THE COMPETITIVENESS OF AUSTRALIAN INDUSTRY

Report No. 2

The Science and Technology Based Industries

Australian Academy of Technological Sciences and Engineering
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FOREWORD

To highlight the challenges and problems of competing in world markets the Academy held Symposia in 1991 and 1992 respectively on “Australian Competitiveness - The Vital Role of Technology” and on “Globalisation of Technology - Threats and Opportunities”. In addition to these Symposia the Academy has carried out a series of studies on the competitiveness of different sectors of Australian industry.

In this, the second of three studies, the competitiveness of small start up science and technology based enterprises is examined. The Academy is grateful to Mr E W Saunders FTS who led the study, to the study team, and to all companies and organisations who provided the information and opinions on which the study is based.

The report highlights the need to commercialise Australian research ideas, to support the development and growth of science and technology based companies particularly in their formative years and the important role such companies can play in the future growth of industry and employment.

The report questions aspects of how we in Australia conduct ourselves today and points to examples of better progress under alternative managements.

It is the essence of science and technology, and indeed, good management, to be continually critical of what we do, in the search for ways of doing better.

I endorse this approach, although this may also mean that not everyone agrees with everything in the report.

The purpose of the report is not to represent an overall Academy view, but to outline the conclusions of a study of this important issue by a group of experienced and dedicated Fellows of the Academy. I recommend the report for thoughtful consideration.

President
Australian Academy of Technological Sciences and Engineering

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It is also grateful to the Team who carried out the study:

Mr E W Saunders	Chairman, formerly Director, ICI Australia and various other companies including two venture capital companies
Dr W I Whitton	formerly Company Director, and Director CSIRO, Institute of Industrial technology
Dr R H Brown	formerly Professor of Engineering and Chief of CSIRO Division of Manufacturing Technology
Mr I W Shedden	Chairman and Chief Executive, Shedden Technology Management Pty Ltd
Mr H C Coe	Executive Officer, Australian Academy of Technological Sciences and Engineering

The Study Team wishes to thank the Chief Executives of the many companies who were interviewed, the State Divisions of the Academy who were involved in a number of interviews, and the many individuals from the financial sector, the IR&D Board and other Government bodies who so willingly shared their views. The Study Team also wishes to thank Dr Anna Bodi and Mr Tony Luksetic of Monash University who assisted in the analysis of the results of the interviews and Mr Lee Boldeman of DIST who assisted with the drafting of the Report.

GLOSSARY OF TERMS

Innovation and invention should be carefully distinguished. Innovation is a complex, iterative, learning process, not a linear progression and involves feedbacks from all the elements of that process.

The terms used to describe that process are:

Innovation	A commercially successful exploitation of an idea, a new organisational arrangement, an invention, or an opportunity. In the case of product innovation the idea involves the development of a new or an improved product, whereas with process innovation the idea involves the development of a new or an improved production process.
Research (R)	Fundamental, basic, strategic or applied research. It includes investigations, literature search, information retrieval.
Development (D)	Scale up in laboratory, scale up to pilot plant or prototype plant trials. It can cost between 3 to 6 times the cost of research depending upon the technology and the size of the firm [1].
Commercialisation (C) which includes	
Production	Design of product, design of process, design of plant fulfilling all production and engineering requirements. Construction of full scale plant. Continuous production of product.
Sales	Marketing, Distribution, Selling, Sales Service and Technical Development. Resulting from sales-new or improved product requirements are defined requiring new R&D. Commercialisation activities can cost 2 to 5 times the cost of research [1].

Other terms used are:

R&D	Research and Development. However in Australia the term is often misused, neglecting much of the development activities.
Industrial Developer	is an experienced businessman with interest in industrial development as distinct from commercial speculation. He usually has some depth of understanding of the technology and markets involved and has a track record in establishing small businesses with the tenacity, flexibility and leadership qualities that implies.
SSE	small, start-up enterprise which with growth becomes an SME.
SME	small and medium sized enterprises.
S&T based industries	Those industries for which science and technology play a major role.
Keiretsu	Japanese industrial groupings.

1. EXECUTIVE SUMMARY

"The competition which really counts in Capitalist Systems is not measured by profit margins but by the development of New Commodities, New Technologies, New Sources of Supply, New types of Organisations." Joseph Schumpeter [2]

This report is based on interviews with over sixty Science and Technology (S&T) based companies, interviews with related institutions, the experiences of members of the Academy in innovation and business, and a survey of relevant literature. It places particular emphasis on the role of Small Start-up Enterprises (SSEs) in innovation.

For a long time Australia has been experiencing a decline in its relative standard of living. In part this is because we have failed to appreciate the key role that innovation plays in economic development. Indeed, we have failed to appreciate that successful innovation involves the application of creative intelligence in the pursuit of market opportunities, not the invention of gadgets. This lack of understanding, compounded by confusion over the relative importance of creativity and efficiency, has inhibited action to arrest the decline.

Australia's geographical isolation, and the insularity encouraged by past protectionist policies, has not encouraged the development of the innovative, outward-looking culture necessary to take advantage of the creative skills of our people and of the rapidly expanding market opportunities for high value-added and specialty products and services. Consequently, the Government's abandonment of protection has been a watershed in Australia's economic development. As a result, many of the cultural barriers to innovation have started to break down, but this is a major task which must be attacked in a more systematic way.

While a sustained and adequately funded cultural change program will make an essential contribution, particularly in the longer-term, action limited to this general level will not deal with all the isolating influences which are undermining efforts at innovation:

- Our educational system is isolated from the challenges of industrial development.
- While the importance of an adequate science and technology base has been recognised, action to build this base has occurred in isolation from support for the other elements in the innovation process. As a consequence, government and industry have failed to adequately commercialise the research results.
- The limited commercialisation efforts taking place are often the efforts of isolated Industrial Developers facing overwhelming odds.
- In particular, our Industrial Developers are isolated from adequate sources of finance and the networks which could support their commercial efforts.
- They are isolated from effective support in their product development and export efforts and from significant government demand for their products.
- They are also isolated from effective support from universities and research organisations.
- Regulatory agencies are isolated from any understanding of the burdens that compliance with their requirements impose on small struggling companies.
- And government policy particularly with respect to SSEs and SMEs is often developed in isolation from any real understanding of what it takes to develop and sell a product in a real market.

Once again the Government has been forced to constrain growth because of a blow-out in the balance of payments deficit. The Study Team believes that positive policies towards innovation

are a way of easing this constraint on our rate of growth. The East Asian experience and the recent rapid growth in our exports of manufactures, particularly as a result of specific industry development programs, gives hope that active innovation policies can be effective in stimulating export and import replacement activity. Consequently, we specifically reject the view that the appropriate adjustments can only be induced by an increase in the savings ratio, important though this might be. Nor do we accept that policies directly targeting the growth of exports and import replacement involves a misallocation of resources.

SSEs play a significant role in innovation, that is in bringing research results and other new ideas to commercial reality. They are also significant, particularly if they grow into SMEs, in the provision of new employment opportunities. Consequently, a high birth rate of SSEs, low mortality and vigorous growth towards medium sized enterprises are essential to a healthy industrial economy.

Unfortunately, there are sound reasons for believing that the composition of the manufacturing sector in Australia, is not healthy.

Retained earnings play a significant role in industrial investment and this form of investment is usually directed at those opportunities that the particular firm knows best. It is well understood among capital market theorists that this form of investment is not “efficient” in the particular sense in which economists misuse that term. There are also strong reasons to believe that formal financial markets are not, and can never be, “efficient”. In particular the creation of superannuation funds through special taxation and regulatory arrangements has disadvantaged small business. And while financial deregulation has delivered a number of benefits to consumers, it has also discriminated against innovation particularly through SSEs. Furthermore, institutional rigidities affecting investment flows tend to self-perpetuate the existing industrial structure, creating strong inertia against desirable structural adjustments. Government intervention in capital markets can overcome this inertia.

The Espie Committee Report [3], prepared by the Academy in 1983, concluded that Australia lacked adequate mechanisms for “growing” the medium-to-large firms so essential to long-term success in high-technology industry. In response the Government introduced the Management and Investment Companies (MIC) Program to promote the development of a venture capital industry. However, the MIC Program was opposed by the Departments of Treasury and Finance. Consequently, the program was poorly designed, and grossly underfunded, and the Government was persuaded to terminate it prematurely. Effective action was constrained by an unwarranted faith in the “efficiency” of financial markets and a failure to appreciate the scale and duration of the effort required. Numerous subsequent reports have highlighted this same problem but have still failed to induce an adequate policy response.

In particular the misuse of simplistic economic models has cut us off from the many economic insights discussed in this Report and led us to ignore the realities of dynamic efficiency and consequently to undervalue innovation. It has also led us to grossly underestimate the degree of imperfection in real markets and to overestimate their capacity to effectively coordinate economic activity. Finally, it has led us to ignore adjustment costs. And while we have been so full of talk about the need for economic “efficiency”, we seem to have forgotten the real costs of unemployment and underemployment. In the process we have ignored the tacit knowledge of our industrial developers acquired through experience in real markets and disregarded their advice.

The need for encouraging innovation has been recognised by the present Government but further positive action is needed. Other Governments have actively pursued a wide range of

policies designed to encourage innovation. Details of some of these policies are given in Appendix 2. We must firstly educate, encourage and suitably reward a host of professional Industrial Developers. The current 150 odd Venture Capital professionals do not of themselves constitute a major development management team. They must be supplemented by larger numbers of experienced professionals whose background, usually technical, has been in other fields by awakening them to the challenges and rewards of developing new technology and projects. We do not lack the talent, we have only been looking for it in the wrong places. We must look to such organisations as medium and large existing companies, consulting and contracting companies, university-related technology companies, and smaller organisations to provide the Industrial Developers of the future.

It will, however, be no use encouraging these Industrial Developers to leave their current careers if we do not have the necessary finance available and accessible for them. Because of the high risk profile of the early stages of the development process, this is simply not going to occur through any free market forces. To provide this capital will take a sustained effort of political will which will only succeed if it has multi party support. At every budget negotiation, there will always be a reason to avoid investment in our long term future. The decision to adopt the measures suggested will have to be taken outside the budget process as a matter of National policy - indeed we would say as a matter of National necessity.

The current report primarily addresses the problems facing science and technology based SSEs which it is hoped will supplement the above reports and community consultation. The experiences of larger firms and of small and medium-sized enterprises (SMEs) have been dealt with in the recent reports Managing the Innovating Enterprise [4] and Emerging Exporters [5] prepared for the Business Council of Australia, and McKinsey & Co for the Australian Manufacturing Council respectively. These reports, along with the systematic process of community consultation currently being undertaken by the Minister for Industry, Science and Technology should provide a firm base for the development of policies to support the increasing growth of SMEs and SSEs.

2. SUMMARY OF RECOMMENDATIONS

1. INNOVATION

As innovation is one of the keys to faster economic, social and cultural growth, Innovation, in all its aspects, should form an important part of our National Vision and be afforded high priority.

1.1 CREATION OF AN INNOVATIVE CULTURE

A significant and sustained cultural change program should be undertaken so as to provide the community underpinnings necessary for innovation. It should:

- seek to correct the attitudes that inhibit long-term investment;
- emphasise the sustained, cooperative and creative service required for effective wealth creation and its distribution;
- extend to building a far better understanding of the innovation process, and the practicalities of effective competition in business, in government departments; and,
- Promote sound business ethics and a sense of social responsibility.

1.2 EDUCATION

1.2.1 Schools should introduce students to the role of innovation in sustaining our competitiveness and living standards. They should also introduce students to the broad range of commercial skills required for effective management of business enterprises.

1.2.2 Universities and TAFE Colleges should be encouraged to develop courses on innovation and the management of innovation particularly for executives of SSEs.

1.2.3 A series of appropriate courses should be made available for awakening Industrial Developers with the necessary skills to the challenges of new technology development.

2. THE SPECIAL ROLE OF SMALL START-UP ENTERPRISES

S&T based SSEs are a key part of the innovation process and therefore warrant special targeted support. The following sections deal specifically with the nature of this support.

3. COMMERCIALISATION OF SCIENCE AND TECHNOLOGY

3.1 Government support for industrial R&D through the 150% tax scheme and the associated grant schemes should be continued. This support, however, needs to be balanced by support for the other elements in the innovation process - development and commercialisation. Consequently, the definitions of the expenditures eligible for government assistance under these schemes should be amended to cover all the elements in the innovation process.

3.2 The IR&D Board should continue with R&D Syndication schemes with a preference for a simplified mechanism aimed at encouraging the broad range of innovative activities rather than just research.

4. NETWORKS

4.1 Given Australia's truncated industrial structure, the promotion of networks should be a particular priority. The Government should take a proactive role in the creation of mutually supportive structures for small, medium and large business. Accordingly, we suggest the establishment of a high-level task force to make detailed proposals for the implementation of the Business Council's recommendation for the creation of such structures based on the Keiretsu model.

4.2 Such networks could assist the delivery of government business improvement programs.

5. THE FINANCING OF SSES

While the government has acknowledged that the Australian financial market has failed to adequately finance SSEs, its actions to correct for this market failure have been too tentative to have a significant impact. No single solution seems appropriate and we suggest the following:

5.1 The Government should give selective treatment to promote the establishment and growth of Science and Technology based industries. In this regard the Study Team again draws attention to the numerous reports (Summarised in Appendix 3) that have recommended special provisions for the financing of Small Start-up Enterprises. Such arrangements are commonplace in other countries. The need is urgent and we believe the initiatives being taken by the Minister in the forthcoming Innovation Statement should focus on this challenge.

5.2 Equity Finance

i) The Government should introduce a tax Rebate applicable to individuals, companies, trusts and superannuation funds for money invested either directly in small companies or management funds which qualify as an Industrial Development Organisation. The relationship between the tax rebate and the funds invested would be varied (even year by year) to fine tune the balance between funds required and funds available. Eligibility would be determined through an accreditation process similar to that for Approved Research Organisations taking account of the following criteria:

- experience as a successful business angel or business developer
- an acceptable level of management expertise
- experience of the development process
- adequate business planning
- activities centred in Australia

ii) As the custodians of the largest pool of long-term investment capital in Australia the Superannuation Funds have to invest in such companies. The Government should make the already generous taxation treatment of these funds conditional on their investing a small proportion of their portfolios, say 0.3% initially growing to 1.5% over five years, in venture capital funds or directly in innovative start-up businesses which are export oriented or import competing (USA Superannuation Funds invest around 4% of their funds in SSEs and SMEs).

iii) Australian Banks should be permitted to provide equity funding to financing long-term innovative investments as recommended by the Industry Commission.

iv) The Commonwealth Development Bank should be retained by the Government as a

wholly-owned specialist small business bank for small business.

5.3 Loan Finance. The Government should continue to pressure the banks to lend on a cash-flow basis and for loan finance to be targeted towards export oriented and import competing companies. The Study Team also draws attention to the need to ensure that concern for the rights of lenders should be balanced by a responsibility to preserve the intellectual property organisation and capital invested in struggling businesses.

5.4 Banks be required to report annually to the Reserve Bank to the extent which they have increased finance and lowered borrowing costs to small business, and that the Reserve Bank have the right to discount interest payable on non-callable deposits to those who are judged to be performing inadequately.

5.5 Bridging Finance and Government-backed Guarantees: The Government should extend the range of bridging finance and guarantee schemes available for the increasing number of situations which fast growing companies face which are not covered by existing DIST, EFIC or Austrade schemes.

5.6 Avoidance of unnecessary sources of cash depletion: Government programs and the requirements of regulatory agencies should be structured so as to avoid placing unnecessary charges and other burdens, including uncertainty, on young companies.

6. EXPORT PROMOTION

6.1 Austrade has a key role to play in the acquisition of the market intelligence needed to substantiate export opportunities and the promotion of Australian products and services. We believe that these efforts are seriously under resourced.

6.2 As the funding of these services on a cost recovery basis is inconsistent with the need for small exporting firms to conserve their limited cash resources, some assistance should be provided to SSEs until they become established in the export market.

7. GOVERNMENT PURCHASING POLICY

7.1 The Study Team notes that the Government has recently responded to the Bevis Committee but has not fully accepted that Committee's recommendations. The policy changes made will only be effective if they are supported strongly by senior Ministers and their Departments.

7.2 The Government's limited program to encourage the demonstration and trialing of new Australian products should be revitalised and extended.

7.3 The terms and conditions associated with government contracts need to be tailored to the requirements of SSEs and SMEs and the government should pay its bills promptly so as to give a contractor a neutral cash flow position.

7.4 State and Commonwealth Departments should question the need for bank guarantees against upfront deposits on a case-by-case basis.

8. REGULATORY ENVIRONMENT

The Administrative doctrine of government regulatory bodies should involve a service ethic to limit the costs and the administrative burdens imposed on SSEs and SMEs in meeting their requirements including limiting appeals to higher judicial authorities. Chapter 14 of the recently

released Report of the Independent Committee of Inquiry into Australia's Standards and Conformance Infrastructure, Linking Industry Globally, contains detailed recommendations which we heartily endorse.

9. ASSISTANCE FROM CSIRO, UNIVERSITIES AND GOVERNMENT ORGANISATIONS.

9.1 CSIRO should be encouraged to extend its liaison program for SMEs to SSEs and a mechanism should be found to assist SSEs at low cost until such time as they have a positive cash flow.

9.2 Universities should be encouraged to extend their incubator schemes where they have competence.

9.3 Commercial arms in universities should be encouraged/assisted to give advice to SSEs at minimum or no cost.

9.4 Government organisations should be encouraged to have a positive encouraging attitude toward SSEs and SMEs.

9.5 Cooperative Research Centres (CRCs) should be encouraged to work with SSEs but because of the differences between CRCs, no precise definition of this cooperation can be given.

3. SETTING THE SCENE

3.1 AUSTRALIA'S PROBLEMS

Every swing of the economic cycle should remind Australians that our economy remains structurally uncompetitive. Under conditions of recession, governments struggle with their fiscal tools to create the conditions for investment, business growth, and increasing employment. But no sooner does the economy start to grow, than there are concerns about rising levels of imports, increasing current account deficits, growing national debt, followed by a resort to tight monetary policy and a return to recession. There is no question that Australia's dependence on overseas savings as a result of our poor savings ratio, combined with the greatly increased volatility of the international financial system has made macro-economic management more difficult. But these problems also reflect the unsatisfactory structural composition of the economy.

Our failure to develop internationally competitive manufacturing and service sectors and the difficulty of generating improved real living standards by exporting commodities is reflected in the relatively slow growth in Australia's per capita income:

- Between 1950 and 1988, only the United States and New Zealand among the eighteen richest OECD nations showed a lower rate of real per capita income growth.

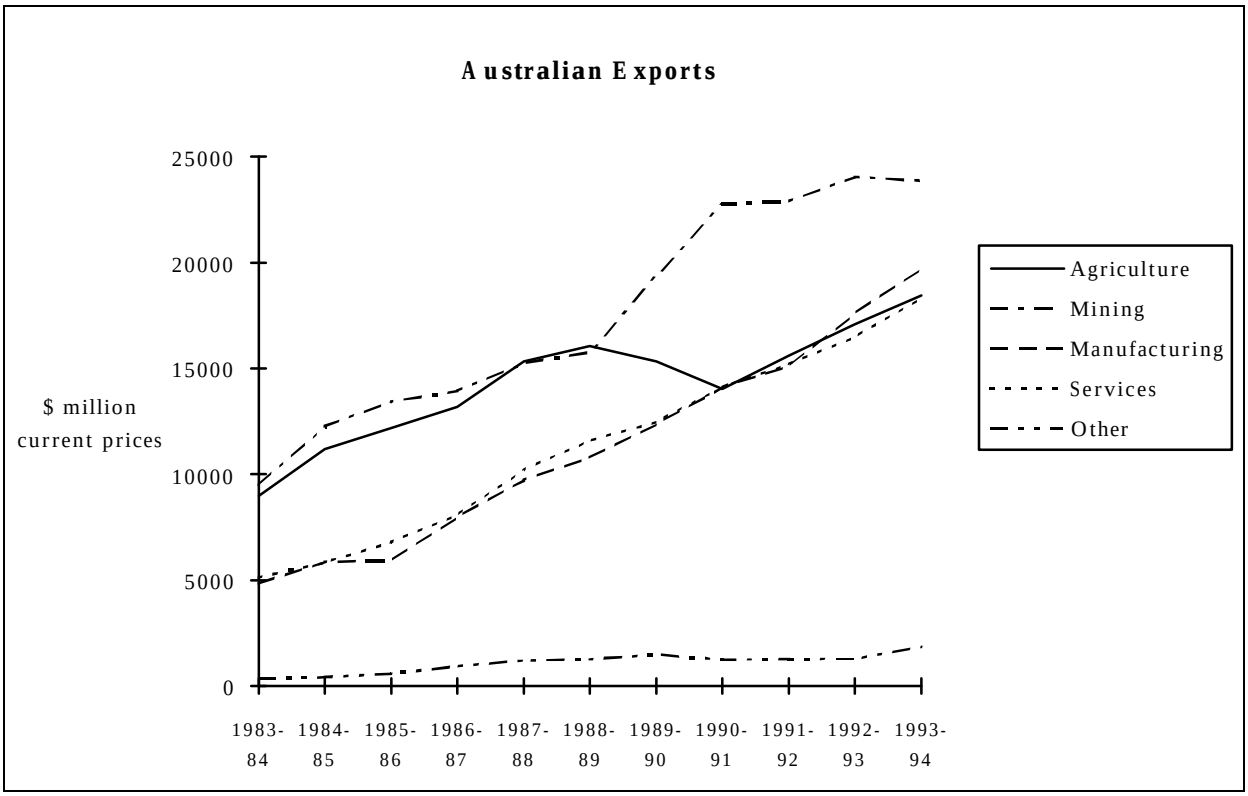
Until we transform this industrial structure, and generate a greater proportion of manufactured goods and services, we will be condemned to a boom/bust cycle and continued relative decline. Furthermore, the Government's goal of a fundamental reduction in our rate of unemployment will not be achieved.

Australian exports, imports and balance of trade 1983/84 - 1993/94 are shown in Figures 3.1 and 3.2. Overall imports have greatly exceeded export in all but one of these years leaving Australia with a large balance of trade deficit.

It is often said that Australia has no choice but to learn to survive on its comparative advantage in commodity-based industries. But, countries relying on commodities to the detriment of manufactures and services are fighting a losing battle:

- For most of this century the trend in Australia's terms of trade has been inexorably downwards, with occasional booms in commodity prices providing the illusion of national riches.
- Diversification in the sources of supply of raw materials has constrained prices.
- There remain significant barriers to world trade in agricultural products and many export markets are spoiled by the export subsidies paid by our competitors.
- Sophisticated manufactures and services allow producers far more scope to earn profits.
- As incomes rise, so too does the proportion of income expended on manufactures and on services.
- Intra-industry trade is far less possible where a nation has specialised in the production of commodities.

In any event this view takes no account of the capacity to create comparative advantage through new knowledge. It is difficult to see how Australia can get off this treadmill of boom-bust macro-economic management without bringing the structural composition of our exports more into line with that of our imports.



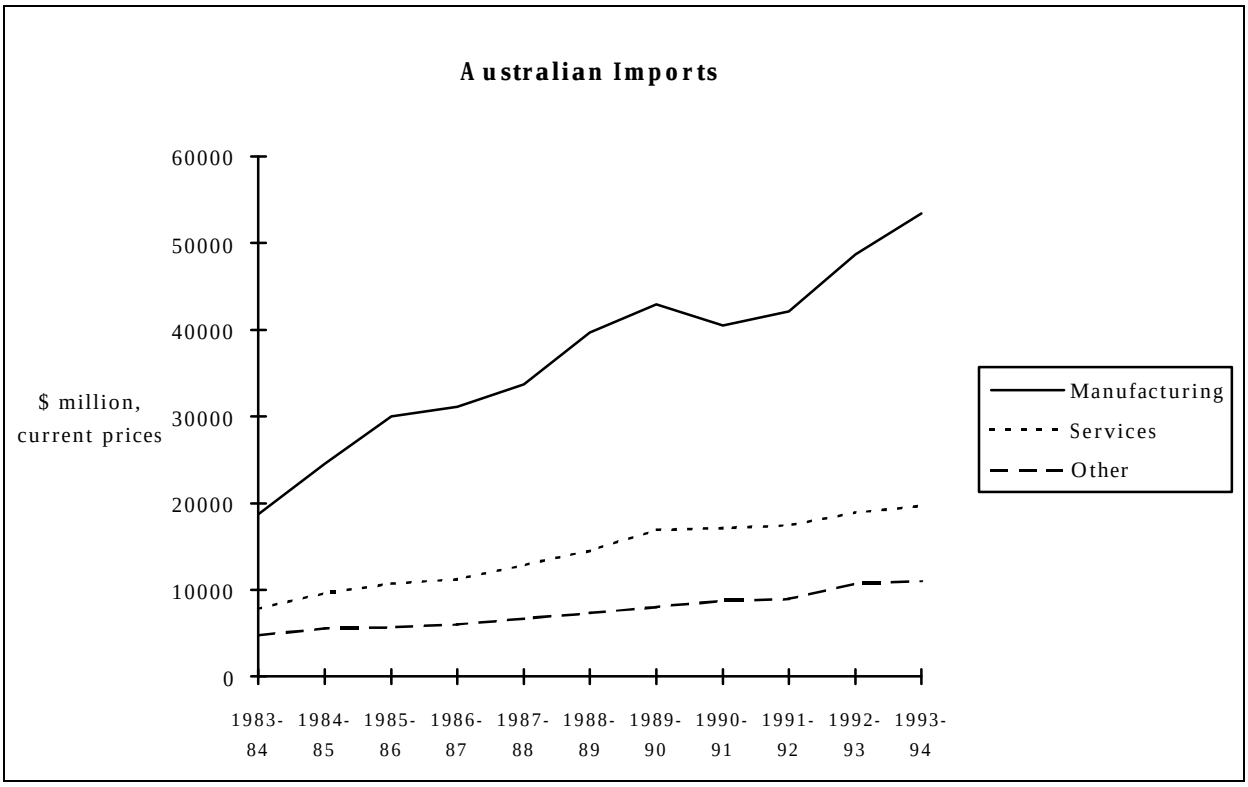


Figure 3.1: Australian Exports and Imports 1983/84-1993/94
Source: Australian Bureau of Statistics

3.2 PAST FAILURE

While protection enabled Australia to acquire a broadly-based manufacturing sector quickly, and apparently painlessly, the ensuing structure was not sustainable [6]. Protection failed because the

particular measures used were inappropriately designed, not simply because they involved static inefficiency:

- Overseas experience suggests that where the package of fiscal, monetary, and trade policies combined to make exporting attractive, firms have been drawn to innovate and compete. At the same time they were often working within a protected home market, so the argument is not a simple one for "free trade".
- Our policies were directed at job creation rather than innovation; indeed, we lacked an innovation strategy for the manufacturing and services sector and the competitive climate did little to encourage innovative thinking.
- Little thought was given to longer-term competitiveness, and the result was to skew the system towards the least-efficient rather than the most-efficient industries.
- Consequently protection produced a fragmented, often low-skilled manufacturing sector.
- There was considerable talk about and investment in research but far less concern about the development and commercialisation of the results of research.
- Australian manufacturing firms were much more likely to be producing below minimum efficient scale for any given industry. Consequently, protection failed to develop critical mass in appropriate industry sectors and we failed to produce the large-sized firms found in other industrialised countries.
- By protecting its industries within a relatively small market and allowing a high degree of direct foreign investment, Australia sacrificed the outward orientation of a free-trading environment.
- Protection combined with an open foreign investment policy resulted in the commanding heights of industry being foreign-owned.

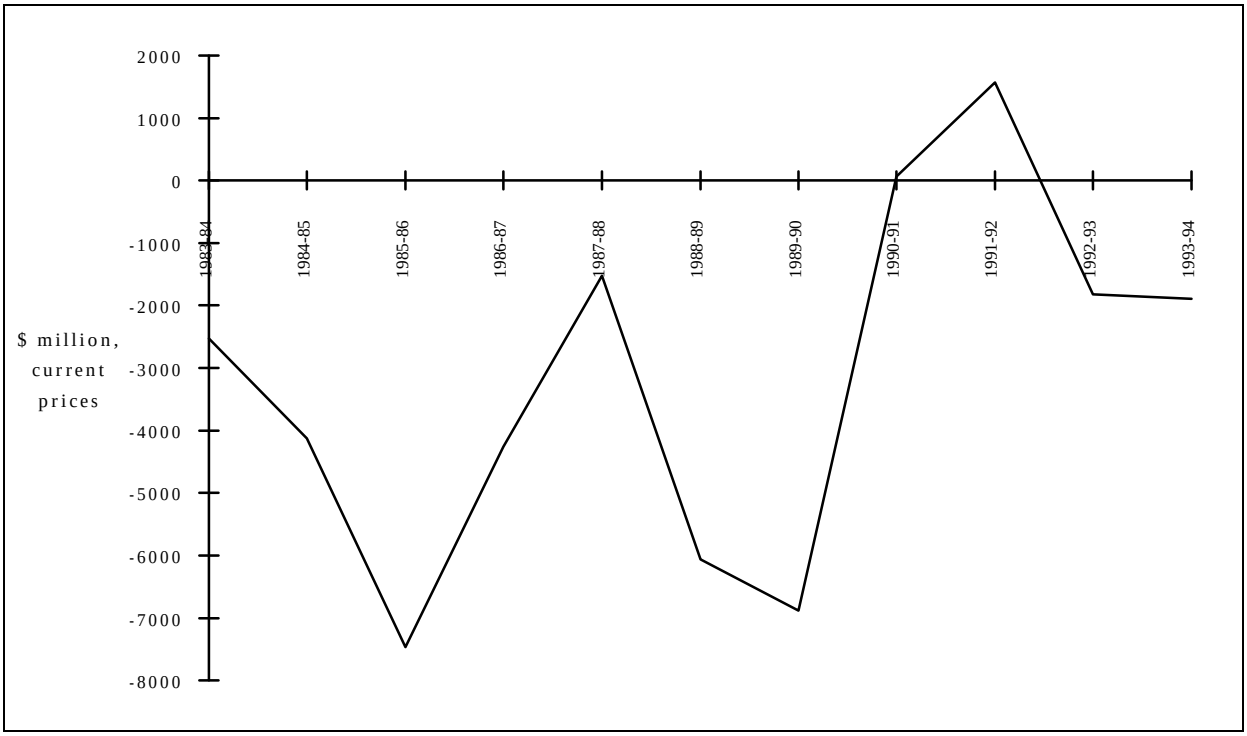


Figure 3.2: Balance of Trade 1983/84 - 1993/94
Source: Australian Bureau of Statistics

- Foreign control was most significant in precisely those parts of the economy which, because of their capital-intensive or technology-intensive nature, offered the best chance of future profits. But export-oriented investment by these firms was constrained by their overseas owner.
- This control and our failure to successfully exploit government purchasing leverage resulted in a failure to develop large, indigenously controlled firms in the crucial capital-intensive and technology-intensive fields.

As a result, Australia failed to participate in a burgeoning international trade in manufactures and manufacturing output as a share of GDP fell from 24.5% in 1969-70 to 14.5% in 1991-92 (in part this also reflects the growing importance of services).

3.3 THE GOVERNMENT'S RESPONSE

The government's abandonment of protection as the fundamental tool of industry development policies is rightly seen as a watershed event in our political and economic history. It has led to a significant restructuring of industry and the realisation that all aspects of the economy have to be internationally competitive if we are to maintain our relative standard of living. However, this restructuring has not been without cost:

- It has taken a heavy toll of import-replacing industries in the higher value-added categories.
- Nor has it been of a kind which would lead to Australian manufacturing graduating to the increasing scale economies, export market penetration and international investment.
- It has not resolved the fundamental problem of a lack of sizeable, export-capable, indigenously-owned firms.
- While manufactured exports grew and the overall export propensity of manufacturing improved, the proportion of domestic consumption filled by imports rose sharply (from 25.4% in 1981-to 33% in 1991-2).
- Industries which improved their export performance over the period 1968-69 to 1990-91 were predominantly low value-added activities.
- It is difficult to sustain a world-class business of any size on the basis of niche products, but difficult to diversify (and remain Australian) when the domestic market for most products remains small and the province of imports.

Industry policy helped to bring about heightened competitiveness in a few activities. But it did not lead to the development of firms with sufficient financial mass to compete in world markets to any significant extent, except in those activities in which an Australian presence was already well-established.

During the eighties we also experienced a burst of new business starts in the higher and speciality technology areas. Unfortunately, these also experienced a high failure rate. A greater success rate could have accelerated the industrial transformation now underway within Australia. Equally importantly, there is strong anecdotal evidence that the rate of new business starts in this area has now slowed dramatically and this, combined with high failure rates, could threaten Australia's chances of sustained industrial growth in the longer term.

Our focus on SSEs cannot, however, be seen in isolation from a broader canvass. A healthy industrial climate requires not just a high rate of successful business starts, but also the progressive transformation of small start-ups into first medium and then larger enterprises. For

much of the fifties, sixties and seventies Australian industry was locked into a structure marked by a small number of generally foreign-owned firms at the top of the industrial pyramid, a large number of generally Australian-owned firms at the bottom, with little in the middle. Somehow, the new business starts during the period simply failed to fight their way into the middle and top. As a consequence, Australia did not share in the rapid growth of new firms taking place elsewhere in the world.

The industrial transformation during the eighties began to change this situation, but there are already fears that this transformation is faltering. It must be maintained, and this requires a policy framework that is directed at all stages of a firms growth.

3.4 THE GOVERNMENT'S RECENT INITIATIVES

In the *Working Nation Statement* [7] of 4 May, 1994 the government sought to accelerate the internationalisation of the Australian economy by focusing on the factors critical to success in the global marketplace. These encompass innovation, the uptake of new technology, business improvement and exporting. In short, the Government aims to help build competitive firms that are characterised by:

- a high degree of trade orientation, and an enhanced ability to compete against imports;
- an increasing focus on high value added areas, leading to the diversification of the economic base;
- a greater integration into the global marketplace via strategic alliances, joint ventures and direct investment;
- the spread of best practice across all areas of activity;
- innovation that pervades all operations of firms;
- environmental sustainability; and
- rapid take up of new technology, and effective linkages between industry and research institutions leading to successful commercialisation of research.

The Prime Minister has committed the government to:

- work to accelerate the growth in business expenditure on R&D and, through successful commercialisation convert more of our existing research and development to a real competitive edge;
- place new emphasis on the diffusion of technology where we are seen as lagging well behind our competitors;
- minimise the constraint that the financing problems of small business have on the development of potentially high growth firms, including early stage businesses, those with new technologies, and those seeking to expand into overseas markets; and
- use government purchasing to aid industry development particularly through better coordination.

This report endorses all these policies and is concerned with ways of successfully implementing them.

3.5 SPECIFIC CONCERNS

Many of the problems that have been raised with the Study Team during the course of this study

have been acknowledged in the Working Nation Statement. We are concerned, therefore, not with the direction of the Government's policy, but with the seriousness with which it is pursuing its stated objectives. In particular we observe that industry and innovation policy is seen by some within the public sector as a marginal activity, to be funded at minimal levels, rather than as vital to a successful economic strategy.

The Study Team believes that a more effective innovation strategy is an essential component of any long-term economic strategy. Our history of successful focused technological development for the primary industries shows that we have the capacity to manage successful long-term innovation strategies focused on real market outcomes. Shifting from a very successful primary/commodity structure to a high value-adding structure may be a little more difficult, but if we have the will we can succeed. However, while we are moving up this learning curve into higher value added activities, levels of failure will be high but can be reduced. Wherever possible we should act to prevent such failures and, where we cannot prevent them, we have to accept that such failures are a price that has to be paid.

It is important, however, to make a distinction between the majority of businesses which have only limited growth potential and those which have high growth potential as the result of some form of innovation. The latter have a far greater potential to contribute to economic growth, employment, export development and import replacement. However, because of their inherent risk, investments of this class are likely to have difficulty attracting finance. Within this class, SMEs and SSEs will be most neglected particularly where a technical innovation is involved. Yet, on the basis of our interviews, we believe that the persistence, flexibility and genuine innovative talent of our SSEs and SMEs can make a significant contribution to success.

We also suggest that the appropriate innovation policy is necessarily experimental. Like the innovation process itself, government policy needs to take account of current theories, the limitations of those theories and the actual environment in which they are to be applied. Government policy itself needs to be innovative in this area. But, good policy, like all other experiments, has to be judged through results achieved and through knowledge of other successful experiments, not by the extent of its conformity to a postulated ideal.

There are, however, some other major barriers to success:

- The need for budgetary constraint to lift the savings ratio may delay effective government action to deal with our unsatisfactory industry structure and our poor innovation record. Indeed, each budget process provides an opportunity for the short term view to oppose essential long-term investment to the detriment of long-term growth. If necessary, appropriate policies should be funded out of the recent increase in the company tax rate. This would have the effect of rewarding innovative activities.
- Our identification as a "Nation of Gamblers" involves almost every scheme devised to yield the occasional winner and the guaranteed eventual losses for the majority. However, we are pathologically averse to gambling in the only meaningful way the 21st Century will recognise - long term investment on a good idea and a good management team.
- Notwithstanding the findings of many reports based on practical experience, and widespread public disquiet, "neo-classical economics" still guides too many aspects of public policy. Recent developments in economic theory need to be given more emphasis (see Section 5).
- Almost all of our public debate about innovation is about how we spend our public Research Dollar. We need to readjust our thinking from "how do we come up with new research breakthroughs", to how do we join the explosion of new ideas by funding and peopling new ventures whose genesis can be anywhere? This is not a suggestion that we spend less on

Research, but that we should become serious about the commercialisation of good ideas.

- Our funding of development and commercialisation is totally out of proportion with our funding of research.

4. ISSUES AND QUESTIONS ARISING FROM INTERVIEWS

The study carried out by an Academy group involved interviews with the Chief Executive or senior executive of approximately 60 companies in the following technology based industries using a questionnaire shown on page (reference).

Biotechnology
Electronics
Pharmaceuticals (both ethicals and OTC)
Computers (both Hardware and Software)
Instruments
Materials
Processing
General Engineering

Companies interviewed were at varying stages of development. The majority were SSEs some were SMEs and some were companies listed on the Australian Stock Exchange. Also included were Divisions of large companies. Follow up discussions were held with government, research, education and financial organisations. These included:

CSIRO
Universities and their commercial arms
Financial institutions and financial advisers
The Industry Research and Development Board
Austrade
The Department of Industry, Science and Technology

Despite the fact that a diverse range of organisations were interviewed it was possible to formulate fairly common views across the range of questions.

The following issues arose out of these interviews:

4.1 LEADERSHIP

The leaders of the successful companies surveyed were strong, dynamic and flexible. They were innovative people who had an understanding of all aspects of the business, from marketing (mostly without any formal training) through to fund raising and financial management. They had a clear sharp vision where they wanted the company to go and pursued this goal with persistence. They understood the technical and financial limitations of their product and company. They were, and had to be, good salesman of their ideas and their products. Not many of them were research scientists, many were engineers. They had a good appreciation of the technology either through their formal training or being self trained.

In those companies which were not as successful the leaders did not have the required versatility. Sometimes the leader was an extremely good scientist who lacked the business judgement to weigh up the other factors. Often there was a failure to recognise the need for prudent financial management and control.

A major problem is how do we develop and encourage entrepreneurial, creative and hungry

leaders?
Many of the good leaders are self trained. We believe more proficient leaders could be developed. Up until the middle to late ‘80s most of the products of our schools and universities saw themselves as either entering the professions such as law, medicine, dentistry or if they were engineers or scientists joining organisations such as CSIRO, universities, Federal or State enterprises or large public companies. Whilst there are still good career opportunities in all of these organisations, they are now scarcer.

There is an acute need to change the culture of our society by encouraging more risk taking and a sense of adventure. This is a change which should not be hard considering our ability to be adventurous and dynamic in other areas especially the arts and sport.

Can our schools, TAFE Colleges and universities develop this entrepreneurial spirit by pointing out the importance of the challenges to Australia’s economic welfare, the huge opportunities and of course the risks in the new emerging industries in the science and technology field?

4.2 MANAGEMENT

A good leader will be able to inspire and integrate a small team with shared common objectives in the early stages of a project. That leader in the early stages has to have a good feel and judgement in an overall business management sense. The Chief Executive Officer (CEO) must be able to recognise problems early and find solutions internally or know where to obtain assistance. The CEO must also have the courage to modify plans or even withdraw from some ventures in which he may have a strong vested interest.

As the company grows the CEO must be able to delegate and at the same time create and maintain an appropriate company culture which reflects the entrepreneurial spirit of its beginnings. The CEO must be able to judge when new management is necessary because the company is entering a different phase of its activities.

Most of the successful CEOs had most of these skills and the ability to pick a few key assistants.

We considered that traditional management courses were unlikely to develop these characteristics. Traditional management courses tend to be geared to medium to large sized companies where the organisation is able to employ skilled and trained specialists in all areas of the business.

In SSEs at least in the early stages the leader and his small team of associates will, of necessity, have to cover all the main functions. Those which stand out as the key functions from this study are:

- understanding the customers real requirements- often working closely with the customers,
- positive marketing of the product and the company,
- obtaining leading edge customers,
- strong financial planning, fund raising ability and prudential financial control, and
- good staff selection.

Several companies interviewed failed initially because their knowledge of the market or their market research did not reveal the real needs of the potential customers. Others had targeted the wrong market areas.

It is believed the answer to this problem lies in a balanced training effort including better

training in marketing, possibly aided by retired business people who have had this experience in the past and can pass this experience to the new players.

4.3 FINANCIAL STRENGTH

The financial backing of start-up companies, along with the entrepreneurial drive, technical experience, and vision of the founder is probably one of the most important factors in the success of small science and technology based companies. All the small companies interviewed complained about the availability of capital.

A high proportion of failures of SSEs is due to lack of finance. For a new company in a start-up situation and especially if S&T based the funds required can be large and frequently far higher than was originally anticipated. Until there is a product on the market there is no positive cash flow. Often the early financial backing comes from the founder's limited resources, or from friends or relatives. In some cases the backing has come from large companies, but because of the present management philosophy of sticking to their core businesses, this source has almost dried up. In the past some support has come from Venture Capital Companies and from MICs. But, these sources are currently not available. Banks, Financial Institutions and the present generation of Venture Capital Companies are only interested in investing if the start-up companies have a good profitable track record.

The MIC scheme was considered a success by some authorities and a failure by others. Its shortcomings were believed to be:

- the scheme was grossly underfunded and was terminated prematurely,
- the timing was unlucky in that the October, 1987 stockmarket crash destroyed much of the progress that had been made,
- the scheme failed to induce institutional investors to invest in venture capital,
- the promoters were often well trained financially, but had little experience in assessing the potential of new companies. In particular they did not understand the requirements for start-up S&T based companies,
- neither the investors nor the government recognised that larger funds were necessary for the development and commercialising phase, and
- because of the long time required for development and commercialisation, patient capital is required, often with no profit for 5 to 10 years.

Financial Institutions, Fund Managers, and so called Venture Management Companies were interviewed and there was almost unanimous opinion that they could not recommend to their clients or their management, investment in these small start up science and technology based companies.

There is a need to find a way to encourage high net worth individuals, large companies, venture capital companies and financial institutions to support emerging science and technology based companies. Much of the capital required is equity not debt capital.

4.4 COMPANY POSITION

In general the companies which were independent and free to act autonomously were the most successful. In small independent companies there is a strong incentive for the CEO and key staff to make the company succeed because they share in the gains and losses. In these companies the

losses could mean the complete collapse of the company and the loss of capital injected by key staff and their backers. Divisions, subsidiaries or associates of large companies are only successful innovators if the parent company adopts a hands off approach, does not impose its bureaucratic systems on the SME or SSE and concentrates on agreeing policies, broad business, strategies and financial objectives at no more than yearly intervals. Under such circumstances having a big company as a big brother can have a number of advantages. The availability of a financial backer is of course of paramount importance but there are other advantages:

- assistance in patenting (and by implication support in developing strategies based on their intellectual property and even, in defending those patents).
- legal assistance in drawing up agreements, contracts and the complications of company law etc
- assistance in accounting, financial management and in obtaining bank overdrafts, loans etc (letters of comfort)

By contrast small independent companies find it difficult to cope with the large charges for patent fees, legal fees and the purchase of various accounting and other services.

Technical and commercial networking is vital for these industries. Very few of the networks are formal, but are formed through visits to distributors, customers, competitors and trade fairs. Generally there is no strong evidence of clusters of companies. However in the telecommunications, computers and pharmaceuticals areas strong links have to be forged and maintained with Telecom and Optus, the computer companies, and bio-medical research centres and international pharmaceutical companies respectively.

Those companies which are successful seem to have continuity of key staff throughout all phases of the product continuum eg creation, research, development, trials, production and marketing. By contrast some of the small companies associated with large companies have suffered because of a high turnover of staff as part of the large organisation's staff development program.

4.5 PRODUCT AND TECHNICAL FACTORS

The products of these science and technology based industries have to be unique in some feature eg cost, design, utility, or delivery. Usually it is the creative aspect such as novelty of design or application. The innovative products or processes are usually a development of existing science and technology using off the shelf components or creating new components. It is their development into commercial products which is unique and creative. They are usually high added value, low budget cost items. There needs to be continual product development or change to meet the market needs.

In only a few cases in the study have the products emerged per se from Universities or Research Institutions. However the people involved have often come from such organisations with an idea which needs Development and Commercialisation.

Manufacturing processes and costs are not usually a key factor in the success of these industries. The manufacturing processes are not capital intensive and in many cases the manufacture of components is carried out by sub-contractors. However this brings with it the danger that competitors can obtain useful product information. Furthermore it can be difficult to get sub-contractors to comply with required standards.

Most of the research carried out is of an applied nature and a large amount is low cost, in-

house development. Alliances with CSIRO, Universities and Research Institutions were not a significant factor except in some cases such as telecommunications and ethical pharmaceuticals. Use of CSIRO's information system to pick up technology from around the world would be helpful, but it does not appear to have been greatly used by the SSEs. One need is to determine how small companies can tap into CSIRO, universities and other Institutions without incurring a large expenditure.

In most cases no patents or copyrights are taken out; not only because they are too expensive, but also they are too expensive and time consuming to defend. A report has been recently been prepared on this subject for the Prime Minister's Science and Engineering Council. Unfortunately it does not address the problem of the high costs of defending patents. It recommends that this should be taken up at Ministerial level, government to Government.

Recently an Insurance company has recommended a scheme for insuring small company patents against violations which would be similar to a third party insurance scheme. This would need to be implemented on a National level and supported by the Commonwealth Government.

4.6 MARKET FACTORS

The markets for the SSEs and SMEs are usually diverse niche markets' high growth and mostly involving exports. Of the companies studied, 50% export between 25-50% of their output, 20% between 15-25%, and 10% up to 15%. The successful companies have identified a market niche in which there are only a small number of competing companies.

There are often overseas competitors which are bigger and more powerful than the companies studied. In order to compete successfully in these markets, it is essential to have a strong distributor network, reward them well and maintain the strength of the network by regular visits.

5. THE ROLE OF INNOVATION IN ECONOMIC DEVELOPMENT

A key finding from companies interviewed was the need to innovate continually to be competitive, the need to have a superior product, to be efficient in production, marketing and market support.

"Where there is no vision the people perish*"

As Kenneth Boulding [8] pointed out, the recognition that economic development is essentially a knowledge process has been slowly penetrating the minds of economists, but they are still too much obsessed by mechanical models to the neglect of the study of the learning process which is the real key to development.

This emphasis on the role of learning in economic development, and of the role of government in supporting that development, has been supported by recent advances in economic theory known as the new growth theories. A recent OECD Report, *National Systems for Financing Innovation* [9] suggests consensus is forming around the following concepts:

- Growth does not flow, as the neo-classical model assumed, from some factor independent of the conventional factors of production but from the accumulated increase in an internal factors (variously thought to be gross investment incorporating technical progress, the store of useful knowledge underlying technical progress, or human capital).
- This factor - technical progress - is a source of increasing returns, ie of a snowball effect whereby growth generates growth, because its creation, allocation and use engender externalities.
- The existence of externalities is consequently not a technology market imperfection but the "ferment" of technical knowledge and the essential condition enabling the accumulation of knowledge in a [self-reinforcing] growth spiral.
- Contrary to the teachings of neo-classical economists, investment in the wide sense exerts a decisive influence on long term growth since it is the vehicle for the accumulation of knowledge and its translation into economic growth.
- While everyone agrees that there is little point in investing huge resources unless they are invested well, the new theories equally stress the organic structure of investment.

It follows that Governments should not simply seek to promote static efficiency, but should seek to capture the benefits available through innovation. For as Schumpeter [2] said as long ago as 1942, "Static efficiency of the equilibrium situation which at every point in time fully utilises its possibilities may in the long run be inferior to the dynamic efficiency of a system which allocates part of its resources to the generation of new knowledge." But to be effective, government policy needs to take account of the particular market conditions that Australian firms face in the world of managerial capitalism.

The international diffusion of technology is neither automatic nor easy. Both the material artefacts and the knowledge to develop and operate them are complex, involving multiple dimensions and constraints in performance that cannot be reduced to codified "information". Tacit knowledge - underlying the ability to cope with such complexity - is acquired essentially through experience, and trial and error. As technological activities become increasingly

*Proverbs 29, 18

specialised, complex and roundabout, tacit and other forms of knowledge are increasingly acquired within firms through deliberate and often costly investment in "change-generating" activities, such as product design, production engineering, quality control, staff training, research, and/or the development and testing of prototypes and pilot plant. Differences in the resources devoted to such deliberate learning - or "technological accumulation" - have led to international differences in economic performance.

The paths of national technological development are cumulative and strongly influenced by prior experience. Technological accumulation involves the progressive acquisition of (largely country-specific and internationally immobile) "intangible capital", in the form of personal, organisational and institutional skills that enabled countries to adopt and develop process and product technologies of increasing complexity. The changing basis of international competitiveness resulting from these technology trajectories has not been pre-ordained.

Examination of the experience of other countries suggests that there are significant national differences in innovation systems. In the words of Professor Gregory [10]:

> "And yet one cannot read the studies of Japan, Germany, France, Korea, Argentina, and Israel, to name a few, without coming away with the strong feeling that nationhood matters and has a pervasive influence. In all these cases, a distinctive national character pervades the firms, the education systems, the law, the politics, and the government, all of which have been shaped by a shared historical experience and culture."

The Industry Commission in its Draft Report on Research and Development [11] concludes that the institutional structure and system of incentives within which innovation occurs may have a great deal to do with explaining what and how much a country gets out of the process. The Commission quotes Freeman approvingly:

> "The rate of technical change in any country ... depends upon the way in which ... resources are managed and organised, both at the enterprise and national level. The national system of innovation may enable a country with rather limited resources ... to make very rapid progress ... [but] weaknesses in the national system of innovation may lead to more abundant resources being squandered by the pursuit of inappropriate objectives or the use of ineffective methods."

This is what many experienced industrial developers have been saying for years. Indeed, many of those interviewed, along with many Fellows of the Academy, believe that Australia has squandered many opportunities over many years because of the failure of neo-classical theoreticians to understand the nature of, and the significance, of innovation. As a consequence our relative standard of living has suffered.

Vision plays a determining role in our perception of what is possible. This understanding is reflected in numerous public statements by community leaders, the following statement by Phillip Brass of Pacific Dunlop to EPAC being a good example:

> "I see the most important agenda item as being the need for a wholly co-ordinated vision by Government on Australia's future direction. Pursuing just the need for increased exports narrows the debate. The challenge confronting the Government today is determining what is best for Australia. The determination of the vision will prioritise the

agenda and the options".

Consequently, we believe that innovation has to be incorporated into an effective national vision.

Recommendation 1 - Innovation

As innovation is one of the keys to faster economic, social and cultural growth, Innovation, in all its aspects, should form an important part of our National Vision and be afforded high priority.

5.1 INNOVATION AS AN ITERATIVE PROCESS

There is a growing understanding of innovation as a complex exploratory process and this is reflected in recent models of the innovation process. The Industry Commission's Draft Report on Research and Development acknowledges that innovation is a complex iterative process. Consequently, the "conventional" linear model, treating the process as a series of discrete activities, forming a linear stable process has been discredited:

Research → Development → Production → Marketing

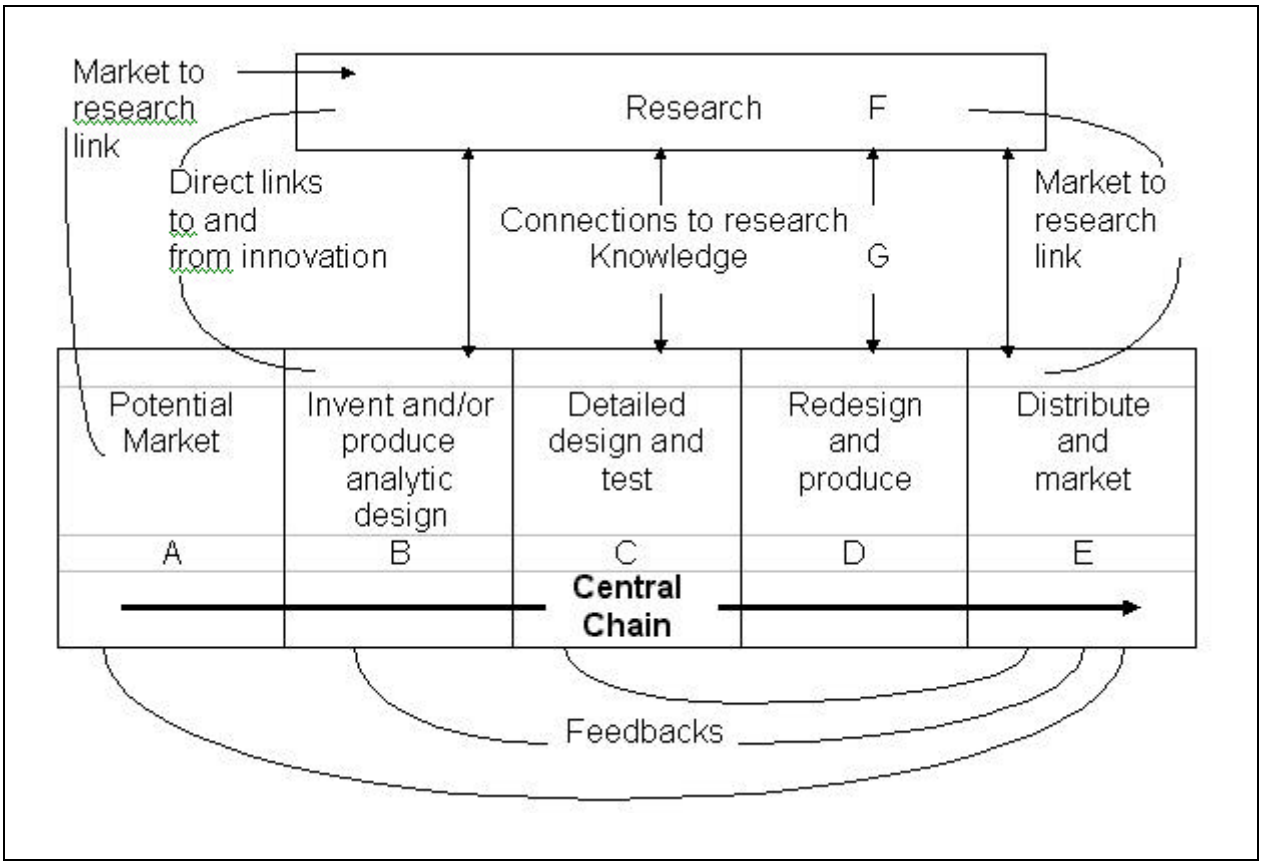


Figure 5.1: Chain link model to show the interactions of the elements in the innovation process.

Newer models such as the chain link model by Klein and Rosenberg [12], now stress the iterative nature of the process (Figure 5.1).

There is an inherent interaction between the identification of market needs, the creative process of concept design and the scientific and/or technological research that can underlie the concept design. This interaction explains why successful innovations require the leadership that ensures close working relations between researchers, product and process designers, marketing people, distributers, customers, maintenance people and management. At all stages in the innovation process there can be a return to earlier considerations and decisions may have to be reversed. The marketing phase is a vital part of this innovation process. It does not occur in isolation and is fraught with uncertainty:

- Success requires a great deal of talent and luck,
- Not only can the innovating firm not know what other firms have planned, they cannot know how they will react,
- Real markets contain dominant firms who often engage in unfair competition and,
- Real markets are often influenced by a wide range of trade barriers and government subsidies.

The accumulation of skills, experience and technical, organisational and marketing know-how, whether at the level of the individual, the firm, the industry, or the nation takes time - the heritage of technology and human capital can only increase through gradual accretion. It calls for organisational structures and mechanisms to ensure the appropriate interactions and feedback inside companies as well as among the various institutions that make up the national innovation system. Since it is a learning process involving accumulated experience as much as novelty, and since learning arises partly out of routine activities, innovation is firmly rooted in the prevailing economic structure. The countries, industries, firms and institutions which have been able to exploit opportunities over many decades and create a base for technological accumulation are the best placed to adapt to the transitions and transformations of structural change. The importance of tacit knowledge in management, production and distribution poses a significant problem for Australia. The acquisition of the requisite knowledge is difficult - it involves the development of routines through trial and error, or by transfer from an established producer. It acts as a barrier protecting existing producers and gives an advantage to established firms planning expansion. The required structural adjustment will not be easy, nor will the required resources flow freely!

5.2 THE NEED TO CREATE AN INNOVATIVE CULTURE

Innovation is, in its development and application, fundamentally a social process, not an event, and should be viewed not in static, but dynamic terms [13]. It takes place through the interaction of many factors - between producers and final consumers, component and system producers, upstream and downstream firms, universities and industry and government agencies and industries. Because of the importance of these interactions, the cultural framework within which they take place has a crucial influence on our competitiveness. As Peter Senge [14] said:

> "One is hard pressed to think of any organisation that has sustained some measure of greatness in the absence of goals, values, and missions that became deeply shared through the organisation".

The root of success lies in a culture which embodies some of the "essences" of entrepreneurship in the education system and the work environment [15]. This involves enhancing the factors important in stimulating entrepreneurial behaviour in the workplace including: freedom, greater ownership, more personal control, commitment to seeing things through, customer service orientation, flexibility, incrementalism, tolerance of mistake making, and overall a greater spirit of feeling of independence and interdependence.

The foregoing should remind us that entrepreneurship is about decentralisation, differentiation and tolerance of chaos rather than standardisation and order. An obsession with the rules is inconsistent with this spirit. It makes particular demands on the industry financing system, its ability to embrace greater uncertainty and longer term-time horizons and to support the link between ownership and control.

But as noted in Setting the Scene, Australia's popular culture is permeated with positive attitudes towards financial speculation to the detriment of real entrepreneurship and the associated investment in real production. The excesses of the 1980s reflected this aspect of our culture as well as being a reaction to financial deregulation. A particularly disturbing aspect of those excesses was the promotion of financial speculators by the popular media as heroes and role models. The perverse influence of such "champions" in setting the goals and aspirations of the community should not be underestimated.

The Government has already recognised that an export-orientated and innovative culture is vital for Australia to remain or to become competitive but its direct efforts to promote this cultural change have largely been limited to Ministerial initiatives. The breaking down of these cultural barriers is a major task, and one which must be attacked in a systematic way which complements the Minister's efforts. Developing a more innovative culture will assist the formation and growth of S&T based SSEs.

Recommendation 1.1 - Creation of an Innovative Culture

A significant and sustained cultural change program should be undertaken so as to provide the community underpinnings necessary for innovation. It should:

- **seek to correct the attitudes that inhibit long-term investment;**
- **emphasise the sustained, cooperative and creative service required for effective wealth creation and its distribution;**
- **extend to building a far better understanding of the innovation process, and the practicalities of effective competition in business, in government departments; and,**
- **Promote sound business ethics and a sense of social responsibility.**

5.3 EDUCATION

Parents have a great influence over the career choices of their children and the attitude of their children to innovation and enterprise. By creating a positive attitude to innovation in the community, more young Australians will take up the challenge that innovation offers. These efforts need to be reinforced within our education system.

In addition specific training is required in our TAFE Colleges and Universities to assist in developing the wide ranging commercial skills required. It also requires effective communication with the public of the vital importance of the innovation process so that demand for training and business activities and government policies is community led.

Recommendation 1.2 - Education

1.2.1 Schools should introduce students to the role of innovation in sustaining our competitiveness and living standards. They should also introduce students to the broad range of commercial skills required for effective management of business enterprises.

1.2.2 Universities and TAFE Colleges should be encouraged to develop courses on innovation and the management of innovation particularly for executives of SSEs.

1.2.3 A series of appropriate courses should be made available for awakening Industrial Developers with the necessary skills to the challenges of new technology development.

5.4 INNOVATION AND THE SPECIAL ROLE OF SMALL START-UP ENTERPRISES

It was found that small firms make a substantial contribution to technical innovation in industries subject to rapid technological change.

5.4.1 THE ROLE OF SSES AND SMES IN THE ECONOMY

There is now much agreement that the growth of the SME sector (and SSEs) throughout all western economies over recent decades constitutes a trend across a broad section of the industrial and commercial economy. The OECD [13] has even suggested that the adjustment of such enterprises to technological, economic, financial and cultural change and their capacity to irrigate and dynamise the industrial fabric, will determine the extent to which industrialised economies remain competitive. The OECD has also suggested that increased importance of SMEs can be attributed to:

- a reduction in the optimum size of production units, especially in capital intensive industries since the first oil shock, and
- smaller firms have an advantage in industries which are in the early stages of the product cycle, in which innovation and skilled labour play an important role, and in which large firms occupy a major share of the market, and
- SMEs are more flexible in adapting to new market conditions.

However, the OECD has also suggested that large firms appear to tolerate the successful performance of an SME with a given product or market segment only so long as this is considered to be linked to temporary changes in market conditions. In the longer term, large firms will respond to protect their market share and this may involve competitively eliminating smaller rivals from the market. If such firms are to survive they have to grow quickly.

In Australia small firms make a significant contribution to employment and output. The Beddall Committee [16] estimated that small businesses contribute roughly 30 per cent of Australia's GDP. In 1989-1990, 693,000 small businesses accounted for around 96 per cent of all non-farm private sector businesses and employed more than 2.5 million people. They operate in every sector of the economy, although their contribution differs widely between sectors:

- They account for about 50 per cent of manufacturing employment and 70 per cent of services employment.
- They also account for about 40 per cent of manufacturing production and 70 per cent of

services production.

The BIE's Small Business Review 1993 [17], A Report on Small Business Innovation, also reported that small firms make a substantial contribution to technical innovation. In industries subject to rapid technological change, where products and processes come and go rapidly, small firms may play the dominant role. This important role has been recognised in the wide ranging support measures adopted in many countries to assist SSEs as every SME grows from an SSE.

5.4.2 CASH FLOW PROBLEMS OF SSES

Figure 5.2 shows the cash flow implications of the innovation process in S&T based companies. The critical factor is a long period of negative cash flow. From the survey carried out on S&T based companies it was found that the founder of an SSE has usually identified a market need and a technology to meet that need and commences working on the idea from his/her own resources often with loans secured against the family assets. As the idea develops and a prototype (or pilot plant) is required more funds are usually needed. In addition, there is a need to fund the preparation of business and marketing plans. Again, this is usually financed by the founder, sometimes with help from family and friends. As the idea matures and approaches marketing, further funds may be raised from family and friends particularly for production. Problems arise, however, if these needs exceed the capacities of these sources, as they frequently do. What follows is often a frantic and fruitless search for additional finance followed by failure and the loss of the family assets. These failures involve a heavy social and economic

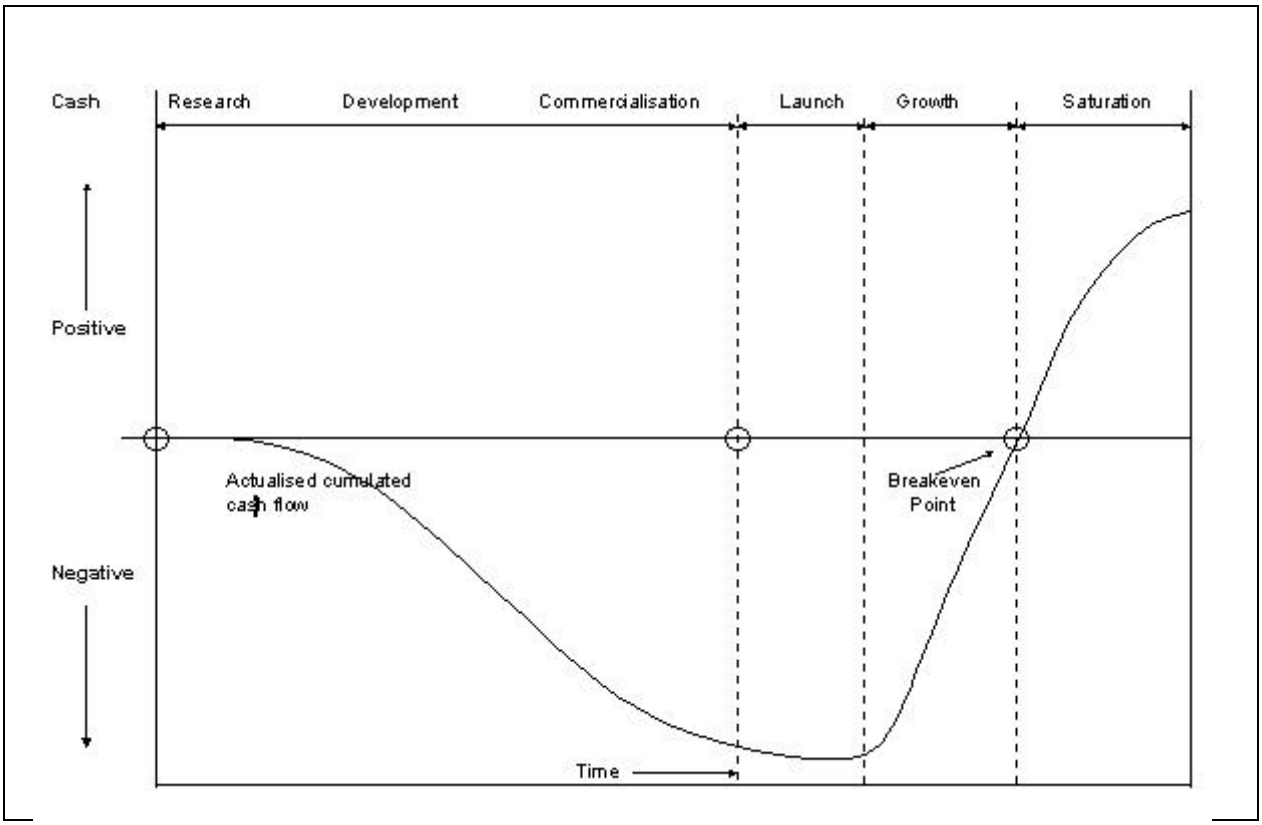


Figure 5.2: Cash-time curve for a single product (After OECD Report)

cost. In the process the intellectual, organisational, relational and physical capital invested in the idea is often dissipated.

Many of these failures can be traced to the commercial and industrial environment faced by these companies:

- The basic challenge is to manage the growth process to the point where sufficient market control exists to generate a self-sustaining cash flow which will support continuous creation of competitive advantages.
- Time to market and its relevance to the market are crucial. Technology innovation itself is rarely an impediment.
- Product development times are influenced heavily by access to proven support resources in such areas as industrial design, packaging, tooling, computer simulation, clinical trialing.
- The relatively small number of product innovation driven businesses and the sophistication of their needs has limited the availability of services targeted at their special requirements.
- The wide geographic distribution peculiar to Australia, further limits the potential for the build up of specialist support in a cost competitive manner.
- The born globals have their risk profile seriously weakened by receiving their early education in the small local market. The cost of providing that international support includes finding financiers with a global perspective, lawyers able to defend intellectual property rights, bankers able to provide tested relationships in emerging economies. Such global vision and experience is in short supply and is expensive.
- Access to a wide range of such support than exists even in close proximity to the venture is important even in the largest Australian industrial centres.
- A window is needed into global technology support networks.

5.4.3 LEADERSHIP CHARACTERISTICS OF SSES

The innovator, often faces the parallel challenge of creating a market and of testing for specification insights when the concept is unfamiliar to any potential purchasers. This requires a different form of analysis and relationship building in targeted markets. It is such an integral part of successful product conception that it cannot be subcontracted. The support role then is to identify individuals or distribution channels that can be integrated to provide the concurrent market relationships with the product development process.

The management of a high growth S&T based SSEs in terms of culture, style, industrial relations and leadership differ widely from both other small businesses and the large corporation.

- Technology innovators are generally starting a business for the first time. They may well have intuitive skills that are appropriate but are unlikely to have suitable experience or training.
- The low population density of such enterprises limits exposure to role models. The need is to provide access to experienced mentors, role models, case study review to accelerate the learning curve, while minimising the threat to the enterprise through error.
- Technology driven businesses usually have to export early in their lives and thus must acquire the skills to manage payments made in foreign currencies, the import of components and increasingly frequently, the deployment of manufacturing and marketing assets elsewhere. This demands a quality and depth of advice on corporate treasury control which is outside the experience of the accountants and bank relationship managers that traditionally service small businesses. The advice resources and services needed are priced within the cost structure of

much larger accounts.

With the constraints on equity sourcing and on the debt carrying capacity of new ventures, growth heavily depends on cash flow being reinvested. Time to a level of market control is a critical survival parameter, because of the improving techniques of copying and fast product introduction available to competitors. That time may be largely determined by expansion capital which has to be internally funded. The critical early growth phase needs protection from all extraneous sources of cash depletion. A strong case can be made out for special tax and government charge deferment until a market position is obtained.

Most of this class of business now has a much higher cost and risk component associated with market introduction than product development. Higher leverage in outcomes may result from a subsidy in the marketing function rather than in R&D. Given the iterative nature of the innovation process such costs may not be easily differentiated. Adjusting the market development and R&D support schemes to reflect this change would bring assistance more in line with the real needs pattern for early cash flow support.

With the maturity of structure of many global technology driven industries the odds have moved further against small businesses with a variety of resource limitations. A viable strategy to overcome this is to lower the risks and costs of market penetration by forming a strategic alliance. This is preferable with a large customer, as some have used Telecom, or a major global that has market control.

- identifying suitable partners, negotiating successfully and managing the size differences are all challenges to inexperienced management which would benefit from outside support. In general an experience base in professional support from accountants and legal advisers has to reflect the operating characteristics of the larger partner. Such advisers with specific in-depth industry and international experience are rare in Australia and expensive wherever sourced. Help is needed to source such advice and to pay for it. We suggest that the government should encourage or pressure larger Australian companies to form strategic alliances with SMEs and SSEs. The government could also provide SMEs and SSEs with subsidised negotiating support as part of its business development programs.

There is a considerable difference in the personality and skills of the people required to perform the different functions of the innovation process. At the research end, there is a need for people who are systematic, analytical and creative. Time is not a major driving imperative for such people. They seek to understand and explain phenomena which come to their notice. At the development and commercialisation stages of innovation, there is a need for people who want to complete a task and will push ahead to achieve a result within the time-frame, even if there may be some items of unexplained operation of the product or process - if it works, that is satisfactory! In a few cases all the skills for successful innovation may be combined in one person, but that is very rare. It is important that the driving “champion” (often the company founder of an SSE) recognises the needs to seek complementary skills for some phases of the project.

The entrepreneurial management of new ventures differs sharply from the more bureaucratic requirements of large business. It requires an opportunism, flare and flexibility that is easy to mistake for the style of money manipulation that has given the word “entrepreneur” such a bad name. Adam Smith notwithstanding, we believe that the true entrepreneur, or industrial developer, is driven by a desire to achieve something of lasting benefit for society, while the

money manipulator's only motivation is making money. Our studies showed that a successful entrepreneur/developer has the following characteristics:

- usually has a primary technical discipline - tradesman, engineer or scientist,
- has acquired accounting and business skills,
- is a capable team leader,
- has chosen to specialise in a technical area with which he is familiar,
- has probably had at least one failure and lived through a number of crises,
- is highly flexible with a well developed network,
- has written and evaluated many business plans,
- has a sense of proportion and a sense of humour, and
- is persistent.

Recommendation 2 - The Special Role of Small Start-up Enterprises

S&T based SSEs are a key part of the innovation process and therefore warrant special targeted support. The following sections deal specifically with the nature of this support.

5.5 GOVERNMENT SUPPORT FOR R&D

Emerging S&T based companies acknowledge Government support for R&D but most have financial difficulties in the commercialisation phase which is not supported.

Neo-classical economists tend to insist that active government support for industry development be justified by market failure arguments and that the costs of government intervention be less than the costs of the market failure. They also tend to assume that such failures are limited and easily identifiable. But the problem with this line of argument is that the very concept of "market failure" is rooted in static neo-classical economies and its inadequate understanding of the process of economic development. In practice the benefits involved in dealing with the imperfections of real markets are diffused and difficult to estimate, while the budgetary or other costs involved in government action are apparent. Consequently, it is often impossible to convince coordinating agencies that the costs of government intervention are outweighed by the benefits and this imposes a significant bias on such decisions.

Some economists have recently objected to such intervention because they attribute Australia's trade deficit to the balance between domestic savings and investment, not to a poor industry structure and inadequate technology and R&D. But the identity relationship between savings and the trade deficit, the basis of this claim, has no explanatory power: it says nothing about the causal relationships at work which are external to their model.

Innovation policy in Australia, influenced by the discredited linear model and the above ideas has focused on R&D. R&D has been seen as the area of potentially high market failure mainly because of spill-over effects. The Industry Commission has now acknowledged that:

- encouraging R&D activity in itself is not sufficient for successful innovation: firms need to integrate their R&D with their market research and marketing efforts before they can benefit from undertaking innovation-related investments,
- links between innovators and individuals with relevant existing knowledge need to be developed and utilised, and
- speed to market and overall efficiency in the innovation process are also important and can be

enhanced by parallel or simultaneous development.

Not only has government support for innovation been based on a discredited model, innovation has largely been viewed as a technology issue. We believe, however, that there is a need to view innovation in the much broader sense originally suggested by Schumpeter [2]. That whole process is characterised by uncertainty and market failure. We also suggest that a balanced exploratory effort is required. Limiting government assistance to R&D could, distort (and often has distorted) that effort. Consequently, government support for innovation needs to address all the elements in that process from support for basic research, through industrial research and development, through the elements of commercialisation (including ensuring adequate access to finance, management, manufacturing facilities, marketing and distribution) and market access and through the rapid growth phase. The strong interactions between all the elements of innovation and the importance of feedback loops requires a holistic approach. Failure to adopt such a holistic approach probably accounts for much of the failure in industry policy in Australia in the post-war period.

Support for R&D in isolation from support for commercialisation also tends to underpin large scale, often radical innovation, which is particularly risky. On the other hand small scale incremental innovations are less risky and better suited to Australia's underdeveloped industrial structure. At the same time a commercialisation scheme would probably exert a great deal of leverage in encouraging non-innovating firms to try innovation.

The public sector performs around 60% of Australia's R&D and the bulk of this (around 85 per cent) is concentrated on research rather than development. Taking account of private expenditure Australia spends approximately twice as much on research as on development. This expenditure pattern leads to the inevitable result that, while Australia is relatively strong in the research "phase" of the innovation process, it is relatively weak in commercialising the results of research. Indeed, it is not even clear that it is the best research that proceeds to commercialisation.

While Commonwealth expenditure on R&D in 1994-95 amounted to about $3 billion its expenditure on support for commercialisation has been negligible and the finance industry has not been financing commercialisation. Consequently we have failed to secure the full benefits of this substantial investment. The Industry Commission has reported that Australia is deriving significant benefit from its R&D effort but we believe that we have failed to exploit the benefits of this substantial effort because of our failure to support development and commercialisation. That effort is relatively small compared with competing countries and therefore no convincing case can be made to merely reallocate available assistance.

A significant Commonwealth initiative is required, therefore, if we are to realise the commercial benefits of this substantial investment. The Study Team appreciates that the government faces a particularly tight budgetary environment and it would be preferable to use the recent increase in company tax rate rather than failing to support the initiatives proposed in this report.

Recommendation 3 - Commercialisation of Science and Technology:

3.1 Government support for industrial R&D through the 150% tax scheme and the associated grant schemes should be continued. This support, however, needs to be balanced by support for the other elements in the innovation process - development and commercialisation. Consequently, the definitions of the expenditures eligible for government assistance under these schemes should be amended to cover all the elements in the innovation process.

3.2 The IR&D Board should continue with R&D Syndication schemes with a preference for a simplified mechanism aimed at encouraging the broad range of innovative activities rather than just research.

5.6 NETWORKING

From the interviews conducted it was evident that most SSEs had not developed adequate Networks and thus lacked a source of expertise and learning from other organisations.

It needs to be understood that comparatively few small businesses will grow substantially beyond their current size and that it is difficult to identify in advance those which are likely to "take-off". There is no question that many innovative ideas are generated by people with wide technical knowledge, but without the broad commercial experience to commercialise that knowledge successfully. Whilst our studies showed that the successful SSEs had Chief Executives who acquired the necessary skills this lack of knowledge is largely a consequence of our underdeveloped industry structure.

Herein lies a major unresolved difficulty involving a large opportunity cost. If the economy is to be restructured to better exploit the potential of science and technology driven industries then it is essential to develop a supportive framework in which this commercial learning can occur. It is unlikely that the additional financial measures being recommended will succeed unless they are matched by strong measures to support this learning. We believe that a part of the answer lies in "waking up" the talent that has been trained in other areas to the challenges that await them in developing new ideas. The cultural change program proposed above will assist in this regard as well as reducing some of the risks involved. The proposed education program will also assist.

Networking, and clustering arrangements can also provide inexpensive access to managerial expertise and offset many of the disadvantages of that smallness. Indeed, a close examination of the growth paths of many SMEs suggests that, at a crucial point, the quality, strength and capability of their private advice networks played a major role. *National Systems for Financing Innovation* [9] points out that the experience of several countries suggests that aid to individual enterprises produces little effect when it is not incorporated in an overall strategy of support for innovation networks. *Small Business Review 1993* [1] suggested that the government establish a brokerage service to promote linkages between small and large firms. While the BIE believed that such linkages were likely to be of substantial benefit to both small and large firms there was considerable reluctance from both sides to form such alliances. At the same time the *McKinsey Report* [5] also suggested that there was a need to better integrate government services including:

- access to finance,
- access to technology,

- export market information, such as AUSTRADE and Department of Foreign Affairs and Trade (DFAT) information,
- potential procurement opportunities,
- management transition advice,
- export skills training,
- best practice management, and
- linkages with larger firms.

The Government's integration of its business improvement programs through the establishment of AusIndustry is an important step in this right direction. However, the government's existing networking program is unlikely to provide the quality and breadth of assistance required. It is too low key and relies on individual firms taking the initiative. It is clearly desirable that government assistance to innovation, especially to small firms, should be delivered in a form which effectively encourages the development of a community of support and which is capable of disciplining, mainly through peer pressure, those small firms.

In this regard, attention is especially directed to the suggestion made in the Business Council of Australia's *Managing the Innovating Enterprise* [4], to encourage the formation of Australian Keiretsu (Japanese industrial groupings). Dr Steve Dowrick in a recent paper prepared for the Industry Commission on *The Role of R&D in Growth* [18] reported evidence of large spillovers within the Keiretsus, suggesting that such long-term institutional arrangements may be desirable in order to internalise knowledge spillovers and to promote innovation.

The Business Councils suggestion, if implemented systematically and integrated with government support would provide that integrated delivery while also delivering the sort of interlinking, mutually supporting structures that have served Japan so well. It is as well to recall that organisational innovation has been the source of human cultural and economic evolution from the earliest times. Thus the creation of such interlinking organisations, balancing international competitive pressures, individual responsibility and mutual support, adapted to our circumstances and culture, could provide us with a sustainable competitive advantage.

While structures are very important, their effectiveness, and the effectiveness of private networks, ultimately depend on trust which can only be developed over time. Market ideology has tended to neglect the essential contribution that sound business ethics make to the capitalist system. Many economists have no sense of history and of the delicately constructed social fabric which makes the difference between workable and unworkable market economies. Nor do they have an adequate understanding of the complex motivations which bind individuals into functioning organisations and effective economies. Fred Hirsch [19] in the *Social Limits to Growth* was particularly concerned that that emphasis on individualistic competition was undermining the social morality which provided the basis of the market system. Hirsch goes on to say:

> "In brief, the principle of self interest is incomplete as a social organising principle. It operates effectively only in tandem with some supporting social principle. This fundamental characteristic of economic liberalism, which was largely taken for granted by Adam Smith and John Stuart Mill in their different ways, has been lost sight of by its modern protagonists... The attempt has been made to erect an increasingly explicit social organisation without a supporting social morality... In this way, the foundations of the market system have been weakened, while its general behavioural norm of acting on the

> criterion of self-interest has won ever-widening acceptance... [but] A system that depends for its success on a heritage that it undermines cannot be sustained..."

Sound business ethics are consequently an essential part of the social infrastructure for businessmen, public servants and politicians. A strong sense of social responsibility can counteract the short-term bias inherent in monetary exchanges and in particular reduces the costs and risks involved in doing business and moderates abuses of market power. Such short-termism is hostile to the long-term relationships and investment required for effective innovation. And it has often been pointed out that a strong sense of social obligation has contributed to the success of the Japanese and German economies [20]. The building of an ethical business environment is therefore an important part of the cultural change program suggested above. In this regard we point out that the law established the minimum standards of behaviour required of citizens before social sanctions are applied, not the optimal standards. There is a limit to which the law can deal with moral failings and the general tightening of the relevant laws that has occurred as a result of the excesses of the 1980s may stifle legitimate activity.

Recommendation 4 - Networks

4.1 Given Australia's truncated industrial structure, the promotion of networks should be a particular priority. The Government should take a proactive role in the creation of mutually supportive structures for small, medium and large business. Accordingly, we suggest the establishment of a high-level task force to make detailed proposals for the implementation of the Business Council's recommendation for the creation of such structures based on the Keiretsu model.

4.2 Such networks could assist the delivery of government business improvement programs.

6. FINANCING INNOVATION

Sources of either loan or equity finance to commercialise products and grow are a major problem for most S&T based SSEs and SMEs.

6.1 THE "EFFICIENCY" OF FINANCIAL MARKETS

If the financial system fails to allocate sufficient resources to innovation, the performance of the entire economy will be impaired. However, there are strong grounds for believing that financial markets are not efficient, and that they discriminate against innovation.

The eminent economist Professor Stiglitz [21], a member of President Clinton's Council of Economic Advisers, has pointed out that the standard theories of the efficiency of competitive markets are based on the premise that the information held by individuals or firms is not affected by what they observe in the market and cannot be altered by any action they can undertake, including acquiring more information. However, financial markets are essentially concerned with the production, processing, dissemination, and utilisation of information. Consequently, there is a presumption that competitive finance markets will be inefficient. Moreover, even with no other barriers to entry, in the presence of costly information there is a presumption that markets will not, in general, be fully competitive. In addition, decisions concerning investments are based on probability judgements which appear to be subject to systematic biases. For example a recent Harvard seminar on *Behavioural Economics for Financial Decision Makers* [22] reported extensive research which documents a wide variety of situations in which sub-optimal behaviours systematically and predictably occur. These irrationalities arise overwhelmingly and disproportionately in contexts of uncertainty such as financial markets. These factors strike at the very heart of the belief that a market-based financial system will allocate resources to the maximum benefit of society. Professor Stiglitz goes on to argue that the directed credit schemes utilised in East Asia have actually been welfare enhancing.

6.2 DIFFERENT FINANCIAL SYSTEMS AND INNOVATION

A financial system is a very complex set of institutions, established procedures, practices and regulations which determine how savings are collected from households, governments and firms and invested to create wealth. Two main systems have evolved:

- market based systems in which financial securities markets play a dominant role in supplying industry with external capital and which are notable for the separation between corporate ownership and control, and
- credit-based systems which give a much more important role to banks, both as financing channels and as partners in corporate management.

In the Anglo-American market-based system financial intermediaries do not play a very active part in monitoring the use of capital by industry. That system replaces internal control of the use of capital with control external to the firm. In continental Europe and Japan, the financial system's involvement in corporate management is much more direct and takes place within the framework of a complex network of bilateral relations between firms and financial institutions. Large-scale intermediaries holding substantial blocks of shares do not merely supply industry with savings, but share some of corporate management's prerogatives regarding investment

project selection and management. Banks have the primary role since historically they have played the leading role in collective savings, while the law has allowed them to become shareholders.

The Japanese system derives from the dismantling of the zaibatzu following World War II. The Japanese authorities set up an institutional framework and encouraged consensus-seeking practices which ensured that low-cost capital was allocated to industry in the light of priorities drawn up on a cooperative basis by the interested parties (firms, financial institutions, and in some cases government). Two main sources of finance for industrial investment have emerged: bank lending and the systematic reinvestment by firms of a large proportion of their profits. This is possible because of the very special nature of relations between finance and industry. It is important to stress how interdependent the various components of this system are:

- a dominant form of industrial organisation, the Keiretsu, whose members have a preferred partner, the main bank, which is their shareholder and on which they depend for the bulk of their loans,
- an ownership structure largely comprised of stable shareholdings made up of cross-holdings in the Keiretsu, and of the equity held by financial institutions, and
- a form of corporate governance which, at all stages of investment project evaluation, focuses on the exchange of information between major, stable shareholders and company managers.

In the German financial system very big banks play a prime role combining the functions of both commercial and investment banks; they dominate credit distribution channels, but are also the foremost brokerage houses. Between the small firms and the big groups linked to banks, there are a vast number of independent medium-sized firms. This is reflected above all in an average self-financing ratio which is exceptionally high for a country with a credit-based financial system. Shareholder stability is not, as in Japan, the result of cross-holdings, but rather of concentration.

In the Anglo-American system instruments managed by financial markets (eg venture capital) play a bigger role in financing innovation than in credit-based systems. Credit-based systems attribute more importance to entrepreneurship and other formulae which only stable bilateral relations with financial partners make possible. Consequently the abundance of venture capital in the United States is not to be explained solely by the fact that the conditions for it are right; it can also be seen to be the reverse side of another form of shortcoming - the fact that large firms are less able to take responsibility for certain aspects of technological development-and consequently special importance is attached to start up firms in the commercial exploitation of technological opportunities; a situation which exists to an even greater degree in Australia since there is no abundance of discretionary capital in the hands of the middle class who might be expected to provide some of the Venture Capital.

Innovation requires a sustained effort, the outcome of which is uncertain. So it is likely that shareholder stability, which is a feature of German and Japanese firms in particular, generate conditions which are more conducive to innovation than the volatile ownership prevailing in English-speaking countries. Recent experience also suggests that mergers and acquisitions, which are a means of controlling the use of capital in market-based financial systems, have a negative effect on the incentive to innovate. Market-based financial systems are also relatively unfavourable to investment in enterprise specific assets, such as R&D and training, and this bias is reinforced by labour markets which favour the mobility of skilled labour, especially of researchers and engineers.

National Systems for Financing Innovation [9] also suggests that liberalisation and

globalisation of financial markets has been at the cost of discrimination against certain kinds of risks, enterprises and investments. They are the kinds of risk for which coverage cannot be provided by "securitised" investment instruments - instruments that preserve the investor's liquidity regardless of the life of the investment to maturity. By enabling investors to indulge their preference for liquidity, financial innovation has probably made it more difficult to finance projects that do not lend themselves to collective evaluation on large, interconnected international markets. These are the investments whose soundness can be judged only from detailed information on the enterprise and the nature of its projects, and which does not translate into the creation of assets recognisable as collateral. Resource investment, especially in training and R&D, are the main victims. Growing disparity in the conditions of access to finance depend on firm size. The first victims are risky projects proposed by small firms unable to guarantee liquidity by having their shares listed on secondary markets. This problem is compounded in countries like Australia, where venture capital is scarce.

6.3 INNOVATION AND FINANCIAL VOLATILITY

National Systems for Financing Innovation [9] points out that investment needs and the means of satisfying them are sensitive to the degree of certainty with which macro economic trends during the depreciation period can be forecast. Interest rate fluctuations caused by monetary turbulence could foster a preference for short-view financial decisions to the detriment of slow-maturing investments. Indeed, there has been wide concern that the present international financial system is far too unstable: it is often described as a vast casino.

The Canberra economist, Fred Argy [23], one of the signatories of the Campbell Committee Report, is one who has recently voiced his concern at this aspect of the current financial system. According to Argy, even if governments want to do the right thing for their economies and for their communities, they face instability in the exchange rate, and in interest rates if they displease the markets. The problem is that markets are dictating to governments not just the need for a lower Budget deficit, but the details of the composition of public sector spending and revenue raising. And they are obsessed with the objective of driving down the size of government. Argy believes that although they are over zealous, markets are basically on the right tracks when they are worried about the deficit. But they are out of line when they start to dictate to governments about the levels of spending on welfare, on labour market programs, on education, on health and on things that don't yield any immediate financial returns. "Unless we can tame this beast that we have created somehow, it will devour government independence completely". Argy believes that it is high time governments in a coordinated way began to look seriously at ways to better manage short-term, destabilising portfolio capital flows. He specifically suggests market-based instruments such as capital inflow and outflow taxes.

The Industry Commission's, *Availability of Capital* [24] was also concerned that continued reliance on debt (as opposed to equity) financing of investment needs, with its contractual obligations to make interest payments, largely in foreign currency, makes domestic living standards more vulnerable to external shocks. For a country like Australia with a large exposure to volatile commodity markets, raising this exposure poses a significant risk. Consequently, the Industry Commission suggests that the main focus of policy should be to address the reasons for the persistence of an unwarranted structural dependence on foreign savings, particularly in the form of debt.

In this connection it is as well to recall Robert Wade's [24] advice regarding the dangers

associated with financial instability:

> "The government must help ease the risk of high debt/equity ratios with the ever present danger of financial instability. This need to socialise risk applies especially in the case of highly correlated risks, ie interest rate changes, major recession, or changes in major export markets, and political risks. Consequently, the impetus for government to shoulder some of the risks is especially strong in countries which are trade dependent. Government can also, of course, control interest rates and exchange rates to dampen firms' exposure to market fluctuations in these two important sources of correlated risk."

In Australia with our Anglo-American market based financial system, we privatise most of these risks, including the risks associated with macro-economic mismanagement.

6.4 AVAILABILITY OF FINANCE FOR SMES AND SSES

The *Espie Committee Report* [23], prepared by the Academy in 1983, concluded that Australia lacked adequate mechanisms for "growing" the medium-to-large firms so essential to long-term success in high-technology industry. In response the Government introduced the Management and Investment Companies Program as a demonstration Program to promote the development of a venture capital industry. However, the MIC Program was opposed by the Departments of Treasury and Finance and as a consequence was designed poorly and grossly underfunded. It failed to induce the major institutional investors to invest in venture capital, and the government was persuaded to terminate it prematurely. This advice was based on an unwarranted faith in the "efficiency" of financial markets and a failure to appreciate the scale and duration of the effort required. Nevertheless, the MIC program began the process of training people to manage venture capital investments and the resulting pool of experience has gradually grown. Numerous reports have subsequently highlighted this financing problem.

National Systems for Financing Innovation suggests that isolated SMEs (and SSEs) suffer considerable handicaps accessing sources of finance, and that globalisation of financial markets has made this problem more acute. This judgement on the effects of deregulation stands in sharp conflict with the beliefs that underlaid the *Campbell Committee Report* [25], the BIE *Review of Venture Capital* [9] in Australia and the *MIC Program* [26] and the Industry Commission Report, *Availability of Capital* [24]. It is consistent, however, with the alternative stream of advice evidenced in Reports in Appendix 3, Previous Reports on the Availability of Capital. Indeed, policy action to address this problem is widespread in many other countries as outlined in Appendix 2, Policies in Other Countries. Indeed, there are good theoretical reasons to expect that Government intervention to improve the availability of capital for innovative investments, particularly for small companies, can enhance economic welfare.

Recent developments in Australia have failed to adequately address this financing problem:

Present funding of Development (which is more correctly commercialisation) by Super Funds through Development Capitalists is limited to about $150 million per annum and this is mainly directed to projects that have already succeeded.

- The observed difference in risk profiles between "Seed and Start-up" Capital on the one and "Development" Capital on the other hand unduly distorts the availability of funds for early stage development.
- Such schemes as Business Angels networks, 150% R&D tax concession, Pooled

Development Funds and the Australian Technology Group, CRCs, AECs and Research syndication each have value in their particular sphere, but they are limited and do not adequately address the problem of funding Commercialisation.

- The IR&D Board makes about $40 million worth of grants a year. Whilst the Board goes to considerable lengths to check on the grantee's capacity to carry through and commercialise the work these grants are primarily aimed at research and development with very little support going towards commercialisation. Indeed they specifically exclude much development activity, even though they are lenient on "management" and "market survey" costs.
- The PDF Program is limited and only covers expansion after commercialisation and consolidation. We have already commented that " development capitalists" are only interested after commercialisation and consolidation.

This study, and the Reports referred to in Appendix 3, demonstrate that the non-availability of capital continues to inhibit the growth of innovative companies particularly SSEs. It needs to be recognised, however, that all available investible funds are currently allocated to other uses. What is proposed necessarily involves a reallocation of those funds towards innovative investments. Because of the nature of innovative investments and the pervasive presence of externalities, the private returns on such investments can deviate from the social returns. This

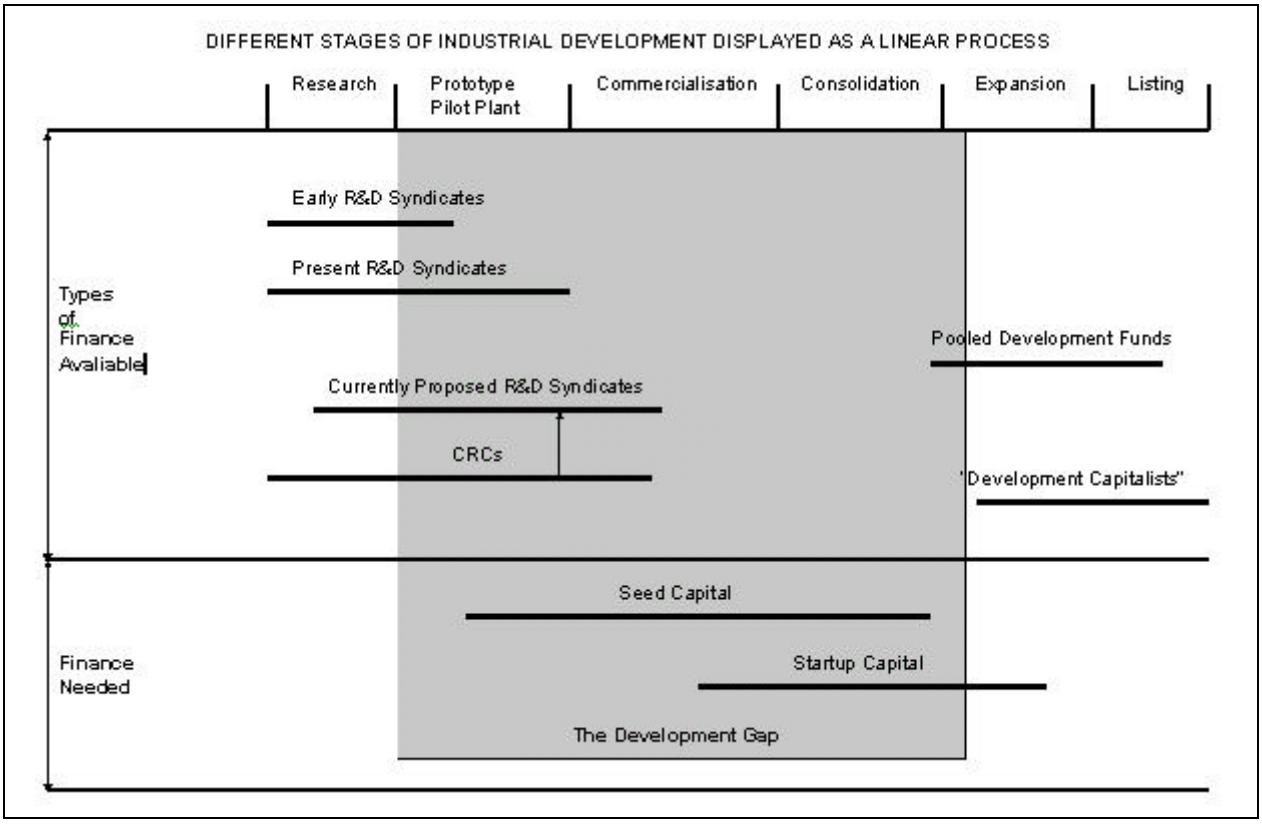


Figure 6.1: Shows various funding mechanisms available and the Development Gap for Seed and Startup Capital in Australia.

means that the investor cannot always capture the full benefits of the investment and this will be reflected in a reduction in the return on his portfolio. (Of course, any reduction in the returns on investment would be a first round effect only. Flow on benefits resulting from the enrichment of the industrial fabric will result in compensating increases in returns on subsequent investment.) It is usual in such cases for the investment to attract some form of public subsidy funded in some way from taxation revenue. In such circumstances it is more equitable if the tax base used is broad and is related in some way to the benefits derived.

The measures that could be adopted fall into the following general categories:

- Direct Government Grants and Concessional Loans,
- Equity Capital,
- Loan Finance,
- Loan Guarantees, and
- Avoidance of Sources of Cash Depletion.

In examining these categories, the Study Team stresses that there are many ways of dealing with the problem. As the Industry Commission pointed out in its draft Report on Research and Development, diversity should be encouraged: "A combination of interventions will generally be needed not only because some may be more suited to particular circumstances, but also because their relative efficacy is uncertain." And further, "Even the most competent assessors make mistakes. They may even make them systematically..." The Study Team is concerned that the Government should adopt a significant and comprehensive set of measures to address the problem rather than being fixated on any particular suggested solution.

6.4.1 DIRECT GRANTS

The machinery already exists to provide grants on a competitive basis for Research and Development, the IR&D Board allocating about $40 million per annum. In addition, $48 million has also been made available over four years under a new concessional loan scheme for commercialisation. This machinery could readily be extended to provide grants for commercialisation and the funding under the loan scheme could be increased. However, we would not see direct grants or concessional loans being funded to a level which would provide the scale of solution required.

6.4.2 EQUITY CAPITAL

6.4.2.1 Direct investment by the Commonwealth

We are conscious that there have been many objections raised over the years to governments being too directly involved in investment decision making and do not favour such a scheme.

6.4.2.2 A New Tax Incentive

Continued concern over the lack of depth of the development capital industry led to the introduction of the Pooled Development Fund (PDF) scheme in I992. The Program was designed to encourage the establishment of investment companies through a concessional tax rate, but the Program failed to attract significant funds because it did not provide an incentive for

the superannuation funds. Consequently, the Working Nation Statement increased the extent of the concession. PDFs are now taxed at 15 per cent instead of at 25 per cent on profits derived from investment in SMEs and 25 per cent on profits derived elsewhere, rather than at the general company tax rate of 33 per cent. Unfranked PDF dividends are exempt from tax. Franked PDF dividends are also exempt unless the shareholder elects to be taxed on them. Any gains on the sale of shares in PDFs will be tax exempt.

However, the change in the rate of concession has failed to induce substantial institutional interest in this vehicle. To date the twenty-two registered PDFs have raised only $56 million. In any event this scheme was aimed at the Development Capital phase rather than the early seed and start-up phases. While, in principle, it would be possible to amend the PDF Program to assist SSEs, we doubt whether, in practice, it will now be possible to revive this program, let alone extend its purposes. Consequently, we suggest that a new taxation scheme will be necessary. A Tax Rebate route is preferred for the following reasons:

- it costs less to administer per unit of investment,
- if necessary it can be expanded later,
- it will materially assist the change of culture Australia badly needs, and
- there is an element of reallocation of funds which would go into tax minimising schemes anyway.

We therefore recommend that the Government introduce a tax rebate applicable to individuals, companies, trusts and superannuation funds for money invested either directly in small companies or management funds which qualify as Industrial Developers. The relationship between the tax rebate and the funds invested would be varied (even year by year) to fine tune the balance between funds required and funds available. The details of the suggested new scheme need to cover such matters as:

- how to define “allowable investment”,
- how to minimise rorting, and
- how to assure that sufficient and not too much money becomes available for development.

None of these is insurmountable if there is sufficient intent to make it work.

We suggest that certain activities should be excluded: Tourism, Retailing, Export/Import Trading, Real Estate, Commercial Property Development, a range of service companies, mining and agriculture (but not secondary processing of either). There will be a need to obtain a balance between the so called “High risk” end of the spectrum (seed and start-up companies) and the lower risk higher expenditure requirements of more mature companies, at least until the investing public have a chance to realise that with the higher risk goes high returns when properly managed.

To minimise rorting we suggested a relatively simple accreditation process, in which companies seeking to manage Investment Funds on behalf of others apply for accreditation as an Industrial Developer in a manner similar to the existing mechanism which accredits Approved Research Organisations. Grounds for accreditation could include:

- experience as a successful business angel or business developer,
- acceptable level of management expertise,
- experience of the development process,
- adequate business planning, and
- activities centred in Australia.

Finally it is necessary to look further afield than financial fund managers for the management talent to carry out the necessary industrial development activity that the Australian economy requires, though the present Development Capital Companies should also be accredited. We therefore recommend that the following types of organisation be encouraged to apply for Industrial Developer status and to develop their potential for such activities:

- development capital fund managers specialising in equity injection to develop more mature sized companies who are prepared to extend their portfolio to smaller, earlier stage companies,
- companies and individuals with a proven track record of industrial development across the spectrum of the development process,
- technology brokers such as commercial companies attached to universities and CSIRO,
- business angels with a track record for assisting the early development of companies,
- statutory bodies with special responsibilities such as ERDC (energy), subsidiaries of electrical authorities, telecommunications groups (Telecom, Optus),
- engineering consulting, construction and contracting companies, and
- specialist consultants in, eg secondary processing of agricultural and minerals projects.

There are superficial similarities between the scheme proposed and the unfairly maligned MIC scheme. This was terminated before it could be fairly judged and the long term results look better than expected. In any case this proposed scheme differs from the MIC scheme in the following important aspects:

- A tax rebate is much fairer and more broadly based incentive than an 100% upfront tax deduction, and will attract a much more diverse and wider response.
- It will have attractions for both high net worth individuals and super funds.
- There is no “watchdog” role to play on performance, simply accreditation of a type similar to applying for an Approved Research Institute.
- By varying the tax rebate as a percentage of the investment and by a gradual process of redefinition it can be extended to the later stages of the Development process.

6.4.2.3 Role of the Superannuation Fund

The Government is supporting savings via superannuation to encourage self provision for retirement and to reduce the reliance of the aged on social welfare payments. Since the mid-1980s this has resulted in an ongoing shift in the savings of Australian households from the traditional banking or deposit taking institutions to life insurance and superannuation. At June, 1991 total assets under the management of the 109 largest funds totalled $127.3 billion but the top twenty funds accounted for $92.5 billion. More funds will flow to superannuation funds from changes made in the 1995 budget. The Assets of the Superannuation funds were invested as shown in Table 6.1.

Table 6.1 shows that significant shifts have occurred in the composition of these investments. In particular, overseas holdings have grown from a negligible amount to the 16 per cent shown above as a consequence of the removal of restrictions on portfolio investment overseas as part of financial deregulation. Given that the liabilities of Australian Superannuation Funds are denominated in Australian dollars there is no need for these funds to hold overseas assets as a hedge against currency risks and some have argued that such an investment pattern is

inconsistent with the broad responsibility of the superannuation funds to the Australian community. Superannuation funds have, however argued that they need to spread their risks and have an obligation to maximise their earnings for the benefit of their

	June 1989	September 1992	September 1993
Equities and shares	23.8	26.2	28.7
Bonds and Securities	19.2	24.5	24.7
Overseas	10.3	14.1	16.0
Short term and cash	14.4	11.0	9.4
Land and Buildings	16.5	9.9	7.3
Loans	7.9	6.2	5.6
Units in Trust plus other	6.5	7.0	7.7
Other	1.5	1.0	0.6
Total per cent	100.0	100.0	100.0
Total $ billion	90.7	152.0	180.1

Table 6.1: Assets Held by Superannuation Funds as a percentage of Total Assets
Source: ABS Catalogue No 5656.0, Assets of Superannuation Funds and Approved Deposit Funds.

policy holders. With such a significant proportion of the national savings pool involved, we suggest that the interests of the policy holders cannot be conceived in such simplistic terms. Consequently, it is by no means clear that regulating the investment decisions of superannuation funds receiving privileged taxation treatment is contrary to the interests of contributors. The present arrangements result in an effective subsidy from the Australian Taxpayer to investments in other countries. Given our capital constraint, we believe that this is unwise. In this regard we point out that the failure of Australian Governments to have either the vision, or the courage, to insist on appropriate export commitments from the beneficiaries of its protectionist policies, probably accounts for the failure of our protectionist policies.

In any event aggregating savings into such large and concentrated funds may well involve significant diseconomies of scale which disadvantage SMEs and SSEs. Indeed, the desire of superannuation funds to invest offshore may well be a consequence of excessive aggregation combined with the thinness of the Australian equity market for blue chip shares and the undeveloped nature of the development capital and venture capital markets. This diseconomy may also fuel periodic bouts of overinvestment in commercial real estate particularly in central business districts and regional shopping centres along with the attendant inflation of asset values.

The income stream of the superannuation funds would therefore appear to be an appropriate taxation base to fund any subsidies required to build such industry based on SSEs and SMEs. In fact the superannuation funds already attract a government subsidy through their concessional taxation treatment. Consequently, this must be a particularly attractive option at a time when there is considerable pressure on government spending. Any short term reduction in their overall returns in the short-term resulting from directing a small proportion of their investment towards SSEs would be offset by the substantial concession they are already receiving.

The failure of these institutions to support the MIC Program and the current PDF Program to any significant extent points to a fundamental design faults with these schemes. Given that substantial incentives have still failed to induce cooperation from these institutions regulation appears unavoidable.

The most commonly suggested formula is to require the super funds, as a condition of their concessional taxation treatment, to invest between 1% and 3% of their total funds in

"Development activities". In the USA superannuation funds invest around 4% of their total funds. This potentially involves a dilemma for fund trustees, who see themselves as being forced to invest in a particular class of investment with the chance of being hounded by their investors and by Government lawyers as a result of increasingly strict rules governing Trustee behaviour.

For this reason, we favour a central Fund of Funds which receives a small proportion of new super fund money from employer contributions *before it reaches the super funds*. The central Fund of Funds would in turn invest in other professionally managed development capital and venture capital funds. The central fund draws equity returns from their instruments and then allocates them to the relevant super funds.

6.4.2.4 Equity Capital from Banks

Current Reserve Bank policy effectively prevents banks from providing equity for prudential reasons. The Reserve Bank's attitude is not, however consistent with the practice in other countries. German Banks, for example, are significant equity investors in German businesses and their stability is rarely questioned. In Britain, where the banking and financial system generally is much closer to our own, banks have much more flexibility to take equity in business. In fact the Yorkshire Bank, the UK subsidiary of the NAB, has a successful and growing equity product for SMEs. Indeed, the NAB has indicated that it wishes to introduce a similar vehicle here, with initial funding of more than $200 million. The East Asian experience strongly suggest that a bank-based financial system confers significant advantages when it comes to financing long-term innovative investments and we believe that Australia should move its institutional arrangements in this direction.

The Industry Commission in *Availability of Capital* [24] saw some merit in banks being permitted to provide limited amounts of equity. It recommended that the Treasurer ask the Reserve Bank to consider whether the current prudential requirements could be eased to allow banks additional freedom to provide equity finance. However, the Reserve Bank has failed to act on that recommendation. We agree with that recommendation. Furthermore, we believe that this is a policy question which the government should deal with as a matter of urgency rather than leaving it to the Reserve Bank to handle as an administrative matter. Some adjustment to the taxation treatment of capital losses may also be needed to facilitate such investments.

6.4.2.5 Role of the Commonwealth Development Bank (CDB)

The Commonwealth Development Bank (CDB), now a wholly owned subsidiary of the Commonwealth Bank (CBA), was established specifically to assist small and medium-sized businesses which would otherwise have difficulty in attracting suitable finance. The CDB has developed a strong reputation and skills in assessing businesses in its specialised area. Whilst security is usually taken, the CDB does not refuse a loan only on the basis of insufficient security. The CDB's charter was amended in 1986 to allow it to also provide equity finance to SMEs which are able to demonstrate prospects of strong sales and profit growth. Since that time the CDB has invested in a small portfolio of projects gradually acquiring the necessary skills. The CDB has set up resources to assist its investee companies including provision of professional advice and has also provided loan funds to some of its investee businesses. In 1992-93, new lending totalled $429.2 million, comprising loans from primary producers ($186.1 million) and loans for business ($243.1 million). As at 30 June, 1993 outstanding loans totalled $1973.5

million.

Given its recognised skills and experience, the CDB is ideally placed to assist the financing of small innovative businesses. However, its association with the Commonwealth Bank, which is in the throws of privatisation, acts as a brake on its further development. Indeed the potential exists for a significant conflict of interest between the CDB with its emphasis on cash flow lending and its "social" charter and the rest of the Commonwealth Banking Group. In our view there is a particular danger that the specialist expertise built up over many years within CDB will be dissipated as the CBA is prepared for further privatisation. Consequently, it is recommended that the CDB should be retained by the Commonwealth as a wholly-owned specialist small business bank with the capital base necessary. With this arrangement the CDB would be able to provide a range of services to SMEs and SSEs similar to that provided by the highly successful Canadian Federal Business Development Bank. It should be noted that the CDB is already involved with the administration of the Concessional Loan Scheme and is prepared to contribute some of its own funds in some cases.

6.4.3 PROVISION OF LOAN FINANCE

While equity capital and retained earnings are the primary and most desirable sources of finance for business establishment, debt finance is often substituted for equity resulting in a level of debt and a gearing ratio which would not be acceptable in larger companies. This level of debt makes such companies highly vulnerable to highly correlated risks such as interest rate changes, recession or changes in export markets. Robert Wade in *Governing the Market, economic Theory and the Role of the Government in East Asian Industrialization* [27] emphasised the need for governments to ease such risks particularly in countries which are trade dependent.

Banks are the most importance source of this debt finance with finance companies and trade credit being other importance sources. While the banks argue that the availability of debt finance to small business has improved greatly, critics claim that the narrow-focused financial community has yet to undergo the "cultural" change that will be needed for an advanced manufacturing economy. These problems include:

- abrupt changes in overdraft limits not associated with their client's realistic prospects,
- their reluctance to lend short-term working capital on the basis of the underlying prospects of the business, such as a sound cashflow history,
- the refusal to lend on the basis of firm contracts or orders,
- a refusal to provide finance to SMEs and SSEs on a long-term basis at fixed reasonable terms for equipment purchases, development activities and other more long term capital investment, and
- reliance on personal collateral for lending compounds any problems related to the inability to attract sufficient equity.

As a consequence of government pressure the banks are at last examining such revolutionary ideas as:

- lending against cash flow rather than assets,
- limiting their fees to small businesses, and
- adopting a more understanding posture to small business.

It seems to us that Government should maintain this pressure on the banks to perform. In particular banks should be required to pay special heed to the financing requirements of export oriented and import replacing firms.

It is often not recognised that the ease with which security can be realised tends to have the perverse effect of encouraging asset-based lending. An excessive focus on the rights of lenders can therefore deprive good investments of capital while promoting better secured but less economic investments. This same focus can also result in the unnecessary destruction of the intellectual, organisational and relational capital associated with struggling companies. The preservation of as much of that capital as possible should therefore be a particular obligation of those responsible for the realisation of the assets of such companies.

6.4.4 BRIDGING FINANCE GOVERNMENT-BACKED GUARANTEES

Rapidly developing companies face a number of situations that are not covered by any of the current export and development incentives. For example:

- Early project development costs, before a formal tender is issued which a consortium can address with the assistance of Austrade's Infrastructure Consortium Program.
- Tendering and project development costs up to the stage of a final contract, which the Export Finance Insurance Corporation (EFIC) cannot cover with a working capital loan until the contract is signed.
- The early stages of penetrating new markets overseas, which might include extensive development and marketing expense.

The features these examples have in common are:

- Heavy, but often temporary, strains on the liquidity of a young, fast growing company.
- Undertaking risks that won't be "Bankable" by Banks, Venture Capitalists or existing government schemes and yet can be judged to be "in the national interest".

A Government guarantee which effectively "shares the risk" for a specific period, may well be a more effective form of assistance than a Grant or a direct investment. It certainly has less need of direct funding, though it creates a contingent liability. To be effective such a scheme needs to be able to arrive at a decision quickly.

6.4.5 AVOIDANCE OF SOURCES OF CASH DEPLETION

SSEs and SMEs face many threats to their financial survival. The avoidance of all unnecessary sources of cash depletion is therefore essential. Even when such companies succeed in selling their products to government the terms of payment and the conditions of contract often impose avoidable burdens. Elsewhere we comment on the cost of many regulatory burdens and the need for a user friendly approach to those regulations. The current user-pays philosophy applying to many government services imposes a significant burden on young companies and can deter them from accessing supporting government programs. The redistribution of these burdens to a later stage in a company's life cycle is therefore desirable.

Recommendation 5 - The Financing of SSEs

While the government has acknowledged that the Australian financial market has failed to adequately finance SSEs, its actions to correct for this market failure have been too tentative to have a significant impact. No single solution seems appropriate and we suggest the following:

5.1 The Government should give selective treatment to promote the establishment and growth of Science and Technology based industries. In this regard the Study Team again draws attention to the numerous reports (Summarised in Appendix 3) that have recommended special provisions for the financing of Small Start-up Enterprises. Such arrangements are commonplace in other countries. The need is urgent and we believe the initiatives being taken by the Minister in the forthcoming Innovation Statement should focus on this challenge.

5.2 Equity Finance

i) The Government should introduce a tax Rebate applicable to individuals, companies, trusts and superannuation funds for money invested either directly in small companies or management funds which qualify as an Industrial Development Organisation. The relationship between the tax rebate and the funds invested would be varied (even year by year) to fine tune the balance between funds required and funds available. Eligibility would be determined through an accreditation process similar to that for Approved Research Organisations taking account of the following criteria:

- **experience as a successful business angel or business developer**
- **an acceptable level of management expertise**
- **experience of the development process**
- **adequate business planning**
- **activities centred in Australia**

ii) As the custodians of the largest pool of long-term investment capital in Australia the Superannuation Funds have to invest in such companies. The Government should make the already generous taxation treatment of these funds conditional on their investing a small proportion of their portfolios, say 0.3% initially growing to 1.5% over five years, in venture capital funds or directly in innovative start-up businesses which are export oriented or import competing (USA Superannuation Funds invest around 4% of their funds in SSEs and SMEs).

iii) Australian Banks should be permitted to provide equity funding to financing long-term innovative investments as recommended by the Industry Commission.

iv) The Commonwealth Development Bank should be retained by the Government as a wholly-owned specialist small business bank for small business.

5.3 Loan Finance. The Government should continue to pressure the banks to lend on a cash-flow basis and for loan finance to be targeted towards export oriented and import competing companies. The Study Team also draws attention to the need to ensure that concern for the rights of lenders should be balanced by a responsibility to preserve the intellectual property organisation and capital invested in struggling

	businesses.
5.4	**Banks be required to report annually to the Reserve Bank to the extent which they have increased finance and lowered borrowing costs to small business, and that the Reserve Bank have the right to discount interest payable on non-callable deposits to those who are judged to be performing inadequately.**
5.5	**Bridging Finance and Government-backed Guarantees: The Government should extend the range of bridging finance and guarantee schemes available for the increasing number of situations which fast growing companies face which are not covered by existing DIST, EFIC or Austrade schemes.**
5.6	**Avoidance of unnecessary sources of cash depletion: Government programs and the requirements of regulatory agencies should be structured so as to avoid placing unnecessary charges and other burdens, including uncertainty, on young companies.**

7. SUPPORT AREAS

7.1 EXPORT PROMOTION

Most SSEs and SMEs interviewed rely on exports for their development and growth and require assistance at no or low cost until established in the export market.

The Australian market is large enough to promote the development of a wide range of sophisticated products and services but is often of insufficient size to sustain the resulting Australian firms in a highly competitive world. Consequently, many innovative firms need to be export oriented from their earliest days. A perceived government interest in a business relationship does raise confidence levels. A presence, real or implied, in negotiations but without involvement is a relatively low cost form of support to early transnational venturers.

Whilst Austrade and Export Development Schemes were initially of assistance the Study Team gained the impression from its interviews that they are no longer as valuable. Austrade now charge for their services. Similarly, the rules and paperwork required for Export Development grants are now so rigid that many of the companies interviewed did not bother.

Overseas Australian Trade Commissioners have discretion, within their budgets, to assist small companies at no cost. This has been very helpful and more flexibility should be built into their budgets for this form of assistance.

Recommendation 6 - Export Promotion

6.1 Austrade has a key role to play in the acquisition of the market intelligence needed to substantiate export opportunities and the promotion of Australian products and services. We believe that these efforts are seriously under resourced.

6.2 As the funding of these services on a cost recovery basis is inconsistent with the need for small exporting firms to conserve their limited cash resources, some assistance should be provided to SSEs until they become established in the export market.

7.2 GOVERNMENT PURCHASING

SSEs and SMEs reported difficulties in obtaining Government contracts for the purchase of their goods and services.

7.2.1 PURCHASING POLICY

In many countries it is considered disloyal for governments to buy foreign goods and there are a wide range of overt and covert mechanisms to discourage such purchases. In Australia, however, the cultural cringe operates to exclude Australian firms from many opportunities. For smaller firms such exclusion is an everyday occurrence.

Opportunities for learning are a scarce economic resource and the public sector's own demand for goods and services is one of the most important such resource. This applies particularly to science and technology industries where the government's own demand and the demand of its business enterprises is often a significant proportion of the total market. Similarly,

the supply requirements of major companies are also a major resource. We believe that these learning opportunities have to be managed to obtain the maximum benefit. Sophisticated domestic demand not only provides local companies with essential cash flow but also with the test and reference sites so necessary for the refinement and sale of sophisticated products. Sales to the Australian public sector are often essential to provide credibility in export markets.

Economists, who usually object to purchasing preference arrangements, simply fail to recognise that this resource can suffer from excessive competition in a classic Tragedy of the Common situation. Nor do they take adequate account of the capacity of large suppliers to engage in unfair competition.

In Australia each of the sources of demand for sophisticated manufactures and sophisticated services - military spending, telecommunications development and infrastructure provision - which had been so important to the development of European, American and Japanese industry was subordinated to other requirements and priorities. The corporatisation and privatisation of government business enterprises which began to gather momentum in the early 1990s has made it even less likely that this form of demand stimulus would be increasingly or consistently used, despite the emphasis given to government-industry links in research.

Even where there was an intention to favour Australian firms execution often faltered. Under purchasing preference arrangements in operation intermittently from the mid-1970s, a specified percentage of the Australian and New Zealand content of tender bids was to be deducted from the price quoted. But such requirements rarely made a difference to the choice of tenderer, because in purchasing complex products, the real decision was made when the tender specifications were drawn up. At the Commonwealth level the *Inglis Report* [28] recognised that previous government purchasing preference arrangements had not been effective and as a result these preference arrangements were abandoned. The States followed suit. Instead agencies were required to purchase on a value for money criteria paying some vague regard to the impact on Australian Industry. At the same time the devolution of responsibility for purchasing throughout government agencies and the corporatisation of government business enterprises inhibited effective coordination.

Purchasing policy has been used effectively under the civil offsets and successor arrangements applying to information technology and communications technology products and to aerospace products bought from transnational companies. The Partnership for Development program, in particular has made a significant contribution to Australia’s exports of ETMs. However, these programs have been less successful in stimulating the growth of indigenous firms.

Purchasing policy was again investigated by the Bevis Committee [29] in 1993 with the government responding in the Working Nation Statement. That Statement acknowledges the key role that government purchasing plays in the development of science and technology based industries. The influence of such purchasing on the fates of SMEs and SSEs was also been recognised. Nevertheless, the government did not accept all of the Bevis Committee’s recommendations. The favourable publicity given to the government’s response may have led to some confidence that finally measures are in hand to enable effective coordination of purchasing at the Commonwealth level. The need to coordinate such purchasing with the States is less well understood.

We are not convinced, however, that the full implications for purchasing policy have been recognised. In particular, we are concerned that the need to foster the growth of Australian SSEs, SMEs and indeed Australian transnationals through purchasing policies should take priority over normal competitive tendering processes. This requires an active management strategy targeted at the strategically important opportunities as well as more passive policies. We also remain to be convinced that the management changes that have been made will be sufficient to overcome the entrenched conservatism and risk aversion of purchasing agencies. We question whether the National Procurement Board will be able to overcome the entrenched resistance to effective purchasing policies. Without a strong commitment from senior Ministers nothing will change! The recommended appointment of a Chief Information Technology Officer* within the Finance portfolio could also be a step towards more effective coordination provided the inherent conflict between the competing priorities of the Departments of Finance, Industry, Science and Technology and Administrative Services are effectively managed.

As *Managing the Innovating Enterprise* [4] pointed out, there appears to be unrealised potential for innovating public sector enterprises to sell technology-based innovations they have developed into Asia and elsewhere. Highly rewarding collaborative relationships can develop with private partners as a result of this commercialisation of their products, services and processes. Such collaboration should become an expected and accepted modus operandi for public enterprises. Leading edge customers often take risks in purchasing or helping to develop new and improved products, services and processes.

Some risk is an intrinsic part of the process, and has to be recognised and accepted by the leaders of public enterprises and their respective governments. (Indeed, risk averse agencies often seek protection from such risks through a defacto purchasing preference in favour of transnational companies). The Government and the community has to be prepared to accept such risks and the occasional failures involved! An attack on this risk aversion and the cultural cringe that underlies it, should form part of the cultural change program recommended in this report.

What has not been recognised is that the corporatisation of government business enterprises and the outsourcing of major government functions, such as Information Technology services, also provides a once only opportunity to enhance the structure of firms within the Australian economy, while improving the balance between major Australian owned firms and foreign firms.

It is also unfortunate that the Government's limited program to encourage the demonstration and trialing of new Australian products and services has fallen into disuse, possibly because it has been administered as a technology program rather than as a purchasing program. Government should revitalise and extend these efforts to encourage larger organisations to become leading edge customers in collaboration with Australian enterprises especially SSEs and SMEs.

7.2.2 PROMPT PAYMENT OF BILLS BY GOVERNMENT

Prompt payment of invoices by Government Departments is invaluable to small business, whose working capital requirements have to be minimised. From a historical position of being a slow payer, several agencies of the Commonwealth Government, and particular areas within those agencies, now take pride in their prompt payment procedures. The CAA and the Department of

*A recommendation of the Report of the Minister for Finance Information Technology Review Group, March 1995

Defence both fit this category. Making this formal Government policy will accelerate this trend. Indeed, moves towards electronic trading would assist with this problem provided the procedures adopted do not inhibit purchasing from SSEs.

7.2.3 REVISED TERMS OF PAYMENT ON GOVERNMENT PROJECTS

It has become accepted practice, particularly in the Defence Department, to schedule payments against acceptance of deliverables, or milestones. This was brought about by the fact that most contracts used to be for the supply of equipment, rather than services. There are now many more contracts for services, or for services and equipment, and this form of payment is at best "lumpy" and at worst provides scope for small-minded tyranny, with disastrous results for small business. The private sector departed from this practice years ago - particularly in the process industries. It is now standard practice to establish a cash flow model which gives a contractor a neutral cash flow position. There is always a provision that, if the contractor is not performing, regular payments are delayed for as long as it takes him to regain performance so the "stick" is available to obtain correct results but much unnecessary agony is avoided. We recommend that the State and Commonwealth governments also adopt neutral cash flow procedures.

7.2.4 UPFRONT DEPOSITS

Until recently, Government Departments gave up front deposits to contractors which in effect funded their working capital. This was of enormous value to small business, and didn't significantly affect the final cost to Government. Recently it was decreed that all such deposits must be backed by a Bank Guarantee, a particularly onerous requirement for small businesses. If they can't back the bank guarantee with bricks and mortar, or against their borrowing limits, such a deposit becomes of negative value, since it stays in a separate bank account, inaccessible to both Government and Contractor. We recommend that State and Federal Government Departments examine the need for Bank Guarantees against upfront deposits on a case-by-case basis.

Recommendation 7 - Government Purchasing

7.1 The Study Team notes that the Government has recently responded to the Bevis Committee but has not fully accepted that Committee's recommendations. The policy changes made will only be effective if they are supported strongly by senior Ministers and their Departments.

7.2 The Government's limited program to encourage the demonstration and trialing of new Australian products should be revitalised and extended.

7.3 The terms and conditions associated with government contracts need to be tailored to the requirements of SSEs and SMEs and the government should pay its bills promptly so as to give a contractor a neutral cash flow position.

7.4 State and Commonwealth Departments should question the need for bank guarantees against upfront deposits on a case-by-case basis.

7.3 REGULATORY ENVIRONMENT

Start up and even Medium Sized S&T based companies reported difficulties that limit their operations and growth with the plethora of Federal and State Laws and Regulations.

From comments received there is no doubt that the plethora of Federal and State Laws and Regulations greatly inhibit the formation, operation and growth of SSEs and SMEs; amongst these are our complex tax system, payroll tax, sales tax and workcare cover. We have already stressed the importance of visits to distributors, customers, trade fairs in building up networks, however the taxation rules requiring itemisation of every expense (including minor ones);and keeping detailed diaries of every visit and discussion acts as a disincentive. The new Industrial Relations Laws also inhibit SSEs and SMEs taking on new employees.

So much of market control now depends on conforming to and creating technical standards, that these can be not only a non tariff barrier but a key part of national competitive advantage in accessing overseas markets. This implies that the government has to subsidise contributions to the formation of technological standards platforms, disproportionate to the size of the immediate Australian commercial presence.

However, accreditation to various quality standards presents SMEs and SSEs with a set of challenges and problems different in many ways from those of larger and/or more established manufacturing companies. Specifically:

- The procedural requirements of IS9000 and AS3900 as presently enforced in Australia are often inappropriate to the needs of a small rapidly growing company whose great strength is flexibility. The end result is to inhibit growth and the flow of activity producing the very reverse of the quality assurance the standard aimed at.
- The cost is prohibitive for such firms and for the country as a whole. The total cost of qualifying the 10,000 such small companies affected would be between $2 and $3.5 billion initially and $500 to 700 million annually and is therefore out of proportion to the advantages that could be obtained.
- Purchasers' pressure, mainly from government instrumentalities, for AS3900 accreditation is mainly responsible for the size of the problem and this needs to be actively discouraged.

These matters have been addressed by the Independent Committee of Inquiry into Australia's Standards and Conformance Infrastructure lead by Kean [30] (see Appendix 4) and we heartily endorse their findings.

Recommendation 8 - Regulatory Environment

The Administrative doctrine of government regulatory bodies should involve a service ethic to limit the costs and the administrative burdens imposed on SSEs and SMEs in meeting their requirements including limiting appeals to higher judicial authorities. Chapter 14 of the recently released Report of the Independent Committee of Inquiry into Australia's Standards and Conformance Infrastructure, Linking Industry Globally, contains detailed recommendations which we heartily endorse.

7.4 ASSISTANCE FROM CSIRO, UNIVERSITIES AND GOVERNMENT ORGANISATIONS

Few SSEs or SMEs reported using CSIRO, universities or other government organisations for information on R&D except on a limited basis because of the time and cost involved.

University and government laboratories have at least three important research roles. One role is to conduct basic or fundamental research aimed at the generation of new knowledge and with no direct commercial goal. Another main role is conducting research aimed at assisting Australian industry to develop commercially successful products and processes. The third main role is education and training of scientists and engineers in both fundamental and applied research practices.

In the basic research field it is appropriate for university and government research laboratories to be the primary originators of their own research projects. However, they should take account of the possible potential value of the research to Australia, and it is desirable that there is consultation with external groups and advisory committees.

In the case of commercially directed research, it is absolutely essential that the work is conducted in close collaboration with commercial enterprises which can develop the results into products or processes. In the past, we have seen many cases where interesting research results have not been commercialised because of only to find a complete lack of interest from any Australian partner. Frequently this has arisen because none of the potential commercial enterprises was looking to make new investments at the particular time of the discovery, or the enterprises found the likely cost of development and marketing was very high. But the most common cause is the fact that the research has not been correctly aimed at an appropriate market. These difficulties can be greatly reduced by the university or government group working as a team with the industrial developers.

In the case of SSEs there is a need to direct research assistance to their current specific product or process development. They are normally much too small to diversify into several new product areas at a time of their early establishment. Thus, a university or government research group can only be useful to an SSE, if it works in close collaboration with the SSE development team.

The establishment of joint researcher and industry team can be of great importance for the training of the researcher in attitudes conducive to effective innovation. This will have important benefits for the nation in the longer term.

We believe that these organisations should:

i) Take the initiative in arranging continuing discussions with groups of companies interested in a common field, aiming at elucidating research needs and market opportunities.

ii) Whenever commercial realities permit, conduct generic research that is beneficial to all companies in a field.

iii) Where there are commercial sensitivities, establish collaborative agreements with individual companies. Preferably, these arrangements should be made at an early, “market need identification”, stage in the innovation process. Then a close working relationship, probably with a common R&D team, should be established between the research group and the company. There should be regular meetings of senior management of the company and the researcher organisation, to review progress and plan future action. It is appropriate that the research organisation should gain financially from a successful commercialisation. However,

the agreement should ensure that the research organisation shares in the, initial, high financial risk.

iv) If a university or government laboratory "discovers" some new phenomenon that might have commercial prospects, the laboratory should seek a commercial partner at an early stage. This search for a partner should involve the issuing of an advertisement to ensure that all companies have an opportunity to respond, but in addition, there should be direct approaches through the network of industry contacts built up by the laboratory.

v) The university or government laboratory should have some base funding to permit it to provide ad hoc advice and consulting services to individual companies seeking help. This service should be directed, in particular, to SSEs and SMEs.

vi) The university and government laboratories should be encouraged to contract research and (particularly) development out to commercial enterprises. Collaborate with other university or government laboratories that have specific expertise is sometimes desirable. This approach will have major benefits in establishing close working relationships between industry, universities and government laboratories.

vii) In addition to research assistance, CSIRO has an excellent information service with links to most of the international sources of technical information. It is recommended that CSIRO policies be adjusted to help companies of all sizes make effective use of this information service in their development activities.

viii) Cooperative Research Centres (CRCs) are now increasing their efforts to work with and through SMEs. It is recommended that they be encouraged to extend this to SSEs and recognition of this should be given in the grants to the CRCs. No exact formula can be prescribed since the situation varies with each CRC.

Recommendation 9 - Assistance from CSIRO, universities and government organisations

9.1 CSIRO should be encouraged to extend its liaison program for SMEs to SSEs and a mechanism should be found to assist SSEs at low cost until such time as they have a positive cash flow.

9.2 Universities should be encouraged to extend their incubator schemes where they have competence.

9.3 Commercial arms in universities should be encouraged/assisted to give advice to SSEs at minimum or no cost.

9.4 Government organisations should be encouraged to have a positive encouraging attitude toward SSEs and SMEs.

9.5 Cooperative Research Centres (CRCs) should be encouraged to work with SSEs but because of the differences between CRCs, no precise definition of this cooperation can be given.

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APPENDIX 1

SUMMARY OF RESULTS OF INTERVIEWS

The study carried out by an Academy group involved interviews with the Chief Executive or senior executive of approximately 60 companies in the following technology based industries using a questionnaire shown on page (reference).

Biotechnology
Electronics
Pharmaceuticals (both ethicals and OTC)
Computers (both Hardware and Software)
Instruments
Materials
Processing
General Engineering

Companies interviewed were at varying stages of development. The majority were SSEs some were SMEs and some were companies listed on the Australian Stock Exchange. Also included were Divisions of large companies. Follow up discussions were held with government, research, education and financial organisations. These included:

CSIRO
Universities and their commercial arms
Financial institutions and financial advisers
The Industry Research and Development Board
Austrade
The Department of Industry, Science and Technology

Despite the fact that a diverse range of organisations were interviewed it was possible to formulate fairly common views across the range of questions.

These views are summarised as follows:

1. COMPANY FACTORS FOR SUCCESS

a) LEADERSHIP

- persistent, strong, dynamic and flexible,
- good business judgement and objectivity (able to delegate and seek advice),
- innovative in all aspects of the business,
- market oriented,
- clear and sharp vision (business strategy) of where the company should go,
- possessing a good idea and recognising a need in the market place,
- technically competent, often an engineer less frequently a scientist,
- high level of commitment both in terms of time, money and effort of the CEO, and
- good salesman of ideas and the company.

b) MANAGEMENT

- creation and management of appropriate company culture,
- use of multi-skilled people,
- integrated small team with emphasis on teamwork with shared common objectives,

- avoid bureaucratic/regulatory overheads inappropriate to company size,
- ability to nurture/integrate/balance both scientific, technical and commercial people/ideas,
- good general management expertise,
- ability to recognise and implement change in management structure, operations, attitudes when appropriate, and
- ability to delegate appropriate decision making to relevant people yet maintain responsibility.

c) **COMPANY FUNCTIONS**

- careful definition of market needs and selection of achievable goals,
- good marketing of product and company,
- strong and prudential financial control,
- good staff selection, training, motivation, empowerment and development, and
- innovative in all functions.

d) **FINANCIAL STRENGTH**

- finance obtained from own sources or strong partner,
- long period of negative cash flow can cause financial problems if continuing supply is not arranged,
- need good financial judgement and competence,
- need to get a balance of equity and debt capital although in the early years equity is usually the most important, and
- the best CEOs developed skills and selling ability to obtain financial backing.

e) **COMPANY POSITION**

- independence and freedom to act (particularly important if either a Division of a large company or supported in some way by a large company),
- good technical and commercial networking, domestically and overseas,
- strong incentives through ownership/vested interest by CEO and key staff (share in both gains and losses), and
- need to learn to cope with Federal and State Government laws and regulations which can inhibit the formation, operation and growth of small companies.

f) **OTHER**

- continuity of key staff through all phases of idea life cycle continuum, ie creation, research, development, trial, production and commercialisation.

2. PRODUCT FACTORS

a) **PRODUCT**

- unique in some feature such as cost, design, delivery, utility and seldom do own research,
- usually a development of existing science and technology,
- usually using off the shelf components,
- continual product development and change to meet perceived market needs, and
- usually high added value, low budget items.

b) **MANUFACTURE**

- flexibility of production including sub-contracting; not capital intensive, but skilled labour intensive.

c) **FOCUS**
- usually niche product, strongly targeted.

3. TECHNICAL FACTORS

a) **TECHNOLOGY**
- usually application of known science or technology (know-how) ie the technology is not unique but its development is.

b) **RESEARCH AND DEVELOPMENT**
- modest applied research, but a lot of in-house/ low cost development, and
- rapid development - little time, money, resources for their own basic research.

c) **ALLIANCES/NETWORKS**
- alliances with CSIRO, Universities, multi national companies not a significant factor in our sample except in a few instances such as Telecommunications and Pharmaceuticals,
- strong networks for some functions (technical, manufacturing, marketing),products or systems,
- clusters were not a significant factor, apart from the telecommunications industry,
- there was no clear pathway for tapping into CRCs, CSIRO, Universities etc to obtain R&D support at low cost for the small companies, and
- if exporting networks and alliances, formal and informal, are important.

d) **PATENTS**
- not significant except in a few cases such as pharmaceuticals. Know-how, confidentiality, speed and flexibility is more important, and
- patent system is too costly /complex to obtain, maintain and defend.

4. MARKET FACTORS

a) **TYPE**
- diverse niche markets (covering the fields of consumer, industry, government influenced, export).

b) **QUANTUM**
- small Australian market size limits growth and ultimate size,
- larger overseas (export) markets,
- high growth rate markets overseas,
- with some products it is possible to move immediately to exports with only a small or no local market, and
- some companies prefer to stick to the local markets because of the risks and problems associated with exports.

c) **STRUCTURE**
- usually compete against many overseas companies,
- good distribution system needed, and
- good intelligence network needed, attendance at world conferences and trade fairs is one of the best ways of achieving this.

d) **MARKET POSITION**
- usually targets local or export niche market. Try to avoid stepping on big companies' toes,
- exports are usually important.

5. NATIONAL FACTORS

a) **GOVERNMENT POLICY**
- government purchasing policy and terms of payment are critical,
- some government assistance by some companies but not all forms of assistance, ie 150% R&D, I R&D Grants, MICs, EMDG, used,
- burden of government imposts such as various taxes, FBT, and details required of travel,
- Australian Standards Association accreditation system is bureaucratic, costly, parochial, and
- no clear national industry policy or focus; no continuity of policy; short term focus on next election; the small enterprise do not have the depth of finance to be turned on or off according to party political whims.

b) **UNIONS**
- no problems when interviewing the companies.

c) **WORKFORCE**
- generally high level of education/ability of workforce plus well trained and dedicated professional and technical staff.

d) **FINANCE**
- low value Australian dollar assists exports,
- fluctuations in Australian dollar hampers company planning and operations,
- difficulty in obtaining funds from financial institutions for growth and exports,
- background of decision makers in financial institutes does not seem appropriate, and
- poor understanding and coverage of Australian Banks in overseas countries apart from our major trading partners.

e) **GEOGRAPHIC**
- most products high value added, low weight, often goods sent by air transport which is competitive,
- close proximity to fastest growing region on or about the same time zone,
- high cost complexity of procedures of sea transport is a disadvantage,
- high cost of setting up overseas offices/distributors.

6. OTHER FACTORS

Certain findings from our discussions were broadly in line with other recent surveys:

- banks rely too much on security and not enough on prospective cash flow in assessing loan applications,
- banks have generally ignored SSEs and in many cases their staff do not understand how small businesses are run,
- the cost of debt finance for smaller firms is too high,
- external equity is very difficult, often impossible, to obtain,
- stock exchange listing requirements exclude smaller companies from the formal market,
- the development of new financial instruments and the greater role played by capital markets have significantly modified the conditions of access to financing and small firms are discriminated against,
- small firms suffer from a chronic shortage of their own funds,
- it is not easy for small firms to compensate for the structural inadequacy of their equity capital by borrowing,
- smaller firms find it more difficult than larger firms to enter capital markets because the existing system for attracting capital is geared towards large bids, and
- SSEs have a greater difficulty in financing intangible investment (studies, research, quality improvement, training and human resources management, sales promotion) which is vital to their growth and to the modernisation of the industrial fabric. Banks are little inclined to finance investment in intangibles, which involve high risk (doesn't provide a tangible security) and is difficult to monitor. Moreover short-term credits are ill-adapted to the time span generally necessary for intangible investment to bring a return.

QUESTIONNAIRE

Company:

KEY FACTORS	
1 COMPANY FACTORS	
a) Leadership b) Management c) Company Functions d) Financial Strength e) Company Position f) Other	
2 PRODUCT FACTORS	
a) Product b) Manufacture c) Focus d) Other	
3 TECHNICAL FACTORS	
a) Technology b) R&D c) Alliances/Networks d) Patents e) Other	
4 MARKET FACTORS	
a) Type b) Quantum c) Structure d) Players e) Market Position f) Other	
5 NATIONAL FACTORS	
a) Government Policy b) Unions c) Workforce d) Finance e) Geographic f) Other	

APPENDIX 2

POLICIES IN OTHER COUNTRIES

The rapid growth of East Asia (Japan, Hong Kong, the Republic of Korea, Singapore, Taiwan, Indonesia, Malaysia and Thailand) in the post-war period has been so extraordinary that there must be some lessons for Australia in this experience. We should also be willing to learn from the experience of other countries.

The World Bank's Policy Research Report, *The East Asian Miracle* [31], claims that this high growth was achieved by getting the basics right: private domestic investment and rapidly growing human capital were the principle engines. Some also got a head start through a better educated labour force and more effective public administration. Macro-management was unusually good providing the essential framework for private investment. Their superior growth is thus attributed largely to superior accumulation of physical and human capital.

But *The East Asian Miracle* acknowledges that this does not tell the whole story. In most of these economies the government intervened - systematically and through multiple channels - to foster development, and in some cases the development of specific industries. Such policy measures included:

- targeting and subsidising credit to selected industries,
- keeping deposit rates low and maintaining ceilings on borrowing rates to increase profits and retained earnings,
- protecting domestic products against import substitutes,
- subsidising declining industries,
- establishing and financially supporting government banks,
- making public investments in applied research, establishing firm - and industry - specific export targets,
- developing export marketing institutions, and
- sharing information widely between public and private sectors.

The report also suggests that these economies have benefited from a profusion of small and medium sized enterprises. Support for SMEs has been most explicit and successful in Taiwan. *The East Asian Miracle* also acknowledges that industrial policy and interventions in financial markets are not easily reconciled with neoclassical economics. Pragmatic flexibility in the pursuit of such straightforward economic objectives such as macro economic stability, rapid export growth, and high savings is as much a hallmark of these economies as any single policy instrument.

Japan has directed enormous financial resources towards developing small and medium sized enterprises. The various government-supported direct-credit programs have proven particularly helpful during times of transition and rapid change. Consequently, the SME sector has become and important cornerstone of Japan's economy. Similar stories are available from South Korea. For instance it is understood that the large electronics, electrical, chemical conglomerate Lucky-Gold Star started as a small business 35 or more years ago making soap. It probably ranks now as one of the largest world-wide conglomerates.

The World Bank's acknowledgement of the positive role played by active industry policy is somewhat remarkable given the strong faith previously shown by them in market forces. Edith F Penrose [32] author of the classic work, *The Theory of the Growth of the Firm* goes further than the World bank and argues that one cannot use the actual history of the industrialising countries of yesterday, nor of today, to justify the repeated insistence that the less developed countries should let market forces guide their economic development policies. Integration into the world economy is urged in the name of "liberalisation", in spite of the fact that the international

economy is not particularly "liberal". Although this economy clearly revolves around markets and consumer demand, both of these are as often manipulated as they are "free". Integration into this economy requires the acceptance of "managerial capitalism" in one form or another, and in many ways involves a degree of subjection to the decisions of very powerful "private hierarchies".

There is no doubt that this aspect of the international trading system is market-oriented; but in a way which seems to be inconsistent with the very premises of neo-classical "free market" liberalism, and to make a mockery of attempts to impose the traditional tenets of economic liberalisation on developing countries. Truly competitive, effective entry of new independent private producers is rarely easy and often impossible, not only because of the control of markets by large producer/distributors, but also because of economies of scope, scale and preferential access to finance; prices are "managed" through control of supply; cross-subsidisation of both internal activities and external markets is common; technical and other processes are extensively protected.

Capitalism including the international world of large and powerful private capitalistic bureaucracies, is subject to large and powerful shocks and fluctuations which, up to the present at least, no one seems to be able to effectively control. Extreme specialisation in line with the "principle of comparative advantage" greatly increases vulnerability to events in the rest of the world. Penrose suggests that some insurance against that vulnerability is not always uneconomic.

"Although according to the tenets of neo-classical liberalism, commercial, financial and trade alliances among rivals are to be deplored for fear of monopoly, monopoly, in its oligopolistic form, as contrasted with the "free play of competitive market forces", is far and away the more powerful fact of economic life." Edith Penrose [32]

Robert Wade's *Governing the Market, Economic Theory and the Role of Government in East Asia Industrialization* [27] is a close examination of the Taiwanese experience informed by references to the experiences of East Asian Economies. On the basis of that examination he, inter alia, makes the following concrete policy suggestions:

- Promote industrial investment within the national boundaries, channelling investment into industries whose growth is important for the economy's future growth.
- Use protection to help create an internationally competitive set of industries. Import protection is (as neoclassical theory says) a powerful tool but it can be badly used. But, the East Asian evidence suggests that protection can be used successfully in combination with other measures to foster the creation of internationally competitive industries.
- Give high priority to export promotion policies. Successful export of manufactured goods is not just a matter of getting the exchange rate right and keeping labour cheap. Marketing, transmission of information, and quality control are the key activities for export success. Very importantly, the government can inspire producers to seek out export markets as a normal part of their operations. Wade also points out that it is misleading to present import substitution and export promotion as mutually exclusive strategies.
- Welcome multinational companies, but direct them towards exports. Multinationals are the primary source of knowledge about technology and production and an important source of knowledge about marketing. However, they should be under pressure to direct their sales towards exports and their input purchases towards local suppliers.
- Promote a bank-based financial system under close government control. A bank-based

system can help avoid the bias towards short-term company decision-making inherent in a stock market system. Such a system can also build political support for the industrial strategy.

A bank-based financial system can have far-reaching implications for the government's role in the economy:

The government must help ease the risk of high debt/equity ratios with the ever present danger of financial instability. This need to socialise risk applies especially in the case of highly correlated risks, ie interest rate changes, major recession, or changes in major export markets, and political risks. Consequently, the impetus for government to shoulder some of the risks is especially strong in countries which are trade dependent. Government can also, of course, control interest rates and exchange rates to dampen firms' exposure to market fluctuations in these two important sources of correlated risk.

In Australia the tendency has been to privatise all these risks, including the risks associated with government macro-economic management.

- The supplier of credit must become involved with company management.
- Governments and banks must develop an institutional capacity to discriminate between responsible and irresponsible borrowing and to penalise the latter.
- The government must maintain a cleavage between the domestic economy and the international economy with respect to financial flows. Without this cleavage, the government's control over the money supply and the cost of capital to domestic borrowers is weakened, as is its ability to guide sectoral allocation. Speculative inflows seeking exchange rate gains can precipitate accelerating movements in exchange rates, with damaging consequences for the real economy. Uncontrolled outflows can leave the economy vulnerable to an investment collapse and make it difficult for government to arrange a sharing of the burden of adjustment to external shocks between the owners of capital and others. More generally, foreign exchange controls are needed to intensify the cycle of investment and reinvestment within the national economy, with outflows only where they can be shown to meet national economic priorities. Otherwise, domestic interest rates come to be determined in large part by US interest rates, and therefore make the economy subject to the kind of macro-economic mismanagement of the US economy seen during the 1980s.

Wade [27] says that he would hesitate to recommend such a controlled system if free markets for foreign exchange and other financial assets were clearly efficient. But, he relies on Paul Krugman's conclusion that

> "belief in the efficiency of the foreign exchange market is a matter of pure faith; there is not a shred of positive evidence that the market is efficient".

Similarly for bonds and stocks:

> "there is no positive evidence in favour of efficient markets".

- Carry out trade and financial liberalisation gradually.
- Establish a “pilot agency” or “economic general staff” whose policy heartland is the industrial and trade profile of the economy and its future growth path. High effectiveness requires the flexibility to withdraw assistance from industries as they become internationally competitive, and the ability not to intervene in some industries at all in the interests of concentrating assistance and limiting costs. Behind this lies the competence and coherence of the central economic bureaucracy, the degree to which political authority is institutionalised, and the connections between the central bureaucracy and other major economic interests, especially the owners and managers of capital.
- Make piecemeal reforms even in soft states so as to create an institutional configuration better able to support a modest industrial policy.

  According to Wade free trade policies are no means of escape from the need for governments to manage the interactions among their own activities. Lacking these capabilities, the US government uses leaky protectionist instruments as much as most other industrialised countries. But its departures from free trade are largely a case-by-case response to domestic political pressure rather than being part of a strategy for gestating or nurturing future competitive industries. With no one being required to explain or defend what is being done, its industrial policies remain ad hoc and implicit. Indeed, the philosophical repugnance against government involvement in industrial promotion is such that the government lacks both detailed knowledge of industries and analytical capacity to select appropriate actions. In these several ways the United states is a model of what developing nations should avoid.

The Following table provides a summary of support measures aimed at small business throughout the world:

Measure	Description	Advantages	Disadvantages
DEBT			
Government loans eg, Malaysia, Japan, USA, Germany	Government offers loans to small business, often at reduced interest rates. Can offer additional concessions to target particular regions, groups or investments eg pollution control, socially disadvantaged. Can be issued by organisations created specifically for that purpose, such as small business finance corporations, or by central banks. Can lend to banks at concessional rates, which then on-lend to small business.	Provides SMEs with an alternative source of debt finance, particularly for those smaller firms unable to meet banks' requirements	Government exposed to full default risk. Not encouraging private sector to increase SME funding. Requires significant budgetary funding.
Loan guarantees eg UK, USA, Canada, Japan, Netherlands, Germany	Where a government organisation guarantees a bank's loan to a small business. Most schemes guarantee 70-90% of the loan and have maximum sizes, etc. Can have requirements for the firm to put up personal collateral and can charge fees to firms to cover costs. Can adjust conditions of schemes to benefit particular regions, groups or investments, eg socially and economically disadvantaged groups.	Allows otherwise sound borrowers who do not have collateral to obtain loans from banks. Private sector decides whether to lend. Private banks still have to assess loan. May train bank managers to look more at the business proposition and less at the collateral and personal security of the small firm. Business collateral schemes lower the interest rate firms have to pay and demonstrate the commitment of the firm.	Government exposed to some default risk equivalent to its guarantee. May require some budgetary funding, the exact amount depending on the level of guarantee given. Collateral schemes may come under criticism for using the personal home as collateral. May defeat purpose of the program if banks' rely too much on collateral.

Mutual guarantee companies eg Spain	Partnerships or cooperatives of private businesses that offer loan guarantees to small banks to cover loans made to small firms that are MGC members. MGCs can be covered by secondary guarantees by joint MGC-public body.	Encourages SMEs to work together and network when they form an MGC. Government has only a secondary guarantee; ie guarantees only a portion of MGCs, not the SMEs themselves.	Government still takes some default risk.
Factoring eg USA, UK	Where a company (factor) takes over the responsibility for collecting payments for sales made by firms. Applies particularly to firms' export sales overseas. The factor buys sales contracts off firms for a price less than the contracts' full value. It is then the factor's job to retrieve the debts. The factor can lend working capital on the basis of the firm's sales contracts.	Firms are repaid money owed to them earlier, improving their cash flow. Can provide working capital to firms based on sales contracts won by the firm, whereas banks may not. Borrowing from factors often compares favourably with other sources in terms of interest cost and flexibility. Scheme grows with the business. Can protect firms from bad debts.	Suffers from an image problem, regarded as a type of "pawn shop". Complex relationships that leave open the possibility of opportunism on the part of manufacturer or the factor. Small businesses may be too small to be dealt with by factoring companies.
Securitisation eg USA	Assets that traditionally rested in bank portfolios (such as mortgages) are packaged into securities and sold off to the market. May be easier to securitise long-term loans financing acquisition of fixed assets, rather than working capital. Government loans or government guaranteed loans can be securitised.	New groups of lenders are attracted to the small business finance market. Allows banks to increase their lending by reducing the assets on their books. Government initiatives to establish secondary markets for small business finance do not require any guarantee.	Investors are uncertain about interest and principal payments. In the case of loan guarantee schemes, if the borrower defaults or pays their loan early, investors may experience premature repayment. Concerns in Australia are whether the small business loan market in Australia has enough homogeneous

			loans of sufficient quality to securitise and the dependence of the proposal on the Government enhancing the credit rating of the securitised loans.
EQUITY			
Government equity guarantees eg Netherlands	Recognised venture capital companies can claim compensation from the government for a certain percentage of their losses from venture capital investments. Can have restrictions on total size of guarantee fund and on total guarantees per VC company. Can be administered by central bank.	Provides alternative source of venture capital. Private sector decides whether to invest. Private venture capitalists still have to assess SME's business prospects.	Requires significant government support if scheme has a high guarantee rate and does not control the size of commitments properly.
Unlisted securities markets eg UK, Japan	A second tier of the Stock Exchange that has less demanding listing requirements. In Australia these were called Second Boards.	Designed to make listing easier for smaller firms and therefore to give them increased access to equity finance.	Investors have shown little interest in USMs and second boards since the October 1987 stock market crash and worldwide recession.
Small business investment companies eg USA, Japan	SBICS can be publicly owned investment companies, or privately owned ones that are licensed by the government or its instrumentalities. These provide long-term loans, and equity.	Gives SMEs an alternative source of equity finance that might otherwise not have existed	Publicly owned organisations that are not operated on commercial criteria may result in large losses.
Small business investment network eg USA, Canada, European Community	Business matching program to bring together potential investors and small businesses seeking equity finance. Develops the informal venture capital market.	Allows firms to seek out appropriate investors they might otherwise not know about. SMEs can go to one place to find many investment options. Whether the	Are not considered to have been very successful at generating new investment projects.

	Can use computer matching through one-stop shop facility.	Scheme generates new investments or not, firms learn more about their funding options and business planning.	

APPENDIX 3

PREVIOUS REPORTS ON THE AVAILABILITY OF CAPITAL

The notion that there may be a "gap" or market failure in the provision of finance to smaller firms is not new, nor is it unique to Australia, dating back to the *MacMillan Committee of Inquiry into Finance and Industry* [33] in the UK in 1931. In 1936 the *Royal Commission into the Australian Banking and Monetary System* [34] made recommendations to assist in the provision of long-term finance. More recently, in 1976 it was suggested that:

> "There must be some concern about the unusually high degree of reliance of small firms upon the trading banks as a source of medium and long-term finance. This partly arises because the banks are not equipped to act as development finance institutions in the proper sense of that term."[35]

and again in 1978

> "A shortage of risk capital for small firms may now be the most obvious manifestation in Australia of the so-called MacMillan Gap."[33]

The *Crawford Study Group* [37] which examined the nature and extent of adjustment problems of Australian manufacturing industry reported in 1979 that the access of small firms to capital was constrained. The Group suggested a government-administered Innovation Authority to provide technical and financial support, where appropriate, to small and medium-sized firms to enhance their capacity to introduce new and improved technology. In 1980 the Small Business Advisory Council Report also recommended that the Government should sponsor a new institution specialising in the provision of long-term loans and equity finance to small businesses. About the same time the Myers Committee, which was established to examine technological change and to review the effectiveness of government policies and programs in facilitating the introduction of new technology, recommended the establishment of a privately owned and administered Venture Capital Corporation, financially assisted by the Commonwealth Government.

The *Campbell Committee of Inquiry into the Australian Financial System* [25], the first major report into the Australian Financial System since the Royal Commission into the Monetary and Banking System in 1936, submitted its final report in September, 1981. This Committee started with the view that the most efficient way to organise economic activity was through a competitive market system which is subject to a minimum of government regulation. It believed that a competitive market unfettered by government regulation is economically neutral in the way it allocates funds to different groups and sectors: investments which offer equal risk/return combinations are priced equally and borrowers with equal risk are offered similar terms and conditions. The Committee was well aware, however, that an "economically neutral" flow of funds may not be consistent with the community's social priorities. Even if there were perfect competition and perfect knowledge, a social misallocation of resources could occur to the extent that private costs and returns - the basis of competitive decision making - may not fully reflect social costs and returns. It believed that the community, while recognising a responsibility to ensure stability and confidence, was nevertheless responsive to the prospect of a more open and flexible financial system, substantially free of intrusive government controls and regulations. The Committees focus on the efficiency of the financial system led it to recommend the immediate or ultimate abandonment of a wide range of direct controls. In effect the Committee was asking that more confidence be placed in the disciplines and processes of the market. The Committee

believed that the cumulative effect of its recommendations would be a more stable, better informed and fairer financial system - yet one that was adequately flexible and responsive to changing needs and conditions.

"The claim is that market liberalisation will enable the financial system to perform its main function of allocating scarce capital more efficiently and will thus benefit the rest of the economy. I argue that much of the rationale for liberalising financial markets is based neither on a sound economic understanding of how these markets work nor on the potential scope for government intervention. Often, too, it lacks an understanding of the historical events and political forces that have led governments to assume their present role. Instead, it is based on an ideological commitment to an idealised conception of markets that is grounded neither in fact nor economic theory." [21]

"... market failures are likely to be more pervasive in these markets; and that there exist forms of government intervention that will not only make these markets function better but will also improve the performance of the economy." [21]

Against this background, the Campbell Committee reported that small businesses are not equal to large businesses in their access to financial markets. In particular:

- loans are more expensive and (in order to protect the lender)security requirements can be more stringent,
- equity funds are more difficult and costly to obtain, especially for new ventures and innovation, and disinclination by investors understandably exists, and
- small business proprietors do not have the same financial expertise as large corporations in presenting their applications for finance.

In the opinion of the Committee, these disabilities, for the most part, do not reflect the in-built technical deficiencies in the allocative role of the financial system. Rather, they basically derive from:

- the necessarily higher relative cost of lending in small amounts,
- the higher risk of lending to and investing in small businesses, and
- the inability of small business proprietors to take full advantage of the opportunities available, whether due to lack of financial sophistication or a reluctance to dilute control.

The Committee recognised that these factors may be compounded by:

- the intrinsic smallness and geographic spread of the Australian market,
- the risk-adverse characteristics of many investors - often accentuated by insufficient knowledge of or familiarity with high technology, science-based activities,
- the limited ranges of institutional or broking facilities for the placement of unlisted shares,
- inadequate awareness by many small businesses of the sources and types of funds available, and
- distortions caused by government controls and regulations.

The Committee believed that its proposals for freeing up the financial system and strengthening its competitive base would remove most of the major constraints inhibiting the market from responding to unexploited opportunities. Against this background, the Committee saw no need,

on efficiency grounds, to recommend further government initiatives in respect of small business and new ventures. At the same time the committee was conscious that, on social or other grounds, the Government may consider it desirable to provide some assistance in this area. The Committee was least well disposed to government financial assistance for:

- loan insurance/loan guarantee schemes,
- specialist small business financing institutions, and
- over-the-counter markets for unlisted shares.

The Committee believed that, if the Government were to consider it socially appropriate to provide assistance in this area, the following form and method would cause least disturbance to the structure and efficiency of the financial system.

Encouragement could be given to the establishment of private Small Business Investment Companies (whose primary role would be to invest in the equity of small businesses, including new ventures and innovations) by making subscriptions to their shares eligible for personal tax relief.

In May, 1983 the Labor Government established the *Martin Review* [38] of the Campbell Committee Report and this Review Reported in December, 1983. This Review was conscious that, for various reasons, the workings of a market-oriented system might not always be consistent with the Government's economic and social objectives and the communities overall interest. This Group saw the Government's policies for the financial system as having regard to the following specific objectives:

- greater competitiveness, efficiency and equity in the working of the financial system,
- maintenance of the stability of the financial system, and
- provision of adequate supplies of finance at reasonable cost to specific sectors of the economy, including the housing, rural and small business sectors.

This Review cited various studies suggesting that there were deficiencies in the operation of the capital market affecting small business. These were generally not related to the cost of finance. They took the form, rather, of gaps in availability, specifically of long-term debt finance, equity finance and venture capital. The review believed that it was difficult to interpret these findings. The Group shared the view of the Campbell Committee that the availability of trading bank finance to small businesses would be enhanced by decontrol of trading bank interest rates. In relation to the suggested establishment of a new institution specialising in the provision of long-term and equity finance for small business the Review noted that the Commonwealth Development Bank had already been established essentially for this purpose and went on to suggest possible directions in which the CDB's role might be expanded to enhance its ability to finance small business. The Review thought, however, that while the CDB had filled a market gap, much of the existing demand for CDB loans would disappear with deregulation of trading banks and market-oriented pricing of CDB loans Nevertheless, the Review considered that there could be a lending role for the CDB, involving less emphasis on security and greater attention to borrowers' income flow. The Group also believed that the CDB's longer-term liability structure and its expertise in the commercial assessment of small business finance provided scope for an equity finance role without raising prudential concerns.

In relation to small business investment companies, the Review noted that such companies had operated in the United States since 1958 under the influence of tax incentives for individual and corporate subscribers and for the SBICs themselves. The Review also noted the

Commonwealth's decision to license Management and Investment Companies (MICs) as recommended by the Espie Committee Report. The Group suggested that the performance of this scheme be monitored and a review undertaken after several years to assess the merits of more general use of SBICs.

In September 1983, following its consideration of the *Espie Committee Report* [3], the Commonwealth initiated the MIC Program to encourage the development of a venture capital market. Subject to meeting criteria designed to limit the scheme to smaller companies with high growth potential, venture companies would be eligible for funding from a licensed MIC. Investors were able to claim a 100 per cent tax deduction in the year of subscription to a licensed MIC; but the annual cost to revenue was limited to $20 million.

The Espie Report was prepared by the Australian Academy of Technological Sciences for the Minister for Science and Technology. The Espie Committee believed that Australia was failing to grasp the opportunities offered by high technology industries for wealth creation and employment growth. In fact, Australia's performance in the high technology sector was being outstripped by many of its developing neighbours in the Asian region. The Espie Committee believed that an object of government must be to nurture new industrial enterprises, based on high technology and which are employment and wealth generating in Australia. Over time, these enterprises would provide the essential "cutting edge" for a more internationally competitive, export oriented and dynamic industrial sector. From its investigations the Committee identified several impediments to the creation of viable, new, high technology enterprises:

- the absence of appropriate sources of capital,
- widespread lack of management skills and commercial experience within existing enterprises. The management difficulties facing new high technology enterprises are inherently different from and greater than those of more conventional small businesses. This is because of particular characteristics of high technology enterprises including the non-commercial, technical backgrounds of the entrepreneurs, together with their the potential high growth rate and export orientation of their sales,
- the limitations imposed by Australia's small and remote market are particularly compounded by the lack of Government support to new product initiatives by Australian enterprises,
- a lack of appropriate technology infrastructure, and
- community attitudes and tax arrangements which work against the early development of fast growing, capital hungry enterprises.

In the face of these obstacles and the lack of significant, coordinated support by government, the Australian high-technology sector was a very small component of manufacturing industry. Because of the lack of precedents of outstandingly successful high technology ventures providing appropriate investment returns, incentives are necessary in Australia to attract private capital into the crucial start up and early growth phase of such enterprises when investors' returns are most difficult to forecast and risk to individual ventures is greatest. The Espie Committee knew of no country which has succeeded in establishing a climate for investment in high technology enterprises without the government taking positive action and, at a minimum, adopting a catalytic role.

The *Bureau of Industry Economics Review of Venture Capital in Australia and the MIC Program* [26] was prepared in 1987. The BIE reported that prior to the commencement of the MIC Program there were few organisations in Australia providing venture capital and the amount involved was not significant. However, following 1984 there had been a steady increase in the

number of non-MIC companies providing venture capital and that there was general agreement that the MIC Program had played a catalytic role in that development. Other contributory factors were deregulation of financial markets, the increase in the number of small rapidly growing high-technology businesses, the development of Second Boards and the buoyancy in share markets. The BIE noted, however, that there were marked differences between the investment behaviour of MIC and non-MIC companies. The MICs had a much higher proportion of their investments in start-up and early-stage projects and in technology based industries in line with the investment focus of the MIC Program. In addition, they provided relatively more management support to their investee businesses and were more patent investors. The BIE concluded from its survey that the size of any venture capital gap had probably declined substantially as a result financial deregulation, the emergence of MIC and non-MIC venture capital companies, and stronger competition among institutions supplying risk capital. The BIE also noted that the concentration by the MICs on start-up and early stage investments might not continue in an unregulated market. The MICs and the MIC Licensing Board argued strongly that at that stage the viability of the venture capital industry had not been demonstrated and that consequently continued government support for the development of a venture capital industry would be required into the medium term. The Bureau took the view that a sufficient demonstration effect had been achieved and recommended that the program be terminated at 30 June, 1988. The Government accepted the advice to terminate the program but set the termination date at 30 June, 1991. In accepting the advice to terminate the program the Government disregarded the alternative advice of the MIC Licensing Board to the effect that a long-term significant effort was required to induce the behavioural change required and to create a healthy venture capital market. *This decision reflects a recent tendency on the part of governments to rely on the theoretical speculations of economists and to ignore the practical knowledge of business men with long experience in dealing with such problems*.

In the event the Stock market crash of October, 1987 and the subsequent flight to quality had the effect of undermining the booming second board market and the growing venture capital market.

In March, 1988 the Minister for Science, Customs and Small Business asked the House of Representatives Standing Committee on Industry, Science and Technology to inquire into the problems facing small business. The Committee reported in January 1990, *The Beddall Report* [15], that a significant obstacle to successful growth and development of small business has been access to finance under appropriate terms and conditions. It recommended that the Industry Commission undertake a review of the availability finance to small business including an examination of measures to which might be undertaken to improve access to start-up and working capital on reasonable terms. The Committee also recommended action to provide information on the sources and forms of finance.

The *Task Force on the Commercialisation of Research, The Block Report* [39], which delivered its findings in November, 1991, was appointed by the Minister for Science and Technology to analyse Australia's performance in commercialising research, the impediments to commercialisation and methods of improving the commercialising of research. The Task Force believed that Australia needed to gain more economic benefit from its research and development activities in order to develop value-added manufacturing and service industries. It identified some factors that hinder the commercialisation of research in Australia, grouped in three broad categories:

- those arising from the structure and characteristics of Australian industry. capital availability,

and

- those arising in the public research sector or in the interactions between the research sector and industry.

The Task force believed that while government programs to encourage innovation in the private sector have to some extent been successful, there has been a lack of emphasis on commercialisation in response to the market. It is also apparent that the structure of Australian manufacturing industry is such that the resources required for commercialisation are not present in many firms. There are many impediments to Australian industry having access to these resources:

- the reluctance of Australian firms to cooperate with each other, to work together and build on complementary strengths,
- the small market size and limited industrial structure in Australia,
- insufficient export-driven manufacturing companies,
- the legacy of Australia's past tariff protection which allowed manufacturers to use obsolete technology in a protected market,
- insufficient patient, long-term equity capital for high-technology, start-up companies, and
- a shortage of management skills in technology commercialisation, especially in small business.

In its more detailed discussion of the problem the Task Force pointed out that compared with the larger economies of our major trading partners the manufacturing sector in Australia is relatively undeveloped and is not characterised by a high level of sophisticated production, marketing, networking or research across a wide range of industry areas. Of the then approximately 31,000 manufacturing firms in Australia, only about 1,800 undertook any R&D (plus another 1,200 companies in the services, mining and agricultural sectors). Manufacturing firms also exhibited a low rate of technology adoption. New management techniques, such as "just in time" and "total quality control" showed an equally low adoption rate. Nor was the manufacturing sector highly export oriented. With the exception of mineral processing, less than 20 per cent of production was exported. The task Force also pointed out that Australia had only a few large firms and a preponderance of very small ones. Yet large firms, particularly technologically sophisticated firms, constitute an important element in a nation's industrial infrastructure. Large firms provide strong local demand for component suppliers and constitute an important source of management skills, technical skills, production facilities and marketing and servicing resources. They are an important trialing and demonstration environment for their smaller counterparts.

As most Australian firms seeking to commercialise research are small start-up companies they inevitably face major obstacles in surviving let alone succeeding. Such firms must therefore identify strategies for achieving the scale, capabilities, resources, and critical mass necessary for market success. This is particularly acute in market areas where speed, market coverage, existing large players, or second generation products are likely to limit the pioneer's initial competitive advantage.

The Task force believed that venture capital companies and institutional investors, in particular superannuation funds had an important role to play in the provision of finance to start-up and developing companies. The Task Force pointed out that in the United States between one and three per cent of assets from pension funds (the equivalent of Australia's life insurance and superannuation funds) is invested in venture capital and believed that Australia's superannuation funds should invest a similar percentage. It identified several impediments to

these institutions investing a proper proportion of their funds in this way:

- their short time horizons
- a preference for highly liquid or foreign stocks

The Task Force also recognised that the lack of a successful venture capital track record in Australia had also been a significant reason why venture capital funds could not raise funds to invest in long-term or start-up projects. The Task Force was concerned at short-termism particularly of the superannuation funds. The Task Force considered that the management of superannuation funds, as the beneficiaries of a government sponsored diversion of national savings, have a duty to consider the national interest when undertaking investments. The funds were considered to have too conservative an investment philosophy, caused in part by regulation, but also by reluctance to undertake the people intensive, time-consuming process of searching for, assessing, making and monitoring direct investments as well as realising these illiquid investments in small business.

The Task force recommended, inter alia, that:

- Australia-wide legislation should be introduced allowing limited partnerships for professional investors.
- Changes should be made to the "prudent man" rule to encourage superannuation funds to invest up to 3 per cent of their assets in venture and development capital investments.
- Superannuation funds should report on their Australian venture and development capital investments in their annual reports.
- Capital gains tax should be deferred on the capital gain realised by original equity investors on the sale of a small technology-oriented business. The IR&D Board should have responsibility for approving appropriate businesses.
- The Government should introduce constructive voluntary insolvency procedures, as recommended in the Harmer Report, and similar to those available in the United States.
- Firms receiving grants from the IR&D Board should be required at the discretion of the Board, to use an adviser drawn from the ranks of recently retired managers, directors or engineers, selected by the Board because of their knowledge and experience. Such an adviser would provide high level management advice, which might involve financial management, advice on overseas marketing or technical assistance. Advisers would be required to regularly report to the Board. Funding for the adviser would be part of the grant.

The Task Force also pointed out that a significant amount of company research is lost through business failure with about 80% of small businesses in Australia failing within five years. US research suggests that the failure rate for companies trying to commercialise research is even higher. They rarely have a positive cash flow, have few bankable assets and their long infancy places them at a greater risk of insolvency from downturns in the business cycle. The Task Force therefore recommended voluntary insolvency procedures similar to those available in the United States.

The Industry Commission also reported on the *Availability of Capital* [24] on 9 December, 1991. This inquiry was largely motivated by concern that SMEs are disadvantaged in their access to loan and equity capital as reported by the Beddall Inquiry. Participants to the Commission's Inquiry presented the Commission with polar views about the availability of capital. While some claimed that good business propositions were being deprived of fund, others argued that there was a shortage of sound projects in which to invest. The Commission was

conscious that the backdrop to its inquiry was a decade which saw:

- major deregulation of financial markets,
- historically high nominal and real interest rates,
- an asset boom culminating in a market crash (October 1987) and subsequent fall-out in property values, and
- strong economic growth followed by recession.

The Commission claimed that the critical focus for its inquiry was on impediments to the efficiency in the capital market which can be altered or removed. Consequently, the Commission's approach was to look for evidence that some areas of potentially profitable investment are failing to attract capital and for possible reasons markets might consistently fail to allocate capital to the most productive use. In assessing concerns about the lending practices of the banks, including alleged excessive risk aversion, reliance on collateral and unwillingness to lend long term, the Commission pointed out that the banks play a central role in maintaining confidence in the entire financial system with duties to depositors which are reinforced by regulation. The Commission concludes that they are meant to be conservative institutions and relatively low-risk lenders. The Commission pointed out that the banks are large bureaucracies with complex administrative structures. The Commission says that this made it difficult for them to adapt readily to the changes in their environment resulting from financial deregulation and this was manifested in many poor lending decisions and subsequently in some over-reaction. Banks are now providing a much wider range of financial products and are able to lend to more small business clients than was possible in the era of financial regulation. It is clear that, while the banks claim to place most importance on the capacity of borrowers to service their loans, that they make extensive use of collateral security as a condition for much of their lending. This is part of mainstream lending and the Commission claims that it can be an efficient way of reducing the information requirements and associated costs of lending decisions.

However, it is not at all clear that the Commission's use of the term "efficient" on this occasion is consistent with the usual meaning of the term in economics and the claim is not based on research referenced in the report. Rather, the use of security as a decision heuristic probably does not lead to the optimum allocation of resources.

The Commission's findings and Recommendations, inter alia, were:

- Perceived problems about the availability of capital were attributable in large part to general economic conditions. (Does this absolve the market or the Government from responsibility).
- Deregulation of capital markets through the 1980s had improved the competitiveness and the general availability of capital, although there have been significant adjustment problems, most obviously in banking.
- It is unlikely that capital adequacy rules are distorting the availability of bank finance.
- There was some merit in banks being permitted to provide limited amounts of equity. The Commission recommended that the Treasurer ask the Reserve Bank to consider whether the current prudential requirements could be eased to allow banks additional freedom to provide equity finance.
- While some smaller companies have had difficulty attracting the services of an underwriter, this reflected the risk preferences of investors, rather than institutional or market failure, and has been exacerbated by the economic climate.
- "Short-termism" in equity markets is attributable primarily to macroeconomic factors. Lowering and stabilising inflation, inflationary expectations and interest rates would address

the main underlying causes of any short-termism in investment decisions.

- The costs of providing a simple rollover exemption for capital gains taxation would exceed the benefits in terms of increased mobility of capital, noting in particular the greater possibility of tax avoidance.
- The highly conservative investment policies of superannuation funds in recent years has reflected a number of temporary or transitional phenomena, but that risk aversion may also be exacerbated by more permanent features of the regulatory framework and would be eased by:
  - legislation to redress any adverse impact of the "prudential Man" rule on trustees' freedom to include risky individual investments in a properly diversified portfolio,
  - employee representatives on boards of trustees being elected by members of schemes, and
  - allowing greater choice for members of schemes as to the allocation of their funds among categories of investments.
- Banks should be allowed to provide superannuation savings accounts as part of their normal business, subject to compliance with ISC and Reserve Bank requirements. This would both enhance competition in the superannuation industry and reduce the potential for policy-induced superannuation growth to divert savings from banks and raise borrowing costs for bank clients.
- The Commission does not believe that Government regulations constraining portfolio choice of superannuation funds, or direct intervention to expand the institutional funds available to smaller companies, would improve the efficiency of the capital market or the economy generally.
- Uniform legislation relating to limited liability partnerships should be introduced in all States and Territories.

In relation to equity financing the Commission commented that the current prudential requirements applying to banks restrict their capacity to provide equity directly to Australian businesses. However, it does not seem likely that a relaxation of these prudential rules would result in a significant increase in the equity funding provided by the banks. The Banks' capital structures would tend to restrict their capacities to take up equity capital, and the existing skills and experience of their staff would be of limited relevance. Nevertheless, the banks' access to information on their customers' businesses could place them in a favourable position to assess prospective equity investments. Some flexibility in this regard might also enable the banks to cater better for the requirements of clients with (perhaps temporary) gearing problems. There is some appeal, therefore, in the suggestion that banks be given some additional freedom to invest a small proportion of their total assets in equity.

The Commission also noted that the claims that there is a shortage of equity finance were not new, referring to the reports listed above. The difference was that they were being made in an environment characterised by substantial deregulation of financial markets resulting from the implementation of proposals in the Campbell and Martin Review in particular. The Commission commented that it was virtually impossible for it to evaluate such claims with the data it had at its disposal. As is the case for debt finance, the existence of unsatisfied demand for capital does not necessarily indicate some failing in the market. This depends on the relative returns from the projects which can and can not raise capital. The approach adopted by the Commission then was to look for possible reasons why the competitive search for profitable opportunities might consistently fail to allocate capital to the most worthwhile projects. The Commission drew attention to the central role of information in capital allocation decisions, arguing that where

there is an "information gap" there may also be a deficiency in capital availability. The BIE in its Report on the MIC Program took a similar approach. There is some merit in this approach, but the extent of "information failure" in market transactions is often misunderstood. In principle, information is always incomplete: complete information requires foreknowledge of an infinite cascade of possibilities and consequences, which are themselves subject to variation, and consequently is unknowable. In short, the future is not something that is discovered but is created. Nor is knowledge something that is always codifiable, and thus easily transmittable.

But "information failure", alone, doesn't tell the whole story. There is also the possibility of failure, particularly systematic failure, in the decision process itself.

Indeed, the Industry Commission goes on to examine one such form of systematic failure in some depth, the possibility of short-termism among institutional investors. Many participants argued that equity markets are biased against projects with longer returns and little cash flow in early years. As the AMP described it:

> "There is a tendency towards short-termism which is exacerbated by trustees of superannuation funds taking notice of the many surveys published by superannuation consultants regarding the performance of institutional investment managers. While the more responsible consultants will emphasise the longer term nature of the business, the fact that the performance charts are the subject of such intense interest naturally results in a focus upon the shorter term investment returns. There is consequently some diminution in the ability of institutional managers to consider investment opportunities which are not likely to produce results within a relatively short time-frame."

It was also argued that:

> "Superannuation funds are, in theory, ideally placed to take a long-term view of their investments. With their major purpose being the funding of retirement benefits, they have little need for immediate liquidity, and are driven by long-term asset accumulation rather than immediate cash flow. This should mean that superannuation funds are potential major providers of long-term equity capital. In practice it is generally perceived that these funds are adopting a much shorter term focus than [this] would imply."*

The Commission noted that similar concerns had been expressed in the United Kingdom and the United States. In assessing these concerns the Commission concluded that lowering and stabilising inflation, inflationary expectations and real interest rates would address the main underlying causes of any short-term emphasis in investment decisions in Australia. The Commission also alluded to "adjustment" problems associated with the deregulation of the finance industry, attributing these at least in part to institutional rigidities. Such institutional rigidities are another recognised form of systematic decision failure and it is by no means clear that what the Commission calls the competitive search for profit opportunities will deal adequately with those failures.

Indeed, it could be argued that the market mechanism, itself, introduces irrational distortions in the way in which investment funds are allocated towards classes of investment which are fashionable at the time, towards those which do not require detailed analysis, and towards those

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*Mr M Baker, a member of a task force established by the Insurance and Superannuation Commission

investments for which there may have been a learned or cultural preference.

The possibility of market failure in the allocation of our savings becomes all the more clear when it is realised that only a relatively small pool of people are involved in making the investment decisions on behalf of the institutional investors. For example, of the $130 billion in superannuation funds just over half is held in funds too small to support in-house investment units. The 40 funds who are unable to make their own decisions utilise the services of asset consultants from only five firms in Australia, ie perhaps just fifteen people, for expert advice. Such a small pool is unable to undertake meaningful research on investment opportunities.

The *McKinsey Report, Emerging Exporters* [5] of June, 1993 focused on small to medium, high value added manufacturers exporting between $2 million and $50 million annually. Among the policy recommendations of this report was for a new and concerted effort by all relevant parties to devise an effective agenda to improve the access of these firms to finance: 62 per cent of the stand alone export-oriented firms interviewed as part of this study said that the availability of finance was either an important or a critically important constraint. The *LEK Study of Service Exporters* [40] also reported that lack of finance was cited as a moderate to severe restraint by 69 per cent of the 1200 companies surveyed."

APPENDIX 4

QUALITY CERTIFICATION

A Report of the Committee of Inquiry into Australia's Standards and Conformance Infrastructure "Linking Industry Globally" was published in May 1995. Two of its most controversial sets of recommendations relate to Standards Australia and the National Measurement Laboratory (NML). It recommends that:

- Standards Australia be reconstituted to become more responsive to its modern market, and divest itself of its consulting subsidiary (Quality Assurance Services).
- NML and National Association of Testing Authorities (NATA) be given a monopoly in laboratory accreditation and also divest itself of its consulting business.

More directly of concern to small business is Chapter 14, which deals exhaustively with accreditation. Some direct quotations illustrate their line of thinking.

> "ISO 9000 does not, of itself, improve or guarantee the QUALITY of a product. Nor does implementation of ISO 9000 by itself constitute TQM ... It merely certifies a consistent quality ... There is more to quality management than the ISO 9000 family of standards."

- The average time to gain certification for small businesses is 15.3 months and the average cost at least $55,000 (and in many cases much more).
- Quality assurance can be achieved without a formal quality management system.
- Information management of quality is more appropriate for small businesses and in many cases is more cost-effective than formal quality management systems.
- Clearly, a separation should exist between the functions of providing training or consulting services on the one hand and auditing and certification on the other.

Concern about ISO 9000 certification is not restricted to Australia. A report by the Small Business Research Trust of the United Kingdom, published in October 1994, was based on the views of 4,000 businesses. Among the findings and recommendations the report made to tailor the application of ISO 9000 more closely to the needs of small business were the following:

- Businesses which are already achieving a high standard of quality through informal methods should not have to apply more formal systems where these are not needed.
- The time and costs of operating (the standard) should be reduced.
- External evidence, from customers for example, should be acceptable as part of the assessment and registration process.
- Recognition that the standard is, at present, primarily seen as a marketing tool by many small businesses.
- Adherence to other quality standards (such as trade standards and Government regulations) should be recognised as part of the assessment and registration process.
- No small supplier should be required to register for the standard if they are able to provide alternative evidence of the consistent quality of their products, goods or services.

The Committee suggests these scenarios are equally visible in the application of ISO 9000 in Australia, and that ISO 9000 should not be regarded as the quality assurance criterion in all situations. The committee considers a better approach would be to concentrate on outcomes and customer needs.

Their recommendation No 36 would, if carried out, have immense implications for small

business.

> "The Australian Quality Control Council, in conjunction with government purchasing authorities and the Wider Quality Movement, develop and promote a three-tier approach for applying quality assurance requirements in purchasing along the following lines:
> - for low value, low risk purchases - self attestation,
> - when dealing with a known supplier - acceptance of a good performance record in the past, and
> - for high value or high risk purchases - a combination of certification to a product standard and/or ISO 9000 certification as appropriate."

The committee forecasts that future revisions of ISO 9000 will allow for self-assessment by firms who wish to implement ISO 9000 but find the cost of third party certification prohibitive. They have a special message for the State and Federal Government purchasing organisation.

> "The enthusiasm of governments to encourage businesses to implement quality assurance systems may be damaging otherwise healthy sectors of the small business sector. The requirement for QA in government purchasing should be discretionary and assessed in each case."