

The Secretary
Financial System Inquiry
GPO Box 89
Sydney NSW 2001
August 26, 2014

Re: What are the best options for improving the tax treatment of VCLPs

Dear Sir/Madam,

Please find attached a submission from the Australian Centre for Financial Studies (ACFS) responding to the Financial System Inquiry's second round call for submissions. The attachment makes observations and recommendations to improve the efficiency of the equity financing of early-stage companies.

The FSI Interim Report identifies a number of barriers to investment in venture capital funds and therefore the availability of equity finance for early-stage firms. Barriers identified include:

- Historically poor risk-adjusted returns, particularly since the mid 1990s
- High and inflexible 2 and 20 fee structure
- Lack of transparency between VC funds and investors
- Undue complexity and uncertainty in taxation of various VC fund structures.

Research conducted by ACFS¹ concurs with these observations, however, notes that the only regulatory barrier observed in the four points listed above is the undue complexity and uncertainty of taxation in VC fund structures. As identified in the Interim report, a key component of the apparently high fees charged by VC funds results from their ongoing engagement with the early-stage firms and the broader innovation ecosystem. A question that must therefore be raised is to what extent these functions can be performed more efficiently and with greater scale through alternative mechanisms. In this regard, international experience suggests that business incubators, angel networks and online platforms for sophisticated investors to assess early-stage deals are increasingly providing competition in this space. Non-VC fund providers of these services are also beginning to appear in Australia² suggesting that there is perhaps scope for greater flexibility amongst VC fund fee structures and innovation in VC fund business models.

An area not picked up in the FSI Interim Report, and one that is becoming increasingly important, is forms of equity financing for early-stage companies being provided outside of VC funds. This includes:

- Direct investment by High-Net-Worth Individuals or Angel Investor Groups

¹ See Attachment: Innovation in Australia

² For example, the York Butter Factory, Aurelius Digital and Venture Crowd

- Family Offices
- Corporate Venture Capital

High-Net-Worth investors play an important role in equity financing of early-stage businesses both in Australia and internationally. According to the Australian Association of Angel Investors' 2010 National Angel Survey³, in 2010, Australian Angels invested more than \$1 billion in early-stage businesses. This compares to less than \$200 million invested by VC funds in the same year. Discussions with family offices also suggest that HNW clients are increasingly funding early-stage businesses directly rather than through VC structures.

A third category of investor that warrants discussion when considering the equity financing of early stage companies is corporate venture capital. Corporate VC is particularly strong in the US with around 13 percent of all 2010 funding deals having corporate VC involvement. Many of the largest US companies including, Merck, Google, Microsoft, Pfizer and 3M are all actively involved in corporate venture capital.⁴ Perhaps an overlooked factor contributing to Israel's success in funding early stage firms, was the country's ability to attract many of the world's largest multinational technology firms to establish operation in Tel Aviv in the period from 1997-2000. Despite the recent founding of VC operations by Telstra, Optus and Westpac, large Australian organisations remain relatively inactive in VC financing of early stage firms. ACFS research notes there are a number of advantages to having a strong corporate VC environment. These include:

- Corporate investors can be either a strategic or financial investor. Strategic investors are likely to demand a lower return on capital than a pure financial investor.
- Corporate VC activity provides alternative trade-sale exit opportunities for other equity investors in early-stage firms.
- Corporate VC may provide early-stage firms with access to manufacturing plants, distribution channels and technology which would otherwise be unavailable.
- Access for early-stage firms to technology and management experts

ACFS agrees that undue complexity and uncertainty of taxation around VCLP and ESVCLP structures should be removed. Furthermore, to create an even playing field between different investment methodologies, alignment of the tax incentives available through various VC fund structures and alternative forms of early-stage equity investment such as that conducted by angel investors, family offices and corporate VC funds may warrant consideration.

The attachment to this submission provides a detailed analysis of the current state of innovation funding in Australia and provides a list of observations on areas of weakness in Australia's innovation ecosystem and potential areas for improvement. We believe that the observations and recommendations made in the report are relevant to the Financial System Inquiry.

³ Australian Association of Angel Investors (2013)

⁴ NVCA (2010)

We would be happy to discuss the issues raised in the submission in more detail with the Secretariat if required.

Yours sincerely,



Professor Deborah Ralston
Executive Director,
Australian Centre for Financial Studies

INNOVATION IN AUSTRALIA

Submission to the Financial System Inquiry

An independent report prepared by the Australian Centre for Financial Studies. ACFS would like to thank members of Australia's Venture Capital sector and family offices for their contributions and insights.

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Executive Summary

Innovation plays an integral role in growing a nation's economy, employment and standard of living through the development of new products, processes and fledgling industries. The importance of entrepreneurship is particularly pronounced in developed economies where the marginal returns to capital and labour continue to diminish and increases in standard of living are increasingly driven by advances in innovation. Therefore, a key challenge for the governments of developed countries globally is creating an environment that is conducive to innovation and ensures that capital is made available to commercialise viable innovations.

This report assesses the current state of innovation financing in Australia against the most successful innovation ecosystems internationally and to provide recommendations on how policy may improve the performance of innovation ecosystems in Australia. The recent cessation of the operations of a number of long-standing brand names in Australia provides a timely backdrop to this report as a reminder of the importance of innovation and the need to constantly develop new industries and to commercialise innovative ideas.

An analysis of innovation ecosystems internationally shows that there are four common success factors: 1) Exceptional universities and research institutions 2) Collaboration between individual agents in the innovation ecosystem 3) International reputation and the presence of international firms in target industries 4) Financial incentives to build critical mass

A fifth important factor in well functioning innovation ecosystems is an intermediary that connects the various agents of the innovation ecosystem. This role has typically been performed by venture capital funds. Therefore, a second objective of this report has been to provide an assessment of the current state and performance of venture capital funds and to determine to what extent the role traditionally being played by these funds is undertaken by alternative agents in Australia's innovation ecosystems.

Key findings

The quality of Universities in Australia is high, with a number of universities ranked in the top 100 internationally. Gross R&D expenditure at 2.2% of GDP also compares favourable with other OECD countries, however, while the quality of Australian Universities and gross R&D expenditure is high, the level of R&D allocated toward commercial outcomes is low, as is the ability of universities to commercialise research internally.

Australia's long-standing capital account surplus is evidence of Australia's ability to attract international capital into areas with a strong international reputation and large multi-national firms such as mining and financial services. However, there is a lack of large multinational firms in target industries such as technology and life sciences to fill the gap left by an economy dominated by mining and services firms. Furthermore, Australian firms rank amongst the worst in the OECD in regard to collaborating with other corporations and research organisations. These characteristics are likely to lead to a reduction in talented individuals in target industries, limited trade sale exit

opportunities for investors in start-ups, limited specialised expertise by investors in technology and biotechnology industries, and reduced corporate venture capital investment opportunities for investee firms.

The financial incentives that have been introduced by both the Federal and State governments including commercialisation grants, the market validation program and R&D tax deductions have been well received by both investee firms and the start-up investment community however there is a discrepancy between the tax incentives available to VC structures such as VCLP and ESVCLP and economic equivalent alternatives such as direct investments made by angel investors and corporate venture capital structures. Despite these competitive distortions there remains a preference amongst investors to use non-venture capital fund structures when making investments in early-stage companies.

Investment in VC funds and committed capital by these funds have dropped significantly since the GFC, however, the trend away from institutional investment in VC funds has been evident since the late 1990s. This reduced investment has been primarily due to poor performance, but also according to investors, the business models of VC funds. Reduced investment in VC funds translates to reduced funding for young companies, especially at the B round funding stage. However, contrary to arguments that the size of Australian VC funds acts as a barrier to improved performance, international studies find that smaller VC funds with total capital below 250 million typically outperform larger funds and that the importance of intra-fund diversification is perhaps overstated.

The risk and return characteristics of VC funds over the last 10 years include poor after-fee returns - a return on paid in capital ratio of approximately 1.11 - low liquidity, fat tails and a strong skew. These characteristics mean the asset class is only acceptable for investors with a high ability and willingness to accept risk. Hence, the current ruling that VC funds are only made available to sophisticated investors is reasonable and their general absence from institutional superannuation portfolios and SMSF portfolios is warranted. An area that does however warrant consideration is adding venture capital funds to the list of eligible investments for Significant Investor Visa applicants as these applicants already meet the definition of sophisticated investors and therefore should have the capacity to evaluate the investment opportunity against their own risk profile and objectives.

In terms of the business model, Australian VC funds typically charge an across the board 2 and 20 fee structure which is equivalent to the fee structure charged in Silicon Valley. Given the recent net-after-fee performance of VC funds and the absence of benefits that Silicon Valley funds provide investee firms, including access to international markets, global networks and specialised technical expertise, this fee structure should be reviewed. Other characteristics that could improve VC fund performance include: greater collaboration with other agents across the innovation ecosystem, increased syndicate investing, fund-of-fund structures and mechanisms to increase liquidity. The report identifies a small number of VC funds with innovative business models that focus on some of these areas.

While there has been a reduction in capital flows to VC funds. Recent times have seen a proliferation in alternative investors, vehicles and investment structures for early stage investments. These investment structures address a number of the weaknesses currently present in the Australian VC model and may be able to fulfil the intermediation role traditionally played by VC funds. These include: 1) Angel Investors 2) Business Incubators 3) Corporate Venture Capital Funds 4) Crowd Sourced Equity Funding Platforms 5) Matching Platforms. Policy to improve Australian Innovation ecosystems should seek to create an equal playing field between various early stage investment avenues and remove barriers to innovations that may improve access to and awareness of early-stage investment opportunities to sophisticated investors.

Recommendations and Observations

1. Commercialisation at universities and research institutes – The low level of commercialized university research may be at least in part due to non-standardisation of agreements between universities and business partners, difficulties in determining ownership shares and lack of resources and expertise in funding and managing patent portfolios. Assistance might be provided to Australian Universities to ensure that they either have their own in-house commercialisation teams to engage in long, and often expensive patenting procedures, or alternatively strong links with other members of the innovation ecosystem including VC firms so that Universities can outsource this function. Such initiatives might draw on the experience of NSW University Easy Access IP which provides easy corporate access to university-developed IP for the purpose of commercialization, or the UK government's Patent Box initiative which offers favourable tax treatment for cash flows stemming from commercialized IP.

2. Financial Innovations Council - In order to strengthen the innovation ecosystem and promote collaboration between the different agents, the Australian Government might consider establishing a Financial Innovations Council to promote networks between Universities and key players in the Australian Innovation ecosystem. It is suggested that a committee could be formed between government and representatives from the innovation ecosystem to explore strategies and policy options for furthering collaboration and attracting new players, particularly those capable of funding later round offers to the system. Such a network might also provide opportunities for business incubators and VC funds to build networks with innovation departments of established corporates.

3. Building international reputation in target industries - Initiatives to attract large multinational companies to establish subsidiaries in Australia may assist in filling the current gap in corporate venture capital and support available from established firms in Australia. Recent developments also suggest the emergence of a viable technology innovation ecosystem. The presence of large domestic corporations and the subsidiaries of multinationals in the technology, medical and bioscience industries would be important additions to the innovation ecosystems of these industries both through their own internal research & development teams and through their role in reducing the risk of VC investment by providing alternative exit avenues through trade sales.

4. Alternative sources of investment for VC Funds – VC investments tend to be illiquid, have the potential for large losses on invested capital and do not have observable market prices. These characteristics make them an unlikely match for retirement fund investment. Further, only 0.03% of SMSFs meet the sophisticated investor requirement of having a minimum of \$10 million dollars in assets, which limits this opportunity. Where SIVs are concerned, while VC is a risky asset class with low risk adjusted returns, the \$5 million investment required is well beyond the investable assets required to achieve sophisticated investor status. Based on the above points, it is suggested that consideration be given to including VC funds amongst the complying investments available to Significant Investor Visa applicants.

5. VC Fund Business model – The current VC fund business model is not conducive to generating the returns required of the volatile and illiquid asset class. Problems with the model include a misalignment of interests - too much reward generated from basic management fee and too little generated from performance based compensation, a shortage of VC funds with specialisation in key sectors and lack of VC fund desire to invest in B round funding. Alternative fee models, greater engagement with other suppliers of VC capital, fund of fund structures and mechanisms to increase liquidity may provide a more attractive investment proposition.

6. Taxation alignment -To create an even playing field between different investment methodologies, alignment of the tax incentives available through various VC fund structures and direct investment in early-stage high risk ventures like that conducted by angel investors and corporates may warrant consideration. Current financial incentives are provided in VCLP and ESVCLP structures but not for direct investment by individuals or corporations. Financial incentives for individual investors in start-up firms were recently introduced in the UK under the Seed Enterprise Investment Scheme (SEIS) and resulted in greater direct investment by individual high-net worth individuals in start-up firms.

The taxation of stock options for firms with revenue below a certain threshold should also be reviewed.

7. Corporate Venture Capital - Given the strategic, rather than purely financial motives, of corporate venture capitalists and their capacity to undertake large funding rounds, policies are needed to increase the activity of both domestic and international corporate venture capitalists in Australia in industries deemed to have a competitive advantage, but which also have high capital intensity, such as healthcare, biotech and clean energy.

8. Online Platforms for Deal Flows – The online platforms being developed in response to crowd sourced equity funding and the service developed by the Australian Small Scale Offerings Board could play an important role in raising local, national and potentially international awareness of early stage investment opportunities, building networks across the innovation ecosystem and increasing potential for syndicate investing as well as providing an additional avenue for raising capital. While the investment characteristics of early stage ventures typically do not make them appropriate investments for retail investors, platforms of this nature should be made available and promoted to sophisticated investors.

1. Introduction

Innovation plays an integral role in growing a nation's economy, employment and standard of living through the development of new products, processes and fledgling industries. The importance of entrepreneurship is particularly pronounced in developed economies where the marginal returns to capital and labour continue to diminish and increases in standard of living are increasingly driven by advances in innovation.⁵

The value of innovation becomes apparent when put in the context of industries dominated by a small number of large firms increasingly focused on core competencies and economies of scale (and subsequent cost controls) to drive profit growth. New firms can challenge incumbents by offering alternative products and services to customers and assist in the evolution of business processes through the development of new technologies. Furthermore, innovation plays a key role in employment growth, particularly over longer time periods.⁶ For example, research from the UK shows that the 6 per cent of UK businesses with the highest growth rates generated 50 per cent of all new jobs between 2002 and 2008.⁷

Innovation is driven by four key components:

- Research & Development
- Commercialisation process
- Capital availability and funding options
- Targeted policy and regulatory infrastructure

An equally important driver of innovation and one that is often cited in both the academic literature and commissioned reports on the subject is the importance of collaboration between the various agents that make up the innovation ecosystem. Foremost amongst these agents has been VC firms, both as intermediaries between the various agents of the ecosystem and as providers of capital. VC firms thereby contribute to the health of the system, but in turn are reliant on the level of innovation to develop a portfolio of investments.

A healthy and collaborative innovation ecosystem is not only more likely to successfully commercialise the research being undertaken but also build the profile of Australia as a viable location for early stage investment for both domestic and international firms and investors.

Australia is well placed to develop a successful innovation supply chain with internationally renowned research and educational institutions and well developed professional services and regulatory infrastructure. However, an area where Australia does not perform as well is in regard to capital availability, particularly post-GFC. This relative lack of capital available to new firms in Australia is highlighted by the 2013 OECD venture capital statistics which show that Australian VC

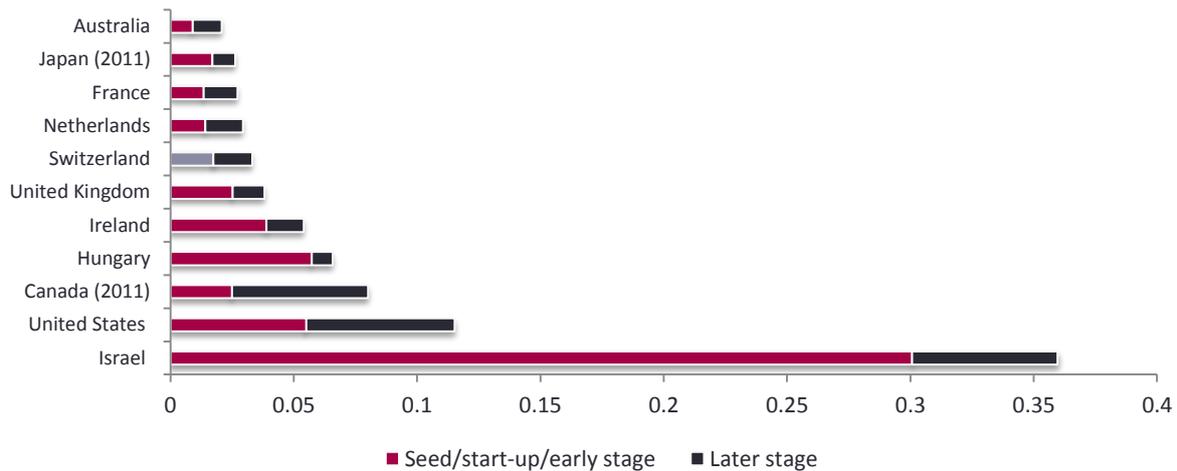
⁵ van Stel et al (2005)

⁶ Rosenberg, D. (2002)

⁷ NESTA (2009)

totals just 0.02% of GDP, one quarter less than that of Canada and only around one twentieth of the level of VC investment in Israel. (Figure 1) Lack of capital availability within Australia can result in startups that would otherwise operate domestically moving offshore for funding causing a reduction in potential employment and GDP growth. The relative lack of activity by local VC funds can have implications beyond capital availability as in successful innovation ecosystems internationally, VC funds have traditionally been the key intermediaries facilitating collaboration between the various members of innovation ecosystem.

Figure 1 Venture Capital Investment as a % of GDP: Selected OECD Countries



Source: OECD, *Entrepreneurship at a glance 2013*

This report analyses the current structure of innovation ecosystems in Australia. In particular the role played by Australian VC funds as both providers of capital and intermediaries between the various agents of Australia’s innovation ecosystems. The report also identifies trends toward alternative agents both internationally and in Australia that are performing these functions while overcoming a number of factors that have led to reduced investment in VC funds. Section 2 assesses the importance of VC and identifies successful innovation ecosystems internationally. Section 3 analyses the current state of VC funds in Australia and the role they play in funding Australian start-up firms. Section 4 explores VC funds as an asset class including historical performance, suitability for various investor types and barriers to investment in VC funds. Section 5 analyses alternative agents in the innovation ecosystem that have the potential to perform the functions traditionally performed by VC funds.

2. The Role of VC Funds and Innovation Ecosystems

The term venture capital (VC) broadly refers to any financial capital provided to early-stage ventures. VC is integral to innovation because the sources of capital most utilized by large and sustainable firms - bank debt and capital from public markets – are generally not available to early stage firms. Lack of track record and equity to use as collateral for a loan are characteristic of start ups, thereby imposing an unacceptably high risk for lenders. There are a number of investors and investment vehicles, however, that provide VC to start-up firms ranging from friends and family at the very earliest stages to external capital provided by large funds and corporates.⁸

The nature of VC investments results in a combination of risk characteristics not present in many other asset classes. These risk factors include illiquidity, high minimum capital requirements, the potential for large losses on invested capital and the absence of observable market prices. In the absence of well developed funding structures, these characteristics can lead to market imperfections and a scarcity of capital availability for start-up firms.

Due to the risk of early-stage companies, various investment structures, vehicles and networks have been devised in an attempt to best meet investor requirements. These arrangements attempt to reduce the risk involved in these investments and to maximize the return available to investors. From the investee perspective it is important that adequate VC funding is available to meet the often unexpected cash flow needs of early stage firms and that subsequent funding can be accessed as new opportunities and challenges emerge. It is also important that the entrepreneur retains enough of the potential upside of the venture to ensure that the objectives of investees and investors, namely a successful venture, remain aligned.

Given the traditionally highly symbiotic relationship between VC funds and the innovation ecosystem, one cannot thrive without the other. Consequently in the following sections we examine key drivers of VC funds and innovation ecosystems internationally and the potential opportunities and challenges for the further development of the Australian innovation ecosystem and VC firms.

2.1 Key Drivers of VC and Innovation Ecosystems Internationally

In examining the funding of start-up firms examples can be drawn from successful innovation ecosystems internationally. A thorough analysis of the innovation ecosystems of the United States, Israel and the United Kingdom can be found in Appendix 1. From the analysis four common factors that have been integral to the success of these ecosystems have been derived and are presented below.

1. Exceptional universities and research institutions:

In each of the international cases analysed, internationally renowned Universities and research institutions have been integral to the development of innovation ecosystems.⁹ These organisations

⁸ See Appendix 4 for definitions of key terms used in report

⁹ In the case of Israel, the defence force has played this role.

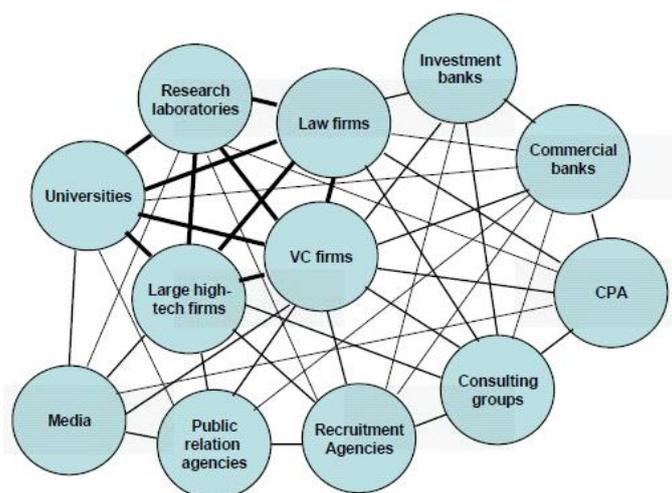
form the basis of strong innovation ecosystems through developing high quality human capital, R&D and technology. However, as noted in the case of the UK, a focus on commercial and practical outcomes rather than pure research is essential for the broader ecosystem.

2. Collaboration across the innovation ecosystem

Collaboration between the various agents of successful innovation ecosystems has been integral to their success. (Figure 2) In both the US and Israel, VC funds have been the intermediary that fulfills this role. Ferrary and Granovetter (2009) note that “Innovation results from a complete network and the entire system is less efficient if only one agent is missing.” They go on to argue that in the Silicon Valley context, VC funds are perhaps the most integral part of this network. This is not due to the funding they provide but through the role they play as the intermediary between entrepreneurs and other important agents in the network. These agents include universities, large companies, laboratories, lawyers, consulting firms, and investment banks.

Ferrary and Granovetter note that at least twelve agents play an important role in the success and robustness of Silicon Valley during periods of global change¹⁰: universities (10), large firms (8,718), research laboratories, VC firms (180), law firms (3152), investment banks (700), commercial banks, certified public accountants (1913), consulting groups, recruitment agencies (329), public relation agencies (311) and media (100 newspapers). (Figure 3) The study notes that these connections allow entrepreneurs in Silicon Valley to access funding, commercialisation and legal advice, business partners and experts. The importance of these connections to new start-up firms is reflected in a number of international VC providers identifying their networks as being more valuable than the capital they provide.¹¹

Figure 2 Silicon Valley's Complex Network of Innovation



Source: Ferrary and Granovetter (2009)

¹⁰ Numbers in brackets signify the number of each category of agent that have a presence within Silicon Valley.

¹¹ For example see Cambridge Associates: <http://cic.us/who-we-are/>

3. International reputation in target industries and presence of international firms and capital:

Innovation ecosystems that have been sustainable and successful have built a reputation around a single industry and have been supported by large multinational companies in that industry. For example, in the US Silicon Valley focuses almost solely on technology while a separate biotechnology ecosystem has been developed in Boston around large biotechnology firms like Merck and Pfizer. Tel Aviv's focus solely on technology has enabled it to attract more than 20 of the world's largest technology firms to begin operations in the area. The presence of International firms has preceded the development of sustainable innovation ecosystems. For example, beginning with Cisco in 1997, Hewlett-Packard, SAP AG, Alcatel Lucent, GE Healthcare, BMC Software, CA technologies and Philips Electronics began operations in Tel Aviv over a three year period. The presence of these firms have been important to the innovation ecosystem through their role in developing a skilled workforce, providing access to state of the art equipment and technology and assisting in promoting the areas international reputation. The presence of large firms is also important to VC funds and investors as they increase potential exit options (through acquisition) and may engage in joint ventures with start-ups or engage in CVC.

4. Financial incentives to build critical mass

With the exception of Silicon Valley, from which many of the world's largest technology firms originated, financial incentives have played an important role in attracting large international firms and international investors to an innovation ecosystem. (Table 1) This suggests that government incentives are critical to developing an innovation ecosystem to the point of critical mass. The relatively low level of financial incentives in the US suggests that once critical mass is achieved the ecosystem can remain sustainable without the same degree of government support.

Table 1 Comparison of International Government R&D Incentives

Country	Nature of Benefit Available	Income Tax Benefit Generally Available
Australia	Tax credit Grants	1. Refundable tax credit of 45% of eligible expenditure incurred where aggregate gross receipts are less than \$20m 2. Non-refundable tax credit of 40% of eligible expenditure incurred where aggregate gross receipts are \$20m or greater
Israel	Tax rate reductions and grants	1. Tax rate reductions through the Alternative Tax Program and Strategic Program 2. Several grant programs are available
United Kingdom	Super deduction and credit	1. 130% volume-based super deduction for large companies. 2. 225% volume-based super deduction for SMEs 3. Cash credits for loss position SMEs 4. Patent Box
United States	Tax Credits	1. 20% traditional credit or 2. 14% Alternative Simplified Credit

Source: Deloitte, (2013) *Global Survey of R&D Tax Incentives, 2013*

2.2 Opportunities and barriers for Australia's Broader Innovation Ecosystems

The following section analyses Australia's performance across the four key parameters for successful VC and innovation ecosystems mentioned previously.

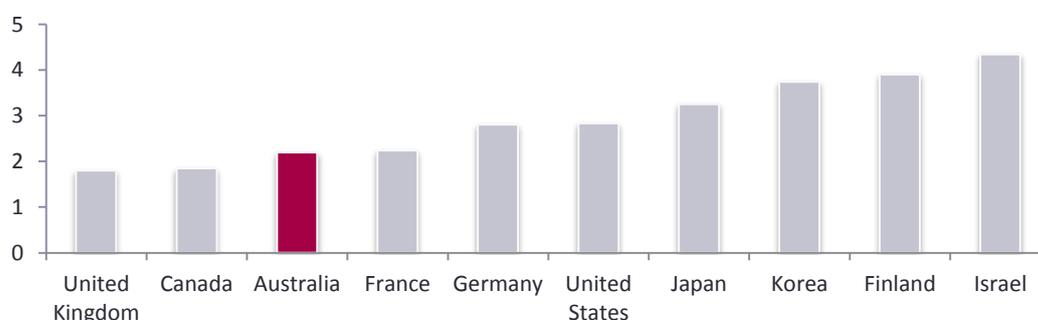
- **Exceptional Universities and Research Institutions**

Universities and research institutions play a key role in supporting both VC and Innovation ecosystems through their role in engaging in research and development to create ideas and technology that can be commercialized by entrepreneurs, providing state of the art equipment and co-working spaces and in equipping the workforce with the skills required to excel in particular industries. Universities can also be involved in the commercialisation of research through in-house incubators and collaboration with industry and VC funds. To highlight the importance of universities in the innovation ecosystem, it is estimated that more than 2000 Silicon Valley companies have been created by Stanford alumni or faculty.¹²

The nature of the research & development and the funding required to provide an industry with a comparative advantage in any given ecosystem can vary greatly depending on the nature and capital intensity of the industry. For example, research and development can require millions of dollars in capital for biotechnology and manufacturing firms but may require less than \$100,000 in funding for software firms and cost almost nothing for service based firms. The skills and equipment necessary to conduct the research and development also vary, a technology or service based entrepreneur may be able to develop the idea either at their own home or at a co-working space provided by a business incubator. Innovations in biotechnology, life sciences and manufacturing are more likely to require professional laboratories available at universities, established corporations¹³ or government owned research institutes. Therefore, the network of agents required to facilitate the research and development stage of an innovative ecosystem can vary greatly across industries.

A broad metric for the amount of resources allocated to the research development stage is gross expenditure on R&D as a percentage of GDP. As can be seen from Figure 6 below, Australia is ranked eighth amongst the 34 OECD countries in terms of gross R&D expenditure.

Figure 3 Gross R&D Expenditure (% of GDP)

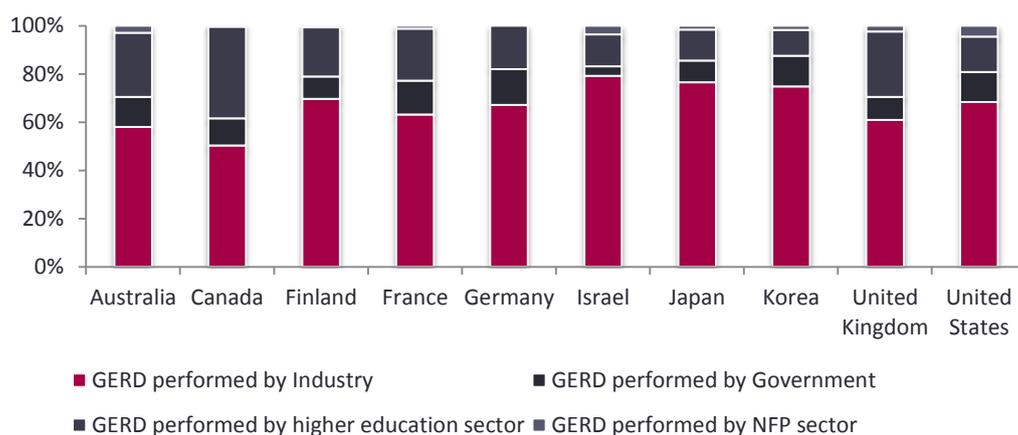


OECD, *Economic Indicators for MSTI*, downloaded Jan 2014

¹² Byers et al (2000)

When looking at gross R&D expenditure in terms of its potential to contribute to an innovation ecosystem and generate commercial outcomes, it is also important to identify the nature of the research being conducted. A 2013 report by Acil Allen Consulting notes that in Australia a little over 20% of all R&D is in pure and basic strategic research, around 37% is in applied research and around 42% is in experimental development (see Appendix 4 for definitions of research). Almost all pure and basic strategic research is performed by Universities while industry performs more than 85% of experimental and development research.¹⁴

Figure 4 Percentage of Gross Expenditure on R&D performed by various sources: 2008 (Percentage of Total)



Source: OECD, *Economic Indicators for MSTI*, downloaded Jan 2014

Figure 15 provides an international comparison of R&D funding sources. It is interesting to note that the proportion of total R&D expenditure attributed to higher education in Australia is amongst the highest internationally while industry expenditure is relatively low. This suggests that while pure and basic research may be relatively strong in Australia, expenditure to commercialise the outcomes of the research appears to be lower than average internationally.

While Australian Universities are very strong in pure research (Figure 3), the most recent Survey of Research Commercialisation (2010-2011) suggests that Australian Universities do not have a strong record in developing these ideas into invention disclosures and patents that can lead to inventions and products that can be commercialized. The survey shows that Australian institutions issued 2.0 patents per \$US100m in research expenditure, well below the US (7.7), UK (7.8), Canada (4.1) and Europe (3.5). Australian Universities also underperformed those internationally in regard to generating invention disclosures from R&D expenditure.

¹⁴ Acil Allen Consulting (2013), *Benefits Realisation Review of Excellence in Research for Australia*.

Figure 5 Australia's Research Quality: An International Comparison

	AUS	CAN	FRA	UK	GER	JAP	SWE	USA
Publications in top-quartile journals per 1000 inhabitants	1.32%	1.22%	0.68%	1.22%	0.74%	0.38%	1.61%	0.89%
Share of world's top 1% highly cited publications, natural sciences and engineering	3.70%	5.10%	5.30%	9.60%	8.00%	3.30%	2.20%	33.10%
Quality of scientific research institutions	5.8	5.5	5.5	6.2	5.6	5.6	5.6	5.8

Source: Austrade (2013)

To assist in this regard, a number of Universities have established commercialisation departments to generate business outcomes from their research outputs. According to the 2010-2011 Survey of National Commercialisation, Australian universities (11) have more full time employees dedicated to commercialisation than the US (10.9), Canada (9.1) and Europe (7.2) but lower than the UK (25.7). As evidenced by the statistics on commercialisation, these departments have had limited success to date. The number of licenses, options and assignments per \$US100m of research expenditure between Australian Universities (8.3) and industry partners is also much lower than those of international universities. This may be due to non-standardisation of agreements between universities and business partners, difficulties in determining ownership shares and lack of resources and expertise in funding and managing patent portfolios. One example of an outsourcing model currently being pioneered by the University of New South Wales is explored in Box 1 below.

Box 1 University of New South Wales: Easy Access IP

In late 2011, in answer to the large amount of intellectual property and a lack of commercialisation resources internally, the University of New South Wales launched its *Easy Access IP* program. The program provides a less complicated and standardized process by which businesses and entrepreneurs can obtain the rights to selected intellectual property and inventions created by the university. The scheme also means that the University does not have to worry about the lengthy and expensive patenting process.

When speaking of the rationale behind the program, Les Field, the deputy vice-chancellor for research at UNSW acknowledges that private businesses are better equipped to commercialise the research undertaken at Universities.

Traditionally, VC funds have cited the lengthy processes and reluctance to give up control shown by Australian Universities as deterrents to engaging more with the sector. While other Universities may be reluctant to completely give away IP for free as per the UNSW model, a standardized royalty based transfer of IP from Universities to the private sector could result in a mutually beneficial outcome for both parties and for the Australian Innovation Ecosystem.

In house incubators and greater collaboration with industry may also lead to increased commercial outcomes for universities. For example, the University of Melbourne is undertaking a number of strategies to facilitate the transition from high quality research through to successful businesses, these include the Melbourne Accelerator Program, an in house incubator for engineering students

Submission to Financial System Inquiry

jointly run by academics and industry professionals with a portfolio of 10 ventures and an \$8 billion dollar joint venture research centre with Microsoft that aims to develop and commercialise computer products that react to human senses and brainwaves.

The UK government has also been active in initiating programs to facilitate increased collaboration between universities and other members of the innovation ecosystem (see Appendix 1). Initiatives such as the Patent Box (which reduces the tax rate to 10% of all profits derived from an eligible patented product), the Higher Education Innovation Fund, and the Catapult Innovation Centres are all designed to develop stronger commercialisation links between industry and research institutions, with the aim of more tangible outcomes from R&D and retaining innovative firms in the UK.

- **International reputation and presence of international firms and capital**

Large established and preferably multinational firms are a key component in building the international reputation of an innovation ecosystem. This reputation is essential for attracting both domestic and international capital to innovation ecosystems and for incentivizing entrepreneurs to remain in a given location. Silicon Valley has been the birth place and is now surrounded by most of the world's largest technology firms and part of Israel's success has come from its ability to attract regional operations of these firms to Tel Aviv. Elsewhere in the US, the Massachusetts Neuroscience Consortium (with members including Biogen, Merck and Pfizer) facilitates early stage research in pharmaceuticals and introduce academics from universities in the area to commercialisation opportunities.¹⁵

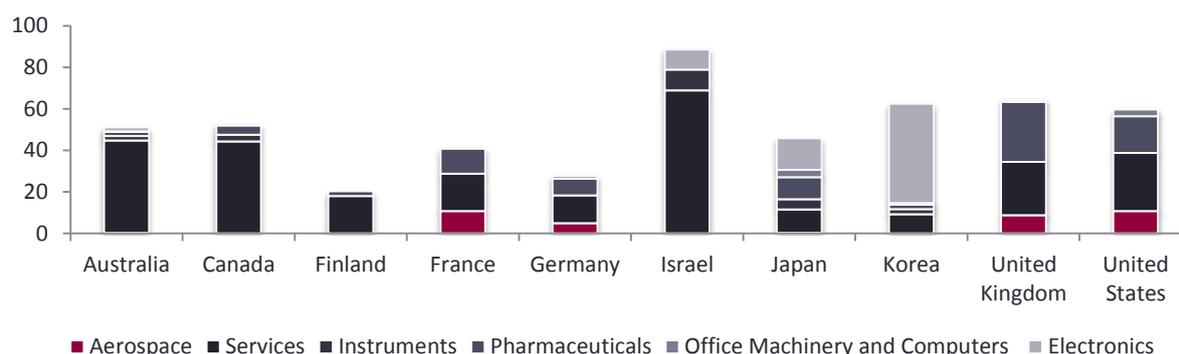
Established domestic firms can also play an important role in building the international reputation of an innovation ecosystem through engaging in R&D and innovation. According to KPMG's Developed Country Innovation Indicators for 2012, Australia does not compare favourably with the rest of the world in regard to company level innovation, being ranked 10th out of the 10 countries studied.¹⁶

Once again, one might suspect that industry structure plays a role. Currently more than 50 per cent of Australia's listed firms operate in the financial services and mining industries. Conversely, around 5 per cent of Australia's listed firms are in the healthcare industry and the proportion of information technology firms is negligible. (Figure 13) The dominance of these industries is reflected in their proportion of total Australian R&D expenditure of which manufacturing (24%), mining (22%) and financial services (16%) make up 62% of all business R&D expenditure in 2011-12.¹⁷ The less granular OECD Main Science and Technology Indicators provide a high level view of the different focus of business R&D expenditures across countries. An excerpt of these indicators is included in Figure 14 below. These statistics suggest that a key deficiency in the innovation ecosystems of non-service industries in Australia may be the absence of major investment and investment by established large corporations.

¹⁵ <http://www.masslifesciences.com/programs/neurosci>

¹⁶ KPMG (2012), *Competitive Alternatives*,

¹⁷ ABS (2013), Businesses spend \$18.3 billion on research and experimental development, Media Release

Figure 6 Per cent of Total Business R&D Expenditure allocated to high-tech manufacture and services (2010)

Source: OECD, *Economic Indicators for MSTI*, downloaded Jan 2014

In recent years, Australia has become home to a number of small and medium sized listed biotechnology firms (For example CSL, ResMed and Cochlear). While these firms have been successful they have yet to begin engaging in corporate venture capital to assist the sustainability of new firms in the Australian Biotechnology ecosystem. The successes of these firms have however begun building international interest in Australia's Biotechnology sector. For example, the US based Cephalon recently acquiring a stake in Melbourne based biotechnology firm Chemgenex. This relationship lead to a subsequent joint venture between Cephalon and Melbourne based Mesoblast.

- **Collaboration across the innovation ecosystem**

Strong networks across the innovation ecosystem have been essential to successful innovation ecosystems. Ferrary and Granovetter (2009) note that the entire innovation ecosystem is less efficient if only one agent is missing and that collaboration between all agents is crucial. A major barrier to growth in Australian Innovation ecosystems is a lack of collaboration between established corporations in Australia and other members of the innovation ecosystem.

According to a 2013 report by the Department of Industry, Australian organisations are amongst the least collaborative of all OECD countries (Table 6). Research suggests that this is to both their own and the country's detriment. As the 2013 Australian Innovation System Report finds, businesses that collaborate with research organisations are more than twice as likely to report increases in productivity. Both SMEs and large Australian firms rank poorly with regard to innovative collaboration (ranked 27th and 28th respectively out of 34 OECD countries) Greater collaboration with international firms in which Australia has strong research capabilities could lead to more commercial outcomes from Australian research and lay a foundation for a sustainable innovation ecosystem built around Australian firms over time.

Table 2 Collaboration between members of Australia's Innovation Ecosystem

	2006	2007	2008	2009	2010	Ranking against OECD countries
Proportion of Australian Businesses collaboration on innovation (% innovation-active firms)	20.6	-	17.1	-	25	23rd
Proportion of SMEs collaborating on innovation (%)	17.7	-	16.9	-	24.9	27th
Proportion of large firms collaborating on innovation (%)	23.5	-	23.5	-	24.4	28th
Proportion of innovation active SME firms collaborating with universities or other research institutions excluding commercial (%)	12.1	-	9.5	-	9.6	15th
Proportion of innovation active large firms collaborating with universities or other research institutions excluding commercial (%)	12.7	-	15.8	-	13.7	21st

Source: Australian Government Department of Industry (2013)

As noted by Ferrary and Granovetter (2009), VC funds (and business incubators) have traditionally played an important role to play in creating greater awareness of collaboration opportunities between start-ups and established firms as collaboration can increase the start-ups prospects (and therefore probability of investment returns) through greater access to technologies, expertise and distribution networks. Collaboration between capital providers and established corporations can also lead to syndicate investment opportunities. For example, recent collaboration between Singtel's Innov8 and a number of Australian business incubators lead to increased capital availability to start-up firms.

- **Financial incentives to build critical mass**

As shown in Israel, government intervention through financial incentives can make VC more attractive as an asset class and assist in building critical mass in an innovation ecosystem. The Israeli government intervention focused on both direct funding (and operation) of VC funds and tax incentives to promote investment to increase the funding of VC firms. The Australian Government has instituted both direct funding and tax reductions to incentivise investment in compliant venture capital funds. More than \$1.6 billion dollars have been invested in Venture Capital Limited Partnerships (VCLPs) since the beginning of the scheme, while the impact of more recent tax incentives such as the ESVCLP structure which is discussed further in Box 2 has yet to be seen due to its introduction coinciding with the onset of the global financial crisis. The Australian Government has also been active in direct funding of VC funds through the Innovation Investment Fund which provides matching funding on a competitive tender basis to successful VC funds.

As noted in section 2 tax incentives for both start-up firms and investors can play an extremely important role in building critical mass in an innovation ecosystem. The UK's relative attractiveness in regards to tax rates amongst English speaking developed countries has proved attractive to

international start up from a tax perspective as evidenced by the planned move by Australian tech firm Atlassian to the UK. (Table 2) According to a 2012 report by KPMG, despite reductions, tax is still an area in which Australia falls behind other developed countries competing for start-up capital both on a total tax and tax on R&D basis.

Table 3 International Tax Comparison

Total Tax Index				Total Tax Index: R&D			
Rank	Country	2012	2010 Rank	Rank	Country	TTI	2010 Rank
1	India	49.7	n/a	1	Canada	29	2
2	Canada	59.1	2	2	India	47	n/a
3	China	59.7	n/a	3	Netherlands	57	4
4	Mexico	63.6	1	4	United Kingdom	63.2	3
5	Russia	71.7	n/a	5	Russia	63.9	n/a
6	United Kingdom	73.3	5	6	Mexico	78.7	5
7	Netherlands	77.2	3	7	China	88.6	n/a
8	United States	100	6	8	United States	100	6
9	Germany	122	7	9	Australia	135.5	1
10	Australia	125.1	4	10	Germany	143.5	9
11	Brazil	142.6	n/a	11	Japan	155.8	8
12	Japan	152.3	9	12	France	157.6	7
13	Italy	152.9	8	13	Italy	233.3	10
14	France	179.7	10	14	Brazil	266	n/a

Source: KPMG (2012), *International Competitiveness Report*

One aspect of the Australian tax system which deserves specific mention in regards to start-ups is the taxation of stock options which occurs on vesting rather than on exercise. Stock options are an effective compensation instrument for start-up firms with low cash reserves but strong future prospects. They also play a role in building loyalty between the employee and the company. The current tax structure means that firms in start-ups must pay tax on options when they vest, meaning that income tax on the options must be paid even if cash has not been received (and often cannot be received) at that point in time.

An additional area that may warrant consideration is increased financial incentives for corporates and individuals to engage more in investment in start-up firms. Current financial incentives are provided in VCLP and ESVCLP structures but not for direct investment by individuals or corporations. Financial incentives for individual investors in start-up firms were recently introduced in the UK under the Seed Enterprise Investment Scheme (SEIS) and resulted in greater direct investment by individual high-net worth individuals in start-up firms. A similar scheme in Australia for both individuals and corporate venture capitalists may assist in building critical mass in Australian Innovation Ecosystems.

3. Domestic Venture Capital Funds

As noted in section 2.1, a key component of successful innovation ecosystems internationally has been collaboration across the innovation system. Traditionally, perhaps the most important agent in facilitating this collaboration has been VC funds. This section analyses the current state and conduct of VC funds in Australia.

VC funds first gained a presence in Australia in the 1970s with Bill Ferris' International Venture Corporation (IVC) (which was capitalised at less than \$500,000) and the government owned Australian Industry Development Corporation. In the following decade government incentives played an important role in the development of the VC industry. The Management and Investments Companies (MIC) scheme was a key factor in the rapid increase in total funds under management by VC firms to around \$500 million by 1987.¹⁸ However, after poor performance in the late 1990's investment in VC funds decreased substantially driven by reduced investment by superannuation funds.¹⁹

Total investment in venture capital in Australia has been relatively low at around .02% of GDP²⁰ and has declined post-GFC. (Table 2) It is notable that the average annual investment for the four years since 2008 is only 57% of the previous four year average. A number of reasons have been proposed as to why this is the case. However, as with all investment alternatives the after fee risk adjusted performance of the investment is the most important factor in determining its desirability.

Table 4 Total Funds Raised by VC funds with an Australian Office

Year	Amount (AUD million)	No. of funds raising capital
FY2003	161.82	5
FY2004	96.09	5
FY2005	349.87	6
FY2006	120.60	4
FY2007	356.92	4
FY2008	313.40	5
FY2009	174.89	9
FY2010	158.00	13
FY2011	80.00	2
FY2012	240.02	4

Source: AVCAL Yearbook 2012

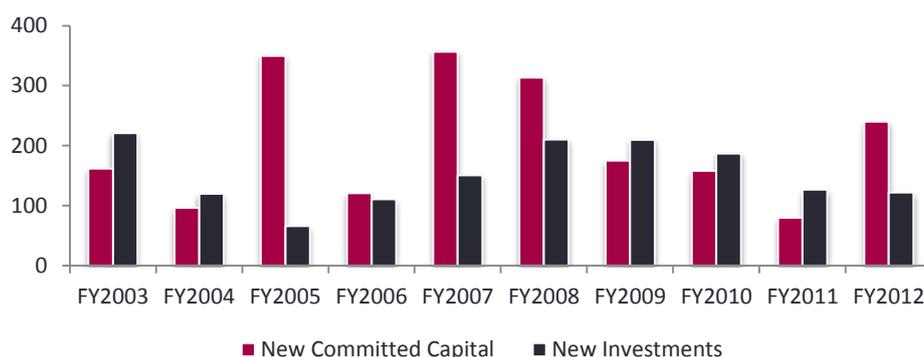
Figure 3 shows the amount of new capital committed and new investments by VC funds each financial year over the period 2003-2012. There has been a marked decline in new committed capital as a proportion of total VC investment since 2008.

¹⁸ Hindle and Gollis (2001)

¹⁹ See Appendix 1: Minutes from funding innovation roundtable

²⁰ The OECD average is just above .04% of GDP.

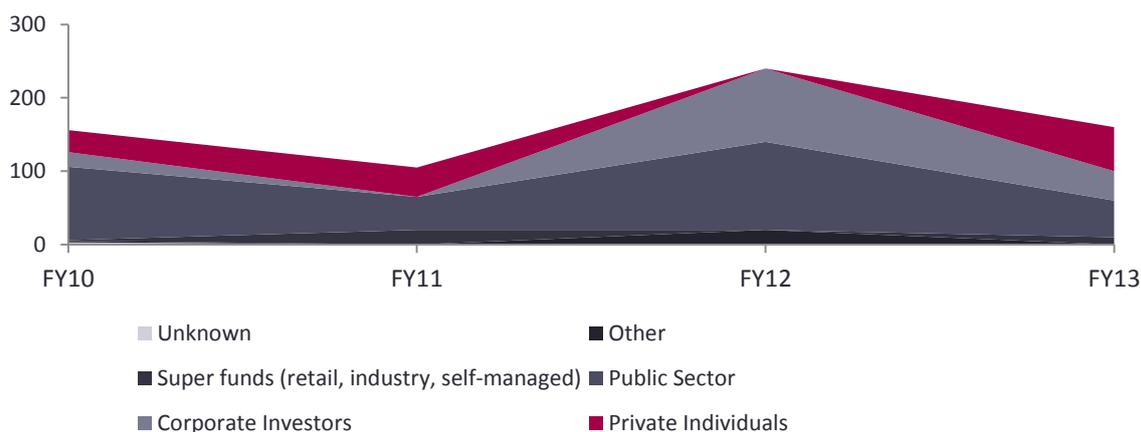
Figure 7 New committed capital and investments of VC funds: 2003-2012 (\$ million)



Source: AVCAL (2013), Yearbook 2013

Over the last three years, more than 50% of total funds raised by VC funds have come from Government funding programs such as the Investment Innovation Fund (IIF) and the Renewable Energy Venture Capital Fund (REVC). The other major source of VC commitments over the last three years has been corporate investors with some commitments being made by private individuals.²¹ The proportion of VC commitments made by superannuation funds has been low. (Figure 4)

Figure 8 Sources of VC Commitment by Investor Type: FY2010-2013 (AUD Million)



Source: AVCAL (2013), Australian Private Equity and Venture Capital Activity Report – December 2013

Structure of VC funds in Australia

The current availability of funding for Australian start-ups has been referred to as an hourglass whereby start up firms have access to small amounts of capital either through VC funds or angel investors and once sustainable, have a number of avenues for raising large amounts of capital either through bank funding or an IPO. However, there is currently a lack of funding in between, at the B round funding stage, known internationally as the “Valley of Death”.²² The Valley of Death can differ depending on industry, however, generally occurs once companies have begun to generate revenue but are still dependent on external capital to meet cash flow obligations and for expansion purposes.

²¹ An overview of VC funding sources internationally is provided in Appendix 3.

²² See Appendix 1: Minutes from Funding Innovation Roundtable

The B round funding stage generally requires a greater investment than when a company first raises capital, making it difficult for many non-syndicate angels and even smaller VC funds to meet the commitment.

In successful innovation ecosystems internationally, large VC funds and the investment divisions of large corporations have been active in filling this gap. The Australian Private Equity & Venture Capital Association Limited (AVCAL) categorises these investments as “later stage VC”. 2013 statistics from AVCAL confirm that only around 20 percent of total VC funding is allocated toward later stage investments with an average investment at this stage of only 1.3 million. Investment at this stage in a company’s lifecycle is less risky than early stage VC investment however the relatively small size of VC funds in Australia makes it difficult for funds to achieve diversification in a portfolio made up of larger B round and beyond investments.

While investor diversification is important, the necessity for individual VC funds to diversify may be overstated. Contrary to suggestions that VC funds require a large capital base to operate effectively and achieve sufficient diversification, a recent study revealed that funds with less than \$250 million outperformed larger funds. The 2010 study of more than 850 US VC funds conducted by Silicon Valley Bank found that the majority of funds larger than \$250 million failed to return investor capital net of fees.²³ The same study found that 66 per cent of small funds returned investor capital net of fees with 10 per cent of small funds returning a multiple in excess of 5 times investor capital.

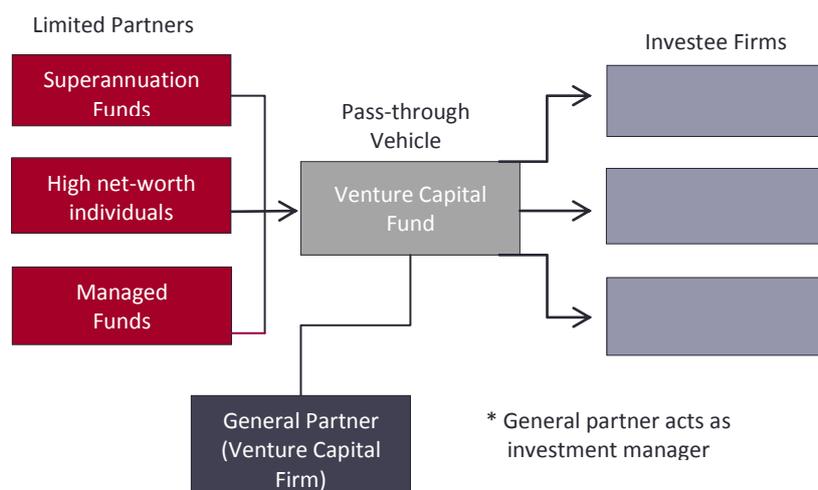
Promising firms that are unable to achieve the required level of B round funding are left with two options 1) continue operations without the required capital which at the very least will reduce the speed of expansion and at worst jeopardise the future of the firm 2) seek capital overseas which can result in both entrepreneurial talent and operations moving to the location of the capital providers. Both of these outcomes reduce the sustainability and development of Australian Innovation ecosystems.

Greater investment in later round funding by VC funds requires either greater interest from international VC funds or greater allocation by domestic investors to domestic VC funds

Conduct of VC funds in Australia

Internationally and in Australia, VC funds typically follow a limited partnership structure. The role of general partner is taken by a VC firm who assumes unlimited liability for the obligations of the partnership. The VC firm also generally acts as the investment manager for the funds raised and is responsible for ongoing engagement with investee firms. Institutional investors and high-net worth individuals join the structure as limited partners by investing in the VC fund. Unlike general partners, their downside risk is limited to the capital committed to the fund. Figure 14 below provides a visual representation of the typical VC structure.

²³ Silicon Valley Bank (2010)

Figure 9 Venture Capital Fund Structure

Source: ACFS

Unlike typical managed funds that are almost always fully invested according to the mandate set in their product disclosure statement, venture capital funds typically draw the capital committed by investors down over time through a series of 'capital calls' as desirable investment opportunities are discovered. This approach also allows venture capital funds to engage in follow on investment in promising investee companies through subsequent rounds of funding.

Returns flow back to investors upon divestment of the underlying investment. Given the illiquid nature of the underlying assets, developing a feasible exit strategy such as an IPO or a separate acquisition of the investment is an important step in the planning stage of any VC investment. This characteristic means that the timing of returns from VC investment can be extremely uncertain. Managing this uncertainty and lack of liquidity must be a key consideration for investors in VC.

In addition to the traditionally limited partnership structure, the Australian federal government has established two alternative structures which provide financial incentives to investors in these funds. (Box 2)

Box 2: VCLP and ESVCLP structures

A Venture Capital Limited Partnership (VCLP) structure is available to funds that invest only in firms with assets less than \$250 million a majority of employees and assets located in Australia and who hold each investment for a minimum duration of twelve months. Furthermore, a number of industries such as real estate, finance and infrastructure are prohibited from investment. To encourage investment of this nature, VCLPs provide a number of tax incentives such as flow-through taxation and capital gains tax exemptions for international investors. VCLP funds are particularly attractive to international investors with more than ten VCLP funds currently operating in Victoria.²⁴ Early Stage VCLP (ESVCLP) structures contain additional incentives including complete exemption from both income and capital gains tax for eligible investments for both domestic and international investors. ESVCLP structures aim to incentivize investment in very early stage start up firms with

²⁴ www.ausindustry.gov.au

total assets below \$50 million. Furthermore, committed capital in an ESVCLP compliant fund must be above \$10 million and below \$100 million.

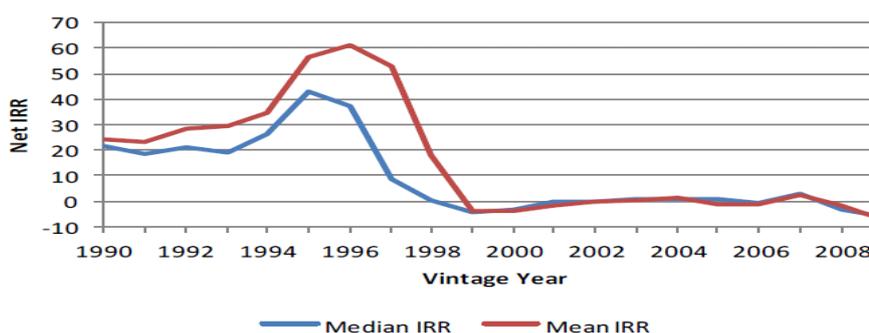
4. Performance of VC Funds and Suitability for Investors

As noted in section 3, a key factor that has led to less capital being allocated toward Australian VC funds has been the risk-adjusted performance of the sector over the last two decades. The following section analyses the performance of VC funds both internationally and in Australia over the last decade, assesses the suitability of VC funds as an asset class for various investor types and identifies mechanisms that could increase capital inflow to VC funds.

4.1 Risk and return of VC Funds: International and Domestic

VC funds are an extremely risky asset class, even in the US which is renowned for its deep and competitive venture capital industry, the 2010 Cambridge Associates benchmark report shows that the average US VC fund with a vintage year after 1998 has barely returned investor capital after fees. (Figure 9)

Figure 10 Venture Capital Fund Performance by Vintage Year

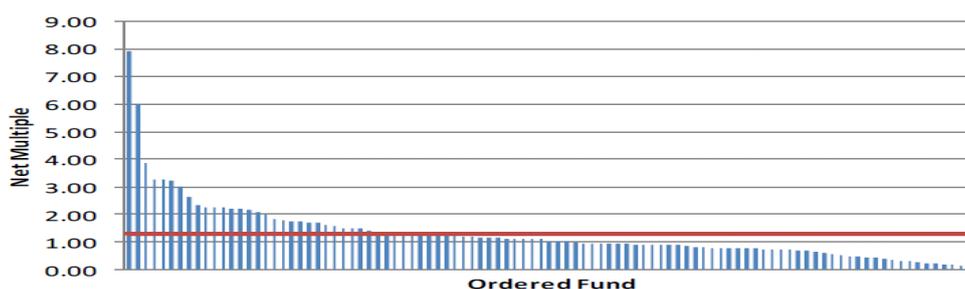


Source: Cambridge Associates (2010), Benchmark Report

In addition to low average returns, a 2012 report by the Ewing Marion Kauffman Foundation also finds that Venture Capital funds have exhibited a strong skew and fat tails²⁵, meaning a small number of funds generate very high returns (up to a multiple of 8) (Figure 10) VC funds are also extremely illiquid, with a need for patient capital as it is often locked up for a minimum of five years. This illiquidity not only causes issues for investors with potential future cash requirements but raises issues for portfolio valuation between transactions and creates mismatches between the evaluation period of the investment committees of institutional investors (usually between 2-5 years) and when returns in VC investment are realised.

²⁵ Cochrane, J. (2001), The Risk and Return of Venture Capital

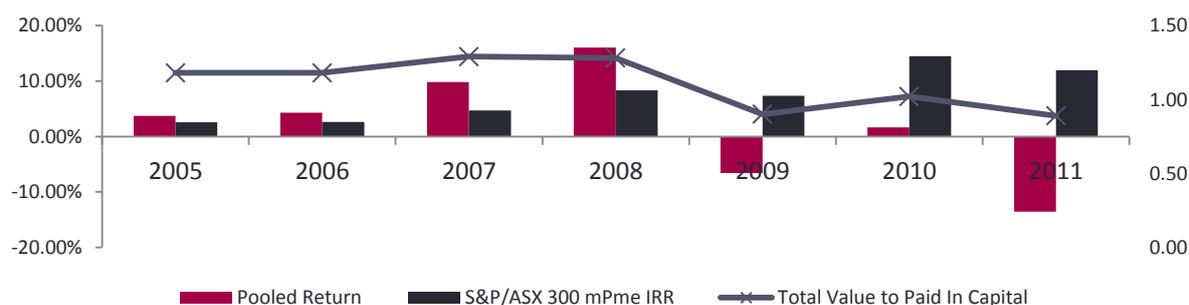
Figure 11 Kauffman VC Portfolio Exit Multiples of Funds (Net of Fees): 1989-2011



Source: Ewing Marion Kauffman Foundation (2012)

Data from Cambridge Associates shows that the returns of Australian VC funds with vintage years from 2005 and beyond has also been poor with an average total value to paid in capital ratio of 1.11 over the period.²⁶ (Figure 14) Based on a public market equivalent basis²⁷, the pooled return of Australian VC funds with vintage years prior to 2008 was greater than that of the S&P/ASX 300 but has significantly underperformed since.

Figure 12 Australian Venture Capital Performance: 2005-2011



Source: Cambridge Associates (2013)

Using the data from the US study which is based on realised returns, the mean return multiple of 1.31²⁸ and extreme volatility in outcomes as evidenced by the dispersion of returns of VC funds, makes it an unattractive asset class for portfolio inclusion (from a pure portfolio optimisation perspective) unless the asset class has very low correlation with the rest of the investment portfolio.²⁹ Unfortunately, due to the illiquid nature of the asset class it is difficult to accurately measure VCs correlation as returns are based on appraisal values which 1) may not reflect the true market value of an investment at any point in time and 2) are not updated frequently enough to determine a meaningful measure of correlation. Despite these shortcomings, it is reasonable to expect that VC would have low but positive correlation with listed equities due to the returns of VC investments being driven more by company specific outcomes than market factors,³⁰ however, the

²⁶ It should be noted that considerable judgement is involved in the Cambridge Associate figures as a significant proportion of the VC fund return (ranging from 60% to 90%) used in calculating performance is unrealised returns based on appraised value.

²⁷ Public market equivalent calculates a dollar weighted rather than time weighted return for an index assuming the cashflows in VC are made at the same time as those into the market.

²⁸ Assuming a 5 year investment horizon this equates to a less than 6% per annum nominal expected return.

²⁹ This is because an asset or asset class should only be added to a portfolio if the new asset's Sharpe ratio is greater than the Sharpe ratio of the existing portfolio multiplied by the correlation of the new asset with the existing portfolio

³⁰ Peng et al (2002)

negative skew of the asset class and low risk-adjusted return suggest that from a pure optimisation perspective VC Funds are only acceptable in the portfolio's of investors with high ability and willingness to take risk.

4.2 Suitability of VC funds for non-institutional investors

The argument can (and has)³¹ been made that allocations to VC can indirectly benefit investors through better broad economic outcomes, job opportunities and the development of new and beneficial technologies. As a result, it has been suggested that various classes of non-institutional investors should have greater access to VC funds. The following section assesses the suitability of VC funds for two classes of investors: Self Managed Super Funds (SMSFs) and Significant Investor Visa (SIV) recipients.

Self-managed superannuation funds

SMSFs have been the fastest growing segment of Australia's superannuation sector with more than half a trillion dollars in funds under management.³² The VC industry has argued that SMSFs are a natural fit for VC investment due to similarly long-term investment horizons.³³

There are a number of issues when considering VC funds as a viable asset class for the majority of SMSF trustees. These concerns center around the ability of superannuation trustees to appropriately assess, manage and tolerate the considerable risk associated with the investment. For most complex investment products, a sophisticated investor test determines whether an investor is eligible to access the investment. Most VC fund structures require an investor to pass this test before they are eligible to make an investment with the fund.

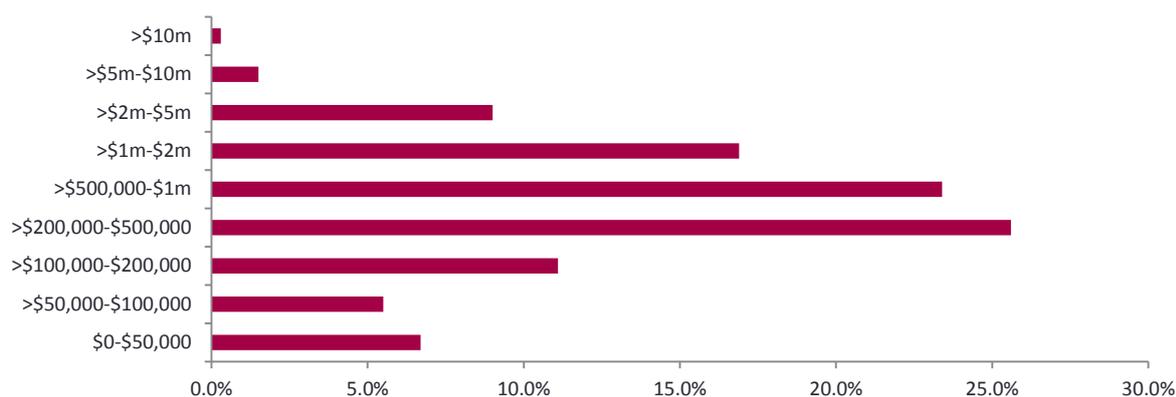
For SMSFs, attaining sophisticated investor status requires the SMSF to have a minimum of \$10 million dollars in assets or alternatively have an individual member of the fund who has attained sophisticated investor status outside of their superannuation investments make a directive to the SMSFs trustee to invest in the restricted asset. As shown in Figure 19, only 0.03% of SMSFs meet the sophisticated investor requirement.

The question then becomes, should VC investment be made more accessible to SMSFs? To answer this question it is important to remember that the primary purpose of superannuation is to provide for the account holder's retirement. According to the ASFA Retirement Standard, a minimum of \$780,000 in superannuation for an individual and \$1 million for a couple is required for a comfortable retirement. Based on these thresholds and the account balance distribution statistics, less than 30% of SMSFs have sufficient assets to meet this goal. SMSFs with total assets in excess of this requirement may have the ability to accept the risk associated with the VC asset class as a small proportion of their portfolio. However, as noted in Section 3, the current after-fee risk-return characteristics of VC make it an unattractive asset class from a portfolio optimization perspective.

³¹ See Appendix 1: Minutes from Funding Innovation Roundtable

³² APRA (2013), Annual Superannuation Bulletin

³³ Frost (2012), Venture capital's call for more funding from SMSFs, The Australian, 18/10/2012

Figure 13 SMSF Account Balance Distribution for 2011-2012

Source: ATO (2013), *Self-managed super fund statistical report – June 2013*

Significant Investor Visa recipients

Another potential source of capital for VC funds is through investments made via the Significant Investor Visa scheme that was established in late 2012. The scheme requires an investment of at least \$5 million dollars to be made into a complying investment that is of benefit to Australia. According to Basis Point Consulting, in October 2013, 65 Primary Visas had been granted nationally through the scheme and another 422 applications had been lodged representing around \$2.5 billion in potential capital inflow.³⁴

Currently the scheme does not include VC funds as a complying investment however, the scheme does include investments in managed funds of many other asset classes including infrastructure and real estate are. Furthermore, direct investment into private Australian companies is considered a complying investment.

The maximum total period of a Significant Investor Visa is 8 years which aligns to the term of VC funds (generally between 5 and 7 years). While section 3 of this report showed VC as risky asset class with low risk adjusted returns, the \$5 million investment required to apply for a significant investor visa is well beyond the investable assets required to achieve sophisticated investor status.

4.3 Overcoming Barriers to VC Fund Investment

As mentioned above one factor that has impacted the ability of VC funds to attract investor capital has been their risk adjusted performance and low liquidity. Broadly, there are three ways in which VC funds can be made more attractive to institutional investors: higher after-fee returns, lower risk, and/or increased liquidity. A number of strategies that VC funds could employ to achieve these objectives are provided in the remainder of this section.

1. Alternative fee structures

VC funds charge notoriously high fees with an almost universal 20/2 fee structure used by Australian VC funds. The fee structure means that VC funds apply a 2 per cent fee on all committed capital

³⁴ Basis Point (2013), Significant Investor Visa, November 2013

(whether or not it is invested) and an additional 20% of all realized returns above a specified benchmark. While it may be true that the due diligence and ongoing engagement required by VC funds is above that required by investment analysts in other asset classes, researchers have argued that the fee structure is poorly aligned to the interests of investors by generously compensating VC fund managers regardless of performance.³⁵

2. Greater collaboration across ecosystem

Ferrary and Granovetta note the importance of Venture Capitalists in Silicon Valley not only as financiers of innovative businesses but more importantly as intermediaries that connect the many heterogeneous agents that make up Silicon Valley's Innovation Ecosystem. In Silicon Valley, VC firms are specialised by sectors: telecommunication equipment, software, biotechnology etc and there is both competition amongst VC funds in each industry and specialised networks that have been forged by VC funds between themselves, prospective entrepreneurs and key services providers relevant to the industry. These links are also advantageous to the VC funds as they develop greater expertise and technical knowledge on the products and services proposed by prospective investee companies as well as the risk of substitute technologies.

Strong networks across the innovation ecosystem can also present VC funds with opportunities to reduce the risk in investee companies through developing relationships with a variety of experts in the sector that can provide both technical and commercial expertise to the investee company. Ferrary and Granovetta notes that by engaging in five key, functions VC funds can increase both the performance of specific investee companies and the aggregate performance of start-ups in their ecosystem:

1. Financing – both directly to the firm and indirectly to other players in the innovation system
2. Selection – choosing the ideas with the greatest chance of success
3. Signalling – a start up funded by a well known VC is more likely to get interest from higher quality employees and from other agents in the innovation system
4. Collective learning function – the stability and continued presence of VC funds allows them to build experience and pass this experience and management expertise on to the next round of entrepreneurs.
5. Embedding – VC firms have the ability to put new entrepreneurs into the existing network of agents and facilitating service and information exchange.

3. Increased Syndicate investing

Syndication allows venture capital funds with a smaller asset base to achieve greater diversification in their portfolios and can increase the breadth of networks available to both the syndicate and the investee company. Research has shown that early stage firms that receive investment from two or more VC funds are more likely to have a successful exit.³⁶ Syndication amongst VC funds is already

³⁵ Ewing Marion Kauffman Foundation (2012)

³⁶ Siddiqui (2010), Venture Capital Syndication in Australia: Patterns and Implications

prevalent particularly amongst Australia's biotech VC funds however there is scope for greater syndication between traditional VC, angel investors, business incubators and corporates interested in engaging in corporate VC.

4. Fund of Fund Structures

From an investor's perspective, risk can also be reduced by greater diversification through fund of fund structures, given the large negative skew and large multiples made on a select few investments, diversification in VC is even more important (for an investor with average fund selection skills) than in other asset classes. Fund of funds in the venture capital space have been slow to take off due to taxation and fee concerns however the launch of a tax-free VC fund of fund by Artesian in 2013 shows that innovation is occurring in this space.

5. Mechanisms to increase liquidity

The Australian Small Scale Offerings Board has created a platform to create a secondary market for VC investment and hence increase liquidity, however the ASSOB secondary market is not currently a core focus of the business. Recent trends and legislation related to crowd sourced equity funding internationally suggest that secondary markets for start-ups will become more available.

Box 3: Australian Venture Capital Fund Innovation

While the previous section has provided a rather bleak description of VC funds, there are a number of Australian VC funds experimenting with new business models, particularly greater collaboration and syndicate investing in an attempt to overcome the barriers to VC fund investment.

Melbourne based **Adventure Capital** has sought to develop greater engagement with both the broader innovation ecosystem and potential investee companies through establishing the York Butter Factory Business Incubator and co-working space. Members of Adventure Capital's investment team share the co-working space with the teams of potential investee firms allowing them to better assess the risk involved with prospective investments. Adventure Capital has also been active in the establishment of Aurelius Digital, a network of angel investors which provides the Adventure Capital staff with an opportunity to collaborate with angel investors in identifying potential deals and syndicate investment opportunities.

BioScience Managers also based in Melbourne have been active in collaboration across the innovation ecosystem. Establishing international networks, including specialists in biotechnology and life sciences, researchers and technical experts has assisted both their own decision making and provided their investee companies with an extended support network. This has improved the proportion of successful companies within the BioScience portfolios and lead to more consistent performance amongst individual investments.

5. Alternative Providers of Early Stage Capital

Coincident with the sharp reduction in capital flows to VC funds has been the proliferation of alternative vehicles and investment structures that are able to perform the functions traditionally performed by VC funds, namely capital provision and intermediation. These alternative providers have also been improving the risk-return profile of such investment by engaging in a number of the strategies listed in Section 4. The following section analyses the current state of a number of these alternative providers of VC in the context of Australia.

5.1 High-Net-Worth Individuals / Angel Investors

High-Net-Worth Individuals (HNWI) through VC funds, angel networks, family offices and individual business angels are the largest providers of external capital to early-stage ventures both in Australia and in the US. It is estimated that in excess of 80 per cent of all capital provided to start-up businesses is provided either directly or indirectly by HNWI. As shown in figure 9 however, the proportion of total Australian VC funding that has come from HNWI has been as much as \$60 million in a year but this flow has been extremely volatile.

HNWIs generally have more ability to take risk than other investor types however it would appear that for many HNWIs, the risk return profile of Australian VC funds has generally been less attractive to these investors than alternative methods for gaining exposure to early stage companies. It is interesting that this relationship has held even after the introduction of tax incentives for investing through VC funds such as the VCLP (for international investors) and the ESVCLP (for domestic investors).

While not captured in Ferrary and Granovetta's network, angel investors have been as important to the success of Silicon Valley as any other member of the innovation ecosystem. Angel investors provided early stage financing and expertise to Bell (now AT&T), Ford, Amgen, Apple and Google. The importance of angel investors in assisting the successful commercialisation of early stage firms is best illustrated by statistics that show that formal venture capitalists invested less than 2 per cent of US seed-stage funding.³⁷

Like venture capital, angel investors can be broken down into various categories ranging from individual high-net worth individuals to organised groups that share deal information and assess business opportunities together. Super Angels who are particularly prominent in the US are high-net worth individuals that invest large sums of money (hundreds of thousands of dollars) each year into early stage firms.

According to the AAI 2010 National Angel Survey³⁸, in 2010 Australian Angel investors invested more than \$1 billion in early-stage businesses, 50% of this was in seed and start-up companies and was directed mostly toward life sciences, clean technologies, web software and IT. This compares to less than \$200 million invested in seed and early stage firms by Venture Capital in the same year.

³⁷ Wiltbank and Boeker (2007)

³⁸ Australian Association of Angel Investors (2013), <http://aaai.net.au/about-us/>

(Figure 6) This discrepancy suggests that like institutional superannuation funds, high-net worth individuals may be similarly deterred from investment in VC funds due to track record and fee structure and prefer direct investment as an angel investor or through an angel network.

Collaboration between angel investors and other members of an innovation ecosystem can lead to greater awareness of potential deals, syndicate investment opportunities and opportunities to share expertise and networks. In 2010, Adventure Capital picked up on this opportunity and established Aurelius Digital, an invitation only angel investor network that meets quarterly. Select start-up firms that have been invited to pitch at these quarterly meetings have included Whispir and Venuemob who have subsequently received funding from VC funds.

To create an even playing field between different investment methodologies, alignment of the tax incentives available through various VC fund structures and direct investment in early-stage high risk ventures like that conducted by angel investors may warrant consideration. For example, in 2012, the UK brought in the Seed Enterprise Investment Scheme (SEIS) which offers significant tax incentives for individuals who take long-term equity shares through direct investment in early-stage companies. The rationale being that supporting innovation through investment in companies that are not listed on a stock exchange is in the national interest but often carries a high risk and hence the tax relief is intended to offer some compensation for that risk.

5.2 Family Offices³⁹

Family offices manage the investments and financial affairs of high-net-worth families. A 2011 report by Family Office Connect estimates that there were 350 family offices managing total wealth of around \$226 billion at the end of 2011. The size of individual family offices ranges from \$10.3 billion to \$100 million.

The multi-generational objectives of these families means that the investment horizons of family offices are typically much longer than those for any individual investor. Furthermore, their wealth gives them above average ability to take risk and an ability to make investments for altruistic reasons, such as giving back to an industry, as well as financial returns. These characteristics of family offices have made investment in early stage firms, particular B round funding, an attractive option for a small proportion of their total portfolio. Traditionally, due to a lack of in-house specific industry knowledge required to conduct due diligence on early stage investment prospects, this function had been outsourced to VC funds. However, due to poor performance by VC funds, both domestically and internationally, early stage investment is now generally performed by individual family members in their own capacity. Another factor that has been important in this move away from family office investment in VC funds has been the generally lower cost of starting a business as a result of technology, making these investments more accessible to individual investors. The suggestion by family offices is that other key barriers to continuing investment through Australian VC funds is lack of specific industry technical expertise and, diminishing desire for VC funds to engage in B round funding.

³⁹ The observations in this sector are the result of a conversation with a prominent member of a large Australian family office

5.3 Business Incubators

Ferrary and Granovetta note that in Silicon Valley, PR agencies and consulting groups play a key role in the Innovation Ecosystem through organizing social events, meetings and social ties between members of Silicon Valley's entrepreneurial community. Since 2011 business incubators like the York Butter Factory, Geniaus and Angel Cube have been playing a similar role in Australia's technology innovation ecosystem. These incubators generate revenue through leasing out sections of the co-working space to entrepreneurs and also provide funding to promising firms either directly or through their connections with VC firms. The University of Melbourne also runs its own in-house incubator the Melbourne Accelerator Program which is available to engineering students.

The STC Incubator established in 2005 provides dedicated laboratories with high-tech equipment relevant to entrepreneurs in the biotechnology, medical devices and life science spaces and has 20 member organisations across these industries. Since establishment, the STC incubator has catered solely to later-stage firms with the capacity to lease out a dedicated space. However in early 2014, STC has announced that they will be offering a co-working space "The Tap" for early-stage firms in these capital intensive industries.⁴⁰

In section 2 it was noted that one of the most important driver of Israel's innovation ecosystem has been an entrepreneurial culture of risk taking. According to a 2013 PwC report, Australia has one of the best regulatory environments for entrepreneurship however Australians appear to have a much higher fear of failure than other innovative countries. The report also finds that an important influence on entrepreneurial activity is the cultural environment surrounding entrepreneurs. In this context entrepreneurial networks like business incubators and mentors with business experience, for example angel investors,⁴¹ have a key role to play in facilitating Australia's innovation ecosystem.

While currently focused primarily on very early stage companies and only investing small amounts of capital, business incubators in Australia have the potential to assume an important role as a link between key players in the ecosystem. This is already being seen internationally where organisations like US based Cambridge Incubators realize the real value they provide to start ups is the networks they provide, rather than the \$1.8 billion in funding that they have assisted start ups in raising.⁴²

5.4 Corporate Venture Capital Funds

An alternative source of capital to traditional VC for later round funding is corporate venture capital. The investment can be purely based on financial reasons but is more often strategic. Strategic investment is important because corporate VC investors will often include joint operation arrangements in the terms of financing to improve the operations, services and offerings of the investing firm. This strategic aspect of corporate VC provides it with an advantage over traditional VC funds as they are able to accept lower returns on the investment in the start-up if the investment

⁴⁰ For more information see www.stcaustralia.org

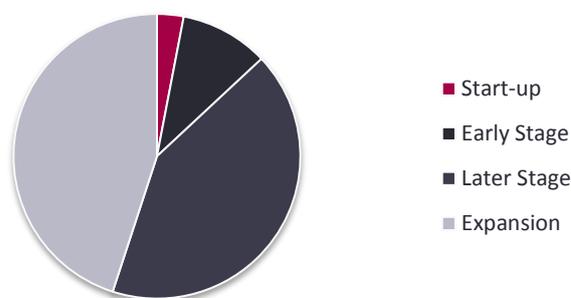
⁴¹ Angel investors are discussed further in section 3.3

⁴² <http://cic.us/who-we-are/>

improves the overall performance of the existing business.⁴³ Corporate venture capital can also assist investee firms in responding to new market opportunities and threats, benefit investee firms beyond the invested capital through access to manufacturing plants, distribution channels and technology. Research has shown that corporate venture capital increases the potential success of start-ups that require specialised equipment and those that operate in extremely uncertain environments.⁴⁴ Conversely, corporate VC may cause issues for start-up firms when the start-up's product is subsequently seen to be in direct competition with that of an investee company. Protection of the IP of start-up firms is also an area that has to be strongly enforced to allow for successful start-up/investee relationships. In the US, almost all corporate VC has been targeted at the early and expansion funding stages for company which suggests it could play an important role in helping to address an area of obvious weakness in Australia's innovation supply chain. As noted in Section 2, the presence of large corporates is also important to VC more broadly as alternative exit options such as acquisition can lower the risk of VC investments.

Corporate VC has been particularly strong in the US with around 13% of all 2010 VC funding deals having corporate VC involvement and many of the US' largest companies including Merck, Google, Microsoft, Pfizer and 3M all actively involved in corporate venture capital.⁴⁵ The two most prominent industries for Corporate VC in the US were biotech (24.8%), industrials/energy (26.7%) and software (11.7%). According to a 2008 report by the National Institute of Standards and Technology, almost two-thirds of corporate VC performed by US corporates was invested outside of the US.

Figure 14 US Corporate Venture Capital Investment by stage: 2006



Source: National Institute of Standards and Technology (2008)

A small number of large Australian firms have begun engaging in corporate venture capital. The most notable of these is Telstra, with Wesfarmers also recently establishing a VC department in March 2013. Singtel's Australian VC arm Optus Innov8 seed has also been active in Australia.

Telstra Ventures

Telstra Ventures was established in 2011 as a wholly owned subsidiary of Telstra corporation. Its focus is on later stage venture capital (series C, D & E rounds) and has stated that it will invest up to

⁴³ Chesbrough, H (2002)

⁴⁴ Park and Steensma (2012)

⁴⁵ NVCA (2010)

\$50m in any single investment. The department looks for start-ups with synergy with Telstra's existing business specifically in the cloud, mobile, media and healthcare (ICT) spaces. Telstra Ventures operates in both Australia and Silicon Valley. Since inception, Telstra Ventures has invested in 6 Australian firms and 3 US firms.

Optus Innov8 Seed

Singtel established the Optus Innov8 Seed fund in Australia in 2011. The fund focuses on A round funding for start-ups in the technology, data and logistics spaces. The fund is active in collaborating with other members of Australia's technology innovation ecosystem including partnerships with Angelcube, the York Butter Factory, the University of Melbourne and Aurelius Digital.

An analysis of the current corporate venture capitalists operating in Australia reveals that there are only a small number of players operating primarily in the technology space. Given the strategic, rather than purely financial motives, of corporate venture capitalists and their capacity to undertake large funding rounds, policies to increase the activity of both domestic and international corporate venture capitalists in Australia should be considered. This is particularly true in industries that Australia is deemed to have a competitive advantage but have high capital intensity such as healthcare, biotech and clean energy.

5.5 Crowd Sourced Equity Funding

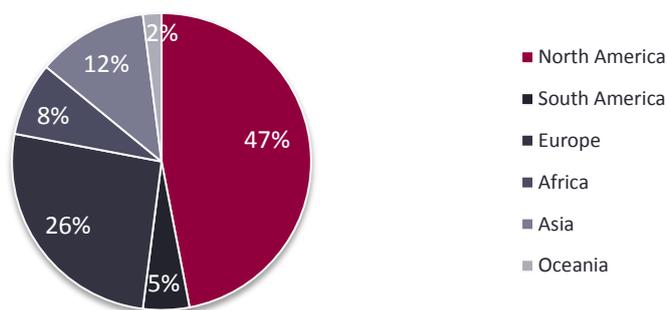
It is estimated that around \$10 billion has been raised through crowdfunding over the last five years, having grown by ten times over this period.⁴⁶ This proliferation of crowdfunding has drawn interest to crowd sourced equity funding (CSEF) which is distinct from crowdfunding as it involves the transfer of financial securities to the capital providers.

The 2012 enacting of the Jumpstart our Business Start-ups (JOBS) Act, in the US has been pivotal for CSEF globally. Particularly relevant in this regard is Title III of the Act which is intended to increase the ease at which start-ups and other companies can use online intermediaries to raise capital. New legislation has also been passed in both the UK and New Zealand to legalise certain CSEF structures.

A 2013 study by Crowd Valley⁴⁷ found that there was significant interest in crowdfunding technologies by a number of the existing players in innovation ecosystems including new companies, angel networks, incubators and universities. The same study estimated the current distribution of crowd funding activity internationally.

⁴⁶ Crowd Valley Inc (2014)

⁴⁷ Crowd Valley Inc (2013)

Figure 15 Crowd-sourced equity funding by region: Per cent of total

Source: Crowd Valley Inc, 2013

In 2013, the Corporations and Markets Advisory Committee began a review of crowd sourced equity funding (CSEF) in Australia to determine whether regulatory changes to legalise CSEF offerings for retail investors in Australia would be appropriate.

In anticipation of potential changes to regulation for CSEF, a couple of Australian platforms are being developed, the highest profile of these is Artesian's VentureCrowd. VentureCrowd is currently been designed for sophisticated investors but will be opened up to retail investors should the laws surrounding CSEF change. VentureCrowd has partnered with almost 20 business incubators and VC funds including Angelcube and the University of Melbourne. The interest in CSEF shown by various members of the innovation supply chain suggest that CSEF platforms could play an important role in raising local, national and potentially international awareness of early stage investment opportunities, building networks across the innovation ecosystem and increasing potential for syndicate investing as well as providing an additional avenue for raising capital.

5.6 The Australian Small Scale Offerings Board

The Australian Small Scale Offerings Board (ASSOB) is an example of how something closely resembling a CSEF platform available to retail investors can be created under current laws. Since being established in 2008, ASSOB has raised more than \$137 million in equity funding for Australian start-up and later-stage unlisted firms. Funding amounts through ASSOB range from \$500,000 to \$5 million. In 2008, ASSOB was successfully raising around \$3 million in new capital for firms a month however post-GFC this figure is closer to \$1 million per month.

The ASSOB model requires that the first \$300-\$600 thousand is raised from investors within a network at a maximum of two degrees from the founder of the company. In later funding rounds, companies can access capital from a broader network of high net-worth individuals however ASSOB does not provide funding directly. Around 60% of all capital raised comes from retail investors and 9% is sourced from international investors. The key services that ASSOB provides are a standardized method to assist entrepreneurs in raising capital from those close to them as well as providing guidance and networks that may provide larger funding in subsequent rounds. Platforms like ASSOB

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provide early stage firms in industries which are not typically covered by VC funds with a platform for raising capital.

It is worth noting that, particularly in early round funding, ASSOBS provides a standardized platform for capital raising through family members and friends. This capital raising may occur without the presence of ASSOBS however the standardization of the process may increase the speed at which capital can be raised and legitimize the capital raising through a formal process.

ASSOB also offers a basic match making service for exchanging equity interests in ASSOBS companies through their Secondary Sales Facility however the service to date remains illiquid with few transactions. This exchange of securities is conducted off-market meaning there is either limited or in many cases no historical transaction data on which to base pricing.

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Appendix 1: State of Innovation Ecosystems Internationally

- **The United States**

The United States has by far the greatest gross expenditure on new ventures of any country in the world. More than \$12.5 billion dollars were invested by VC funds in almost 2,000 deals in the first half of 2013. This compares with \$1.5 billion in all of 2012 in Japan, the OECD country with the second largest venture capital investment. Research by the Kauffman Foundation suggests that less than 1% of the estimated 600,000 new employer businesses created in the United States each year obtained capital from VC funds suggesting that total capital flow into new business is much higher and that US based entrepreneurs are able to access a variety of funding sources and support networks when establishing new enterprises. For example, prior to Facebook's IPO in 2012, Facebook's shareholders included a long list of angel investors and corporate VC funds.

A key contributor to the US's ability to discover and fund innovative early stage companies has been due to the success of Silicon Valley, a region which contains only around 1% of the total US population. Almost 50% of US venture funding and one third of all deals come out of Silicon Valley, California.⁴⁸ In 2005, the region was also home to 22,000 companies and 1.15 million jobs.⁴⁹

Ferrary and Granovetter (2009) describe Silicon Valley as an innovation ecosystem defined as a network that has the ability to continually develop breakthrough technologies that form the basis of new industries. Innovation ecosystems rely on the existence and nurturing of start ups which in turn result from both the ability of the individual entrepreneur and the network of agents surrounding the entrepreneur

In the case of Silicon Valley, breakthrough technologies have continued to be developed for more than 70 years despite global change and competition in software development first from Japan and more recently from India and China. The focus of Silicon Valley on breakthrough technologies has been important to its ongoing ability to attract investor capital, discover new industries, generate new employment opportunities and consistently discover high growth companies. These characteristics of breakthrough technologies are in stark contrast to technologies and processes that focus on generating incremental efficiency improvements in existing industries.

Given the United States' position as global leader in venture and early stage investment it is perhaps surprising that by international standards the amount of Government support afforded to funding innovation is low. The US Government has put a higher priority on IP protection and market-based mechanisms to drive innovation. In regard to financial incentives, the United States has had a research tax credit available to qualified research expenditures that can reduce tax by up to 20 per cent.

This relatively low amount of direct government support for the funding and facilitating of innovation in the US is a testament to the sustainability of the nation's innovation ecosystem, the

⁴⁸ PriceWaterhouse Coopers & NVCA (2013)

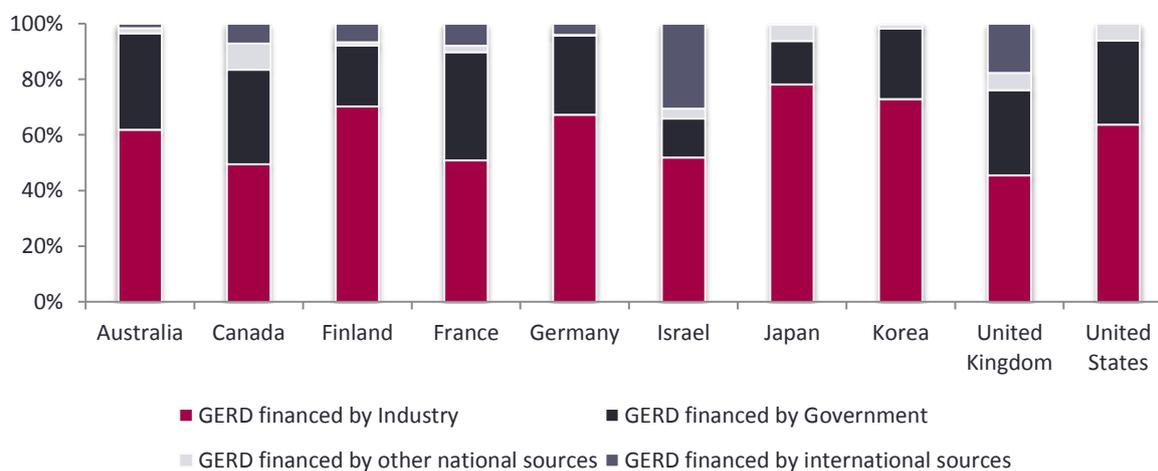
⁴⁹ Ferrary and Granovetter (2009)

networks and collaboration between all the key members in the innovation supply chain, the strong reputation of the country as a destination for start-up investor capital, and the willingness of domestic investors in the US to inject capital into higher risk ventures.

- **Israel**

Since the late 1990s Israel has been at the forefront of innovation with a greater share of GDP invested in venture capital than in any other country. (Figure 1) From the beginning of 2012 through to November 2013 international firms have acquired around \$4 billion worth of Israeli technology firms.⁵⁰ These acquirers have included major multinationals including Google, Apple, IBM and CISCO. Like in the United States, the country's innovation is driven out of a small region with a well functioning innovation ecosystem. For Israel, this region known as Silicon Wadi and is located in the area around Tel Aviv. The path to building a successful innovation ecosystem in Israel has been very different to the unplanned system in Silicon Valley and the Israeli government has played a key role in facilitating its development. One differentiating factor in Israel's innovation ecosystem compared to that of most other countries has been its ability to attract international capital with around 70% of all venture capital funding in Israel coming from international sources.⁵¹ Generous tax benefits offered to international investors in Israeli venture capital have played an important role in this regard. As a consequence, Israel is a stand out in its ability to attract foreign capital to fund innovation has meant that around 35% of all of Israel's expenditure on R&D is being provided by international sources. (Figure 4)

Figure 16 Percentage of Gross Expenditure on R&D (GERD) financed by various sources: 2008* (Percentage of Total)



Source: OECD, *Economic Indicators for MSTI*, downloaded Jan 2014

*Australian figures are not available post 2008

* Public Universities are included under government while non-public university expenditure falls into other national sources

The success of Israel in facilitating innovation sets a benchmark for how an innovation cluster can be created through Government planning, policy and strategy. At a 2013, United Nations meeting, Mr

⁵⁰ Petroff (2013), The author notes that this figure does not include private data so the actual figure is likely to be much larger

⁵¹ OECD (2004), *Venture Capital: Trends and Policy Recommendations*

Yigal Erlich, founder of Yozma, the first government backed Israeli Venture Capital fund listed eight key prerequisites for a successful innovation driven economy.⁵²

1. Entrepreneurial Culture
2. High quality Human Resources
3. Developed Defense-related Technologies and R&D
4. Global Technology Companies
5. Capital Availability
6. Proven Global Exit Avenues
7. Modern Infrastructure (legal, banking, financial, accounting, IP protection)
8. Government Support

For Israel, with the exception of an uncertain environment which may promote an entrepreneurial culture of risk taking, many of these factors have been developed directly through government intervention. The present “state of the art” government research facilities through the military and mandatory conscription have also played an important role in providing Israeli researchers both with an opportunity to apply their research and to an opportunity to engage with cutting edge technology. Mandatory conscription has also provided future entrepreneurs, researchers and venture capitalists with the opportunity to build lasting networks with personnel from these research facilities, an important foundation for collaboration across their innovation ecosystem.

It is interesting to note that while in the present day Silicon Valley most of the factors listed above are sustained organically as a result of collaboration between the organisations that make up its Innovation Ecosystem (Figure 3), Government research facilities did play an important role in facilitating collaboration between the key agents of this network in its early days. In the early part of the 20th century US military and Navy research contracts were integral in getting Universities and research centres to collaborate with military departments and in developing a culture of looking for practical outcomes from their research.

Government policies that promote a strong innovation ecosystem in Israel go well beyond the tax incentives provided in the United States. The Israel Government enforces mandatory conscription for all Israelis over the age of 18, this experience provides an opportunity for young high school graduates to learn applied technical skills and work with advanced technologies.⁵³ In 1993, the Israeli government launched Yozma, a US\$220 million government-owned venture capital fund which resulted in a number of privately owned VC fund offshoots. This presented Israeli entrepreneurs with early stage funding options and helped the nation’s technology ecosystem build a reputation that has led to substantial international capital flows into the sector. Finally, the Israeli government has provided a number of financial incentives including grants and generous tax reductions for start-

⁵² Erlich (2013)

⁵³ Silicon Valley also had strong military research connections in the first half of the 20th century.

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up firms and early stage (particularly international) investors. A 2013 report by PriceWaterhouse Coopers outlines a number of these incentives which are presented below⁵⁴:

- Grants for investment and R&D;
- Assistance by way of infrastructure, reductions in rent for factories in development areas and training of labor;
- Higher rates of depreciation for fixed assets and R&D expenditure for approved activities;
- Funding available to contribute, over two to three years, up to 50% of the approved cost of R&D projects undertaken jointly by enterprises in Israel and the US; and
- Grants of 50% of the approved expenditure are available for beta testing sites;

Furthermore, since 2002 foreign investors have had a permanent exemption from capital gains tax payable on investments in Israeli venture capital funds and approved start up firms.

Israel is a benchmark of how government intervention, particularly foreign investor tax incentives and publicly funded research institutions can be combined to kick-start and generate international interest in an innovation ecosystem.

- **United Kingdom**

The UK has traditionally attracted around one-third of all European venture capital⁵⁵. The UK has been attractive to innovative businesses due to its high expenditure on R&D and for being host to many of the best universities in Europe. The UK has also traditionally been a popular destination for international innovation capital with almost 20% of all R&D expenditure funded by international sources. More recently however there have been a fall of in this funding to the extent that in the 2nd Quarter of 2013, Germany attracted more venture capital. This slip in R&D and an inability to generate economic benefit through commercialising much of the research has sparked a number of commissioned reports and white papers to investigate strategies for enhancing the UK's innovation ecosystem.

These studies have found that while the UK has had an exceptional record in producing pure research, the country has been less successful in introducing innovations to market or facilitating collaboration between research institutions and business. It is interesting to explore the various policies being implemented by the UK to create a sustainable innovation ecosystem as the UK has many of the same advantages and weaknesses as Australia.

The UK government has been extremely active with policies to increase the contribution of gross value added from innovative industries to the UK economy. These policies have focused primarily on driving innovation through large direct and indirect expenditures targeted at research organisations

⁵⁴ A complete list can be found in the PriceWaterhouse Coopers report 'Innovation' which can be accessed via: <http://www.pwc.com/gx/en/technology/pdf/How-governments-foster-innovation.pdf>

⁵⁵ Pritchard (2013)

and start-up firms. The UK government has also been active in initiating programs to facilitate increased collaboration between universities, publicly funded research organisations and business.

Listed below are some of the innovations being utilised in the UK to enhance its innovation ecosystem:

- **Tax credits:** The UK offers extremely generous tax incentives for research intensive firms. These tax credits are largest innovation funding mechanism provided by the UK Government. The UK tax deductions for R&D can be in excess of 200% of expenditure which is one of the highest rates of subsidization for taxation internationally (Table 1).⁵⁶
- **Patent Box:** The patent box scheme which became active in 2013. The scheme allows for a reduction in the tax rate to 10% of all profits derived from an eligible patented product. The intention of this scheme is to both encourage the commercialisation and retention of existing products in the UK and to encourage international researchers and firms to create and commercialise patents in the UK.
- **The Higher Education Innovation Fund:** The fund provides support to higher education organisations to support knowledge exchange between higher education organisations and other agents in the UK's innovation ecosystem. A key objective of the fund is to develop long-term and sustainable relationships between Universities and industry to develop tangible outcomes from the research undertaken at Universities that can benefit the UK economy.
- **Catapult Innovation Centres:** The Catapult program comprises seven research centres located in different areas in the UK that are focused on a number of specialty areas. The centres provide large co-working spaces for industry, individuals and researchers that provide both knowledge share opportunities and state of the art facilities that would otherwise be inaccessible for many start-ups and individual entrepreneurs. The primary objective of the Centres is to produce commercial outcomes and to facilitate collaboration between researchers and industry. The Catapult Centres first became operational in 2013.

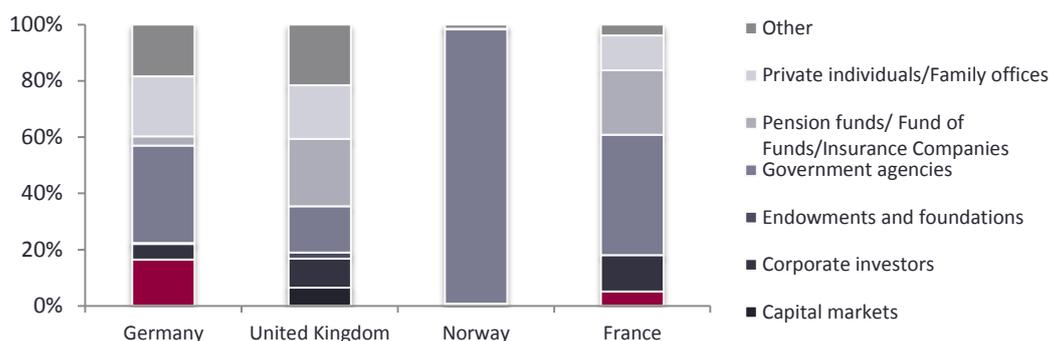
The UK tax credits have been particularly effective in facilitating a viable technology innovation ecosystem in London. As noted in the section on the United States, an innovation ecosystem can be successful without having low tax rates and high government subsidies, however in the cases of the UK and Israel these have undoubtedly helped. Financial incentives can be particularly strong, in industries where a business is not dependent on physical assets (software and technology) *ceteris paribus*, low tax rates and financial incentives can be attractive to innovative start ups.

⁵⁶ According to the Deloitte Report '2013 Global Survey of R&D Tax Incentives', deductions in Singapore can be as high as 400% for complying R&D expenditure

Appendix 2: Funding Sources of VC Funds Internationally

Capital for VC funds internationally has come from various institutional sources and high net-worth individuals. The relative importance of any one segment of funding varies greatly across countries. For example, pension funds and other institutional investors are the key funding sources for VC funds in the US whereas government agencies provide a large proportion of VC funding in continental Europe. Figure 16 highlights the heterogeneous nature of VC funding sources even amongst European nations.

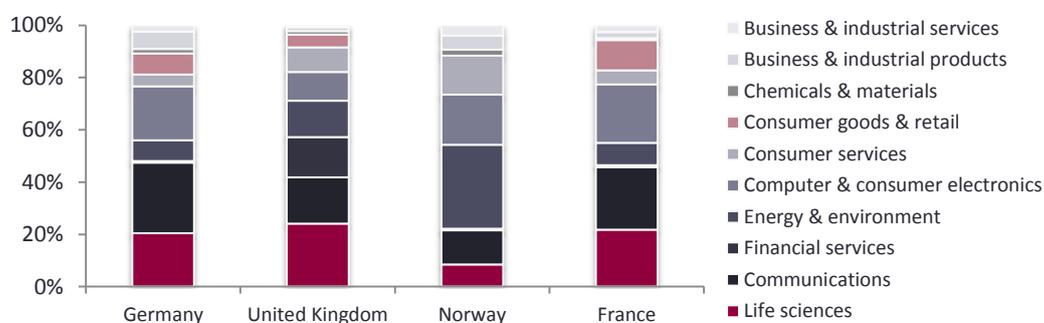
Figure 17 Country comparison of funding sources for European VC funds 2012



Source: *European Private Equity and Venture Capital Association, 2013*

Mayers et al (2003) find that sources of VC funding have a direct impact on the investment activities of VC funds. Their study finds that countries with VC funding coming primarily from banks, insurance companies and pension funds are more likely to find VC funds investing in (lower risk) later stage activities while VC funds who receive funding from private investors and corporations are more likely to invest in (higher risk) early stage VC. The study also finds that VC funds backed by financial institutions and governments are more likely to invest domestically.⁵⁷ Figure 5 below provides a comparison of the VC investment by industry of selected European nations. It is interesting to contrast the heavy investment by primarily government funded Norwegian VC funds into energy and environment with the much more private funded VC of the UK who have a greater focus on financial services and life sciences.

Figure 18 Country comparison of VC investment by Industry by European VC funds 2012



Source: *European Private Equity and Venture Capital Association, 2013*

⁵⁷ Mayers et al (2003)

Appendix 3: Key changes in the US JOBS Act and relevance to CSEF⁵⁸

The following section outlines key points from two of the relevant sections from the US Jumpstart our Business Start-Ups (JOBS) Act which was established in 2012.

Title II of the JOBS Act: Access to Capital for Job creators

- Prior to this Act entrepreneurs were unable to publicly advertise investment opportunities in their company to ‘accredited investors’.⁵⁹ Title II of the Jobs Act has changed this law meaning investment opportunities in start-up firms can now be advertised to accredited investors through tools like online platforms without requiring an accompanying prospectus. This amendment could potential raise awareness amongst accredit investors of early-stage investment opportunities.

Title III of the JOBS Act: Crowdfunding

- Title III of the JOBS Act allows regulated Crowd Sourced Equity Funding (CSEF) Platforms known as ‘funding portals’ to act as intermediaries to both accredited and retail investors
- To receive funding portal status the CSEF platform must provide users of the platform with standardised investment and risk information and must undertake appropriate due diligence to minimize fraud.
- A company may raise a maximum of \$1 million in a 12 month period through crowd sourced equity funding
- Title III of the Act does not allow for CSEF platforms to provide secondary market services to investors.

⁵⁸ Corporations and Markets Advisory Committee (2013)

⁵⁹ Accredited investors is a similar concept to sophisticated investors in Australia. Accredited investors include natural persons with individual net worth, or joint net worth with their spouse, that exceeds \$1m; or natural persons with income exceeding \$200,000 in each of the two most recent years, or joint income with a spouse exceeding \$300,000 for those years, and a reasonable expectation of the same income level in the current year.

Appendix 4: Definitions used in this report

Venture capital funds (VC funds) are pooled investment vehicles that raise funds from institutional and sophisticated investors to provide capital to start-up and early stage companies in exchange for equity in the investee company. VC funds have traditionally played a key role in successful innovation ecosystems as financiers of early stage firms who do not generate sufficient cash flow or are considered too risky for traditional bank financing. Perhaps more importantly, VC firms often provide non-financial assistance through their role as intermediaries between the various networks of an innovation ecosystem.

Corporate venture capital (CVC) refers to departments or subsidiaries of large established corporations that make direct investment in early-stage firms by established organisations in the same industry.

Angel investors are high net worth individuals often with a history of entrepreneurship or business management who provide capital and business expertise to start up firms. Angel investors generally invest both financially and intellectually into high growth business opportunities.

Business incubators: Business incubators provide a space for entrepreneurs to receive mentorship and commercialisation advice. Incubators can also offer a co-working space to develop an innovation culture in which individual entrepreneurs can discuss ideas and share experiences and in some instances also provide small amounts of VC to early stage firms.

Funding Rounds: Start-up firms typically raise capital over a number of funding rounds until they reach a sustainable state at which they can fund new investment through free cashflow or non VC capital providers. The amount of capital required typically increases at each funding round. While funding rounds vary depending on the investment, the dot points below provide an overview of the various funding rounds:

- Round A funding is the first stage at which a start-up seeks external capital from a formal capital provider outside of their family and/or friend network. A round funding is typically used for product development and early stage business operations.
- Round B funding generally occurs after the product or service is generating revenue and is used for new capital expenditure and the working capital required to scale up operations.
- Round C funding or mezzanine finance is often used to fund the transition of a start-up from a private firm to IPO or acquisition.

Innovation ecosystem: a network that has the ability to continually develop breakthrough technologies that form the basis of new industries. Innovation ecosystems rely on the existence and nurturing of start ups which in turn result from both the ability of the individual entrepreneur and the network of agents surrounding the entrepreneur

Pure basic research is experimental and theoretical work undertaken to acquire new knowledge without looking for long term benefits other than the advancement of knowledge.

Strategic basic research is experimental and theoretical work undertaken to acquire new knowledge directed into specified broad areas in the expectation of practical discoveries. It provides the broad base of knowledge necessary for the solution of recognised practical problems.

Applied research is original work undertaken primarily to acquire new knowledge with a specific application in view. It is undertaken either to determine possible uses for the findings of basic research or to determine new ways of achieving some specific and predetermined objectives.

Experimental development is systematic work, using existing knowledge gained from research or practical experience, which is directed to producing new materials, products, devices, policies, behaviours or outlooks; to installing new processes, systems and services; or to improving substantially those already produced or installed.

Crowd sourced equity funding (CSEF) is a process by which firms can raise capital via issuing debt or equity securities through online offers.