity, rather than in competing exchanges. The joint venture between NASDAQ, a stock market in the United States (which has been the most popular venue for high growth companies to list their shares) and small trading platform SharesPost Inc is a recent example of the trend towards segmented stock markets.

Finally, it should be observed that the uncertainty or 'regulatory fog' has already been addressed to some extent in the United States with the introduction of the JOBS Act and India (where the Securities and Exchange Board announced plans to allow small and medium-sized entities to list their shares without an initial public offering (IPO) in October 2013.[16] The situation in Europe may call for immediate attention. It is not yet clear whether the new online platforms will be able to carry out their activities without facing a high level of regulatory scrutiny. Recent examples of financial market innovations (i.e., hedge funds, dark pools, high-frequency trading) suggest that as the media attention surrounding these new players grows, European regulators will be more tempted to intervene with heavy-handed regulation. Still, if the growing industry of secondary trading platforms does not find the space to develop, Europe may be left with a defective and incomplete venture capital ecosystem. For these reasons, European policymakers can support faster growth by starting to design a light regulatory framework to encourage the formation of alternative liquidity providers.

[16] The Securities and Exchange Board of India allows listings of SMEs without an IPO, a move expected to bridge the liquidity gap. The companies will be listed on a platform which is open only to institutional (professional) investors (in order to avoid the introduction of stringent regulations).

4. Conclusion

Governments often influence the development of innovative and emerging growth companies by providing financial support and promoting external funding to venture capitalists. By focusing on recent trends in the venture capital industry, we found that 'new' types of investors and alternative investment opportunities are the main factors in shaping a 'new' venture capital cycle. Motivated by this evidence, this paper suggests that governments should take these trends and developments into account when deciding on how best to stimulate business growth and innovation.

This paper examines the funding gap in early to mid-stage companies. The gap is largely due to traditional venture capital providers moving towards less risky financing of later and growth stage companies. Two important points emerge from this analysis. First, new types of investors are emerging to fill the funding gap, such as super-angels and crowdfunding platforms. Second, the later stages of the cycle are also impacted by the decline in fundraising and investment by traditional venture capitalists.

This paper also shows the extent to which corporate venture capital is increasingly viewed as smart capital that has the potential to significantly contribute to the growth of small and medium-sized companies and thereby also help solve the liquidity gap. More specifically, because traditional corporate venture capital divisions suffer from some limitations as investors, venture capitalists increasingly establish partnerships with mature corporations.

The findings confirm that these new collaborative venture capital models may provide an effective basis for funding innovative projects. One of the features of these new models is that corporations have become anchor investors in venture capital funds that invest in both related and unrelated industries. Our results also point to the emergence of an outsourced venture model or minority corporate venture model. In these models, venture capital funds, which are managed by independent venture capitalists with outstanding track records, make investments in start-up firms on behalf of large corporations.

With these results in mind, we suggest an initial solution for government intervention in the venture capital sector. While economic studies on the impact of smart co-investment schemes on VC investment are very recent, they show that public funding can be used to provide a leverage effect to investments from the private sector. In fact, experience with government-sponsored funds, such as the High Tech Gründerfonds, confirms that the network creating capabilities of these initiatives has the anticipated productivity effects for large corporations, venture capitalists as well as the entrepreneurs. The results also give support to online platforms. They appear to have a positive effect on the emergence of collaborative funding models.

In this paper, we indicated that there is a growing need to develop a pre-IPO market for venture capital-backed firms. To support this position, we observed that there are several options. First, we have seen that trading platforms can bridge the liquidity gap in the venture capital cycle and reduce the fragmentation of the VC industry. The evidence suggests, however, that such a marketplace is likely to be most effective when it forms part of a segmented exchange with multiple tiers, preferably as a springboard for 'higher' segments. A second claim advanced in this paper is that government involvement in the creation of pre-IPO marketplaces can provide important support for the venture capital cycle. Finally, without properly structured rules and regulations, it is difficult to develop a sustainable venture capital industry.

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A high level independent Expert Group on Knowledge Transfer and Open Innovation was set up at the end of 2012 to assess if there is a case for more policy action on Open Innovation and Knowledge Transfer. In order to meet the objective, the Expert Group considered whether Europe performs below its potential in creating value out of knowledge and ideas, and what can be done to foster knowledge sharing and utilisation. Europe faces two existential challenges: (1) how to create sustainable growth given the vast overhang of public and private debt and (2) how to do this given the transformational impact of disruptive technologies on traditional models for business and public sector organizations, banks, universities and public research organizations. The response to the challenges Europe is facing has to be smart, radical and above all, innovative. For the EU to continuously raise and reach its growth potential, it has to be innovative and thoroughly enterprising.

This report delivers a new, advanced Open Innovation paradigm: building and funding ecosystems for co-creation. It provides a coherent whole of policy recommendations for Open Innovation and Knowledge Transfer, across four priority areas where this Expert Group recognizes that actions must be taken. The necessary building blocks for an ecosystem for co-creation are: 1) to put Open Innovation and Knowledge transfer in the spotlight; 2) to embrace innovative businesses, grow innovative markets, innovation hubs and networks; 3) to make Universities and PROs more entrepreneurial and 4) the smart integration of capital into the ecosystem.

In order to bring Open Innovation and Knowledge Transfer to the next level it is essential to build an ecosystem in which Open Innovation and Knowledge Transfer, or co-creation, can thrive. An ecosystem for co-creation in turn will breed trust, visibility and transparency. Co-creation ecosystems will thereby act as magnets for innovation and economic development.

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