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Industry Research and Development Amendment Bill 2003

Michael Priestley
Economics, Commerce and Industrial Relations Group
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Industry Research and Development Amendment Bill 2003

Date Introduced: 3 December 2003

House: House of Representatives

Portfolio: Industry, Tourism and Resources

Commencement: The main provisions commence on Proclamation. However, if the Bill is not proclaimed within six months of the date of Royal Assent, it will commence on the first day after that period.

Purpose

The Industry Research and Development Amendment Bill 2003 amends the *Industry Research and Development Act 1986* (the Act) to remove the existing powers of the Industry Research and Development Board (the Board) to commit, approve or recommend government expenditure on Research and Development (R&D). The Bill also provides that such functions cannot be conferred on the Board by ministerial direction under the Act. These financial tasks will instead be undertaken by the Department of Industry, Tourism and Resources (DITR).

Background

Administration of the Government's R&D and innovation support programs is shared between the Board, AusIndustry – the business support agency within the DITR – and the Australian Taxation Office in accordance with their legislative responsibilities.

The R&D tax concession is the largest such support program both in terms of value and the number of businesses assisted and is estimated to cost around $400 million per annum. The next largest program is the R&D Start Program which funds grants and loans totalling approximately $200 million per annum.

Unlike the R&D tax concession, which is a tax expenditure and is uncapped, expenditure for the R&D Start Program is capped at $180 million per annum and is supplemented from the Budget, with funds for successful grant recipients being committed to future years.

In April 2002, the R&D Start Program was suspended unexpectedly due to the over commitment of funds. No new applications were considered and new approvals were suspended until additional funding became available. At the time the Minister indicated that the suspension would not affect the 600 or more projects already receiving funding. The Minister also announced an external review of the disbursement of the R&D Start grants by AusIndustry, the agency responsible for administering the program.[1]

Following an eight-month suspension, the program resumed in November 2002 and the first grants under the new round of funding arrangements were announced in March 2003.[2]

Summary of Changes

The changes in the Bill bring the administration of the R&D Start Program under closer scrutiny of the Minister by removing the Board's financial powers to commit, approve or recommend government expenditure on R&D. The changes do not affect the Board's core function in providing support for R&D projects through the selection of grants and loans. Other changes include:

- expanding the Board's role to include the encouragement of innovation programs as well as research and development programs
- providing for a 'technical assessment' in relation to an assessment of the eligibility and merits of a proposal for research and development, or the assessment of the progress of a proposal that has received approval, and
- giving the Minister power to direct the Board to provide a 'technical assessment' in relation to programs administered by the Department, and to specify what should be in such an assessment.

As noted in the Minister's Second Reading Speech, the changes clarify the role and function of the Board so as to allow the Board to concentrate on its main functions:

> The Bill clarifies that the Department of Industry, Tourism and Resources controls, and is accountable for, program finances, not the Industry Research and Development Board. The amendments remove an administrative anomaly and clarify and confirm the financial accountability arrangements for innovation, currently and into the future. The amendments remove the Board's power to commit and approve the expenditure of Commonwealth funds under the *Financial Management and Accountability Act 1997*. Under the *Financial Management and Accountability Act*, it is the Chief Executive Officer of the Department of Industry, Tourism and Resources who is ultimately responsible for the administered funds appropriated to the Department, not the IR&D Board.
>
> In practice, the amendments will result in little difference to the existing operating procedures under the various innovation and research and development programs. Currently, the Board delegates its financial functions to officers of the Department of Industry, Tourism and Resources but under the existing Act retains some

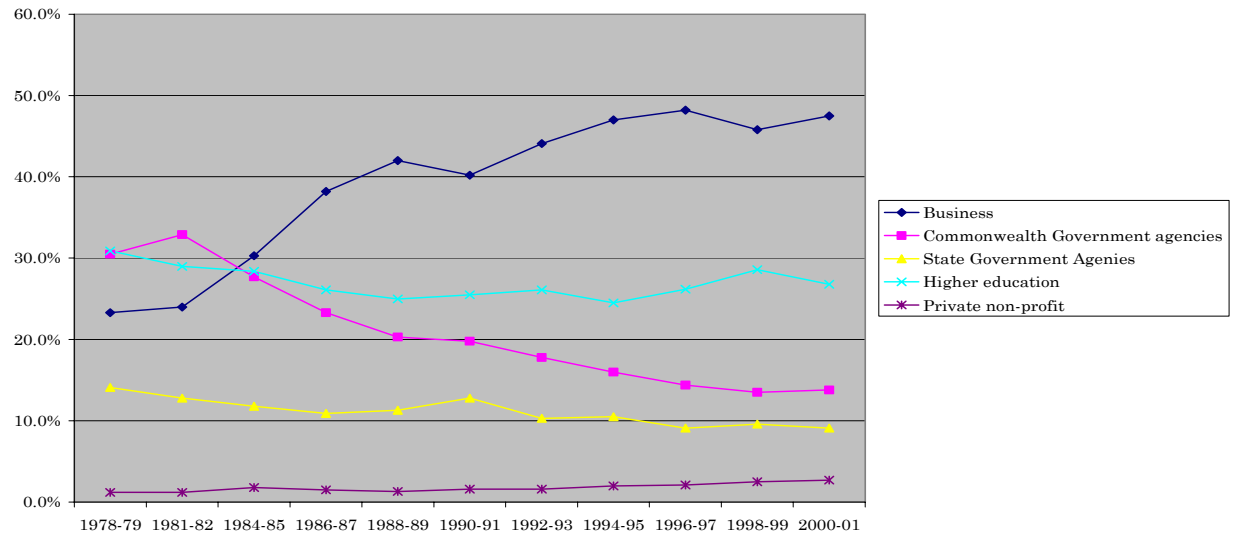
responsibility for Commonwealth finances. By removing the Board's financial responsibilities, the Bill enables the Board to focus on the assessment and prioritisation of applications – where its expertise lies – and not on managing funds.

Australia's R&D Performance and Financing

Gross expenditure on R&D in Australia as measured by the Australian Bureau of Statistics (ABS) now totals $10.3 billion or 1.5 per cent of GDP (see Table 1). In 2000–01, business enterprises performed close to 48 per cent of Australia's total R&D. The other R&D performing sectors include higher education institutions with 27 per cent, Commonwealth Government agencies with 14 per cent and State Governments with 9 per cent.

Investment in R&D by the business sector has grown significantly over the past 20 years, having increased its share of Australia's total R&D from 24 per cent in 1981–82 to 47.5 per cent in 2000–01. The figure below charts the increasing investment in R&D by the business sector and declining proportion of R&D expenditure by government (both State and Commonwealth). The proportion of R&D expenditure by higher education institutions has remained more or less static over the same period.

Figure 1
Percentage of R&D funded by business, government agencies and higher education institutions



Although the Commonwealth Government does not provide a large direct investment in R&D, it is a major source of funds, providing funds to both the higher education and business sectors through various R&D support programs. The Commonwealth provides around 40 per cent of the funds for R&D in Australia and another 7 per cent through indirect means of the R&D tax concession. Funding for R&D is still, however, dominated by the private sector which provides around 48 per cent of the total R&D performed in Australia.

Table 1: Australia's R&D performance sectors 1978 to 2001[3]

Performing Sectors	1978-79	1981-82	1984-85	1986-87	1988-89	1990-91	1992-93	1994-95	1996-97	1998-99	2000-01
						Current Prices ($million)					
Business	245.8	373.7	731.1	1288.6	1798.3	2099.8	2861.9	3508.3	4234.7	4094.7	4917.4
Government	469.9	714.7	955.3	1154.9	1352.3	1704.0	1823.9	1976.1	2064.3	2069.9	2368.4
Commonwealth Government agencies	321.2	514.8	669.4	786.5	869.6	1034.0	1155.4	1193.3	1266.6	1207.1	1424.8
State Government agences	148.7	199.9	285.9	368.4	482.7	670.0	668.5	782.8	797.7	862.8	943.6
Higher Education	325.5	452.5	685.7	881.7	1072.9	1332.8	1695.2	1829.6	2307.6	2555.1	2774.5
Private Non-Profit	12.6	20.9	43.5	49.1	53.3	85.4	101.9	152.7	185.8	220.1	283.2
TOTAL	**1053.8**	**1561.8**	**2415.6**	**3374.3**	**4276.8**	**5222.0**	**6482.9**	**7466.7**	**8792.4**	**8939.9**	**10343.5**
						Chain Volume Measures ($million at 2000 - 01)					
Business	-	-	-	2137.0	2664.5	2740.9	3555.2	4209.6	4829.2	4474.1	4917.4
Government	-	-	-	1799.2	1899.9	2180.8	2203.7	2307.8	2301.0	2223.9	2368.4
Commonwealth Government agencies	-	-	-	1235.5	1223.6	1324.5	1395.1	1393.7	1412.5	1296.4	1424.8
State Government agencies	-	-	-	563.7	676.3	856.3	808.6	914.1	888.5	927.4	943.6
Higher Education	-	-	-	1440.9	1587.6	1783.5	2184.8	2249.3	2672.1	2818.0	2774.5
Private Non-Profit	-	-	-	84.1	80.2	113.1	127.9	185.2	212.2	237.5	283.2
TOTAL	**-**	**-**	**-**	**5461.3**	**6232.2**	**6818.3**	**8071.6**	**8952.0**	**10014.4**	**9753.5**	**10343.5**

Source: ABS, unpublished R&D data provided to Science and Innovation Analysis Section, DEST in August 2003.

International Comparison

In 2001, OECD countries spent US$645 billion on R&D or around 2.3 per cent of overall GDP. The business sector was the main source of this funding providing more than 63 per cent of the total. In the United States, the business sector provided 68.3 per cent of R&D funding, in Japan business provided 73 per cent and in the United Kingdom business provided 46.2 per cent.[4]

As well as being the main source of funding for R&D, the business sector was also the major performer of R&D. In 2001, 70 per cent of the OECD's total R&D was performed by the business sector, higher education performed 17.3 per cent and government 10.4 per cent.[5]

Table 2 compares OECD countries (including Australia) according to their expenditure on R&D by each of the R&D performing sectors as a percentage of GDP.

Table 2: Expenditure on R&D as a percentage of GDP, OCED countries 2000

Country	Business %	Government %	Higher education %	Total(a) %
Finland	2.41	0.36	0.61	3.38
Japan	2.11	0.29	0.43	2.83
Iceland	1.56	0.71	0.45	2.72
Korea	1.96	0.35	0.30	2.61
United States	2.04	0.18	0.38	2.60
Switzerland	1.95	0.03	0.60	2.58
Germany	1.75	0.34	0.40	2.49
France	1.37	0.38	0.41	2.16
Belgium	1.46	0.34	0.19	1.99
Netherlands	1.11	0.25	0.57	1.93
Canada	1.09	0.22	0.55	1.86
United Kingdom	1.21	0.22	0.38	1.81
Australia	**0.72**	**0.35**	**0.41**	**1.48**
Czech Republic	0.80	0.34	0.19	1.24
Ireland	0.83	0.09	0.23	1.15
Italy	0.53	0.20	0.33	1.06
Spain	0.50	0.15	0.28	0.93
Hungary	0.36	0.21	0.19	0.76
Poland	0.25	0.23	0.22	0.70
Portugal	0.22	0.19	0.29	0.70
Slovak Republic	0.44	0.17	0.06	0.67
Turkey	0.21	0.04	0.39	0.64
European Union	1.22	0.26	0.40	1.88
Total OECD	1.56	0.23	0.38	2.17

(a) Does not include private non-profit.

Source: OECD STI Scoreboard 2003, Table A.5.1 R&D expenditure by main sectors of performance as a percentage of GDP

In 2000 Australia spent 1.48 per cent of its GDP on R&D, ranking 13 out of 22 OECD countries. Looking at each of the three R&D performing sectors in terms of their R&D-to-GDP ratio, Australia ranks fourth, behind Iceland, France, Finland and Korea for R&D performed by government. This is despite the long-term decline in government (both State and Commonwealth) R&D in Australia.

Looking at higher education expenditure on R&D, Australia ranks tenth but ranks higher than Ireland, the United Kingdom and the United States. Australia's low overall ranking is the result of the relatively low level of business R&D which fell well short of the OECD average. Looking at business sector expenditure, Australia ranks fifteenth. Italy, Spain, the Slovak Republic, Hungary, Poland, Portugal and Turkey are the only countries in which business expenditure on R&D amounts to a lower proportion of GDP than in Australia.

Pattern of business enterprise R&D

Australia has a different pattern of business enterprise R&D (BERD) to many other countries in the OECD group. Firstly, the communication equipment and high-technology industries, which are the first or second R&D sector in most countries, are not included in the top five efforts in Australia. New technologies, aerospace, chemical and computers are also absent with these again featuring prominently in the top group for other OECD countries.

According to the OECD science, technology and industry scoreboard, services accounted for 22 per cent of total business sector R&D in the OECD in 2000. In Norway, almost half of total business R&D (48 per cent) is carried out in the services sector. Australia (40 per cent), Spain (38 per cent), Denmark (35 per cent) and the United States (34 per cent) are the only other countries where services sector R&D represents more than 30 per cent of business R&D. By comparison, less than 10 per cent of business R&D is carried out in the services sector in Japan and Germany. High-technology industries accounted for more than 52 per cent of total manufacturing R&D in 2000, ranging from 60 per cent in the United States to 47 per cent and 44 per cent in the European Union and Japan, respectively. New technologies, such as nanotechnology, also account for a growing part of business R&D.[6]

In Australia, business R&D is geared more to the services sector than manufacturing and high technology industries, in particular property and business services which account for close to 20 per cent of all R&D. Australia's top group includes finance and insurance (19 per cent), motor vehicles (10 per cent), mining (9.5 per cent), wholesale and retail trade (7.5 per cent) and petroleum (7.5 per cent).[7]

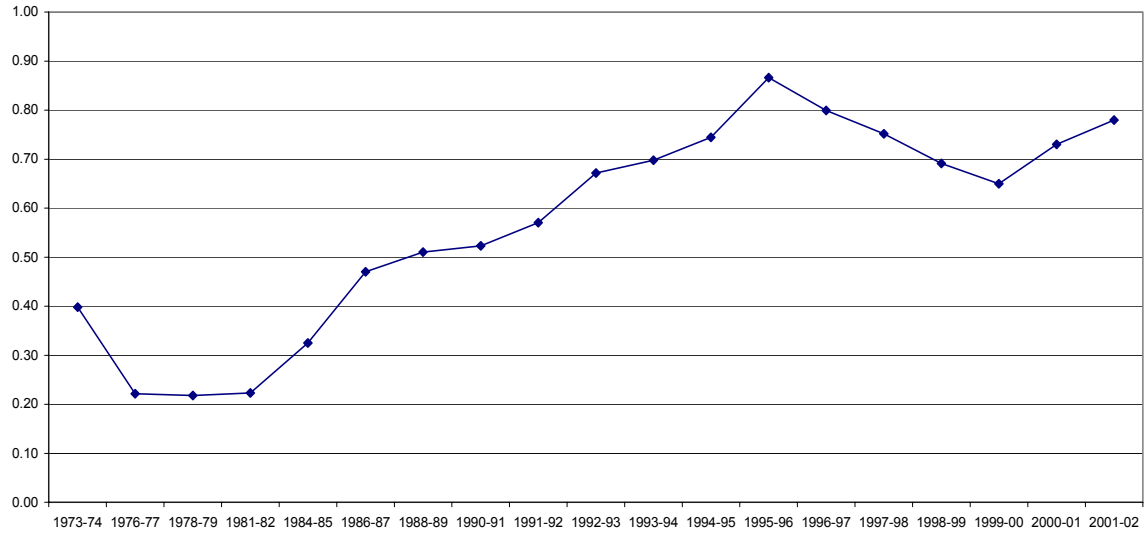
While Australia lacks the concentration of R&D-intensive industries as in other countries, there are many other factors that can affect business investment in R&D. Factors such as government policies, taxation, the availability of venture capital and of skilled professional managers can also influence the level of business R&D.

Growth in BERD

Historical and recent trends

The figure below shows the historical and recent trends in BERD as a percentage of GDP from to the early 1970's to 2001–02, the most recent year for which data is available.

Figure 2: Business expenditure on R&D as percentage of GDP



Source: ABS and Department of Science

There is no doubt that Australia experienced strong growth in BERD through the mid 1980's and for the decade through to 1996. BERD grew from just 0.32 per cent of GDP in 1984–85 to a peak of 0.87 in 1995-96. The average annual rate of increase in BERD through the 1990's was relatively strong at almost 12 per cent. At the time of the decrease in 1996–97, BERD as a proportion of Australia's GDP was 0.80 per cent. In 1995–96 this ratio was 0.87 per cent, but in 1994–95 was 0.74 per cent. Following changes to the R&D tax concession BERD fell in the four subsequent years, declining to just 0.65 per cent in 1999–00 then rising to 0.73 per cent in 2000–01. In 2001–02, BERD rose again to 0.78 per cent of GDP.[8]

Benefits of increased BERD

Evidence shows that individual firms and the national economy benefit from business R&D and that the social benefits of increased business R&D are wide-ranging. An OECD report found that "Countries with large increases in the intensity of business R&D to GDP and in the share of business R&D in the total R&D, including Australia, Denmark, Finland, Ireland and Sweden, appear to have experienced a pick-up in [productivity] growth in the 1990's".[9]

The OECD report also argued that links between innovation and national growth are well established:

> ***R&D provides an important contribution to output and total factor productivity***. The empirical evidence typically shows that a 1% increase in the stock of R&D leads to a rise in output of 0.05-0.15%. There is also evidence that R&D may play a different role in small and large economies (Griffith *et al*., 1998) ...in smaller ones, it primarily serves to facilitate technology transfer from abroad.

In Australia, two studies have estimated the rate of social return and the net benefits to a firm as a result of increased business investment in R&D. The most recent study of the net benefits of R&D spending in Australia suggests that the rate of social return to an investment in BERD is nearly 40 per cent.[10] A 2001 Productivity Commission Staff Paper estimated that a firm's participation in the R&D tax concession raised R&D by around 60 per cent.[11]

Government support for BERD

There is a general acceptance that some form of government support for business R&D is justified to increase investment in R&D and, ultimately, to increase economy wide welfare and promote sustained economic growth.

In February 2000, the Business Council of Australia and the Commonwealth Government convened the National Innovation Summit (NIS) to develop recommendations to improve Australia's R&D effort. Following the summit an Innovation Summit Implementation Group (ISIG) was established whose task was to assess and prioritise the NIS recommendations. The ISIG report, *Innovation-Unlocking the Future*, was presented to Government in August 2000.

The report noted the absolute decline in BERD in Australia since the mid-1990s and a relative decline in BERD as a percentage of GDP. Australia's R&D performance continued to fall well below the OECD average for BERD and was declining still further while the OECD average for BERD continued to rise. The report expressed concern that without strong public and private sector funding for R&D Australia was at risk that it would not be able to compete in a modern, knowledge-based economy. The report recommended additional tax incentives for small and large businesses undertaking R&D.

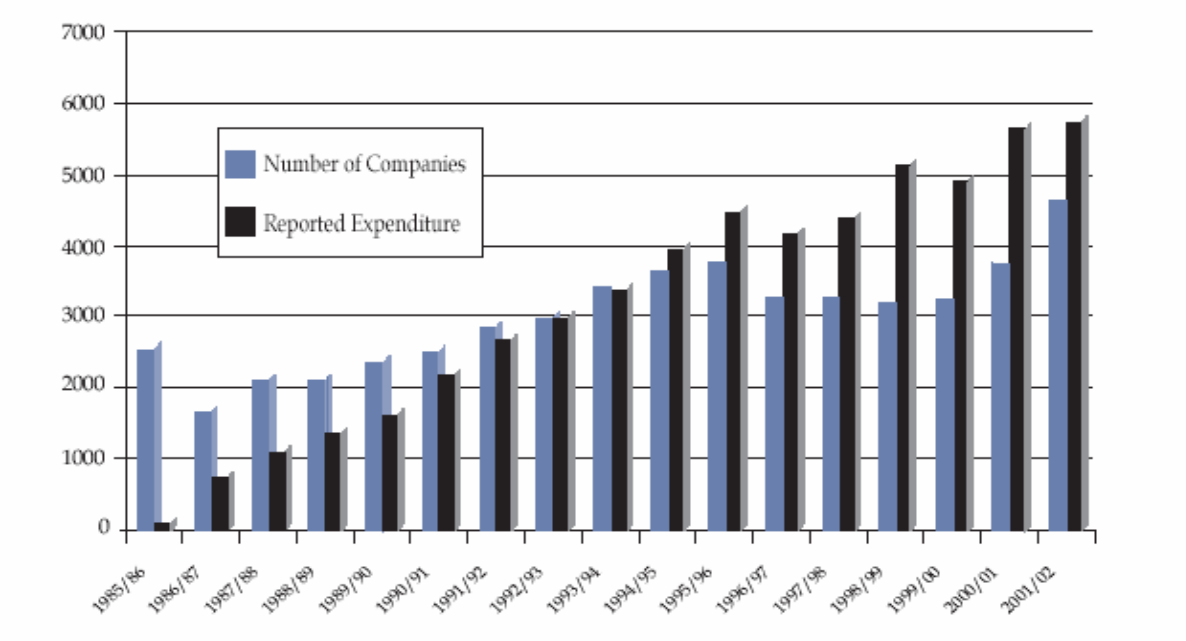
At the same time, the Chief Scientist was commissioned by the Government to review Australia's science capability. In his report, *The Chance to Change: Final Report*, the Chief Scientist noted the same low ranking of Australia's BERD among OECD countries and the need to modify the R&D tax concession to encourage greater innovation by business. The recommendations of the Chief Scientist were consistent with, and in some cases overlapped, those of the ISIG report.

The Government's 2001 innovation statement, *Backing Australia's Ability*, responded to the ISIG report and recommendations of the Chief Scientist. New initiatives to encourage private

sector R&D included the introduction of a new 175 per cent 'premium' R&D tax concession and a tax offset (tax rebate) for small and medium-sized enterprises (SMEs), and changes to the definition of R&D requiring both innovation and high levels of technical risk for eligible R&D projects. The Government later announced changes to simplify the premium R&D tax concession. It also introduced new tax incentives for venture capital investments.[12]

There has been an encouraging increase in BERD since *Backing Australia's Ability* and there are very good indications that BERD will continue to increase while the domestic economy remains strong. In its 2002–03 Annual Report the Board noted that, as at the end of 30 June 2003, 4639 companies were registered for the R&D tax concession (24 per cent above the previous highest level of 3733 in 1995–96).[13] (See Figure 3 below.)

Figure 3: Summary of registration data from 1985 to 2001–02 (as at 30 June 2003)



R&D Tax Concession

The R&D tax concession was introduced in 1985 and provided a 150 per cent deduction for eligible R&D expenditure. The 1996–97 Budget reduced the concessional rate from 150 per cent to 125 per cent and closed the Syndicated R&D program (a tax loss scheme). A 175 premium (or incremental) rate was introduced in 2001 for additional R&D that was undertaken above a base level of R&D.

Currently there are 4707 businesses registered for the R&D tax concession with reported R&D expenditure totalling $6 billion.[14] The majority of these businesses (67 per cent) report R&D spending of less than $500 000 and only 2 per cent of businesses report R&D expenditure of more than $10 million.[15]

In 2002 the Australian National Audit Office (ANAO) undertook a performance audit of the R&D tax concession and concluded it was well managed.[16] The ANAO audit report made four recommendations for strengthening areas of joint governance and performance management by each agency. The ANAO recommendations have since been implemented. However, the report noted that DITR's performance indicators focus primarily on inputs and outputs, rather than providing direct assessment of the effect of the tax concession and its R&D support programs in increasing business R&D.

How the R&D tax concession increases R&D spending

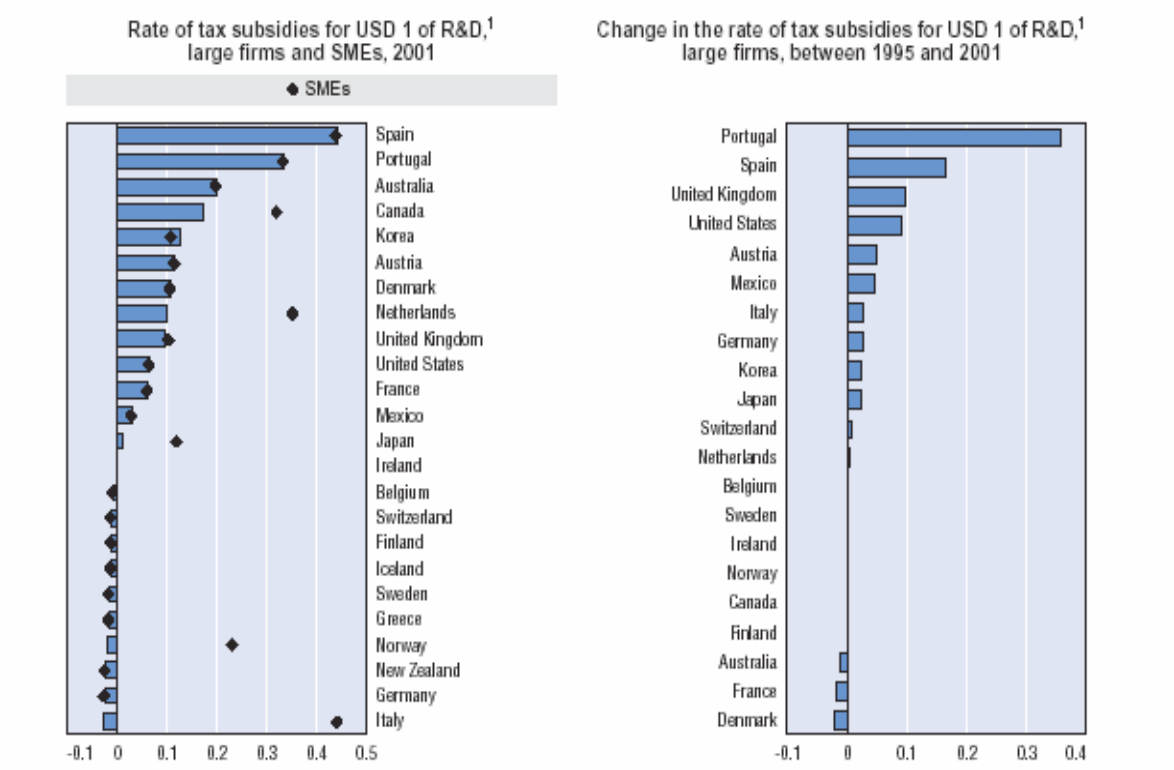
An OECD report, *Public and Private Financing of Business R&D*, noted the differences between direct and indirect forms of R&D financing, and how tax incentives can be effective in reaching large number of businesses and increasing R&D spending:

> *Tax incentives* provide governments with a means of financing a portion of the R&D conducted in all qualifying R&D-performing organisations. This approach cannot only enable greater number of firms to benefit from the incentive, but also allows markets (*i.e.,* individual firms) to determine how R&D funds are spent. Nevertheless, tax incentives do not allow government to easily direct business R&D into areas with high social returns; nor do they appear to encourage non-R&D performing firms to begin investing in R&D (European Commission, 2000). Rather, tax incentives are used as financial instruments that operate at the level of general budget considerations [to] expand business R&D programmes at the margin. Because they are taken against earnings (with some provision for carry-forward), tax incentives are more likely to favour projects that generate near-term profits than long-term exploratory projects and investments in research infrastructure that might generate larger spill-overs (David and Hall 2000).
>
> As a result of these differences, governments rely on a mix of direct and indirect policy instruments to address the specific challenges firms face in financing R&D. Indirect mechanisms, such as tax credits are used to boost overall levels of business R&D where they are depressed and to extend benefits to a large number of firms, including SMEs. Nevertheless, more direct forms of support may be needed to redirect industry R&D efforts towards areas with potentially large social and economic benefits and greater technological risks (and opportunities).[17]

In the international context, Australia provides a generous R&D tax concession to encourage business investment in R&D. The OECD has estimated that Australia's R&D subsidy to large businesses is one of the highest in the OECD group. Only Portugal and Spain provide higher tax subsidies for large firms (see Figure 4 below and Tax treatment of R&D, OECD, STI Scoreboard 2003).

For SMEs or firms with fewer than 250 people, the R&D tax concession is also generous when compared to the tax subsidies available in other OECD countries. Only Italy, Spain, the Netherlands, Portugal, Canada and Norway provide higher subsidies to SMEs.

Figure 4: Tax treatment of R&D by OECD countries



1. Tax subsidies are calculated as 1 minus the B index. For example, in Spain, 1 unit of R&D expenditure by large firms results in 0.44 unit of tax relief.

Source: OECD, STI/EAS Division, May 2003.

Approximately 12 per cent of businesses that have registered for the R&D tax concession intend claiming the 175 per cent premium concessional rate. The 2001–02 financial year is the first effective year of operation of the new 175 per cent premium R&D tax concession and it is too early to assess its impact, but previous studies by the Industry Commission and Bureau of Industry Economics suggested that an incremental rate was more effective at increasing R&D expenditure than a higher, flat rate tax concession.[18]

R&D Start Program

The Government introduced R&D Start in 1996 to assist businesses to undertake R&D and commercialisation through a range of grants and loans. Funding of $500 million was provided for the program to 2000.[19] The program comprised four elements:

- grants for R&D projects in SMEs, involving Large and Small Grants
- grants for graduate-based R&D projects
- grants for collaborative R&D projects, and
- concessional loans.

In 1998 the program was expanded as part of the Government's *Investing for Growth* statement and funding for the program was increased to $739 million for the period July 1998 to June 2002. Larger businesses were able to access the program and two new categories were introduced – *Start Plus* and *Start Premium*. The previous elements, Large Grants of $1 million or more and Small Grants of up to $1 million were combined into *Core Start*.

In January 2001, the Government announced through *Backing Australia's Ability* that R&D Start would receive additional funding of $535 million to 2006. Table 3 shows the budgetary impact of the Government's R&D support programs and additional funding for R&D Start from 2002–03 to 2005–06 (negative amounts indicate expenditure, positive amounts indicate savings or revenue).

Table 3: Impact on fiscal balance ($m)

Initiative	2001/02	2002/03	2003/04	2004/05	2005/06	Total
ARC Competitive Grants	-19.2	-92.5	-142.8	-205.4	-276.5	-736.4
Project Infrastructure	-26.8	-47.7	-68.7	-89.3	-104.5	-337.0
University Infrastructure	-26.3	-53.2	-54.4	-55.5	-56.6	-246.0
World Class Centres of Excellence	-6.0	-12.6	-17.0	-23.9	-31.5	-91.0
Major National Research Facilities	-5.0	-20.0	-30.0	-50.0	-50.0	-155.0
R&D Start	0	-41.9	-117.6	-174.7	-200.7	-534.9
Premium Rate Tax Concession	-30.0	-90.0	-105.0	-110.0	-125.0	-460.0
Streamlining the R&D Tax Concession	5.0	45.0	85.0	115.0	95.0	345.0
Rebate for Small Companies	0	-6.0	-3.0	-2.0	-2.0	-13.0
Expand CRCs	0	0	-55.0	-57.0	-115.0	-227.0
Expand COMET	-10.0	-10.0	-10.0	-10.0	0	-40.0
Innovation Access Program	-1.0	-22.0	-24.0	-26.0	-27.0	-100.0
Pre-Seed Fund	-6.4	-16.9	-21.8	-21.8	-11.8	-78.7
Biotechnology Innovation Fund	-5.0	-5.0	-10.0	0	0	-20.0
New Industries Development Program	-5.1	-5.2	-5.2	-5.2	-1.0	-21.7
Additional 2000 university places	-13.9	-24.7	-33.0	-39.5	-39.9	-151.0
Attracting IT&T Workers	0.5	0.6	0.6	0.6	0.7	3.0
Postgraduate Education Loans	-0.7	2.0	7.7	11.7	15.9	36.6
Online Curriculum Content	-4.5	-7.2	-7.4	-7.5	-7.7	-34.1
National Innovation Awareness Strategy	-5.0	-7.0	-7.0	-7.0	-9.0	-35.0
Total	**-159.4**	**-414.3**	**-618.6**	**-757.5**	**-946.6**	**-2,896.2**

The suspension of the R&D Start program in April 2002 delayed R&D projects that were ready to start and was criticised by business at the time.[20] In the 2003–04 Budget, R&D Start received additional funding of $41 million to maintain the program until 30 June 2007. The additional funding enables grants to be approved in 2003–04 and brings total funding to approximately $1.7 billion.

Australia's Brain Drain: Myth or Reality?

According to a recent study, over one million Australians are living overseas, representing almost a 20th of the population, with many expatriates being professionals earning more than $200,000 per year, predominantly in the United States and Canada.[21] The report by the Committee for Economic Development of Australia (CEDA) notes that globalisation of labour markets is now an important element in the increasing international flow of workers and that most emigrants leave Australia for *'better employment opportunities'* and career aspirations. The report claims that globalisation has created an international labour pool from which Australia is able to draw significant numbers of skilled and professional people.

Contrary to popular perceptions, the report argues that there has been a net gain of skills to Australia but cautions that "Australia cannot afford to ignore its home grown talent in the global competition for skilled labour. Those who emigrate include many of Australia's key researchers and innovators. We have much to gain from young Australians working overseas, provided many of them return. We should seek to achieve the double bonus of attracting foreign workers while also retaining and regaining the best of our talent." The report concluded:

> *...Australia is not experiencing a net brain drain*, although the differences between incoming and outgoing flows in levels and types of expertise and training need to be distinguished. On balance, we are experiencing an overall net brain gain and a substantial 'brain circulation'.

By contrast, other studies show that the brain drain is indeed real. A study carried out by the Australian Mathematical Society, *Mathematical Sciences in Australia: Looking for a Future*, documented the movement of highly qualified mathematicians and statisticians from Australian universities and showed a serious brain drain.[22] Not only were experienced researchers leaving Australia but so were beginning researchers and very few were returning. This is consistent with the CEDA report.

However, the increasing number of researchers leaving for university placements and research opportunities overseas is an essential part of scientific training and the flow of information especially in the business and research sectors. The so-called 'brain drain' can represent a healthy demonstration of Australian expertise and innovation on the world stage. But, as the two studies show, the return of young, highly skilled Australians from overseas can prove to be more problematic given the individual transaction costs of a return to Australia.

While the number of qualified personnel and researchers leaving Australia is increasing, figures show that Australia is a net importer of skilled professionals across all occupations. In 2001–02, the number of skilled people coming to Australia exceeded those leaving by 114,440 (see Table 4 below). In terms of the proportion of researchers employed in the

workforce, Australia ranks well above the OECD average and ahead of Canada, Ireland and the United Kingdom.[23]

Table 4: Persons arriving and departing permanently or long term, by occupation 2001-02

Occupation	*Arrivals* no.	*Departures* no.	*Net gain* no.
Persons in selected occupations			
Specialist managers	6 762	3 840	2 922
Professionals			
Natural and physical science	2 324	2 030	294
Building and engineering	9 944	7 131	2 813
Computing	9 478	4 415	5 063
Health	10 656	8 416	2 240
Education	11 001	10 091	910
Other	29 014	24 469	4 545
Total	*79 179*	*60 392*	*18 787*
Other occupations	81 110	66 885	14 225
Not stated/inadequately described	22 149	11 620	10 529
Not applicable(a)	125 275	54 376	70 899
Total	*307 713*	*193 273*	*114 440*

(a) Includes retired, pensioners, disabled, housekeepers, students and unemployed.

Source: ABS, *Human Resources by Selected Qualifications and Occupations*, 8149.0, 2001.

Main Provisions

Innovation activities

Item 1 of **Schedule 1** of the Bill adds "and innovation activities" to section 3 Object of Act of the *Industry Research and Development Act 1986* so that the section would read:

> The object of this Act is to promote the development, and improve the efficiency and international competitiveness, of Australian industry by encouraging research and development activities and innovation activities.

Definition of technical assessment

Item 18 inserts a definition of 'technical assessment' in section 4 (Interpretation) of the Act. The term is defined separately in relation to (a) an application for government funding and (b) a proposal that has already been approved:

technical assessment means:

(a) in relation to a **proposal** for research and development or a **proposal** for innovation in respect of which an **application has been made** for the expenditure of Commonwealth money under a program to which Ministerial directions under section 18A apply – an assessment of, and the provision of advice and recommendations concerning:

(i) the eligibility of the proposal, and of the applicant, to participate in the program; and

(ii) the technical merit of the proposal; and

(iii) any other matter specified in the Ministerial directions; and

(b) in relation to the **progress** of particular research and development or a particular innovation initiative in respect of which the expenditure of Commonwealth money **has been approved** under such a program – an assessment of, and the provision of advice and recommendations concerning:

(i) the progress of that research and development or of that innovation initiative; and

(ii) any other matter specified in the Ministerial directions.

Item 20 adds provision of technical assessments to the Minister as a function of the Board under the Act.

Minister's power to direct the Board to provide a technical assessment

Item 23 inserts a new section 18A into the Act allowing the Minister to give directions to the Board for the provision of technical assessments in relation to any program relating to research and development matters or innovation matters that are administered by the Department. Proposed subsection 18A(2) provides that the Minister can require an assessment of the potential commercial returns or other benefits to the Australian economy from a research and development or innovation project.

Repeal of the Board's financial power to commit and approve the expenditure of Commonwealth funds

Item 27 repeals Part III of the Act, which confers powers on the Board to commit and approve the expenditure of Government funds.

Concluding Comments

In comparison with other countries in the OECD, Australia's R&D performing sectors rank high in terms of their R&D-to-GDP ratio, with the exception of BERD which lags well behind the OECD average.

The *Backing Australia's Ability* statement has helped to arrest the decline in BERD that followed the removal of R&D syndication and there are good indications that the new measures via R&D Start grants, the premium R&D tax concession and industry programs to support business investment in R&D will continue the improvement in BERD.

Much has been said of Australia's brain drain and the exodus of Australia's best minds for overseas jobs, but there is no hard and fast evidence to suggest that Australia is losing out from the international flow of skilled professionals nor, for that matter, from the flow of information and ideas that characterises innovation in the business and research sectors.

While the changes in the Bill appear minor, they will improve the administration of R&D Start and other R&D support programs administered by AusIndustry. Giving the Minister power to require the Board to provide technical assessments of R&D proposals and ongoing R&D projects will help ensure that the best outcomes are achieved for publicly funded R&D in Australia.

Endnotes

1. See 'Cost blowout brings halt to R&D grants', *The Australian Financial Review*, 26 April 2002 and 'Hopefuls on hold while R&D Start Program reviewed', *The Australian Financial Review*, 16 May 2002.
2. See Media Release, 'A Surge as R&D Start Powers Australian Innovation', Minister for Industry, Tourism and Resources, 03/50, 3 April 2003.
3. Table taken from Backing Australia's Ability, *The Australian Government's Innovation Report 2003-04: Real Results, Real Jobs*, Table 2: Overview of Australia's domestic R&D, by sectors of performance, 1978–79 to 2000–1, p. 95.
4. OECD Science, Technology and Industry Scoreboard 2003, Table A.3.1. R&D expenditure by source of funds (Percentages), p. 166.
5. OECD Science, Technology and Industry Scoreboard 2003, Table A.3.3. R&D expenditures by main sectors of performance (Percentages), p. 168.
6. See OECD Science, Technology and Industry Scoreboard 2003, A.4.2. Business R&D by industry, and A.4.3. R&D in selected ICT industries and ICT patents, pp. 24-27. For a discussion of Australia's industry structure and the structural differences between Australia and other countries, see *Riding the Innovation Wave: The Case for Increasing Business*

Investment in R&D, Report of the House of Representatives Standing Committee on Science and Innovation, June 2003, Chapter 2: International comparisons of public and private sector expenditure on R&D.

7. ABS, *Research and Experimental Development, Business*, 8104.0, 2001–02, Resources Devoted to R&D, By Industry, p. 8.
8. *Backing Australia's Ability 2002–03, Real Results Real Jobs*, Commonwealth Government's Innovation Report, 2002, p. 26.
9. See OECD "A New Economy?: the Changing Role of Innovation and Information Technology in Growth", 2000, p. 28.
10. The social rate of return is the ratio of net social benefit to revenue foregone, times 100. See R Maddock, "Social costs and benefits from public investment in innovation", *Melbourne Institute Quarterly Bulletin of Economic Trends*, 2000, 4.00, pp. 17-20.
11. See J Revesz & R Lattimore. *Statistical Analysis of the Use and Impact of Government Business Programs*, Staff Research Paper, Productivity Commission, November 2001 (for a copy of the paper, see web site: http://www.pc.gov.au)
12. See Venture Capital Bill 2002, Bills Digest No. 77 2002–03.
13. Industry Research and Development Board, *Annual Report 2000–03*, p. 5.
14. *Backing Australia's Ability. Real Results Real Jobs,* Commonwealth Government's Innovation Report, 2003-04, p. 61.
15. Industry Research and Development Board, *Annual Report 2002–03*, p. 62.
16. The Auditor-General, Audit Report No. 40 2002–03, Performance Audit, R&D Tax Concession, Department of Industry, Tourism and Resources, the Industry Research and Development Board and the Australian Taxation Office.
17. OECD *Public and Private Financing of Business R&D*, DSTI/STP (2002) 23/REV1, May 2002, p. 22.
18. See Industry Commission, *Research and Development*, Report No. 44, 1995, pp. 564-566.
19. Of the initial $500 million, $180 million was accessible over three years for businesses applying for grants and loans, $210 million went to support larger R&D projects and around $130 million was committed to the Innovation Investment Fund Scheme, a venture capital raising initiative.
20. See 'Small business caught short on R&D', *The Australian Financial Review*, 30 April 2002 and Australian Business Foundation, *Transcript*, p. 295, House of Representatives Inquiry into Business Commitment to R&D in Australia, 28 October 2002.
21. Committee for Economic Development of Australia, *Australia's Diaspora: Its Size, nature and Policy Implications*, December 2003.
22. See Federation of Australian Scientific and Technological Societies (FASTS) Occasional Paper No. 3, October 2000.
23. OECD Science, Technology and Industry Scoreboard, 2003, A.9.2. Researchers, p. 57.