

**FEDERATION OF AUSTRALIAN SCIENTIFIC
AND TECHNOLOGICAL SOCIETIES**

Science and Technology for the Social, Environmental and Economic Benefit of Australia

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Ms Shelley McInnis
The Inquiry Secretary
House of Representatives Standing Committee on Science and Innovation
R1 Suite 116
Parliament House
Canberra ACT 2600

Dear Ms McInnes

Inquiry into Business Commitment to R&D in Australia

Attached is a submission from FASTS to the Inquiry.

We would be willing to expand on the points in the submission or to give evidence in person, if the Committee required further details.

Yours sincerely

Toss Gascoigne
Executive Director

Inquiry into Business Commitment to R&D in Australia Submission from FASTS

Background

Business expenditure on R&D (BERD) has a long history of weak performance in Australia, and currently languishes at about one third of the level in countries with which we would like to compare ourselves: the modern economies of western Europe, north America and Asia. Through the period of the early 1990s, Australian BERD was increasing faster than any comparable country, to reach a peak in 1996; but when the tax concession for BERD was reduced in that year, business responded by cutting their investment in R&D.

Clearly the level of Government support for BERD is a factor.

Other factors have been suggested as well. One is the ‘branch economy’ tag that Australian industry wears. Research is normally conducted close to head office, and if head office is in the US or the UK or Europe or Japan, that is where most of the research will be conducted.

A third factor is the size of the Australian market. A population of 19 million does not provide a market of sufficient size to support the sort of R&D that is required to develop new products or improve existing ones.

A fourth possible factor is a cultural one in our society. Although the links between science and industry are growing (through programs such as the CRC Program), many scientists in Australia are not comfortable speaking the language of industry and commerce, and much of industry does not appreciate the possibilities and limitations of science. The two sides do not mix and interchange as they do in the advanced countries of the world.

A fifth factor is a “short-term” attitude in Australia. Our society generally is not used to planning for the future, for making the sort of patient investments that will pay off in the long term. This translates to industry: CEOs of major companies now have a life expectancy of four years, and their remuneration packages often include share options. This encourages CEOs to cut costs to drive up the share price, even if it involves sacking the R&D personnel. The philosophy is that any cutting of costs is good, even if it limits the long-term future of the company.

One additional factor was identified by Robin Batterham in his report “A Chance to Change”: “In Australia 64% of business enterprise R&D is performed in firms of less than 500 employees, with only 24% performed in firms with greater than 1,000 employees. Thus, for the majority of Australian firms, longer-term research is very difficult to carry out within the firm unless it expends considerably more than the industry average on R&D. In the United States however 54% of industrial R&D is carried out in firms with greater than 10 000 employees, with only 18% in firms of less than 500 employees. Thus, in the USA there is a large number of firms with the scale that enables them to carry out longer-term research in-house.”

FASTS believes the Government needs to address each of these factors if it wishes to lift BERD:

- To set incentives to industry at attractive levels
- To encourage foreign companies to source some of their R&D here
- To continue pushing Australian companies to take an international view of markets
- To break down cultural barriers between industry and science
- To ensure that taxation and other settings favour appropriate long-term investments
- To encourage a patient investment approach through setting national goals

The three issues

What would be the economic benefit for Australia from a greater private sector investment in R&D?

There are several reasons why private sector investment in R&D should be strongly encouraged by Government.

1. Scientific innovation is integral to the functioning of society. “Every aspect of our lives is touched by science – the food we eat, the clothes we wear, our health, industry, agriculture, manufacturing, environment and the success of our international business. In this new century, science will be fundamental to Australia’s prosperity, the quality of life of all Australians, and to sustaining the Australian environment.”¹
2. Innovation in science and technology is a significant driver of a nation’s standard of living and is essential to maintain international competitiveness. “The industries that support a high and rising standard of living today are knowledge intensive...Success in international trade has become more of a function of the ability to develop and deploy technology and skills than of proximity to low cost inputs. Innovation... has become vital to success in international competition...the essential character and source of competitive advantage is innovation and change.”²
3. Corporate research and development is a crucial component of the wealth creation process. *“Investments in R&D have high rates of return. The social rate of return which may be close to 50%, exceeded the high private rate of returns, of 20 to 30%, by a considerable amount because of ‘spillovers’ - benefits that accrue as other researchers make use of new findings, often in applications far beyond what the original researcher imagined.”*³ These high returns for investment in R&D are reported in numerous international studies, some of which place the social rate of return at over 60%⁴. There is clearly a strong incentive for both the nation and the private sector to benefit from this investment.
4. It provides the opportunity for Australia to generate and own intellectual property arising from inventions. This creates significant opportunity for individual and national wealth creation, and allows Australia to manage its exposure to imported products and technologies.
5. Innovation and R&D creates a community of highly skilled workers which in turn generates high value employment, and a core body of knowledge and skills to address emerging national environmental and health crises.

What are the impediments to business investment in R&D?

Despite these good reasons, it is clear that Australian businesses are not investing in R&D to anywhere near the same extent as competitors in other countries. Australia’s historically poor performance in private sector R&D has been well documented. Currently, Australian BERD is well behind our international competitors as a percentage of industry domestic product, and has slipped from 14th in the OECD 1997 to 20th in 1999 (Figure 1).

¹ (*Delivering the Goods – Research for a Nation*. www.csiro.com).

² (Croccombe GT et al, 1991 “Determinants of national competitive advantage”, in *Upgrading new Zealand’s Competitive Advantage*, Oxford University Press, Auckland.)

³ *Supporting R&D to Promote Economic Growth: The Federal Government’s Role*, US President’s Council of Economic Advisers, October, 1995.

⁴ Studies compiled by Professor Steve Dowrick, ANU, and presented at the Melbourne Institute Economic and Social Outlook Conference, April 4-5, 2002.

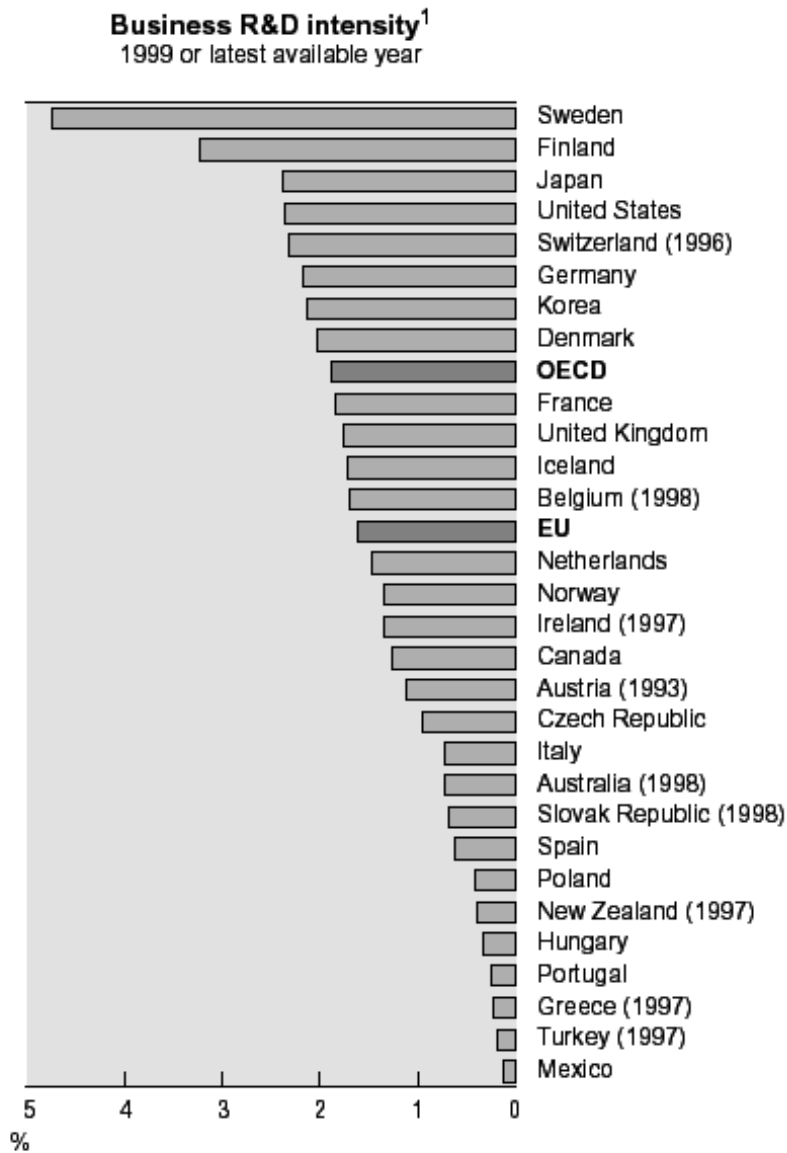


Fig. 1 Business enterprise sector R&D expenditure as a percentage of domestic product of industry (1999)⁵.

From a peak in 1996 (0.86%), Australian BERD fell dramatically to 0.64% in 2000, recovering somewhat in 2001 to 0.72%. Most other OECD countries increased BERD as a percentage of GDP during the same period (Figure 2).

Some reasons for under-investment in R&D by Australian businesses.

Firms' decisions to undertake R&D are based on their anticipated private rate of return on their investment, and the likely time to realise returns on that investment. The time frame for such returns is long for investment in scientific R&D, and the private rate of return is significantly lower than the social rate of return. With the requirement on public companies in Australia to report to shareholders and to the market quarterly, there is significant pressure on firms, especially SMEs to perform in the short term by cutting costs and increasing revenue. In fact, the rewards for long-term investment may not be seen in the term of appointment of the Board or CEO making the investment decision. This is especially true of firms in countries

⁵ OECD Science, Technology and Industry Scoreboard 2001 – Towards a knowledge-based economy.

outside the US or Japan⁶. Therefore firms are reluctant to invest heavily in R&D without additional incentives.

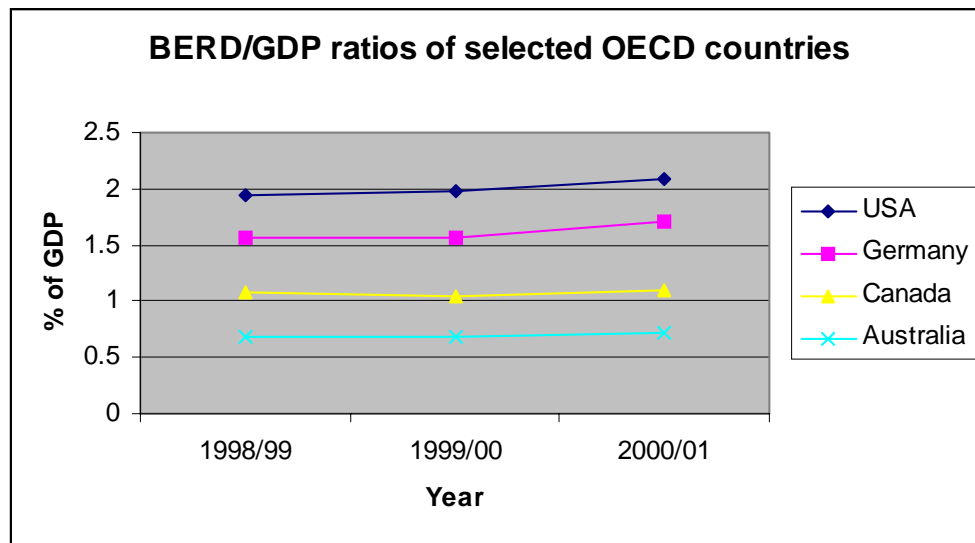


Fig. 2 BERD/GDP ratios for selected countries⁷.

Another impediment is that the cost of conducting R&D is mainly in salary and associated costs. Technical staff are often seen by management as a net cost and of having a restricted or narrow focus.

A final deterrent to Australian industry investment in R&D has been the changing and confusing nature of incentive schemes in recent times.

What steps need to be taken to better demonstrate to business the benefits of higher private sector investment in R&D?

Given the three factors outlined above – lower private rate of return, smaller market size and long-term horizons – there is clearly significant potential for market failure. Thus there is a key role for Government to provide incentives to companies which will justify expenditure on R&D to shareholders of SMEs.

FASTS supports the use of a balanced range of incentive schemes. These include:

- The use of enhanced tax deductibility and tax credits for genuine R&D investments;
- Improvements to mechanisms providing linkages to university and government research sectors e.g. the R&D START scheme;
- Greater incentives for attracting long term venture capital, including an internationally competitive capital gains tax system; and
- Augmented incubator schemes and measures to protect high technology start up companies from premature takeover.
- Industry has been deterred from investing in R&D by frequent changes to incentives, and by the reduction in their value. Ideally these incentives should be applied under a long-term national science policy which recognises the role of such investment in strengthening Australian industry and commerce. Government incentives should be sufficiently simple and attractive to encourage R&D investment, and should be consistent to enable long-term planning.

⁶ Eaton et al., 1998.

⁷ *Research and Experimental Development, Businesses*, 2000-01, ABS catalogue 8104.0.

FASTS would like to see the Government introduce a combination of taxation and legal reforms and improvements to venture capital (outlined below).

TAXATION AND LEGAL REFORM TO STIMULATE R&D

Australia should be an attractive place to invest in high technology companies. In order to compete successfully, companies need a taxation and legal environment that encourages innovation and allows rapid responses to new ideas and consumer demands.

While these issues received considerable attention by the Innovation Summit Implementation Group⁸, the Chief Scientist in *The Chance to Change*⁹ and the Government in *Backing Australia's Ability*¹⁰, FASTS believes further action is warranted if Australia's poor BERD performance is to be improved.

A. R&D Tax Concessions

R&D tax credits have become a popular policy tool in many other countries. For example, the UK government intends introducing a new R&D tax credit in Budget 2002. This move by other countries, if unanswered by Australia, risks providing further incentives for moving R&D off-shore.

Studies¹¹ indicate that compared to the original (1985) R&D tax deductibility of 150% at the 1985 company tax rate of 49%, the R&D deductibility at the current corporate tax rate of 30% would need to increase to 185% to return the same net tax benefit. The present 125% deductibility under BAA (with 175% for new R&D only in the year in which it is introduced) compares unfavourably with the earlier rates, and with overseas rates of deductibility, which in some cases reach 200%¹².

FASTS recommends that the present R&D tax concession be replaced by a sliding scale. When companies invest a higher proportion of their company turnover in R&D, they should be rewarded with a higher percentage deduction. For R&D intensity greater than an upper level of say 5%, the deductibility should be at least equal to the 175% upper BAA rate to be internationally competitive, while the lowest rate e.g. for less than 1% R&D intensity, could attract less than the current 125% deductibility. Rather than simply rewarding companies in the year of the increased R&D level, the deductibility rate should be determined from the R&D percentage year-by-year.

For companies which do not show a profit in their early development phase, BAA has replaced tax deductions with tax rebates in order to provide companies with an immediately tax benefit. This creates a favourable environment for high technology start-up companies that frequently do not become profitable for a number of years, and particularly benefits SMEs. However, the same sliding scale incentive to increase the proportion of R&D should apply to pre-tax companies.

B. Capital Gains Tax

The Capital Gains Tax (CGT) environment is very important to attract domestic and overseas investors in innovative projects. During its last term, the Government reduced CGT, which should encourage venture capital investment. This has made Australia's CGT regime more competitive, but we must ensure that this remains so.

⁸ Innovation: Unlocking the Future, Final Report of the Innovation Summit Implementation Group, August 2000.

⁹ The Chance to Change, Final Report by the Chief Scientist, November 2000.

¹⁰ Backing Australia's Ability: An innovation action plan for the future, January 2001.

¹¹ Michael Johnson and Associates, submission to the Ralph Review on company taxation.

¹² Singapore National Science and Technology Board: <http://www.nstb.gov.sg/>.

Typically, new high-tech companies do not show profits for several years because of the need to reinvest in growth. As a result, venture capitalists can only reap returns by exiting the investment and realising capital gains.

A tapered CGT rate, reduced annually in proportion to the length of time the asset is held (as in the UK), would attract investment without destabilising either the long-term prospects for high technology industry (due to speculative movements of capital), or long-term social equity. This tapered rate should be strictly targeted to high technology industries.

C. Company Takeover Laws

Current Australian law allows the relatively easy takeover of start-up companies early in their development, particularly at a stage when cash flow is critical. This not only sees the loss of promising high technology companies to overseas interests and often shifts R&D effort offshore, but also acts as a disincentive to investors who may wish to realise long term gains. FASTS supports the introduction of legislation aimed at limiting the premature takeover of Australian companies.

D. Intellectual Property Protection

IP rights are an important factor in protecting the research investment of knowledge-based economies. Currently, IP rights allow exclusive licensing of technology to organisations that take on the development of products requiring further investment; these rights thus act as an incentive to commercialisation of new technology. This should not necessarily be seen as a breach of competition policy, because without such exclusive intellectual property agreements commercialisation may be compromised and development moved offshore where the Trade Practices Act cannot reach it.

FASTS believes that Australian innovations in scientific R&D are not always captured for the economic, environmental and social benefit of Australia; and nor are they always protected from exploitation by outside agencies. Australian scientists and technologists must protect their IP via the patent system and by appropriate strategic alliances with industrial partners. As such, IP protection should be an allowable R&D deduction.

Setting clear rules for IP protection is important, but a balance must also be achieved between commercial interests and reasonable community access to the work of publicly funded research institutions. The government must acknowledge the risks to the research and innovation system that may result if the IP protection granted is too strong and non-exclusive licensing becomes too rare.

VENTURE CAPITAL

The amount of venture capital available in Australia is low by international comparisons. *“The amount we invest in the early stage of our venture capital market is small compared to international levels. Without access to early stage finance, businesses have little hope of developing an initial concept, developing prototypes or forming management teams to drive innovation forward.”*¹³. Australia’s current international standing is well below the OECD (and EU) average, and with little venture capital available for early stage development (Figure 3).

¹³ ISIG Report.

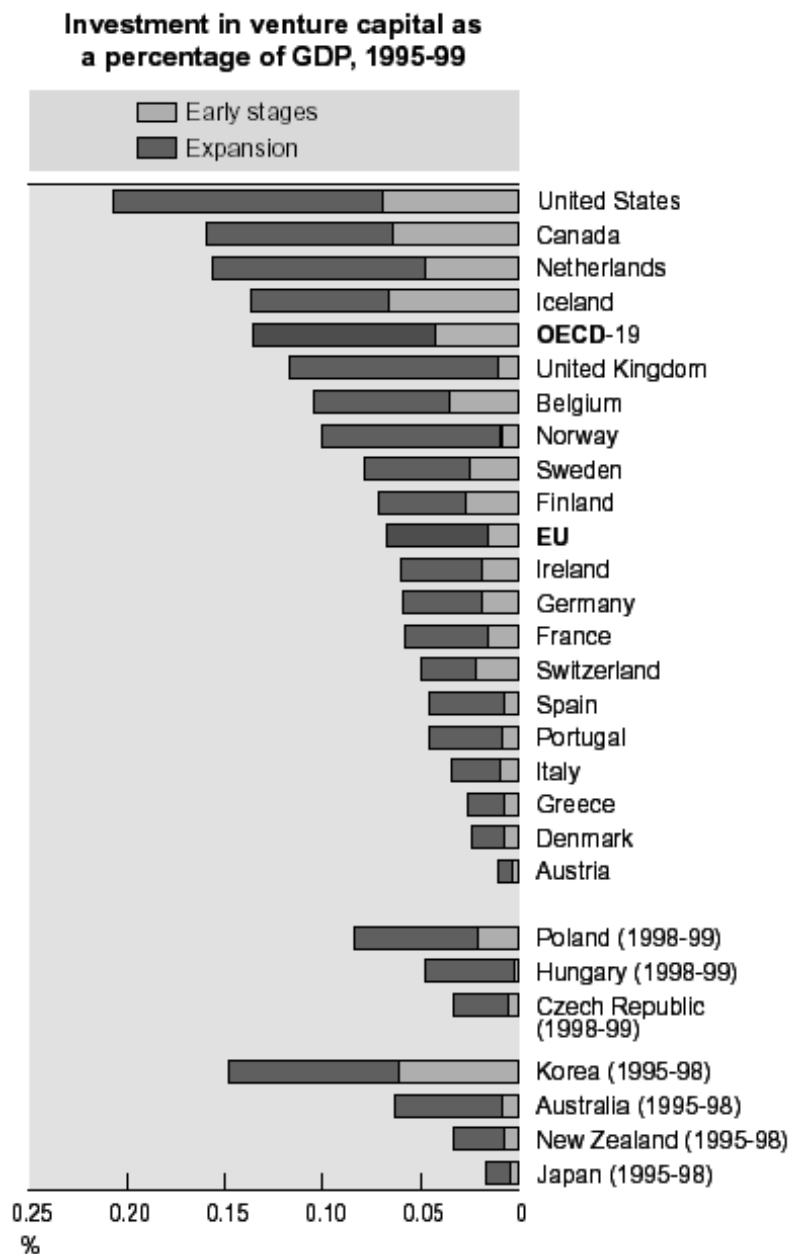


Fig. 3 Investment in venture capital as a percentage of GDP, 1995-99¹⁴

A cultural change is needed in the Australian financial sector to allow recognition of the long-term economic benefits of investing venture capital in high technology growth industries. The Government has previously addressed this issue by introducing the Innovation Investment Fund (IIF) Program, the Pharmaceutical Industry Investment Program – (PIIP) and the Pooled Development Fund (PDF) Program, all of which represented an excellent investment of taxpayers' money, and created growth areas of employment in Australia. This has not been enough to keep pace with our international competitors.

The structural improvements to taxation and legal reform advocated above will not in themselves improve the accessibility of venture capital for innovative industries. Additional measures FASTS recommends include allowing R&D tax deductibility for interest and dividends earned by investors in trusts and/or funds set up specifically for investment in R&D and in high technology industries. FASTS supports the Government's establishment of competitive Pre-Seed Funds for universities and government research agencies. We believe

¹⁴ OECD Science, Technology and Industry Scoreboard 2001 – Towards a knowledge-based economy.

this has the potential to make a significant contribution both to the culture within these institutions but also to developing commercial applications of value to the economy.

FASTS also recognises that while investment by large financial institutions such as the US pension funds may be needed to increase the range of venture capital available, it is important that this does not distort the mix of financial institutions investing in high technology. Indeed, FASTS questions why Australia's superannuation funds are not playing a more important role as a source of domestic venture capital for start-up companies in the high technology sector.

OTHER INCENTIVES FOR STIMULATING BERD

The above measures for reform to tax, legislation and venture capital should be further supported by other innovative incentives.

A. 100 POST-DOCS

FASTS proposes an extension of the present R&D START Scheme, which would make available 100 postdoctoral positions in industry each year. These positions would be funded in the same way as R&D START Graduates, i.e. 50/50 by government and industry in open competition, but could be independent of collaborations with universities.

This proposal would enhance existing schemes by placing postdoctoral scientists with research project experience directly into the private sector. The aim of the proposal is to bridge the gap between industry and research. Although many of these post-docs could expect to work in research positions with industry, this would not be compulsory under the FASTS' proposal; and they could work in sales or marketing or administration positions. The aim is to break down the cultural barriers which inhibit close collaboration between the sectors. The post-docs should be encouraged to build a career path in the company and eventually increase the level of scientific representation in the boardroom.

B. VOLUNTARY SECTOR LEVIES

Government also has a role to encourage industries with common interests to set up research funding bodies via voluntary sector levies. These funding bodies can then consider specific research proposals from universities, government and private organisations that relate to generic areas of interest for the industry, rather than for proprietary applications.

This is a particularly important innovation for SMEs, which on their own may not be able to perform R&D requiring a high level of investment. The Rural Industry R&D Corporations are an appropriate model.