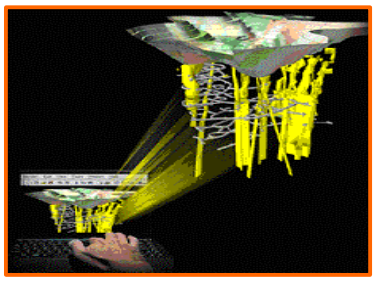
Creating an Effective Venture Capital

Environment in Western Australia

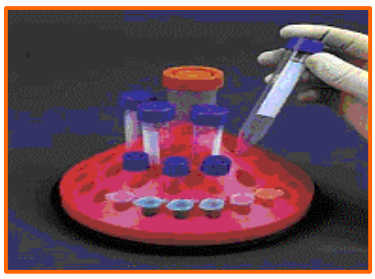
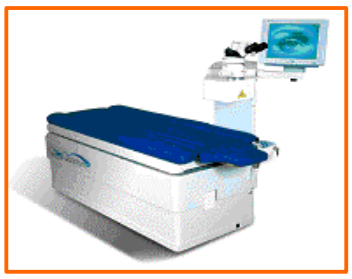





Russell Barnett and Tim Mazzarol

Guidelines for Government, Industry and Universities

A Discussion Paper


September 2002

GSM

australian venture CONSULTANTS PTY LTD

Australian Venture Consultants Pty Ltd and the University of Western Australia Graduate School of Management (GSM) have published this report for the consideration and comment of industry, government and educators. Any comments or queries pursuant to this report should be addressed to either of the parties below.

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Foreword

On the 8th August 2002, the North West Shelf Venture Partners were advised that the Venture had been selected from a short-list of three potential suppliers of LNG for Phase I of the Guangdong LNG Project in South China. Subject to final negotiations, this contract will be worth between $20 and $25 billion in export earnings over a twenty-five year period, or an approximate additional 3 percent per annum on Western Australia's current export earnings. This project was celebrated widely in Western Australia, as the additional Woodside earnings and State Government royalties will be significant and it will have a considerable multiplier effect on the Western Australian economy. Present and past governments were publicly thanked for their unqualified support during the courting and negotiation period, predictions of long-term export contracts with China were proclaimed and local industry anticipated the possibility of securing related services contracts. However, this event also serves to highlight the continuing dependency of the Western Australian economy on natural resources.

The reliance of the Western Australian economy on the exploitation of its vast natural resources has been well documented, as has its vulnerability as a price taker in the global commodity markets. The scale of the State's resources allows Western Australia a degree of comfort in that it is unlikely that an income crisis will place the State in dire straits during the life times of those who have contributed to this report. Whether or not the wells dry-up and the holes become dust, it is highly likely that the commodity markets will become increasingly competitive as previously third-world or socio-politically unstable resource rich nations, such as some of those in Eastern Europe, South America, Asia and Africa, begin to compete effectively from their lower cost bases, more accessible geographic locations and increasingly stable socio-economic climates. It is likely that Western Australia will continue to export the expertise and knowledge of its resources sector to these countries, however as knowledge transfer begins to take effect, Western Australia may become less and less relevant as a centre of resources industry expertise.

Downstream industry development and industry diversification does not happen over night. The considerable cultural and economic systemic changes that need to occur in order to achieve this in Western Australia require a long-term strategy and a collaborative and concerted effort in the pursuit of that strategy. At the very nucleus of such industrial regeneration is an effective and inspired new venture creation environment, a critical component of which is an efficient and accessible venture capital market, particularly at the early stages of venture development.

It is only by combining and focusing the resources of industry, government and educators that Western Australia will be able to improve the effectiveness of its venture capital sector. Following a process of research and discussion with individuals and organisations engaged in the venture capital 'sector' within Western Australia, a series of three separate 'guideline' papers were to be produced – one for industry, one for government and one for the universities. However, the central theme that has emerged from our investigations is a need for a coordinated and collaborative approach, thus a

combined paper is more in the spirit of this theme of collaboration. It is hoped that this report will invite comment, criticism and recommendations from industry, government and the universities and lay the foundations for a more collaborative and coordinated approach to improving the Western Australian venture capital market and the venture creation scene as a whole.

1. Introduction

This report is the fourth in a series of research investigations, which have examined the nature of the venture capital market in Western Australia. The preceding reports are as follows:

- 'The Nature of Venture Capital in Western Australia' (Barnett, 2001)

  This paper outlines the findings of an initial identification and examination of the main actors in the Western Australian venture capital scene, as well as the venture capital culture in Western Australia.

- 'The Social Processes of Venture Capital: The Case of Western Australia' (Barnett & Mazzarol, 2002)

  This paper discusses the social processes of venture capital markets, using the Western Australian venture capital scene as a case study.

- 'Western Australian Venture Capital Industry Forum: Preliminary Summary of Outcomes (Australian Venture Consultants Pty Ltd and the Graduate School of Management, 2002)

  This paper highlights the key findings from presentations and structured discussions at the Western Australian Venture Capital Industry Forum, which was hosted by the Graduate School of Management (GSM) and attended by approximately 40 organisations broadly involved in Venture Capital in Western Australia.

The research conducted by Barnett and Mazzarol, together with observations and comments provided by delegates at the Western Australian Venture Capital Industry Forum, identified a number of key issues relating to perceived deficiencies in the Western Australian venture capital scene and the Western Australian venture creation environment as a whole.

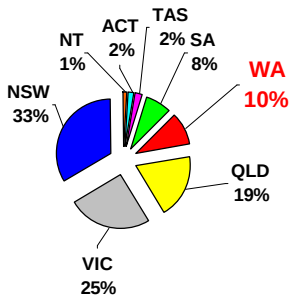
This paper is designed to bring together the key observations from the research and the Western Australian Venture Capital Industry Forum, synthesised with a number of successful models already in practice to produce some practical guidelines for industry, State government and universities on which readers are invited to comment.

2. The Western Australian Economy

2.1 Western Australia in the National Context

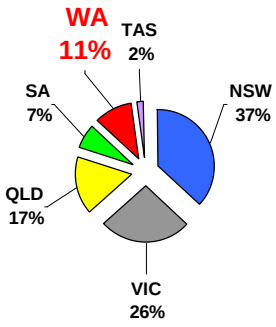
The state of Western Australia accounts for approximately one-third of the landmass of the Australian continent. Seventy-five percent of its population of approximately two million people live in its capital, Perth, which is as far from the nearest capital city, Adelaide, as Leningrad is from London. Accounting for only ten percent of the Australian population, it is the fourth most populous state. However, despite the State's modest contribution to the national population, Western Australia makes a significant contribution to the national economy. In 2001, Western Australia:

State Contributions to National Population (Source: ABS 2002)



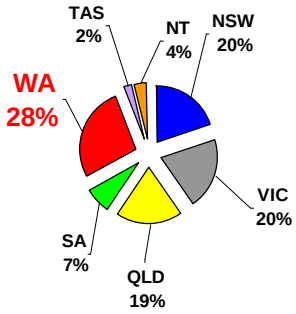
- Accounted for $70 billion, or 11 percent, of Gross National Product.

State Contributions to GNP (Source: ABS 2001)

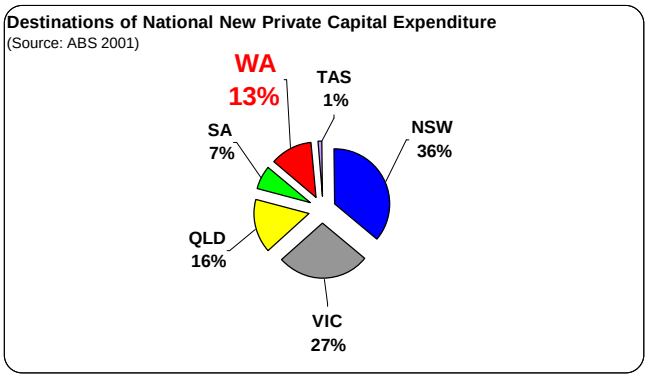


- Accounted for $30 billion, or 28 percent, of National Export Revenues.

Contributions to National Export Revenues (Source: ABS 2001)



- Received $5 billion, or 13 percent, of National New Private Capital Expenditure.

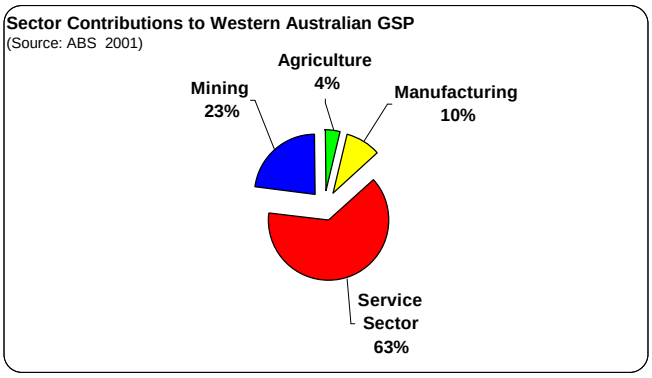


This all seems fairly impressive from a State so physically isolated and relatively modest in population. However, without the State's titanic mining sector, the picture is not so reassuring.

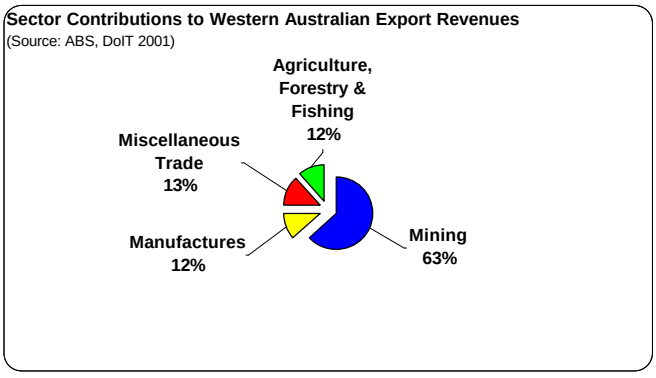
2.2 Composition of the Western Australian Economy

The Western Australian economy is characterised by a significant services sector, which largely exists to support the States mining sector. The mining sector drives the Western Australian economy by:

- Contributing $16 billion, or 23 percent of Gross State Product.

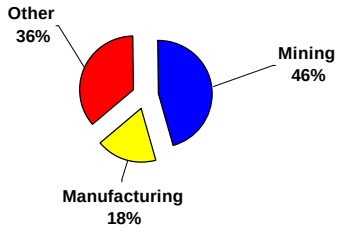


- Contributing $19 billion, or 63 percent of State Export Revenues.



➲ Receiving $2.3 billion, or 46 percent of New Private Capital Expenditure in the State.

Destination of New Private Capital Expenditure in Western Australia (Source: ABS 2001)

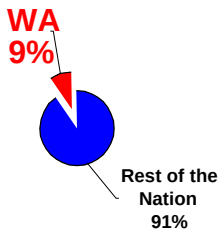


The dominance of the resources sector is not the problem. It is a major source of employment, a catalyst for innovation within the sector and a major economic base from which new, diverse industry growth can be launched. Of concern is the State's inability to diversify its industrial base.

2.3 Research Activity in Western Australia

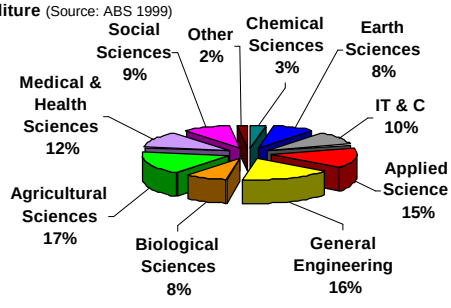
In 1999 $830 million dollars was spent on research activity in Western Australia, representing 9 percent of the national research expenditure. Of this $830 million, the private sector contributed $500 million (60%), the Commonwealth Government contributed $250 million (30%) and the State Government contributed $80 million (10%). Although the main recipients of research expenditure in Western Australia were the general engineering, applied science and agricultural disciplines, research expenditure does seem reasonably well dispersed among a number of disciplines.

Research Expenditure in Western Australia (Source: ABS 1999)



There are a number of possible reasons why this relatively diverse research base has not manifested itself in the form of a more diverse economy:

Sector Allocation of Western Australian Research Expenditure (Source: ABS 1999)



- There is typically a significant time lag for research activity to manifest itself in the form of new products, businesses and industries. However, the ventures that we find seeking early stage capital in Western Australia are of a reasonably diverse nature.

- Research and development output is being exported either to the Eastern States or overseas, once it becomes ready for commercialisation.

- The commercialisation environment in Western Australia, including capital and expertise to develop and implement strategic commercialisation strategies, remains under-resourced and fragmented.

The reality is that all of these factors contribute to the lack of industrial diversity. However, the focus of this paper is the adequacy of the local commercialisation environment, particularly in relation to the supply of local venture capital.

3. An Effective Venture Creation Environment

If the Western Australian economy is to successfully diversify and build on its natural resource base, it must create and maintain an effective new venture creation environment. There are at least five key elements to an effective venture creation environment:

- Accessible and diverse sources of venture capital
- An enabling culture
- Strong and accessible networks
- Supportive infrastructure
- Supportive government

3.1 Accessible and Diverse Sources of Venture Capital

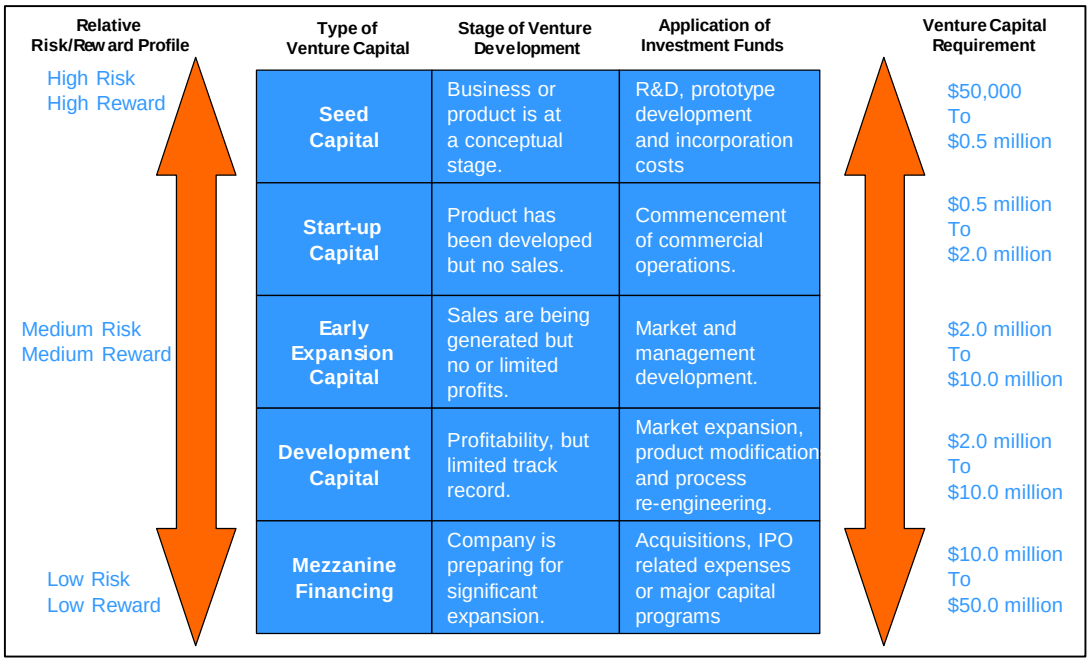
A range of clearly visible and accessible sources of venture capital must exist.[1] This includes sources that represent each of the various stages of venture investment as depicted in the diagram overleaf, as well as diversity within each stage so that the unique requirements of individual ventures can be effectively met.

Ideally, a clearly visible source of funding is continually available for qualified investments from:

- Angel investors and high net-worth individuals
- Formal venture capital funds
- Corporate venture investors
- Government assistance programs where private sector market mechanisms have failed to facilitate investment

Furthermore, because of the intense investment management processes involved with early stage venture investing, sources of effective early stage venture capital need to be local.

[1] Golis, C. (1998). Enterprise and Venture Capital: A Business Builder's and Investor's Handbook, 3rd edition, Sydney, Allen & Unwin.



The Venture Capital Spectrum[1]

3.2 An Enabling Culture

New business successes that lead to the creation of new products, processes and research initiatives that address current and future market needs and which create new jobs, improve the standard of living in society. A culture that celebrates these business successes and which understands the difficulties and challenges associated with commercialisation and commercialisation risk, serves to foster and encourage entrepreneurial activity and venture investment. Such cultures are central to successful entrepreneurial countries such as the United States and Israel.[2]

3.3 Strong and Accessible Commercial Networks

Strong local networks within industries and which extend across industries and geographic boundaries are critical for ventures both in terms of developing their businesses and accessing capital. However, such networks are only effective if they are visible and accessible. Given the geographic isolation of Western Australia, this is paramount.

[1] Adapted from Golis, C. (1998). *Enterprises and Venture Capital: A Business Builder's and Investor's Handbook,* 3rd edition, Allen & Unwin, Sydney. & Humphrey, N, (2000), 'Worth the Risk: How to Win Venture Capital Funding', *Journal of the Securities Institute of Australia,* no.3, Spring.

[2] NCOE (2000). Building Companies, Building Communities: Entrepreneurs in the New Economy.

3.4 Supportive Infrastructure

Central to effective entrepreneurial management is the ability to source and assemble a range of resources, which are often beyond the immediate means of entrepreneurs in smaller firms. Competent local resources of human capital, real estate, technical research and development infrastructure and professional services are critical for new venture creation.

3.5 Supportive Government

The role of Government in this area can be critical, not so much in attempting to 'pick winners', but through playing a facilitative leadership role. For example, the public sector can support new venture creation and growth by focusing on two critical elements[1]:

- The education of entrepreneurial managers
- Facilitation of innovation within industries

The creation of new entrepreneurial ventures and their successful development is contingent on the existence of entrepreneurial managers willing to accept risk and commit to long-term growth. Assisting such individuals requires a dual-track approach involving both direct and indirect support.

One of the most valuable forms of assistance to a nascent or a novice entrepreneur is management education. However, such education needs to be delivered in a flexible and timely manner. Part of such education is the widening of these individual's personal networks so as to enhance their knowledge of who to turn to for support when needed. Government can assist in the education of entrepreneurs through the promotion of appropriate courses and the facilitation of a network of supporting agencies (both public and private) able to assist entrepreneurs with appropriate skills and resources.

At the industry level, the focus of Government should be on the enhancement of innovation in all its forms (e.g. both product and process, technical and human). Effective industry policy is by nature indirect and long-term. It is necessary to increase the awareness within all sectors of the State's industries, the importance of embracing new technologies and benchmarking against world's best practice.

Government must foster an attitude that their role is to facilitate industries and the individual firms within them toward global markets and international competitiveness. This will be an indirect role and should place as much emphasis on established industries as emerging ones.

[1] Washington D.C., The National Commission on Entrepreneurship.

4. Venture Capital in Western Australia

Venture capital is sourced by Western Australian ventures from the following:

- Commonwealth government programs such as BITS, COMET, R&D Start and IIF
- Angel investors and high net-worth individuals
- Local and national formal venture capital funds
- Corporate venture capital investors
- Share market

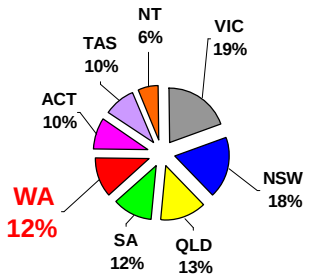
4.1 Commonwealth Government Programs

The Commonwealth government has promoted a number of programs designed to correct the apparent market failure at early stage (seed, start-up and early expansion) venture capital. These programs have been significant contributors to early stage ventures in Western Australia, with a total of approximately $90 million being made available to early stage ventures in Western Australia over the past three years.

Building on Information Technology Strengths (BITS) Program.

Western Australia has one BITS incubator, Entrepreneurs in Residence, which manages $10 million dollars of BITS funding, or 12 percent of the national BITS fund allocations. Each Australian State or Territory has at least one BITS Incubator, with New South Wales and Victoria having three and Queensland two.

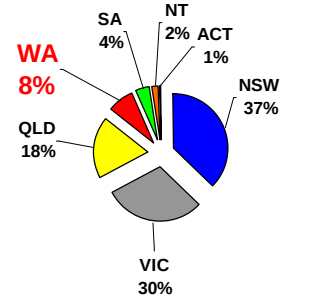
State Allocations of Federal BITS Funding
(Source:Dep of Communications, Information Technology & the Arts 2002)



In the first year of the BITS program, the Western Australian BITS Incubator received ninety-two applications for incubation, or 8 percent of the total applications made by ventures to BITS Incubators Australia-wide. In its first year of operation the BITS Incubator in Perth has invested in five Western Australian Ventures:

- Calytrix Technologies Pty Ltd
- Ergotel Pty Ltd
- Intierra

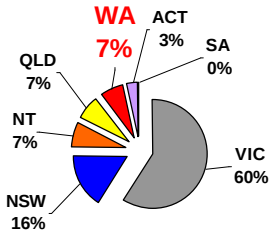
Applications for BITS Incubation by Ventures
(Source: Dep of Communications, Information Technology & the Arts 2002)



- Pisces Internet Systems
- Supersoftware (International) Pty Ltd.

This portfolio represents 7 percent of the total number of venture investments made under the BITS Program Australia-wide. Only BITS Incubators in New South Wales and Victoria have produced successful graduates from the program thus far.

Investments by BITS Incubators
(Source: Dep of Communications, Information Technology & the Arts 2002)

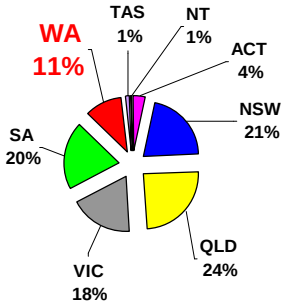


Commercialisation of Emerging Technologies (COMET) Program.

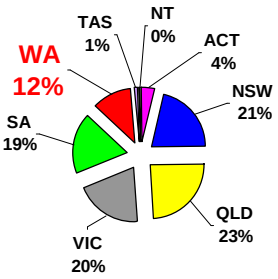
Western Australia has two COMET Business Advisors. In its first two years of operation forty COMET Grants were awarded to Western Australian businesses for a total of $2.2 million. The following list represents the top quartile of Western Australian COMET Grant recipients:

- Lenium 3 Sports ($60,800)
- Mechantronics ($69,000)
- SLAMP ($76,000)
- Optimiser Pty Ltd ($81,600)
- Prail Pty Ltd ($94,586)
- Tasocs Pty Ltd ($99,200)
- Solar Energy Systems Pty Ltd ($100,000)
- CIV Pty Ltd ($100,000)
- Weed Control Australia ($100,000)
- Quickstep Technologies ($100,000).

Number of COMET Grants Awarded in Each State
(Source: AusIndustry 2001)



Value of COMET Grants Awarded in Each State
Source: AusIndustry 2001

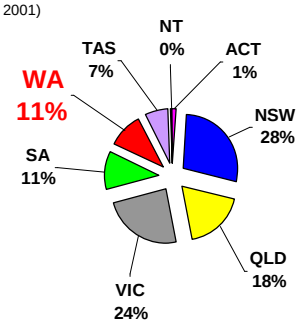


R&D Start Program

A total of sixty-one R&D Start Grants were awarded to Western Australian ventures for a total of $44.5 million prior to the suspension of the program in December 2001. The following is a list of the top quartile of Western Australian R&D Start Grant recipients:

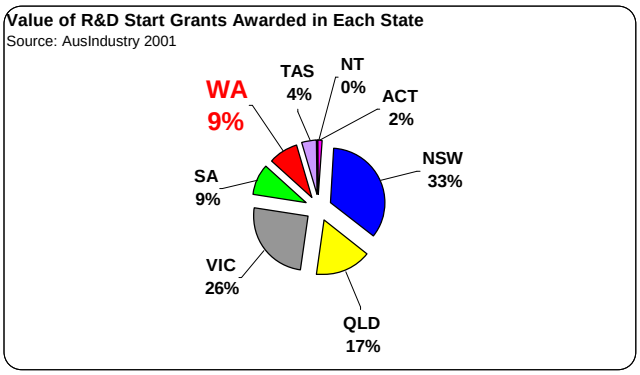
- Advanced Nano Technologies Pty Ltd

Number of R&D Start Grants Awarded in Each State
(Source: AusIndustry 2001)



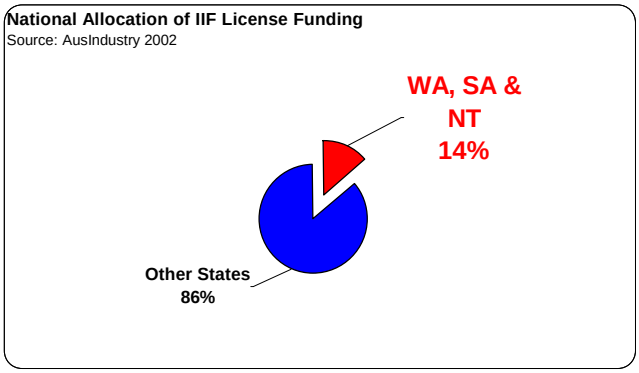
($2,865,050)

- Nautronix Ltd ($2,583,860)
- Titan Resources NL ($1,974,490)
- Peko Rehabilitation Project Pty Ltd ($1,743,490)
- ZBB Technologies Ltd ($1,708,000)
- Beuteaux Australia Pty Ltd ($1,657,600)
- Micromine Pty Ltd ($1,468,677)
- Advantage Air Australia ($1,377,772)
- WA South Sea Pearls Pty Ltd ($1,207,000)
- Western Aerospace Limited ($1,204,850)
- Sanford Ltd ($1,174,300)
- Plexus International Ltd ($1,144,221)
- Grain Biotech Australia Pty Ltd ($1,096,800)
- Bookleaf Pty Ltd ($1,095,950)
- RF Innovations Pty Ltd ($1,091,650)
- Meditech Research Ltd ($1,038,750).



Innovation Investment Fund (IIF)

Western Australia has one formal venture capital fund with an IIF License for $22.3 million, Foundation Capital, and that license covers Western Australia, Northern Territory and South Australia. Coupled with private sector funds, Foundation's Innovation Investment Fund has a total of $35.68 million available for investment in early stage ventures.



4.2 Angel Investors and High Net-worth Individuals

Another significant source of early stage venture capital in Western Australia are angel investors and high net-worth individuals. It has been estimated by a number of individuals active in the Western Australian venture capital scene that there are between two and three hundred individuals in Western Australia who have a high net-worth or angel investor profile.[1]

It has also been suggested that this potential angel investor market in Western Australia can be segmented as follows:

[1] Barnett, R. (2001). *The Nature of Venture Capital in Western Australia* unpublished research paper, GSM UWA, Perth.

- Industry specialist high net-worth individuals, such as retired specialist in the medical, oil and gas, mining or agricultural sectors.
- Generalist high net-worth individuals such as retired partners of professional services organisations such as the major law, accounting, stockbroking and management-consulting firms.
- Successful entrepreneurs

A number of more visible investment vehicles have been established by individual, or groups of angel investors in Western Australia for the sole purpose of venture capital investment including, Add Venture Capital, Techstart and Capital Technologies. However, angel investors in Western Australia mostly remain unorganised and access to the angel investor market at large is limited to:

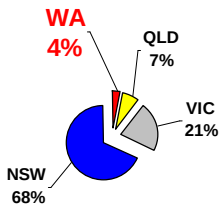
- Existing professional networks
- Existing social networks
- Networked professional advisers and other 'gatekeepers'.

Furthermore, angel investors in Western Australia seem relatively unfamiliar with the risks associated with commercialisation and technology outside of the resources sector.

4.3 Formal Venture Capital

By formal venture capital, we refer to investment vehicles that have been established exclusively for venture capital investment and which are funded predominately by other institutional investment vehicles. There are approximately fifty funds registered as members of the Australian Venture Capital Association, of which only two, Foundation Capital and Rothschild Golden Arrow Fund, are headquartered in Western Australia. The Rothschild fund, focuses on the resources sector.

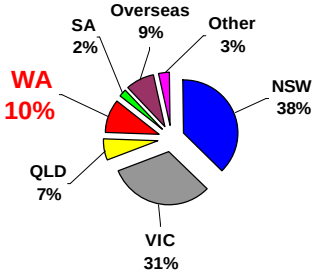
Location of Formal Venture Capital Fund Headquarters
(Source: AVCAL 2001)



There are also a number of national and international venture capital funds that have representation in Western Australia, such as:

- Innovation Capital
- Gresham Funds Management
- Loftus Capital

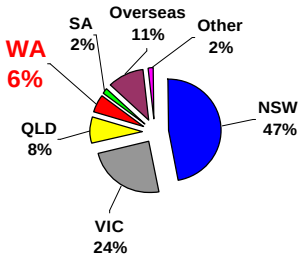
Number of Ventures to Receive Formal Venture Capital Investment
Source ABS 2000



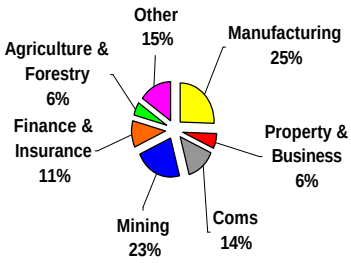
- Macquarie Bank.

In 1999-2000, a total of sixty-six Western Australian ventures received formal venture capital, representing 10 percent of the total number of Australian ventures receiving formal venture capital investment. However, in terms of value, Western Australian ventures received a total of only $137 million of formal venture capital, or 6 percent of the national total. Furthermore, the mining sector was a dominant recipient of formal venture capital in Western Australia, both in terms of the number of ventures to receive formal venture capital and the total value of formal venture capital investment.

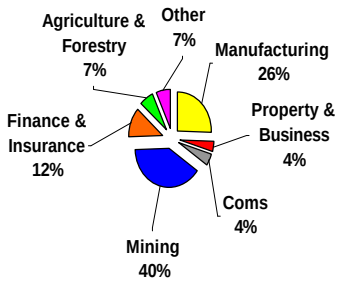
Value of Formal Venture Capital Investment in Australia (Source: ABS 2000)



Number of Western Australian Ventures Receiving Formal Venture Capital (Source: ABS 2000)



Value of Western Australian Formal Venture Capital Investment (Source: ABS 2000)



Although formal venture capital in Western Australia represents the single largest identifiable source of venture capital and despite it being cited as possessing a strong entrepreneurial spirit, it has mostly focused on later stage investment. There are a number of possible reasons for this, including:

- A relatively small number of investment ready early stage ventures in Western Australia.
- A preference for the risk-reward profile offered by later stage venture capital, which is the result of the economic dynamics of funds management and performance which in most cases seems to favour a smaller number of larger, later stage investments over a large number of small, high-risk investments.
- The immature nature and absence of critical mass of formal venture capital investment in Western Australia, which has resulted in an absence of specialist skills and early-stage investment experience among venture capital investors and the limited development of the strong international networks and linkages that are often required for venture assessment and development at an early stage.

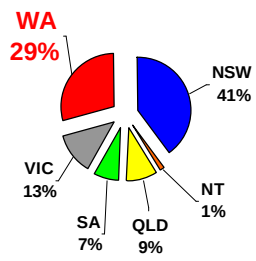
4.4 Corporate Venture Capital

Corporate venture capital, or corporate venturing, is present in Western Australia but limited because of the small corporate presence in the State. Companies such as Clough Engineering, Woodside Petroleum (Metasource), GRD Group and Wesfarmers regularly make venture capital investments. Corporate venture capital is often criticised because the corporate culture, corporate strategic priorities and the process of intrapreneuring can often be detrimental to the focus and best interests of the venture. However, corporate venture capital in Western Australia has been cited as being a good local source of links to world-class business and markets. It is also relevant where expensive specialist capital equipment is required to develop and test a venture prototype or product.

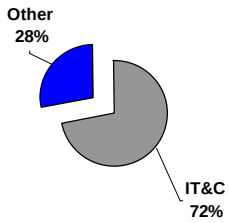
4.5 The Share Market

The most interesting aspect of venture capital in Western Australia is the uniquely significant role that the formal equities market plays as a source of venture capital. In 1999-2000, twenty-five companies with registered addresses in Western Australia raised under $15 million each via Initial Public Offerings (IPO). This represented a source of some $160 million of venture capital and represented 30 percent of all IPOs under $15.0 million in Australia during 1999-2000. However, the availability of such venture capital seems to be very much driven by the general investment sentiment. For example 72 percent of the IPOs in Western Australia mentioned above were in the IT&C sector, reflecting the market sentiment of the time.

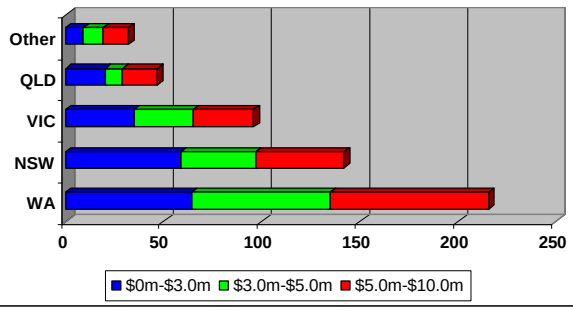
Source of IPOs Under $15.0 million 1999-2000 (Source: Iress 2002)



Sector Allocation of Western Australian IPOs 1999-200 (Source: Iress 2002)



Registered Addresses of Listed Companies Capitalised Under $10.0 million (Source: Iress 2002)



Furthermore, Western Australian companies account for 40 percent of all companies currently listed on the Australian Stock Exchange with market capitalisations of less than $10.0 million.

Although the share market represents a relatively easily accessible source of venture capital when general market sentiment supports investor

confidence, funding rapidly dries up when sentiment subsides leaving the venture in a listed environment, with no immediate avenue to subsequent funding. Because it is relatively easy to list, many ventures are exposed to a listed environment far too early in their development, resulting in a misallocation of scarce financial and managerial resources.

4.6 Socio-Cultural Observations

Venture capital investment is an intensely social process and as such it is prudent to make a number of socio-cultural observations in relation to the Western Australian scene:

- Because of Western Australia's physical isolation from major world markets and commercial centres, many businesses that are based in Western Australia (except those with strong strategic or operational ties) remain in Western Australia because their stakeholders make a lifestyle 'choice'. This places an external influence on the business plan of many local ventures, which is not always commercially optimal.
- Many Western Australians have an isolationist attitude. This stems from the late 1800s when Western Australia did not wish to join the Federation movement, but was forced to participate by migrant miners. This attitude was perpetuated during the early 1900s when communication and travel technologies placed a considerable physical barrier between Western Australia and the national decision making centres of the Eastern States. In part, this attitude remains.
- Western Australia's economic base (resources and agriculture) has its roots founded in a 'pioneering spirit' which historically manifested itself in exploration and experimentation with new methods and products. The State's entrepreneurial spirit today still carries much of this legacy.
- Most inherited wealth in Western Australia has been accumulated over only a few generations and has typically been developed from 'entrepreneurial' activity. This is a double-edged sword in that some of this wealth has a higher propensity to invest in risk as a result of its origins. On the other hand, some of this money has become very conservative in recognition of the difficulties associated with risk investment in Western Australia.
- In Western Australia, successful business people are at the worst treated with a degree of mistrust, at best not held in the same reverence as say sporting identities and most commonly simply not celebrated in Western Australian society at all.
- Western Australia is a small and close-knit society, where social and professional and business networks overlap extensively. However, there remains a considerable social distance between 'backyard' inventors, research and development academics, entrepreneurs and the financial community.
- There is an absence of a 'technology' culture in Western Australia, which is exacerbated by the lack of any 'icon' technology companies in the State.

- Western Australia hosts very few corporate headquarters outside its few resource companies and firms or groups such as Wesfarmers and BankWest. This results in a relatively low level of strategic capital, which is depleted even further every time a corporate headquarters in Western Australia migrates to the Eastern States.
- The entrepreneurial culture in Western Australia still carries a legacy from the 1980s, where a number of cases of 'over-promotion and under-delivery' painted Western Australia in a negative rather than positive light.
- The venture creation community as a whole is highly fragmented; with large gaps existing between the various stakeholders. This is a paradox because the sector is quite small and closely knit, but remains fragmented by a tendency towards competitiveness at the expense of cooperation.

5. Discussion of the Issues

Despite its many strengths the Western Australian venture capital sector requires further enhancement before it can fully support the level of economic diversification desired within the State over the long-term.

5.1 Sources of Venture Capital

There are inadequate sources of venture capital both in terms of the availability of funds and diversity of sources, particularly at early stages. This means that there is an absence of a clear funding path for start-up businesses. This is not surprising given Western Australia's relatively small capital market and commercial infrastructure. However, it does appear that the existing venture capital resources are not operating at optimal efficiency.

Early stage ventures in Western Australia seem to rely heavily on unstructured angel networks, Commonwealth Government programs and in rare cases, limited formal and corporate venture capital. Sourcing early stage venture capital from the Eastern States or overseas is generally difficult because the "tyranny of distance" makes the intense investment management processes that are required at early stage problematic. Further, the tendency for early stage ventures to seek a listed environment when general market sentiment is in their favour is of concern. Very few of these ventures mature into world-class businesses and a major contributor to their failure is the resource distracting nature of a listed environment. A concerted effort needs to be made to better marshal the existing local resources and perhaps stimulate increased venture investment activity at the early stages.

5.2 Socio-Cultural Issues

Although the Western Australian investment culture carries a legacy of entrepreneurial spirit, there are aspects of the Western Australian culture that are antipathetic towards new venture creation.

A major problem seems to be the general attitude harboured by society toward business personalities, both successful and unsuccessful. The fact that successful entrepreneurs are not celebrated outside their own circles means that individual success stories are not well known and inspiration for aspiring entrepreneurs is largely absent. Further, the presumption that entrepreneurial failure occurs either because the entrepreneur is grossly incompetent or because they have engaged in dubious behaviour means that there is a critical gap in the entrepreneurial learning process. These attitudes are partially a legacy of the 1980s and a concerted effort is required to change these attitudes and perceptions both within Western Australian society and externally.

The intensely social nature of the Western Australian business environment provides great potential for strong local networks in the venture capital scene. However, currently there is a considerable social gap between inventors and research academics, entrepreneurs and the financial community. This makes it more difficult than is perhaps necessary for start-up ventures to gain access to potential investors and necessary human capital. This problem is further exacerbated by the highly fragmented nature of the venture capital industry itself in Western Australia.

A concerted effort to bridge these social gaps and to bring a higher instance of organisation to the venture capital industry in Western Australia would go a long way to making the existing venture capital resources in Western Australia more efficient. Over the longer term a process is required to educate society on new venture creation and to change existing perceptions. It is only through such a program, combined with some successful venture creations that the entrepreneurial spirit that is inherent in Western Australian culture will result in successful industrial regeneration. The entrepreneurial culture of 'over-promising and under-delivering' also needs to be curbed and this will only be achieved through a process of education and investor awareness that renders over-promotion ineffective.

5.3 Supportive Infrastructure

The significant size of the services sector in Western Australia (63% of Gross State Product) is indicative of the advisory resources that are available in the State. Although, there are numerous management, legal, accounting, investment banking and marketing advisors in Western Australia, the relevance of their services to a start-up venture is variable.

If we acknowledge that early stage venture creation and venture capital investment requires specialist skills and services, then we need to identify providers of those services and make them visible and accessible to start-up ventures. Appropriate advisors need to be identified early in the venture creation process, such that a long term advisory relationship can be formed. Furthermore, these advisors need to be well networked, not only locally but also with Eastern States and international advisers and sources of capital and other resources. They also need to know when their value-add is diminishing and help introduce the venture to parties who may be able to contribute additional value. The fact that Western Australian advisers have a high propensity to accept equity in lieu of cash fees makes them more accessible to cash starved early stage ventures. However, it also can be a motivation for ventures to seek a listed environment too early in their development cycle.

5.4 A Supportive Government

Attempting to create a more effective venture creation framework in an environment where the government is either anti-entrepreneurship or indifferent is a futile exercise. Government support for a

more effective venture creation environment goes well beyond providing public sector funding. The government can play a significant role in helping to marshal local resources, educate society and change perceptions through promotional, educational and networking initiatives.

An important role which has not been met by any participant in Western Australia as yet is the collation and publication of data relating to venture capital in Western Australia, including the identities of actors and details of venture capital transactions that are being executed.

The government also has a role in promoting Western Australia globally as a place to invest and operate a business. The 'lifestyle' element to living in Western Australia, combined with strong education facilities makes it an attractive option. However, business will not choose to stay in or migrate to a place as commercially isolated as Western Australia without real economic incentives.

The guidelines that are outlined in the following sections are designed to address these issues in a collaborative and coordinated manner.

6. Guidelines for State Government

The Government's role in any venture capital agenda will always be the subject of some debate. However, there should at least be a relative level of agreement on two issues:

- First, new ventures, particularly those based on new technologies, contribute disproportionately to economic growth, employment, exports and industrial regeneration. Further, because they are typically based on new or emerging markets, they contribute significantly toward meeting the current and future needs of society. As such, it is reasonable to argue that the creation and maintenance of an environment conducive to new venture creation should be a public policy priority.

- Second, the distinct absence of early stage venture capital in Western Australia that has been observed is not unique. Commonly known as the 'equity funding gap', the scarcity of early stage venture capital investment has been noted in United Kingdom, several European Union countries and from time to time in the United States. This 'equity funding gap' occurs because of a failure of the private sector market mechanism at early stage venture capital, which is attributed to a range of factors that are common to early stage ventures, high-risk investment and the economic dynamics of funds management. Numerous public sector programs around the world have been successful in rectifying this market failure.

Public sector participation in the venture capital market can adopt one, or a combination of four main forms:

- Direct intervention that provides ventures with an alternative source of capital in the form of public sector grants.
- Direct intervention that is designed to modify certain market or investment variables in an attempt to encourage private sector venture capital investment in early stage ventures.
- Indirect intervention that is designed to improve the efficiency of the existing venture capital resources by facilitating networking, educational and promotional initiatives that increase market accessibility, improve the quality of venturing and change existing detrimental perceptions and attitudes.
- Fiscal intervention at the venture level that is designed to reduce the operating costs of new ventures.

6.1 Venture Grant Schemes

The allocation of public sector funds to ventures represents the most direct form of public sector intervention. Although, public sector grants can represent a much needed lifeline for early stage ventures, the allocation of public sector funds for general commercial application is often rendered

inefficient because of the absence of commercial decision making in the allocation process and the fact that such programs tend to be subject to intense political scrutiny. Public sector grant schemes seem most effective when they are provided for a specific application within the venture. Examples include a business planning process, commissioning market research or conducting specific technical research and development. The Commonwealth Government COMET and R&D Start Grant programs operate on this basis. While such grants provide financial assistance for targeted activities, they do not provide the working capital requirements needed for financing sustained business growth.

6.2 Intervention Designed to Encourage Private Venture Capital Investment

Public sector programs designed to encourage venture capital investment have been effective in other jurisdictions such as France, Germany and United Kingdom, and indeed were the motivation behind the Commonwealth Government's IIF Program. These schemes seem to be most effective when targeted at stimulating formal venture capital investment. The impracticalities of attempting to stimulate business angel investment by this method are prohibitive and a program targeted at corporate venture capital would, but its nature, tend to be sector specific in most instances.

Before we can explain how such programs serve to stimulate formal venture capital, it is important to understand some of the dynamics of early stage formal venture capital investment. At least four factors have been identified as contributing to the scarcity of early stage formal venture capital investment:[1]

- First, early stage venture investment presents the investor with a significantly disproportionate risk-reward profile. This is the result of the difficulties associated with measuring what are typically immature or highly fragmented markets, the long lead time to commercialisation and investment harvest, the risks associated with accelerated technology obsolescence and the fact that early stage ventures invariably lack the necessary resources to capitalise on their opportunity.

- Second, later stage venture capital funds have historically outperformed early stage venture capital funds in terms of both size of returns and security of returns. The only exception has been in the United States during the 1990s, where the 'Silicon Valley Phenomena' resulted in quantum and accelerated early stage venture capital fund returns. However, this was arguably a unique experience and not likely to be replicated in Western Australia.

- Third, early stage venture investing frequently requires ongoing investment such that the early stage investor is not excessively diluted by subsequent rounds of financing or by decreasing valuations.

[1] Murray, G. (2000). *Early Stage Venture Capital Funds, Scale Economies and Public Support,* Warwick Business School, Warwick University, United Kingdom.

- Finally, early stage venture investment typically involves small investment amounts and intensive investment management. This changes the economics and dynamics of funds management considerably. First, it means that the fund is small and because management fees are based on a percentage of funds under management and governed by industry standards, management remuneration is less attractive. This means that it is difficult to attract quality management to early stage funds and because raising investment funds is contingent on the management's reputation, it is difficult to actually raise the fund. Second, because early stage investments require intensive management, a larger number of investment executives are required and thus the fund's costs are significantly higher.

Government policy designed to encourage formal venture capital to invest in early stage ventures is commonplace. Such policies are frequently based on three types of instrument:[2]

- **Downside Protection Instruments** are policies that are designed to partially protect the early stage venture capital fund from the considerable downside risk by underwriting investment losses. Because early stage venture capital funds are considered by the institutional investment community to carry a high degree of risk, these programs make it much easier for an early stage venture capital fund to raise funds. However, because the downside is limited, fund managers can become overly aggressive in their investment behaviour. Examples of such programs include the SOFARIS Scheme in France that covers 50 percent of the loss for a five-year period and the BTU Scheme in Germany, which covers 75 percent of the loss over a five-year period.

- **Upside Leverage Instruments** are policies that are designed to multiply the financial benefit that the early stage fund receives from a performing investment. This is achieved by coupling public sector funds with private investment on the basis of some predetermined ratio, where in the case of a successful investment, the government receives the return of its capital, plus a market linked interest rate and possibly a disproportionately small percentage of the profits. This provides the early stage fund with a relatively cheap source of capital through which it can obtain significant upside leverage for its institutional investors. An example of such a scheme is the Commonwealth Government's IIF Program.

- **Fund Costs Support Instruments** are policies designed to subsidise the costs of operating an investment fund. The smaller, early stage venture capital funds are not able to support the economies of scale that the larger later stage investment funds can. Management fees and compliance costs absorb a larger portion of resources in an early stage fund than they do in a later stage fund. Further, because management fee rates are based on industry norms, and because institutional investors have a large amount of bargaining power with the smaller funds, reputable fund managers are rarely attracted to early stage funds. Policy can overcome this predicament by

[2] Murray, G. (2000). *Early Stage Venture Capital Funds, Scale Economies and Public Support,* Warwick Business School, Warwick University, United Kingdom.

supplementing the costs associated with operating the fund, including the fund manager's fee. An example of such a scheme is the European Seed Capital Pilot Program.

6.3 Strengthening the Venture Creation Environment

Whether additional early stage venture capital resources are attracted or not, the efficiency of existing resources can be improved by introducing a range of integrated and coordinated programs aimed at improving the quality of venturing in Western Australia. Critical to the success of such a policy initiative is to make it a Government priority that is driven from a high level through all departments, such that it manifests itself in a coordinated approach.

The Venture Capital Unit of the Queensland Department of State Development has developed such a program known as the Capital Raising Pipeline (the 'Pipeline'). The Pipeline sources early stage ventures from universities, entrepreneurs, corporate spin-offs, Cooperative Research Centres and Government research programs and guides them through a five stage program designed to transform them into an investment ready venture.

- The first stage is a series of workshops designed to introduce the venture to the phenomenon of venture capital and the realities of the venture capital markets.

- The second stage is a series of workshops designed to assist the venture in becoming venture capital investment ready. This involves identifying potential venture capital resources, preparing an investment ready business plan and learning to pitch the opportunity to potential investors. The Pipeline also attempts to match ventures with suitable private sector mentors at this point.

- The third stage emphasises the importance of networks in both raising venture capital and in building the business. The Pipeline helps the venture identify appropriate networks and engage them.

- The fourth stage is designed to assist ventures in targeting the most appropriate sources of venture capital and engages those sources either directly, or through facilitated investment showcase seminars and formal angel investor networks.

- The fifth stage, involves introducing the venture to the global marketplace through international networks and relationships with foreign government agencies.

In its first two years, The Pipeline program has assisted approximately thirty ventures to raise a total of $15.0 million. The program's success has not been the result of its structure as much as the policy momentum that surrounds it and the following factors have contributed equally to its success:

- Government people driving the program have a strong understanding of venture capital and relevant commercial experience.
- The policy is driven from senior Cabinet members.
- The program is operated in significant consultation with the private sector.
- The program is not sector specific and has an overriding State development agenda.
- Regional ventures have access to the program via regional State Development Centres.
- The program is supported by initiatives such as the State hosting the Australian Venture Capital Association Conference.

6.4 Fiscal Intervention at the Venture Level

Because most fiscal tools are only available to Commonwealth policy makers, the State Governments ability to influence ventures at this level is limited. However, State Government taxes such as payroll tax can be a significant cost to early stage ventures. Making early stage businesses exempt from such anti-growth government charges can go a long way toward stimulating growth and generating new businesses that will make a much more significant contribution toward public revenues if allowed to prosper. What is important is determining the most appropriate fiscal policy environment to stimulate the establishment and growth of small firms. Western Australia has enjoyed a strong track record in the creation of new business ventures. In 2001 there were an estimated 132,000 privately owned, non-agricultural small firms, under the control of an estimated 186,300 owner-managers, with 66 percent of these firms home-based.[3] It can be seen therefore that the majority of the State's small firms are micro-enterprises employing only the owner-manager. While such ventures remain important within the overall economic development of the State's economy, the reality remains that most small businesses will remain small, will not require venture financing and will contribute only marginally to the employment and wealth creation within the community.

Government policy should be placed on assisting what have become known in the United States as *Entrepreneurial Growth Companies* (EGC).[4] These EGC firms are growth oriented and embrace innovation with a desire to quickly expand beyond their regional boundaries to become established in national or international markets. It is important to note that such firms are not necessarily based on high technology and generally do not require significant injections of venture capital from foundation.[5]

What distinguishes the EGC firms is their desire to find innovative points of differentiation within their product or processes to offer superior quality or value to the market. Productivity enhancement

[3] *Characteristics of WA Small Business*, WA Labour Market Economics Office, April 2002.
[4] NCOE (2001). *Five Myths About Entrepreneurs: Understanding How Small Businesses Start and Grow.* Washington, D.C., The National Commission on Entrepreneurship.
[5] Bhide, A. (2000). *The Origin and Evolution of New Businesses*. Cambridge, Oxford University Press.

through innovation coupled with entrepreneurial drive by the owner-managers is the key to successful small firm growth and subsequent growth.

6.5 Recommendations

The Western Australian Government should appoint an Advisory Council comprised of industry leaders in the Western Australian venture creation community to commission research and advise the government on the following:

State Government Research and Development Grant Scheme

With the R&D Start Grant program suspended in December 2001, a significant hole has been created in the funding of research and development activities in Western Australia. With the private sector generally unwilling to carry risks associated with research and development this is a matter of concern. A research and development grant scheme funded by the Western Australian Government would be a welcome initiative. However, the successful operation of such a program would require significant resources, not only in terms of the actual grants, but also to facilitate the necessary administration systems. The most prudent way to move forward on such an initiative might be to joint venture a research and development grant scheme with the Commonwealth Department of Industry.

State Government Scheme Based on an Upside Leverage Instrument

Downside protection instruments and fund operating cost support schemes do not provide a natural incentive for quality investment decision making, and as such are prone to poor performance and political scrutiny. If the State Government is to attempt to address the 'equity funding gap' that exists at early stage venture capital investment, the most appropriate instrument through which this could be achieved is an upside leverage instrument similar to the current Commonwealth Government IIF program. In fact, a similar scheme was suggested for the national context by reputable venture capitalist Bill Ferris.[1]

The proposed Western Australian scheme should consider the appropriateness of the following parameters:

- A directive to invest in early stage ventures.
- Investment of $20 to $25 million of public monies to be coupled with private sector investment on a ratio of 1:1 in a fund with a life of ten years. The Government would receive a return of its capital, plus a market linked interest rate, plus 10 to 15 percent of the profits, which are to be applied to funding a second early stage fund under a similar scheme. This provides potential for the program to be self-funding in the future.

[1] Ferris, W.D., (2001), 'Australia Chooses: Venture Capital and a Future Australia', *Australian Journal of Management,* vol 26. Special Issue.

- A State Development based investment charter that is designed to promote industrial diversity within Western Australia.
- A mandate for the fund to be based in Western Australia and to review regional investment opportunities.
- A national tender for the management contract with selection based on a track record in early stage venture capital investment. The Government might also consider subsidising the management fees for the first few years to attract a quality manager.

Such a scheme would increase the availability of early stage venture capital in Western Australia as well as improve the dynamics of the local venture capital sector, this increasing the State's venture creation strategic capital.

State Government Sponsored Investment Ready Pipeline

The Queensland model has served to demonstrate that a clear and accessible path to financing for ventures can make a significant difference to the new venture creation environment. The Western Australian government should investigate methods of working with the private sector to establish a model similar to the Queensland Government's Venture Capital Pipeline. Not only would such a program assist ventures, but it will also provide Western Australian investors with an improved supply of investment ready product and thus facilitate the growth of formal venture capital, angel investor networks and corporate venture capital alike.

Taxation Relief

Taxation breaks that will directly contribute to the growth of new business ventures are a welcome initiative. However, as noted above, the State Government is limited in its capacity to use taxation in this way and care needs to be taken to avoid the creation of taxation shelters that reduce the overall competitiveness of ventures and become opportunities for manipulation.

7. Guidelines for Industry

One of the key characteristics of the Western Australian venture capital industry is its highly fragmented nature. This is detrimental to an effective venture creation environment for at least four key reasons:

- First, it is not conducive to information sharing and service collaboration between industry participants.
- Second, the industry is not visible to entrepreneurs and venture managers, which means it is difficult for ventures to identify the resources that they are attempting to obtain.
- Third, a lack of 'solidarity' on critical industry issues renders it an ineffective lobbying group.
- Fourth, the absence of cooperation combined with the small scale of venture capital in Western Australia renders the sector irrelevant in the national and global context.

Although some informal networking does occur it is typically limited to existing commercial relationships. As such, some form of venture capital industry organisation is desirable in Western Australia. In the Eastern States the Australian Venture Capital Association (AVCAL) performs this role effectively. However, historically its activities have been largely confined to the Eastern States, with recent forays into South Australia and the Northern Territory.

There can be no argument that AVCAL is the primary venture capital industry association in Australia. Further, any agenda that it may wish to pursue in Western Australia should be welcome by industry. However, the current state of fragmentation of the Western Australian venture capital industry needs to be addressed at micro-industry level through frequent industry events that address local industry issues and provide the opportunity for networking. An independent local organisation risks being irrelevant in the national and global context because of the immature and small scale of the Western Australian venture capital scene. It is our contention that there are only two forms that a Western Australian venture capital industry organisation can realistically adopt:

- **A local Western Australian chapter of AVCAL** that has a membership that reaches into the broader venture capital community. Ideally, staff independent of industry participants would operate the Western Australian chapter. However, given that the convenor must possess a degree of industry knowledge to be effective, it is unlikely that a totally independent person will be identified in the relatively immature Western Australian sector.

- **A local organisation that is independent of AVCAL**, but closely aligned with the national organisation. This would allow micro issues to be addressed, while maintaining vital links with the

national organisation. Further, an agenda could be established that if the local organisation achieves certain milestones, it is adopted as a chapter of AVCAL at some future date.

A third option is the status quo, that is a series of uncoordinated events that are hosted independently by the universities, government departments and industry participants, outside of any collective industry agenda and on an ad hoc basis. This has a significant drawback in that it does not provide for the industry to be identified as a body, or for a long-term industry improvement agenda to be developed and pursued.

Whatever form a local industry body may adopt, its core objective should be to improve and promote the quality of venturing and venture investment in Western Australia by:

- Increasing the effectiveness of communication and cooperation between participants.
- Identification of key industry issues and potential solutions to problems.
- Lobbying of State government on local industry issues.
- Forming relationships with national and international investment markets and industry organisations.

7.1 Recommendations

An Inclusive Approach to the Formation of a State Venture Capital Industry Organisation

A council of senior industry participants should be formed for the purpose of pursuing a three-staged agenda:

- First, to obtain a view from a broad range of Western Australian venture capital industry participants on the preferred structure of a local venture capital industry organisation.

- Second, to engage the Australian Venture Capital Association at an appropriately senior level to determine its objectives for Western Australia and to establish the most appropriate strategy to move forward.

- Third, to facilitate the implementation of that strategy.

8. Guidelines for Universities

The role of the universities in any State venture capital agenda is two-fold:

- First, the universities are the primary educators of the human capital that form inventors, entrepreneurs, venture management and investment management executives.

- Second, their research and development activities are a major source of new technology and innovation on which new ventures can be based.

8.1 Source of Human Capital

Undergraduate and graduate business courses at all the universities in Western Australia offer programs in entrepreneurial studies. Most of the State's undergraduate and postgraduate business or commerce programs offer at least one or two units within a degree major in the area of small business management or entrepreneurship. At an undergraduate level, Curtin University of Technology has been a national leader in terms of total enrolments in its small business and entrepreneurship programs.[6] The various university business schools also participate in national business planning competitions and support entrepreneurship education at an industry level via sponsorships and targeted short course programs such as the "Small Business Growth Program" run by the Curtin University Business School's Entrepreneurship and Enterprise Development Unit.

Despite an increasing level of activity in entrepreneurship education within the business school's curriculum, there remains a gap within most university programs in terms of venture capital financing and commercialisation of innovative ideas. Much of the focus of university-based courses has been placed on small business management and new venture creation of which venture capital is dealt with as a relatively small albeit important component. The level of participation between the university business schools and the venture capital industry remains low with few dedicated venture capital courses available to students. Further, the targeting of this education is somewhat unfocused, offering a relatively broad, generic approach to entrepreneurship. Within the institutions there continues to be a separation of the various academic disciplines resulting in commercialisation of scientific research being undertaken without much involvement by the business faculties. Within industry there is a lack of targeted programs designed to enhance the skills and knowledge of such groups as professional advisors, engineers and the venture capital sector itself.

The Graduate School of Management (GSM) at the University of Western Australia is seeking to address these issues through the creation of a new specialisation within its MBA program that will

[6] Breen, J., and Bergin, S. (1999). *Small Business and Entrepreneurship Education in Australian Universities.* Melbourne, Small Business Research Unit, Victoria University of Technology.

focus on entrepreneurship and innovation. This specialisation will feature a dedicated unit in venture capital and will seek to integrate business management education into the commercialisation of emerging technologies through a partnership with the University's Office of Innovation and Industry via the University's "Pathfinder Program"[7]. The GSM is also planning to establish a new Centre for Entrepreneurial Management and Innovation (CEMI) with the objective of enhancing the University's engagement with industry in the areas of commercialisation, enterprise enhancement and innovation.

Entrepreneurship is a relatively new discipline within universities but one that has enjoyed substantial growth throughout the world in recent decades. Approaches to teaching entrepreneurship are hotly debated among academics with many, often competing perspectives. However, there is recognition that such programs require a balance between theory and practice, and need to be targeted at multiple communities. To provide an appropriate educational environment for the generation of entrepreneurship and innovation within Western Australia, there is a need for universities to offer programs targeted at entrepreneurs (both prospective and established), as well as the many professionals that comprise the network support environment that surrounds them. For example, professionals such as accountants or lawyers would benefit from education programs designed to prepare them to better assist entrepreneurs seeking to grow their firms or commercialise new products. Engineers and scientists engaged in research areas would also benefit from education programs designed to assist them to commercialise their intellectual property. Education programs could also be usefully targeted at the venture capital sector sharing best practice knowledge among potential investors and business angels.

It is unlikely that any one program will be suitable for all, and universities should ensure that they could offer flexibility in their course design as well as their delivery channels. To be effective, courses in this area must:

- Contain course content and case studies that are contemporary and globally benchmarked, but modified for the local context.
- Draw heavily on industry human capital in the form of adjunct professors and guest industry expert lecturers and workshop facilitators.
- Allow students to network extensively with other institutions and industry, so that career path alternatives are relatively clearer than they are at the present.
- Actively engage with industry to generate real commercial ventures or assist in the development of existing ones.
- Link Western Australian entrepreneurs; venture capital investors and business advisors into international networks of best practice and knowledge.

[7] This program has committed around $700,000 over five years to assisting the commercialisation of emerging technologies from within the UWA academic faculties.

For the various business schools in Western Australia to achieve this, a high degree of collaboration is required, such that the use of limited local industry resources is optimised and not strained by demands from the separate institutions and so that the business teaching and research activities in Western Australia have a fighting chance of having some global relevance. This will not be easy given the highly competitive funding environment in which Australia's universities are required to operate. Specialisation within the five Universities, which seek to focus on each institution's individual strengths, appears to be a preferable option to open competition resulting in duplication and the over stretching of already thin resources.

There is a strong argument that entrepreneurial management units should be offered to students as part of technical curricula offered by the science and engineering faculties. The conventional MBA programs that are offered by the universities currently address general management curricula with secondary (and in some cases limited) focus on entrepreneurship issues. Within the United States there has been a growth in Master of Technology Management (MOT) programs since the first such degree was launched by the Massachusetts Institute of Technology. In contrast to MBA programs the MOT seeks to combine business management skills with engineering and science disciplines. Regardless of whether the program is an MBA, MOT or another type of course, there is a current gap in the formal education of engineers, scientists and business managers within Western Australia's higher education institutions in the process of commercialisation.

The State's business schools can also play a role in promoting entrepreneurship. Babson College in Massachusetts has a 'Hall of Fame', which profiles successful entrepreneurs, particularly those who are members of the University's Alumni. Making students aware of the story behind local entrepreneurs would go a long way to increasing the level of awareness in Western Australia. The recently launched "40 under 40" program to identify and reward the leading young entrepreneurs and leaders within Western Australia is a positive step in this direction and one embraced by the State's universities. However, despite such initiatives entrepreneurship education remains undervalued in comparison with more established, high profile disciplines.

8.2 Improving the Commercialisation of University Research and Development Activities.

The successful commercialisation of University originated research and development activities has been a challenge that has been lamented worldwide. In keeping with a central theme of programs aimed at improving the general effectiveness of this space, solutions to this problem seem to be born in the spirit of collaboration. By harnessing the resources of a network of university commercialisation offices, individual faculties within the State's university community, industry and government the chances of successful commercialisation of university-based research and development would surely be improved. Furthermore, such a network is critical in an environment where the individual institutions are too small to be globally relevant.

Evidence from research in the United States suggests that enhanced levels of innovation and commercialisation were found in regions were there was a wide range of different types of research and development activities (e.g. university research, non-profit research centres, for-profit research centres), which interlinked, but were independent of each other.[8] Universities and specialised research centres were found to be the 'driving force' behind innovation in almost all regions studied across the United States with universities able to 'institutionalise entrepreneurship' and encourage a regular flow of commercially attractive ideas.[9]

The universities of Western Canada have set an interesting precedent. Westlink Innovation Network Ltd is an organisation of universities in the States of Manitoba, Saskatchewan, Alberta, British Columbia and Western Ontario. Its objectives are to:

- Increase general local, national and international awareness of the value of the research and development activity in the Universities.
- Promote a more collaborative approach to technology transfer.
- Create an entrepreneurial culture within the Universities.
- Promote and facilitate increased activity in knowledge-based economic development and scientific innovation.
- Develop systems for monitoring human capital within the universities and externally such that it can be better networked for the purposes of research and development and commercialisation.
- Attract external investment and intellectual capital.

Westlink is pursuing these objectives through initiatives in four main areas:

- It acts as a catalyst for improved networking by facilitating meetings between member university commercialisation offices, university faculties and by hosting commercialisation showcases. It also champions regional technology transfer through national and global advocacy.
- It conducts a number of commercialisation short courses and seminars for university staff and industrial partners.
- It prospects for opportunities to bundle and package technologies from across member universities in order to create commercialisation opportunities that would not exist for technologies otherwise.
- It undertakes a range of activities for government and industry on a fee-for-service basis, such as scanning for technology investment opportunities.

[8] Porter, M. E. (2001). *Clusters of Innovation: Regional Foundations of U.S. Competitiveness*. Washington, DC., Council on Competitiveness.

[9] Ibid.

Westlink also has access to a small pool of seed investment funds that it can use to stimulate the commercialisation of research and development activities within its member universities.

The recent formation in Australia of the Australian Institute for Commercialisation (AIC) was a Queensland Government initiative designed to advocate the improvement of the commercialisation environment in Australia in general. However, it seems to have a fairly high-level agenda to identify issues inhibiting commercialisation, advocate necessary policy change, promote relevant education and cultural change and promote the sharing of information between AIC members. The University of Western Australia's "Pathfinder" program is a program designed to improve the commercialisation activities within that institution by improved intra-institution and external networking and access to a pool of pre-seed capital. However, it does not seem to address the issue of inter-institutional cooperation, particularly with other Western Australian universities.

Academic research into entrepreneurship and its related topics (e.g. small business management) has expanded significantly within Western Australia's universities over the past decade. Edith Cowan University established a Small to Medium Enterprise Research Centre (SMERC) during the 1990s and the overall participation of Western Australian universities at such international conferences as the International Council of Small Business (ICSB) in recent years has been good. Despite such activities the focus of academic research with the State's business faculties has tended to weight towards small business management rather than innovation and commercialisation. The integration of business research with scientific research to achieve enhanced commercialisation outcomes has remained low.

8.3 Recommendations

As a Source of Human Capital

Western Australia's universities should examine their undergraduate and postgraduate curricula in the fields of entrepreneurship, small business management and innovation to ensure that collectively they:

- Are aligned to meet the needs of local industry and are able to deliver tangible benefits to industry via assisting new venture creation, business development or commercialisation of ideas.
- Are targeted at the needs of a variety of different stakeholders (e.g. entrepreneurs, professional advisory groups, R&D specialists, venture capital).
- Can be delivered to entrepreneurs and industry in a flexible 'just-in-time' manner that adapts to the needs of the student including those entrepreneurs and other industry participants who lack the time to undertake large formal degree programs.
- Are grounded in real world applications that can be directly applied to solving business problems.
- Are multi-disciplinary and successfully integrate a range of academic communities (e.g. science, engineering, business and the arts) so as to encourage maximum innovation.

- Engender a spirit of enterprise that produces graduates with a desire to apply their imaginations to finding innovative solutions with commercial potential to create new business ventures, and who are equipped with the knowledge, skills and networks to succeed at such ventures.

Improving Commercialisation of University Research and Development Activities

Western Australia's universities should examine their research and commercialisation policies to ensure that they:

- Work with local industry and venture capital to improve the process of technology transfer.
- Establish benchmarks for the commercialisation of university generated intellectual property with a view to ensuring that they efficiently disseminate knowledge.
- Encourage multi-disciplinary research and commercialisation activities designed to bring otherwise disparate academic faculties together around projects that can assist local industry to innovate and achieve enhanced international competitiveness.