A study of New Zealand's venture capital market and implications for public policy

To the Ministry of Research Science &Technology

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Prologue: A View from Boston

Josh Lerner

Harvard Business School and National Bureau of Economic Research

Living and working in Boston, it is easy to be convinced of the power of the venture capital model. The city is one of the great hubs of the venture capital industry, and these funds are integrated into Boston's fabric in many ways. For instance, venture capitalists provided seed funding to many of the leading companies today in the Boston area; the funds employ many of Harvard Business School's graduates; and many academic researchers aspire to make discoveries that will attract the interest of these investors. Venture capital has had a profound and very positive effect on life in the region over many years.

This local view is supported by an examination of studies on the impact of venture capital on the U.S. economy. Numerous works have suggested that not only does venture capital account for an impressive amount of private wealth creation, but has led to important wider social benefits as well. In particular, technological innovation—which economists have long argued is a critical driver of growth and prosperity—has been documented to be closely linked to venture capital funding.

It is natural to wonder, though, whether the venture capital industry can have the same effect elsewhere, particularly in a small and geographically isolated nation such as New Zealand. After all, the industry we see in Boston today is the product of many decades of evolution. The region's venture industry has benefited from its proximity to the many universities of the region and the financial hub of New York. Can these beneficial effects be duplicated in New Zealand?

Certainly, these concerns are reasonable ones. A venture capital industry cannot be created overnight. Even long-run subsidies to catalyze a venture industry can be wasted unless the legal and regulatory infrastructure and sufficiently attractive investments are present. Thus, it is important not to inflate expectations of how rapidly and easily a venture capital industry can be created.

At the same time, it is important to note that the venture capital industry is changing in ways that will make growth of an industry in New Zealand more likely. Investors in the United States and Europe are becoming increasingly willing to look beyond their backyards, and search the world for attractive firms. Major capital markets—particularly those geared towards emerging growth companies—have been much more willing to embrace offerings from anywhere in the world. A number of nations that have "got it right"—who have succeeded in simultaneously creating favourable government policies for venture funds and nurturing nascent technology companies—have reaped an explosive growth in their venture activity, including both domestic funds and overseas organisations.

This study addresses these important and challenging issues. In it, we take both a realistic and optimistic perspective. We acknowledge that there are substantial barriers to developing a venture industry in New Zealand. Venture capital is an "increasing returns" business: it is much easier doing the hundredth venture investment in a sector or a city

than the first. As our interview findings on the New Zealand market emphasise, a corollary to this observation is that pioneering venture funds are likely to face many frustrations and challenges.

But we also point to many hopeful indicators. These include an emerging venture capital market from current policy settings, the changing dynamics of the venture industry world-wide, and the success that policymakers have enjoyed elsewhere. Moreover, the steps required to create a promising venture market are not mysterious: numerous case studies and large-sample analyses have identified unambiguously appropriate and inappropriate steps that policymakers can take.

It is beyond the scope of this prologue to summarise all the recommendations of this study. But three important themes stand out.

The first critical message is that the most important steps that policymakers can take are to create an environment that is conducive to venture investment. Far too often, policymakers have been tempted to directly intervene in the venture market in a way that has ignored the real possibilities and needs of the market. Creating a favourable environment—including addressing problematic tax policies, regulatory hurdles, and barriers to entrepreneurship and the commercialisation of academic technology—is a very important starting point.

A second important lesson is the need for patience. Far too often, policymakers have expected immediate returns from their venture capital initiatives. The historical record teaches us that building a venture capital industry is likely to take many years. The "increasing returns" nature of the venture capital industry means that pioneering funds and entrepreneurs are likely to face many challenges. Impatiently abandoning a venture capital initiative after a few years because it does not seem to be yielding fruit is an all-too-frequent mistake of policymakers.

A third central theme is the need to listen to the market. It is a natural human tendency to want to design detailed policies that are perceived to address public objectives precisely. In the venture capital arena, however, these efforts to "over-engineer" programs have frequently been counter-productive. By attempting to mandate where venture capitalists will invest (e.g., targeting particular industries) or how investments will be structured (e.g. by restricting the securities used), policymakers have frequently hobbled their fledgling venture capital industries. Moreover, potential foreign institutional investors and co-investors, who are often critical to the growth of a young venture industry, are often scared away by such provisions.

It is my sincere hope that this study will be helpful as New Zealand policymakers address these exciting and important policy challenges.

Josh Lerner

September 2005

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Executive Summary

Introduction and context

This study of the New Zealand venture capital market was commissioned by the Ministry of Research Science & Technology (MoRST) and sponsored by a number of other government agencies with a view to informing the development of public policy in this sector.

We define venture capital as a subset of private equity, and that portion that is focused on equity or equity-linked investments in privately held, high growth companies in their seed, start-up and early expansion phases of development.

Private equity funds are pools of capital specialising in venture capital, business expansions, leveraged and management buyouts, mezzanine investments, distressed debt, and related investments. Internationally these pools of capital are typically organised as partnerships and are not listed and traded in the securities markets, and hence the term "private equity".

Public policy interest in venture capital arises from the contribution this form of financing could make to the New Zealand economy, by spurring innovation and economic growth. Thus the study examines venture capital from the perspective of how a vibrant venture capital market could strengthen the New Zealand innovation system and recommends actions the government could take to achieve this.

The study (and this summary) is presented in four Parts; an introduction and context, the role of venture capital in innovation and growth, venture capital in New Zealand, and implications for public policy.

Many start-up firms require substantial capital. A firm's founder may not have sufficient funds to finance the business alone and therefore must seek outside financing. Entrepreneurial firms characterized by significant intangible assets (e.g. intellectual property), negative earnings in their early development, or unproven products are unlikely to receive bank loans or other debt financing, and typically struggle to attract normal equity financing. Venture capital aims to fill this gap in the supply of finance.

The supply of and demand for venture capital within New Zealand (or any economy) is a complex story. On the supply side it includes savings behaviour, tax and regulatory policy, the perceived attractiveness of the country and this asset class from an investor's perspective, and the perceived quality of the legal and commercial law enforcement agencies.

Demand-side influences include the quality of our education and research institutions, their ability to transition bright ideas from the laboratory to the market place, the level of investment in R&D, the willingness of individuals to take entrepreneurial risks and the extent to which New Zealand's culture and education system support this risk taking.

This study focuses primarily on supply-side issues, and specifically on actions the government could take to create a more conducive environment for the development of a venture capital market.

Government initiatives to promote innovation and growth

The Government has set an economic growth objective to return New Zealand's real per capita income to the top half of the OECD. It has recognised that in order to achieve this target a significant transformation of the New Zealand economy into a more innovative, globally connected economy is required. To support this transformation the Government developed the Growth and Innovation Framework (GIF), which identifies three main areas to strengthen the innovation system:

- Growing New Zealand's Research and Development (R&D) capability and encouraging the commercialisation of R&D.
- Developing the formation of networks between businesses that encourage the recognition and realisation of market opportunities, collaborative research efforts, and increased technology and skill transfer between organisations.
- Encouraging the formation of a venture capital market to finance the commercialisation of innovation.

New Zealand invests significant amounts in R&D and business development (but its R&D investment as a percentage of GDP ranks in the lower half of OECD countries). For example, government invests in excess of $1 billion per annum in R&D and programmes related to business development. The nine Crown Research Institutes (CRIs) employ 3,000 research personnel, and total R&D expenditure (public and private) in New Zealand is estimated to be 1.16% of GDP, or approximately $1.7 billion.

In a number of other economies (e.g. the US, the UK, Israel and Singapore) venture capital plays a substantial role in supporting the commercialisation of innovation and the development of young, high-growth firms. It is this prospect that drives public policy interest in New Zealand to develop a sustainable New Zealand venture capital market.

Venture capital, innovation and growth

The financing of young and emerging firms is a risky business. Uncertainty and information gaps characterise these firms, particularly in high-technology industries. These information problems make it difficult for potential financial providers to assess these firms, and can permit opportunistic behaviour by entrepreneurs after the financing is received.

To address these information problems and the challenges of developing these businesses, venture capital investors employ a variety of mechanisms that have proven to be very effective. These include careful selection and screening of investee firms, close monitoring and control of the firm as it develops with the staged release of finance dependent on the achievement of milestones, and experience and networks in transiting the firm to more traditional forms of ownership (e.g. by way of an IPO or sale to a corporate).

Market evidence from the US indicates that venture-backed firms achieve a public listing earlier, grow faster, and are more innovative than their peers.

Rationale for government intervention and its limits

The first—and arguably most critical—task for government is to ensure that public policy settings (e.g. tax and regulatory settings) are conducive to venture capital investments. This involves removing impediments to the formation of venture funds and the companies they back, and may extend to support for the development of such activities.

It is instructive to observe that all venture capital markets of which we are aware were initiated with government support. These markets do not appear to emerge without some form of assistance. This leads to the question as to what it is about these markets that requires the need for government support, at least in their formative stages.

The desirability of venture capital from a public policy perspective lies in the importance of innovation as a spur for economic growth (as recognised in the GIF), and that venture capital appears to be a very efficient stimulator of innovation.

The potential market failures that suggest government assistance may be appropriate and needed to support the formation of a venture capital market relate to R&D spill-overs, infrastructure building, and information asymmetries.

R&D spill-overs (or positive externalities) refer to the divergence between (higher) social rates of return relative to private rates of return from R&D investments. These could arise, for example, from the economic rents associated with innovations accruing to competitors who rapidly introduce imitations, to developers of complementary products, or to the consumers of these products. Where these spill-overs are prevalent firms will invest below the social optimum.

Evidence suggests these spill-over problems are particularly severe among small innovative firms, as these organizations are less likely to defend effectively their intellectual property positions or to extract most of the rents in their product markets. These small firms are also likely to be candidates for venture capital financing. Thus the clients of venture capitalists are often firms that are still at a stage in their development cycle in which R&D spill-overs are prevalent.

In terms of infrastructure building, evidence indicates venture capital is an "increasing returns" business (e.g. the activity of one fund makes it easier for a second fund to operate) and relies on a significant infrastructure (or eco-system) which is relatively specific to it. This infrastructure includes, for example, the entrepreneurs, investors, lawyers, accountants and business advisers, information on the market and the information providers, and the wider capital markets that are familiar with the venture capital process and its requirements. Individual private investors or fund managers benefit from this infrastructure and may be unable to exclude others from also accessing many of its benefits. Thus some aspects of this infrastructure may have the characteristics of a public good (non-rivalry consumption and non-excludability) or a club good (excludability but at least partial non-rivalry in consumption). If so, individual market participants can be expected to under-invest in this infrastructure. This suggests a possible role for government support in the establishment phase of the market, or for a "club" to undertake some of these investments (e.g. the New Zealand Venture Capital Association, or NZVCA).

As regards information asymmetries, empirical research suggests that new firms, and especially technology-intensive ones with products yet to be tested in the market, may be

unable to raise sufficient capital to fund all their positive net present value projects due to information problems in the normal financing markets. This same issue arises for fund managers that wish to raise a venture capital fund in a market for which there is limited or no track record of performance.

Government support for processes that reduce this information asymmetry (e.g. by lowering transaction costs for private investors) may be desirable and efficient, particularly in the early stages of the market's development. The New Zealand Venture Investment Fund (NZVIF) investment in the due diligence selection process of fund managers is an example, as other investors are able to free-ride on such investments (and they appear to do so). This is often referred to as the "certification effect".

At the same time, history conveys some substantial cautions about government intervention to spur venture capital. Literally tens of billions of dollars have been squandered by governments internationally in ill-conceived efforts to stimulate venture capital.

An extensive political economy and public finance literature emphasises the distortions that may result from government subsidies as particular interest groups or politicians seek to direct subsidies in a manner that benefits themselves. In the venture capital context this may express itself in firms accessing support due to their political connections rather than the strength of their business plan, or firms securing support based on their likelihood of success regardless of whether government support is needed to achieve that success (and to try and avoid the politically expensive event of government-backed firms failing).

Over time public programmes tend to converge towards the same market segments as the private sector, rather than addressing gaps in the provision of risk capital. This can potentially crowd out private investors or even delay the development of private participation in the venture capital market.

This tendency of the political decision-making process to lead to sub-optimal outcomes points to the need for the careful design of any publicly funded support for venture capital. The fund-of-fund design used for the NZVIF is a good example of this, whereby the decision-making to allocate funds to fund managers is devolved to an independent board and its staff, and is subject to private investors committing $2 for $1 of NZVIF money to the same fund (i.e. the fund manager must pass a market test prior to obtaining government support).

Venture capital in New Zealand

Prior to the establishment of the NZVIF programme in 2002 and the resulting VIF Seed Funds there was a virtual absence of dedicated venture capital funds operating in New Zealand. Private equity investment activity had been focused in later stage investments, management buy-outs, restructurings and so forth, with occasional investments in the venture capital space.

Government had previously provided support for the venture capital sector by way of the Development Finance Corporation in the 1970s/80s, and the Greenstone Fund in the early 1990s. However neither was dedicated to venture capital and neither led to the formation of a venture capital market.

The NZVIF was established in 2002 with $100 million of committed capital and structured along the following lines:

- As a Crown Owned Company with an independent board of directors. Directors are selected for their venture capital and commercial experience.

- As a fund of funds, investing in privately managed venture capital funds (known as VIF Seed Funds). It invests on a 1:2 ratio in the funds. The Funds must be a minimum of $30 million (inclusive of VIF). To date six such Funds have been established, with five Funds currently active.

- It invests in the Funds on the same terms as private investors, except that (i) other investors in each Fund are provided with an option that is exercisable up to the end of the fifth year of the Fund to buy out the NZVIF investment on the basis of capital plus interest only (i.e. other investors can access any upside above this amount) and (ii) the Fund must operate within the investing profile across seed-start-up-early expansion as set out by NZVIF. It participates in investor governance decisions on the same terms as private investors, with the same voting rights. Investor governance arrangements reflect current market practice.

NZVIF undertakes an extensive selection and due diligence process prior to investing in a fund.

Since its inception NZVIF has also undertaken several activities to promote and encourage the development of the sector, including:

- Establishment of standard venture capital investment documentation, designed for the New Zealand market. Such documentation was not previously available in the New Zealand market and was developed without antecedents, based on standard international best practice.

- Submissions to government on venture capital issues.

- Sponsorship of NZVCA for specific market development initiatives.

- A series of institutional investor seminars conducted in New Zealand, and annual one-on-one education and promotion meetings held with targeted venture capital fund managers and Fund of Funds operating in the Australian market.

- Commissioning of a survey from US based Venture Economics, to identify international venture capital fund managers that may have an interest in New Zealand, and publication of articles in relevant investor journals.

The overall size of the New Zealand venture market remains small (on a percentage of GDP basis, 0.11%) relative to other OECD countries.

This relatively low level of venture capital is further highlighted when the level of New Zealand investment in venture capital is compared with other OECD countries relative to three indicators of innovation; gross expenditure on R&D (GERD) as a percentage of GDP, the number of patents per million inhabitants, and the number of scientific publications per million of inhabitants.

As part of this study we conducted twenty-two structured interviews with market participants. From those interviews, and the available market data, we make the following observations on the New Zealand market and the impact of NZ VIF to date:

- Prior to NZVIF there was little formal venture capital activity and practically none of the infrastructure required to build a venture capital market.

- NZVIF has contributed significantly to the development of the sector. Since its inception there has been a significant increase in the availability of venture capital funds for early stage investments. The programme has attracted $120m of private investment capital for investment in venture capital investments and once fully invested in funds it should attract $200m of private investment capital alongside the NZVIF $100m commitment.

- The current VIF Seed Funds are close to fully invested, which means that limited capital[1] is available for further venturing investments.

- The design of VIF as a fund of funds, and requiring private co-investors, appears to be appropriate to the needs of the NZ market and to be working well.

- However, since the inception of NZVIF, to our knowledge no new venture capital fund has been established without the backing of NZVIF. Thus the goal of self-sustainability appears to be still some way off and it appears so far the sector still requires the involvement of NZVIF to stimulate the market.

- To date neither local nor international institutional investors have invested in the VIF Seed Funds (with one exception). Their involvement will be critical to a self-sustaining sector.

- The NZVIF programme and the VIF Seed Funds have contributed positively to the development of a larger pool of individuals with the necessary skills and expertise in seed and start-up investment.

- Of some concern is the lack of venture capital deals originating from universities and CRIs. Although one of the objectives of NZVIF is to improve the commercialisation of innovation from CRIs and universities, most deals have originated from elsewhere.

In summary, it appears that NZVIF has played a positive and important role in catalysing the venture capital sector. However, the New Zealand market is still small and at a very early stage in its overall development. The sector appears to continue to require government support to develop and does not appear to be close to a self-sustaining position.

Implications for public policy

New Zealand invests substantially in R&D (government and private), even though this investment is less than many other OECD countries. Any mechanism such as venture

[1] It should be noted that the remaining $35 million is expected to be invested in 2 – 3 new venture capital funds over the next year.

capital that has the potential to improve the level of commercialisation of that investment needs to be considered within the context and size of this wider investment.

Our interviews with market participants provided a clear view that the New Zealand venture capital market is in its infancy. We were also left with the impression that the New Zealand innovation system produces relatively good science but struggles to transit innovative ideas from the laboratory to the market.

The question arises as to whether venture capital, as defined in this study, is an appropriate approach to boosting the commercialisation of innovation in the New Zealand context. We consider the evidence suggests it is, as:

- Other small economies (e.g. Israel and Singapore) have benefited greatly from a strong venture capital sector.

- Other financing methods for young, high-growth firms that could supplant venture capital have not emerged (including very little corporate venturing activity). Angel investing, which is a complement to venture capital in many markets, appears also to be in its infancy.

- The structure and operation of venture capital fund managers are well suited to addressing some of the key impediments to the establishment and growth of innovative New Zealand firms, by providing networks and skills to assist New Zealand firms to enter international product markets, to access ever increasing pools of capital as the business grows, and to access attractive exit options for founders and investors once the business is established.

- The venture capital process helps focus scarce resources to those businesses most likely to succeed. In a small economy the efficient use of these resources is critical.

- The fact that New Zealand's legal system is based in the common law tradition and that the country shares a common language with the largest venture capital system also lowers the barriers to the growth of this sector.

We conclude a vibrant venture capital market should bolster significantly the capability of New Zealand's innovation system to commercialise local innovation and convert those innovations into economic growth. We also conclude that the current venture capital market under-services the New Zealand innovation system in terms of the quantum of capital available from locally-based funds and the breadth and depth of services provided by venture capital fund managers.

We question whether the New Zealand venture capital market will ever embody a full set of services, and the size required to fund some firms through their growth cycle, as is available in the much larger markets of the US and Europe.

However, the detail as to the extent to which these services are developed locally versus being imported from other venture capital markets is probably best left to the markets to decide. In our view, the key implication for public policy is to ensure that venture capitalists are able to operate seamlessly across the New Zealand border and that New Zealand tax and regulatory settings are consistent with international norms. In this way New Zealand's innovation system should have access to the most appropriate forms of venture capital.

It is on the basis of the above conclusions that we develop our recommendations for public policy, which are aimed at growing and strengthening New Zealand's venture capital market. We note that some of these recommended policies (e.g. development of the limited partnership arrangements) potentially have relevance for the wider private equity market as the wider market typically uses this legal structure also.

Stage setting initiatives

We consider the first and arguably most critical task for government is to ensure that public policy settings (e.g. tax and regulatory settings) are conducive to venture capital investments. Three groups of activities are particularly important.

First, it is necessary to ensure that entrepreneurship itself is an attractive option (the reason for this is much wider than supporting venture capital markets but entrepreneurial activity drives the demand for venture capital). As one example, we are surprised at the very low level of deal flow to the VIF Seed Funds to date (6%) sourced from universities and the CRIs. Given the large research resources channelled to these institutions each year, this outcome suggests the need to improve the incentives for these entities to commercialise their research and to ensure any impediments to these activities are removed. It is important that government policy to promote the commercialisation of research and the development of the NZVIF programme are aligned, as they are complements – if they are not acting in the same direction neither is likely to succeed.

The attractiveness of entrepreneurial activity also has tax policy implications as studies have documented that its attractiveness is very sensitive to the differential between the effective tax rates on capital gains and ordinary income.

Second, it is important to ensure that international and domestic investors find the New Zealand market attractive, straightforward and well-informed to do business in. In order to create an attractive and well-informed investment environment the government must ensure that tax and regulatory features are in compliance with international norms. Even an appearance of a difference can be enough to deter such investors.

Having a vibrant national venture capital association (or similar organisation) that can gather and disseminate meaningful and timely data in a credible manner is also a critical building block.

Third, government can harness and grow international linkages between the domestic market and other markets relevant to the development of the domestic venture capital market.

We recommend government undertake the following stage setting initiatives to improve the market conditions for New Zealand venture capital.

High priority initiatives

Encourage entrepreneurship

- Identify ways to improve the flow of innovation from universities and CRIs to the market place. This should include reviewing the incentives and impediments CRIs and universities face to pursue the commercialisation of research, with a view to strengthening their incentives and removing impediments. Government

policies in this area and in relation to the NZVIF programme need to be aligned as they are complementary.

Tax and regulatory settings

- Implement a limited partnership arrangement with tax flow-through as already announced, and ensure the detail of this arrangement is tested with those conversant with international norms.

- Remove the tax impediments to trans-Tasman capital flows. This is an issue much wider than venture capital, but it is an important element in assisting the New Zealand venture capital market to access greater scale with respect to capital raising and investing.

- Clarify the capital/revenue distinction for income tax purposes as it applies to venture capital activity and ensure that investing in venture capital is not tax disadvantaged relative to common investment alternatives, and that it complies with international norms from a non-domestic investor's perspective.

Improve information and education on the market

- Provide financial support to develop further an information base on the New Zealand venture capital market by an organisation that is well placed to undertake this development and to maintain this information base over time (e.g. the NZVCA).

- Support the education and showcasing of New Zealand venture capital opportunities to local and international institutional investors.

Harness and grow international connections

- Continue to use international linkages forged by government and its agencies to assist New Zealand venture capital funds and investee firms to form international links, and for international investors to link with New Zealand opportunities. Ensure these services are aligned with the requirements of market participants.

- Support the international showcasing of the New Zealand venture capital market by organisations well placed to do this.

Other initiatives

Encourage entrepreneurship

- Use public events to promote the importance of entrepreneurship and innovation to New Zealand's economic well-being and to celebrate successes, and support such events staged by organisations well placed to deliver these messages.

- Encourage the inclusion of entrepreneurship courses in a wide range of tertiary programmes, including in technology-based programmes.

Tax and regulatory settings

- Ensure that tax losses generated in the early stages of a business' development can be offset against future taxable income even if shareholders change in the interim.

- Ensure the sale of patents is taxed in a manner consistent with the sale of any other capital asset.

- Align the GST treatment of equity investment funds (including venture capital funds) with that of other financial service providers. Explore ways of reducing the compliance costs arising from the requirements of the Securities Act and of unlisted firms issuing employee share options, with a view to ensuring that this form of remuneration is straightforward for small firms to implement.

Harness and grow international connections

- Support networks and associations that connect New Zealanders living overseas with the New Zealand business community (e.g. the Kea network), and make use of these networks and the individuals within them when formulating policy that requires an international perspective.

- Provide scholarships or secondments to promising New Zealand students or professionals to locate for a period in off-shore organisations (e.g. universities or venture capital firms) to learn from and create networks within more developed venture capital markets.

Direct interventions

Another potential though very challenging role - for government is intervening directly in the venture capital process as an investor. To be effective such interventions need to be sensitive to the venture capital market's needs and dictates.

One common failing is for governments to design programmes that ignore the market's dictates. Effective programmes, such as the Israeli Yozma programme (and the NZVIF), address this problem by demanding that private sector players provide matching funds.

A second frequently encountered problem is to ignore the realities of the venture capital process. For instance, many public venture capital initiatives have been abandoned after a few years: the programme designers have apparently not understood that these markets take many years to evolve. Others have added requirements—such as the stipulation that investee firms focus only on "pre-commercial" research—that while seemingly reasonable from a public policy perspective, run counter to the nature of the venturing process. In other cases, reasonable programmes have been undermined by other poorly considered initiatives sponsored elsewhere by government that provide capital to seed and early stage firms at very low rates (or even at zero cost in some granting programmes), and thus distort the market and potential recipients' expectations for venture capital. In New Zealand there are a number of granting programmes that appear to be, from a grant recipient's perspective, a substitute for venture capital (note this should not be confused with government support for pre-seed stage R&D).

The venture capital funding process incorporates, quite intentionally, a rigorous screening and monitoring process of investee firms. This work is undertaken by fund managers

operating in purpose-built entities (in terms of incentives, information and capabilities). The NZVIF programme has been designed carefully to dovetail into these processes. Other government support programmes have not been designed in this way, include decision-making process more distant from the market (and in some cases involving ministers), and in many cases provide capital in the form of a grant (i.e. at zero cost to the firm). These grants can be expected to displace, rather than enhance the development of a venture capital market. The essence of this issue is about the most efficient form of delivery of government support to the venture capital sector – in our view the NZVIF programme is designed appropriately for this task and should be used accordingly.

A third pitfall is the failure to design appropriate evaluative mechanisms. Ideally, programmes should undergo careful scrutiny at two levels. First, each programme should be carefully analyzed. Second, fund managers (in the fund of fund model) or others participating in the programmes should be scrutinized. It is important to ensure that the groups benefiting from these programmes are the most promising in the industry in terms of market performance, rather than simply those most adept at garnering public funds.

A final frequent failing is to ignore the international nature of the venture capital process. Today's venture industry is global on many levels. Investors' capital commitments, venture capitalists' investments, and the entrepreneurial firms themselves increasingly flow across borders and continents. To attempt to build a national venture capital market without strong global ties is a recipe for an irrelevant and unsuccessful sector.

In our view the NZVIF structure is a sound approach for delivering direct government support to the venture capital markets. It distances commercial decision-making from the political process, it requires private investors to match government funding and thereby allocates funds on the basis of market signals, and it supports the development of a market structure that private investors are participating in and can be expected to support in the future (subject of course to its performance). Thus in our view the NZVIF approach has been designed appropriately as a market catalyst and our recommendations below build on this conclusion.

The NZVIF has $35 million left to invest in VIF Seed Funds from its original $100 million commitment from government. It is currently running a round to establish further VIF Seed Funds. In our judgement this initial NZVIF programme of $100 million for VIF Seed Funds will need to be extended if the government wishes to ensure a sustainable New Zealand venture capital is established. It is difficult to be precise as to what additional amounts would be required, and over what period, as it is dependent on a range of market factors such as the success or otherwise of existing VIF Seed Funds managers, the extent to which non-VIF funds invest in the New Zealand market, the extent to which institutional investors support the New Zealand venture capital market, the quantity and quality of deal flow, and so forth.

However, for illustrative purposes, if the NZVIF were to invest in two funds per annum with a VIF compliant component of $50 million each, and its contribution were 1:2 as is the case now, this would suggest it would need to invest $33 million per annum. If this continued for a 3-year period, it would amount to a total additional NZVIF investment of $100 million, and additional total private capital raised of $200 million (i.e. a total of $300 m). If on average each fund invested a similar amount over a five-year period (along with the VIF Seed Funds from the first $100 m), this level of capital raising would build to

approximately 0.08% of GDP (or $120 m in 2004 terms) of venture capital investment per annum in 3 years. This level of investing is about the 75th percentile of the OECD in 2004 (as a percentage of GDP).

The amount of additional capital the government would need to inject for any given level of NZVIF investment would depend on the extent to which NZVIF's interests in VIF Seed Funds are bought out by other investors, thus freeing up NZVIF capital for the establishment of additional funds (the buy-out option permits other investors to buy out the NZVIF interest within the first five years of the fund at the price of the original capital plus the government bond rate).

It is also possible for the NZVIF (and other investors) to sell its interest in a VIF Seed Fund to other investors in the secondary market. Given the buy-out option exists for five years from when a Fund is established, and the limited track record in the New Zealand market to date, its seems unlikely that it would be in the interests of NZVIF and its shareholder to sell its interests in the short to medium term. However it may well be a useful exit path for NZVIF over the long term, once the venture capital market is more established.

It appears to us the NZVIF programme was established with a view to it being a one-off commitment by government. In our view this programme now needs medium term direction (3-5 years) from government, in order to clarify the direction of the programme for the NZVIF Board, and to signal to the venture capital market the level and nature of NZVIF's involvement going forward.

Within this context, we suggest a review of the following policy issue and implementation issue within the NZVIF approach to check they are designed to best achieve the NZVIF objectives. They are:

- In terms of policy, that the level of required matching private funds, and the associated buy-out provision, be reviewed. The rationale for government support of this kind is strongest the earlier the stage of the investment. It is possible that fund managers may be able to raise larger amounts of private matching funds for early stage investments for each dollar of government support if the terms were different to those that currently apply. For example, the matching requirement or the buy-out terms could vary across stages of investment to reflect the greater need for support for investment in the earlier stages. There is no obvious optimal approach, but we suggest it would be useful to review these settings, and to inform that review with a survey of investors and fund managers on this issue.

- In terms of implementation, that more flexibility be given as regards the time at which a fund manager is able to raise a VIF Seed Fund. To date the NZVIF has selected VIF Seed Fund managers from rounds undertaken periodically. We understand a primary driver for this has been to create an environment in which potential managers can be compared, and to create an event to strengthen interest in the programme. However, fund managers are likely to want to raise funds at times other than these rounds, and the round itself may concentrate demand in the investor market that makes fund raising more difficult. Now that the programme is more established and information is available on the quality of potential managers from previous rounds, we suggest this approach be reviewed with a view to providing greater flexibility. We note this implementation issue is a matter for the NZVIF Board rather than being a government policy issue.

We recommend the government adopt the following approach in developing any further direct interventions in the venture capital market.

High priority initiatives

- Develop a medium-term plan for the VIF Seed Fund component of the NZVIF programme. This needs to address the level of funds available to this programme over the medium term (e.g. the next 3-5 years) and the terms on which funds are to be made available (e.g. the matching rule and buy-out terms).

- Avoid the temptation to meddle in the allocation of funds through the NZVIF structure, by for example the government determining which sectors to target (as the expertise and incentives to allocate funds across sectors and within them lies with the venture capital fund managers, not the government).

- Ensure alignment between other government support mechanisms for venturing firms and the NZVIF programme and consider shifting funds from the other programmes to the NZVIF programme. The NZVIF programme has been designed specifically for delivering government support to the venture capital market. Competing programmes that provide low (or zero) cost capital to the same potential recipient firms will undermine the NZVIF programme and the development of the venture capital market, as they do not incorporate the same commercial rigour.

- Strengthen the role of NZVIF to educate the local and international investor market on New Zealand venture capital market opportunities and extend this to the development of an investor-partnering programme aimed at attracting local and international institutional investors to this asset class.

Other initiatives

- Ensure the NZVIF performance is evaluated periodically at two levels; its effectiveness as a programme overall, and the performance of the market participants involved in it.

Future evaluation of NZVIF

We were requested in this study to recommend ways to evaluate the NZVIF programme in the future.

The goals of the NZ VIF are:

- To accelerate development of the venture capital industry by increasing the level of early stage investment activity in the New Zealand market;

- To develop a larger pool of people in New Zealand's venture capital market with skills and expertise in seed and start-up investment;

- To facilitate commercialisation of innovations from the Crown Research Institutes (CRIs), Universities and the private sector; and

- To get more New Zealand businesses on paths to global success by increasing their access to international experts, networks and market knowledge.

The primary policy objective overriding these goals is to establish a self-sustaining venture capital market. Thus, any future evaluation of the programme needs to assess whether a self-sustaining venture capital market has been established, with secondary analysis focusing on the role of NZVIF in the establishment of that market. The former is the most crucial from an economic perspective – NZVIF could perform on all points of the compass but a self-sustaining market may not be achieved for other reasons.

The acid test of NZVIF is whether it can make itself either irrelevant by catalysing a venture capital market which overtakes it or, as with Yozma programme, convert itself into a sustainable fund of funds manager which is independent of government support.

We propose a pragmatic, public management approach to the future evaluation of NZVIF, namely a two-stage process of:

- Evaluation of the primary policy objective – this would be a capital market oriented review of whether or not the venture capital market is sustainable. In public sector management parlance this is a review of outcomes.

- Evaluation of the programme – namely a review of the outputs of NZVIF from a quality, quantity and process perspective. In public sector management parlance this is a review of outputs.

In terms of weighting of effort, the former is the most important. The governance of NZVIF, and ongoing monitoring by departments, should largely attend to the latter.

We counsel against a "scorecard" approach to evaluation. There is little in the literature to support the weighting of criteria and, although appealing in a presentational sense, it suggests fallacious precision. Either the weightings will be incorrect, or the variables will not be independent, or the model itself may be susceptible to external shocks.

We outline a number of methodological issues that are likely to arise in an evaluation of the primary objective and suggest ways of undertaking an evaluation that should go some way to addressing them.

Part I Introduction & context

1 Introduction

This study of the New Zealand venture capital market was commissioned by the Ministry of Research Science & Technology (MoRST) and sponsored by a number of other government agencies with a view to informing the development of public policy in this sector. The terms of reference for the study are appended.

The study fits within the context of a range of initiatives undertaken over recent years by the New Zealand Government to promote innovation and economic growth. In this context the interesting aspect of venture capital is the manner in which this form of financing has spurred economic growth and innovation elsewhere, and the potential for it to make a similar contribution to the New Zealand economy going forward.

1.1 Venture capital and study scope

We define venture capital as a subset of private equity, and that portion that is focused on equity or equity-linked investments in privately held, high growth companies in their seed, start-up and early expansion phases of development.

Private equity funds are pools of capital specialising in venture capital, business expansions, leveraged and management buyouts, mezzanine investments, distressed debt, and related investments. Internationally these pools of capital are typically organised as partnerships and are not listed and traded in the security markets, and hence the term "private equity".

Many start-up firms require substantial capital. A firm's founder may not have sufficient funds to finance the business alone and therefore must seek outside financing. Entrepreneurial firms characterized by significant intangible assets, that expect years of negative earnings in their early development, or have uncertain prospects are unlikely to receive bank loans or other debt financing, and typically struggle to attract normal equity financing. Venture capital aims to fill this gap in the supply of finance.

Thus venture capital fund managers can play a very significant role in providing finance and related expertise to fuel the development of young and growing firms in an economy. There is growing evidence that vibrant venture capital markets spur innovation and economic growth.

New Zealand's venture capital markets however are small and relatively immature. The Government has set a goal, within the context of the Growth and Innovation Framework (GIF), to lift New Zealander's per capita GDP to the top half of the OECD league table. Public policy interest in venture capital arises from the contribution that venture capital could make to the New Zealand economy.

The supply of and demand for venture capital within New Zealand (or any economy) is a complex story. On the supply side it includes savings behaviour, tax and regulatory policy, the perceived attractiveness of the country and this asset class from an investor's perspective, and the perceived quality of our legal and commercial law enforcement agencies. Demand-

side influences include the quality of our education and research institutions, their ability to transition bright ideas from the laboratory to the market place, the level of investment in R&D, the willingness of individuals to take entrepreneurial risks and the extent to which New Zealand's culture and education processes support this risk taking, and the demonstration effect of success breeding success.

This study focuses on a subset of the supply-side issues, and specifically on actions the government could take to create a conducive environment for investment in venture capital, and on possible direct government involvement to encourage the development of these markets. In order to set a context for the study we describe wider government actions that influence both the supply of and demand for venture capital, but analysis of these wider issues falls outside the scope of the study.

1.2 Structure of report

The report is structured in four Parts:

- Part I provides an introduction to the study and its New Zealand public policy context as regards wider innovation and growth initiatives.

- Part II examines the literature on the role of venture capital in innovation and economic growth, identifies lessons that can be learned from government interventions in venture capital markets elsewhere, and explores the rationale for government intervention, its limits and their implications for designing government interventions in this sector.

- Part III explores the history and size of the venture capital sector in New Zealand and the development and impact of the NZVIF programme, and documents the views we received from interviewing market participants. We draw from this material our observations on the development of the New Zealand venture capital market so far.

- Part IV draws out the implications of the findings of this study for the development of public policy for the venture capital market and government's potential involvement it, and we make suggestions for the future evaluation of the NZVIF programme.

2 Government initiatives to promote innovation and growth

Over recent years, the Government has undertaken a wide range of initiatives to promote innovation and growth in the New Zealand economy. These include the development of the Growth and Innovation Framework and related programmes, increasing expenditure on R&D, developing a wide array of programmes to support commercialisation of R&D and business development more generally, and commissioning a number of studies on the capability of the financial system to provide small and medium businesses with the necessary capital to grow. These Government initiatives form an important part of the context within which venture capital markets operate.

In this section, we provide an overview of these Government initiatives (other than NZ VIF) aimed at increasing innovation and economic growth and which are likely to have some influence on the development of venture capital markets.

2.1 Growth and innovation framework in New Zealand

In late 1999 the newly elected Government recognised that New Zealand's social and economic development could not continue satisfactorily without change. It was concerned with the size of the current account deficit and an over dependence on the production and exporting of commodities.[2] New Zealand's skills in the knowledge-based industries were considered lacking and New Zealanders' living standard were continuing to fall relative to their OECD peers.

The Government began initiating policies to facilitate a transformation of the economy and identified the critical role of innovation and knowledge in achieving this and ensuring that New Zealand could compete successfully in the international marketplace.

In February 2002 Prime Minister Helen Clark released the Government's economic growth objectives, the main goal being to return New Zealand's real per capita income to the top half of the OECD. It was recognised that in order to achieve this target a significant transformation of the New Zealand economy into a more innovative, globally connected economy would be required.

While innovation could be driven by businesses, the Government recognised its role in providing a conducive environment to support a more rapid transformation. This led to the development of the Government's Growth and Innovation Framework (GIF).

The GIF identified three main areas to strengthen the innovation system:[3]

- Growing New Zealand's Research and Development (R&D) capability and encouraging the commercialisation of R&D

[2] Helen Clark (2002), Foreword of "*Growing an innovative New Zealand*".
[3] See www.med.govt.nz for the Growth and Innovation Framework, *"Progress Reports August 2003".*

- Encouraging the formation of networks between businesses that encourage the recognition and realisation of market opportunities, collaborative research efforts, and increased technology and skill transfer between organisations

- Encouraging the formation of a venture capital market to finance the commercialisation of innovation (there was a concern that in its absence, R&D would continue to be commercialised largely by offshore interests, resulting in New Zealand not realising the full value of its investment.)

Consequently the Government has led several initiatives and programmes (often in collaboration with the private sector) aimed at achieving the above. At the R&D level, this has included providing funding for research consortia, grants for private sector R&D and establishing centres of excellence for research. At the organisational level it has fostered collaboration amongst stakeholders with programmes to promote the facilitation of crucial networks between businesses.[4]

As part of the GIF programme, the Government recognised the need to monitor New Zealand's progress and evaluate the effectiveness of its economic growth policies. In August 2003 the Growth and Innovation Framework Benchmark Indicators report was published to initiate this monitoring, followed by a second and revised Economic Development Indicators report in February 2005. This report covers indicators on investment, innovation, enterprise, international connections, skills and talent, and economic foundations. These indicators are framed as drivers of labour utilisation and labour productivity, which ultimately drive GDP per capital.

In recognition of the important potential role of venture capital in commercialising R&D and contributing to economic development, the Government in 2002 established the New Zealand Venture Investment Fund (NZ VIF).

2.2 Research and development

The GIF recognises the importance of R&D as a driver of innovation. The 2003 and 2005 Economic Indicators Reports provide a useful measure of the growth and absolute level of R&D in New Zealand. The results show that New Zealand's level of funding remains low relative to international peers.

As at 2003, New Zealand gross expenditure on R&D was 1.15% of GDP (refer to the figure below). While this was up on 1999's estimate of only 1.00% of GDP, it is still in the lower half of the OECD range.[5] The MED suggests that the latter findings may be attributable to the lack of very large firms, distance from large firms and an industrial structure more heavily weighted towards the primary sector than most other OECD countries. [6] Tax treatment of R&D may also have an influence. Several OECD countries have generous tax subsidies for R&D activity, while New Zealand's tax system is basically neutral with respect to R&D relative to other investments.

[4] MED, Growth and Innovation Framework, "*Progress Report August 2003*"
[5] These values were obtained from the report originally produced by the OECD. There have been changes in the coverage of the survey over time, and the 2002 survey expanded coverage of R&D activity compared to previous years. This may have impacted the findings.
[6] See page 57 of MED (2005) report titled "*Economic Development Indicators 2005*".

Although New Zealand's current levels of R&D are comparatively low, expenditure on R&D has grown significantly since 1989. As illustrated below, growth in gross expenditure in R&D in New Zealand has significantly exceeded average growth rates across the OECD, with basic expenditure in R&D growing even more rapidly. [7]

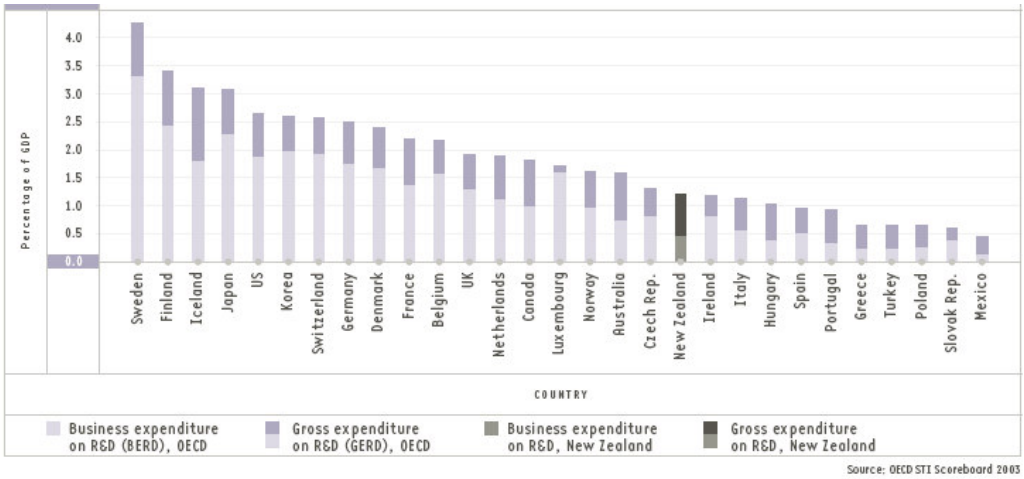

Table 2.1. New Zealand's gross expenditure on R&D in 2002 relative to other countries in the OECD.

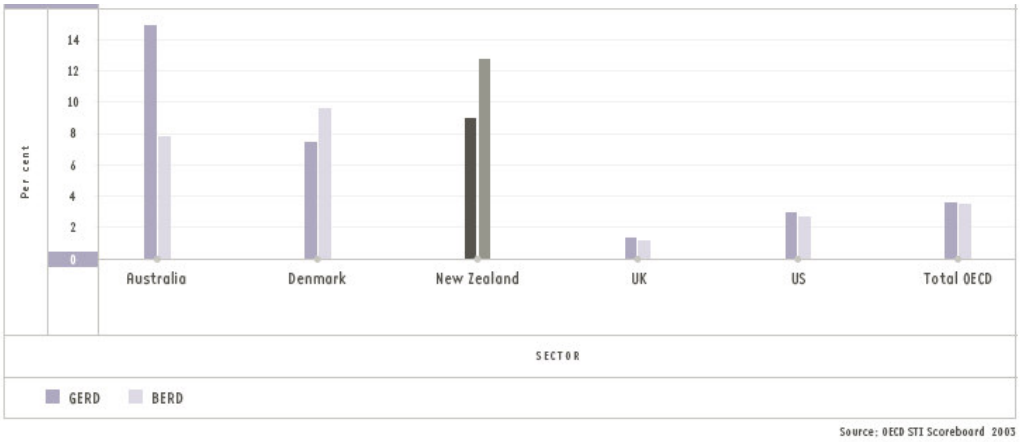

Table 2.2. Average annual growth of gross expenditure on R&D and basic expenditure on R&D for a selection of OECD countries between 1989 and 2002.

Since the establishment of GIF, the Government initiated a number of programmes to enhance investment in R&D, key example of which are:

- The provision of funding for Vote Research, Science and Technology (RS&T). It consists of several categories including the Research for Industry which provides funding for research consortia, Technology New Zealand and Grants for private sector R&D, and in the longer-term capabilities needed to support a high value added economy, such as the Marsden Fund and New Economy Research Fund.

[7] New Zealand's expenditure on basic and strategic research was 0.52% of GDP in 2002.

- The establishment of Centres of Research Excellence, which focus on areas of particular importance to New Zealand such as advanced materials and bio-protection. These Centres are based in tertiary institutions and have links to other tertiary institutions and the Crown Research Institutes.

- The introduction of a Performance Based Research Fund (PBRF) for tertiary institutions. This fund aims to improve the quality and focus of research and provide incentives for investment in basic research.

- Establishment of the New Zealand Trade and Enterprise's (NZTE) Enterprise Culture and Skills Activity Fund. This is a contestable fund designed to develop an enterprising culture across New Zealand, including students, employers, employees, businesses and groups in the community.

2.3 Support for business development

The Government has initiated a wide range of funding programmes to encourage business development by promoting growth and expansion of R&D, entrepreneurship and business development.

As at 2005 Vote RS&T investment totals $600 million operational expenditure and $33 million capital expenditure. As part of the Government's Appropriations, the various Crown agencies are funded via 'output classes'. Output classes are evaluated under different goals. The goals that are relevant to this study are 'knowledge' and 'economic', as these are aimed at improving and facilitating R&D, innovation, business development and the interface between each. Below is a description of the two relevant goals and examples of funding schemes introduced under each. [8]

Knowledge Goal: Its purpose is to accelerate knowledge creation and develop people, learning systems and networks to enhance New Zealand's capacity to innovate. Twenty seven percent or $170 million has been allocated to this goal in the 2005/06 budget. Examples of initiatives and funds under this goal include:

- The MoRST CRI Capability Fund of $38m to retain and develop research and science capabilities in Crown Research Institutes.[9] The nine CRIs have total assets of $470m and employ 4,128 staff members, of whom 2,947 are engaged in research.

- The Marsden Fund of $34m for excellent research exploring the frontiers of new research.

[8] The funds listed in this section do not represent a complete list of funding initiatives undertaken by the Government in support of its 'economic' and 'knowledge' goals.

[9] There are 9 CRIs namely, AgResearch Ltd, Industrial Research Ltd, Institute of Environmental Science and Research Ltd, Institute of Geological & Nuclear Sciences Ltd, Landcare Research New Zealand Ltd, National Institute of Water and Atomospheric Research Ltd, Scion, New Zealand Institute for Crop & Food Research Ltd and the Horticulture & Food Research Institute of New Zealand Ltd.

- Promoting an Innovation Culture ($3.5m) to develop relationships that strengthen and encourage a culture of innovation.

- Supporting Promising Individuals ($17m) for awards and fellowships to retain, attract and support people who sustain the innovation system.

- New Economy Research Fund (NERF) of $62m for research capability and knowledge development in areas and technology where new industries and enterprises are emerging.

- Other funds and initiatives that serve to help the Government achieve its knowledge goal include the Maori Knowledge and Development Research, Development of International Linkages and the International Investment Opportunities Fund.

Economic Goal: Its purpose is to increase the contribution of knowledge and technology to the competitiveness of New Zealand enterprises. In the 2005/06 budget, forty percent or $251.576m has been allocated to achieving this goal. Examples of relevant funding schemes include:

- The MoRST Pre-Seed Accelerator Fund of $4 m to assist an innovative process or product from the conceptual stage to the point where there is a demonstrably marketable product or process.

- Technology New Zealand's assistance for firms adopting and developing advanced technologies through programmes such as Technology for Business Growth, Technology for Industry Fellowships and Grants for Private Sector R&D. These investments have been expanded steadily in recent years and will total $54 million in 2005/06.

- Research for Industry ($188 million in 2005/06) for increasing the global competitiveness of our food and fibre, manufacturing and services industries; and in national infrastructure such as energy and our urban environment.

- The recently announced Seed Co-investment Fund of $40 million, to co-invest alongside pre-qualified private investors (e.g. angel investors) in seed and early stage businesses. This Fund is to be administered by the NZVIF.

Examples of other funding initiatives that support the economic goal are as follows:

- The MoRST Equity Investment fund aimed at Crown Research Institutes and Tertiary Education Institutes ($5m in 2005/06). It provides capital to enable these organisations to develop new 'platform technologies' to the point where commercial feasibility can be demonstrated and private sector investors are prepared to co-fund the work and, eventually, buy out the technology.

- The MED Strategic Investment Fund ($8m in 2005/06), which makes available three types of assistance: feasibility study grants, guarantees of funding for the implementation of significant projects and cash grants. The Fund aims to provide a signal to investors that they are welcome in New Zealand, ensure investor's

needs are met, impediments are identified and removed, and better enable New Zealand to benefit from investment by granting incentives to investment activities that generate significant economic benefits, including spill-over benefits.

- The NZTE Cluster Development Programme ($1m in 2005/06), aimed at helping clusters in different stages of development by funding facilitators.

- The NZTE Regional Partnership Programme ($22m in 2005/06), which brings together key players in particular regions and industries. This programme has aided the formation of Regional Centres of Excellence and has brought together key players in particular industries.

- The NZTE Incubator Development Programme ($3 m in 2005/06), which assists in the establishment of incubators to provide new businesses with mentoring, support and practical advice from experienced people.

- The NZTE Escalator programme ($2m in 2005/06), which aims to assist the growth of small to medium sized enterprises by providing (through selected service providers) advice on funding their business growth, when additional investment is needed and how to access it.

- The NZTE Enterprise Development Grants programme (EDG) ($7m in 2005/06), which provides grants to assist businesses and entrepreneurs to gain additional skills and abilities to pursue their business development goals by building capability and supporting market development initiatives.

- The NZTE Beachheads programme ($1m in 2005/06), which assists firms to develop international linkages.

2.4 Related studies on financing NZ businesses

The MED has commissioned over the last year or so a number of research projects under the banner of "Access to Finance". The purpose of these research projects has been to improve the Government's understanding of the capability of New Zealand's financial systems in providing for the financing requirements of small and medium sized business. To date the following reports have been commissioned:

- A survey of Bank lending practices to SMEs

- Capital raising on the New Zealand Stock exchange

- New Zealand's Angel Capital Market – the supply side

- A demand side analysis of New Zealand firms' financing

The "Survey of bank lending practices to SMEs" by PricewaterhouseCoopers (PWC) and "New Zealand's angel capital market – the supply side" by Infometrics have been completed and key points relating to venture capital are summarised below. These reports provide a useful context for this study (we understand the other two research papers have yet to be completed).

Report on bank lending practices to small and medium sized enterprises

This report found no obvious signs of inefficiency in the market for lending to small and medium sized enterprises (SMEs). Banks were favourably positioned towards lending to SME's, which they perceive as a profitable sector. Interest rates charged by banks were found to be competitive in comparison to larger businesses and international comparisons.

Notwithstanding these points, the report noted that not all SMEs had good access to bank lending facilities. The banks commented that they either did not, or were unwilling to lend to start-up SMEs and SMEs where the only asset or collateral was intellectual property (IP). Furthermore, banks did not regard it as their role to fund start up ventures.[10] Interestingly, the study identified a zero percent allocation of bank lending to SMEs in the technology sector.

The report identified theoretical and empirical support for the view that equity is the preferred form of funding for IP-based businesses, especially those in the start-up phase where information asymmetries are a significant hurdle to other capital suppliers.

Report on New Zealand's angel capital market

In this report, the emergence of the venture capital market is described as a response to market failures in the formal financial markets. This is largely attributable to the problem of information asymmetry, whereby the cost of initiating the required research is greater than the benefit of issuing the loan (or acquiring equity). Further, despite the inherent greater risks of a start-up venture, the upside of the 'debt' investment for the bank is limited at the level of interest rate charged on the loan, thus downwardly biasing the bank's expected returns. Consequently, credit providers will readily engage in capital rationing.

Similarly, the existence of angel investors is regarded as potential evidence of imperfections in the venture capital market, that is angels are filling an unmet demand for funds from the venture capital market or alternatively, venture capital funds are missing opportunities to attract financing from angel investors. [11]

The study explores different policy initiatives that might improve financing and subsequent growth in the venture capital sector. Three options are explored, namely debt funding, equity funding and direct funding.

The reports cites examples from overseas that show Government policies which provide debt funding have enjoyed little success. These include Canada's Small Business Finance Programme and UK's Small Firms Loan Guarantee Scheme. In these loan guarantee programmes, the risk of loans to innovative SMEs is transferred to the public sector. Success of these programmes depend on their ability to achieve a financially sustainable default rate while providing loans to borrowers that would normally have been rejected. However, most of these guarantee schemes have not been sustainable without subsidy, have low volumes and high operating costs.

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[10] See page 49 of PWC (July 2003), *"Bank Lending Practices to Small and Medium Sized Enterprises*".
[11] See page 44 of Infometrics (June 2004) *"New Zealand's Angel Capital Market: The Supply side".*

The report notes that increased equity financing, through a shift in funding that allows pension funds to invest in the venture capital market, can have a positive effect on the development of the venture capital sector, as was evident in the United States. However, the report cautions that relaxing investment regulations per se does not guarantee growth, as a risk averse culture or inexperience may continue to deter investment in this area.

Finally, the report notes that direct state funding, as adopted for example in Korea and Germany, has generally yielded poor results. Typically, these investment structures provide little incentive for careful monitoring of investments and government managers often lack the necessary knowledge and experience to manage such investments effectively.

Part II Venture capital, innovation & growth

3 Venture capital role in innovation and growth

Venture capital was established to address the very challenging funding issues faced by young, technology-intensive firms. This structure has been shown to have a substantial positive effect on economic growth. Not only is the overall economic impact of venture-backed firms substantial, but they appear particularly effective in stimulating economic growth. While there may be a need for government intervention to "prime the pump" of venture capital, the policies must be designed carefully to avoid all-too-common pitfalls.

In this section we describe the history of venture capital and the key messages from the academic literature on the relationship between venture capital, innovation and economic growth.[12]

3.1 Context

During the 1980s and 1990s there was a tremendous boom in the private equity industry. The pool of U.S. private equity funds—partnerships specializing in venture capital, leveraged buyouts, mezzanine investments, build-ups, distressed debt, and related investments—has grown from $5 billion in 1980 to just under $300 at the beginning of 2004. Private equity in Europe also dramatically increased, from four billion euros in 1989 to thirty-five billion in 2004. Private equity's growth over that period has outstripped that of almost every class of financial product. At the same time, the sector has been characterized by a pattern of boom and bust: the rapid increases in fundraising in the late 1960s, mid 1980s and late 1990s were followed by precipitous declines in the 1970s, early 1990s, and early 2000s. Much of the most dramatic growth has arisen from the venture capital sector, which specializes in funding young and emerging firms.

As a result of this rapid growth, venture capital has attracted increasing attention in both the popular press and academic literature. The recent dramatic growth and intense cyclicality in the venture capital industry has been accompanied by new academic research that explores its form and function.

Venture capital funds are closely related to those conducting buyout investments, sharing similar legal structures, incentive schemes, and investors. Those funds similarly invest in entities that often find external financing difficult to raise: troubled firms that need to undergo restructurings. Similar to venture capitalists, buyout funds protect the value of their equity stakes by undertaking careful due diligence before making investments and retain powerful oversight rights afterwards. Together, the organizations that finance these high-risk, potentially high-reward projects are termed private equity groups.

[12] Unless indicated otherwise this section is based in Gompers, P and Lerner J (1999), "*The Venture Capital Cycle*"; Gompers, P. and Lerner J. (2001), "*The Money of Invention: How Venture Capital Creates New Wealth*"; and Fenn, G. W., Liang, N. and Prowse, S. (2005), *"The Economics of the Private Equity Market"*

Typically, these investors do not primarily invest their own capital, but rather raise the bulk of their funds from institutions and individuals. Large institutional investors, such as pension funds and university endowments, are likely to want illiquid long-run investments such as private equity in their portfolio. Often, these groups have neither the staff nor the expertise to make such investments themselves.

3.2 History of venture capital in the United States

The venture capital industry was in its initial decades a predominantly American phenomenon. It had its origins in the family offices that managed the wealth of high net worth individuals in the last decades of the nineteenth century and the first decades of this century. Wealthy families such as the Phippes, Rockefellers, Vanderbilts, and Whitneys invested in and advised a variety of business enterprises, including the predecessor entities to AT&T, Eastern Airlines, and McDonald-Douglas. Gradually, these families began involving outsiders to select and oversee these investments.

The first formal venture capital firm, however, was not established until after World War II. American Research and Development (ARD) was formed in 1946 by MIT President Karl Compton, Harvard Business School Professor Georges F. Doriot and local business leaders. A small group of venture capitalists made high-risk investments into emerging companies that were based on technology developed for World War II. One of the key insights of Doriot's was the need for a financing service (later to become known as venture capital) that has the capability to undertake three tasks; to sort the promising firms from many applicants, to control those firms in a way that limits the agency problems by using a mixture of incentive and monitoring tools, and to develop a certifying role for bringing new firms to the market through a reputation for quality and fair dealing.

The success of the investments ranged widely: Almost half of ARD's profits during its 26-year existence as an independent entity came from its US$70,000 investment in Digital Equipment Company in 1957, which grew in value to US$355 million. Because institutional investors were reluctant to invest, ARD was structured as a publicly traded closed-end fund and marketed mostly to individuals. The few other venture organizations begun in the decade after ARD's formation were also structured as closed-end funds. The early venture capital funds were almost exclusively focused in the United States, with the exception of a few government-backed initiatives such as the United Kingdom's 3i.

The first venture capital limited partnership, Draper, Gaither, and Anderson, was formed in 1958. Imitators soon followed, but limited partnerships accounted for a minority of the venture pool during the 1960s and 1970s. Most venture organizations raised money either through closed-end funds or Small Business Investment Companies (SBICs, which were federally guaranteed risk-capital pools that proliferated during the 1960s). While the market for SBICs in the late 1960s and early 1970s was strong, incentive problems ultimately led to the collapse of the sector. The annual flow of money into private equity during its first three decades never exceeded a few hundred million dollars and usually was substantially less. During these years, while a few funds made a considerable number of investments in buyouts and other transactions involving mature firms, private equity organization were universally referred to as venture capital funds.

The activity in the private equity industry increased dramatically in late 1970s and early 1980s. Industry observers attributed much of the shift to the U.S. Department of Labor's clarification of the Employee Retirement Income Security Act's "prudent man" rule in 1979. Prior to this year, the legislation limited pension funds from investing substantial amounts of money into venture capital or other high-risk asset classes. The Department of Labor's clarification of the rule explicitly allowed pension managers to invest in high-risk assets, including private equity. Numerous specialized funds—concentrating in areas such as leveraged buyouts, mezzanine transactions and such hybrids as venture leasing—sprung up during these years. Another important change in the private equity industry during this period was the rise of the limited partnership as the dominant organizational form.

The subsequent years saw both very good and trying times for private equity investors. On the one hand, venture capitalists backed during the 1980s many of the most successful high-technology companies, including Cisco Systems, Genentech, Microsoft, and Sun Microsystems. Numerous successful buyouts—such as Avis, Beatrice, Dr. Pepper, Gibson Greetings, and McCall Pattern—garnered considerable public attention in the 1980s. At the same time, commitments to the private equity industry during this decade were very uneven. The annual flow of money into venture capital funds increased by a factor of ten during the first half of the 1980s, but steadily declined from 1987 through 1991. Buyouts underwent an even more dramatic rise through the 1980s, followed by a precipitous fall at the end of the decade.

Much of this pattern was driven by the changing fortunes of private equity investments. Returns on venture capital funds had declined sharply in the mid-1980s after being exceedingly attractive in the 1970s. This fall was apparently triggered by overinvestment in a few industries, such as computer hardware, and the entry of many inexperienced venture capitalists. Buyout returns underwent a similar decline in the late 1980s, due in large part to the increased competition between groups for transactions. As investors became disappointed with returns, they committed less capital to the industry. During these years many of the early funds geared towards European and Asian private equity investments were formed. These pioneering funds frequently encountered disappointing returns, a function of inexperienced venture capitalists and entrepreneurs.

The 1990s saw these patterns repeated on an unprecedented scale. Much of the decade saw dramatic growth and excellent returns in almost every part of the private equity industry. This recovery was triggered by several factors. The exit of many inexperienced investors at the beginning of the decade ensured that the remaining groups faced less competition for transactions. The healthy market for the initial public offerings during much of the decade meant that it was easier for all investors to exit private equity transactions. Meanwhile, the extent of technological innovation—particularly in information technology-related industries—created extraordinary opportunities for venture capitalists. New capital commitments to both venture and buyout funds rose in response to these changing circumstances, increasing to record levels by the late 1990s and 2000.

But as is often the case, the growth of private equity increased at a pace that was too great to be sustainable. Institutional and individual investors—attracted especially by the tremendously high returns being enjoyed by venture funds—flooded money into the industry at unprecedented rates. In many cases, groups staggered under the weight of capital. In other cases, groups that should have not raised capital succeeded in garnering

considerable funds. Too rapid growth led to over-stretched partners, inadequate due diligence, and in many cases, poor investment decisions. The industry is still addressing the legacy of this growth.

But the most revolutionary changes in private equity in recent years have not been in the patterns of investment, but rather in the structure of the private equity groups themselves. Private equity organizations, while in the business of funding innovation, had been remarkably steadfast in retaining the limited partnership structure since the mid-1960s. In recent years, however, a flurry of experimentation has taken hold in the industry. Among the changes have been the establishment of affiliate funds in different regions and nations, and the expansion of the funds offered by buyout funds to include real estate, mezzanine, and bond funds.

What explains these sudden changes on the part of the major private equity groups in recent years? Gompers & Lerner consider this reflects a more fundamental shift in the industry, as private equity groups struggle to address the increasing efficiency of their investing. [13] Facing increased competition, they are seeking to find new ways to differentiate themselves.

Evidence of the increased efficiency of the private equity industry can be seen in many places. While venture capital for much of its first decades had the flavour of a cottage industry, with a considerable number of relatively small groups working alongside one another; today it is much more competitive.

Given this changed competitive environment, the leading groups are increasingly seeking to differentiate themselves from the mass of other investors. They are employing a variety of tools to build up and distinguish their "brands", to help distinguish themselves from other investors. These steps include the strategic partnerships, provision of additional services, and aggressive fundraising described above, as well as many other initiatives to build their visibility in the international markets.

To be sure, private equity is not unique in this transformation. For instance, the investment banking industry underwent a similar transformation in the 1950s and 1960s, as the leading "bulge bracket" firms solidified their leadership positions. The gap between the leading banks and the following ones greatly increased during these years, as the leading groups greatly enhanced their range of activities and boosted their hiring of personnel. Similarly, the management of the major banks was transformed during these years, as procedures were systematized and management structures formalized.

3.3 History of venture capital outside the U.S.

Venture capital's evolution outside the United States was much slower. While private equity flourished in many nations in the 1980s, the venture industry only developed slowly.[14] Beginning in the mid-1990s, however, investments in venture capital outside the United States proliferated.

[13] See Gompers & Lerner 2001, chapter 10.
[14] U.S. investors make a clear distinction between buyouts and venture capital. However, in most other regions of the world the term *venture capital* encompasses *all* private-equity investments.

In part, the growth during the 1990s reflected limited partners' enthusiasm for venture capital in all sizes and shapes during these years. But it also may have reflected a more profound shift: that private sector conditions had ripened for venture capital to flourish in other countries and regions around the world. The same underlying technological innovations driving the U.S. venture-capital revolution have unleashed a similar surge of entrepreneurial spirit elsewhere. Countries that had relatively dismal track records of financing fresh ideas are now experiencing the first stirrings of entrepreneurial revolution. This second consideration points to an optimistic future for venture-capital markets outside the United States.

Unfortunately, even less evidence exists on the international venture capital experience than in the United States. This may stem in part from the difficulties inherent in measuring entrepreneurial activity in many countries. Most governments have not invested in the data-collection technologies needed to gather useful feedback on their policy initiatives.

Not surprisingly, there are many similarities with the U.S. experience across nations. One of the most striking parallels is the pattern of fundraising and investment. As in the United States, international private-equity activity shows a cyclical pattern. After growth in activity in the 1980s, the period from 1989 to 1992 saw substantial declines in fundraising. Many of these early funds had disappointing returns, mirroring the U.S. experience in those same years. Between 1991 and 1999, however, international private-equity commitments increased nearly fourfold. The subsequent years saw substantial declines.

To deepen our understanding of international venture capital we take a closer look at the experience in Europe. As we'll see, on the supply side of venturing, tax policies and attitudes of large institutional investors play a prominent role in the availability of venture funding. On the demand side, legal, regulatory, and cultural forces all influence whether people with creative ideas will be motivated to seek the financial backing they need to commercialize their innovations.

It is natural to focus on Europe, as it is the second most developed private-equity market after the United States. Still, not all European nations enjoy the same degree of private-equity action. On an absolute basis, the largest and most developed private-equity market in Europe is the United Kingdom, followed by fast-growing Germany and then France. As a percentage of GDP, Belgium, Denmark and Sweden are the highest.

European private equity has endured a roller-coaster ride similar to that in the United States: A boom in the late 1980s was followed by a bust in the early 1990s. The closing years of the 1990s saw an extraordinary recovery. Fundraising—fueled by U.S. institutional investors' heightened interest in European opportunities—far surpassed earlier milestones.

Historically, over 90 percent of European private-equity funds went to buyouts or other later-stage investments. Between 1995 and 1999, venture-capital commitments grew more than tenfold in Germany- from 89 million euros to more than 1 *billion* euros in 1999. Similarly, venture-capital commitments in France grew from only 26 million euros in 1995

Though we try to keep the distinction clear, the lack of sufficient data on venture capital and private-equity investments outside the United States can muddy the picture.

to 519 million euros in 1999. Investors saw deal prices escalate and bidding wars break out- all signs that too much money was chasing too few deals. Almost inevitably, returns of these venture funds proved disappointing, and fundraising in the venture sector collapsed.

The European venture-capital market has experienced the same changes as the larger private-equity market—but at a much more accelerated tempo. In its earliest years, the European private-equity industry contained a considerable portion of venture-capital investments. Over time, however, that portion has dwindled owing to these funds' poor performance. For instance, between 1980 and 1994, most mature, *large* buyout funds in Great Britain boasted a net return of 23 percent, and the average *midsized* buyout fund earned 15 percent. Meanwhile, the typical venture fund had a net return of just 4 percent over this same period. As a result, most venture-capital specialists failed to raise new funds, and generalist investors (such as Apax and 3i) began targeting buyouts instead.

This situation began reversing itself around 1997, in part because of new attention from U.S. venture groups, and particularly East Coast-based organizations such as General Atlantic and Warburg Pincus. Attracted by the modest valuations of European technology and biotechnology start-ups relative to their U.S. counterparts, general partners from these firms began travelling to Europe to invest in portfolio companies. This trend accelerated at the end of the decade, as U.S. groups such as Benchmark and Draper Fisher Jurvetson began targeting large amounts of capital (sometimes in dedicated funds) for European venture investments. The superior performance of these investments in the last years of the decade also helped revive the market—at least for a brief period of time.

Meanwhile, European-based funds also made more venture-capital investments. Groups that had been active for a number of years, such as Atlas Ventures, now raised large funds, thanks to high returns. New entrants—many of them modelled after U.S. groups—also ramped up their involvement in this investment arena (examples include Amadeus in the United Kingdom and Early Bird in Germany). Finally, generalist funds increased their allocation to venture-capital again. For example, in the late 1990s 3i began allocating 40 percent of its capital to technology funds—up from 15 percent in the past.

Once the level of returns began suffering, however, many of the established groups began scaling back their private equity initiatives. Many of the new funds have struggled as well to raise additional capital. Many will be unable to raise new funds, and will go out of business.

At the same time, there have been some very positive changes in the European venture market that augur well for the future. Traditionally, national boundaries have compartmentalized the key sources of capital for European venture investing. Venture firms would raise funds from banks, insurance companies, and government bodies in their own country, with little involvement from outside investors. The one exception was in the United Kingdom, where fundraising has long had a strong international flavour and particularly heavy involvement from U.S. institutional investors. These barriers are now breaking down, however. Institutional investors—particularly in the United States—are now investing more in European funds, as are international venture capital firms.

What impact have these changes exerted on the overall venture scene in Europe? As one consequence, investment advisors, sometimes called gatekeepers, have multiplied. These firms advise investors, primarily large institutions, about their private equity investments

or directly manage their holdings. Several large U.S. gatekeepers have established in Europe, drawn there by pension reforms as well as European *and* U.S. institutional investors' new involvement in that region's venture industry. Local advisors have also established successful concerns.

Unlike their U.S. counterparts, many European venture capitalists often have financial or consulting, rather than operating backgrounds. Perhaps as a result, they traditionally have not gotten as involved in their portfolio companies' management as U.S. venture capitalists do. Instead, they tend to focus more on assessing those firms' financial performance.

Also unlike the U.S. approach, European venture firms tend to invest in the same country where the fund is located. This preference reflects traditional legal and regulatory restrictions (which have since eased) and the distinct business cultures that characterize the various European nations. However, localization of investment still strongly defines the "European way."

Finally, whereas the size of U.S. venture capital transactions has ballooned in recent years, European transactions have not followed suit. As a result, some European start-ups find it difficult to compete in the "winner-take-all" contests that characterize the high-tech industry.

3.4 Why should policymakers care about venture capital?

In recent years, there has been an explosion of efforts to stimulate venture capital around the globe. This reflects the increasing understanding that private equity (and its venture capital component) has played a critical role in growing the US economy, and increasingly elsewhere as well. The types of firms that private equity organizations finance—whether young start-ups hungry for capital or ailing giants that need to restructure—pose numerous risks and uncertainties that discourage other investors.

The financing of young and restructuring firms is a risky business. Uncertainty and informational gaps often characterize these firms, particularly in high-technology industries. These information problems make it difficult to assess these firms, and permit opportunistic behaviour by entrepreneurs after the financing is received.

3.4.1 How do venture capitalists boost innovation?

To address these information problems, venture capital investors employ a variety of mechanisms, which seem to be critical in boosting innovation.

The first of these is the screening process that venture capitalists use in selecting investment opportunities. This is more efficient than the process that corporate research and development typically uses. A key metric important for all venture capitalists is whether a particular business proposal has a sustainable competitive advantage. In the technology industries that venture capitalists target, sustainable competitive advantages normally derive from intellectual property and innovative ability. Unless a venture capitalist sees the potential for patents or some other form of protected intellectual property, the investment is unlikely to proceed.

By contrast, most large, mature corporations tend to look to their existing lines of business when choosing projects to fund. Technologies outside the firm's core market, or projects that raise internal political tensions, often get shelved. In fact, many successful venture-backed start-ups are launched by employees who leave when their company declines, to pursue what they see as a promising technology.

In addition to the initial selection process, the advice that venture firms provide to entrepreneurs, as well as the post-investment monitoring and control, support top-quality innovation. Venture capitalists also tend to spot more potential future applications of technology than larger, mature companies do, perhaps because older companies focus on narrower markets.

Finally, the staging of investments also improves the efficiency of venture capital funding. In large corporations, research and development budgets are typically set at the beginning of a project, with few interim reviews. Even if projects do get reviewed mid-stream, few of them are terminated when signs suggest they're not working out. This contrasts with venture capital funding patterns in which funding commitments are provided in stages, with thresholds needing to be reached for funding to continue. Thus an innovative idea only continues to be funded if its promoters are able to continue to execute, and conversely those projects that prove promising are able to access capital in a timely fashion. Thus, it is not surprising that venture capital has emerged as the dominant form of equity financing in the U.S. for privately held high-technology businesses.[15]

Interviews with venture capitalists and entrepreneurs suggest that the consequences of these tools is that venture capital plays an important role in boosting innovation. Their assistance has two dimensions: accelerating growth and assuring long-run success.

With reliable, predictable support from venture capitalists—no matter what the economic climate—startups can invest in the research, market development, marketing, and strategizing that they need to attain the necessary scale to go public. As a result, venture-backed firms tend to be considerably younger at the time of their IPOs than nonventure-backed companies. Table 3.1, Age of Venture-Capital- and Nonventure-Capital-Backed IPOs, captures this phenomenon. The table shows the time, in months, from company founding to the issuing of equity in an initial public offering in various industries. In almost every industry, the venture-backed IPOs reached the public market sooner than the nonventure-backed group. Venture capitalists speed the development of companies because they help companies pursue effective strategies and ensure access to capital.

[15] While evidence regarding the financing of these firms is imprecise, Freear and Wetzel's (1990) survey suggests that venture capital accounts for about two-thirds of the external equity financing raised by privately held technology-intensive businesses from private-sector sources.

Industry	Venture-backed firm age at IPO	Nonventure- backed firm age at IPO
Oil and Gas	109.1 (81)	80.1 (42)
Chemicals	44.9 (43)	111 (49)
Metals	180.5 (115.5)	195.9 (145)
Machinery	67.2 (56)	122.7 (67)
Electronics	93.2 (65)	144.6 (97)
Instruments	62.5 (50)	104.1 (75)
Airlines	39.4 (48)	81.9 (50)
Communications	67.9 (54)	108.9 (53)
Wholesale/retail	72.2 (51)	126.2 (101)
Restaurants	42.4 (40)	107.0 (68)
Finance	66.2 (49)	145.2 (77)
Software	73.1 (54)	95.8 (93.5)
Computer Services	100.6 (89)	70.7 (43.5)
Research Services	48.1 (57)	95.7 (56.5)
Consulting Services	67.2 (69)	95.5 (72)
Repair Services	90.8 (49.5)	91.8 (77)
Health Services	46.72 (41.5)	51.65 (29)
Social Services	28.0 (28)	44.0 (44)
Other Services	70.2 (57.5)	184.1 (120)

Table 3.1. Age of Venture Capital and Nonventure Capital-backed IPOs. Comparison of average (median) age at initial public offering date (in months) for a sample of venture capital-backed and nonventure capital-backed firms.[16]

Market evidence suggests that the early participation of venture firms—including their guidance, monitoring, shaping of management teams and boards, networking, and credibility—helps innovators sustain their success long after their company issues an IPO.

[16] Analysis by Josh Lerner of SDC Corporate New Issues and VentureXpert databases.

Table 3.2, Relative Performance of Venture-Capital- and Nonventure-Capital-Backed IPOs, bears this out. This graph plots the returns on all venture capital- and nonventure capital-backed IPOs in the US from 1976 through 1999.[17] The returns shown for each year represent the average percentage return, for all companies that had gone public within the previous five years. In this way, the graph compares relatively recent performance at each point. This graph suggests some striking ramifications. As just one example, if an investor chose to put $1 in 1976 into nonventure capital-backed IPOs, she would have had $11.02 at the end of 1999. If that same investor had put that $1 in venture-capital-backed IPOs, she would have accumulated $164.43 by that same year. While it is recognised that the very high returns in the late 1990s in the technology sector were probably abnormal (and that venture backed firms were weighted towards this sector), the graph illustrates superior performance of venture-capital-backed IPOs for many years.

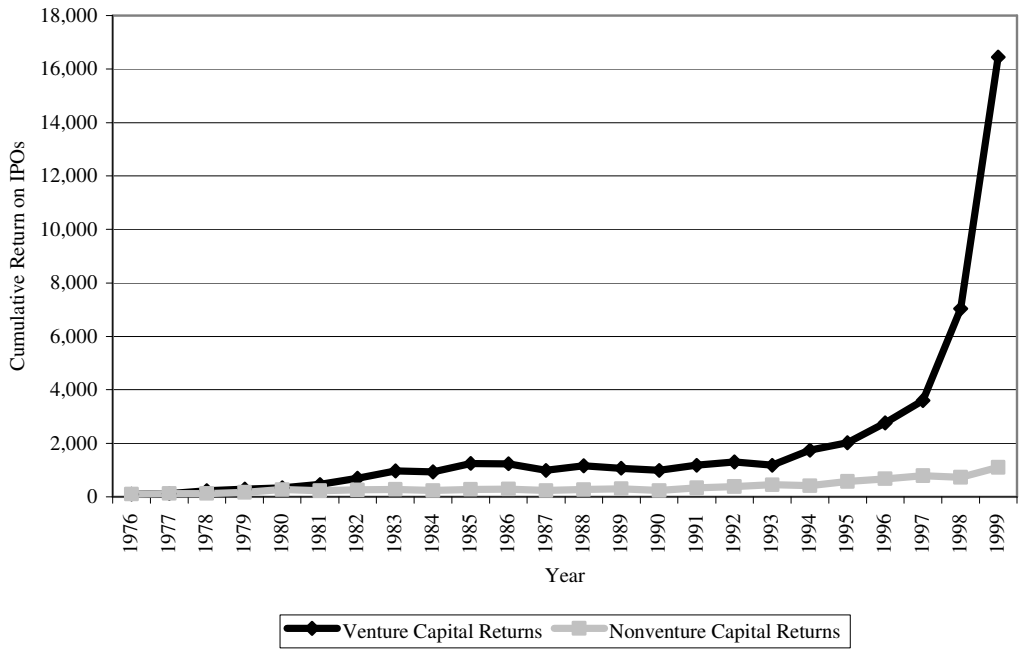

Table 3.2. Relative Performance of Venture Capital and Nonventure Capital-backed IPOs

3.5 Impact of venture capital on the economy

Clearly, venture capital exerts a major impact on the fates of individual companies. But does all this fundraising and investing influence the overall economic landscape as well? How would we even determine whether such an influence exists? And if it did exist, how would we measure it?

In this section, we look at the experience of the US venture capital market, which is the most developed and mature. It is important to note, though, for most of the period 1970

[17] Analysis by Josh Lerner of VentureXpert and Center for Research into Securities Prices databases.

to 1995, investments made by the entire US venture-capital sector totalled less than the research-and-development and capital-expenditure budgets of large, individual companies such as IBM, General Motors, or Merck. On the face of it, we might conclude that the importance of the the venture-capital sector has been exaggerated.

One way to explore this question of economic impact is to examine the impact of venture capital investing on wealth, jobs, and other financial measures across a variety of industries. Though it would be useful to track the fate of *every* venture-capital-financed company and find out where the innovation or technology ended up, in reality we can track only those companies that have gone public. Consistent information on venture-backed firms that were acquired or went out of business simply doesn't exist. Moreover, investments in companies that eventually go public yield much higher returns than support given to firms that get acquired or remain privately held.

These firms have had an unmistakable effect on the U.S. economy. In December 2004, 917 firms were publicly traded on U.S. markets after receiving their private financing from venture capitalists (this does not include the firms that went public, but were subsequently acquired or delisted). The activity in the IPO market closely mirrors the investment cycles of venture capital financing. During the early 1980s and the 1990s, the U.S. economy witnessed a marked increase in both venture-capital investment activity and venture-backed IPO activity. The evidence is clear: A healthy public-offering market has gone hand-in-hand with a robust venture-capital sector. We explore this relationship between public-offering markets and venture-capital fundraising in more depth later in this report, but the main point to make here is the strength of this relationship.

One way to assess the overall impact of the venture-capital industry is to look at the economic "weight" of venture-backed companies in the context of the larger US economy. Table 3.3, The Impact of Venture Capital in 2004, reveals some startling numbers.[18] By the end of 2004, venture-backed firms that had gone public made up over 14 percent of the total number of public firms in existence in the United States at that time. And of the total market value of public firms ($21 trillion), venture-backed companies came in at $2 trillion—9 percent.

	Number of U.S. Public Firms	Market Value of Firms ($ Trillions)	Sales of Firms ($ Trillions)	Operating Income of Firms ($ Trillions) (Mean After-Tax Margin)	Number of Employees (Millions)
VC-Backed	917	2.06	0.63	0.11 (17.2%)	2.52
Non-VC-Backed	5,750	21.45	13.94	2.67 (19.2%)	42.42
VC % of Total	13.8%	8.8%	4.3%	3.9%	5.6%

Table 3.3. The Impact of Venture Capital in at the US as at 2004.

[18] Analysis by Josh Lerner of Computstat, SDC Corporate New Issues, and VentueXpert databases.

Venture-funded firms also made up over 4 percent ($0.6 trillion) of total sales ($13.9 trillion) of all U.S. public firms at the time. And contrary to the general perception that venture-supported companies are not profitable, after-tax operating margins for these companies hit an average of 17.2%—close to the average public-company profit margin of 19.2%. Finally, those public firms supported by venture funding employed 3.5 percent of the total public-company workforce—most of these jobs being high-salary, skilled positions in the technology sector. Clearly, venture investing has fuelled a substantial portion of the U.S. economy.

Venture investing not only supports a substantial fraction of the U.S. economy; it also strengthens particular industries. To be sure, it has relatively little impact on industries dominated by mature companies—such as the energy, manufacturing, and transportation industries. That's because venture investors' mission is to capitalize on revolutionary changes in an industry, and the above sectors often have a relatively low propensity for radical innovation.

But contrast those industries with highly innovative ones, and the picture looks completely different. For example, companies in the computer software and hardware industry that received venture backing during their gestation as private firms represented more than 75 percent of the software industry's value.[19] Venture-financed firms also play a central role in the biotechnology, computer-services, industrial-services, and semiconductor industries. All of these industries have experienced tremendous innovation and upheaval in recent years. Venture capital has helped catalyze change in these industries, providing the resources for entrepreneurs to generate substantial returns from their ideas.

As these statistics suggest, venture capitalists create whole new industries and seed fledgling companies that later dominate those industries. The message is clear: The venture-capital revolution served as the driving force behind the transformation of the U.S. economy in the late 20th century.

3.6 The impact of venture capital on innovation

It might be thought that it would not be difficult to address the question of the impact of venture capital on innovation. For instance, one could seek to explain across industries and time whether, controlling for R&D spending, venture capital funding has an impact on various measures of innovation. But even a simple model of the relationship between venture capital, R&D, and innovation suggests that this approach is likely to give misleading estimates.

This is because both venture funding and innovation could be positively related to a third unobserved factor, the arrival of technological opportunities. Thus, there could be more innovation at times when there was more venture capital, not because the venture capital caused the innovation, but rather because the venture capitalists reacted to some fundamental technological shock which was sure to lead to more innovation. To date, only two papers have attempted to address these challenging issues.

The first of these papers, Hellmann and Puri (2000), examines a sample of 170 recently formed firms in Silicon Valley, including both venture-backed and non-venture firms.

[19] Gompers, P. and Lerner J. (2001), "*The Money of Invention: How Venture Capital Creates New Wealth"*

Using questionnaire responses, they find empirical evidence that venture capital financing is related to product market strategies and outcomes of start-ups. They find that firms that are pursuing what they term an innovator strategy (a classification based on the content analysis of survey responses) are significantly more likely and faster to obtain venture capital. The presence of a venture capitalist is also associated with a significant reduction in the time taken to bring a product to market, especially for innovators. Furthermore, firms are more likely to note obtaining venture capital as a significant milestone in the lifecycle of the company as compared to other financing events.

The results suggest significant interrelations between investor type and product market dimensions, and a role of venture capital in encouraging innovative companies. Given the small size of the sample and the limited data, they can only modestly address concerns about causality. Unfortunately, the possibility remains that more innovative firms select venture capital for financing, rather than venture capital causing firms to be more innovative.

Kortum and Lerner (2000), by way of contrast, examine these patterns on an aggregate industry level, rather than on the firm level. They address concerns about causality in two ways. First, they exploit the major discontinuity in the recent history of the venture capital industry: as discussed above, in the late 1970s, arising from the U.S. Department of Labor clarification of the Employee Retirement Income Security Act (a policy shift that freed pensions to invest in venture capital). This shift led to a sharp increase in the funds committed to venture capital. This type of external change should identify the role of venture capital, because it is unlikely to be related to the arrival of entrepreneurial opportunities and they exploit this shift in instrumental variable regressions. Second, they use R&D expenditures to control for the arrival of technological opportunities that are anticipated by economic actors at the time, but that are unobserved to econometricians. In the framework of a simple model, they show that the causality problem disappears if they estimate the impact of venture capital on the patent-R&D ratio, rather than on patenting itself.

Even after addressing these causality concerns, the results suggest that venture funding does have a strong positive impact on innovation. The estimated coefficients vary according to the techniques employed, but on average a dollar of venture capital appears to be three to four times more potent in stimulating patenting than a dollar of traditional corporate R&D. The estimates therefore suggest that venture capital, even though it averaged less than three percent of corporate R&D from 1983 to 1992, is responsible for a much greater share—perhaps ten percent—of U.S. industrial innovations in this decade.[20]

A natural concern with the above analysis is that it looks at the relationship between venture capital and patenting, not venture capital and innovation. One possible explanation is that such funding leads entrepreneurs to protect their intellectual property with patents rather than other mechanisms such as trade secrets. For instance, it may be that the entrepreneurs can fool their venture investors by applying for large numbers of patents, even if the contributions of many of them are very modest. If this is true, we might infer that the patents of venture-backed firms would be lower quality than nonventure-backed patent filings.

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[20] Kortum and Lerner (2000), "*Assessing the contribution of venture capital to innovation*", Rand Journal of Economics, 31, 674-692.
[21] Kortum and Lerner (2000)

How could we investigate this question of patent quality? One possibility is to check the number of patents that cite a particular patent. Higher-quality patents, we might assume, would be cited by other innovators more often than lower-quality ones. Similarly, if venture-backed patents are lower quality, then companies receiving venture funding would be less likely to initiate patent-infringement litigation (it makes no sense to pay money to engage in the costly process of patent litigation to defend low-quality patents.)

So, what do we get when we measure patent quality with these criteria? As it happens, the patents of venture-backed firms are more frequently cited by other patents and are more aggressively litigated—thus we can conclude that they are high quality. Furthermore, the venture-backed firms more frequently litigate trade secrets, which suggests that they are not simply patenting frantically in lieu of relying on trade-secret protection. These findings reinforce the notion that venture-supported firms are simply more innovative than their nonventure-supported counterparts.[21]

No matter how we look at the numbers, venture capital clearly serves as an important source for economic development, wealth and job creation, and innovation. This unique form of investing brightens entrepreneurial companies' prospects by relieving all-too-common capital constraints. Venture-backed firms grow more quickly and create far more value than their nonventure-backed firms. Reflecting these advantages, venture capital exerts a powerful effect on innovation.

4 Lessons from other countries

In this section we explore the experience of other countries in developing their venture capital markets and draw lessons for New Zealand.

We take two approaches - first, we review the findings from an OECD study of venture capital trends and policies in ten countries. Second, we explore the policies and their results from five countries that we are aware have taken significant steps to develop their venture capital markets and on which there is readily available information.

We note that lessons from other countries need to be interpreted in their context and the evolution of their markets. The literature does not provide a ready model for undertaking a tight comparison of various public policy approaches to venture capital markets and their results. Further, the performance of each market is very susceptible to a wide range of factors other than the public policy settings, including the conditions of international capital markets (e.g. the bursting of the "tech bubble" in the early 2000s). Thus the lessons derived in this chapter indicate at the extremes what to avoid, and what probably should work well, but do not deliver precise policy prescriptions.

4.1 Findings from ten OECD studies

The OECD undertook studies of venture capital trends and policies in ten member country studies in 2003, covering Canada, Denmark, Israel, Korea, Portugal, Norway, Spain, Sweden, the US and the UK. The venture capital policy recommendations from

these studies were summarised in a 2004 publication and the relevant table from that publication is reproduced below.[22]

Box 1. VENTURE CAPITAL POLICY RECOMMENDATIONS

Investment regulations:

- *Ease quantitative restrictions on institutional investors to diversify sources of venture funds*
- *Support the development of a private equity culture among institutional investment managers*
- *Facilitate creation of alternative investment pooling vehicles, such as funds-of-funds*
- *Improve accounting standards and performance benchmarks to reduce opacity of venture capital funds and protect investors*
- *Remove barriers to inflows of foreign venture capital finance*

Taxation

- *Reduce complexity in tax treatment of capital from different sources and types of investments*
- *Decrease high capital gains tax rates and wealth taxes which can deter venture capital investments and entrepreneurs*
- *Evaluate targeted tax incentives for venture capital investment and consider phasing out those failing to meet a cost-benefit test*

Equity programmes

- *Use public equity funds to leverage private financing*
- *Target public schemes to financing gaps, e.g. start-up firms*
- *Employ private managers for public and hybrid equity funds*
- *Consolidate regional and local equity funds or use alternative support schemes*
- *Focus venture funding on knowledge-based clusters of enterprises, universities, support services, etc.*
- *Evaluate public equity funds and phase-out when private venture market matures*

Business angel networks

- *Link local and regional business angel networks to each other and to national initiatives*
- *Ensure linkages between business angel networks and technology incubators, public research spin-offs, etc.*
- *Provide complementary support services to enhance investment-readiness of small firms and increase demand*

Second-tier stock markets

- *Encourage less fragmentation in secondary-stock markets through mergers, e.g. at Nordic or European level*
- *Enhance alternative exit routes such as mergers and acquisitions (M&As)*

We comment on the relevance of each of the five groups of recommendations as follows.

4.1.1 Investment regulations

New Zealand does not have regulatory restrictions on the ability of institutional investors to invest into venture funds so this point does not require change. The material from our interviews (see chapter 8) indicates that institutional investors have practically no appetite for New Zealand private equity and this is a very significant impediment to the development of the venture capital market. We explore this further in chapter 9.

In relation to facilitating the creation of alternative investment pooling vehicles, the design of the NZVIF programme is capable of this, and a version of this could be strengthened by the NZVIF developing formal or informal partnering arrangements with institutional investors to encourage their participation in venture capital and lower their transaction costs in doing so. We raise this in our recommendations in chapter 9.

[22] OECD (2004), *"Science Technology Industry - Venture capital: Trends and policy recommendations*", page 5.

There is very limited information on the New Zealand venture capital market (although it doesn't appear to be a problem of accounting standards) and we suggest ways to address this in chapter 10.

We agree removing any barriers to the inflow of foreign venture capital finance is important, and for New Zealand this relates primarily to tax settings and the development of limited partnership arrangements consistent with international norms. This is covered in chapter 9.

4.1.2 Taxation

We make a number of recommendations in relation to changes to tax settings in chapter 9 and provide greater detail on them in chapter 10. We note most of these issues have already been identified and are on the government's tax policy agenda.

4.1.3 Equity programmes

The NZVIF programme is designed to leverage private financing and we agree with this approach. It is targeted to start-up firms (seed, early stage and early expansion) and employs private fund mangers to select and monitor investee firms.

Consolidation of regional schemes does not appear to be directly relevant to New Zealand, but alignment of government granting schemes that potentially displace venture capital is. We recommend in chapter 9 that the government review the alignment of these schemes with the NZVIF programme and consider shifting funds from them to the NZVIF programme.

We consider the venture capital fund managers are the best placed to determine the allocation of funds to various sectors and therefore recommend against the government determining the focus of these funds. However, in New Zealand very little of the deal flow to the VIF Seed Funds comes from the universities and the CRIs and we suggest this is an issue the government should address in terms of ensuring any impediments to this deal flow are removed and incentives are in place to encourage it (i.e. it should work on the demand rather than the supply side in this regard)

We agree with the desirability of phasing out direct public support for the venture capital markets, the implication of which is the NZVIF should aim to make itself irrelevant by catalysing the market in such a way that it overtakes it, or alternatively that it becomes a fund of funds that is able to stand on its own feet without government support (as the Yozma programme did).

The fourth point on angel networks and incubators falls outside the scope of this study, although we recognise there are important links between them and the venture capital markets. We note there are Government programmes designed to support incubators (e.g. the NZTE Incubator Development Programme) and the recently announced Seed Co-Investment Fund is designed to support angel investors. The government should ensure these two programmes (and any other related ones) are coordinated in a constructive way from the perspective of market participants.

The fifth point appears to have little relevance in the New Zealand context from a public policy perspective, as any merging of secondary markets (and their structure more generally) is, in our view, best driven by commercial considerations rather than some

general policy view that consolidation is required. Perhaps the key point for public policy is that regulatory settings should not dictate the structure of these markets, but these issues fall outside the scope of this study.

4.2 Experience of five countries

We explore venture capital policies and their results from five countries that we are aware have taken significant steps to develop their venture capital markets and on which there is readily available information. These are Israel, Singapore, Canada, Australia and Finland. In each case we set out summary statistics on the market, describe the policies and their results, and conclude with our findings for the New Zealand context.

4.2.1 Israel

A snapshot as at 2004					
Investment by stage			**Sector Distribution of investments**		
Stage[1]	*Amount (USm)*	*Percentage*	*Sector*[1]	*Amount (USm)*	*Percentage*
Early	$258	39%	Communications	$215	32%
Expansion	$353	53%	Software	$160	24%
Later	$54	8%	Life Sciences	$138	21%
Total	*$665*	*100%*	Internet	$16	2%
Private Equity	$626		Semiconductors	$77	12%
Total	$1,291		Other Technology	$59	9%
			Total	*$665*	*100%*
Macro economic indicators					
GDP[1] (USm)	$117,600				
Venture Capital as % of GDP	0.57%				
PE/VC as % of GDP	1.10%				
GERD as % of GDP[2]	4.72%				

Table 4.1. A snapshot of investment in venture capital/private equity in Israel as at 2004.
[1] These values were sourced from the IVA 2005 Yearbook. Investment in private equity was proxied by capital raised
[2] Most recent value available 2002 sourced from the OECD *"Main Science and Technology Indicators Report, 2005"*.

Government initiatives

Prior to the Israeli government's direct involvement in the venture capital markets in the early 1990s it provided significant support to R&D, channelled through the Office of the Chief Scientist (OCS). The goal of these programmes was to promote science based export oriented industries that would promote employment or improve Israel's balance of payments. These programmes included financial incentives for approved commercial

R&D expenditure by providing matching funds, [23] multiyear funding for consortia of industrial firms and academic institutions for the development of "generic, pre-competitive technologies" and an incubator program. The Israeli government supported international cooperation in the area of R&D by negotiating bilateral R&D agreements with the US, Canada, the Netherlands, and Spain. [24]

The Israeli government's first major policy development directly in relation to venture capital was its Inbal Fund in 1991. Inbal was an equity guarantee scheme which provided 70 percent guarantees to investors in local venture capital funds. As such this government initiative was solely targeted at mitigating the downside risk of venture capital investments. The program helped the formation of six venture capital funds each with USD 15 million to USD 20 million and all of these funds were publicly traded on the Tel Aviv Stock Exchange. [25]

The Inbal programme suffered from onerous and costly bureaucratic procedures and periodic reporting requirements. These burdens meant that the program was unable to attract professional venture capitalists required to operate effectively and the funds fared poorly. [26]

The Yozma government equity programme was the second major government policy aimed at stimulating the domestic VC industry and was established in 1993 with USD 100 million. The Yozma programme had two functions. Firstly it acted as a fund of funds and provided up to 40 percent of capital raised by funds. In order to qualify for this contribution funds had to attract the other 60 percent of capital and also had to source a reputable foreign venture capital fund or foreign financial institution to be a private investor.

Importantly the Yozma programme also contained an option for the government share to be bought out within the first seven years at initial value plus interest. Thus the incentives of Yozma meant that the government provided an option in relation to upside incentives. In the first three years ten public private funds were established with most having approximately USD 20 million. Two of the funds, however, attracted more than the minimum 60 percent required by private investors and began with USD 35 million each, of which only USD 8 million was government funding through Yozma. As such the government investment of 80 million was successful in leveraging in USD 150 million of private capital. [27]

The second function of Yozma was to make direct investments in start-up companies. This was done through the Yozma Venture Fund which was established with USD 20 million.

Yozma successfully attracted co-investors largely from the United States, Germany and Japan and with their backing launched a second fund in 1995, primarily targeted at high

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[23] Trajtenberg, M (2001) "R&D Policy in Israel: An Overview and Reassessment", in Feldman M and Link A (eds) (2001) *Innovation Policy in the Knowledge Based Economy* pp 409- 454.
[24] Trajtenberg, M (2001).
[25] OECD (2003), "*Venture Capital Policy Review: Israel"*, STI Working Paper 2003/3, OECD, Paris, p 14.
[26] Avnimelech, G., Kenney M., and Teubal, M., (2004), "*Building Venture Capital Industries: Understanding the U.S. and Israeli Experiences"*, BRIE Working Paper 160, March 2, 2004, page 32.
[27] Avnimelech, G., Kenney, M., and Teubal, M. (2004) p 33.

growth companies in the ICT and the life science sectors. Typical investments ranged from USD 1 million to USD 6 million.

The Yozma Group managed over USD 170 million in funds and made direct investments in more than 40 companies. The Group also led to various IPOs in the United States and Europe and also positioned other firms well for acquisition of further investment by multinational companies.

The Yozma Group developed strong relationships with leading technology incubators and academic institutions in Israel and, for example, established the Yozma III CEO Club which was a network involving founders and senior executives of successful enterprises.

Following its overwhelming success at stimulating a vibrant domestic VC industry, Yozma's nine venture capital funds and fourteen direct investments were auctioned and subsequently privatised at the end of 1998. The government retained a minor interest in two of its funds.

Yozma's success can be illustrated by various measures. Firstly in the period from 1990 to 2000 total capital raised by Israeli venture capitalists was approximately $10 billion, of which approximately $5.5 billion was managed by Yozma related VC firms. [28]

More recently the Israeli government has introduced several other policies in an attempt to address issues in relation to high tax rates and a weaker market subsequent to the global downturn in 2000-2001.

Firstly the Israeli government attempted to attract foreign capital into venture capital by introducing targeted back-end tax incentives for foreign investors. These took the form of temporary exemptions from capital gains tax and were introduced in 2000 and were later transferred to permanent exemptions in 2002.

Secondly, subsequent to the global downturn in 2001, a Seed Fund was established in 2002 and another public/ private fund established to invest in start ups with equal contributions. The fund was established with a more modest level of government investment of USD 11 million. Under this fund the government owns 50 percent of investee start-ups but it cannot appoint directors or engage in management. The program also contains an option for private investors to buy back the government's share within five years at the initial price plus interest.

[28] Avnimelech, G., Kenney, M., and Teubal, M. (2004), p 34.

4.2.2 Singapore

A snapshot as at 2003					
Investment by stage[1]			**Sector Distribution of investments[2]**		
Stage	*Amount (USm)*	*Percentage*	*Sector*	*Amount (USm)*	*Percentage*
Early	$152	28%	Not available	Not available	
Later	$390	72%			
Total	*$542*	*100%*			
Macro Economic Indicators					
GDP (Usm)[3]	$109,100				
Early stage as % of GDP	0.14%				
All stages as % of GDP	0.50%				
GERD as % of GDP[3]	2.13%				

Table 4.2. A snapshot of investment in venture capital/private equity in Singapore as at 2003.
[1] *"The 2005 Guide to Venture Capital Asia"* no longer divides country investments by stage. To get a proxy, the 2003 total investments for Singapore from the "*2005 Guide to Venture Capital*" were used and then 2002 proportions of early and later stage investments in Singapore was applied.
[2] *"The 2005 Guide to Venture Capital Asia"* no longer provides a breakdown of country investments by sector.
[3] Sourced from the "*CIA World Factbook*".
[4] Sourced from the "*OECD Main Science and Indicators*" report, May 2005.

Government initiatives[29]

In 1985 the Singaporean government launched a broad range of policies, which were designed to help lift the economy out of economic recession and transform it (and to shift away from the heavy reliance on the manufacturing sector to drive exports and economic growth). This included the establishment of a government equity fund which was called the Economic Development Bank (EDB) Venture Capital Fund and was capitalised with S$ 100 million.

In 1991, however, the government changed its policy focus with the establishment of the National Technology Plan. This plan was managed by the National Science and Technology Board (NSTB) and its role was to coordinate initiatives designed to improve the international competitiveness of Singapore in science and technology. The Plan was to run for five years and it had a significant budget of S$ 2 billion. One of its early objectives was to increase national expenditure on R&D to 2 percent of GDP.

Following the first National Technology Plan, a second Plan was initiated, also for a five-year period. The budget was doubled to S$4 billion and the objective was to refocus and

[29] This material is based on Koh and Koh (2002), "*Venture Capital and Economic Growth: an Industry Overview and Singapore's Experience*", SMU Economics and Statistics Working Paper Series, Paper No 21-2002 and Singapore Management University and Singapore Economic Development Bank (1995), "*More Venture Capital Funds Managed in Singapore*", 28 December 1995, www.sedb.com.sg.

strengthen science and technology R&D initiatives. The main focus was to ensure the provision of suitable institutions and a climate to support entrepreneurship.

Government funding for research at Singapore universities also increased significantly during this period, particularly in relation to the life sciences and communications sectors. For example, research funding at the National University of Singapore almost tripled between 1996 and 2001.

The government has also been supportive of the entry of foreigners with professional and technical expertise and through the EDB ran the INTECH programme which provided training for venture capital industry professionals.

In 1994 the government established a new fund called the Regional Investment Company (RIC), which was part of the government's Regional Investment Fund Programme. The fund was capitalised with S$ 100 million and its aim was to assist SMEs with high growth potential to expand in the region.

The next fund was established in 1999, when the government turned to direct investment in venture capital after several years focusing on national R&D initiatives and growth strategies based on regional expansion. The Techno-preneurship Investment Fund (TIF) was to be managed by TIF Ventures, which originated inside the National Science and Technology Board (NSTB). The broad objective was to promote technologically driven entrepreneurship and to develop the venture capital industry. The fund had US$ 1 billion which was divided between three sub funds; the broad based fund (US$ 500 million), the strategic fund (US$250 million), and the early stage fund (US$ 250 million).

The Venture Investment Support for Startups was another fund which was launched in 1999 to focus on providing equity to high-technology startups in conjunction with experienced venture investors. The Government contribution to the fund was a more modest sum of US$10 million.

Another government fund called the Business Angel Co-investment Scheme was also established in 1999. This fund consisted of government co-investments in the technology sector with business angels and was jointly managed by the NSTB, EDB and TIF Ventures.

From 1999, the EDB also managed a loss insurance protection scheme for investors in high tech start-ups called the Technopreneur Investment Incentive Scheme.

In 2001 another government fund was established, this time focusing on seed stage financing, called the Startup Enterprise Development Scheme (SEEDS) and was capitalised with S$ 50 million for the provision of funds to start-ups on a matched funding basis.

The significant role of government funds in Singaporean venture capital is demonstrated by the fact that in 2000 about 19%, or US$7.4 billion of the venture capital funds in Singapore had their origins in government funding.

Evaluating the performance of these government venture capital policies is somewhat difficult as the data on the venture capital industry is incomplete and not available publicly. Having noted this, however, the overall size of venture capital funds under management in Singapore has grown from S$48 million in 1983 to S$13.7 billion in 2001.

4.2.3 Canada

A snapshot as at 2004					
Investment by stage[1]			**Sector Distribution of investments[1]**		
Stage	*Amount (USm)*	*Percentage*	*Sector*	*Amount (USm)*	*Percentage*
Early	$871	49%	Life Sciences	446	25%
Expansion	$754	43%	IT	921	52%
Later	$137	8%	Other Technologies	72	4%
Total	$1,762	100%	Traditional	323	18%
			Total	1,762	100%
Macro Economic Indicators					
GDP[2] (USm)	$1,014,000				
Early stage as % of GDP	0.09%				
All stages as % of GDP	0.17%				
GERD as % of GDP[2]	1.94%				

Table 4.3. A snaphot of investment in venture capital/private equity in Canada as at 2004.
[1] These values were sourced from the Canadian Venture Capital Association.
[2] Sourced from the "*OECD Main Science and Technology Indicators Report 2005*". GERD as a % of GDP is most recent value available, as at 2003.

Government initiatives[30]

In Canada the first major government initiative which attempted to stimulate the domestic venture capital industry was the introduction of Labour Sponsored Venture Capital Corporations (labour funds) in 1993. The labour funds (and their enabling legislation) were designed to increase the participation of retail investors in small and medium sized companies in Canada.

In particular the labour funds provided significant front-end tax relief for retail investors. Specifically investors received tax incentives at the federal level of up to 20 percent on up to CAD 5000 of investments made in labour funds. Further, provincial tax credits of 20 percent in Ontario and Quebec matched this tax credit. [31] In 1996, however, the federal (and matching provincial) tax credits and associated amounts were reduced to 15 percent on up to CAD 3500 of investments. Under the Registered Retirement Savings Plan (RRSP) investments also qualified for further tax credits.

There was a minimum holding period for investments in labour funds of five years, which was subsequently increased to eight years in 1995.

The labour funds had to ensure that 90 percent of investments were made in Canadian firms. Further, there were restrictions placed on the timing of investment of funds. In

[30] This material is drawn from A Carragher and D Kelly (1998), *"An Evaluative Comparison of the Canadian and American Private Equity Markets*", Journal of Private Equity, vol 1 no 3 and the OECD (2003), *Venture Capital Policy Review: Canada"*, STI Working Paper 2003/4, OECD, Paris
[31] In British Columbia the tax credits were for up to 30 percent.

particular, initially 60 percent of funds had to be invested within three years of deposits, and in Ontario this was subsequently further tightened to require 50 percent of deposits to be invested within one year and 70 percent within two years.

Labour unions were involved in the governance of labour funds through board of director representation. However they were not involved in the day-to-day management.

The labour funds had a number of problematic incentive issues. Firstly, the incentives of the labour fund managers were not closely aligned to the incentives of their retail investors. Labour funds faced penalties for non-investment of a ratio of deposits within a set timeframe yet managers' personal performance incentives encouraged them to not dilute the quality of the investments they made and hence to hold-off making investments despite the penalties the labour fund would face.

Secondly the costs associated with the reporting requirements of being publicly listed securities were onerous. Thirdly the high number of retail investors increased the cost of administration and the fixed period for holding could lead to mass exodus of retail investors at the end of the stipulated period once all of the tax incentives had been accrued.

Fourthly, the labour funds provided retail investors with front-end tax credits. These tax incentives led to retail investors having incentives to invest in these funds for tax benefits that could be accessed irrespective of the performance of the fund, and thus distorted efficient investment behaviour.

The overwhelming effect of the labour funds was to dramatically increase the size of capital invested in venture capital funds in Canada. The vast oversupply of capital and the relative lack of quality deal flow crowded out private investment from experienced investors.

Subsequent to the introduction of labour funds, the federal and provincial governments also developed government equity programs. The Business Development Bank of Canada (BDC) is the main federal government venture capital institution and has several initiatives.

Firstly there are privately managed seed capital funds which are established with private partners. As of 2001, there were four seed capital funds and the total funds from the BDC and its partners had reached CAD 112.5 million. Complementing these are provincial government backed regional venture capital funds. These funds focus on start-up companies, particularly in the technology sector.

Secondly there is the more general BDC Venture Capital Fund which makes investments at any stage from seed to expansion to acquisition and includes both private and publicly listed companies.

Thirdly it provides a hybrid financing instrument which includes both debt financing and venture capital. Investment sizes are limited from CAD 100 thousand to CAD 1 million. Finally the BDC also provides a range of management programmes for small firms.

The Canadian venture capital market has now recovered somewhat from the earlier problems associated with the labour funds, probably due in large part to its proximity and access to the large US venture capital markets.

4.2.4 Australia

A snapshot as at 2004					
Investment by stage[1]			**Sector Distribution of investments**[4]		
Stage	Amount (US$m)	Percentage	Sector	Amount (US$m)	Percentage
Expansion	$234	25%	Agribusiness	9	1%
Later	$612	66%	Communications	25	3%
Total	$931	100%	Construction/Housing	3	0%
			Distribution/Transport	131	14%
Macro Economic Indicators			Environment	5	1%
GDP (US$m)[2]	634,931		Etailing/Retailing	118	13%
VC as % of GDP	0.01%		Food/Beverages	53	6%
VC/PE as % of GDP	0.15%		Health/Biosciences	243	26%
GERD as % of GDP[3]	1.62%		Info Tech/Software	26	3%
			Manufactuing – Cons	61	7%
			Manufacturing – Ind	98	11%
			Media/Entertainment	1	0%
			Resources/Mining	36	4%
			Services – Bus/Fin	55	6%
			Services –Cons	11	1%
			Technology	18	2%
			Tourism/Leisure	40	4%
			Total	931	100%

Table 4.4. A snapshot of investment in venture capital/private equity in Australia as at 2004.
[1] These values were obtained from the AVCJ.
[2] Sourced from the *"OECD, Statistics Directorate, May 2005"*.
[3] Sourced from the *"OECD Main Science and Technology Indicators Report, volume 2005/01"*.
[4] Sourced from Private Equity Media.

Government initiatives

The Australian government has introduced various supply-side government programs to assist the development of the venture capital industry. These government programs have operated as part of the activities of AusIndustry, which is responsible for delivering products, services, and information that support industry, research and innovation. AusIndustry was established in 1995 and is part of the Department of Industry, Tourism, and Resources.[32]

[32] This section relies on AusIndustry, *"Summary of Aus Industry Products*, July 2005", www,ausindustry.gov.au (last viewed 27/07/05) and other materials from the AusIndustry and Department of Industry Tourism and Resources websites as specified.

The first venture programme was introduced in 1992 and is called the Pooled Investment Funds (PDFs) Program. This program was designed to support small and medium sized enterprise through the provision of tax incentives. This includes concessional income tax treatment of PDFs and exemptions from capital gains tax from the sale of shares in PDFs. PDFs provide a pool of funds for investment in companies with assets of less than $50 million. In the period to June 2004 PDFS had raised more than $700 million, with over $600 million invested in 482 companies. At present there are 96 registered PDFs.[33]

The second initiative was the Innovation Investment Fund (IIF), which commenced in 1998. IIF consists of nine public/private venture capital funds that invest in early stage technology companies over ten years. The funds are operated by licensed private fund managers, each with between $30 and $ 50 million in funds. The ratio of public to private funds is up to a maximum of two parts public to every one part private (2:1 ratio). The total government investment in the nine funds is $221 million and private contributions total approximately $137 million (a total of $358 million).

An interim review of the IIF was undertaken in 2002. The report found that IIF had successfully increased the number of funds in the period 1998 to 2002, although many of these funds are small. A few of the larger funds relate to investment and retail banks that have supported significant investments in the communications sector. The fund has been most successful in attracting investments in start-up and early expansion stages, and seed investments appear to remain under supported. The fund faced major difficulties in the global downturn in technology markets in 2000.[34]

The third program is the Commercialising Emerging Technologies (COMET) program, which was established in 1999 and operates as a competitive grants program that provides support to businesses and individuals in the commercialisation of innovative products, processes and services. COMET is delivered by a network of private business advisors and was initially established for three years with funding of $30 million. An interim review of COMET was undertaken in 2000 and recommended that COMET be continued.[35] COMET has subsequently been extended until June 2011, as part of the government's policy of *Backing Australia's Ability – Building Our Future through Science and Innovation*.[36] Total government commitment to the COMET program now stands at $170 million.

The fourth program is the Renewable Energy Equity Fund (REEF) which was established in October 2000 as a specialist venture capital fund for the commercialisation of renewable energy technologies. REEF is also a public/private fund which is funded on a 2:1 ratio of government to private contributions of capital. The government investment in the program is $18 million, with the total initial capital of the fund amounting to approximately $27 million.

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[33] Department of Industry, Tourism and Resources, "*Pooled Development Funds (PDF) Program Fact Sheet*", www.industry.gov.au (last viewed 27/07/05).
[34] AusIndustry, "*Interim Evaluation of the Innovation Investment Fund*", www.ausindustry.gov.au (last viewed 27/07/05).
[35] AusIndustry, "*Commercialising Emerging Technologies (COMET) Interim Evaluation*", www.ausindustry.gov.au (last viewed 27/07/05).
[36] The total government commitment to that policy is $5.3 billion and follows the "*2001 Backing Australia's Ability strategy*".

The fifth program is the Pre Seed Fund which was established in November 2002. The Pre Seed Fund consists of four public/private venture capital funds that invest in private companies involved in the commercialising of research and development from universities and public sector research organisations. Like the other government funds it was established on the basis of a 2:1 government to private funding ratio and for a duration of ten years. The fund was capitalised with $72 million from the government and totals $108 million. The funds are managed by venture capitalists with experience in research, commercialisation and the development of sustainable businesses.[37] The managers provide management and technical expertise relevant to the development of the commercial potential of the technology. In return managers receive an equity investment in the companies or projects. The maximum amount for investments under this program is $1 million.[38]

Finally, legislative reform in 2002, as amended in June 2004, led to the introduction of the Venture Capital Limited Partnerships Program (VCLPs). This program enables funds to apply to the Pooled Development Funds Registration Board to be registered as a VCLP. Registration as a VCLP provides the opportunity to obtain capital gains tax relief for Limited Partnerships which are established in Australia, Canada, France, Germany, Japan, the UK and the US in relation to investments in companies that meet stipulated requirements. These include the investment must be for a minimum of 12 months, the investee firm must have assets of less than $250 million, over 50% of its employees and assets must be in Australia, and the predominant activity of the investee firm may not be in property or land development, finance, insurance, construction or infrastructure, or making investments.[39] To date nine funds have been registered as VCLPs.[40]

The financial performance of the IIF, Pre-seed and REEF programmes are struggling thus far. At the end of the 2003/04 year the Government's net (net of distributions) investment across these funds was $120 million, and this investment had a valuation of $82 million, which suggests an unrealised loss of $38 million.[41]

In May 2005 the government commenced a Review of Venture Capital policies, including those mentioned above. One of the terms of reference relates to consideration of the appropriateness, effectiveness and efficiency of existing government support including the PDF Program, IIF, COMET, Pre-Seed Funds and venture capital limited partnerships.[42] Submissions made to the review are not yet publicly available and the review has yet to issue a draft report.

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[37] The four fund managers are Allen & Buckeridge (life sciences), GBS Venture Partners (information and communication technologies), SciVentures and Starfish Ventures (technology sector).
[38] Department of Industry, Tourism and Resources, *Pre-Seed Fund*, 2005. www.industry.gov.au (last viewed 27/07/05).
[39] AusIndustry, "*Fact sheet: Venture Capital Limited Partnerships, July 2005.*" www.ausindustry.gov.au (last viewed 27/07/05).
[40] AusIndustry, *"Media Release: Venture Capital Review Underway – 10 May 2005"*, www.ausindustry.gov.au, (last viewed 27/07/05).
[41] As reported in the Australian Venture capital Journal, August 2005, page 4 & 5.
[42] Review of the Venture Capital Industry, Terms of Reference (3).

4.2.5 Finland

A snapshot as at 2004					
Investment by stage[1]			**Sector Distribution of investments[1]**		
Stage	*Amount (EuroM)*	*Percentage*	*Sector*	*Amount (EuroM)*	*Percentage*
Early	€ 40	18%	Communications	€ 13	6%
Expansion	€ 60	27%	Computer Related	€ 34	15%
Later	€ 122	55%	Other Electronics Related	€ 4	2%
Total	€ 222	100%	Biotechnology	€ 6	3%
			Medical/Health Related	€ 37	17%
Macro Economic Indicators			Energy	€ 6	2%
GDP[1] (EuroM)	€ 149,700		Consumer Related	€ 14	6%
Early stage as % of GDP	0.03%		Industrial Products /Services	€ 28	12%
All stages as % of GDP	0.15%		Chemicals and Materials	€ 26	12%
GERD[2] as % of GDP	3.49%		Industrial Automation	€ 1	1%
			Other Manufacturing	€ 21	9%
			Transportation	€ 2	1%
			Financial Services	€ 14	6%
			Other Services	€ 4	2%
			Agriculture	€ 0	0%
			Construction	€ 4	2%
			Other	€ 10	4%
			Total	*€ 223*	*100%*

Table 4.5. A snapshot of investment in venture capital/private equity in Finland as at 2004.
[1] These values were sourced from the *"2005 European Venture Capital Yearbook"*.
[2] This was sourced from the *"OECD Main Science and Technology Indicators Report 2005"*. It was based on most recent data available, as at 2003.

Government initiatives[43]

The Finnish government established the Finnish Industry Investment Ltd (FII) in 1995 as a government owned investment company. FII has the primary policy goal of assisting in the establishment, development and financing of venture capital funds investing in seed and start-up firms. FII invests indirectly in seed and start-up firms via its role as a cornerstone investor in venture capital funds. In this respect FII has acted as a fund of funds. FII has also increasingly become involved in making direct venture capital

[43] This material is drawn from Maula, M. and Murray, G. (2003), "*Finnish Industry Investment Ltd: An International Evaluation"*, Ministry of Trade and Industry and Vihko R., Castells M., Georghiou L., Jalkanen S., Meyer-Krahmer F., Vuoko P. and Grohn M. (2002). "*Evaluation of Sitra 2002",* Sitra, Helsinki.

investments in Finnish firms. All of FII's investment decisions, including valuations and negotiations, are undertaken by its relatively small in-house investment team.

FII's investments are made on the same basis as other shareholders. Thus it does not provide any additional upside incentives to normal commercial returns for private investors and as such the government's actions do not shift the risk/return profile for private investors as is commonly the case in other public/private funds.

As a government entity, FII is subject to a requirement that it undertakes its investment activities *profitably* under the general public sector management framework. This is interpreted to mean that *annual* returns are expected to be above the inflation rate.

The Finnish National Fund for Research and Development, called Sitra, is a government entity that was established in 1967. Sitra is also involved in making government investments in the venture capital industry.[44] Sitra is involved in acting indirectly in venture investments in both Finland and internationally as a fund of funds, although its focus has increasingly been on direct investments in early stage domestic firms. Hence there is considerable overlap in the respective roles of FII and Sitra in relation to investments in the venture capital industry in Finland. Sitra made its first direct investment in 1987 and has developed its own specialist investment teams in the information technology and life sciences sectors. Sitra's focus has also shifted from growth oriented (expansionary) companies to seed and pre-seed funding.

In addition to these government organisations there are also other government support organisations operating in the venture capital industry in Finland. Finnvera is actively involved in providing business development, marketing, and internationalisation support services. Tekes, the National Technology Agency, is involved in basic research, applied research and research and development. Tekes is also involved in joint operations with Sitra in relation to seed stage financing in Finland.

Both FII and Sitra have both suffered from various issues in achieving their ultimate objective, which is to address market failures in early stage venture capital. Firstly, an independent review undertaken of FII in 2003 noted that the *roles* of FII and Sitra are unclear and FII's increase in direct investments has made its role increasingly unclear.

Secondly, FII suffered from an annual profitability requirement, the interpretation of which requires FII to report a profit each year. This sits uneasily with the longer-term investment cycle in venture capital and in practice appears to have resulted in FII moving into later stage investments in order to satisfy this goal of annual profitability.

Sitra has struggled to achieve its objective since the market downturn in 2001, resulting in reduced resources at its disposal. This has impacted on Sitra's ability to continue its involvement in venture capital investments. A review of Sitra in 2002 found that it had not been sufficiently successful in attracting foreign venture capital investment to Finland.

As a result of the above limitations, the authors of the FII review concluded that neither FII nor Sitra have been able to successively prevent the near disappearance in Finland of private venture capital funds investing in seed, start-up and early stage investments.

[44] Note that Sitra obtains virtually no funding from the State budget.

The FII review included recommendations that:

- FII should take a more proactive role in stimulating the supply of seed-stage venture capital.[45]
- FII should preferably focus on indirect investments and act as a fund of funds rather than devote significant resources to direct investments in firms.
- FII's performance should be measured over a sufficiently long period of time to take account of the cyclical nature of venture capital investments.

4.2.6 Lessons

In this section we reflect on lessons that can be drawn for the experience of the above five countries and conclude with their implications for New Zealand.

- The Israeli government's direct investment policy, the Yozma Group, was instrumental to the successful pump priming of the Israeli venture capital industry. The fund's incentives were well designed and were successful at leveraging foreign capital and management expertise. This enabled an opportunity for local managers to learn from their foreign counterparts and enabled the training of venture capital professionals and support services (e.g. banking, law and accounting) who would go on to successfully operate the domestic venture capital industry independent of direct investment by government equity programs. Another important lesson was the associated timely exit of the government from the Yozma group activities once it had successfully established a sustainable venture capital sector.
- Early government initiatives in Singapore focused on demand side policies in relation to the development of capabilities in research and development. Subsequent government policies, particularly in the late 1990s, shifted focus to supply side policies focusing on venture capital investments in seed and start-ups in high technology sectors. The major lesson derived from the Singaporean experience is that complementary demand side policies can very effectively foster the research and development and entrepreneurial capabilities that are imperative to the development of a self sustaining and robust venture capital industry.
- The Canadian experience provides an illustration of the counter-productive effects of poorly designed policies. The tax incentives for the LSVCCs program led to an influx of inexperienced investors into venture capital. The excess competition for potential investment-ready firms crowded out private sector investment. It also led to a wastage of resources and to many experienced investors, including US pension funds, shifting away from the Canadian markets over this period.

[45] Note this contrasts with the findings of the Sitra Review which found that Sitra's shift to seed and preseed financing " filled an important gap in the Finish innovation system" Vihko R., Castells M., Georghiou L., Jalkanen S., Meyer-Krahmer F., Vuoko P. and Grohn M. (2002) pp 14-15. Also note comments that Finland had the highest proportion of seed stage financing of all the Nordic countries, p 13.

- Lessons from Australia are at best tentative at this stage but the current review is likely to provide more insights. Experience to date suggests, consistent with lessons learnt from other jurisdictions, public/private funds which leverage both private capital and management expertise and which focus on seed and start-up firms seem to be successful at increasing the overall supply of venture capital. However we understand there has been limited uptake of the venture capital limited partnership arrangements due to the restrictions placed on the investments that qualify for this.

- The key lesson to be drawn from the experience of Finland is the need to design any direct government stimulation of these markets in such a way that is attractive to private investors (e.g. by shifting their risk/return profile through the inclusion of favourable buy-out provisions or other mechanisms). A further lesson is that the performance assessment framework for government participation in venture capital markets needs to take account the long-term nature of these investments and recognise that annual profitability targets in the early period of these investments are likely to be counter-productive.

4.2.7 Implications for New Zealand

The country studies provide some general pointers for venture capital policy in New Zealand, which include:

- On the supply side, the need to design any direct interventions with a view to catalysing the market for private investors, rather than ignoring market dictates. Without this approach the government is likely to find it difficult to attract other long term investors (e.g. the Finland experience) or over-reach and cause a flood of capital followed by a drought (the Canadian experience). Any conditions placed on tax or regulatory instruments designed to attract capital need to be considered carefully as they may lead to the instrument becoming unattractive to the market and thereby not meeting its objective (e.g. as appears to be the case with the VCLPs in Australia).

- On the demand side, government's typically have an array of support mechanisms to stimulate R&D and the demand for venture capital and related business development financing. It is important that these programmes are broadly aligned with the commercialisation process (as appears the case in Singapore) and that they serve to shift firms and innovative ideas along the commercialisation path, and do not unduly undermine the venture capital or other commercial financing processes.

- Significant external factors intervene that disrupt policy aspirations. This reminds us of the importance of policies that can respond to the market and unexpected change.

- Policy matters. A well-designed policy intervention is a necessary condition for appropriate stimulation of venture capital markets and, conversely, ill-conceived interventions can cause immense damage.

5 Rationale for government intervention

It is natural to ask why government should intervene in the venture capital market at all, as it may appear an activity best left to private market players. In this chapter we explore the rationale for possible government intervention and its limits.

5.1 Why government intervention?

It is instructive to observe that all venture capital markets of which we are aware were initiated with government support. These markets do not appear to emerge without some form of assistance. This leads to the question as to what it is that requires the need for government support in these markets, at least in their formative stages.

The desirability of venture capital markets from a public policy perspective lies in the importance of innovation as a spur for economic growth (as recognised in the GIF), and that venture capital appears to be a very efficient stimulator of innovation. Venture capitalists have developed a set of tools that are very well suited to the challenging task of nurturing high-risk but promising new ideas and taking them to market. Venture capital will never supplant other well-springs of innovation, such as vibrant universities and research laboratories, but is rather best viewed as a complement to them. A healthy venture capital industry could be an important contributor to New Zealand's innovation system.

In contrast to the extensive research on other government interventions in the economy, such as regulation, taxation , welfare and privatisations, government interventions in the venture capital markets have been subjected to much less academic research and there is not as yet a well developed theory, and empirical testing, of the costs and benefits of government involvement in this sector. However, there is an emerging view that government assistance may be warranted to address one or more of three issues – R&D spill-overs, infrastructure building, and information asymmetries.

At the same time, history also conveys some substantial cautions about government intervention to spur venture capital. Literally, tens of billions of dollars have been squandered by governments internationally in ill-conceived efforts to stimulate venture capital. In many cases, these efforts have been doomed to failure due to poorly designed programmes which were not based on an understanding of the workings of venture capital markets, or were designed as a "top-down" programme without any role for signals from the market.[46]

5.1.1 The presence of R&D spill-overs

An extensive literature (reviewed in Griliches (1992) and Jaffe (1996)) has documented the presence of economic spill-overs (or positive externalities) from R&D. These spill-overs take several forms. For instance, the rents associated with innovations may accrue to competitors who rapidly introduce imitations, to developers of complementary products, or to the consumers of these products. Whatever the mechanism of the spill-overs,

[46] See Gompers & Lerner (2001), chapters 8 & 9, and section 5 of this study.

however, the consequence is the same: firms will invest below the social optimum in R&D.

After reviewing a wide variety of studies, Griliches estimates that the gap between the private and social rate of return is substantial and probably between 50% and 100% of the private rate of return (depending in part on the nature of the R&D). While few studies have examined how these gaps vary with firm characteristics, a number of case-based analyses (Jewkes (1958), Mansfield, *et al.* (1977)) suggest that spill-over problems are particularly severe among small firms. These organizations may be particularly unlikely to defend effectively their intellectual property positions or to extract most of the rents in their product markets. These small firms are also likely to be candidates for venture capital financing.

Public finance theory demonstrates that publicly financed support can be an appropriate and efficiency enhancing response to raise the level of investment in activities that generate positive externalities. While this is widely recognised in the case of core R&D (e.g. this is the basis for the FoRST and other granting programmes for R&D) it may also apply in the case of venture capital.

Viewed in this way, venture capital is an extension of the innovation system which already receives government support. In this context venture capital is designed to provide finance and associated business development services to firms which are still at a stage in their development cycle in which R&D spill-overs are prevalent.

5.1.2 Infrastructure building

A growing body of literature has suggested that venture capital is an "increasing returns" business: activity by one fund makes it easier for a second fund to operate, and so forth.[47] It is also clear that a venture capital market relies on a significant infrastructure (or eco-system) relatively specific to it to be self-sustaining. This infrastructure takes a variety of forms, including the following examples (Lerner, 2000):

- Entrepreneurs become familiar with the trade-offs associated with venture capital financing. Initial disputes about the types of terms and conditions commonplace in venture financing are balanced with an appreciation for the types of gains possible with the involvement of a seasoned financier.
- Intermediaries such as lawyers, accountants and business advisers become familiar with the venture capital process and can better advise entrepreneurs and financiers alike.
- Investors gain greater comfort that the sector in which venture capitalists are operating is viable one and become more willing to back funds, and to invest in venture-backed IPOs.
- Venture capitalists more readily find peers with whom they can share transactions. The syndication of transactions is an important form of "judgment sharing," which allows venture capitalists to make more effective decisions than if they were operating alone.

[47] Lerner (1994); Sorenson and Stuart (2001); and Hochberg, et al. (2005).

Individual private investors or fund managers are unlikely to be able to capture themselves many of the benefits from establishing this infrastructure and thus can be expected to under-investment in it. This form of market failure suggests a possible role for government.

The United States' Small Business Investment Company (SBIC) program provides an example of how public venture programs can support the development of venture-investing infrastructure.[48] This programme stimulated the proliferation of many venture-related institutions in Silicon Valley and Route 128—the two major venture capital locations in the US. One notable example, Venture Economics, which originated as the SBIC Reporting Service in 1961, gradually expanded its scope to become the major source of returns data on the entire venture industry.

New Zealand's experience to date supports the view that some form of government stimulation is required to establish the infrastructure required to sustain a venture capital market. Prior to NZVIF there was no venture capital market to speak of, or infrastructure to support it, but this has increased over the last three years (but remains small).

We note infrastructure building would suggest a transitory role for government support, lasting only for as long as is required for a critical mass of infrastructure to be in place.

5.1.3 Information asymmetries

Empirical research suggests that new firms, and especially technology-intensive ones with products yet to be tested in the market, may receive insufficient capital to fund all their positive net present value projects due to information problems in the normal financing markets.[49] This same issue arises for fund managers that wish to raise a venture capital fund in a market for which there is limited or no track record of performance.

As discussed above, venture capitalists specialize in financing these types of firms and have developed a range of mechanisms that attempt to address some of these information problems. Public supported programmes may assist this process by providing "certification" to private investors as to the most promising investments.

Lerner (1999) suggests this "certification effect" as one of the key driver behind the very marked higher performance of awardee firms in the United States Small Business Innovation Research (SBIR) program, relative to matching non-awardee firms. This difference in performance is illustrated in Table 5.1., . This table presents the growth in employment between 1985 and 1995 of 541 firms that received Phase II awards between 1983 and 1985 as part of the Small Business Innovation research program, as well as that of 894 firms that did not received awards that were selected to match these firms as closely as possible. The tabulation is presented for all awardees, and for firms that were or were not located in a zip code with at least one early-stage venture financing between

[48] Noone and Rubel (1970).

[49]. The literature on capital constraints (reviewed in Hubbard (1998)) documents that an inability to obtain external financing limits many forms of business investment. Particularly relevant are works by Hall (1992), Hao and Jaffe (1993), and Himmelberg and Petersen (1994). These show that capital constraints appear to limit research-and-development expenditures, especially in smaller firms.

1983 and 1985. The table shows that the awardees grew considerably faster than companies in the same locations that did not receive awards.

	Change in employment for…	
	SBIR awardees	**Marching firms**
Entire sample	+26	+6
Firms in zip code with VC activity	+47	+3
Firms in zip code without VC activity	+13	+7

Table 5.2. Growth of SBIR awardees and matching firms. This table is based on Lerner (1999).

A public programme designed as a fund of funds, as is the case with the NZVIF, is likely to address information asymmetries as between investors and fund managers. This could be achieved by, for example, heavy investment in due diligence procedures and performance reporting requirements, thus creating a "certification" effect in the investing market for those fund managers that are able to meet the NZVIF requirements. Our interview evidence suggests this has in fact been happening in the New Zealand market.

5.2 Limitations of government interventions

Even if there are sound economic reasons why government interventions in the venture capital markets could potentially be efficiency enhancing, there are also reasons why this potential may not be achieved.

5.2.1 Distortions from political decision making

An extensive political economy and public finance literature emphasizes the distortions that may result from government subsidies as particular interest groups or politicians seek to direct subsidies in a manner that benefits themselves. As articulated by Olson (1965) and Stigler (1971), and formally modelled in works such as Peltzman (1976) and Becker (1983), the theory of regulatory capture suggests that direct and indirect subsidies will be captured by parties whose joint political activity such as lobbying is not too difficult to arrange (*i.e.*, when "free-riding" by coalition members is not too large a problem).

These distortions may manifest themselves in several ways. One possibility (discussed, for instance, in Eisinger (1988)), is that firms may seek transfer payments that directly increase their profits. Politicians may acquiesce in such transfers in the case of companies that are politically connected. A more subtle distortion is discussed by Cohen and Noll (1991) and Wallsten (2000) where officials may seek to select firms based on their likely success and fund them regardless of whether the government funds are needed to achieve that success. They can then claim credit for the firms' ultimate success even if the marginal contribution of the public funds was very low. In programmes where a central group makes highly visible awards, the dangers of political distortions are likely to be higher.

An illustration of these problems can be found in the largest public venture program in the United States, the SBIR program. Congressmen and their staffers pressure program managers to award funding to companies in their states and, reflecting this, in almost every recent fiscal year all 50 states have received at least one SBIR award. Table 5.2 above highlights the consequences of such political pressures. In particular, it contrasts what happened to the workforce size of SBIR awardees located in regions characterized by considerable high-tech activity (that is, with VC activity in the same zip code) and those elsewhere. It reveals that in the 10 years after receipt of SBIR funding, the workforce of the average award recipient in a high-tech region grew by 47, a doubling in size. The workforces of other awardees—those located in regions *not* characterized by high-tech activity—grew by only 13 employees. Though the recipients of SBIR awards grew considerably faster than a sample of matched firms, the superior performance, as measured by growth in employment (as well as sales and other measures), was confined to awardees in areas that already had private venture activity. In the name of geographic "diversity," the programme funded firms with inferior prospects.

Staying with the SBIR example, particular companies have managed to capture a disproportionate number of awards. These "SBIR mills" often have staffs in Washington that focus only on identifying opportunities for subsidy applications. This problem has proven difficult to eliminate, as "mill" staffers tend to be active, wily lobbyists. Moreover, "mills" commercialize far fewer projects than those firms that receive just one SBIR grant (Lerner, 1999).

This tendency of the political decision-making process leading to sub-optimal outcomes points to the need for the careful design of any publicly funded support for venture capital.[50] The fund of fund design used for the NZVIF is a good example of this, whereby the decision-making for the allocation of support is devolved to officials and an independent board, and is subject to private investors committing to the same fund (i.e. the fund manager must pass a market test prior to obtaining government support). Further, under this arrangement, the allocation of funds to individual firms is undertaken by the fund manager who in turn is subject to the governance exercised by private investors.

5.2.2 Duration and extent of public funding programmes

In nearly all the OECD countries, venture capital investment has started as a publicly funded activity. Thus Government funds have been used to effectively 'prime the pump' for private venture capital by reducing the imbalances of funding across different stages, sectors and regions. This is particularly so in the early stages such as seed and start-up where the risk profile of investments are considered much steeper than its later stage counterparts, the investment horizon is longer and there is often a lack of liquidity and general certainty of the investment's return. Hence, private sector investors are often reluctant to invest in these early stages and government may play an important role in risk-sharing and ensuring sufficient equity capital is raised.

[50] For a wider description of these public sector design issues see Chapter 10 of Scott G. (2001), *"Public management in New Zealand: Lessons and Challenges"*, New Zealand Business Roundtable, and Horn M. (1995), "*The Political Economy of Public Administration – Institutional Choice in the Public Sector"*, Cambridge University Press.

In some countries, the government has played a dominant role for a long period of time. Examples include the US SBIC programme and Yozma in Israel. These schemes not only channelled substantial amounts of risk capital to young firms, but helped to train managers who later launched their own funds, stimulated growth in venture markets and instilled a venture culture.

However not all public initiatives are well-targeted and some have outlived their original purpose and usefulness. Over time public programmes tend to converge towards the same market segments as the private sector, rather than addressing gaps in the provision of risk capital. This can potentially crowd out private investors or even delay the development of private early stage financing. It is therefore necessary that the type and extent of government's role is continually evaluated. For example, in Israel Yozma was terminated as private sources of capital grew in the late 1990s, and was then re-invigorated in the early 2000s to address the lack of venture capital funding following the bursting of the "tech bubble".

These two examples illustrate that government funding should probably not continue indefinitely and that its purpose and direction may need to change over time. Whilst government venture funds can serve different purposes, for instance the Community Development Fund in the United Kingdom and the New Markets Venture Capital programme in the US, which have social goals, including technology transfer, job creation and economic development (as well as commercial aims) many of the public funds predominantly aim at priming the pump for private venture financing. It is therefore useful to develop an evaluation system of such programmes which is capable of identifying the point at which a market is self-sustaining, or requires a different form of intervention.

In chapter 9 we develop further our view of the appropriate role of government in the New Zealand venture capital market in the form of recommended public policy initiatives to this market forward.

Part III Venture capital in NZ

6 History of NZ venture capital

Prior to the establishment of the NZVIF programme in 2002 and the resulting VIF Seed Funds there was a virtual absence of dedicated venture capital funds operating in New Zealand. Private equity investment activity had been focused in later stage investments, management buy-outs, restructurings and so forth, with occasional investments in the venture capital space.

6.1 Government participation in venture capital

Government has intervened in the venture capital (or similar) markets in three distinct phases, as follows:

- With the establishment of a development bank
- With the establishment of a private equity fund
- With the establishment of NZVIF.

6.1.1 Development Finance Corporation was the first initiative

Government intervention in venture capital has been significant. Government interventions in private equity and venture capital can be traced back to the establishment of the Development Finance Corporation (DFC), established in 1964.

DFC was established as a development bank jointly owned by private banks, the Reserve Bank and the Government.[51] It was created to assist the development of New Zealand industry, and in particular the export sectors. Its mandate included investment in areas now described as venture capital and it supported two venture capital style programmes, the Applied Technology Programme and the Small Business Venture Capital Fund. These were consolidated into DFC Ventures in 1984.

DFC became fully government owned in 1973 and until 1977 enjoyed the benefit of a government guarantee. From the mid-1980s DFC took a more commercial approach to it's lending, reflecting the changed public policy environment at the time to encourage all state-owned businesses to perform in accordance with commercial criteria.

The government in 1988 sold DFC to the National Provident Fund (80%) and Salomon Brothers (20%). In 1989, subsequent to severe deterioration in asset prices, DFC became technically insolvent, which led to it being placed under statutory management and eventually wound up.

[51] This description of DFC is drawn from a speech from Dr Don Brash when Governor of the Reserve Bank of New Zealand titled *" The DFC failure – lessons for banking supervision"*, and published in the Reserve Bank Bulletin Vol 54, No 1, 1991.

6.1.2 The Greenstone Fund established in 1993

The next example of government involvement in venture capital/private equity markets was the establishment of the Greenstone Fund in 1993. This $25 million fund was a joint government/private sector fund with investors Government (20%), the National Provident Fund (20%), National Mutual (20%) and AMP (40%). Pencarrow Private Equity Ltd was (and remains) the fund manager. While its mandate allowed for investment in venture capital projects, in practice it has focused on later stage investment and management buy-outs.

Greenstone was established as a 10 year limited life fund, but has subsequently been extended to March 2006 (with capacity to extend to March 2007) in order for it to realise its last two investments in an orderly manner. Greenstone has already returned its original capital to investors and the extent of its overall financial success is dependent on the terms on which it exits its remaining two investments.

We note that neither DFC nor the Greenstone Fund were successful in seeding a venture capital market in New Zealand.

6.2 Establishment of NZVIF in 2002

The most recent example of government intervention in the venture capital markets is the establishment of the New Zealand Venture Investment Fund (NZVIF) in 2002. The following provides some context to the development of NZVIF.

6.2.1 The state of the market as at 2000-02

The New Zealand venture capital market prior to NZVIF was characterised by:

- A virtual absence of dedicated local venture capital funds, very few private equity funds that invested in venturing, and a general lack of skills in these funds to manage venture capital investments.
- Little evidence of venture capital funds/managers with a venturing investment track record, operating in the NZ market. There were one or two groups with some private equity track record.
- A fledgling industry association.

Of the wider group that identified themselves as venture capital fund managers that existed at the time, it is not known how formalised their structures were, or whether they had the typical characteristics of a standard venture capital fund. [52]

There were a number of funds that were either publicly listed vehicles or captive funds (on behalf of a single investor). Two of the current VIF Seed Fund managers were operating as stand alone private equity fund managers at that time: No 8 Ventures and Direct Capital. Direct Capital had achieved a first close of their TMT Ventures Fund, which was established as a specialist Australasian telecommunications & media fund,

[52] Features such as fixed life funds and blind pool of capital committed to a portfolio of investments.

with capacity to do both early and late stage investments. No 8 Ventures had recently raised its first venture capital fund, and was actively investing. In addition there were several individuals involved in various ways with technology companies, either brokering deals, advising and/or investing. Much of the activity was driven off the success of individual New Zealand technology companies that had caught the technology wave of the 1990's.

6.2.2 Government begins to stir

It was during this time, in the presence of limited activity in the local market, that the government began to (again) consider its role in venture capital and the importance of the sector in contributing to the growth of the economy. In particular, Government perceived a lack of commercial projects being brought to market by the CRIs and universities. This concern extended to a perceived gap in the supply of appropriate forms of financing and commercialisation/investment experience available to support emerging, innovative New Zealand companies and technologies.

In 2000 the NZ Treasury commissioned a study to review the New Zealand venture capital sector. The following extract from its Executive Summary sets out its key findings:[53]

> *"The quality of decision making and advisory services within the venture capital market is critical to its medium term performance. Private sector advisors and investors have strong incentives as well as the requisite experience to provide high quality advice and make wise investment decisions. Any involvement by the government in this market should ideally be via existing players rather than standalone public agencies.*
>
> *As for venture capital firms an exit strategy should be a priority for any government programme to assist business development via the venture capital market. The market is maturing steadily – gaps are being closed and the market is segmenting to cater for specific demands. Although this process is slow, the increased number and range of businesses active in the venture capital market over the past five years confirms that progress is being made. It tends to be more difficult for governments to withdraw from programmes than to start them. The more permanent a programme is perceived to be, the more likely it is to distort business behaviour.*
>
> *If profitable projects are being forgone in the venture capital market it most probably relates to information. Differences in the quality and depth of information held by the two parties in most venture capital deals can vary significantly. The time and cost of achieving information symmetry and therefore achieving a mutually acceptable agreement can be prohibitive and therefore no deal is consummated. It is difficult to conclude confidently that such impasses constitute a market failure.*
>
> *The logical point for the government to intervene would be to reduce transaction costs for participants. In the first instance, this is probably best achieved via direct assistance to those already involved in grooming and mentoring prospective businesses. The quality of this work is critical and therefore is best left in the hands of those with a clear incentive to*

[53] *"New Zealand's Venture Capital Market: A study Commissioned by the New Zealand Treasury"*, by Infometrics Ltd, July 2000. The extract on findings are paragraphs 12 – 17 of the Executive Summary.

complete the task accurately, promptly and skilfully – generally private sector businesses and individuals.

A key issue for any intervention is to avoid distorting the incentives and disciplines that are already becoming established within the venture capital market, and to avoid displacing current and potential players. This is especially important in a market that historically has been quite fragile.

New Zealand's venture capital market is maturing. Not fast enough for some and not soundly enough for others. The fundamental issue for this market is to build confidence amongst investors and entrepreneurs that the market will continue to develop effectively. The emergence of well-managed and successful private sector venture capital businesses is an important element in this process. Any government intervention in this market needs to be sensitive to generating distortions that could undermine confidence in the vigour and sustainability of venture capital firms."

At this point, the Growth and Innovation Framework had not yet been established and the innovation strategy not yet articulated. However, implicit thought at the time was that in the 'innovation process' a deficiency was present in the New Zealand market with respect to the commercialisation skills available for young potential technology companies. This was evident by the absence of any clear direction or route for high growth companies to develop and a lack of risk capital and skills to nurture these companies through the challenging early stages of development.

6.3 Implementation of NZVIF

6.3.1 Goals of NZVIF

The Government established the NZVIF with the purpose of accelerating the growth of the New Zealand venture capital market through co-investment with private investors and related market development activities. The NZVIF was established with four goals:[54]

- To accelerate development of the venture capital industry by increasing the level of early stage investment activity in the New Zealand market;
- To develop a larger pool of people in New Zealand's venture capital market with skills and expertise in early stage investment;
- To facilitate commercialisation of innovations from the Crown Research Institutes (CRIs), Universities and the private sector; and
- To get more New Zealand businesses on paths to global success by increasing their access to international experts, networks and market knowledge.

6.3.2 Development path

The Government, following a review of venture capital investment programmes implemented in other jurisdictions, including Australia, Singapore, US and Israel, chose to model NZVIF around Israel's successful Yozma fund. It was felt that Israel's comparable

[54] See CAB Min (01) 6/1 and NZVIF's "*Statement of Corporate Intent, 1 July 2004 – 30 June 2009*".

size, distance to market, similar challenges in attracting capital and its approach of developing the sector out of its emerging strength in science and technology made it an appropriate choice. This fitted with New Zealand aspirations of developing a venture capital sector that would emerge from the basis of a strong science and technology platform. In 2000 Yigal Urlich, the founder of the Yozma Fund came to New Zealand to advise on the implementation of a public venture capital funding programme.

6.3.3 Features of Yozma adopted

Some features of the Yozma fund that were considered favourable and appropriate in the New Zealand context were as follows:

- The adoption of an equity based investment model. Other countries had sometimes supported business development by underwriting companies' debt. However, the outcome of such an approach had not always been favourable. Furthermore, in the context of stimulating a venture capital market such an approach was not viewed as appropriate.

- A buy-out option for private investors. This provided the opportunity of making available capital for reinvestment. It would also further encourage private investment as such an approach effectively would give them the option to take a much greater share of the upside.

- A fund of fund model, whereby investment commitments are made to private venture capital fund managers. The fund managers take responsibility for making and managing investments, without interference. This effectively distances the government from the commercial decision-making process and ensures that investment decisions are based on a solid commercial imperative.

- Co-investment alongside private investors. Such an approach could serve to encourage private investors into the market, by improving portfolio diversification and thus reducing investment risk.

- Standard venture capital structures and commercial terms, for example fixed life funds with profit share to align manager and investor interests.

6.3.4 Features of Yozma discarded

Although many of the features of the Yozma Fund were adopted, others were discarded. The key differences between the NZVIF and Yozma Fund are as follows:

- The NZVIF investment ratio was less generous. While The Yozma fund provided $1 for every $1.50 of capital raised, the NZVIF provides only $1 for every $2.00 raised in the private sector.

- The investment stages covered by the two funds were not identical. The Yozma fund was directed at all stages of venture capital. In contrast, the VIF design had initially specified only seed investments. Following advice from the Yozma fund to extend this for portfolio and risk management reasons, and indications from the market that this would be necessary in order to raise matching funds, the restriction was loosened to include early expansion investments.

- Yozma included generous tax provisions, to attract offshore diaspora investors. However, the New Zealand market raised concerns about tax issues at the very outset of VIF development. Despite attempted engagements with officials on this matter, little progress was made in respect of the key issues such as "look-through" tax treatment for investors.

- Adoption of different legal structures. In the Yozma funds a standard Delaware Limited Partnership structure was adopted, but in New Zealand a similar partnership structure was not available and the preferred model of local venture capital fund managers has been unincorporated joint ventures.

6.3.5 Institutional structure of NZVIF

Initially VIF sat within MoRST, with an Advisory Board. However, prior to any investments being made it was structured as a limited liability Crown Owned Company, which ensured the Crown could distance itself from risk and liability in respect of the investments made. This approach also ensured distance and independence from decisions about appointment of venture capital fund managers and from individual investment decisions.

The NZVIF is structured as follows:

- As a Crown Owned Company with an independent board of directors. Directors are selected for their venture capital and commercial experience. The original Board was appointed until August 2004, but this has been extended twice, most recently until 30 June 2006 to enable completion of the capital commitment process.

- As a venture capital fund of funds, investing in privately managed venture capital funds (known as VIF Seed Funds, or "Funds"). It invests on a 1:2 ratio in the funds.

- With a minimum fund size of $30 m (inclusive of VIF) required for fund managers to participate. To date six such funds have been established, with five funds currently active.

- With investment in the Funds on the same terms as private investors, except that (i) other investors in each Fund are provided with an option that is exercisable up to the end of the fifth year of the Fund to buy out the NZVIF investment on the basis of capital plus interest only (i.e. other investors can access any upside above this amount) and (ii) the Fund must operate within the investing profile across seed-start-up-early expansion as set out by NZVIF. It participates in investor governance decisions on the same terms as private investors, with the same voting rights. Investor governance arrangements reflect current market practice.

NZVIF's decision to invest in a Fund is made following completion of an extensive selection and due diligence process, undertaken on the Fund Manager, to determine whether the Fund proposal is "investment grade". Formal and detailed Fund Management and Co-investment Agreements, reflecting standard venture capital commercial practices, are then negotiated.

As outlined above, NZVIF plays an ongoing role in governance of the Funds invested in, through an Investor Advisory Committee. However, neither NZVIF nor private investors participate in the investment decision-making.

6.3.6 Establishment of first NZVIF seed funds

During the first investment round NZVIF played an active role, not only in raising local and international awareness of the NZVIF programme, but also in helping to educate the local investor market about venture capital as an asset class.

An important process was the establishment of the Funds through a process of competitive selection. There was a first selection round in 2001 and there have been subsequent selection rounds.

The selection process combines a rigorous in-house desktop assessment of all proposals received, with the selection of a shortlist of applicants who are then referred to an independent due diligence process. The independent due diligence has been conducted by Wilshire Australia Pty Ltd, an independent specialist private equity advisor. A standard methodology and fixed criteria are used to assess and rank all applications received and to determine whether they are "investment grade". Following the completion of external due diligence the NZVIF Board selects those applicants it wishes to proceed to negotiate investment terms with, based on whether they are "investment grade" and also meet the requirements of the NZVIF programme mandate. Once fund agreements are finalised, investment activity commences.

Criteria sought in VIF Seed Fund managers are that they:

- Comprise people with the skills and experience needed to qualify as an "investment grade" manager.
- Have the potential to become world-class venture capital fund managers.
- Are fully aligned with the purpose and intent of the VIF programme.
- Have convincing investment strategies aligned with the early stage focus of the VIF programme.
- Can engage professionally with appropriate long-term investors and succeed in raising the required private co-investment.
- Can be expected over time to deliver the superior returns expected from an experienced and successful venture capital fund manager.

A monitoring and reporting framework is agreed with each VIF Seed Fund manager. This enables NZVIF to collect the economic and financial data it needs for the required regular reports to shareholding Ministers on the performance of each fund and the impact of the VIF programme. This also enables NZVIF to monitor each Fund to ensure it is compliant with its investment agreement and investor governance requirements.

6.3.7 Other NZVIF initiatives

Since its inception VIF has undertaken several activities to promote and encourage the development of the sector. These have been locally and internationally focussed initiatives including:

- Establishment of standard venture capital investment documentation, designed for the New Zealand market. Such documentation was not previously available in the New Zealand market and was developed without antecedents, based on standard international best practise.

- Submissions prepared on venture capital tax issues, related to tax treatment of offshore investors, in New Zealand venture capital funds, and advice to Government on market development issues, advice on NZVIF progress and on the state of the New Zealand venture capital market.

- Sponsorship of NZVCA for specific market development initiatives, for example venture capital key investment terms guidelines (for entrepreneurs).

- A series of institutional investor seminars conducted in New Zealand, supported by Wilshire Associates. Target investors were both pension funds and institutional investors e.g. GSF, NPF, EQC, AMP, Alliance, ACC. Additional presentations and seminars were also conducted with industry groups such as ASFONZ.

- Annual one-on-one education and promotion meetings held with targeted venture capital fund managers and Fund of Funds operating in the Australian market.

- Commissioning of a survey from US based Venture Economics, to identify international venture capital fund managers that may have an interest in New Zealand. There have now been two annual surveys designed and conducted by NZVIF, to gather information and better understand international private equity and venture capital investors and what it would take to attract them to invest in New Zealand.

- Publication of articles in relevant investor journals.

7 Current state of the NZ market

The historical discussion of the NZ market highlights both how new the venture capital market is and how difficult it is likely to be to establish a sustainable venture capital market. We evaluate in this section the current state of the market.

Information difficulties are substantial. As noted before, the history of venture capital in New Zealand prior to 2002 is tied to the development of a very small number of private equity and venture capital fund managers and the data on venture capital as a subset of private equity activity is not readily available or reliable. There is reasonably good information on the NZVIF programme, and as it represents a substantial portion of the market it is a reasonable proxy for the state of the market where wider information is not available.

In this section we:

- Describe the current state of the NZ venture capital market
- Describe the relative performance of the NZ market.
- Review NZVIF progress and milestones
- Assess whether the market has reached a level of sustainability

Current state of market

Data on the amount invested and the deal flow by stage for recent years (2002, 2003, and 2004) has been collated and diagrammatically presented below.[55]

In 2004 the amount invested in all private equity was $158m. The total number of deals undertaken was 59, up from 39 and 51 in 2002 and 2003 respectively. These values indicate a steady increase in the level of activity in venture capital and private equity in New Zealand.

[55] Data for these tables have been obtained from the *"New Zealand Venture Capital Monitor 2004".*

The amount invested in early stage has averaged $13.4m over the last 3 years. Although the amount is invested is up from the previous year, it is still below the amount in2002.

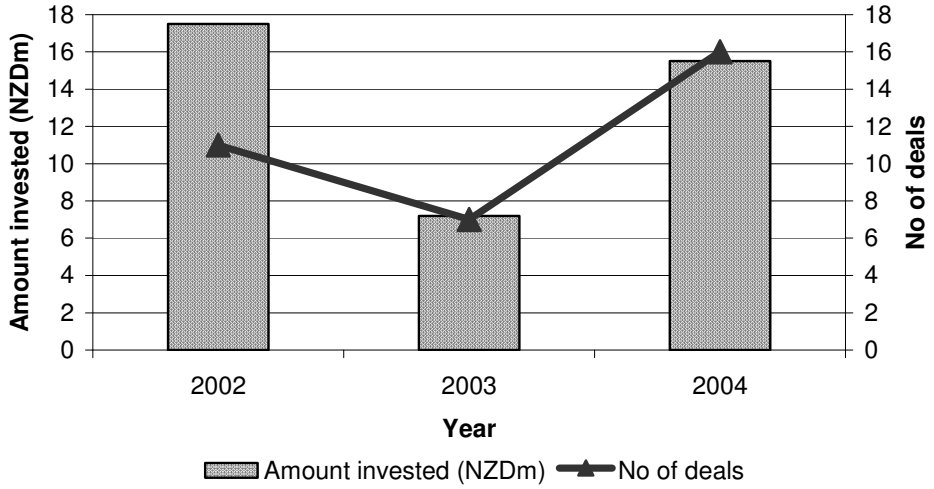


Table 7.1. Annual amount invested and number of deals in venture capital stage investments for 2002 – 2004. Sourced from the *"NZ Venture Capital Monitor"*.

There is a strong and steady increase in the amount invested in the expansion stage of venture capital. The amount increased from $14 m in 2002 to $44 m in 2003 and $96 m in 2004. This represented a year on year growth rate of 300% and 220% respectively.

Despite the dramatic increase in investments between 2003 and 2004, the number of deals undertaken actually declined very slightly. This indicates the average deal size for this stage of investment increased.

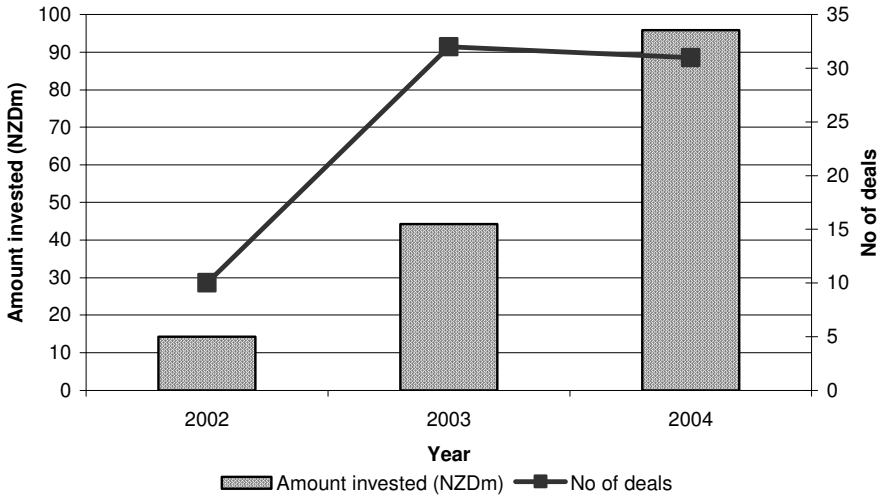


Figure 7.2. Annual amount invested and number of deals in the expansion stage for 2002 – 2004. Sourced from the *"NZ Venture Capital Monitor"*.

Although the amount invested in later stage as at 2004 ($39m) is up on the previous year, it is still less than the amount invested in 2003 ($43 m). In terms of deal flow in later stages, there has been a constant decline. As at 2002, the number of deals undertaken was 13, but by 2004 this had declined to 7.

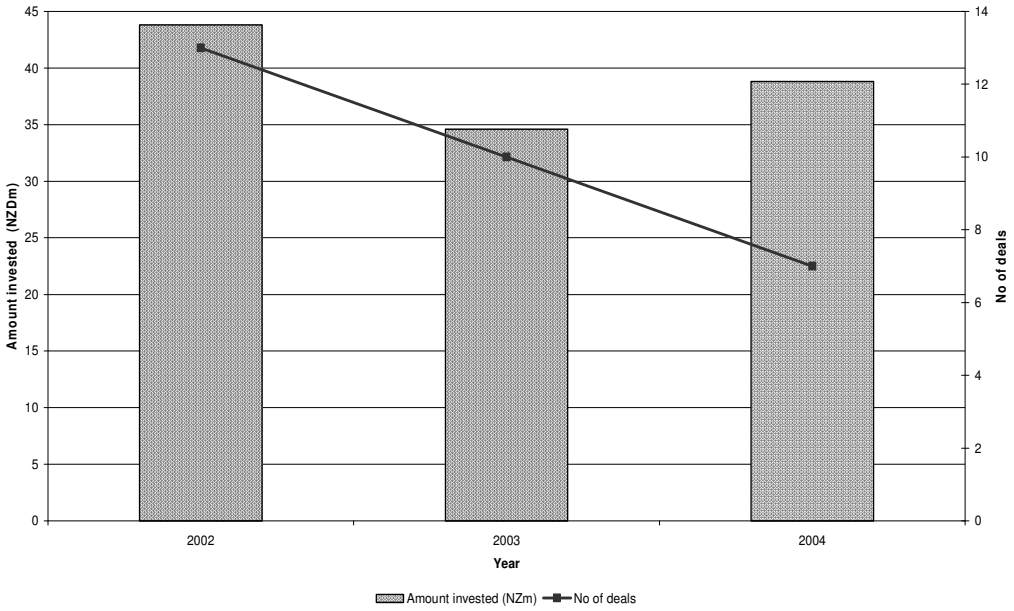


Table 7..3. Annual amount invested and number of deals in later stage for 2002 –2004. Sourced from the *"NZ Venture Capital Monitor".*

The above tables have effectively provided a snapshot of the level of activity in each of the venture capital stages in New Zealand and how this has changed over recent years. In the subsequent tables the level of investment and number of deals as a percentage of total is shown together for the various stages.[56] This provides an opportunity to evaluate the activity within each stage relative to the other stages.

It is apparent that the amount invested in later stage investments is not only declining, but also the proportion of later stage investments to total investments. As at 2002 later stage equity dominated investments (58%), but by 2004 constituted only 26% of all investments made. In contrast, the amount and proportion invested in the expansion phase has grown significantly. In 2002 it was only 19%, but by 2004 was 64%. However, this change has not extended to seed and start-up investments. Investment activity at this level appears to be relatively unchanged.

Although deals in early stage represented 30% of all deals the level of investment in this stage was only 10% of total investments as at 2004.

[56] Raw data used to prepare these tables were sourced from the *"NZ Venture Capital Monitors."*

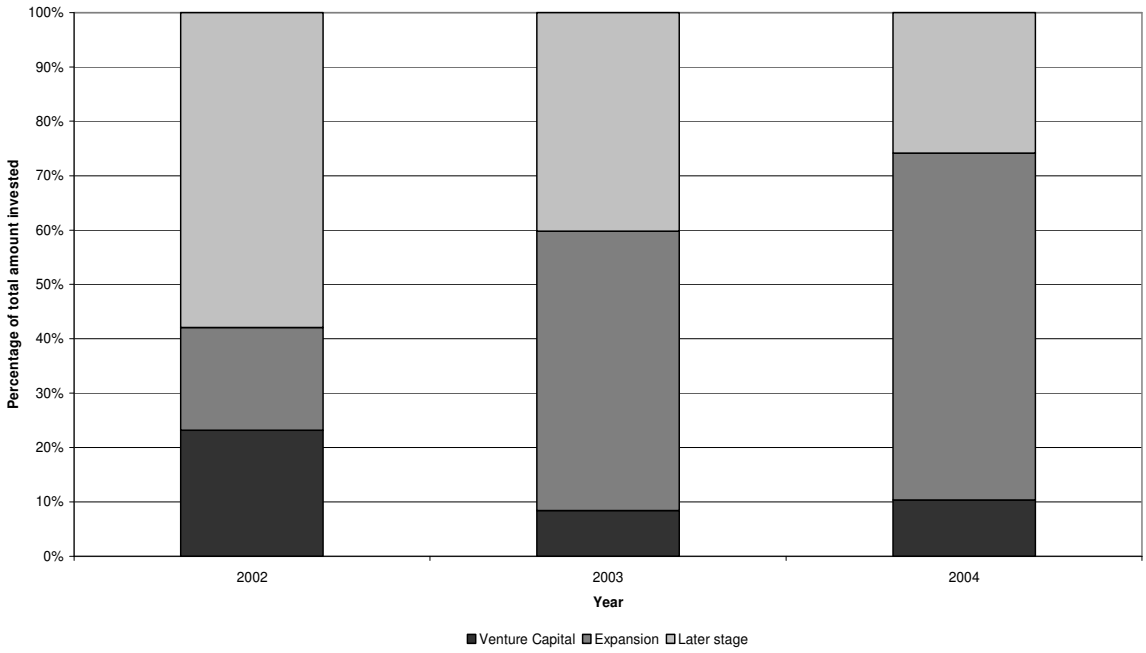


Table 7.4. Annual amount invested as a percentage of total investments from 2002 –2004.

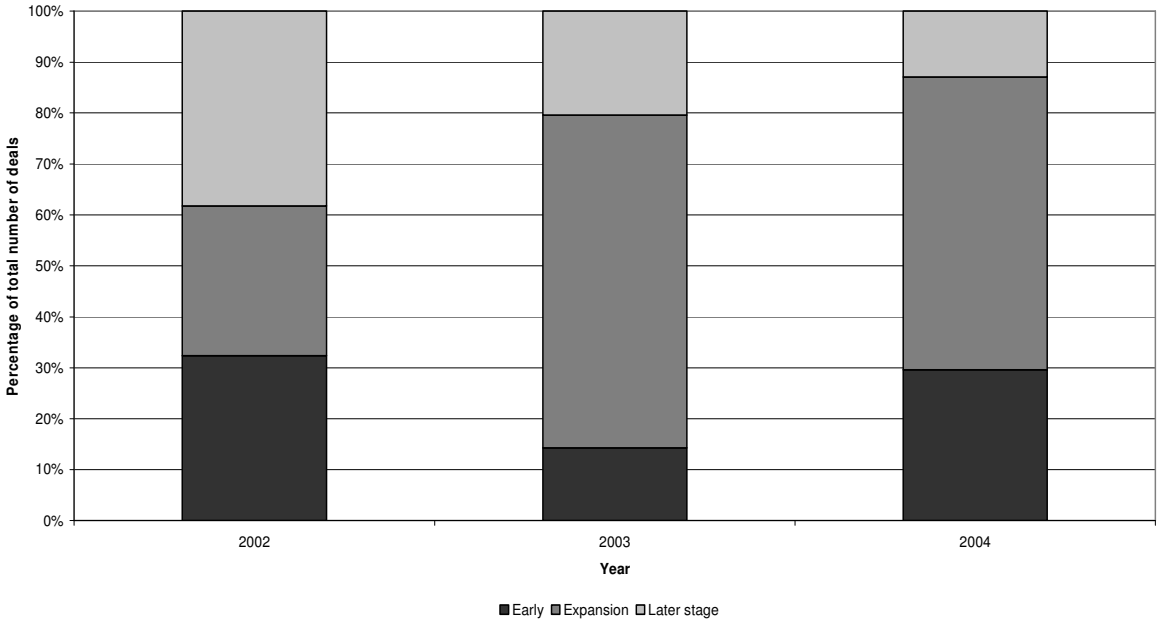


Table 7.5. Number of deals as a percent of total deals from 2002 – 2004.

In the next set of tables[57], the level of activity by deals and amount invested in New Zealand venture capital are compared between sectors. The top three sectors by number of deals in New Zealand for 2004 were communications, information technology/software and technology and biotechnology. The top three sectors by amount invested for 2004 was tourism/leisure, resources/mining and communications.

The inconsistency in ranking between deal flow and investment amount identify two factors that need to be considered when viewing the statistics. First, the New Zealand market is still relatively small, so a single large investment can significantly affect the apparent activity in a sector. For example, the favourable ranking for resources/mining is unlikely to be reflective of a sector that is expected to grow rapidly over the next few years. Rather it is a result of a few large investments. Second, some sectors are inherently risky. For example, in the technology sector, the information asymmetry is large and the ability to asses future uses/potential for products difficult. There is always the risk that a technology rapidly becomes outdated and the investment no longer feasible. On the flip side, if the investment pays off, its returns are likely to be much greater than investments in other more established sectors such as tourism or resources, which can be labour and asset intensive.

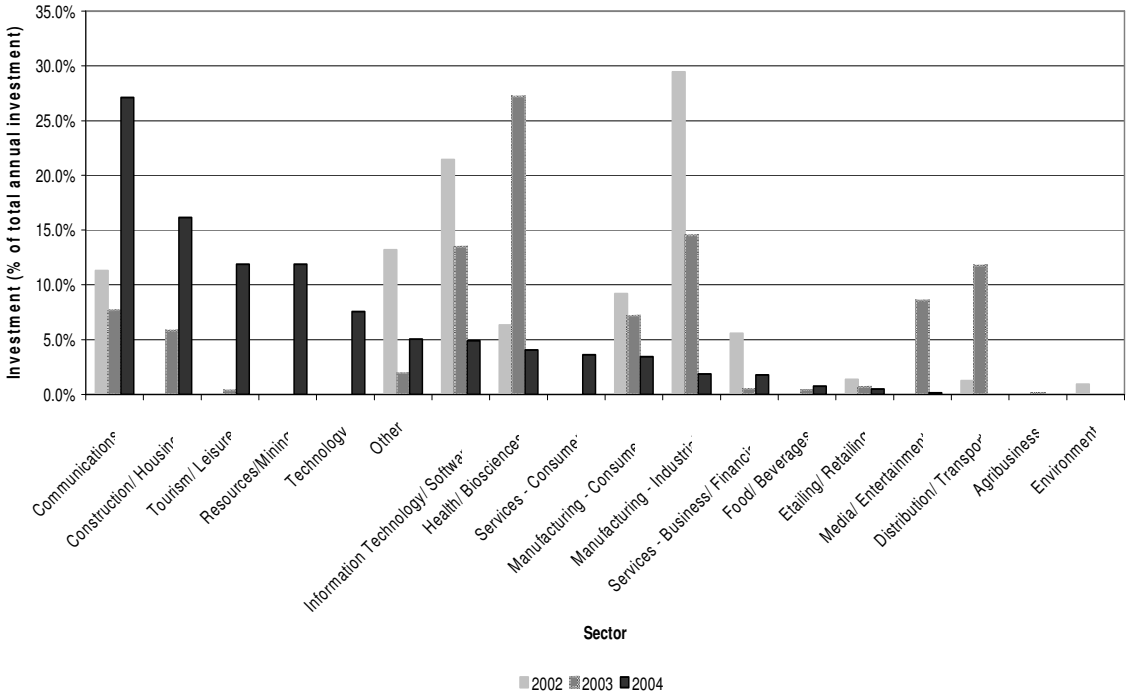


Table 7.6. Annual investment by sector in NZ as a percent of total annual venture capital/private equity investment (2002 – 2004). Sourced from Ernst & Young.

[57] Data used from the NZ Venture Capital Monitors.

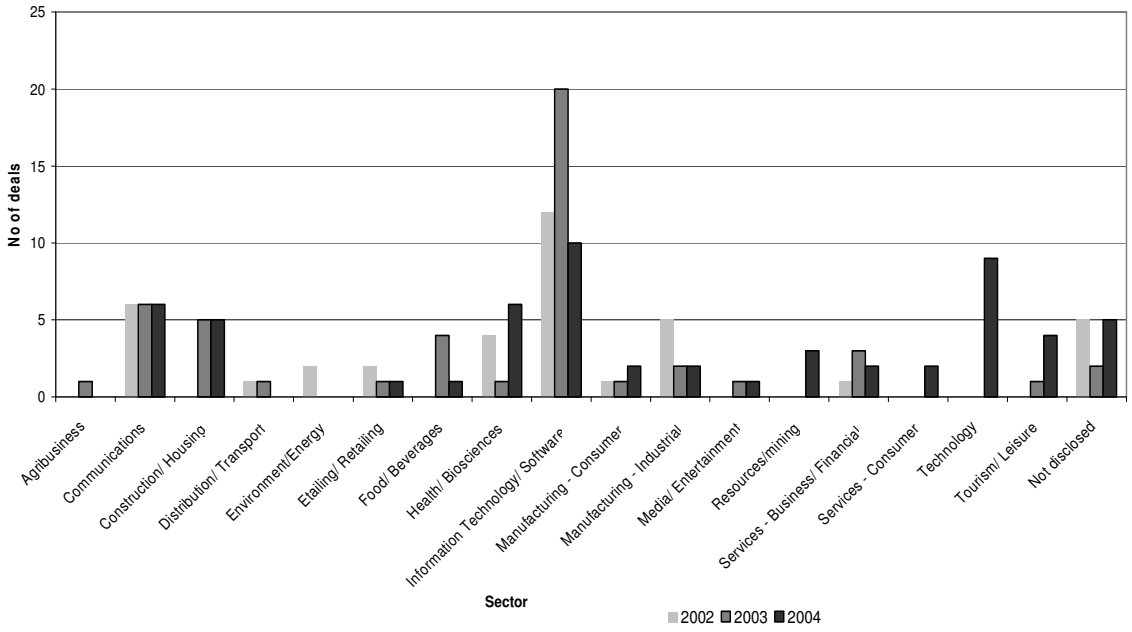


Table 7.7. Number of deals per sector in New Zealand between 2002 – 2004. Sourced from Ernst & Young.

7.1 VIF progress and milestones

The Government committed $100 million to the NZVIF in 2002 on its establishment.

Since its early beginnings NZVIF has grown significantly both in terms of the number of Funds and amount of capital committed to Funds. Following the finalisation of the BioPacificVentures Fund, NZVIF has committed $65m in capital. It therefore has $35m of capital unallocated. Tabulated below is a description of the key milestones NZVIF has achieved since its inception in June 2001.

Milestone	Date
Government announces $100m for investment in NZ seed and start-up, high tech companies. Investment to occur as a partnership between government and private investors, through establishing new, privately managed VC funds.	June 2001
VIF (Advisory) Board appointed.	August 2001
Round 1 Call for Interest from prospective venture capital fund managers. 44 Registrations of Interest received, 16 invited to submit a Full Application. External due diligence completed on 8 short-listed Applicants.	November 2001 February 2002
Six Investment Grade VIF Seed Fund Managers selected by VIF Board. Contract negotiations proceed. One fund withdraws from negotiations.	April 2002
First VIF Seed Fund (IOM) established at $60 million.	October 2002

First contract signed with a VIF Seed Fund manager.	
First investment made.	Jan 2003
$30 million minimum fund size achieved by 4 new VIF Seed Funds (No 8, TMT, Endeavour i-Cap, iGlobe Treasury) between November 2002 and June 2003. VIF investment ratio of 1:2 alongside private investors in all cases. Sponsors of IOM elect to buyback VIF Capital investment, releasing $20 million capital for re-investment.	June 2003
Round 2 Biotech Fund Call for Interest.	August 2003
Final Close achieved by all current VIF Seed Funds. $150 million committed by VIF ($50m) and private investors ($100m). Three investments made through the VIF Programme. Fully active investment phase begins for established VIF Seed Funds.	Dec 2003 Jan 2004
4 Biotech Funds short-listed for due diligence. Due diligence completed on 2 Biotech Funds. Decision to progress one proposal, Life Science Ventures (LSV). $15 million conditionally allocated for investment in LSV. BioPacificVentures[58] Fund First Close announced. Together with Inventages, $100 million raised.	Feb 2004 March 2004 14 March 2005
29 investments in 24 companies made to date, including 8 seed, 9 start-up and 7 early expansion A total of $58.4 million invested (VIF & Private) through the VIF Programme. To date $60 million of VIF capital committed for investment. If BioPacificVentures Fund is finalised as expected, VIF will commit a further $5 million, bringing the total investment commitment to $65 million.	August 2005
New VIF investment round commenced, to allocate remaining $35m VIF capital	August 2005

Table7.8. Key milestones for NZVIF since its inception in 2001. Sourced from NZVIF.

The progress of the fund on a year-by- year basis is set out below. At June 2005[59], $55.1 million has been invested into the four funds representing 36.7% of committed capital. Investments into a total of 23 companies have been made. Of these investments, 16 are seed or start up investments, and 6 of the deals originate from CRIs.

$65.9m is invested or committed for investment representing 44% of committed capital. NZVIF has advised that it anticipates that, on average, 25 percent to 30 percent of capital commitments are to be reserved for follow-on investment. The NZVIF also anticipates that approximately a further 15 percent of capital commitments will be reserved for management fees. This leaves only about 10 to 15 percent of capital commitments in the existing Seed Funds for new investments over the next 2 to 3 years.

[58] LSV was later renamed BioPacificVentures.

[59] As at 30 June 2005 NZVIF had made commitment of $65m to five funds, however, BioPacificVentures had not begun investing at this point. Consequently, the subsequent analysis and review is based on the four active funds at the time, to which NZ VIF and the private sector had made investment commitments of $150 million.

VIF Progress (cumulative since inception)	2002/03	2003/04	June 2005	SOI Forecast (2005)
No of companies invested in (cumulative)	3	11	23	15-22
No of seed and start up investments	1	8	16	8-11
Number of companies exporting	2	4	9	7-10
No of deals from Crown Research Institutes and universities	0	4	6	3-4
No of VIF Seed Funds *	5	5	6	6
Percentage of NZVIF $100m committed to VIF Seed Funds **	65%	50%	65%	60%
No of investment personnel	11	13	16	15
Cumulative amount invested through VIF Programme (NZVIF & private sector)	$14.2m	$25.5m	$55.1m	$43.7m - $57.2m

Table 7.9. VIF Programme performance indicators since its inception in 2002. Sourced from NZVIF Statement of Intent and Annual Report.

Note: * The 2002/03/04/05 values includes the IO Management Fund, which has exited the NZVIF Fund

** The 2002/03 value includes capital committed to the IO Management Fund, which was returned to VIF when the buy-out was exercised by IO Management investors.

The VIF Seed Fund aggregate investment performance for 2004 and 2005 is tabulated below. This includes NZVIF's statement of intent forecast for 2005. At present the NZVIF portfolio is valued at $10.77m versus a cost of $14.4m. The difference is due to impairments, which totalled $2m. The residual is as a result of the exercise of the IO Fund buy-out option, which included NZVIF's share of the investment.

The portfolio is valued by the VIF venture capital managers using standard industry guidelines. This requires managers to value their portfolios at fair market value in accordance with GAAP. For early stage companies fair market values are determined at cost or by an independent third party pricing event, but subject to write-downs where in the manager's view the performance/prospects of the company cannot sustain these values. In this instance, the manager should make a provision for impairment in the valuation of the company.

	Programme (NZVIF + private) 2005	NZVIF 2005	SOI Forecast 2005	NZVIF 2004
Value of investments made by VIF Seed Funds as at June 04	$8.46m	$2.82m	N/a	$1.84m
New investments made by VIF Seed Fund managers in 2004/05	$25.44m	$8.48m	$5.2m to $8.0m	$2.14m
Impairment in the value of investments	$1.662m	$0.554m	0	$1.16m
Increase in the value of investments	$0.084m	$0.028m	0	0
Value of investments held by VIF Seed Funds as at June 05	$32.31m	$10.77m	$9.0m - $13.5m	$2.82m
Value of undrawn investment commitments made by VIF Seed Funds as at June 05	$10.75m	$3.58m	N/a	$2.4m
Cost of NZVIF investments (cumulative since inception)	$43.2	$14.4m	$10.5m - $15.0m	$5.88m

Table 7.10. Position and performance of NZVIF as at 2005 in comparison to the previous year, its statement of intent forecast, and the total of NZVIF and co-investors. Sourced from NZVIF Statement of Intent.

7.2 Current VIF Seed Funds

The companies invested in by VIF Seed Funds represent a wide range of industry sectors and technologies and span the spectrum of seed through to early stage expansion. The average initial investment size is $2.01 million with investments ranging in size from $100,000, through to $8 million. Average investment size is $460,000 for seed, $1.84 million for start-up and $4.31million for early expansion investments. This is tabulated below.

Stage	Number of companies	Average investment size
Seed	8 (8)	$0.46m
Start-Up	9 (11)	$1.84m
Early Expansion	7 (10)	$4.31m
Total*	24 (29)	$2.01m

* This includes the five co-investments between VIF Seed Fund managers

Table 7.11. Number of companies invested in by stage as at 30 June 2005. Values in brackets indicate total number of investments made. As some managers co-invested, the number of investments and number of companies invested in differ.

7.2.1 The majority of investors are private

The composition of investors into VIF Seed Funds is described below. The graph illustrates that only a very small proportion of investors are offshore and that the majority of investors outside the government are private investors.

This pattern of investment is quite different to other more developed markets. For example, in Europe private investors only constituted 8% of total investors into private equity.[60] Of further interest is the absence of any investments by pension or super funds. As at 2004, pension funds constituted 19% of the total investors investing into private equity in Europe.

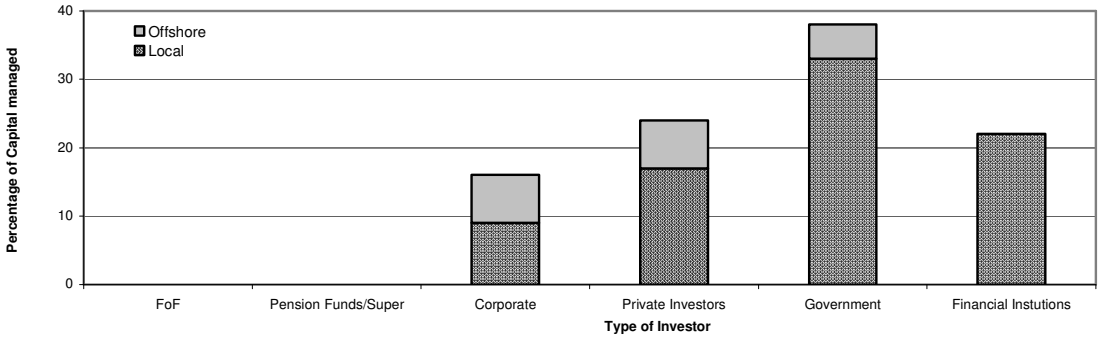


Table 7.12. Profile of investor base of VIF Seed Funds as at 2003-2004. This is based on NZVIF data on investor profiles for the 4 established VIF Seed Funds. Sourced from the NZVIF Progress and Achievement Report 2003-2004.

The investor profile described above can be contrasted to the spread of investors that VIF research believes reflects investment patterns in the US, Europe and Australian markets.

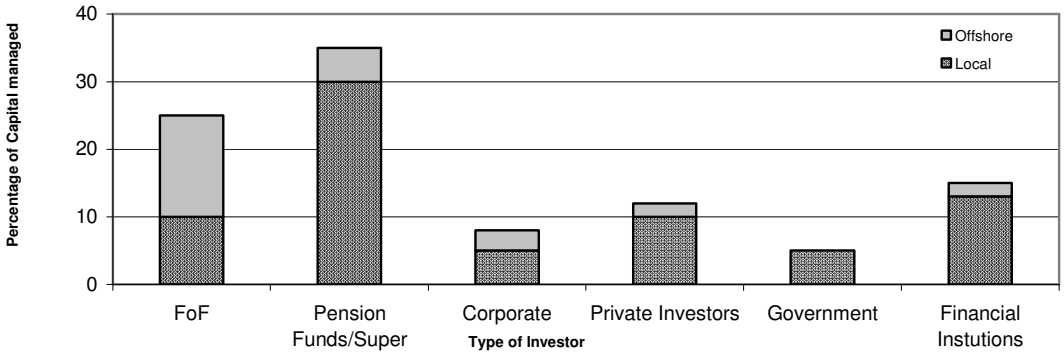


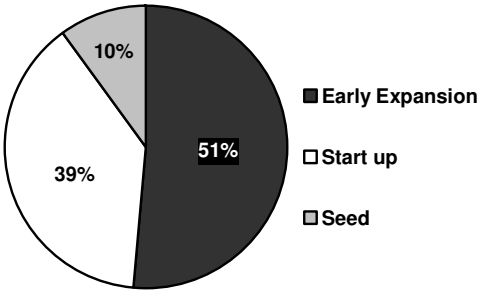
Table 7.13. Potential future investor profile in a mature New Zealand venture capital industry. This is an NZVIF estimate of a potential future investor profile, in 10 years. It was based on recent data and trends gathered from investor profiles from the US, Europe and Australia. Sourced from the NZVIF Progress and Achievement Report 2003-2004.

7.2.2 VIF Seed Fund investments and deal flow by stage and sector

The majority of investment (by value) by VIF Seed Funds to date has been in the early expansion phase and only a small proportion (10%) has been made at the seed stage (see Table 7.14 below). This is in contrast to the number of deals undertaken, which have been 8, 9, and 7 in seed, start up and early expansion respectively (see Table 7.11).

[60] Refer to the "*2005 EVCA Yearbook.*"

In terms of investment by sector, the telecommunications sector has had the largest allocation. Biotechnology constituted only 13% of investments (by value), but with the establishment of the BiopacificVentures Fund, this sector is anticipated to grow over the next few years.



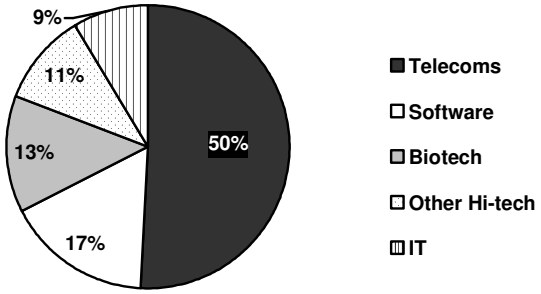
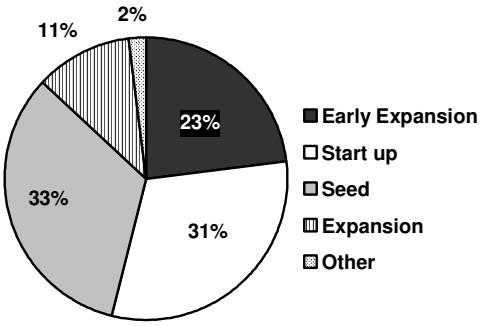


Table 7.14. Actual Portfolio: A breakdown of NZVIF investment through venture capital funds by sector and stage as at 30 June 2005. Sourced from the NZVIF.

Table 7.15 sets out deal flow statistics (i.e. a breakdown of the deals presented to VIF Seed Managers, expressed in terms of number of deals). We note the seed stage has provided the largest amount of deal flow (33%, followed closely by start up at 31%).



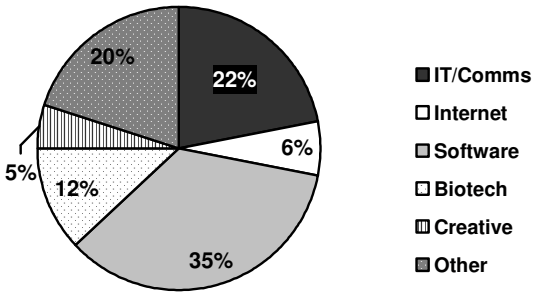


Table 7.15. Aggregate NZVIF deal flow by stage and sector. This is as at 30 June 2005. Sourced from NZVIF.

7.2.3 Universities and CRIs deal flow has been limited

A further breakdown of deal flow by source is provided below. Although the universities and CRIs have been viewed as a rich source for the commercialisation of science and technology, their contribution to date has been very limited (< 10%).

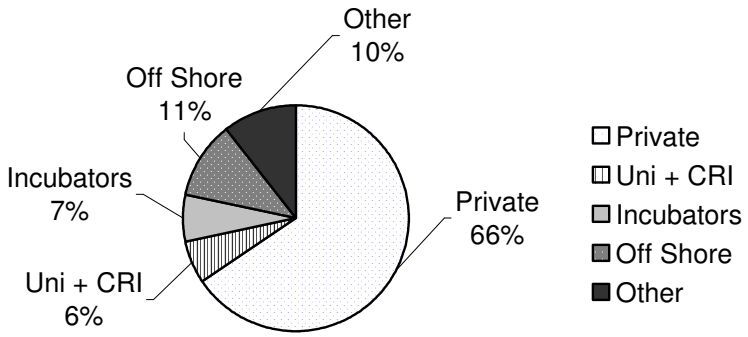


Table 7.16. Aggregate deal flow by source of origin as at 30 June 2005. Sourced from NZVIF.

7.3 Relative performance of NZ venture capital market

7.3.1 Relative performance to private equity

The table below illustrates the increase in committed capital to New Zealand based private equity funds since 1996. The level of capital commitments has increased sharply in 1999 and lifted again significantly in 2004.

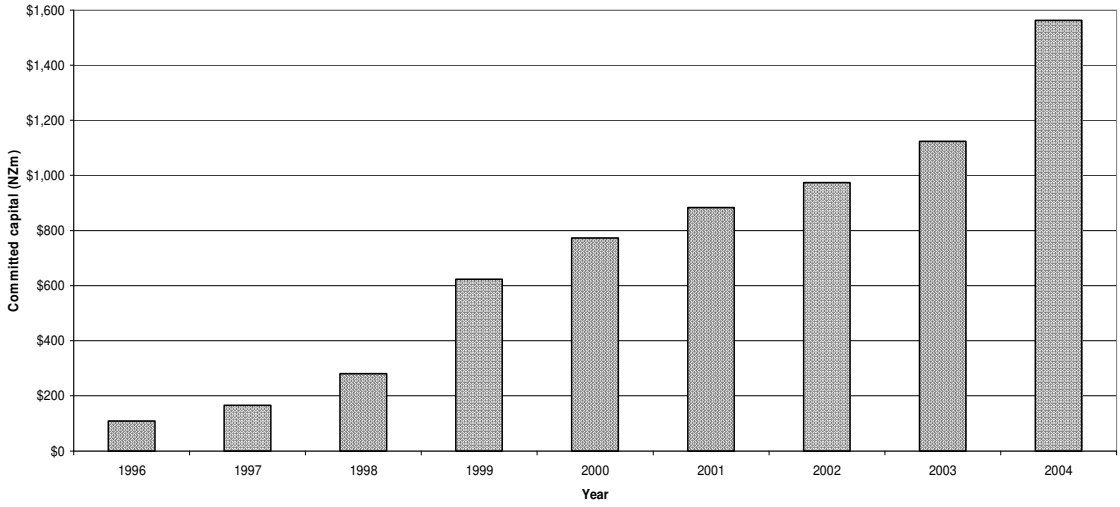


Table 7.17. Total committed capital since 1996**.** Values from 1996-2001 were sourced from the *"2005 Guide to Venture Capital in Asia."* Values from 2002 – 2004 were sourced from the *"2002 – 2004 NZ Venture Capital Monitors."*

The annual investment in total private equity and early stage from 1996 –2004 is shown below. As in the case of committed capital, a sharp rise in the level of investment was observed for 1999 and 2004.

Typically, only a very low proportion of the invested capital has been directed towards venture capital projects. This suggests that the primary drivers of growth (or absence thereof) in the private equity market in New Zealand have been attributable to investments made in projects other than in the venture capital sector. This view is consistent with the findings from our interviews in which investors, their advisers and a number of fund managers indicated that, in terms of investing in private equity in New Zealand, the venture capital stage was much less preferred than other later stages (e.g. buy-outs, restructurings and expansion of established businesses).

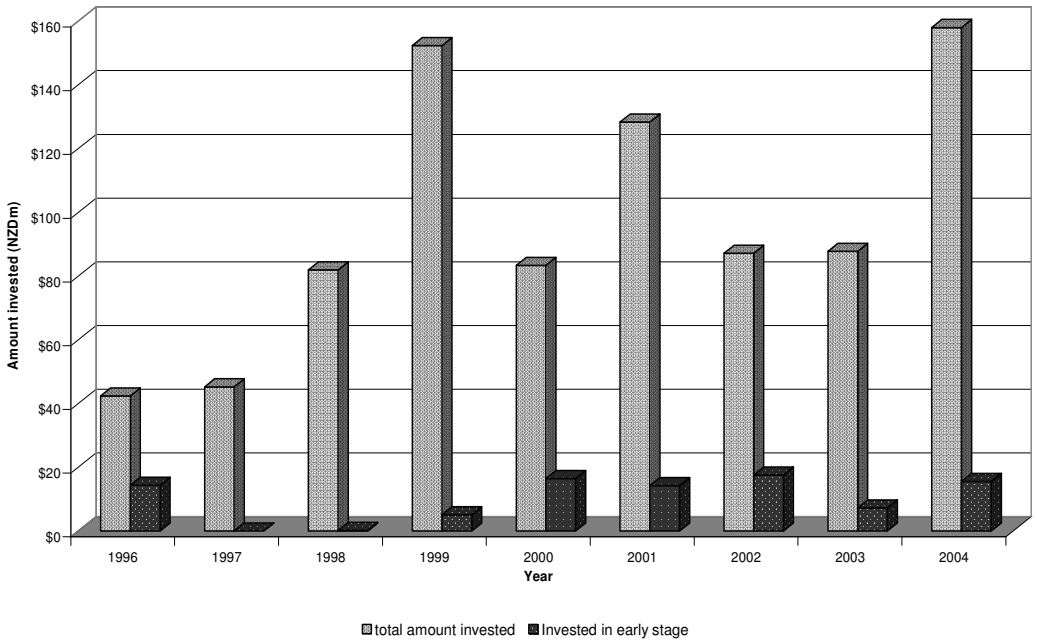


Table 7.18. Total annual investments made in venture capital/private equity relative to annual investments in venture capital (seed and start-up) from 1996 –2004. Data for 1996 – 2001 was sourced from Private Equity Media and data from 2002 – 2004 from *"NZ Venture Capital Monitor 2004"*.

7.3.2 Low levels of investment compared to OECD countries

Table 7.19 compares the level of investment made by private equity funds into New Zealand businesses relative to this form of investment in other OECD countries in 2004, expressed as a percentage of GDP. Similarly, Table 7.20 compares the level of investment by private equity funds into the venture capital component across OECD countries.

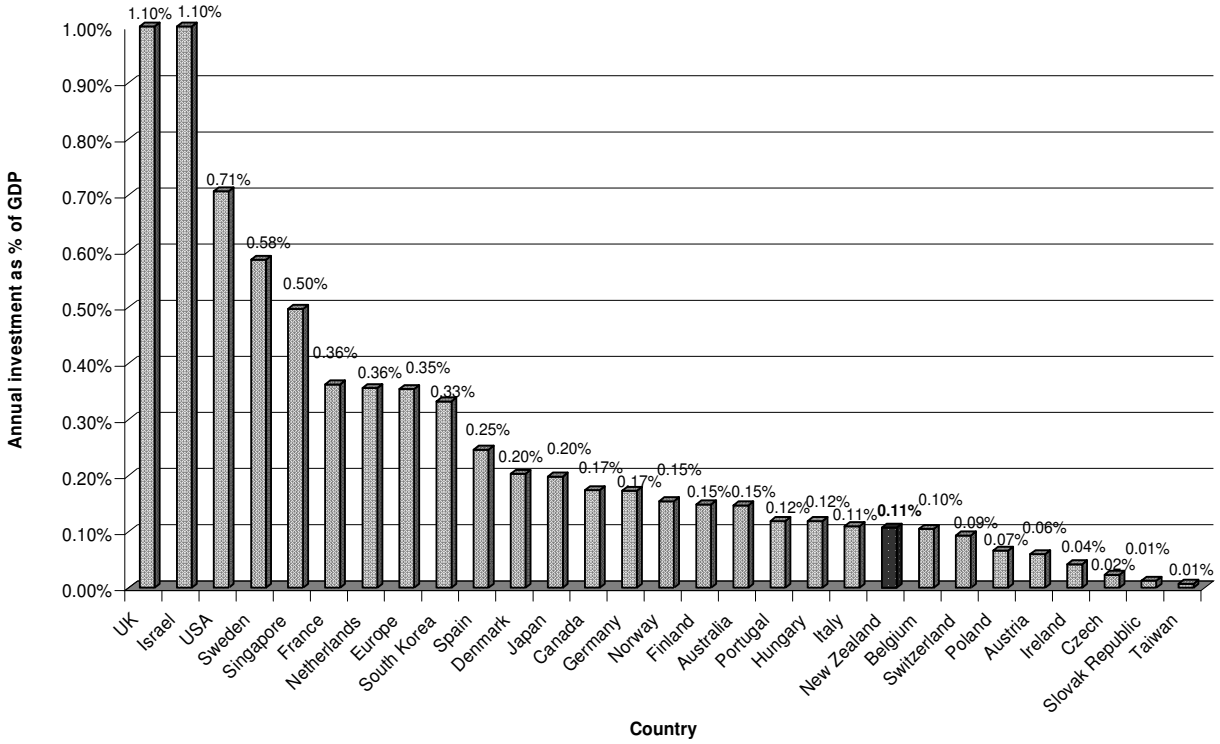


Table 7.19. Annual investment (2004) in venture capital and private equity as a percent of GDP.

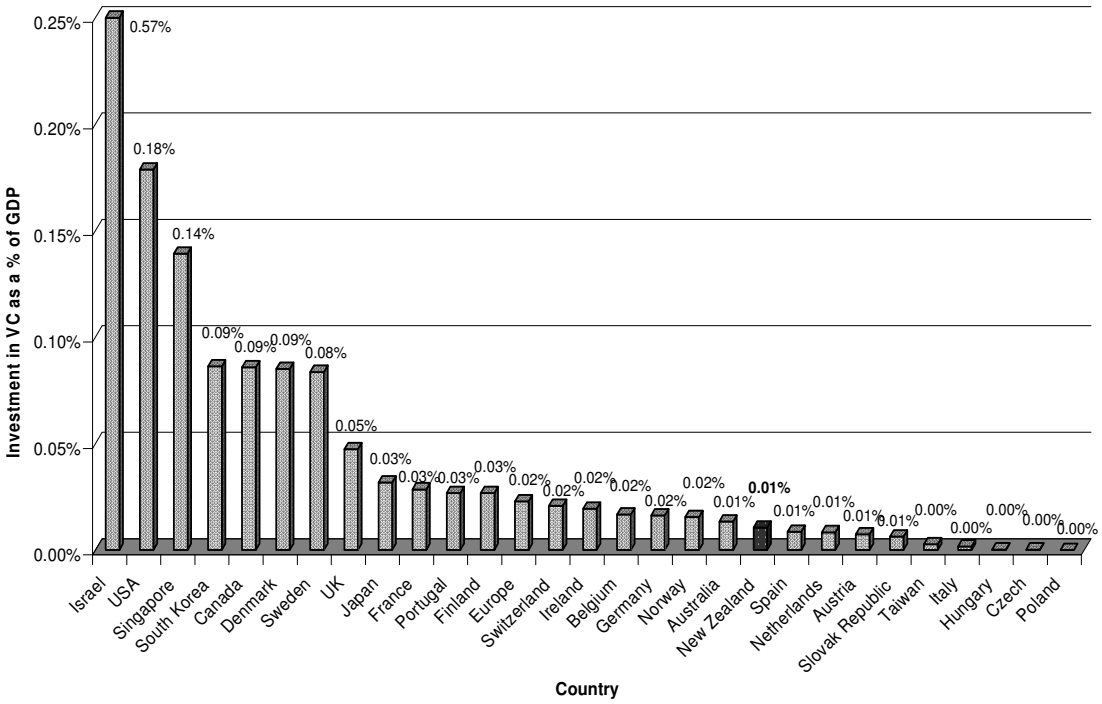


Table 7.20. Annual investment in venture capital (seed and start-up) as a percent of GDP (2004).

These tables suggest that both private equity in general, and venture capital in particular, are significantly less utilised as a means of financing in New Zealand than is the case in most OECD countries. In fact New Zealand's level of investment relative to GDP in the sector of venture capital and private equity is in the lower half of the OECD ranking.

In the table below, we have provided an indication of the level of investment that would be required if New Zealand were to increase its investment in venture capital to a level comparable to other countries in the OECD, such as Ireland, UK and Singapore.[61] For example, if New Zealand were to increase its level of investment to that of Ireland it would need to invest $30m annually. Similarly if New Zealand's level of investment relative to GDP were to reach that of Singapore, it would require an almost 10 fold increase ($133m) in investment relative to its current level of $15m.

Venture capital as a percent of GDP	Countries at similar level of investment (VC/GDP) as at 2004	Venture capital investment ($m) per annum required by New Zealand
0.01%	**New Zealand**, Spain, Austria	$15
0.02%	Germany and Ireland	$30
0.03%	Finland and France	$44
0.04%	-	$59
0.05%	United Kingdom	$74
0.06%	-	$89
0.07%	-	$103
0.08%	Sweden	$118
0.09%	Canada and Denmark	$133
0.10%	-	$148

Table 7.21. Level of investment required in New Zealand in venture capital to reach levels comparable to other countries in the OECD in 2004 terms. Currently New Zealand's venture capital investment is 0.01% of GDP or $15m.

7.3.3 Low investment relative to indicators of innovation

This relatively low level of venture capital in New Zealand is further highlighted below. The following three tables plot New Zealand and the comparator countries as a function of their investment in venture capture as a percentage of GDP (in 2004) and three indicators of innovation; gross expenditure on R&D (GERD) as a percentage of GDP, the number of patents per million inhabitants, and the number of scientific publication per million of inhabitants. The trend line is the linear least squares regression line of best fit.

These indicators of innovation suggest probable demand for venture capital, as firms commercialising innovative ideas into marketable products and services are the primary recipients of venture capital.

[61] For the purposes of this table, New Zealands GDP for 2004 has been used. If GDP increases, then the level of investment required will have to increase to achieve the same proportion.

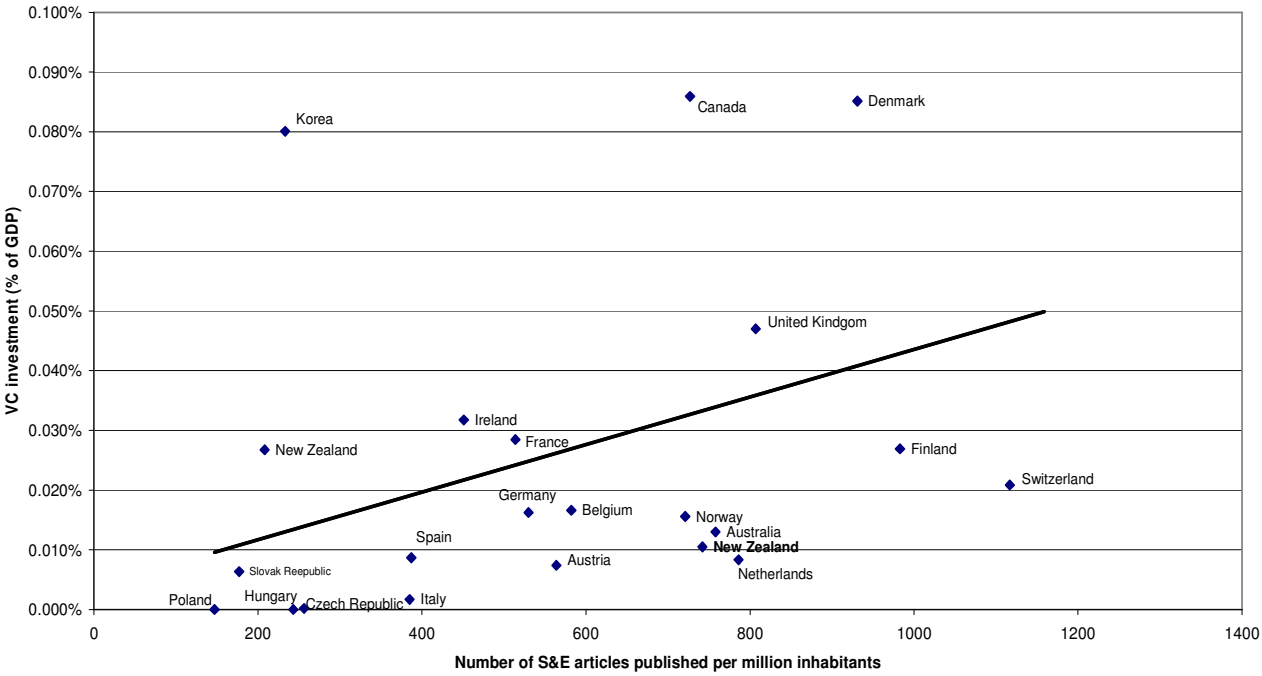


Table 7.22. Venture capital investment (% GDP) as function of number of science and engineering articles per million inhabitants - by country. Israel and the US are omitted as outliers.. Information on data sources is provided in the appendix.

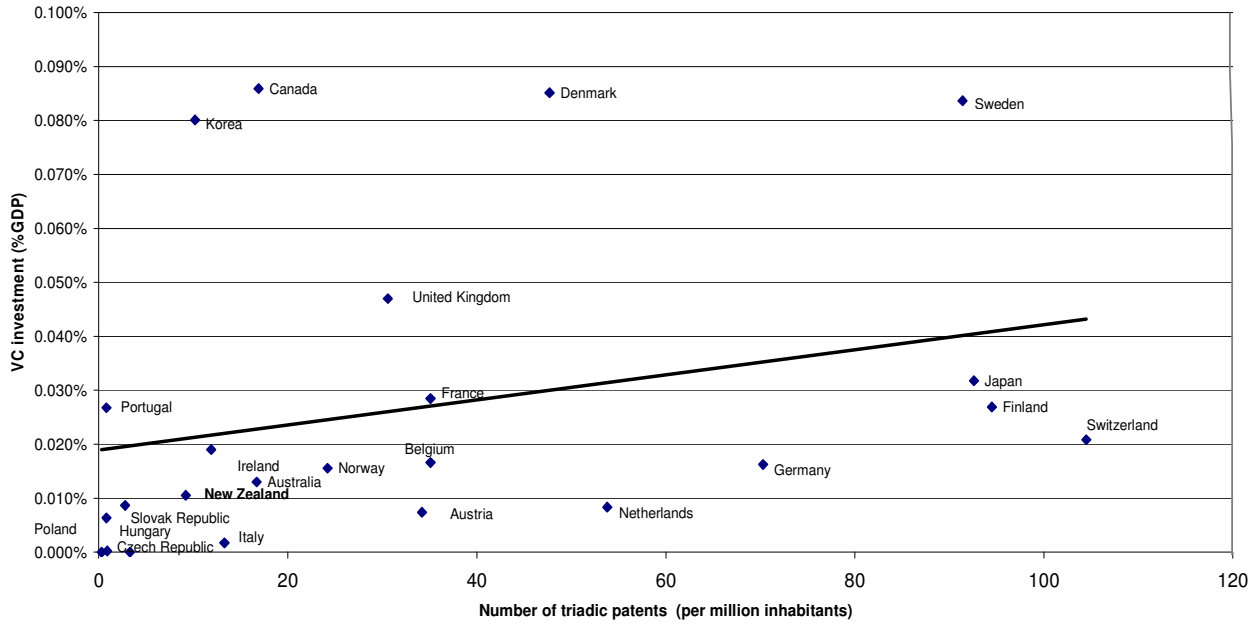


Table 7.23. Venture capital investment (% of GDP) as a function of number of triadic patents (per million inhabitants) - by country. For illustrative purposes, Israel and the US are omitted as outliers. Information on data sources is provided in the appendix.

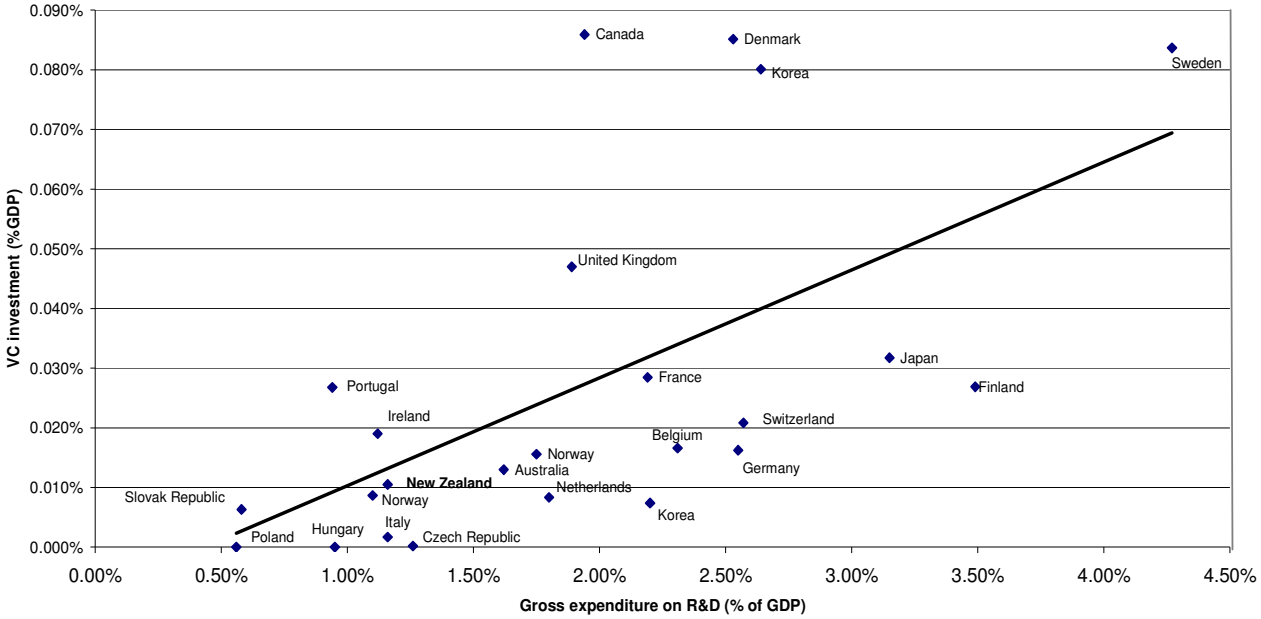


Table 7.24. Venture capital investment (% GDP) as a function of gross expenditure on R&D (% GDP) - by country. Israel and the US are omitted as outliers. Information on data sources is provided in the appendix.

7.3.4 Relatively low weightings in early stage investment

Tables 7.25 to 7.27 illustrate the relative weightings of private equity investments in each country with respect to the stage of the investee firm being invested in, denoted as early stage, expansion and later stage.

The percentage of New Zealand's private equity invested in early stage is modest (10%), and combined with its low ranking in terms of total private equity investments in the same year (2004) as illustrated above (0.1% of GDP relative to for example 0.5% - 0.9% for the top four comparator countries), this again illustrates the very small size of the New Zealand venture capital market.

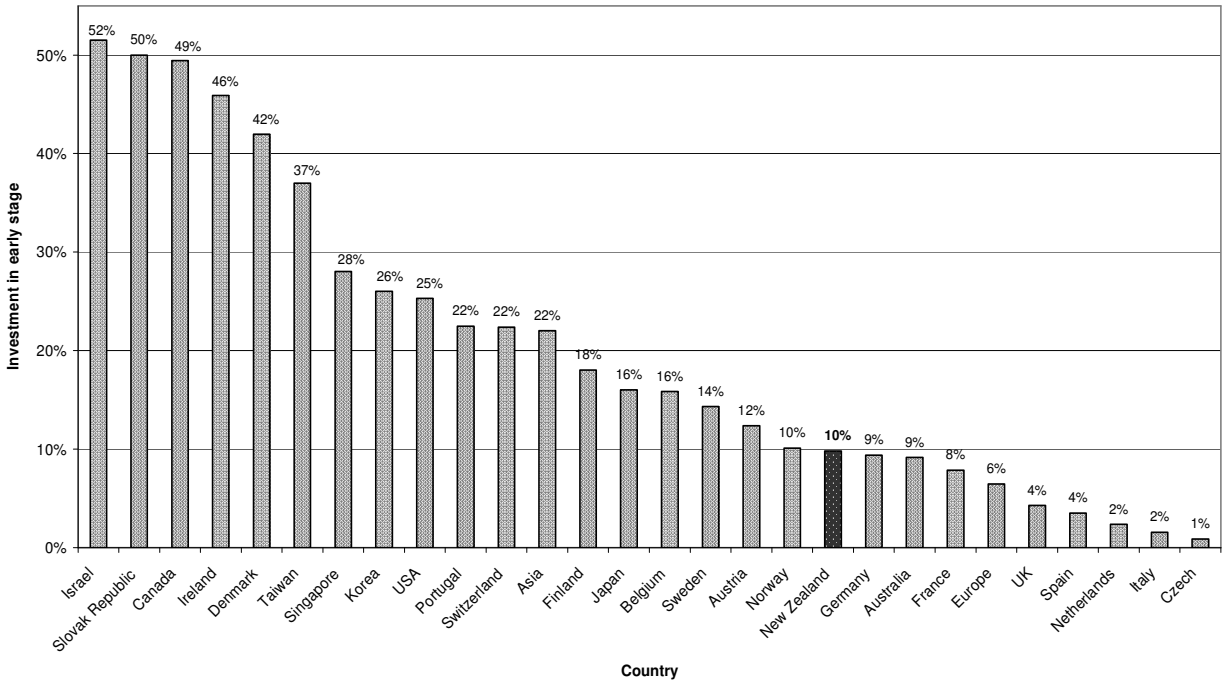


Table 7.25. Country comparison of investment in early stage (seed and start-up) as a percent of total investments in venture capital/private equity (2004).

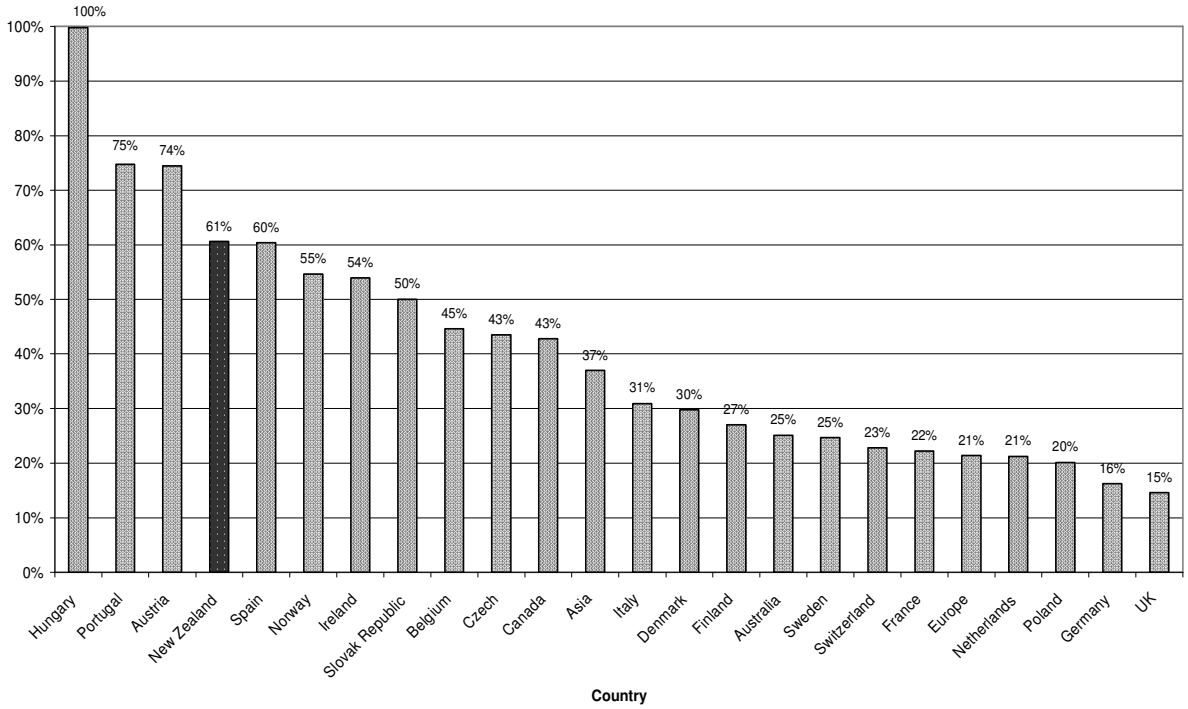


Table 7.24. Country comparison of investment in expansion stage relative to total venture capital/private equity investment (2004).

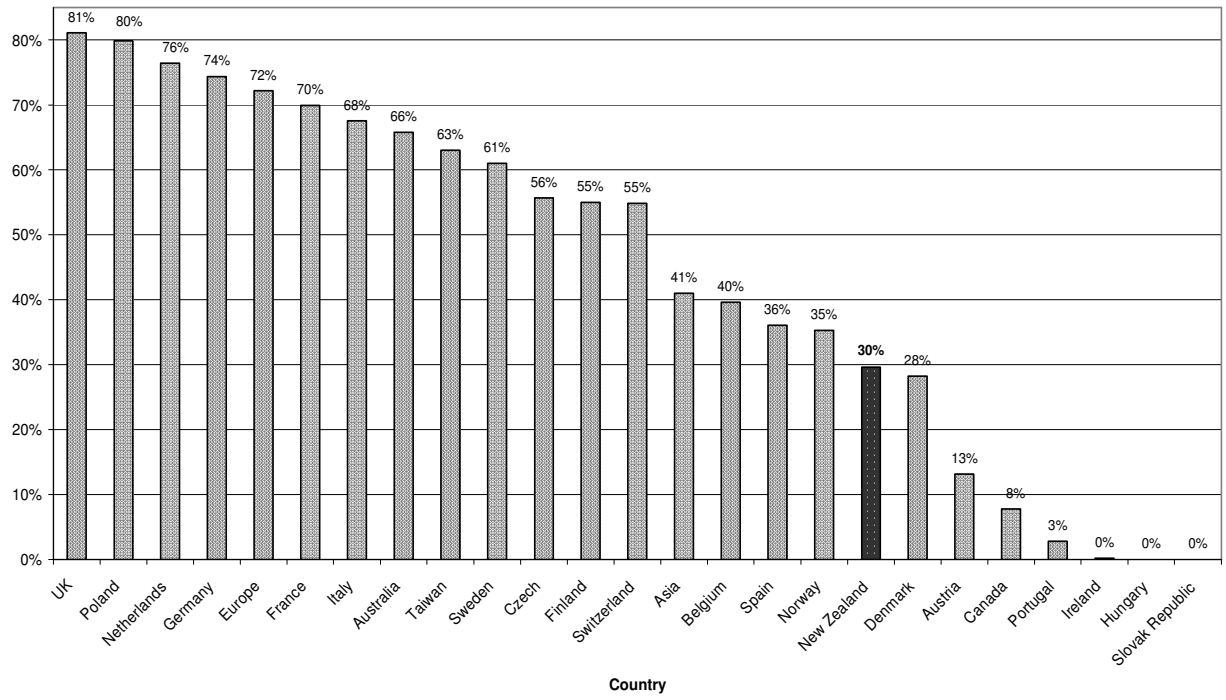


Table 7.27. Country comparison of late stage investment relative to venture capital/private equity investment (2004).

8 Market Perspectives

There has been much discussion in the policy literature of the need to observe the embedded relationship of Government with industry whilst developing public policy. Policy makers, in effect, need to listen to the market. This is always difficult to achieve, as the 'noise' from unique circumstances and one-off events may cloud sentiment and hide (to policy makers) real concerns and problems felt by the majority of market participants.

This section tries to disseminate the 'noise' from market perceptions, leaving us with a clear understanding of true issues and concerns felt in the marketplace. To achieve this dissemination, we interviewed twenty-four market participants with a range of positions to achieve a representative sample of all market participants (full methodology is described below).

8.1 Methodology and approach

We adopted a qualitative research approach with unstructured and structured interviews. Interviews were recorded individually, collated and then analysed to identify trends and relevant issues.

8.1.1 Structured interviews

The interviews were conducted face-to-face where possible, or otherwise were conducted over the phone. Two persons conducted all of the interviews (with the exception of three due to interviewee availability). The interview strategy was as follows:

- Unstructured interviews were conducted with central industry actors – the data from these interviews was used to develop the structured interviews.
- The sample frame was agreed with MoRST and included market actors at the investee firm, venture capital manager, investor and market advisor level.
- The questionnaire was reviewed by the project team and by MoRST and MED, was piloted, and then the interviews were conducted.
- Further interviews were conducted to corroborate preliminary findings and to identify possible other views that had not been captured in the initial sample frame.

The preliminary interview data was subsequently validated and challenged through integration of comment by LECG's project team.

In order to preserve confidentiality, the names of individuals interviewed, their positions and the name of the firm involved have been suppressed.

8.1.2 Comment on the sample

Rather than randomly select participants from within the venture capital sector, we (in discussion with MoRST and MED) decided to select interviewees from the five distinct categories of market participants shown below, namely investors and their advisers, venture capital managers, investee firms and other. The benefit of such an approach was that we could eliminate the potential sampling bias of a selection restricted to only a narrow group (non-representative group) of market participants in the venture capital sector or the risk of potentially only being exposed to a small subset of the issues facing the industry as a whole.

We agreed to interview circa 30 persons across the different categories, but due to timing constraints and availability restrictions we had to restrict the number of participants interviewed to that described below.

	Number of persons interviewed
Investors & advisers	7
VC managers	6
Investee firms	11
Other	2

Where appropriate, the questions between categories remained consistent so that perspectives from all market participants could be compared and all angles considered. Within each category, participants were carefully selected to ensure a representative sample of each subset. Further details on our sample selection are as follows:

- The investors interviewed ranged from institutional investors, both locally and offshore, advisers to institutional investors, corporate investors, through to high net worth individuals in both venture capital and private equity markets. Our selection included participants that invested in venture capital offshore, but not in New Zealand, those that restricted their mandate to investments in private equity and those that did not invest in private equity or venture capital.
- At least one manager from each of the major venture capital funds was interviewed. These managers were all currently active and able to provide good coverage of the venture capital market and the interface with private equity.
- The investee firm participants formed the single largest group interviewed. Participants that received venture capital funding were carefully selected to ensure that firms from different sectors and stages of development would be included. However, our selection was not restricted to those firms currently receiving venture capital support but extended to firms that had successfully exited, those that were unsuccessful in getting venture capital and those that chose not to seek venture capital. The latter were particularly useful as they were able to illustrate other avenues and approaches firms may take to develop the firm and amplified

the difference between funding sources, such as between venture capital and angel investment.

The 'other group' included individuals that played advisory roles to market participants. These advisors engage with a variety of participants and were valuable in providing an overview of issues and sentiment felt in the sector.

8.1.3 Case studies

During the structured interviews most interviewees, in responding to our questions, related their own experiences in the New Zealand venture capital sector in order to substantiate their assertions or comments. We developed from this interview material, and other secondary material, four short case studies that aim to clarify some of the key issues identified in the structured interviews.[62] The table below lists the four case studies and the issue each explores.

Title	Topic
A success story of continued local benefits	A review of a New Zealand success story focussing on the continuing local benefits associated with an overseas trade sale
Successful technology transfer	An example of how technology can be successfully transferred from a crown research institute to the market
International collaboration and co-investment.	An example of how international linkages and networks are crucial to the development and growth of New Zealand firms
Term sheet	A view of the role of the term sheet in venture capital and identification of their common features.

8.1.4 In the context of a young venture capital market

It was well recognised among interviewees that New Zealand venture capital is at an infant stage in comparison to its international counterparts. Consequently concerns within the industry were nearly always tempered with the remark that many of the problems are only growing pains that are likely to be resolved in later years.

However, interviewees did believe that the youth of the market did place New Zealand on a back foot relative to other countries in its ability to attract foreign investment. For instance one interviewee spoke of the expected lower returns in New Zealand, "…[B]ut New Zealand is underdeveloped and the possibility of greater returns (30x-40x on investment) is lower than in Europe or the United States." The infancy of the industry also contributes to some of the internal frictions between participants, as inexperience is prevalent. It was not uncommon to hear market participants complain of the general lack of experience of a range of participants in the sector.

[62] Other issues were also identified during the interviews, but these could not be raised in the case studies due to confidentiality reasons.

The problem of maturity is compounded by the fact that New Zealand is small and geographically isolated. Most interviewees felt that little could be done to resolve this issue. For example one interviewee stated: "It will be hard for New Zealand on its own, given its size and position to attract investment; it also competes against Asian countries such as Japan and Korea." On a similar note, another interviewee stated, "The size of New Zealand, its market, and small trading volume will always remain a stumbling block."

Thus interviewees were concerned that even if New Zealand venture capital grew significantly and performed well, it would inevitably be difficult (or nearly impossible) to outperform other international countries.

In the material below we identify issues expressed consistently by participants in the marketplace. This is complemented by commentary on that material in which we attempt to interpret the interviewee material. The issues covered include the stage of development of New Zealand venture capital market, the level of investment (including institutional) in the sector, the regulatory environment, exit mechanisms, the interface between research and venture capital, and importantly the role of government in developing the sector. Due to the infancy of the sector in New Zealand issues around the relationship between investee firms and fund managers was also explored.

8.2 Summary perspectives from interviews

8.2.1 Quality of deal flow

Although the quality of deal flow is not readily quantifiable, it was considered an important indicator of the stage of development of the industry sector and indicative of possible problems.

For example, investors expressed concern of a lack of quality deals to invest in. One interviewee stated, "There is no real choice of investment opportunities in venture capital and private equity in New Zealand" and "Data is needed otherwise we are going on faith."

On the venture capital fund level, managers expressed diverse opinions. One manager believed that the number of investments had dropped while the quality had improved. In contrast, another manager believed there had been little change in the quality and number of investment opportunities.

In order to provide context for some of these comments, we refer to a study by Bottazi and Da Rin (2002) which explores the issue of business proposals in European venture capital. These authors found that on average, venture capitalists reviewed 114 business proposals per year and selected less than five in total. In comparison, a New Zealand venture capital fund manager who was interviewed indicated that he received approximately five business proposals per week and 15-20% were feasible and could be considered. Whilst this remark is in should not be cited as representative, anecdotally it does suggest that New Zealand has a reasonable quantity of deal flow.

During our interview process, we were also able to engage with several market participants who were actively involved at the R&D level and the interface between R&D and venture capital. Concern was expressed regarding the ability to transfer technology, for example one participant said "They (the venture capitalists) are keen to invest… but I

think they have difficulty understanding technology developments." Another investee firm noted, "The next stage (venture capital) is almost non-existent and the locals did not have the necessary knowledge." Despite these problems at the transfer stage, nearly all interviewees were positive about the level and quality of New Zealand's R&D itself.

Many participants spoke highly of New Zealand's research capabilities. For example, an interviewee, when commenting on the R&D conducted in his company stated, "They became reliant on us to do their research and we became experts in their field." Similarly another interviewee stated, "New Zealand science is good for producing research."

Commentary:

A clear issue is the technology transfer abilities of universities and CRIs. It is a rich source for the commercialisation of science and technology and in the US many venture capital clusters are developed around tertiary institutions. However, in New Zealand it does not appear that we have not yet fully utilised this source. Statistics provided by NZVIF indicated that at present deal flow from universities and CRIs constituted only 6.5% of total deal flow. While definitive data are difficult to come by, we believe this ratio would be much higher in the nations with more mature venture markets.

HTS-110 – Successful technology transfer

Purpose of case study

HTS- 110 is an example of a successful implementation of a special purpose vehicle created for the purpose of technology transfer and commercialisation of technology from a Crown Research Institute into international markets.

About the company

HTS-110 focuses on delivering magnet systems and components to manufacturers of scientific devices. The core technology is High Temperature Superconducting (HTS). The devices that use these components are likely to be smaller, more efficient, and environmentally friendly.

The beginning

The Department of Science and Industrial Research (DSIR) originally developed the technology in the late 1980's and early 1990's. The Electricity Corporation funded its development, recognising the considerable potential benefits of HTS to electricity generation and transmission.

DSIR and then Industrial Research (IRL) developed a strong portfolio of patents in HTS and then, recognising that it needed to get the technology used, licensed the portfolio to American Superconductor Corporation (AMSC). In particular, DSIR identified that it would not ever have the capability of making the $100 million investments that are needed to manufacture HTS wire.

IRL continued to develop the relationship with AMSC with the aim of maintaining its core technology base. This relationship was developed through contract research and technology support. Currently, it is the only outsource laboratory for the BSCCO wire currently produced by AMSC.

The story

In late 2003, IRL recognised that it had core technology, but that it was ill placed to take advantage of that opportunity. It established a special purpose vehicle (HTS-110) to hold and commercialise the HTS knowledge base. The company was established with a Chief Executive for the start-up phase, and a handful of core technologists.

Particular care was taken over establishment of the special purpose vehicle as follows:

- AMSC agreed to become a partner to the venture and allowed use of the product licenses. The President and founder of AMSC sits on the Board of the company, through personal interest and because of a passion for the technology.
- IRL provided the key staff – those who could design the products, and those who could build the products. Three are design and 3 are manufacturing.
- Endeavour Capital came on board with venture capital funding and Mark Dosser acted as the financial officer for the company. Overseas venture capital was considered but there was already a New Zealand relationship, and the amount of capital required was too small to attract interest.
- Board governance integrated other key linkages – Paul Callaghan from Victoria University (an international expert in HTS) and Bob Buckley from IRL, who leads IRL's HTS research effort.

A PGST grant from FORST of around $285,000 levered the investment from the partners. In our interviews, the company indicated that it would not have received this grant without the involvement of a venture capitalist.

Today, the company has established a magnet and component product catalogue, has modest sales of $1.5 million with distribution points in Asia and Europe, and is cash positive.

HTS-110 is highly complimentary of the NZTE's efforts to promote the establishment of a supply chain based around HTS technologies. It has helped link together niche manufacturers and builds confidence that a possibility exists for New Zealand to become a world leader in this area of technology.

Key points

In order to establish the appropriate technology base it is necessary to:

- Find the technology partner and build the relationship with the partner over time - There is a core alliance with the world leader (and largest seller) of HTS wire, namely AMSC. IRL deliberately built the relationship over a number of years. This relationship created the option space for the venture to become active. Of most importance, the relationship gives HTS-110 tremendous credibility from the market leader, and gives it the ability to leverage internationally.
- Establish the vehicle and get the right technologists on board. IRL obtained the services of key technologists. The tacit knowledge that they had was as important as the formalised intellectual property (the product licenses) held by AMSC. Of the seven technologists in the company, six came from IRL.
- Obtain the support of venture capitalists to help shape the venture. Ironically, in the case of HTS-110 the capital has been less important at this stage than the required business support. However, the capital is expected to gain importance as the venture expands and grows.

8.2.2 The role of VC managers

Many investee firms found the relationship with venture capital managers, especially in the negotiation phase and early stages, quite tough. It was not uncommon to hear that venture capital managers were considered 'tough' and really 'vulture capitalists' who 'want the firm for nothing'. In contrast, some interviewees viewed the local venture capital managers favourably and considered them an integral component to the long-term success of the firm.

The conflicting accounts helped us establish a list of reasonable needs that the investee firms require from the venture capital manager to ensure ongoing success of the firm and to secure a fruitful relationship between both parties. This list, distilled from the experiences described by participants during the interviews is as follows:

- The role of venture capitalist should not be restricted to a capital provider.[63] Many interviewees spoke of the necessity for 'sweet' equity, i.e. an equity injection with specialist knowledge. Hence, the venture capitalist needs to be in a position to add

[63] The venture capital firms are generally aware of this and to the extent appropriate do participate in the decision-making processes of the company. For example, one venture capital firm said, "We try to get heavily involved with the investee firm management. We work on providing value and contributing to its expansion." On a similar note, another venture capital manager said, "They (the managers) are pretty active and normally spend a day a week with the investee firm."

value through both technology and product advice, as well as marketing, sales and other higher order business advice. It was this specialist knowledge combined with previous relevant experience that was considered in some instances more valuable than the capital itself. Many participants expressed concern that venture capitalists often came from a financial or investment banking background with little operational experience.

- Generally, the investee firms favoured a more interactive approach between venture capitalist and investee firm. Those participants that spoke favourably of their venture capitalist tended to meet with them regularly and felt that they actively contributed to the development of the firm, for example one participant spoke of bringing 'discipline' and 'structure' to the firm and another of 'leveraging knowledge'. Thus firms are really looking for a strategic partner who can guide the company as it progresses.

- The presence of international linkages was another crucial element, cited by interviewees, of 'value-add' and ultimately beneficial to the investee firm. The linkages came in many forms, namely

  - Access to overseas experts with necessary technical knowledge in the field of interest.

  - Linkages to other capital providers who could facilitate the next stage of development or linkages to venture capital providers which are US or European based.

  - Access to knowledge of international product markets, and connections to customers and thus being able to facilitate international market penetration and growth.

  Some investee firms felt that efforts were being made by local venture capital firms to bridge this need, but as yet had not been fully successful.

- The size of the venture capital fund needs to be appropriate to the present and future financing needs for the investee firms, while recognising that a New Zealand fund may be a stepping-stone to other larger venture capital funds. In other words, the venture capital fund must not only provide the necessary funds early on in the relationship, but it is imperative that it also has the ability to commit additional funds to the company to match its growth. Naturally such capital may need to be staged because, from the venture capitalist's perspective, an abundant supply of funds may encourage wasteful spending.[64] However, from our interviews, it appeared that in some instances, the growth path of the company was impeded due to an inability of the venture capital manager to commit funds as necessary to support expansion.

[64] For example, one interviewee stated: " Many New Zealand firms are under-capitalised, but you need to think of the counter-factual. If you pump cash into these firms, then you have to question whether this is useful or will simply result in a higher burn rate."

- The ability of venture capital managers to add credibility to the company and its intentions to expand. One investee firm said, "Working with x fund, gave us exposure and increased our credibility, i.e. our plans were deemed realistic in the public eye and strengthened our market positions." Nearly all investee firms interviewed expressed this sentiment.

Commentary

The role of venture capitalist should not be (and is typically not) restricted to capital provider. They play an important role in helping businesses develop through the early stages and make appropriate business decisions. It is appropriate for investee firms to expect 'value add' from their venture capitalist.

The criticism of some investee firms that not enough follow-on capital is available warrants attention. If insufficient capital is available businesses cannot grow to their full potential, and the full benefits of the investment cannot be achieved. It is therefore important that additional capital is set aside for later stage development. However, given the early stage of the market's development and its difficulties in securing initial capital, the issue of follow-on capital is likely to persist for a while. In the short term, the only solution to this problem is likely to be encouraging the involvement of overseas venture investors in investee firms alongside local venture capital fund managers.

Thus, the expression for the need for international linkages is really a by-product of our market. Given New Zealand's size and geographical position, expansion of a business requires penetration of the overseas market. This process can be difficult, but can be rapidly accelerated through effective networks and communication channels. Even as New Zealand's market grows, the need for international linkages is likely to continue.

The Term Sheet – A discussion

Purpose of case study

To review aspects common in a term sheet between a venture capitalist and an investee firm, explore why these may be contentious or cause tensions in the relationship, and look at the reason for the terms from a venture capitalist's perspective

Background

During our interviews, interviewees often expressed concern about the term sheet presented to them by venture capitalists. Several market participants felt that many in New Zealand were unfamiliar with these terms and their role in governing the investor/investee relationship. Consequently, receipt of the term sheet was sometimes met with reservation from investee firms, which after reading the document felt it was unfairly harsh on the company and did not appropriately consider the risks borne by the investee firm.

What is a term sheet?

The term sheet is a document that outlines the key financial and other terms of a proposed investment. It is used to achieve preliminary and conditional agreement to key terms and is the basis for drafting investing documents. As well as being subject to negotiation of the final legal documentation, a term sheet will usually contain certain conditions, which need to be met before the investment is completed (conditions precedent).

Terms

Any term sheet can have a range of possible terms. We focus on those terms that relate to ownership/control and the investment/funding process and how these may be considered contentious from the perspective of the investee firm.

Ownership/control

One market participant mentioned that the disadvantage of venture capital was that "You run the risk of diluting ownership or even losing control." Terms that can explain this sentiment relate to the following:

Investor consents – for example, "So long as there are at least *x* percent of the preferred shares outstanding, the prior written approval of the investors holding *x* percent of the preferred shares will be required to: amend the constitution, change share capital, acquire any new business, shares or other securities, sell or deal with assets other than in ordinary course of business, wind up the company or appoint or remove directors to or from the board of the Company."

From the investee firm's perspective this term can clearly restrict its ability to make decisions independently, but from the venture capitalist's perspective, it provides the venture capitalist assurance that any activity, which may significantly alter the nature or risk return profile of the business, will need their approval.

Board Representation – for example, "The board will have a maximum of *x* directors. For so long as the investor holds (or will hold) *x* percent of the issued share capital of the Company on an as converted basis, the investors will have the right to appoint *x* number of directors (the 'investor directors')."

The investee firm may see this as a potential loss of contol, but for the venture capitalist it serves to protect his or her interest in the firm.

Rights attaching to preferred shares – for example, "If no [qualified] IPO or corporate transaction has occurred within x years from completion or redemption of the preferred shares cannot be completed, the [majority] of investors [holding *x* percent of the shares] will have the right to require the company to engage in a liquidation process by way of IPO, corporate transaction or liquidation." Alternatively it may be expressed as, "If no [Qualified] IPO or Corporate Transaction has occurred within x years from completion, each of the preferred shares will be redeemable at the option of the holder for an amount in cash equal to [the original purchase price][the liquidation preference], plus all accrued but unpaid dividends."

These conditions can be worrisome for the investee founder, as it exposes him or her to the risk of 'losing' the company. However, from the venture capitalists perspective, it provides a way of limiting the investment horizon and an opportunity to exit.

For investee firms unfamiliar with venture capital, the above terms really do feel like a 'handing over of power' and it is likely that they will resist or try to limit the ability of terms to cause a potential shift in control of the company. However, these terms are not uncommon in venture capital.

Valuation/investment

Another issue raised during the interviews was that negotiations for venture capital were often tough. As one interviewee stated, "We [the company] want cash for nothing and they [the venture capitalists] want the company for nothing". Specific terms relating to valuation/investment are discussed below:

Investment (amount) – For example, "You have told us that the proposed business plan calls for an equity injection of *x*. Of this amount, funds managed by us will provide *x* alongside investment by other venture capital funds or financial institutions." In this example syndicated funding, i.e. participation of multiple venture capitalists is assumed. In this case an additional clause may be

included, for example: “The company must secure institutional co-investment of at least x on identical terms from other venture capital funds or similar organisations acceptable to us. We will not underwrite the total funding sought nor guarantee the securing of co-investors.”

This can be frustrating for the investee firm. It means that they need to find further funding before they can access the equity promised by the venture capital firm. However, from the venture capitalist’s perspective, this requirement serves to diversify the investment. It also acts as an additional check because due diligence will have to be carried out by another venture capital firm to confirm that the investee firm is a suitable investment.

Investment (type) – For example, “The investment will be in the form of convertible participating [redeemable] preferred shares at a price of x per preferred share.”

It is typical that a new round of investor creates a new series of preferred shares to distinguish the rights that attach to their preferred series from those that attach to all prior series of shares. This is because at the time of creation, each series of preferred shares is usually based on different company valuations and circumstances and thus reflects different risk profiles.

Although the rights attaching to the shares are usually aimed at mitigating the venture capitalist’s risk in the investment, the venture capitalist can initiate other mechanisms. One example of this is not to provide all funding up front, but rather in stages (or tranches) contingent on the investee firm’s ability to meet certain commercial targets or milestones. This is usually expressed as follows:

Investment (by milestone) – For example: “The investment will be staged with x percent being invested at completion (the ‘First Tranche’) and x percent being invested subsequently. The investors will have the right, but not the obligation to subscribe for subsequent tranches. In addition, provided that the performance milestones referred to in paragraph *x* have been met, the ‘Board’ will have the right to call subsequent tranches within *x* months of a performance milestone being satisfied.”

The term is designed not only to act as an incentive for the investee firm, but is also designed in such a way that if the firm does perform, further funding is ensured. Whilst the term does provide protection to the investee firm and a ‘carrot’ in terms of future funding, the ‘stick’ is still present and can be a cause of concern to the firm. Failure to perform runs the risk of stopping the company’s expansion/growth path.

Sometimes in the term sheet another term such as, “The proceeds from the investment must be used for the Company’s working capital requirement [in particular]” is included. This is another approach used by the venture capitalist to ensure that funds are used for the desired purposes and protects the venture capitalist from wasteful spending. From the perspective of the investee firm it may be considered restrictive as it prevents the firm from allocating funds to where it sees appropriate.

Key points

The term sheet sets out the terms for the relationship between the venture capitalist and the investee firm. Although some of the terms will be contentious especially in terms of what role or control the venture capitalist may have over the company or how funding is provided, the terms are generally designed to:

- Ensure the company acts in the best interest of growing or expanding the business.
- Minimise the exposure of the venture capitalist’s investment to risk, or provide avenues for it to take action.
- Allow the venture capitalist to gain more control and or limit its level of investment if the investee firm is underperforming.

8.2.3 Exiting issues

Research suggests a vibrant IPO market serves to stimulate venture capital activity, by providing an important exit vehicle for investors.[65] Thus any deficiencies at this end of the venture capital cycle can have trickle down effects on the industry as a whole.

It was therefore interesting to hear market participants' perceptions on the ability to exit in the New Zealand market and whether a series of international listings or absence of local listings could be attributed to deficiencies (such as exhaustive compliance costs) in the New Zealand context. Our interviews suggested that many firms were shying away from local listings for reasons other than inefficiencies in the local market. These were as follows:

- There is a growing trend to exit via trade sales. Many interviewees stated that a trade exit was 'desirable' and would be 'prevalent in the future'. In their view the proliferation of technology has widened the gap between the investor's knowledge of the technology and the knowledge required to assess its present and future value. Thus outside investors are not always well placed to correctly value companies rich in technological or intellectual property. On the other hand, firms within the sector are well placed to evaluate the intellectual property produced and potentially use it as a springboard to develop further products. Furthermore, some market participants believe that the work required in achieving a trade sale is much less than that for a IPO, as less emphasis is placed on margins or sales and more on the potential present and future use of the technology.

- Achieving an international (as a opposed to a New Zealand) trade sale or listing was viewed by many as a natural progression in the life cycle of a New Zealand firm, as it inevitably migrates offshore as it expands.

- The price multiples achieved by firms listed overseas such as on the NASDAQ are significantly higher than those that would be achieved in New Zealand. One market participant spoke of an international P/E listing multiple of more than double that offered for a potential listing on the local exchange. Based on such multiples, one interviewee commenting on the decision to list overseas stated, "I did not have to think long."

Commentary

As mentioned by the participants, there is a tendency for New Zealand investee firms to steer away from local listings in part due to the growing appetite for trade sales and secondly due to the migration of companies offshore.

The literature suggests the absence of a vibrant IPO market will reduce the level of investment in venture capital: see, for instance, the studies of Black and Gilson (1998) and Jeng and Wells (2000). At the same time, many emerging venture markets seem to be thriving without venture capital markets: in particular, the NASDAQ market in the U.S.

[65] Jeng, L. A. and Wells, P. C., (2000), "*The determinants of venture capital funding: evidence across countries.*" Journal of Corporate Finance 6: 241-289.

and the Alternative Investment Market in the U.K. are emerging as destinations for venture-backed companies world-wide.

We probed interviewees on this issue and asked them to elaborate on local market conditions and impediments to local listings. Nowhere were we able to find direct evidence of inefficiencies and in fact some participants stated that the higher compliance costs associated with investing offshore made a New Zealand listing more attractive. However, one shortcoming could be extrapolated from the comments made by participants. The lower price multiples and sometimes lack of interest shown by the New Zealand market suggests a lack of investor knowledge. Also, there is often a clear need to align with an offshore participant to allow further growth and realisation of full potential.

Navman – A success story of continued local benefits

Purpose of case study

Typically, when a New Zealand firm looks offshore, there is concern that potential migration of the company will see a loss of the country's resources and commercial capabilities. In this case study we explore the flip side, i.e. what are the benefits of looking offshore and how can this benefit the local economy. Navman provides an excellent example. In this case study we explore how it has developed as a result of its purchase by an international firm and how this has benefited New Zealand.

About the company

Navman began by providing the US market with OEM marine instruments. The development of personal GPS products propelled Navman's product range into land navigation, which in turn has

expanded into cutting edge in-car navigation. Today, Navman's product range includes marine electronics, land based GPS, fleet management solutions and OEM production.

The company's head office is in Auckland, with offices and subsidiaries in Christchurch, USA, Australia and the UK. Its number of employees is estimated at five hundred, but is still growing.

The beginning

Navman began about 18 years ago as Talon Technology[66]. It started conservatively and without any venture capital assistance. As a start-up Navman searched for the most cost effective path to the market. In the absence of any brand or distribution channel, the company focused on making a good product and better understanding its customer base. Following exposure to the US market, the company established its own distribution in Australia. After the first 5 or 6 years, Navman's sales had reached 3 million through OEM business.

The story

Although Navman began slowly, its growth over the last 5 years or more has seen a rapid increase. In 1997 the company received its first round of venture capital funding from a small USA based public listed company Ultradata Systems Inc of St Louis. The company grew very rapidly from 1997 and in 2001 it brought in NZ based Emerald Capital to complete a new funding round and at the same time to buy back the shareholding from Ultradata Systems Inc. The company became the recipient of several awards including Supreme Exporter of the Year (Trade New Zealand), Supreme Award for Excellence (HiTech) and Deal of the Year (HiTech).

[66] The company's name was changed to Navman in 2001.

By 2001 the company was performing well and had won almost $1 million in Government grants for the year, bought back its own shares from a minority US shareholder and went on to buy the GPS division of Nasdaq-listed semiconductor maker Conexant.

It was a New Zealand fairytale in the making, when in 2003, with sales close to $150m and staff number estimated at 350, it was announced that Brunswick Corporation of the USA had approval to acquire Navman NZ for $54.5m (for 70 percent) with the right to buyout the remaining 30 percent before the end of 2005.

Brunswick is a giant US-based manufacturer of marine and outdoor equipment, with 10,000 retail outlets in the US and abroad and owns leading consumer brands such as Mercury and Mariner.

Naturally, from the perspective of many locals, this buyout was disappointing news, as they thought from a New Zealand context such a sale would see the loss of a rich pool of human resources and intellectual property to an offshore entity.[67] However, many saw strong synergies and potential growth from the acquisition. The comments from several key participants were as follows:[68]

Nigel Metge (Investment manager, specialised manufacturing investment New Zealand) – "A marriage made in heaven – increased trade, distribution, financing, technology development and strategic alignment – all in one."[69]

Peter Maire (Founder of Navman) – "We realised we would not achieve that level of growth without partnering with an international company that matched our vision."

George Buckley (Chairman and Chief Executive of Brunswick Corporation) – "We have a firm belief that technology is a vital ingredient to our products…. We began to look around the world for companies that had that kind of capability and New Zealand with its tradition and history in the marine industry was a fertile ground."

Post acquisition, Navman did not migrate offshore, but instead maintained its headquarters in New Zealand. There has been a significant rise in staff, estimated at 500 and still growing (an increase of around 40% since acquisition) and an increase in its research and development facilities. In fact in March 2005 the company opened a new 50,000 square-foot facility in Auckland. Furthermore, being part of an international group with huge worldwide distribution partners should enable Navman to reach its goal of $1 billion sales by 2007.

Thus the acquisition of Navman by an offshore entity has not resulted in a migration of New Zealand skill and expertise internationally, but rather has facilitated local growth of the company and ensured a continued demand for its products. This in turn has positive spill-over effects for local businesses.

Key points

The case study highlights the restrictions of a New Zealand market, namely:

- The country's geographical isolation, which makes penetration of foreign markets challenging.
- New Zealand's relatively small size, which means that desired growth (in company revenue and size) cannot be sustained in the local company without looking offshore.

[67] For example in the Herald (25/06/03) an article on the sale of Navman stated, "But the sale to Brunswick highlights a familiar trend among New Zealand's most successful IT companies – they get plucked up by overseas investors."

[68] See www.investnewzealand.govt.nz

However, it also highlights that even though access to international markets is necessary to overcome some of the obstacle of size, it does not have to be associated with a departure of New Zealand expertise and knowledge. Rather it is possible for firms to remain local while still achieving the desired growth by forming strong networks or ties with international companies. This in turn has positive spill-over effects for New Zealand's economy.

8.2.4 Barriers to growth

Venture capital serves as a vehicle to accelerate growth and the expansion of firms and is consequently a crucial component of the government's growth and innovation framework. During our interviews we explored this idea, aiming to identify from interviewees the limitations of venture capital in facilitating growth of New Zealand firms, how these shortcomings could be addressed and what alternative approaches could be considered. In doing so, we identified two distinct barriers to growth; the first was a tangible set of problems, which in most parts could be overcome by venture capital, while the second related to a set of intangible 'cultural' impediments, which could not be readily resolved through venture capital. The two categories are described below.

Tangible barriers

- The inability to raise sufficient initial capital was often not cited as the most constraining barrier to growth. Many investee firms thought that access to initial capital was readily available and that other factors more significantly impeded or limited their ability to establish and grow. However, on this point participants did readily express concern as to their ability to achieve follow-on funding. For example, one interviewee stated:

  "The bigger issue for my company and others has been to achieve follow on funding."

  Thus the absence of follow-on funding was seen to stifle progress and inhibit growth. It was seen to change the growth trajectory of a firm and potentially cripple its position in the market.

- Almost every participant cited 'experience' as a significant barrier to growth. Comments ranged from simple statements such as: "It was difficult to get people on board with the relevant experience" to more serious responses such as "The biggest challenge facing an investee firm is experience." Thus a high premium was placed on human capital. Most interviewees felt that the relevant skill base was lacking in New Zealand and looked offshore for support.

- Another barrier to firm growth was the absence of a relevant knowledge base or skill set. On a management level, this was akin to 'lack of experience' described above, as a deficiency in management skills was attributable largely to lack of experience. As one interviewee stated: "These guys (the managers) lack any experience or are aware of what is required to develop the business. The result is that these firms are steered in the wrong direction."

- The absence of international connectedness/networks was another common problem. Many of the firms interviewed felt that growth could not be attained without the use of overseas networks or contacts, international collaboration or even overseas migration. The presence of global interconnectedness could potentially allow for the integration of products into an existing overseas supply chain, leveraging local knowledge with that of international experts or rapidly establishing an international market or presence for a local product.

Commentary

The above factors, sufficient follow-on funding, relevant experience, appropriate knowledge base and international connectedness/networks sound familiar – reason being, these were the exact characteristics sought by investee firms from their venture capitalist. Thus it appears that firms approaching the venture capitalist are not looking exclusively to access capital, but rather considering the ability of the venture capitalist to remove tangible impediments the company is likely to face during its period of growth and expansion. Further support for such a hypothesis came from remarks by parties that expressed a negative sentiment towards venture capital. These generally criticised venture capitalists for being only 'reactive' and not displaying the 'level of participation' that they had expected.

Again, there are two ways to interpret these remarks. Tensions between entrepreneurs and venture investors are inevitable, particularly when the entrepreneurs are relatively inexperienced and may have inflated expectations. At the same time, the value-add that the venture capital community can provide is likely to be constrained by the lack of operating and venture investing experience of many of the investment professionals.

Intangible barriers

The impediments to growth, especially in the very early stages are not strictly limited to tangible factors. Interviewees often alluded to a subtler impediment, but equally stifling. This was as follows:

- A 'fear of failing'. Market participants felt that overseas, such as in the United States, failure is not viewed negatively and is considered part of the learning process, for example one interviewee stated, "[Overseas] war stories strengthen and provide experience." In contrast New Zealand participants feared failure and were averse to taking the risks required to achieve the success witnessed by companies overseas. Consequently individuals were reluctant to take the next big steps or step outside of their comfort zone.

- Being content with what has been achieved. Some market participants expressed concern that once a level of success was achieved, the desire to grow further was absent. For example, one interviewee stated that once the firm reaches a certain level of turnover, and the owner can afford the boat and holiday house, no effort is made to progress the company further. On one occasion this was referred to as the 'dinghy mentality'.

Commentary

Resolving the intangible barriers is difficult because it really forms part of the country's psyche and is cultural in nature. However, participants agreed it should not be ignored.

At the same time, as the experience of Israel illustrates, these perspectives can change quickly: one or two successes can serve as a powerful example to other entrepreneurs.

Proacta – International collaboration and co-investment

Purpose of case study

Proacta provides an example of the benefits of an investee firm collaborating with offshore entities to leverage its knowledge and market position. It also provides the opportunity to explore why and how a firm may seek offshore investment and the difficulties associated with such an approach.

About the company

Proacta is a biotechnology company developing a new generation of cancer drugs that uniquely target physiological attributes of solid tumours. The company holds exclusive worldwide rights to 25 patent families, across more than 9 chemical families. The development of its portfolio is supported by significant grant funding and led by acknowledged international experts in the field at the University of Auckland and Stanford University.[70]

The beginning

Proacta was first established in 2001 and was a spin-off from the University of Auckland. Initially it functioned in conjunction with a university in London, but failure to gain any support from venture capitalists for its enzyme products saw the departure of the 'London connection' as the company began to focus on products (in the treatment of hypoxic cell death), which were developed from research carried out exclusively at the University of Auckland. In 2002 the company commenced discussions again with venture capitalists about procuring funding.

The story

Initially, very little interest was shown by New Zealand venture capitalists who had a very limited understanding of this aspect of the biotechnology sector and were unable to assess the company's potential. Consequently the company began to seek offshore funding. Although some venture capital firms were interested, many expressed reluctance to invest. Typical comments included, "New Zealand is too far", "How do we control from here" and "Why are locals not interested?"

Subsequently, Proacta approached Stanford University to participate in the research, after which several US venture capitalists began to express interest. There was still reluctance by New Zealand venture capitalists to invest in the company, and finally Proacta was able to secure funding from GBS Venture Partners (Australia), but only with the caveat that the investment would have an American lead venture capitalist. Proacta achieved support from Genetech Inc after which GBS Venture Partners then offered to take the lead position in the syndicated investment. Roche then joined as another member of the syndicate, as did Endeavour Capital and No 8 Ventures.

While Proacta has its origins in outstanding New Zealand research (facilitated by Government grants), to grow its business requires the building of networks and connections offshore. The fact its venture capitalists are US and Australia based (as well as New Zealand) assists in this, as does its connections with Stanford University. The importance of these offshore connections is expected to grow as the company moves its products through the various research phases and begins to develop its marketing strategies.

Key points

This case study highlights the following points:

[70] See www.proactatherapeutics.com for further information.

- Lack of knowledge in some sectors restricts the level of investment by local venture capitalists, as they are unsure how to evaluate products and businesses in this area.
- Offshore venture capital firms do express interest in local firms, but are wary of the 'distance' and why onshore investment is lacking.
- Joint off- and onshore investing can prove beneficial to all parties concerned. Local venture capitalists can provide guidance within the New Zealand context and can leverage off knowledge from experts in offshore venture capital firms. The offshore venture capital firms also provide a useful source of contacts and networks.
- Similarly collaboration with offshore entities gives local companies access to foreign markets, adds further support and credibility to research done locally and allows for the next step in the commercialisation process to occur.

8.2.5 Capital raising issues

There were two distinct categories of individuals that provided valuable insight into the issues and concerns around capital raising in New Zealand. The first was the investors into venture capital funds and their advisors, and the second was the venture capital fund managers who actively engage in capital raising.

The previous section described the resistance of investors to invest in New Zealand venture capital. Based on these findings, it was not surprising that the second group, the venture capital fund managers, consistently expressed their difficulty and frustration in raising venture capital funds.

Both party's views were often opposing, with each party blaming the other. The investors, as described earlier are reluctant to commit funds to venture capital in the absence of a track record, while venture capital managers believe that without some form of backing, especially from local institutions, the sector can never grow and achieve the desired returns required to attract additional capital. It was these reasons that led some venture capital managers to suggest that a form of compulsory investment by local institutions (where they are an arm of Government) would greatly facilitate the growth of the sector.

We explored the approaches taken by venture capital managers in overcoming this hurdle. In doing so, we were able to identify more about the nature of investors in venture capital and what drives their decisions. This is described below:

- Many of the investors targeted by the venture capital funds were not institutions, but rather high net worth individuals. We note that these investors constitute 25% of all investment in the VIF Seed Funds.

- Nearly all investors that invested in New Zealand venture capital did not appear to invest exclusively for returns. Interviewees often spoke of some form of 'connection' between the investor and New Zealand. This could often take the form of a previous holiday or even a kiwi friend. Thus the investment decision was motivated by an interest in the country and not purely based on a financial perspective.

- Similarly, New Zealander's investing in local venture capital funds spoke of "giving something back" or "giving them a kick to help these companies" as

reasons for their investment. The investors did not suggest that they did not expect returns from their investment, but that their decision did incorporate a non-financial element.

- Community based investors had indicated a strong interest in investing on venture capital in their community to support local business development.

Commentary

Many of the statements provide valuable insight into the types of people that constitute the investment pool and reasons people invest into venture capital. However, an underlying concern from market participants was the total absence of institutional investors (with exception of one). This is especially so as these investors provide much of the ongoing investment in venture capital funds offshore. Certainly, in part the lack of institutional involvement reflects the immaturity of the market: few institutions or their consultants are likely to be willing to invest without a well-defined track record. It is also worth highlighting that in many emerging venture markets, the key early investments have been provided not by domestic institutions (who are often unfamiliar with the asset class), but rather by seasoned institutional investors abroad.

The NZVIF identified the composition of investor type in the VIF Seed Funds in its report entitled 'Progress and Achievement report 2003/04", which is as follows. [71]

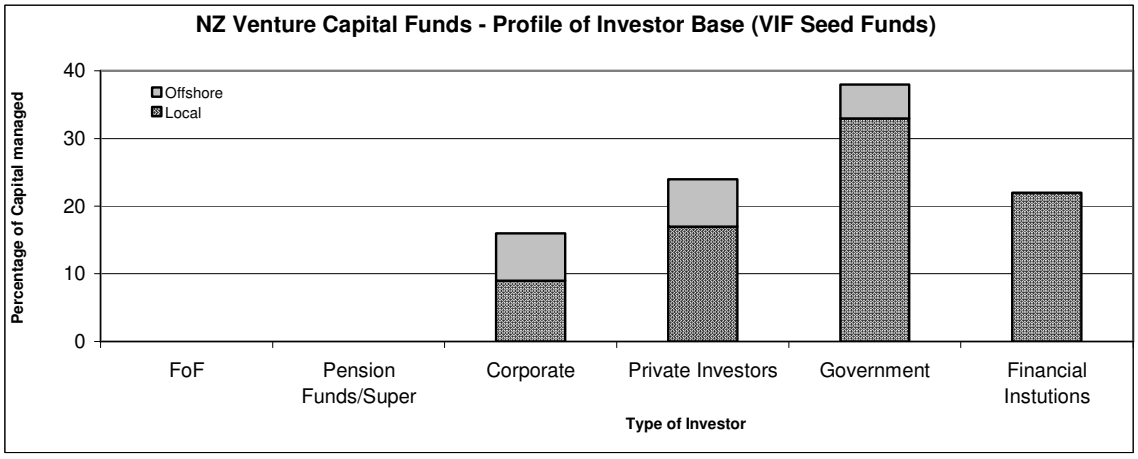


Figure 8.1. This is based on NZVIF data on the investor profile of the established VIF Seed Funds and is not intended to represent entire, current NZ VC industry.

NZVIF also put forward a view of investor composition for a mature venture capital market in New Zealand, based on trends in offshore markets. This is given below. As can be seen, NZVIF believes that a mature market could be expected to be dominated by funding from pension/super funds and funds of funds. Based on the findings from these interviews, although there is some early interest from financial institutions and community trusts, little progress has been made to achieve this investor composition, particularly in respect of pension funds.

[71] Figure 8.1 and 8.2 have been sourced from page 19 of the NZ VIF Progress and Achievement report 2003/04.

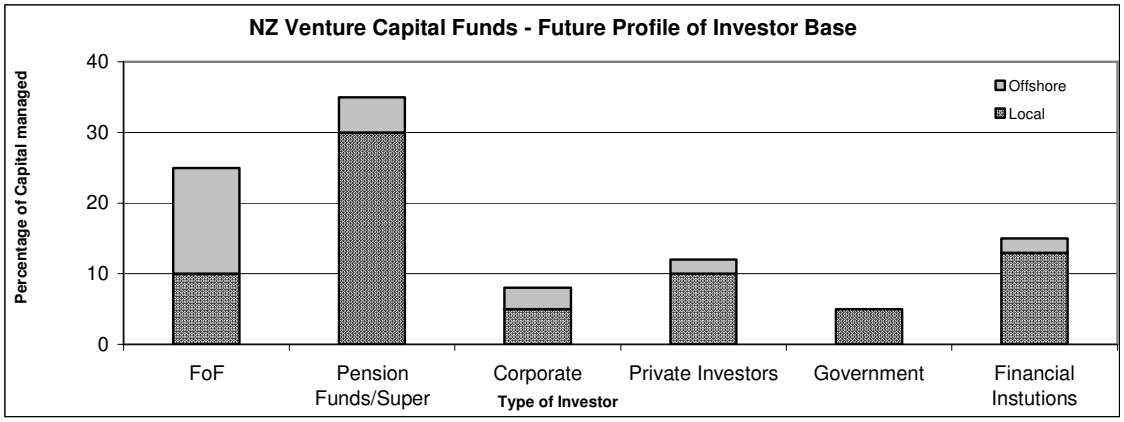


Figure 8.2. This is an NZVIF estimate only, of the potential future investor profile, in 10 years time. To construct this profile NZVIF reviewed recent data and international trends on private equity investor profiles from US, Europe and Australia.

8.2.6 Institutional barriers to investing in New Zealand venture capital funds

Many of the participants interviewed who were responsible for investing decisions expressed a lack of enthusiasm for investing in venture capital and in New Zealand in particular.[72] This has important implications. If such statements are valid, and Government considers a venture capital market is desirable, then efforts need to be made to address the shortcomings in the marketplace. This could take the form of public-funded venture capital investments (along the line of the NZVIF) to initiate the market. It could also point to a knowledge gap between investors' understanding of the market and the true conditions, which would suggest the need for some form of knowledge bridge to overcome the inertia of investors to invest in the local market.

Below, comments from market participants are summarised.

- For some investors New Zealand's venture capital market is too small to warrant an investment in the sector. Typically a minimum size is required for an investment, otherwise transaction/administration costs will offset any gains. Many of New Zealand venture capital funds are around $50m, which are considered at the small end for foreign institutions.

- It was perceived as against prudent portfolio theory to invest in New Zealand venture capital funds. If New Zealand is viewed as a subset of the world portfolio, and private equity as a subset of alternative assets, then investment allocation in New Zealand venture capital will inevitably be low or even inappropriate. This concern is compounded by the perceived increased risk of venture capital relative to other asset classes.

- An extension of the above problem is that investors generally view venture capital as a subset of private equity. Thus funds will generally not be targeted specifically at venture capital, but rather private equity. When an investment is made only a small proportion of that investment, to the extent that is appropriate for

[72] Some of the concerns expressed related to the inherent characteristics of venture capital – such as longer investment horizon, lack of liquidity and lack of transparency. Whilst these were important concerns we focused on issues raised that related specifically to New Zealand venture capital.

diversification purposes, will be directed towards venture capital. In contrast, it appears the investors feel much more comfortable targeting an allocation at the later stage investments. For example one investment manager said, "I do not view venture capital as an attractive asset class. Perhaps private equity is a viable option." Another interviewee noted that they did invest in venture capital and private equity, but that they directed most of their investments towards the private equity end.

- The limited size of New Zealand venture capital was repeatedly cited and stressed by investors as an impediment to investment in the sector.

- The higher level of information asymmetry present in the New Zealand market. The problem of New Zealand's small size and geographical isolation are compounded by the fact that there is little research or available information on the New Zealand venture capital/private equity markets.

- The absence of a track record was repeatedly raised and considered a serious hurdle. If an investor is considering investing in New Zealand venture capital, it is hard to validate the investment decision without some form of supporting data. Furthermore, this track record needs to be favourable. One interviewee stated, "It is the returns which drive investment decisions."

- To a lesser extent, the inconsistency between New Zealand and its international counterparts regarding venture capital legislation. In particular, the absence of a limited partnership model adopted overseas was raised – thereby creating concerns for foreign investors as to their tax and liability status when investing in New Zealand. Whilst it was recognised as an impediment to investment, most interviewees did not believe rectification of these issues would serve as a serious catalyst for further investment.

- Lack of local investment was viewed as a secondary impediment to investment in New Zealand. Some interviewees spoke of 'market asymmetry' and that overseas investors would not suggest to understand the New Zealand market better than its locally based investors. Hence absence of a local presence in venture capital could be and on occasion was perceived negatively by foreign investors.

Commentary

The absence of a track record in New Zealand venture capital appears a very significant barrier to attracting investment. This issue, along with limited information on the emerging market and the very small size of the sector in international terms, appear to be the main limiting factors from an investor perspective, and they suggest some of the issues that the sector faces. At the same time, small nations such as Israel Singapore and Taiwan have succeeded in marshalling investment in their venture industry from domestic and (especially) overseas sources.

8.2.7 The role of government

Responses from participants were quite divergent on the role of government in the venture capital sector. Whilst many participants felt that the early stage of venture capital was a particularly difficult segment to grow and therefore welcomed support of any form in this area, some participants clearly felt that the government had no role to play. It was

argued that if the private sector did not realise any gains in this sector, then this area may not be feasible and alternative avenues for investment should be considered rather than reviving an underperforming area of the market.

Interestingly, not all participants had a clear-cut opinion. Another emerging line of thought was that government had a responsibility to activate the sector and facilitate it reaching critical mass, i.e. a point at which its activity is self-sustaining, after which it could retreat and allow the sector to develop on its own. For example, an interviewee expresses support for VIF and stated, "This approach is an attractive way to kick start the industry."

The latter opinion is consistent with that expressed in the literature on policy frameworks for developing a self-sustaining venture capital market. For example, in the study on the European venture capital market, Cope (2005) believes the following lessons can be learned:

- Channelling public funding through a well-managed Fund of Funds operator is the best mechanism but clarity of objectives and appropriate performance measures are needed.

- If a market appears healthy, public-funds should be phased out in a controlled manner as they no longer fulfil the role of addressing market failures.

- Public policy must focus on creating the conditions or ecosystems that enables the industry to prosper rather than the singular policy of provision of funds.

Interviewees comments on the role of government are presented in two categories – the first is their opinions on current initiatives while the second focuses on further initiatives.

Current initiatives

- Support needs to be controlled and consistent. Interviewees were almost unanimous on this issue. If government support is provided, then it needs to continue in line with the nature of the investment. That is, the investment horizon for venture capital is long term (often in excess of ten years) and so it is of no use to the industry if support is provided in the initial phase, but subsequently removed at the later stage. The effect of such an approach is to cripple existing projects and negate the progress made. Only once projects (investments) have been seen through to completion can the industry begin to build on itself and reap the benefits of earlier investments.

- Staying in early stage investments and not straying towards later stage. It is acknowledged that early stage investments are the most difficult to develop while later stage investments, especially towards the private equity end are often favoured by investors due to its reduced investment horizon and less volatile rate of return. However, if Government plans to support the early stage of investment, then its investment mandate needs to be tightly restricted to the early stage spectrum without deviating towards later stage investments (even if returns appear more reliable). Some participants expressed concern that this migration may already be occurring as focus shifts from assisting early stage companies to ensuring a profitable return on investments.

- Current government initiatives successfully encourage investment in the early stages by mitigating some of the risk faced by investors. As mentioned, early stage investments tend to attract less attention from investors, as these are less liquid, have longer investment horizon and appear more risky than later stage investments. However, the option in the VIF programme to buyout the government's contribution in the event the fund performs well, or absorb some of the shock in the event the fund underperforms, is viewed favourably by investors as it changes the risk/return profile of the investment and makes it more attractive.

- Conversely some participants expressed a concern for limiting investment to the early stage of investments. These participants believed that it might be appropriate to invest also or even predominantly in later stage investments initially. Although these opinions appear to contradict, they were actually the expression of the same objective, i.e. to encourage the level of investment in the sector. The early stage 'supporters' were focusing on limiting the downside risk to investors, thereby encouraging investment, whilst the later stage 'supporters' wanted to encourage investors into venture capital by introducing them to the 'easier' end of the market, where the returns, investment horizon and risk are lower. They considered this in turn would eventually have a trickle down effect to early stage investing as the investors become more comfortable with venture capital.

Commentary on current initiatives

The comments on the need for long term and consistent public policy in this sector are consistent with findings from research more widely undertaken, such as that of Gompers and Lerner (2001) and Cope (2005). The diverging views as to whether government support should be focussed at early stage investing, or later stage, underscores in our view the need to define in reasonably precise terms the problem that any government support is aimed to address. In our view the argument for government support due to market failures is much more compelling at the seed, early stage and possibly early expansion stages of a firm's development than in later stages, and any government support should be focused in those stages accordingly.

Further initiatives

- The need for education. Interviewees repeatedly cited the need to improve the level of education both for investors and investees. Many venture capital fund managers felt that the hesitancy of local investors to invest in the area of venture capital/private equity was attributable to a lack of understanding of the asset class and the nature of investments in this area. On the investee level, the lack of education translated into protracted and sometimes strained negotiations between investee firms and venture capital firms, as the former is unfamiliar with the approach taken by venture capitalists.[73]

[73] This issue is compounded by the fact that New Zealand investee firms appear to be much more familiar with angel investment. Under this approach, the firm is given equity with typically less control over or restrictions on its activity. Consequently, venture capital with its vigilant managers and tight control mechanisms appear overbearing and too demanding.

- Increasing the awareness of the sector in New Zealand. Many overseas (and local) investors are not aware that a venture capital sector exists in New Zealand and therefore are reluctant to invest in the 'far corner of the world'. By raising the profile of venture capital in New Zealand, parties become interested and more willing to make investments. Thus perception has the ability to drive some of the investment decision-making. The New Zealand Venture Capital Association (NZVCA) was often praised in this regard. It was widely recognised that the organisation plays an important role in promoting the sector and raising its profile.

- The presence of a track record is pivotal to securing investments. It was recognised that New Zealand venture capital is at its early stage and thus a track record has not yet been achieved. However, as it emerges, it needs to be communicated to investors. It was noted that the presence of a track record, or at least greater access to current market data, would provide a valuable platform for investors to base their decisions on and reduce the asymmetry of information, which is a common obstacle facing foreign and local investors.

Commentary on further initiatives

The comments on the need for further education and improved information on the increased are consistent with those made in relation to barriers to the capital raising process.

8.2.8 Defining success

Throughout the interview process we posed the question to interviewees, "Where do you see venture capital in New Zealand in the future and what indicators would need to be present so that we could consider the New Zealand venture capital/private equity sector as vibrant and successful?" In responding, nearly all interviewees recognised the size limitation of New Zealand and the fact that venture capital is long-term in nature and any attempts to measure success in the short term would be fraught.

Most interviewees were, however, able to provide a list of indicators that they would expect to see within the New Zealand market to deem the market as vibrant and self-sustaining. For example one interviewee immediately responded, "Regular exits, a history of investors with fat returns, about half a dozen $100m funds, returns greater than 20% and changes to tax laws."

We collated the responses from the various interviewees and summarised those features consistently described by market participants.

- A history or track record of successful exits by venture capitalists from investee firms.

- The removal of legislative barriers and inconsistencies with international norms. Most interviewees believed the New Zealand's venture capital sector could not achieve the level of investment and success it was searching for if it did not make the necessary changes to legislation to ensure that New Zealand's investment vehicles were consistent with the international limited partnership used overseas and to remove the uncertainty around investor's tax status.

- The presence of experienced individuals. This was on two levels – the first was on the venture capital side, i.e. managers who have experience in raising funds, investing in firms and seeing these firms through to exit. The second was on the investee firm level, i.e. managers that have successfully run a business through to exit and have moved on to the next venture (i.e. serial entrepreneurs that are keen to repeat the process and ultimately accelerate company development and expansion).

- The presence of a track record. Interviewees expressed the need to see a history of successful investments with positive returns. This would have the effect of attracting further growth and funding in the sector.

- A growth in the market size. Most interviewees were vague regarding the approximate size (some estimated around ten funds of approximately $50-$100m each), but all agreed that more funds and larger pools of committed capital would be evident in a thriving market.

Commentary

These indicators of success were along the lines we were expecting and provide a useful starting point in considering the stage at which government support could be curtailed. An important point is that there is not one critical indicator, but rather a series of measures which suggest the health of the venture market.

8.2.9 The interface between angel investment, venture capital and private equity

While much of the government support (in terms of providing capital) has been directed at the early stage of investment in venture capital, interviewees often commented on the appropriateness of such an approach. In doing so, the characteristics of each 'stage' of development were compared. A summary of the key issues expressed by market participants and their views on the appropriateness of funding at the different stages is described below:

- Investors that wish to extend their portfolio into alternative assets are much more likely to consider investing in private equity than venture capital or angel investments. There is a track record for returns in private equity, the liquidity risk is lower, the perceived likelihood of loss of an entire investment is less and information asymmetries are smaller. The favourable perception of private equity is corroborated by venture capital managers' perceptions that raising funds for private equity funds is much easier than for venture capital funds.

- Given the more positive investment characteristics of private equity, market participants often argued that this area did not require any government support and albeit small, was self-sustaining. Despite majority agreement on the absence of any need for support in the private equity space, several participants argued that it might be a useful point of entry for the government to promote the sector as a whole. That is, successful promotion of this stage would have a positive trickle down effect on the earlier stages of investment, as investments in the area of private equity become more prevalent and a track record is established.

- Venture capital in New Zealand is very small and faces many obstacles. Consequently support (at least for now) is required if that area of investment is to grow. The only question for some interviewees was if the support is aimed at providing enough momentum for the sector to reach critical mass and become self-sustaining, or whether it would merely be supporting an underperforming asset class.

- There are investment opportunities at the level preceding early stage investments, i.e. at the level of angel investment, but these businesses are not eligible for government funding given the stage of investment and are generally overlooked by venture capitalists, as the level of investment required is too low or too early. Thus a potential funding gap exists, which many interviewees agreed could be appropriately bridged through some government support. [74]

Commentary

The recently announced Seed Co-investment Fund is aimed at stimulating the angel investment market. It will be available for co-investments of up to 50 per cent of an equity investment with private investor groups. Government investment will be limited to $250,000 in any single proposal by pre-qualified investment partners.

8.3 Observations so far

Based on the available market data and our interviews we would make the following observations on the NZ market and the impact of NZ VIF.

- Prior to NZVIF there was little formal venture capital activity and practically none of the infrastructure required to build a venture capital market.

- NZ VIF has contributed significantly to the development of the sector. Since its inception there has been a significant increase in the availability of venture capital funds for early stage investments. The programme has attracted $120m of private investment capital for investment in venture capital investments and once fully invested in funds it should attract $200m of private investment capital alongside the NZ VIF $100m commitment.

- The current VIF Seed Funds are close to fully invested, which means that limited capital is available for further venturing investments.

- The design of VIF as a fund of funds, and requiring private co-investors, appears to be appropriate to the needs of the NZ markets and be working well.

- However, since the inception of VIF, to our knowledge no new venture capital funds have been established without the backing of VIF. Thus the goal of self-sustainability appears to be still some way off and it appears so far the sector still requires the involvement of NZ VIF to stimulate the market.

[74] At the time of the interviews the launch of the Seed Co-investment Fund designed to fill this perceived gap had not been announced.

- To date institutional investors have not invested in the VIF Seed Funds (with one exception). Their involvement will be critical to a self-sustaining sector.

- The VIF programme and the VIF Seed Funds have contributed positively to the development of a larger pool of individuals with the necessary skills and expertise in seed and start-up investment.

- Of some concern is the lack of venture capital deals originating from universities and CRIs. Although one of the objectives of NZ VIF is to improve the commercialisation of innovation from CRIs and universities, most deals have originated from elsewhere.

In summary, it appears that NZ VIF has played a positive and important role in catalysing the venture capital sector. However, the New Zealand market is still small and at a very early stage in its overall development. Moreover, the historical record suggests that these public initiatives take a long time to bear fruit. This suggests the sector continues to require support and does not appear to be close to a self-sustaining position.

Part IV Implications for public policy

9 Comments and implications for public policy

9.1 The wider innovation system

Government support of venture capital needs to be viewed in the context of its (and others) investment in the wider innovation system, as venture capital has proven in a number of other countries to be one of the key contributors to commercialising innovation and thus ensuring that innovations are converted into economic growth.

The Government's operational Vote RS&T investment for 2005/2006 is $600 million and includes a remaining $28 m capital to NZVIF. Other investments in the growth and innovation system include:

- The MoRST CRI Capability Fund of $38 million to retain and develop research and science capabilities in Crown Research Institutes. The nine CRIs have total assets of $470 m and employ 4,128 staff members, of whom 2,947 are engaged in research.

- The New Economy Research Fund of $62 million for research capability and knowledge development areas of science and technology where new industries and enterprises are emerging.

- Technology New Zealand's assistance for firms adopting and developing advanced technologies through programmes such as Technology for Business Growth, Technology for Industry Fellowships and Grants for Private Sector R&D. These investments have been expanded steadily in recent years and will total $55 million in 2005/06.

- The Marsden Fund of $34 m for excellent research exploring the frontiers of new research.

New Zealand's gross expenditure (including government and private sector expenditure) on R&D was 1.16%[75] (or circa $1.712b), which in comparison to other OECD's countries was ranked in the lower half.

New Zealand invests substantially in R&D, even though it is less than many other OECD countries. Any mechanism such as venture capital that has the potential to improve the level of commercialisation of that investment needs to be considered within the context and size of this wider investment.

Our interviews with market participants provided a clear view that the New Zealand venture capital market is in its infancy. We were also left with the impression that the

[75] See page 18 of OECD's "*Main Science and Technology Indicators report, 2005/1*". Based on 2003 data.

New Zealand innovation system produces relatively good science but struggles to transit innovative ideas from the laboratory to the market.

The question arises as to whether venture capital, as defined in this study, is an appropriate approach to boast the commercialisation of innovation in the New Zealand context. While it is difficult to be definitive on this point, we consider the evidence suggests strongly that it is, as:

- Other small economies (e.g. Israel and Singapore) have benefited greatly from a strong venture capital sector.

- Other financing methods for young, high-growth firms that could supplant venture capital have not emerged (including very little corporate venturing activity). Angel investing, which is a complement to venture capital in many markets, appears also to be in its infancy.

- The structure and operation of venture capital fund managers are well suited to addressing some of the key impediments to the establishment and growth of innovative New Zealand firms, by providing networks and skills to assist New Zealand firms to enter international product markets, to access ever increasing pools of capital as the business grows, and to access attractive exit options for founders and investors once the business is established.

- The venture capital process helps focus scarce resources to those businesses most likely to succeed through the use of structured processes to select firms for investment, and a staged method of financing which includes close monitoring of the performance of the firm against milestones. In a small economy the efficient use of these resources is critical.

- The fact that New Zealand's legal system is based in the common law tradition and that the country shares a common language with the largest venture capital system also lowers the barriers to the growth of this sector.

We conclude a vibrant venture capital market should bolster significantly the capability of New Zealand's innovation system to commercialise local innovation and convert those innovations into economic growth. We also conclude that the current venture capital market under-services the New Zealand innovation system in terms of the quantum of capital available from locally-based funds and the breadth and depth of services provided by venture capital fund managers.

We question whether the New Zealand venture capital market will ever embody a full set of services, and the size required to fund some firms through their growth cycle, as is available in the much larger markets of the US and Europe. However, the detail as to the extent to which these services are developed locally versus being imported from other venture capital markets is probably best left to the markets to decide. In our view, the key implication for public policy is to ensure that venture capitalists are able to operate seamlessly across the New Zealand border and that New Zealand tax and regulatory settings are consistent with international norms. In this way New Zealand's innovation system should have access to the most appropriate forms of venture capital.

It is on the basis of the above conclusions that we develop our recommendations for public policy, which are aimed at growing and strengthening New Zealand's venture capital market.

We summarise below our recommended initiatives in the two categories of stage-setting and direct interventions. To help provide focus we identify those recommendations we consider high priority in terms of enabling the current venture capital market to move to the next stage in its development. Chapter 10 develops the tax and regulatory initiatives in more detail, chapter 11 does the same in terms of improving the availability information on the market, and chapter 12 suggests ways in which the NZVIF could be evaluated in the future.

9.2 Stage setting initiative

The first—and arguably most critical—task for government is to ensure that public policy settings are conducive to the development of the venture capital market. This involves removing impediments to the formation of venture funds and the companies they back, and may extend to providing indirect support for the development of such activities.

Three groups of activities are particularly important. First, it is necessary to ensure that entrepreneurship itself is an attractive option (the reason for this is much wider than supporting venture capital markets but entrepreneurial activity drives the demand for venture capital). Such efforts are likely to have several dimensions. In a number of nations, formal or informal sanctions against those who are involved in failed ventures can discourage people from taking the high-risk step of leaving secure employment to start a new venture. Ensuring that creative ideas can move easily from universities and research laboratories (e.g. CRIs) to the market is critical.

We are surprised at the very low level of deal flow to the VIF Seed Funds to date (6%) sourced from universities and the CRIs. Given the large research resources channelled to these institutions each year, this outcome suggests the need to improve the incentives for these entities to commercialise their research and to ensure any impediments to these activities are removed. It is important that government policy to promote the commercialisation of research and the development of the NZVIF programme are aligned, as they are complements – if they are not acting in the same direction neither is likely to succeed.

Tax policy is also likely to influence the attractiveness of entrepreneurial activity as studies have documented that the attractiveness of entrepreneurial activity is very sensitive to the differential between the effective tax rates on capital gains and ordinary income.[76] Finally, education is likely to be critical. Ensuring that business and technology students are exposed to entrepreneurship classes will allow them to make more informed decisions; and creating training opportunities in entrepreneurship for mid-career professionals is likely to pay dividends.

Second, it is important to ensure that international and domestic investors find the New Zealand market attractive, straightforward and well-informed to do business in. In many

[76] See Gompers P. A., and Lerner J. (1998), "*What drives venture fundraising*", Poterba, J. M, (1989), "*Venture capital and capital gains taxation",* and OECD, (2004), *"Science Technology Industry – Venture Capital: Trends and Policy Recommendations."*

venture markets that have successfully established in the past two decades the critical early investments have not been made by domestic investors, but rather by experienced international private equity investors. These investors are likely to have the depth of knowledge and experience that enables them to make substantial bets on the most promising organizations, and the ongoing involvement of international investors plays an important role in integrating local venture capital fund managers (and investee firms) into the international markets.

In order to create an attractive and well-informed investment environment, governments must ensure that tax and regulatory features are in compliance with international norms. Even an appearance of a difference can be enough to deter such investors.

Having a vibrant national venture capital association (or similar organisation) that can gather and disseminate meaningful and timely data in a credible manner is also a critical building block.

Third, governments can harness and grow international linkages between the domestic market and other markets relevant to the development of the domestic venture capital market. This could take a number of forms including harnessing the talent and energy of expatriates living outside its borders who are inclined to help it (for instance as angel investors, as mentors to and champions of domestic venture capitalists, and as advisors when contemplating public policy initiatives), using government (and its agencies) linkages and networks to provide businesses a head start in creating their own, and in supporting international "showcase" events for the local venture capital market.

We recommend government undertake the following stage setting initiatives to improve the market conditions for New Zealand venture capital.

9.2.1 High priority initiatives

Encourage entrepreneurship

- Identify ways to improve the flow of innovation from universities and CRIs to the market place. This should include reviewing the incentives and impediments CRISs and universities face to pursue the commercialisation of research, with a view to strengthening their incentives and removing impediments. Government policies in this area and in relation to the NZVIF programme need to be aligned as they are complementary.

Tax and regulatory settings

- Implement a limited partnership arrangement with tax flow-through as already announced, and ensure the detail of this arrangement is tested with those conversant with international norms.

- Remove the tax impediments to trans-Tasman capital flows. This is an issue much wider than venture capital, but it is an important element in assisting the New Zealand venture capital market to access greater scale with respect to capital raising and investing.

- Clarify the capital/revenue distinction for income tax purposes as it applies to venture capital activity and ensure that investing in venture capital is not tax

disadvantaged relative to common investment alternatives, and that it complies with international norms from a non-domestic investor's perspective.

Improve information and education on the market

- Provide financial support to develop further an information base on the New Zealand venture capital market by an organisation that is well placed to undertake this development and to maintain this information base over time (e.g. the NZVCA).

- Support the education and showcasing of New Zealand venture capital opportunities to local and international institutional investors.

Harness and grow international connections

- Continue to use international linkages forged by government and its agencies to assist New Zealand venture capital funds and investee firms to form international links, and for international investors to link with New Zealand opportunities. Ensure these services are aligned with market participant requirements.

- Support the international showcasing of the New Zealand venture capital markets by organisations well placed to do this.

9.2.2 Other initiatives

Encourage entrepreneurship

- Use public events to promote the importance of entrepreneurship and innovation to New Zealand's economic well-being and to celebrate successes, and support such events staged by organisations well placed to deliver these messages.

- Encourage the inclusion of entrepreneurship courses in a wide range of tertiary programmes, including in technology-based programmes.

Tax and regulatory settings

- Ensure that tax losses generated in the early stages of a business' development can be offset against future taxable income even if shareholders change in the interim.

- Ensure the sale of patents is taxed in a manner consistent with the sale of any other capital asset.

- Align the GST treatment of equity investment funds (including venture capital funds) with that of other financial service providers.

- Explore ways of reducing the compliance costs, arising from the requirements of the Securities Act, of unlisted firms issuing employee share options , with a view to ensuring that this form of remuneration is straightforward for small firms to implement.

Harness and grow international connections

- Support networks and associations that connect New Zealanders living overseas with the New Zealand business community (e.g. the Kea network), and make use of these networks and the individuals within them when formulating policy that requires an international perspective.

- Provide scholarships or secondments to promising New Zealand students or professionals to locate for a period in off-shore organisations (e.g. universities or venture capital firms) to learn from and create networks within more developed venture capital markets.

9.3 Direct interventions

Another potential—though very challenging role - for government is intervening directly in the venture capital process as an investor. To be effective such interventions need to be sensitive to the venture capital market's needs and dictates.

One common failing is for governments to design programmes that ignore the market's dictates. Far too often governments have sought to encourage funding in industries or geographic regions where private interest simply was not there. The result has been wasted resources. Effective programmes, such as the Israeli Yozma programme, addressed this problem by demanding that private sector players provide matching funds.

A second frequently encountered problem is to ignore the realities of the venture capital process. For instance, many public venture capital initiatives have been abandoned after a few years: the programme designers have apparently not understood that these markets take many years to evolve. Others have added requirements—such as the stipulation that investee firms focus only on "pre-commercial" research—that while seemingly reasonable from a public policy perspective, run counter to the nature of the venturing process.

In other cases, reasonable programmes have been undermined by other poorly considered initiatives sponsored elsewhere by government that provide capital to seed and early stage firms at very low rates (or even at zero cost in some granting programmes), and thus distort the market and potential recipients' expectations for venture capital. In New Zealand there are a number of granting programmes that appear to be, from a grant recipient's perspective, a substitute for venture capital (note this should not be confused with government support for pre-seed stage R&D).

The venture capital funding process incorporates, quite intentionally, a rigorous screening and monitoring process of investee firms. This work is undertaken by fund managers operating in purpose-built entities (in terms of incentives, information and capabilities). The NZVIF programme has been designed carefully to dovetail into these processes. Other government support programmes have not been designed in this way, include decision-making process more distant from the market (and in some cases involving ministers), and in many cases provide capital in the form of a grant (i.e. at zero cost to the firm). These grants can be expected to displace, rather than enhance the development of a venture capital market. The essence of this issue is about the most efficient form of delivery of government support to the venture capital sector – in our view the NZVIF programme is designed appropriately for this task and should be used accordingly.

A third pitfall is the failure to design appropriate evaluative mechanisms. Ideally, programmes should undergo careful scrutiny at two levels. First, each programme should be carefully analyzed. While recognizing that any initiative will take time to bear fruit, it is important to periodically take stock as to what aspects appear to be working well and which are problematic. Second, fund managers (in the fund of fund model) or others participating in the programmes should be scrutinized. It is important to ensure that the groups benefiting from these programmes are the most promising in the industry in terms of market performance, rather than simply those most adept at garnering public funds.

A final frequent failing is to ignore the international nature of the venture capital process. Today's venture industry is global on many levels. Limited partners' capital commitments, venture capitalists' investments, and the entrepreneurial firms themselves increasingly flow across borders and continents. To attempt to build a national venture capital industry without strong global ties is a recipe for an irrelevant and unsuccessful sector.

In our view the NZVIF structure is a sound approach for delivering direct government support to the venture capital markets. It distances commercial decision-making from the political process, it requires private investors to match government funding and thereby allocates funding on the basis of market signals, and it supports the development of a market structure that private investors are participating in and can be expected to support in the future (subject of course to its performance). Thus in our view the NZVIF approach has been designed appropriately as a market catalyst and our recommendations below build on this conclusion.

There is one policy design issue and one implementation issue within the NZVIF approach that we suggest be reviewed to check these approaches are likely to best achieve the NZVIF objectives. They are:

- In terms of policy, that the level of required matching private funds, and the associated buy-out provision, be reviewed. The primary aim of this approach is to improve the risk-return profile of private investors and thereby encourage their entry into this market. The rationale for government support of this kind is strongest the earlier the stage of the investment. It is possible that fund managers may be able to raise larger amounts of private matching funds for early stage investments for each dollar of government support if the terms were different to those that currently apply. For example, the matching requirement or the buy-out terms could vary across stages of investment to reflect the greater need for support for investment in the earlier stages. There is no obvious optimal approach, but we suggest it would be useful to review these settings, and to inform that review with a survey of investors and fund managers on this issue.

- In terms of implementation, that more flexibility be given as regards the time at which a fund manager is able to raise a VIF Seed Fund. To date the NZVIF has selected VIF Seed Fund managers from rounds which are undertaken periodically. We understand a primary driver for this is to create an environment in which potential managers can be compared, and to create an event to strengthen interest in the programme. However, fund managers are likely to want to raise funds at times other than these rounds, and the round itself may concentrate demand in the investor market that makes fund raising more difficult. Now that the programme is more established and information is available on the quality of potential

managers from previous rounds, we suggest this approach be reviewed with a view to providing greater flexibility. We note this implementation issue is a matter for the NZVIF Board rather than being a government policy issue.

We recommend the government adopt the following approach in developing any further direct interventions in the venture capital market.

9.3.1 High priority initiatives

- Develop a medium term plan for the VIF Seed Fund component of the NZVIF programme. This needs to address the level of funds available to this programme over the medium term (e.g. the next 3-5 years) and the terms on which funds are to be made available (e.g. the matching rule and buy-out terms).

- Avoid the temptation to meddle in the allocation of funds through the NZVIF structure, by for example the government determining which sectors to target (as the expertise and incentives to allocate funds across sectors, and within them lies with the venture capital fund managers, not the government).

- Ensure alignment between other government support mechanisms for venturing firms and the NZVIF programme and consider shifting funds from the other programmes to the NZVIF programme. The NZVIF programme has been designed specifically for delivering government support to the venture capital market. Competing programmes that provide low (or zero) cost capital to the same potential recipient firms will undermine the NZVIF programme and the development of the venture capital market, as they do not incorporate the same commercial rigour.

- Strengthen the role of NZVIF to educate the local and international investor market on New Zealand venture capital market opportunities and consider extending this to the development of an investor partnering programme aimed at attracting local and international institutional investors to this asset class.

9.3.2 Other initiatives

- Ensure the NZVIF performance is evaluated periodically at two levels; its effectiveness as a programme overall, and the performance of the market participants involved in it.

Biotechnology sector

Purpose of case study

To consider whether the requirements of biotech suggest the need for the government to mandate sector specific venture capital funds.

Background

The biotechnology sector has attracted a lot of interest from the government and private sector, with the establishment of the biotechnology taskforce in 2002 and the recent establishment of the $100m BioPacificVentures Fund to invest exclusively in life sciences, with a focus on prevention, nutrition and agbiotech.

In this section we provide a brief overview of biotechnology in New Zealand and identify the challenges facing investors in this area, especially regarding the large capital investments required and the long lead time between initial discovery and reaching the market place. We also discuss the various positions on the government or the market determining the scope of funds and the whether sector specific funds should be mandated.

Why the interest?

As part of the Government's Growth and Innovation Framework the Government identified biotechnology as a sector worthy of special attention and direct government effort. A biotechnology taskforce was established and its aim was to agree priorities and develop action plans to stimulate growth and develop the international competitiveness of the sector.

These initiatives have been undertaken in the belief that New Zealand has particular skills in life sciences that could be better exploited and that life sciences sit at the core of some of the productive functions of New Zealand's key export industries. Thus, there is sustained capability that could be better used and in turn enhanced.

Why choose biotechnology?

The biotechnology taskforce believes that New Zealand has significant science strengths (capability, critical mass, infrastructure and international collaborations) in many areas of the biological and medical sciences relevant to biotechnology.

What is biotechnology?

Biotechnology in New Zealand is defined differently from international definitions. Biotech in the US has generally come to mean what we call human biotech.

The Taskforce definition is substantially wider. The Taskforce identified eight areas where there are opportunities to build on New Zealand's existing and emerging strengths. These are New Zealand's unique blend, large animal based technologies, plant based technologies, biomedical science and discovery, bioprocessing technologies and manufacturing, innovative foods and health, agritechnologies, medical technologies and biocontrol, biosecurity and bio-remediation.

Government funding

Up until recently most of the research funding for the biotechnology sector has come from government. The bulk of the funding for basic biotechnology research in New Zealand is sourced from the Marsden Fund, Research for Industry and New Economy Research Funds.

Stages of development

Within each of biotechnology's classifications and its respective product areas, the path to commercialisation is different and is largely dependent on the regulatory processes governing release of the product or development of the technology.

The pathway for development of biotechnology is different for each product group. For instance, the use of animal databases is considerably easier than the development of a new chemical entity for human consumption. Likewise, even within drug research, the development path for a cancer drug is different from that of a drug used in, for instance, cardiovascular care. The former generally is accepted for regulatory approval post Phase II trials, whereas a heart drug would probably need to proceed through Phase III trials, with requisite complex multicentre, double-blinded trials, and with the requisite complex support, infrastructure and cost that such a development programme entails.

At the distant end of perceived risk is pharmaceutical development. The table below provides an outline of the typical stages of development for a pharmaceutical product, the duration of each, the required investment and the probability of the drug reaching the market place[77]. It is a useful tool to identifying the challenges in investing in this part of the biotechnology sector, the large capital investment requirements and long lead-time to reaching the marketplace.

In the early stages of development, during discovery and pre-clinical tests, the cost required to undertake the necessary R&D can typically range between $3-5million and the duration between 4 to 6 years. Whilst it is not unusual for R&D to be capital and time intensive, the added problem in this sector is that this is really only the first of many regulatory hurdles facing the commercialisation of a potential product. In fact, the probability that a product/idea at the pre-clinical stage actually reaches the marketplace is low – some suggest only about 5%.

If preclinical trials are successful and the products withstand Chemical, Manufacturing and Controls (CMC) and Investigational New Drug requirements then the next development stage is clinical testing, which consists of Phase I (safety) studies, Phase II (initial efficacy) studies and Phase III (comparative efficacy) studies. At these stages the commercial viability of the product can be actively considered as a rapid increase in the probability of reaching the market place is observed. However, this is not without cost. Typically costs at this stage of development range between $10m and $30m (but may be much more) and can take anything between 6 to 9 years to complete.

Almost all research-based companies would be seeking additional capital at the time of Phase III trials. Almost all research-based companies would be seeking additional capital at the time of Phase III trials. That capital is likely to come as a package with the skills to undertake the further work to get the drug to the market.

[77] This table was sourced from the Wisconsin Technology Network's website in its report on the complexities and cost of Mid-West biotech drug development. (see http://wistechnology.com). Although cost estimates and duration are specific to an American market, these can also be considered relevant in a New Zealand context, where the drug even if discovered locally will most likely have clinical trials carried out overseas and will need to meet US FDA approval if it is to be marketed in America.

The next and final set of hurdles is CMC for New Drug Application (NDA), NDA and an FDA review. This can take anything between 2 to 5 years and an investment cost of between $5m and $10m. However, following FDA drug approval, the ability of the product to reach the marketplace is guaranteed from a regulatory perspective, and the success of the drug will depend on its efficacy, its pricing, whether it is truly innovative or a "me-too" and the success of its marketing and sales distribution teams.

Thus the life cycle of a pharmaceutical product is long; it can take between 12 and 22 years from the discovery of a product to the point that it can actually be used by consumers if Phase III trials are needed. This process can cost anything between $20m to $50m for many products, and for some pharmaceutical drugs it can be up to five to ten times this amount[78].

Where the cost and risk of this investment falls is more open to question. A lot of research investment is carried out with public money or through universities internationally. Increasing, pharmaceutical companies will identify likely development teams and co-invest, or purchase the rights to drugs in latter stages, with the development risk largely been carried by the researchers and their sponsors. The latter stage investments are risky but are much less risky than the initial discovery processes.

In contrast to pharmaceutical developments, medical devices do not face such steep regulatory hurdles. A device can be brought to market reasonably quickly. And Agbiotech faces other challenges. For instance, the Hazardous Substances and New Organisms Act 1996 is likely to have more impact than US Food and Drug Agency regulations.

Investing along the R&D and development spectrum

Based on the life cycle described above, it is clear that the risk profile for the investor and cash requirements for the investment shift dramatically during the development of the product. This is illustrated on the next page.[79]

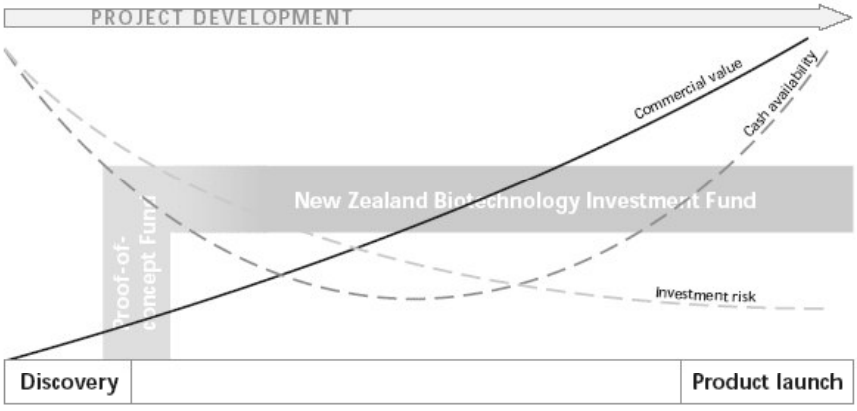


Figure 3 – Risk Profile R&D to Commercialisation

Should the Government support sector specific funds?

[78] The report by the Wisconsin Technology Network makes reference to some estimates by Big Pharma companies of costs between $800 and $900m to develop a successful drug.

[79] This table was taken from the Biotechnology taskforce report (2003) titled: Growing the biotechnology sector in New Zealand: A framework for action.

There is considerable pressure for sector specific funds. The general argument is that Our view on this point is two-fold. First, we believe that government is ill-advised to mandate the scope of funds as these decisions need to reflect market realities from which the government is isolated. These decisions are much better left to fund managers who operate in purpose-built entities (in terms of information, capabilities and incentives) for making these decisions and managing the attendant risks. Secondly, the risks of technology development are equal in other areas. For example, HTS-110 has had a 20-year development path. In a way, the regulated nature of pharmaceutical development helps relieve risk as the procedures, standards and returns are relatively clear. Any policy intervention needs to be indifferent to the source of the innovation but pay particular heed to what general level of activity is being sponsored.

In our view, investment opportunities need to stand and fall on their own merits and venture fund specialisation in biotech (or in other areas) is best developed according to market dictates rather than government mandates.

10 Tax and regulatory settings

In recent years New Zealand's tax and regulatory environment has been viewed by some market participants as having features that impede the development of venture capital markets, and in particular with respect to attracting international investors. For example, the NZVIF Statement of Intent 1 July 2004 – 30 June 2009 states (page 10) that, "…until best practice Limited Partnership Legislation is in place, together with transparent tax treatment, New Zealand will struggle to attract even the smallest amount of international investor interest."

The Government has announced recently a number of intended changes to tax and regulatory settings related to the venture capital markets. Changes have also been made in certain areas. In this section we describe recent and intended changes and also the tax issues raised by interviewees. We cover the following issues:

- Limited partnerships
- Capital/revenue account distinction for income tax
- Sale of shares from off-shore investor perspective
- Retention of R&D tax deductions through ownership change
- Trans-Tasman tax arrangements
- NZ/US double tax agreement
- Tax on sale of patents
- GST on fund manager services
- Employee share option schemes

Many of the above issues relate to the effective taxation of capital gains (while recognising New Zealand does not have a formal capital gains taxation regime). This issue is of particular importance in the venture capital context as studies have documented that the attractiveness of entrepreneurial activity is very sensitive to the differential between the effective tax rates on capital gains and ordinary income.

10.1 Limited partnership

New Zealand legislation does not currently provide for the limited partnership structures used widely in other venture capital markets, for example in the US, Singapore and Israel. Key features of these limited partnerships are: [80]

[80] See for more detail the Government's discussion document to reform special partnerships, Part II Partnership Act 1908, released in December 2003

- *Liability status of partners.* In the limited partnership the partnership comprises of general and limited partners. The general partners are liable for the debts and obligations of the limited partnership, while the extent of liability for limited partners is restricted to the amount of their capital commitments.

- *Separate legal entity.* In a limited partnership the entity is not viewed for tax purposes as a separate legal entity Rather investments are taxed according to the tax status of the limited partners.

- *Tax flow through.* The consequence of not having a separate legal entity is that it permits tax flow through. This is advantageous to the limited partner as he or she may be able to avoid double taxation, or creates the ability to off-set tax payments if the limited partner has tax exempt status in his or her home jurisdiction.

- *Ring fencing of losses against other income.* In limited partnerships, the limited partner can offset tax losses against its other income. This is particularly desirable from an investor's perspective in venture capital funds as losses often accumulate in the early years of a fund.

The Government has recognised the desirability of instituting limited partnerships and in late 2003 issued a discussion document titled "Limited partnerships in New Zealand: A proposal to reform special partnerships". Subsequently legislative changes have been made to allow partners in special partnerships to offset tax losses against other income. [81]

In April 2005 Cabinet approved the introduction of a new limited partnership regime to New Zealand. Features of this regime are to include flow-through tax status, limited liability for investing partners, separate legal entity status and 'safe harbour provisions' which will allow limited partners to participate in management in certain prescribed circumstances. The Bill is currently being drafted. The design detail of the tax treatment is still being worked through and the IRD intends to issue a discussion document on the taxation of partnerships later this year. The Government plans to introduce the Bill to the House in 2006.

10.2 Capital/revenue account distinction for income tax

In New Zealand there is no formal capital gains tax. Gains derived from the realisation of investments are divided into two classes for income tax purposes– those on 'revenue' account and those on 'capital' account. Realised gains on 'revenue' account are taxed (e.g. gains from shares bought and sold by a trader in shares) while those on 'capital' account are not (e.g. gains from the sale of shares which were not purchased with the intention of resale). This distinction can have considerable impact on post-tax returns and therefore on investors' decision-making across a wide range of investments, was covered in the Stobo Report released in October 2004, and is currently the subject of a discussion paper as it relates to collective investment vehicles. [82]

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[81] This was enacted by way of the Taxation (Annual Rates, Venture Capital and Miscellaneous Provisions) Act 2004.

[82] The discussion document was titled "Taxation of investment income: The treatment of collective investment vehicles and offshore portfolio investments in shares".

In the case of New Zealand venture capital funds the manner in which the revenue/capital distinction is determined can have the effect, from the perspective of investors, of disadvantaging for tax purposes this asset class relative to other investments. This is due to the typical cycle of venture capital investing. Most venture capital funds intend to sell their interests in investee firms at some point and this intention can give rise to any gains on sale being classified for tax purposes as being on revenue account. At the least the current settings give rise to significant uncertainty as to the appropriate tax treatment for venture capital investments.

The key issue to address is that the manner in which the revenue/capital distinction is formulated does not have the effect of disadvantaging this asset class relative to other similar investments. It is also important to emphasise the need for legal clarity and the benefits from international consistency.

10.3 Sale of shares from off-shore investor perspective

We understand some off-shore investors have been of the view that a technical risk exists that any gains on the sale of shares of unlisted New Zealand investee companies could be taxable to the non-resident investor.

The Government has responded to this issue by amending the law to provide an exemption for such tax, subject to a number of conditions related to the investor and the investee firm. These changes were included in the Taxation (Annual Rates, Venture Capital and Miscellaneous Provisions) Act 2004.

The Government has also announced changes that would provide an exemption for foreign investors investing alongside the New Zealand Venture Investment Fund Limited. These changes are included in the Taxation (Depreciation, Payment Dates, Alignment, FBT and Miscellaneous Provisions) Bill 2005.

10.4 Retention of R&D tax deductions through ownership change

Taxpayers are able to deduct certain R&D expenditures for tax purposes, but there are restrictions on the extent to which tax losses (arising from R&D expenditure or otherwise) may be carried forward to future tax periods. In particular a company can carry forward its tax losses only where the tax benefit arising from the offset is obtained by at least 49% of the natural person shareholders who originally bore the loss (referred to as the shareholder continuity rule).

Technology companies, in particular, often have a long lead-in period in which they incur major expenditure before realising income from it, but under current law they can loose R&D tax deductions if they bring in new shareholders after their initial development stage, but prior to accessing their tax losses.

The 2003 reports completed by the Biotechnology and ICT taskforces reported these current tax rules as a barrier to the growth of the technology sector in New Zealand, and both taskforces recommended a relaxation of the current loss carry-forward rules.[83]

The Government has responded by introducing a Bill[84] that would enable companies to allocate certain R&D expenditure to future tax years even though there may be changes to shareholding in the intervening periods that breach the shareholder continuity rules. The changes would better suit the growth cycle of technology companies and remove a current barrier to R&D investment for some firms by enabling them to access their tax deductions for R&D expenditure subsequent to bringing in new equity investors. The amendments would apply from the 2005-06 income year.

10.5 Trans-Tasman tax arrangements

Australian and New Zealand tax regimes operate an imputation system which results in dividend streams being taxed only once, where the investor and the firm are domiciled in the same country.

Prior to 2002 Trans-Tasman 'triangular investment' (where an Australian or New Zealand investor invested in a company operating in their own country but resident in the other jurisdiction) was unable to access imputation credits (e.g. Australian shareholders of a New Zealand company operating in Australia were unable to access Australian franking credits).

In 2003 legislation was passed[85] to reduce double taxation of certain trans-Tasman investments. The changes permit companies to choose to allocate imputation credits representing New Zealand tax paid and franking credits representing Australian tax paid, in proportion to their ownership of the company. However the credits pertaining to each country can only be claimed by its residents.

Technically this initiative arose through amendments to permit Australian companies to join New Zealand's imputation credit rules. Additionally, amendments were included to permit a new form of grouping for imputation purposes only, which Australian companies can join. This mitigates the problem that imputation credits cannot be passed through intermediate companies that are resident in neither Australia nor New Zealand.[86]

This triangular tax reform provides some relief to Australian and New Zealand investors from the residence taxation imposed on income that has already been taxed at source by their home governments. It removes some, but not all of the impediments of Trans-Tasman business from a tax perspective and to end should improve the flow of capital (venture capital and other forms) across the Tasman.

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[83] See page 56 of the Taxation (Depreciation, Payment Dates, Alignment, FBT and Miscellaneous Provisions) Bill: Commentary on the Bill.
[84] The Taxation (Depreciation, Payment Dates Alignment, FBT, and Miscellaneous Provisions) Bill 2005
[85] The Taxation (GST, Trans-Tasman Imputation and Miscellaneous Provisions) Act 2003
[86] See the explanatory note of the Taxation (GST, Trans-Tasman Imputation and Miscellaneous Provisions) Bill 2003

The Australian and New Zealand Government are currently reviewing further their 1995 Double Tax Agreement, and in particular whether changes should be made by amending the agreement or as part of a comprehensive re-negotiation.[87]

10.6 NZ/US double tax agreement

In 1982 a double tax agreement (under the Convention between the United States and New Zealand for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with respect to Taxes on Income) was signed between the United States and New Zealand. Under this agreement non-residents who invested via certain "fiscally transparent entities" were eligible for the reduced non-resident withholding tax rates.

However, over the last few years US investors have raised concerns that a strict interpretation of the double tax agreement would exclude certain types of commercial entities that have become common in the US. Confusion arose over the treatment of income derived from an entity that was situated and treated as fiscally transparent in one jurisdiction but not treated as fiscally transparent in the other jurisdiction. Consequently some fiscally transparent entities based in the US that invest into New Zealand would not be eligible for the reduced non-resident withholding tax rates, to which the US investors would otherwise be entitled to.

In February 2005 the United States and New Zealand entered into a mutual agreement to clarify the entitlement of members of certain fiscally transparent entities. The effect of the new agreement is that if United States investors invest through US fiscally transparent entities in New Zealand, the investor would still be afforded the benefits of the treaty even if domestic law in New Zealand did not treat the entity as fiscally transparent. The Inland Revenue Department believes that these changes should attract more United States investment, especially in the area of venture capital.[88]

10.7 Tax on sale of patents

This issue relates to the tax implications associated with the sale of patents (and other intellectual property). We understand that profits derived on the sale of patents attracts income tax, whereas the sale of other capital assets or the sale of shares (see discussion above on this) normally does not.

This issue is of particular importance where the venture capitalist has funded the development of a patent and possibly the early stages of commercialising product from that patent, and the most attractive exit path is to sell the patent, or the company (which may be unattractive from a legal risk perspective) to an international corporate with the appropriate channels to market. Differing tax treatment across the various forms that such a transaction could take (e.g. the sale of the patent or the sale of shares) can be expected to create inefficiencies.

The Government has announced it intends to introduce a tax change that would allow companies to spread their tax liability on patent sales over three years, rather than having

[87] See the media statement released by Hon Michael Cullen on 08 June 2005.
[88] This comment was made by Robin Oliver, Inland Revenue's Deputy Commissioner, Policy (see www.taxpolicy.ird.govt.nz).

to pay it all in the year of sale.[89] It is intended this change would apply from 1 April 2007. While this measure would go some way to reducing the difference in tax treatment of the sale of patents relative to other capital assets, it appears not to address the issue fully.

10.8 GST and venture capital funds

From 1 January 2005 the supply of financial services in New Zealand by a GST-registered person to another GST registered person may be zero-rated.[90] The changes integrate the supply of financial services more fully into the GST system by taxing supplies of financial services at the rate of zero percent and allowing financial services providers to deduct input tax in respect of those supplies. This is in contrast to the previous "exempt" treatment of financial services whereby GST was not charged and financial services providers could not deduct input tax for GST paid on goods and services used in supplying financial services.

Fund managers are generally considered to have a taxable activity for GST purposes and GST applies to the management fees charged by managers for overseeing investment funds (and these management services are not likely to be considered "financial services" for the purposes of the GST Act and therefore are not zero-rated). Under current definitions equity investment funds themselves are not considered to have a GST taxable activity as they are not considered to be making supplies of goods and services for consideration (which is one requirement for a taxable activity). As a consequence, equity investment funds are unable to deduct GST paid on management fees charged by fund managers.

We understand officials are currently reviewing the GST treatment of equity investment funds and whether the zero-rating rules should be extended to such activities .[91]

10.9 Employee share option schemes

Internationally, employee share option schemes are often used by start-up firms to reduce their cash outlays in the early stages of development and to align employee incentives with the interests of shareholders. We understand in the New Zealand context the provisions of the Securities Act as regards the issuing of securities (e.g. the issuing of an investment statement and prospectus, or obtaining an exemption from doing so) can make the cost of issuing share options to employees prohibitive. We suggest Government explore ways of reducing these costs with a view to ensuring that this form of remuneration is straightforward for small firms to implement.

10.10 Summary

Market participants and commentators have raised a number of tax and regulatory issues that appear to impede the development of New Zealand's venture capital market.

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[89] Press release by the Minister of Finance, 2 August 2005, at http://www.taxpolicy.ird.govt.nz/index.php?view=387

[90] Subject to certain legislative criteria. See the Taxation (GST, Trans-Tasman Imputation and Miscellaneous Provisions) Act 2003 and Taxation (GST, Trans-Tasman Imputation and Miscellaneous Provisions) Commencement Order 2004.

[91] For a discussion of these issues see the discussion paper issued by the Minister of Finance in 2002, "GST and Financial Services".

Government has responded over recent years to address a number of these issues, or has announced an intention to do so. While most issues appear to have been identified, the detail as to how they are addressed will be important, and we recommend Government check this detail with suitably qualified market participants and the NZVCA.

11 Information on New Zealand's venture capital market

Information on venture capital markets is difficult to gather from regulated, public sources. Unlike mutual funds and listed entities, venture capitalists in the US and many other nations are generally exempt from disclosures under security laws and are not required to reveal their investments or organizational details in public filings. This is also the case in New Zealand.

Thus, the primary sources of information in early research on venture capital have been the companies in which the funds invest. For the subset of venture-backed firms that eventually go public, information is available in IPO prospectuses and related filings. Investments in firms that do not go public are more difficult to uncover, since these investments are usually not publicized.

The relative performance of venture capital funds is an important issue for investors. Venture capitalists typically raise funds every few years. Limited partners (e.g. wealthy individuals, endowments, and institutional investors) provide the bulk of the capital. An investment in a venture fund is almost always for at least a ten-year period, and funds may only be withdrawn under extreme circumstances. Prior to making such commitments potential investors scrutinize the performance of venture fund manager's past funds. While fund managers present historical performance data in their offering documents, the methodology of these calculations is frequently idiosyncratic. Furthermore, because the IPO market is so variable, potential investors usually look for measures of relative, rather than absolute performance.

To fill this paucity of information on the performance of venture capital markets, information providers have emerged in most venture capital markets who have established methodologies for collecting and presenting information on the performance of the market, and who have won the confidence of market participants to provide the necessary (and often commercially sensitive) information.

In this section we identify and discuss the sources of New Zealand venture capital information, some of the difficulties we encountered in this study with that information, and suggested ways to improve this information going forward.

11.1 Information on NZ venture capital markets

The two main sources we used for information on New Zealand's venture capital market information was Private Equity Media (which provides the database for the Australian Venture Capital Journal) for periods 1994 to 2002, and the New Zealand Venture Capital Monitor (VC Monitor) series of 2002, 2003 and 2004. The Asian Venture Capital Journal Yearbook covers New Zealand but we found that information added little to the other two sources (as it is aggregated with private equity). All sources rely on market participants responding voluntarily to surveys, or on market intelligence.

Statistics New Zealand undertook a Business Finance Survey: 2004,[92] which was sponsored by the Ministry of Economic Development, with the aim of gathering information on the capital structures of businesses in New Zealand, the sources of finance they use and their recent financing experiences. This was the first time this survey was undertaken. While it provides much useful information on the financing of firms in general, the survey was not focused on the venture capital component of financing and provided little information in this area. We note that the Australian Bureau of Statistics[93] has undertaken surveys of the venture capital sector and this may be an area Statistics New Zealand could develop further in the future.

We found it took considerable effort to gather the New Zealand information and assemble it in a way similar to that used in other jurisdictions for comparative purposes (as in chapter 7). These comparisons were not readily available.

The advantage of the material from Private Equity Media is that its series commenced considerably earlier than the VC Monitor. However, this database from 2002 onward is significantly incomplete by comparison with the VC Monitor and it appears many New Zealand respondents have no longer completed the Private Equity Media surveys subsequent to the establishment of the VC Monitor.

The VC Monitor was an initiative of the New Zealand Venture Capital Association (NZVSA) and Ernst & Young. Its inaugural publication, the NZ Venture Capital Monitor 2002, was launched in 2003 with the following stated objectives:[94]

"This and future surveys will enable us to

- *Create accurate information on the size and structure of the venture capital and private equity industry in New Zealand;*
- *Facilitate analysis of industry trends and portfolio returns over time;*
- *Better quantify the impact of the industry on the New Zealand economy; and*
- *Assist generally in developing the venture capital and private equity industry in New Zealand."*

To meet these objectives this information would need to be made available, and be presented in a way that enables analysis of the sector and its performance. This information is provided to a limited extent in the VC Monitor. However, when we requested access to this information to undertake analyses as per the above objectives we were faced with the prospect of being charged a very high fee. In further discussions it became apparent that the ownership of the information and protocols for accessing it were not agreed as between the NZVCA and the service provider, Ernst & Young, and that access to this information for the purposes of analysis was in effect not possible.

If this database is to emerge as the trusted point of reference for the New Zealand venture capital markets, protocols as to its ownership, the methodologies used to gather, assemble

[92] Statistics New Zealand, "Business Finance Survey: 2004", 2 May 2005
[93] Australian Bureau of Statistics, "Venture Capital, 2003-04", 5678.0, 26 November 2004
[94] See page 3 of "*The NZ Venture Capital Monitor 2002*"

and present it, and the manner and extent to which interested parties can access it will need to be clarified.

11.2 Approaches in other markets

Information on the US venture capital markets, and on the British and European markets, are well developed and provide useful examples as to how the New Zealand information could be improved, and in a way that would provide ready comparison with these markets.

Venture Economics (which is a unit of Thomson Securities Data Company)[95] collects extensive information on the US markets through primarily the joint PricewaterhouseCoopers/Thomson Venture Economics/National Venture Capital Association MoneyTree™ Survey. This information is analysed through the Thomson Venture Economics' VentureXpert™, which has been endorsed by the National Venture Capital Association (NVCA) as the official US venture activity database.

The Venture Economics' VentureXpert™ includes (amongst other things) the dates of venture financings, the investors in each round, and the amount of funds disbursed. It includes firms that did and did not go public. While the database was begun in 1977, the firm subsequently encoded its earlier records on venture financing dating back to the early 1960s. The NVCA publishes a detailed Yearbook based on the Venture Economics data.

This Yearbook is underpinned by an extensive database maintained by Venture Economics and from which detailed reports are available for a fee, as is access for use of a range of analytical tools. This includes, for example, reports and analysis of the performance of individual fund managers, investee firms, and investors.

Venture Economics has gradually expanded its international coverage, beginning with Europe. In recent years it has begun gathering information on transactions in Asia and the Pacific region as well. For example, in the case of New Zealand it lists in its database approximately one hundred venture capital or private equity backed firms with details on the firm, its financing rounds and its investors.

11.2.1 EVCA Yearbook example

The EVCA Yearbook provides a good example of the compilation and comparison of venture capital and private equity market data across a number of countries. This and similar publications report on private equity as a whole, with venture capital being identifiable in terms of the stage of investment that is undertaken. We have annexed an example of one country (the UK) from the 2004 EVCA 2004 Yearbook for illustrative purposes. Each country section includes:

- A description of the activity in the country for the year, sources of capital, investment patterns, the legal and fiscal environment and exiting activity.

[95] Venture Economics was originally know as Capital Publishing and was established in 1961 to report on the SBIC programme.

- A summary of the type of investors that have invested into private equity funds and the distribution of investments by stage undertaken in the year.

- Data on funds raised (in the current and previous year) in terms of type of fund, type of investor, geographical breakdown of source, and expected allocation of the funds raised in terms of stage investment.

- Data on investments by private equity funds that include investor type, stage of investments, extent of syndication, their geographical distribution and sector distribution.

- Data on divestments in terms of type of transaction.

- Data on the overall private equity portfolio at cost, geographical flows of private equity, and macro economic indicators.

Most of the above measures are also summarised in a Europe-wide summary, along with descriptive comment.

In addition, many of the national venture capital associations publish their own yearbooks.

11.3 Improving information on the NZ venture capital market

Information on the performance of the venture capital market is a key infrastructure component of other venture capital and private equity markets. The general model for gathering, managing and providing access to this information is a combination of a club approach (by way of venture capital associations), and professional information management firms (e.g. Venture Economics) that charge for information products.

The NZVCA has made an important and useful start to fill this information gap. Significant further investment is required to establish this information base as an authorative source for the sector, and to ensure it can be readily interpreted by international investors. The Government has an interest in ensuring sufficient of this information is in place in order to be able to evaluate the performance of the NZVIF programme in the future.

Over the medium term we expect this information source should be able to become self-sustaining through a combination of "club" support from the NZVCA and the development of saleable products from the database, as is the case elsewhere. In the short term, however, given the critical role this information plays in the development of the venture capital market and in supporting the NZVIF programme, we recommend the Government support its development financially. If it chooses to do so, we suggest it should take the following approach:

- Ensure the information is gathered, analysed and presented in a manner that makes sense from the perspective of market participants, including potential international investors. A New Zealand idiosyncratic database is unlikely to be of much use. Thus we suggest government (or the NZVIF), in collaboration with the NZVCA, explore ways to establish internationally recognised methodologies for collecting, analysing and presenting this information. This may be best achieved by linking with one of the established international information providers, and

exploring whether this could be undertaken along with the Australian venture capital market (as international investors are likely to associate the two markets).

- Ensure the ownership of the data is clear, and that processes are in place to provide orderly governance (including input from market participants) of any changes to the information collected, how it is presented, and its accessibility. Generating a good quality database will not be a small task and most probably will, in practice, develop in stages (with the VC Monitor as the first step). Securing the confidence of market participants will be critical to its success as we anticipate the provision of this information will remain voluntary.

- Ensure information is gathered across those market dimensions we suggest for the evaluation of the NZVIF in the future (see chapter 12). This includes information on the overall venture capital market (as well as on the subset of government sponsored programmes) to enable evaluation of the government programme relative to wider market performance.

We note the development of an information base on the New Zealand venture capital markets is complementary but different from the role we suggest in chapter 9 for the NZVIF of investor education and the possible development of investor partnering programmes. The development of an information base would be an ongoing role to ensure the market is and remains well informed, whereas the NZVIF role would be focused on attracting investors to this market in its early stages of development.

12 Future evaluation of VIF

One of the outputs of this study is to identify best practice in evaluating (interim and ex-post) programmes similar to the NZVIF and to suggest how this could be applied to the evaluation of the NZVIF in the future. A related output is to describe the key features of a well-functioning venture capital markets appropriate to the future needs of New Zealand. This section covers both of these topics.

12.1 Identify the key policy objectives

The starting point for any evaluation of a government programme is the goals that it was designed to achieve. The goals of the NZ VIF are:

- To accelerate development of the venture capital industry by increasing the level of early stage investment activity in the New Zealand market;
- To develop a larger pool of people in New Zealand's venture capital market with skills and expertise in seed and start-up investment;
- To facilitate commercialisation of innovations from the Crown Research Institutes (CRIs), Universities and the private sector; and
- To get more New Zealand businesses on paths to global success by increasing their access to international experts, networks and market knowledge.

The primary policy objective overriding these goals is to establish a self-sustaining venture capital market. Thus, an evaluation needs to assess whether a self-sustaining venture capital market has been established, with secondary analysis focusing on the role of NZVIF in the establishment of that market. The former is the most crucial from an economic perspective – NZVIF could perform on all points of the compass but a self-sustaining market may not be achieved for other reasons, for example due to the small size of New Zealand's economy.

The acid test of NZVIF is whether it can make itself either irrelevant by catalysing a venture capital market which overtakes it or, as with Yozma programme, convert itself into a sustainable fund of funds manager which is independent of government support.

12.2 Substantial methodological issues

There are a set of major methodological issues that are associated with the assessment of the primary policy objective, including:

- Lack of independence of the policy objective – sustainability of a venture capital market is, in part, dependent on the sustainability of the New Zealand's overall innovation and growth system. On the one hand, there is a systematic issue, namely the lack of economies of scale, which will feature in the assessment of most of New Zealand's economic activities. In this instance, the success of the venture capital market is also crucially dependant on the ability of New Zealand's science and technology infrastructure to perform in terms of the development of innovative ideas and the transfer and commercialisation of those ideas.

- Lack of an easily identified counterfactual and therefore inability to identify the marginal impact of the programme. A crucial issue in public policy evaluation is the question of what would otherwise have happened, i.e. what is the alternative state of the world if there were not this intervention. At one level, in this instance, the question is simplistic, as there has been very little venture capital activity in New Zealand. But, on the other hand, there is a subtler question of what activity has been displaced, or what alternative activity (such as in the angel investor market) could otherwise have happened.

- Lack of ability to value the outcomes fully – the outcomes are only partially about the direct success of the programme. However, the reason for Government intervention is to further support the wider goals of innovation and growth. The indirect benefits, such as greater incentive for commercialisation, and consequently of greater incentive for knowledge development, and of consequent spill over effects, is very difficult to identify and value.

- Lack of a developed model of the indicators of success – there is much in the literature that leads to development of possible criteria for assessment but there is little in the literature that is definitive in terms of the macroeconomic criteria for success. Rather, there is a list of "what we would expect to see" or annotations for what is good practice.

- The circumstance of external economic factors – the country studies reveal that good policy design is essential but not sufficient. Markets are fickle and those countries that have run foul of, for instance, the technology bust of the early 2000s would find they face the collapse of venture capital funds whether or not policy was appropriate.

- Timeframe for analysis – there is no clear point where a venture capital market becomes sustainable. We note that this report specifically excluded an evaluation of NZVIF as it is too early to consider. In its early stages a programme is likely to influence primarily qualitative factors that are not readily measurable (e.g. building capability, improving information flows, creating market conventions) which over time, it is hoped, will convert into quantifiable market performance measures (e.g. amount of capital raised, amount invested, and the performance of funds).

- Aversion to commercial failure - a number of the VIF Seed Funds can be expected to fail, or in other words, not provide a positive return to their investors including the Crown. Additionally, some of the companies they invest will fail, possibly in a very public way. Policy environments are adverse to failure and, despite there being general assent to the idea that failure will occur, evaluation of the intervention could be triggered prematurely by lack of policy or political resilience.

The approach and method suggested below aims to take account of these issues as far as possible.

12.3 Approach and method

We propose a pragmatic, public management approach to evaluation of NZVIF, namely a two-stage process of:

- Evaluation of the primary policy objective – namely a capital markets oriented review of whether or not the venture capital market is sustainable. In public sector management parlance this is a review of outcomes.

- Evaluation of the programme – namely a review of the outputs of NZVIF from a quality, quantity and process perspective. In public sector management parlance this is a review of outputs.

In terms of weighting of effort, the former is the most important. The governance of NZVIF, and ongoing monitoring by departments, should largely attend to the latter.

We counsel against a "scorecard" approach to evaluation. There is little in the literature to support the weighting of criteria and, although appealing in a presentational sense, it suggests fallacious precision. Either the weightings will be incorrect, or the variables will not be independent, or the model itself may be susceptible to external shocks. However, we include the NZVIF scorecard below as a useful example of how to identify some of the dimensions of a sustainable market.

12.3.1 The NZVIF scorecard approach as an example

To assess the state of development of the New Zealand venture capital industry, NZVIF developed a scorecard (shown below).

The scorecard provides indicators for each of the key success factors and assesses the level of progress made so far. A score out of 5 was given for the progress made within each factor. This can be seen in the last column of the table. All scores were added to give a total out of 25. The individual scores and total shown in the table were those given by NZVIF in its evaluation of the NZ market as at 2003/04.[96]

Based on NZVIF's evaluation, the market still has some way to go before it can stand on its own. The scorecard suggests ongoing industry development, the right regulatory settings and government investment support are needed to continue to develop and sustain VC industry growth, and ensure medium-term viability of the industry.

[96] The scorecard was extracted from the NZVIF 2003/04 Progress and Achievement Report.

Success Factor	Indicators	Assessment of Progress	Score[97]
VC Skills	• A core of 3-4 VC managers who have successfully raised 2nd and 3rd vintage funds of scale and have established a track record of investment performance. • Evidence of successful high profile exits by 3-4 VC managers. • Funds reaching end of agreed life and distributing assets to investors • Range of funds active in the market at any one time, spanning the full spectrum of VC/PE. • Evidence of international VC activity in NZ through a number of co-investments or partnerships.	• Two VC fund managers have raised their second fund. Very limited evidence of exits and investment track record, particularly for early stage investments. Direct Capital has an established private equity track record. • There are a number of late stage non-technology, private equity funds operating in NZ. • One VC/private equity fund (Greenstone) has reached its 10-year milestone. Direct Capital has established track record for later stage. • Very limited range of VC/PE offerings available – dominated by late stage, non-technology funds. • To date only one or two international VC's actively participating in NZ based deals, eg Advent International, GBS Ventures (both with VIF Seed Funds).	**2/5**
Capital	• Evidence of investment allocations made by pension funds, private institutional investors, private equity/VC funds of funds, both locally and internationally. • Recognition of VC/PE as an asset class by local institutional investors and advisors. • VC industry as a % of GDP comparable to other relevant OECD countries. For example Australia.	• Limited institutional investment interest– primarily community trusts & ACC from onshore. Offshore institutional interest is from Government backed funds, eg. TIF. As yet no pension fund or fund of fund participation either local or international. • More awareness from local pension funds of opportunity, but it is likely that investment allocations, when made, will be to later stage private equity with the majority invested offshore. • NZ VC industry is currently .08 % of GDP compared with .32% for Australia.	**1/5**
Deal Flow	• Evidence of a consistent "pipeline" of quality deal flow from Uni's, CRI's & incubators. • A critical mass of entrepreneurs, founders, IP developers who have had successful partnerships with NZ VCs and can assist other entrepreneurs.	• Some recent evidence of Uni and CRI deals being funded by VCs – Ectus, HTS-110, Xegen, Proacta – all through VIF Seed Funds. • Evidence of increased activity at pre-seed & seed level to promote investment ready deals.	**2/5**
Regulatory Environment	• Standard VC partnership structures in place. • Clarity of tax treatment of capital gains and free carry. • Competitive tax treatment for tax-exempt investors. • R&D tax concessions. • Enabling.	• The NZ regulatory environment is not currently conducive in attracting either local or offshore institutional investors to the NZ VC industry. • There are indications of Government intention to address this issue. Progress is slow. • Initiatives for mutual recognition with Australia not yet being progressed.	**3/5**
VC Industry	Established, effective VC Association including: 1. Active lobbying on behalf of industry. 2. Promoting the asset class and collating performance data,	• VC association established and actively engaging with Government on key blockages. • Inaugural survey of VC/PE industry undertaken, but not clear if resource is available to continue. • VC association is not yet self-funding and	**3/5**

[97] The score is an assessment of **actual progress**, compared with **expected progress** at the time (2003/04), against the **medium term goal**.

	3. Developing best practice industry standards. 4. Self-funding through membership and sponsorship, with paid executive director. • Historical data on investment activity and performance, at aggregated level, over 5-10 year time period. • Role of VC well understood in market.	is struggling to survive • As yet has not exhibited strong leadership on best practise. • As yet no data available on investment performance at aggregate level. • Market understanding of VC is poor	
TOTAL			**11/25**

12.4 Evaluation of whether the market is sustainable

This NZVIF scorecard identifies several key factors required to achieve a sustainable venture capital sector, namely:

- Venture capital skills, including the capability of the venture capital managers to deliver, both in experience, technological and financial skills, and in terms of relevant networks.

- Capital, the ability to attract and support fund development and the capital needs of growing investee companies, as well as support for new opportunities. This in turn requires fund manager to be able to demonstrate track record.

- Deal flow, recognising that venture capital acts as a path to commercialisation of new businesses in competition with other pathways.

- Regulatory environment, the hygiene factors that allow the NZ venture capital market to operate internationally.

- Venture capital industry infrastructure, the ability of the venture capital industry to support itself.

Other factors that we have identified include the need for:

- Integration into the international markets and the ability to attract regular investments from international investors (as evidenced, for example, by the presence of international limited partners in local venture capital funds and frequent syndication of transactions with off-shore funds).

- Local and institutional investors as investors in venture capital funds.

- Whether funds managers have the capability and experience to undertake the critical tasks of the venture capitalist.

- Sufficient scale to provide investee firms with a reliable source of capital.

- An established reputation amongst emerging firms such that venture capital is a source of funding they consider as a matter of course.

- An active pool of informal investors, some of which are former entrepreneurs or venture capitalists (that is the market enjoys the confidence of those with extensive experience in it).

- Numerous exits via trade sales and IPOs in international markets (i.e. it has demonstrated the ability to produce internationally attractive firms).

- A strong venture capital association that nurtures the local venture capital eco-system, including the provision of high quality and accessible information on the sector relevant to attracting continued investment.

An evaluation would need to span these topics. We cover some of the methodological issues that are likely to arise in doing so.

12.4.1 Addressing methodology issues

Identifying the marginal impact of the NZ VIF programme

One desirable way to evaluate the impact of a government programme on a market is to identify market participants that are not part of the government programme and use the performance of that group as the benchmark (or control group) against which the performance of the participants that are part of the programme is compared.

A example of this approach is the study undertaken by Lerner[98] of the long-run effects of the US federal government programme, Small Business Innovation Research (SBIR). The SBIR prior to the study had issued around $7 billion in grants to firms over a 14-year period (1983 – 97). In this study Lerner compared the performance of firms (in terms of revenue and employee growth and their ability to attract venture financing) that received SBIR support with a group of similar firms that did not. In this way the study was able to isolate the impact of the SBIR programme on firms from many of the other variables that were influencing firm performance over that period.

Jaffe[99] develops this approach to evaluation further in relation to evaluating public research support programmes. He suggests, for example, that one way to address the selection bias inherent in most programmes (that is the programme selects the high performers and thus their subsequent performance above the average is not necessarily a reflection of the impact of the programme) would be to award grants randomly to a group of potential awardees, and use the non-awardees of this group as the control.

While awarding NZVIF support to VIF Seed Funds in a random manner is impractical, it may be possible to go some way to creating a control group for the NZ VIF programme. This could operate at the Fund level and in relation to investee firms:

- At the Fund level, information could be collected on all venture capital funds, in a manner that enabled comparison with the performance of those funds relative to the VIF Seed Funds.

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[98] Lerner, J. (1999), *"The government as venture capitalist: The long-run impact of the SBIR program."* Journal of Business 72:285-318.
[99] Jaffe, A.B. (2002), *"Building program evaluation into the design of public research support programs,"* Oxford Review of Economic Policy, vol. 18, pp. 22-34.

- At the investee firm level, information could similarly be collected on all investee firms and the performance of those funded by the VIF Seed Funds could be compared through time with those funded by other venture capitalists.

In the New Zealand context the small number of venture capital participants is likely to limit the effectiveness of this approach, at least over the next few years. Thus it may be desirable to incorporate information from participants in other markets, but this brings with it potential distortions in the evaluation arising from differences in the economies. However on balance a wider set of comparators is likely to be useful.

In order to implement this approach the key issue is to collect data in a manner that enables ready and reliable comparison. In our view the best way in practice to achieve this would be to align the data collection instruments (usually undertaken by survey) and methodologies for analysing and presenting the data with those used by one of the established international data providers (e.g. Venture Economics approach in relation to the European Venture Capital Association) that have extensive experience in managing this information and have large and long-duration databases on potential comparator firms and funds.

In a nutshell, in order to evaluate the NZVIF programme effectively, we suggest the government look to ensure performance information is being gathered, analysed and presented on the whole of the New Zealand venture capital market (and on matching non-venture backed firms), and in a manner that is consistent with the approach taken by providers of that same information in other venture capital markets that could be used as comparators. We outline this approach to improving information on the New Zealand markets in chapter 11.

Time period for evaluation

We have emphasised elsewhere in this study that venture capital markets, and the related demand and supply-side factors that drive them, take time to develop. This long-term perspective is reflected in the investing arrangements in the sector where it is common for investors to commit to ten-year funds with very limited opportunity for exit within that period (and which leads to the nickname "patient capital").

It follows that any evaluation of the NZVIF as regards its impact on market outcomes also needs to keep the long view in mind. In fact this was reflected in the terms of reference of this study in that an evaluation of the NZVIF was explicitly excluded as the sponsors of the study considered it was too early to undertake such an evaluation.

We suggest an evaluation of the primary policy objective about every three years is likely to be a reasonable balance between allowing sufficient time for the markets to respond, versus the need for government to monitor the performance of the programme and modify its direction as required.

However, this timetable should not preclude more regular scrutiny of the NZVIF programme through:

- Making performance information on the NZVIF programme and on the New Zealand venture capital market overall more widely available, and in a manner that invites comparison between NZVIF backed funds and investee firms and other market participants (locally and internationally).

- The annual planning and review processes which tend to focus on the level of agreeing the services to be provided and reporting on the delivery of those services.

12.5 Output evaluation of the NZVIF programme

The second, or output, level of evaluation is substantially easier.

The NZVIF operates to achieve its goals through the delivery of the following services:[100]

- Its "core business", which is to establish and monitor the VIF Seed Funds. This has included establishing the initial set of four Funds and in 2004/05 adding a biotech Seed Fund, and in an ongoing sense comprises monitoring the performance of the Seed Funds, reporting to government on performance, and completing the allocation of committed capital to the NZ VIF programme (of $100 million).

- Undertaking work on the development of new programmes as agreed with government.

- Advising the government on venture capital market issues.

- Contributing in other ways to the development and growth of a sustainable New Zealand venture capital market, which includes working with the NZVCA to develop the industry, using international best practice approaches in its role as an investor in the Seed Funds and thereby promoting industry standards, and supporting the establishment of a database to profile and measure the New Zealand venture capital market.

- Assisting in attracting increased institutional investment into the New Zealand venture capital market, by promoting NZ venture capital market opportunities to local and off-shore institutional investor groups, advising the government on initiatives to attract investor interests, engaging with gatekeepers who are influential to investors' portfolio decisions, and undertaking a venture capital education role amongst NZ institutional investors.

It is important to note that the NZVIF invests in the Seed Funds on the same terms as other investors excepting that (1) other investors in each Fund are provided with an option that is exercisable up to the end of the fifth year of the Fund to buy out the NZVIF investment on the basis of capital plus interest only (i.e. other investors can access any upside above this amount) and (2) the Fund must operate within the investing profile across seed-start-up-early expansion as set out by NZVIF. For both these reasons the financial performance of the NZ VIF itself is not readily comparable to that of other investors, but the performance of the Seed Funds themselves and the investee firms should be able to be meaningfully compared with their peers.

[100] See pages 4 and 8 –10 of the NZ VIF Statement of Intent 1 July 2004 – June 2009.

12.5.1 Documentation readily available

The current planning and reporting documents and processes of the NZVIF, consistent with other Crown Entities, are designed to provide information on whether the services or outputs it has committed to provide, and for which it has received funding, have indeed been delivered. These include the:

- Annual Statement of Intent, covering a 5 year forecast period.
- Quarterly reports provided to the Shareholding Ministers on the performance of NZ VIF, the VIF Programme and the VIF Seed Funds.
- Annual NZ VIF reports, inclusive of audited Financial Statements and a Statement of Service Performance.
- Annual Progress and Achievement Reports provided to the Minister of Research, Science and Technology.

12.5.2 Measuring the impact of NZVIF

Some of the NZVIF goals are not readily measured with confidence or reported on internationally using a consistent methodology (e.g. this is true of 3 of the of 4 goals) and particularly so in the early stages of the programme. We suggest some useful proxy measures could be developed along the following lines.

Expertise and skills

In relation to the NZVIF goal of developing a larger pool of people in New Zealand's venture capital market with skills and expertise in seed and start-up investment, an annual head count of full time equivalent venture capital investment directors could be included in the market data. This could be supplemented with indicators of quality, for example the length of their experience in venture capital investing or as entrepreneurs. We recognise this approach would not be precise and could be subject to some manipulation but is probably better than no data on this dimension. The European Venture Capital Association reports head count so we suggest its experience in this area could be investigated.

Commercialisation of innovation

In relation to the third goal of facilitating commercialisation of innovations from the Crown Research Institutes (CRIs), Universities and the private sector, the Association of University Technology Managers (AUTM) has surveyed universities, research institutions and hospitals in the US and Canada for a number of years on measures related to commercialising technology.[101] These measures include:

- Research commercialisation staff employed.
- Research expenditure.

[101] See http://www.autm.net/about/ for a description of the AUTM approach.

- Invention disclosures, patent applications filed and patents issued.
- Licences executed and income arising from licensing.
- Start-up companies formed.

The Australian Government has adopted this methodology and has published recently the survey results for 2001 and 2002.[102] We consider this approach could be usefully applied in New Zealand as well, however it is likely to take significant effort and engagement from the respondee organisations to implement successfully. This suggests its successful implementation would probably require a wider constituency than just those interested in the development of the venture capital markets.

Businesses on paths to global success

In relation to the fourth goal, to get more New Zealand businesses on paths to global success by increasing their access to international experts, networks and market knowledge, we do not know of any single measure. However, some measures of success and international connectedness could be derived from information on:

- The extent to which New Zealand based venture capital funds have secured support from local and international institutional investors.
- The extent to which off-shore based venture capital funds have invested in New Zealand firms.
- The extent to which investee firms have been refinanced with outside financiers, local or international.
- The extent to which investee firms have formed alliances with major global partners in their sector.
- The extent to which investee firms are deriving revenue from overseas markets.

[102] "National survey of research commercialization, years 2001 and 2002: Selected measures of commercialisation activity in universities and publicly funded research agencies", Department of Education, Science and Training, the Australian Government, October 2004

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Glossary[103]

Seed: An investee company is at the seed stage of its development if the investment will enable development, testing and preparation of a product or service to the point that it is feasible to start business operations.

Start-up: An investee company is at the start-up stage of its development if the investment will enable actual business operations to get underway. This includes further development of the company's product(s) and initial production and marketing.

Early stage: Refers to seed and start-up.

Early Expansion: An investee firm is at the early expansion stage of its development if the investment provides capital to initiate or expand commercial production and marketing but where the company is normally still cash flow negative.

Venture Capital:[104] Defined as a subset of private equity, and that portion that is focused on equity or equity-linked investments in privately held, high growth companies in their seed, start-up and early expansion phases of development.

Private Equity: Private equity funds are pools of capital specialising in, business expansions, leveraged and management buyouts, mezzanine investments, distressed debt, and related investments. Internationally these pools of capital are typically organised as partnerships and are not listed and traded in the security markets, and hence the term "private equity".

[103] The definitions for seed, start-up and early expansion have been taken from NZVIF (see www.nzvif.co.nz).
[104] There is considerable debate regarding the definition of venture capital and private equity and it varies from region to region. The above definition has been used in this study and is consistent with that used in the US.

Data and sources

In the section below, the data used to develop the tables within chapter 7 'Current state of the market' are described and tabulated. The sources for the data are also provided.

Annual amount invested and number of deals in different stages in New Zealand for 2002-2004

Year	Amount invested (NZDm)		
	Early	Expansion	Later
2002	17.5	14.3	43.8
2003	7.2	44.2	34.6
2004	15.5	95.8	38.8

Year	No of deals		
	Early	Expansion	Later
2002	11	10	13
2003	7	32	10
2004	16	31	7

Proportion invested and number of deals in different stages in New Zealand for 2002 – 2004

Year	Proportion of total amount invested		
	Early	Expansion	Later stage
2002	23%	19%	58%
2003	8%	51%	40%
2004	10%	64%	26%

Year	Proportion of total deals		
	Early	Expansion	Later stage
2002	32%	29%	38%
2003	14%	65%	20%
2004	30%	57%	13%

These values were based on data sourced from the 2004 New Zealand Venture Capital Monitor.

Total committed capital from 1996 – 2004

Year	Total Committed Capital (NZDm)
1996	$109
1997	$166
1998	$281
1999	$623
2000	$773
2001	$883
2002	$973
2003	$1,124
2004	$1,562

Data from 1996 – 2001 was sourced from the 2005 Guide to Venture Capital in Asia and converted from USD to NZD using an exchange rate of 1.509[105]. Data from 2002 – 2004 was sourced from the New Zealand Venture Capital Monitors.

Total capital invested in venture capital relative to total invested across private equity / venture capital from 1996 – 2004.

Year	Total invested (NZDm)	Invested in venture capital (NZDm)
1996	$42	$14
1997	$45	$0
1998	$82	$0
1999	$152	$5
2000	$83	$16
2001	$128	$14
2002	$87	$18
2003	$88	$7
2004	$158	$16

Data from 1996 – 2001 was sourced from Private Equity Media. Australian Dollar denominated investments were converted to NZD using historic rates. Data from 2002 – 2004 was sourced from New Zealand Venture Capital Monitor 2004. Venture capital was defined as seed and start-up.

[105] This was the rate used for 2004 by the OECD Statistics Directorate.

Venture capital /private equity as a percentage of GDP

In order to determine the investment in venture capital/private equity as a percent of GDP for 2004, it was necessary to determine (i) the amount invested and (ii) the GDP for each country. Division of (i) by (ii) provided us with the desired values.

2004 GDP estimates for selected countries

Country	GDP (currency in millions)
Australia	USD 634,931
Austria	235,100 €
Belgium	283,800 €
Canada	USD 1,014,254
Czech	86,400 €
Denmark	194,600 €
Finland	149,700 €
France	1,441,800 €
Germany	2,177,000 €
Hungary	80,600 €
Ireland	146,300 €
Israel	USD 117,600
Italy	1,349,400 €
Japan	USD 3,624,625
Netherlands	466,300 €
New Zealand	NZD 147,609
Norway	€ 199,900
Poland	196,500 €
Portugal	135,000 €
Singapore	USD 109,100
Slovak Republic	33,300 €

South Korea	USD 855,300
Spain	798,700 €
Sweden	277,500 €
Switzerland	291,700 €
Taiwan	USD 528,600
UK	1,729,700 €
USA	11,750,000

Estimates for Austria, Belgium, Czech, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland and UK were obtained from the EVCA 2005 Yearbook.

Estimate for Japan and was based on 2003 values sourced from the OECD, Statistics Directorate, May 2005.

Estimates for USA, South Korea, Singapore (2003), Taiwan (2003) were obtained from the CIA World Factbook.

Estimate for Israel (2004) was obtained from the IVA 2005 Yearbook.

Estimates for Canada, New Zealand, Australia, Japan (2003), Korea (2003) were obtained from OECD, Statistics Directorate, May 2005 and where appropriate converted to local currency.[106]

Investment in venture capital and private equity in millions

	Early Stage	Expansion and later stage	Total
Australia	USD85	USD846	USD931
Austria	17 €	123 €	141 €
Belgium	47 €	250 €	298 €
Canada	CAD 871	CAD 891	CAD 1,763
Czech	0 €	20 €	20 €
Denmark	166 €	229 €	395 €

[106] GDP and exchange rates sourced from the OECD Statistics directorate are available in the *Main Science and Technology Indicators book, volume 2005/1.*

Europe	2,378 €	34,542 €	36,920 €
Finland	40 €	182 €	222 €
France	410 €	4,816 €	5,227 €
Germany	354 €	3,412 €	3,766 €
Hungary	0 €	0 €	0 €
Ireland	28 €	33 €	61 €
Israel	USD 665	USD 626	USD 1,291
Italy	227 €	1,457 €	1,480 €
Japan	USD 1,151	USD 6,041	USD 7,192
Korea	USD 739	USD 2,102	USD 2,841
Netherlands	39 €	1,620 €	1,659 €
New Zealand	NZD 16	NZD 143	NZD 158
Norway	31 €	277 €	308 €
Poland	0 €	130 €	130 €
Portugal	36 €	125 €	161 €
Singapore	USD 152	USD 390	USD 542
Slovak Republic	2 €	2 €	4 €
Spain	69 €	1,898 €	1,967 €
Sweden	232 €	1,390 €	1,622 €
Switzerland	61 €	212 €	272 €
Taiwan	USD 14	USD 24	USD 38
UK	820 €	18,266 €	19,086 €
USA	USD 20,993	USD62,000	USD 80,993

Data relating to all European countries were obtained from the EVCA 2005 Yearbook.

Data for Australia was obtained from the AVCJ.

Data for New Zealand was obtained from the New Zealand Venture Capital Monitor.

Data for Canada was obtained from the Canadian Venture Capital Association.

Data for Israel was obtained from the IVA 2005 Yearbook. Investment in private equity was not available and was proxied by amount of capital raised.

Data for the USA was obtained from the 2005 NVCA Yearbook. Investment in private equity was not available and was proxied by amount of capital raised.

Data for 2004 for countries, Taiwan, Singapore, Japan and Korea could not be obtained. Estimates were achieved by using 2003 data gathered from the 2005 Guide to Venture Capital in Asia and using 2001 country proportions of venture capital relative private equity investments.

Venture capital investments as percent of GDP

Country	Venture Capital as a % of GDP
Israel	0.57%
USA	0.18%
Singapore	0.14%
South Korea	0.09%
Canada	0.09%
Denmark	0.09%
Sweden	0.08%
UK	0.05%
Japan	0.03%
France	0.03%
Finland	0.03%
Portugal	0.03%
Switzerland	0.02%
Ireland	0.02%
Belgium	0.02%
Germany	0.02%
Norway	0.02%
Australia	0.01%
New Zealand	0.01%
Spain	0.01%

Netherlands	0.01%
Austria	0.01%
Slovak Republic	0.01%
Taiwan	0.00%
Italy	0.00%
Czech	0.00%
Hungary	0.00%
Poland	0.00%

Early, expansion and late stage investments as a percent of GDP

Country	Early, expansion and late stage investments as % of GDP
UK	1.10%
Israel	1.10%
USA	0.71%
Sweden	0.58%
Singapore	0.50%
France	0.36%
Netherlands	0.36%
Europe	0.35%
South Korea	0.33%
Spain	0.25%
Denmark	0.20%
Japan	0.20%
Canada	0.17%
Germany	0.17%
Norway	0.15%

Finland	0.15%
Australia	0.15%
Portugal	0.12%
Hungary	0.12%
Italy	0.11%
New Zealand	0.11%
Belgium	0.10%
Switzerland	0.09%
Poland	0.07%
Austria	0.06%
Ireland	0.04%
Czech	0.02%
Slovak Republic	0.01%
Taiwan	0.01%

Gross expenditure on R&D (2003) as a percent of GDP - by country

Country	GERD as % of GDP
Australia	1.62%
Austria	2.20%
Belgium	2.31%
Canada	1.94%
Czech Republic	1.26%
Denmark	2.53%
Finland	3.49%
France	2.19%

Germany	2.55%
Hungary	0.95%
Ireland	1.12%
Italy	1.16%
Japan	3.15%
Korea	2.64%
Netherlands	1.80%
New Zealand	1.16%
Norway	1.75%
Poland	0.56%
Portugal	0.94%
Slovak Republic	0.58%
Spain	1.10%
Sweden	4.27%
Switzerland	2.57%
United Kingdom	1.89%
United States	2.60%
Israel	4.72%

GERD estimates were taken from the OECD Main Science and Technology Indicators Report (Volume 2005/1). Where possible 2003 data was used.[107]

[107] 2003 data was not available for all countries. For example, Denmark, New Zealand, Italy and Ireland data was based on 2002 estimates. Sweden's estimate was taken from 2001 and is considered underestimated.

Number of triadic[108] patent families (2000) per million inhabitants – by country

Country	Patents per million of inhabitants
Australia	16.7
Austria	34.2
Belgium	35.1
Canada	16.9
Czech Republic	0.9
Denmark	47.7
Finland	94.5
France	35.1
Germany	70.3
Hungary	3.3
Ireland	11.9
Italy	13.3
Japan	92.6
Korea	10.2
Netherlands	53.8
New Zealand	9.2
Norway	24.2
Poland	0.3
Portugal	0.8
Slovak Republic	0.8
Spain	2.8
Sweden	91.4

[108] Patent filed at the EPO, the USPTO and the JPO.

Switzerland	104.5
United Kingdom	30.6
United States	53.1
Israel	54.5

Data for the above countries was obtained from the OECD Science, Technology and Industry Outlook. All values were estimates and described as provisional.[109]

Number of science and engineering articles published per million inhabitants (2001) – by country

Country	Science and engineering articles per million inhabitants (2001)
Australia	758
Austria	564
Belgium	582
Canada	727
Czech Republic	256
Denmark	931
Finland	983
France	514
Germany	530
Hungary	243
Ireland	432
Italy	385
Japan	451
Korea	233
Netherlands	786

[109] Estimate for the US was underestimated or based on underestimated data.

New Zealand	742
Norway	721
Poland	147
Portugal	208
Slovak Republic	177
Spain	387
Sweden	1159
Switzerland	1117
United Kingdom	807
United States	705
Israel	1007

All estimates relating to the number of publications per country were obtained from the OECD Science, Technology and Industry Outlook, 2004.

Annual investment by sector in New Zealand as a percent of total annual venture capital/private equity investment (2002-2004)

Sector	Year		
	2002	**2003**	**2004**
Communications	11.3%	7.7%	27.1%
Construction/ Housing	0.0%	5.8%	16.2%
Tourism/ Leisure	0.0%	0.3%	11.9%
Resources/Mining	0.0%	0.0%	11.9%
Technology	0.0%	0.0%	7.6%
Other	13.2%	1.9%	5.0%
Information Technology/ Software	21.4%	13.5%	4.9%
Health/ Biosciences	6.3%	27.2%	4.1%
Services - Consumer	0.0%	0.0%	3.6%

Manufacturing - Consumer	9.2%	7.2%	3.4%
Manufacturing - Industrial	29.4%	14.5%	1.8%
Services - Business/ Financial	5.6%	0.5%	1.8%
Food/ Beverages	0.0%	0.4%	0.8%
Etailing/ Retailing	1.4%	0.7%	0.5%
Media/ Entertainment	0.0%	8.6%	0.1%
Distribution/ Transport	1.3%	11.7%	0.0%
Agribusiness	0.0%	0.1%	0.0%
Environment	0.9%	0.0%	0.0%

Data was collated from the 2002, 2003 and 2004 New Zealand Venture Capital Monitors.

Number of deals per sector in New Zealand between 2002 – 2004

Sector		Year	
	2002	2003	2004
Agribusiness	0	1	0
Communications	6	6	6
Construction/ Housing	0	5	5
Distribution/ Transport	1	1	0
Environment/Energy	2	0	0
Etailing/ Retailing	2	1	1
Food/ Beverages	0	4	1
Health/ Biosciences	4	1	6
Information Technology/ Software	12	20	10
Manufacturing - Consumer	1	1	2
Manufacturing - Industrial	5	2	2
Media/ Entertainment	0	1	1
Resources/mining	0	0	3

Services - Business/Fin	1	3	2
Services - Consumer	0	0	2
Technology	0	0	9
Tourism/ Leisure	0	1	4
Not disclosed	5	2	5

Estimates were sourced from the 2002, 2003, and 2004 New Zealand Venture Capital Monitors.

Terms of reference

Description of the Work

A1 Background

The Ministry of Research, Science and Technology, together with the Ministry of Economic Development and the Crown Company Monitoring Advisory Unit wish to commission a piece of work on the current and future efficacy and adequacy of private equity (PE) and venture capital (VC) markets as a functioning part of New Zealand's innovation system.

The main objective of this project is to provide an assessment that will assist the Government to make appropriate policy and budget decisions on existing and potential instruments in the PE/VC area, including the New Zealand Venture Investment Fund (NZVIF). The review needs to address five key questions:

- What is the essence/key features of a well functioning VC/PE market appropriate to the future (10-20 years) needs of New Zealand?
- What is the current state of the pre-VC to PE investment scene in New Zealand (currently) and what impact is this having on the emergence and growth of innovative/high tech firms?
- Using a robust analytical framework and drawing on the empirical evidence, determine whether impediments to market development exist and what role, if any, government can play, along with market participants, in encouraging development of the VC/PE industry.
- What are the options, if any, for government intervention in this space, with particular reference to other countries' experiences and sectoral differences?
- What would a best practice evaluation look like to assess the NZVIF in, say, 2-5 years time?

The aim of this study is to also gain better understanding of New Zealand VC/PE markets by examining such factors as their efficiency, size, depth, quality, impact on economic development, and potential contribution to future economic development.

A2 Description of the Work

1. Scene Setting

- Describe the essence/key features of a well functioning VC/PE market and the role that that market plays in the growth of innovative/high tech firms New Zealand.
- Indicate how a well functioning New Zealand VC/PE market could expect to look in 10-20 years.
- Identify features of how international PE/VC markets operate, and how they influence the New Zealand VC market at present and over the next 10 years.

The study should look at issues such as the economic impact of VC programs on investors, the development of fund manager skills and investee company skills and any market changes that have taken place in the last 10-15 years.

The study should also examine existing private/public sector mechanisms in the pre-venture capital to PE space and identify any gaps that require government intervention.

2. Quantitative and Qualitative Assessment of New Zealand VC/PE markets

- Interview selected people who have experience and understanding across the range of VC/PE markets and investment, in order to gain a "rich picture" of the current state of the New Zealand VC market. Interviewees should include but not be limited to representatives of NZVCA, NZVIF, business owners, current practitioners, etc...

- Provide 6-8 bottom up case studies from a firm perspective that will enable policy makers to better understand the impact of VC/PE on high tech firms. Provide an assessment of how representative these case studies are.

- Complete a survey of current data sources containing information on the VC/PE markets in New Zealand, an assessment of that data for the purposes of this terms of reference, and identification of any gaps in the data that might be addressed in a subsequent study.

- Complete a review of available international datasets and surveys of PE and VC, to provide comparative data, for assessing the current NZ VC and PE market.

- Identify key indicators and benchmarks and develop a baseline for the current state of the VC/PE market.

- Compare the performance of current New Zealand VC/PE markets across all stages of investment and a full range of investment opportunities.

The information gathered from the quantitative and qualitative analysis should enable MoRST to develop an aspirational scorecard that can be used to measure the impact of the of VIF programme on the VC/PE markets and also enable government agencies to consider the broader economic impacts of VC/PE in New Zealand.

3. Sector Specific Analysis

- Compare the performance of current New Zealand VC and PE markets across different sectors.

- Does VC/PE favour one sector over another and what are the factors that account for this?

The biotech industry has identified a number of impediments and issues relating to VC/PE financing. The report should examine any issues for this particular industry and suggest possible solutions. Attention should also be focused on the impact of the VIF programme and whether it best serves the needs of various sectors.

4. Country Analysis

- Complete a country review, focussed on comparable countries/states that have identified investment as an important factor in improving economic performance through increased investment in higher value-added products/services. We expect the stocktake will focus on 4-5 countries selected for the relevance of their experience and potential comparability with New Zealand.

    - Identify trends in market development of these countries.

    - Examine the nature and type of role government has played in each case to support market development. Note that it is important that the review not only focus on the role government intervention has played in industry development but also the role of quasi-government and private players (including industry associations, and institutional investors). Special attention should be paid to what barriers and limitations countries faced and, in each instance, how those barriers were overcome, and who took the lead/responsibility.

    - Using the evaluation evidence from these countries' programmes, assess the effectiveness of the programmes in contributing to market development.

    - Assess how applicable these countries' experiences are to New Zealand.

5. Literature Review

- Review the theory and empirical evidence on the role of VC/PE in economic development.
- Assess existing reports and data available from relevant government, agencies and private sector organisations (e.g., Securities Commission, Stock Exchange, NZ Venture Capital Association, Investment New Zealand, New Zealand Trade and Enterprise, the Treasury, the Ministry of Economic Development, and NZVIF) on New Zealand's VC/PE markets, in order to gain an understanding of the current state of the markets.

- Review historical development of the VC/PE industry in New Zealand, including a summary of New Zealand's government interventions, including NZVIF.

6. Policy Implications

Based on the above analysis:

- Identify actual and potential gaps and market failures in the VC and PE markets in New Zealand, and the structural or other causes of such gaps, (e.g. lack of institutional investment, elements of New Zealand tax policy, special features of New Zealand economy, structure of New Zealand investment market). Indicate the impact of these market failures and gaps to date, and future potential impact.

- Draw out the lessons learned for New Zealand policy makers.

7. Institutional Investment

The Board of VIF are concerned at the lack of institutional investment in VC/PE and recently made the following observation:

"The lack of New Zealand institutional investor interest in VC investment, particularly for early stage ventures, remains the most significant issue for the development of the VC industry. Global institutional investors, with their long-term investment view, are the cornerstone investors in venture capital markets, without this investor support prospective VIF Seed Fund managers will face a major impediment to raising the matching capital."

The Ministry would like to understand what are the impediments to institutional investment in VC/PE and whether there are policies or practices that would contribute to raising the level of institutional investment by the public and private sectors?

8. Best Practice Evaluation

The intent of this study is not to evaluate the success or failure of the VIF programme. We believe it is too early to consider this issue. However, as a precursor to an evaluation of NZVIF in, say, 2-5 years time, this study should address the following:

- What is best practice internationally in evaluations (interim and ex-post) of similar programmes?
- How would you apply this best practice in the specific case of NZVIF?

EVCA Yearbook example

Presented below is an example of how data on a country's venture capital/private equity activity and investments is presented by the European Venture Capital Association in the EVCA 2005 Yearbook. For the purposes of this example, we have chosen the United Kingdom. The section has been reproduced by permission of the European Private Equity and Venture Capital Association.

UNITED KINGDOM

Background

Market confidence of UK investors continued to improve in 2004 and this has helped lead to a record level of investment activity in 2004. Much of the increase in the activity however came from outside the UK.

The total amount invested by UK private equity firms rose by 41% from €13.5 billion in 2003 to €19.1 billion in 2004. This increase can largely be accounted for by the level of investment at the buyout stage, which increased by 60%, reaching €15.1 billion, now representing 79% of total investments by amount. Much of the increase was due to management buyout activity in continental Europe. Technology investments represent over half of all investments by number, having increased to 1,475 investments in 2004 from 1,189 in 2003. However the amount invested in the technology sectors declined, now representing just over 16% of total investments by amount, down from a 26% share in 2003.

Funds raised decreased substantially in 2004, down 33% from the 2003 total of €15 billion funds raised to €10.1 billion. This simply reflects the current stage in the fundraising cycle, 2004 saw mainly mid-market fundraisings. However, some very large funds are currently in the marketplace and a large increase in funds raised is expected to be reported for 2005. Some 79% of funds raised in 2004 are expected to be allocated to buyouts, with just 4% to early stage and expansion technology deals. The pension funds were again the largest contributor to funds raised at €2.2 billion, 26% of the total. The fund of funds were in second place at €1.5 billion, 18% of the total.

Sources of Capital

Total funds raised in 2004 declined to €10.1 billion, down 33% from the previous year's total of €15.0 billion. Independents contributed 61% of total funds raised at €6.1 billion, down from their 87% share in 2003, whilst captives contributed €2.2 billion, representing 22% of funds raised, up from a 9% share in 2003. Pension funds were again the largest contributor to funds raised, contributing 26% of total funds raised at €2.2 billion, down only slightly from their 27% share in 2003. Fund of funds were the second largest contributor at 18% of funds raised amounting to €1.5 billion, down a little from their 20% share in 2003. The banks followed in third place contributing 15% of the total, as in 2003, at €1.2 billion.

Private individuals represented 9% of funds raised at €745 million, up from their 3% share in 2003. The insurance companies contributed 7%, again as in 2003, at €570 million. Corporate investors increased their share of funds raised from 2% to 6%, amounting to €486 million. Government agencies reduced their contribution from 6% in 2003 to 5% in 2004, amounting to €436 million. Academic institutions increased their contribution from 2% to 3%, amounting to €260 million. Once again overseas investors committed substantially more than UK sources to UK private equity funds – 95% more in fact.

Of the funds raised in 2004, 79% (€8 billion) are expected to be allocated to buyouts (though this was reduced from 92% in 2003) while only 4% (€410 million) is expected to be allocated to high technology early-stage and expansion deals (as in 2003). Funds allocated to industries outside the technology sector at the venture capital stages increased substantially from around €675 million to €1.6 billion.

Investment Patterns

Investments by UK private equity and venture capital organisations rose an impressive 41% in 2004 from €13.5 billion in 2003 to an all-time record level of €19.1 billion in 2004. The number of investments rose 11% from 2,508 to 2,783 and the number of companies invested in rose 6% from 1,505 to 1,598. Average size of investment in 2004 was €6.9 million, compared to €5.4 million in 2003.

Independent organisations invested 77% of the total amount, compared to 70% in 2003. Captives increased their share slightly to 5% from 4% in 2003, whilst semi-captives reduced their share from 26% to 18%. In recent years, several large captive venture capital organisations have become semi-captives and accordingly investment by captives continues to represent a small proportion of the whole market.

Some 90% of investments by amount did not involve syndication in 2004, a different picture from 2003 when there was a fair amount of syndication, with 17% nationally and 21% transnationally syndicated.

Buyouts increased from €9.5 billion in 2003, or 70% of the total investment amount, to €15.1 billion in 2004, or 79% of the total investment amount. The number of buyout investments increased from 556 to 682 and the average deal size for a buyout increased from €17.0 million in 2003 to €22.2 million in 2004.

The number of seed investments increased from 65 to 84, though the amount invested at the seed stage fell from €28.6 million to €12.1 million, representing just 0.1% of the total amount invested. The number of start-up investments increased from 710 in 2003 to 864 in 2004, with the amount invested in start-ups increasing from €593 million to €807 million. As in 2003, the most number of investments in 2004 were at the expansion stage at 1,046 or 38% of the total number of investments, down from 1,074 investments in 2003.

The amount invested outside of the UK increased in 2004 to 53% of the total at €10.1 billion, up from 46% of the total or €6.3 billion in 2003. The amount invested in the high technology sector fell by 10% from €3.5 billion in 2003 to €3.1 billion in 2004. Technology investments now represent just over 16% of total investments by amount compared to 26% in 2003. However, the number of high-technology investments increased by 24% from 1,189 to 1,475, accounting for 53% of the total number of investments.

Once again, consumer related companies were the largest category overall with 26% of the total amount invested at €4.9 billion. Computer related was again the category with the highest number of investments at 20% of the total, 563 investments, up from 472 in 2003. Communications was the second largest category by amount at €2.8 billion, representing 15% of the total investment by amount in 2004. Medical/health related was the second largest category by number of investments with 337 investments, representing 12% of total number of investments.

■ Legal and Fiscal Environment

The UK has one of the most favourable legal and fiscal environments in Europe for the development of the private equity and venture capital industry, as confirmed in the EVCA paper Benchmarking European Tax & Legal Environments. Succeeding UK governments have been keen to support venture capital investment in small and early-stage businesses and in the technology sector in particular. The UK government is in the process of launching a new scheme that it hopes will address the so-called "equity gap" between angel funding and private equity finance to stimulate investment in ventures looking for between £250,000 and £2 million. This new scheme, the Enterprise Capital Funds (ECFs), will comprise a combination of funding from private and government sources with a "pathfinder" round of ECFs to be shortly in place now that the European Commission has approved the UK ECF programme.

On the negative side for private equity, new legislation was announced in March 2005 to extend the transfer pricing rules to business financing arrangements where a number of persons act together to provide finance to a company and those persons would collectively be able to control the company.

The consequent restriction on interest deductions in many private equity situations is concerning, especially as the structuring of private equity transactions and the use of limited partnerships was explicitly agreed with the Inland Revenue some years ago.

University spin-outs were unwittingly caught in tax rules introduced in the 2003 budget which sought to tackle deliberate avoidance of income tax by rewarding employees with shares which are liable to the lower capital gains tax rates. Despite recent draft legislation to correct the situation, university academics are still risking a large tax hit by setting up spin-out companies to develop new cutting edge technology as the new regulations will work by ignoring the intellectual property (IP) value (i.e. the idea or new technology) when calculating the value of the academic's shares. However, other factors can push hypothetical share values back up and still leave academics with an unmanageable tax charge. If the idea subsequently fails, the Inland Revenue will not repay the tax.

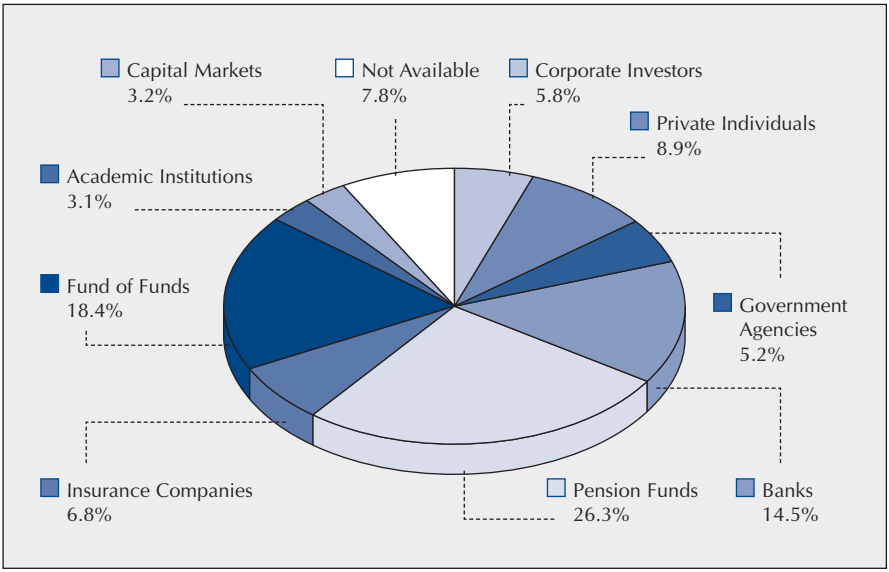
Spin-out companies are sometimes created from public sector research establishments. Researchers will be given shares to reward their contributions to the work. So far a PAYE/NIC charge might arise to those individuals due to the value of the IP transferred. A measure announced in the 2005 budget will allow the value of the IP to be disregarded, thereby only taxing the individual on a disposal of his shares.

■ Exiting

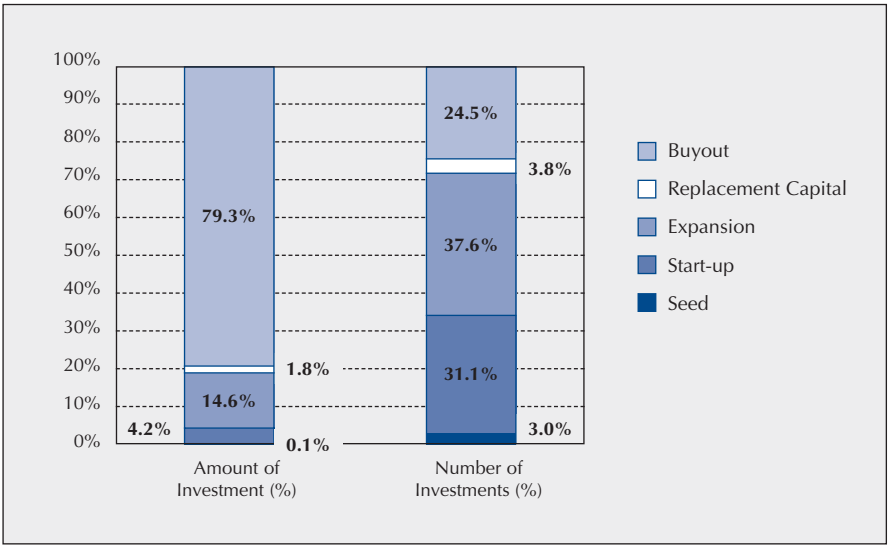
The total amount divested increased considerably, from €7.5 billion in 2003 to €11.2 billion in 2004. Repayment of principal loans was the largest category of divestment again in 2004 both by amount and number of divestments. 32% of divestments by number were by repayment of principal loans, compared to 38% in 2003, amounting to €3.4 billion or 30% of the total amount divested.

Divestment by trade sale was the next largest category at 17% by number (compared to 11% by number in 2003) and 22% by amount at €2.4 billion (compared to 20% by amount at €1.5 billion in 2003). Just 3% of divestments by number were by flotation (IPO), representing €662 million by amount, compared to 1% by number in 2003 at €727 million. Sale to another venture capitalist represented 4% of divestments by number in 2004 but 14% by amount at €1.6 billion, compared to €1.2 billion in 2003. Write-offs, at €940 million in 2004, now represent just over 8% by amount, reduced from their share of 11% of divestments by amount in 2003.

Private equity raised by type of investor in 2004



Stage distribution of investments in 2004



Funds Raised

Amount (in € x 1,000)	2003		2004	
PRIVATE EQUITY RAISED BY SOURCE	**Amount**	**%**	**Amount**	**%**
Independent Funds Raised in Year	13,086,923	87.3	6,145,554	61.1
Amount Raised by Captives	1,349,167	9.0	2,230,003	22.2
Subtotal New Funds Raised	**14,436,090**	**96.3**	**8,375,556**	**83.3**
Realised Capital Gains	554,658	3.7	1,681,185	16.7
Total Funds Raised	**14,990,748**	**100.0**	**10,056,741**	**100.0**
PRIVATE EQUITY RAISED BY TYPE OF INVESTOR				
Corporate Investors	259,850	1.8	485,782	5.8
Private Individuals	375,338	2.6	745,425	8.9
Government Agencies	923,910	6.4	435,529	5.2
Banks	2,136,541	14.8	1,214,456	14.5
Pension Funds	3,955,489	27.4	2,202,771	26.3
Insurance Companies	981,654	6.8	569,538	6.8
Fund of Funds	2,872,782	19.9	1,541,102	18.4
Academic Institutions	346,466	2.4	259,642	3.1
Capital Markets	28,872	0.2	268,018	3.2
Not Available	2,555,188	17.7	653,293	7.8
Subtotal New Funds Raised	**14,436,090**	**100.0**	**8,375,556**	**100.0**
Realised Capital Gains	554,658	-	1,681,185	-
Total Funds Raised	**14,990,748**	**-**	**10,056,741**	**-**
GEOGRAPHICAL BREAKDOWN OF PRIVATE EQUITY RAISED				
Domestic	5,036,891	33.6	3,409,235	33.9
Other European Countries	3,193,029	21.3	2,212,483	22.0
Non-European Countries	6,760,827	45.1	4,435,023	44.1
Total Funds Raised	**14,990,748**	**100.0**	**10,056,741**	**100.0**
EXPECTED ALLOCATION OF FUNDS RAISED				
High-Tech Early-Stage	434,732	2.9	241,362	2.4
Non High-Tech Early-Stage	179,889	1.2	40,227	0.4
High-Tech Expansion/Development	89,944	0.6	170,965	1.7
Non High-Tech Expansion/Development	494,695	3.3	1,599,022	15.9
Venture Capital	**1,199,260**	**8.0**	**2,051,575**	**20.4**
Buyout	13,731,525	91.6	7,974,996	79.3
Other	59,963	0.4	30,170	0.3
Total Funds Raised	**14,990,748**	**100.0**	**10,056,741**	**100.0**

Amount (in € x 1,000)	2003						2004					
	Amount of Investment	%	Number of Investments	%	Number of Companies	%	Amount of Investment	%	Number of Investments	%	Number of Companies	%
Initial Investment	10,270,673	75.9	776	30.9	578	38.4	15,554,025	81.5	1,181	42.4	751	47.0
Follow-on Investment	3,267,926	24.1	1,732	69.1	927	61.6	3,531,956	18.5	1,602	57.6	847	53.0
Total Investment in Year	**13,538,599**	**100.0**	**2,508**	**100.0**	**1,505**	**100.0**	**19,085,981**	**100.0**	**2,783**	**100.0**	**1,598**	**100.0**
DISTRIBUTION OF INVESTMENTS BY INVESTOR TYPE												
Independent	9,441,418	69.7	2,178	86.8	1,285	85.4	14,699,746	77.0	2,262	81.3	1,228	76.8
Captive	583,887	4.3	94	3.7	80	5.3	935,444	4.9	220	7.9	176	11.0
Semi-Captive	3,513,295	26.0	236	9.4	140	9.3	3,449,957	18.1	299	10.7	192	12.1
Public Sector	0	0.0	0	0.0	0	0.0	833	0.0	2	0.1	2	0.1
Total Investment	**13,538,599**	**100.0**	**2,508**	**100.0**	**1,505**	**100.0**	**19,085,981**	**100.0**	**2,783**	**100.0**	**1,598**	**100.0**
STAGE DISTRIBUTION OF INVESTMENTS IN YEAR												
Seed	28,646	0.2	65	2.6	41	2.7	12,069	0.1	84	3.0	67	4.2
Start-up	593,013	4.4	710	28.3	421	28.0	807,615	4.2	864	31.1	495	31.0
Expansion	1,966,765	14.5	1,074	42.8	676	44.9	2,787,250	14.6	1,046	37.6	596	37.3
Replacement Capital	1,484,017	11.0	103	4.1	75	5.0	350,879	1.8	107	3.8	70	4.4
Buyout	9,466,158	69.9	556	22.2	293	19.4	15,128,167	79.3	683	24.5	369	23.1
Small	657,533		441		232		1,467,432		504		243	
Mid-market	4,444,139		94		49		6,883,316		150		103	
Large	2,778,738		14		7		3,615,632		19		15	
Mega	1,585,748		7		4		3,161,787		10		7	
Total Investment	**13,538,599**	**100.0**	**2,508**	**100.0**	**1,505**	**100.0**	**19,085,981**	**100.0**	**2,783**	**100.0**	**1,598**	**100.0**
SYNDICATION OF INVESTMENTS IN YEAR												
No Syndication	8,415,088	62.2	1,587	63.3	939	62.4	17,081,494	89.5	2,206	79.3	1,254	78.5
National Syndication	2,310,792	17.1	450	17.9	315	20.9	1,227,144	6.4	423	15.2	243	15.2
Transnational Syndication	2,812,719	20.8	471	18.8	251	16.7	777,343	4.1	154	5.5	101	6.3
Total Investment	**13,538,599**	**100.0**	**2,508**	**100.0**	**1,505**	**100.0**	**19,085,981**	**100.0**	**2,783**	**100.0**	**1,598**	**100.0**

Amount (in € x 1,000)	2003						2004					
	Amount of Investment	%	Number of Investments	%	Number of Companies	%	Amount of Investment	%	Number of Investments	%	Number of Companies	%
GEOGRAPHICAL DISTRIBUTION OF INVESTMENTS IN YEAR												
Domestic	7,277,200	53.8	1,776	70.8	1,080	71.8	8,958,486	47.0	2,324	83.5	1,275	79.8
Other European Countries	5,693,154	42.1	617	24.6	342	22.7	9,395,432	49.2	354	12.7	238	14.9
Non-European Countries	568,245	4.2	115	4.6	83	5.5	732,062	3.8	106	3.8	85	5.3
Total Investment	**13,538,599**	**100.0**	**2,508**	**100.0**	**1,505**	**100.0**	**19,085,981**	**100.0**	**2,783**	**100.0**	**1,598**	**100.0**
SECTORAL DISTRIBUTION OF INVESTMENTS IN YEAR												
Communications	2,212,337	16.3	346	13.8	183	12.2	2,833,189	14.8	283	10.2	175	10.9
Computer Related	719,063	5.3	472	18.8	309	20.5	1,031,409	5.4	563	20.2	312	19.5
Other Electronics Related	285,291	2.1	208	8.3	109	7.3	206,175	1.1	146	5.2	79	4.9
Biotechnology	252,722	1.9	178	7.1	118	7.9	171,234	0.9	183	6.6	97	6.1
Medical/Health Related	593,768	4.4	247	9.9	149	9.9	1,071,393	5.6	337	12.1	202	12.7
Energy	189,380	1.4	20	0.8	18	1.2	413,450	2.2	51	1.8	32	2.0
Consumer Related	3,555,230	26.3	253	10.1	142	9.4	4,919,507	25.8	275	9.9	142	8.9
Industrial Products and Services	356,034	2.6	122	4.8	55	3.6	578,588	3.0	155	5.6	86	5.4
Chemicals and Materials	137,549	1.0	37	1.5	24	1.6	542,330	2.8	56	2.0	31	1.9
Industrial Automation	108,128	0.8	18	0.7	14	0.9	30,190	0.2	31	1.1	17	1.0
Other Manufacturing	1,345,943	9.9	125	5.0	82	5.4	1,983,982	10.4	177	6.4	102	6.4
Transportation	916,574	6.8	50	2.0	26	1.7	256,900	1.3	31	1.1	18	1.1
Financial Services	397,075	2.9	80	3.2	57	3.8	1,061,794	5.6	79	2.8	45	2.8
Other Services	1,274,567	9.4	200	8.0	118	7.9	2,335,784	12.2	245	8.8	150	9.4
Agriculture	176	0.0	2	0.1	2	0.1	14,356	0.1	13	0.5	7	0.5
Construction	126,103	0.9	35	1.4	20	1.3	214,055	1.1	40	1.4	27	1.7
Other	1,068,659	7.9	114	4.6	80	5.3	1,421,644	7.4	115	4.1	77	4.8
Total Investment	**13,538,599**	**100.0**	**2,508**	**100.0**	**1,505**	**100.0**	**19,085,981**	**100.0**	**2,783**	**100.0**	**1,598**	**100.0**
Subtotal High-Tech	**3,467,256**	**25.6**	**1,189**	**47.4**	**759**	**50.4**	**3,130,101**	**16.4**	**1,475**	**53.0**	**815**	**51.0**

For "Total Investments" for the number of companies column see Methodology and Definitions under Investments and Divestments.

Divestments

Amount (in € x 1,000)	2003						2004					
	Amount of Divestment	%	Number of Divestments	%	Number of Companies	%	Amount of Divestment	%	Number of Divestments	%	Number of Companies	%
Divestment by Trade Sale	1,457,757	19.6	238	11.1	163	12.6	2,431,341	21.8	389	16.6	248	17.3
Divestment by Public Offering	1,149,872	15.4	225	10.5	117	9.0	1,219,143	10.9	292	12.4	150	10.4
Divestment by Flotation (IPO)	727,336		12		8		662,322		67		32	
Sale of Quoted Equity	422,536		213		109		556,820		225		118	
Divestment by Write-Off	815,360	10.9	321	15.0	174	13.4	940,479	8.4	309	13.1	178	12.4
Repayment of Principal Loans	1,531,408	20.6	817	38.2	543	41.8	3,357,479	30.0	758	32.2	469	32.6
Sale to Another Venture Capitalist	1,248,013	16.7	69	3.2	29	2.2	1,581,707	14.2	94	4.0	58	4.1
Sale to Financial Institution	604,001	8.1	45	2.1	23	1.8	317,714	2.8	36	1.5	24	1.7
Sale to Management (Buy-back)	335,185	4.5	190	8.9	112	8.6	299,653	2.7	227	9.7	164	11.4
Divestment by Other Means	310,269	4.2	236	11.0	137	10.6	1,032,282	9.2	247	10.5	146	10.1
Total Divestment in Year	**7,451,865**	**100.0**	**2,141**	**100.0**	**1,298**	**100.0**	**11,179,796**	**100.0**	**2,352**	**100.0**	**1,437**	**100.0**

For "Total Divestments" for the number of companies column see Methodology and Definitions under Investments and Divestments.

Portfolio at Cost

Amount (in € x 1,000)	2003			2004		
	Amount	Number of Investments/ Divestments	Number of Companies	Amount	Number of Investments/ Divestments	Number of Companies
Portfolio at Cost 1st Jan	45,821,101			51,907,835		
Total Investment in Year	13,538,599	2,508	1,505	19,085,981	2,783	1,598
Total Divestment in Year	(7,451,865)	2,141	1,298	(11,179,796)	2,352	1,437
Portfolio at Cost 31st Dec	**51,907,835**			**59,814,020**		

Geographical Flows of Private Equity

Amount (in € x 1,000)	2003	2004
FUNDS	**Amount**	**Amount**
Funds raised by local PE houses (1)	14,990,748	10,056,741
INVESTMENT		
Investment by local PE houses (2)	13,538,599	19,085,981
(-) Foreign investment by local PE houses	(6,261,399)	(10,127,494)
Local investment by foreign PE houses (3)	97,794	711,750
Total Investment in Country	**7,374,994**	**9,670,057**

Notes:
(1) Also includes funds raised by local offices of foreign groups that have a distinct local fundraising activity.
(2) Also includes domestic investments made by local offices of foreign groups.
(3) Investments made by foreign private equity (PE) houses with no local offices.

Macro Economic Indicators

All amounts in € billion	2003	2004
Number of Private Equity Executives	1,629	1,658
Private Equity Investment as % of GDP	0.856%	1.103%
GDP*	1,582.2	1,729.7
Private Consumption*	1,037.1	1,125.8
Public Consumption*	329.3	367.7
Consumer Prices (MAY 2000=100)*	109.7	111.2
Producer Prices (MAY 2003=100)*	101.3	103.8
Interest Rates (3-month)**	2.87%	2.12%
Interest Rates (10-year)***	4.58%	4.93%
Retail Sales (1949=100)*	113.2	118.5
Unemployment Rate*	3.0%	2.8%
Total value of completed M&A (€ million)	105,983	88,583
Number of completed M&A	2,185	1,988
Total value of IPOs (€ million)	4,527	5,628
Number of IPOs	64	192

Source: Thomson Financial
** National Source*
*** European Banking Federation & Financial Market Association*
**** European Central Bank & EUROSTAT*

Note:
Number and amount of M&A deals are split per country based on the location of the target
Number and amount of IPOs are split per country based on the location of the issuer