The R&D Tax Concession – Impact on the Firm

Report on a Survey of 116 Firms

Department of Industry, Tourism and Resources
Canberra

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1. Executive Summary

Detailed analysis of data underpinning these findings is in sections 2, 3 and 4 of this Report.

1.1 Why and How Firms Undertake R&D

- For around 90 percent of interviewed companies, an ongoing commitment to R&D is central to their business competitiveness. This commitment to R&D plays a key role in:

  - establishing new markets through the development of new products, processes or services;
  - maintaining and growing their market position through the development of new or improved products, processes or services; and
  - maintaining or growing revenues by reducing the costs of producing, operating or delivering existing products, processes or services.

- Companies use at least one, and often all, of three R&D investment strategies:

  - a proactive approach – investment in R&D to generate new products, processes or services;
  - a reactive approach – investment in R&D to modify or improve their existing products, processes or services in response to customer demand or market opportunities;
  - a production efficiency approach – investment in R&D to develop new or improved production processes to reduce costs and enhance productivity, while still delivering the same product or service.

(*section 2.1*)

- Companies reported that the focus of their R&D activities was:

  - to develop next generation versions of existing products, processes or services (66 percent);
  - incrementally extend existing products, processes or services (54 percent);
  - develop radical products, processes or services that are entirely new to an industry (32 percent);
  - adopt and/or adapt existing off-the-shelf technology (21 percent).

(*section 2.2*)

- Overall, expected benefits from investment in R&D are:

  - to improve competitiveness through increased productivity or reduced production costs (38 percent of total responses),
  - to stay ahead of the market, or enter new markets (28 percent of total responses); and
  - to meet changing customer needs through the development of new innovative products or services (26 percent of total responses).

- For small businesses, the main expected benefits from investment in R&D were to develop new products or services, and to develop new markets.

- For medium businesses, the main expected benefits were to maintain or improve competitiveness, and to improve market share.

- For large businesses, the main expected benefits were the development of new, or improvements to existing, methods or processes for production, to maintain or improve competitiveness, and to improve market share.

(*section 2.3*)

- There was a strong correlation between expected and actual benefits from investment in R&D.

- The cost and time to complete R&D projects is often underestimated, even by companies with experience in undertaking R&D projects. Projects with a high risk and which are undertaken without any identifiable market or business need are less likely to be successful.

(*section 2.4*)

- More than 90 percent of interviewed companies prefer to undertake most of their R&D in-house. Firms cited a number of reasons for this:

    - to protect the commercial value of the outcomes of their research by limiting competitor awareness;
    - to enhance their competitiveness by retaining knowledge within the firm;
    - to assist in retaining skilled technical and trades staff in a tight labour market by offering stimulating work opportunities; and
    - many R&D projects involve changes to the process of manufacture, design or production, and draw heavily on the skills and knowledge of those staff who have an understanding of existing arrangements and requirements for improvement (there is a cross fertilisation of knowledge between existing arrangements and the desired outcomes of the R&D).

(*section 2.5.1*)

- Establishing an R&D partnership with another company was a strategic decision, given that it presents an opportunity to access new markets and/or sales and distribution channels.

- Collaboration, especially with public research organisations, becomes more likely as the size of a business increases. Smaller companies prefer to collaborate with other businesses rather than public research organisations, with interviewed companies citing difficulties in working with large, bureaucratic public-sector research organisations as the main reasons for this.

(*section 2.5.2*)

- Businesses contract out R&D when the knowledge, skills or facilities are not available internally, or when the work is not commercially sensitive, for example testing or construction.

(*section 2.5.3*)

- Formal mechanisms to protect intellectual property (IP) are used by 48 percent of firms. The remaining participants used industrial secrecy, technical dead ends to prevent reverse engineering, and speed to market to protect their IP and gain a return on their investment.

- Small and medium companies noted that gaining patent protection for the outcomes of R&D has a high cost, is time-intensive, and results in the disclosure of sensitive knowledge to competitors. These firms also have limited capacity to effectively pursue patent infringements.

- Small and medium companies also believe that retaining their knowledge gives them a competitive advantage.

- Large companies and companies in industries with long research and product cycles are most likely to patent the outcomes of R&D:

    - Companies in the pharmaceutical and biotechnology sectors are strong users of the patent system as their IP represents a key commercial asset.
    - Companies in the ICT sector prefer "informal" methods of protection, given their rapid product cycles and limited ability to gain IP protection for software.

(*section 2.6*)

- Barriers to commencing and/or completing R&D projects are lack of financial resources and shortages of skilled labour:

    - financial constraints are more significant in small companies than in medium and large companies, given fewer internal resources, difficulty in absorbing risk and difficulties in accessing external sources of funding; and
    - skills shortages, especially for engineering and trades staff, are particularly acute in regional areas.

(*section 2.7*)

- Strong economic conditions have underpinned strong levels of investment in R&D in interviewed companies over the last 5 years. R&D is often the first cost to be cut during a business downturn given that returns on investment in R&D are uncertain, indirect, and can involve a long lead time.

(*section 2.8*)

- The likelihood that R&D decisions is made through a structured, formal approval process increases as the size of the firm increases.

- New R&D projects are generally supported by management if they are considered to be essential to the firm's competitiveness or market position.

- The majority of firms undertake their R&D to meet evolving business needs, rather than according to a set annual budget.

(*section 2.9*)

1.2 Benefits of the R&D Tax Concession

- This study found that investment in R&D produces public benefits, in addition to the private benefits that accrue to the firm:

    - the results of R&D are diffused to other businesses to become the basis for products, processes or services in those firms in 47 percent of cases; and
    - the results of R&D improve environmental and human health outcomes in 73 percent and 83 percent of cases respectively.

(*section 3.1.1*)

- Investment in R&D indirectly produces longer-term benefits through positive behavioural change. Most companies, especially small and medium companies, advised that doing R&D has resulted in a stronger understanding of the benefits of R&D and commercialisation (83 percent), an enhanced commitment to R&D

(73 percent), and positive changes in the way it manages its R&D projects (80 percent).

(*section 3.1.2*)

- Overall, firms commented that the R&D Tax Concession:

  - provides a certain, direct and timely return on investment in R&D;
  - raises awareness of R&D as an investment option among company decision makers (i.e. puts R&D on the radar screen);
  - acts as leverage to raise equity to support further investment in R&D; and
  - encourages companies to broaden the scope of R&D projects, with additional expenditure on projects tending to focus on finding a better solution to a problem and expanding the scope of R&D projects to meet market demand.

- According to participants, the R&D Tax Concession:

  - influences the size of investment in individual R&D projects by companies in 51 percent of cases.
  - brings forward R&D expenditure on projects to enable faster completion, increasing the commercial value of the results in 26 percent of cases; and
  - induces additional R&D expenditure through increased investment in projects that would not otherwise be supported in 13 percent of cases.

(*section 3.2.1*)

- The R&D Tax Concession positively influences the R&D budget and timing of individual projects, but does not appear to encourage companies to undertake R&D projects for which there is a poor business case, just to receive a tax benefit.

(*section 3.2.2*)

- For two-thirds of participants, the R&D Tax Concession has resulted in a more structured approach to R&D and an increased recognition of the long-term benefits of R&D. It has enabled around one-third of participants to upgrade human resources and improve the availability of research equipment.

(*section 3.2.3*)

- Firms overwhelmingly reported decisions on the location of R&D activities were made on the basis of available expertise, facilities and cost.

- The R&D Tax Concession influenced 19 participating companies (17 percent) towards undertaking R&D in Australia rather than overseas, although it was not necessarily the most important factor in their decision making process.

(*section 3.2.4*)

- A number of factors limit the impact of the R&D Tax Concession program on firms that participated in the study, including:

  - lack of awareness – 22 percent of firms advised that they were unaware of the R&D Tax Concession at the time they decided to undertake R&D;
  - an inability to claim the R&D Tax Concession in respect of software that is not for multiple sale. This is an issue for both IT companies and manufacturers writing software to customise the operation of sophisticated capital equipment; and

- cost in time and money to register and claim the R&D Tax Concession compared to the benefit. This is particularly an issue for micro companies and small projects (under $50,000 per annum expenditure). These view were expressed, unprompted, by 15 percent of firms surveyed.

(*section 3.3*)

1.3 R&D Tax Offset and 175% Premium

- The **R&D Tax Offset**, through providing a cash benefit, has a major impact on inducing additional R&D in small companies as it:

  - enables recipient companies with otherwise lumpy cash flows to perform R&D on a continuous basis by providing a regular and certain cash flow;
  - directly funds increased investment in R&D;
  - provides a return on investment, even when the project is not a technical success; and
  - enables companies to employ more staff to work on R&D.

- The R&D Tax Offset also impacts on recipient businesses by:

  - providing financial support for the commercialisation of new technology coming out of the R&D; and
  - contributing to the growth of the business, including by acting as leverage to raise equity to support further R&D in small companies.

- There was limited evidence that the expenditure and turnover thresholds for the R&D Tax Offset impact on business strategies or artificially constrain investment in order to claim the R&D Tax Offset:

  - 3 companies, of the 30 R&D Tax Offset users surveyed, reported restricting investment in R&D to less than $1 million and 3 companies reported that they had restricted turnover to less than $5 million.
  - 2 companies gave a positive response to both questions.

(*section 4.1*)

- The **175% Premium** has resulted in an enhanced commitment to additional, speculative high-risk R&D projects amongst the 26 participants. It has also underpinned an expansion to the business and research strategy of firms.

- Few small and medium companies have the capacity to significantly increase their R&D expenditure in a short period and thus gain the benefit of the 175% Premium.

(*section 4.2*)

Case Study - Humpty Doo Barramundi

Humpty Doo Barramundi **is a small fish farm which grows and harvests barramundi for domestic and export markets. Despite the presence of key competitors from the Asian region, the *Humpty Doo Barramundi* is experiencing a 20 percent annual growth rate, due to lower production costs.**

The firm has a strong vision for the future, which is underpinned by R&D. Its R&D activities are focusing on enhancing production and management systems to improve efficiencies, productivity and yields. The company also invests in improving the survival and quality of fish. Investment in R&D is long-term and high risk as projects can take from 1 to 3 years to complete. Once implemented, project outcomes may take a further 18 months to 2 years to generate a benefit (based on the life cycle of the fish).

The company adopts the following business growth model:

Survive *Don't run out of cash*
↳ ↳*Manage your risks*
↳ ↳*Maintain personal relationships*
↳ ↳*Invest proceeds in R&D*
↓
Learn ↳ *Learn about your business AND your industry*
↳ ↳*Invest proceeds in R&D*
↓
Grow ↳*Develop aspects of your business that bring the greatest returns*
↳*Generate and retain some profits*
↓
Diversify ↳*Exploit/develop opportunities that leverage from your existing business*
↳*Generate and retain some profits*

If things go bad, drop back to the necessary level – as far back as you need to go to address the problem or to survive.

Humpty Doo Barramundi **does not have formalised research relationships with other players in the industry and public sector research organisations, so research tends to be undertaken in-house. Some minor projects are contracted out, but these tend to be based on automation and new equipment, and reflect a lack of engineering expertise in the firm. R&D is completed in-house to ensure synergies between the business and production cycle, and to retain knowledge within the firm. The firm prepares an annual R&D plan, however, projects are fluid. Some R&D projects are reactive, and meet a particular need as it arises.**

The R&D Tax Concession, in particular the Tax Offset, has been important to *Australian Barramundi Culture*, allowing it to increase the quantity of investment and shorten the time frame of R&D projects. Availability of the R&D Tax Concession and the support it gives to the business has created 'a momentum within the firm, which it is now starting to leverage off'.

Given its small size, *Humpty Doo Barramundi* has invested heavily in organisational change in recent years, introducing ISO 9000 and 14000 (including supporting documentation) and training for staff.

2. Why and How Firms Undertake R&D

2.1 R&D Strategies

All 116 study participants were known innovative companies, with 96 having claimed the R&D Tax Concession for the 2002-03 financial year. Consistent with this, 90 percent of all participants reported that R&D is either an "important" or "core" activity in their overall business strategy, through:

- establishing new markets through the development of new products, processes or services;
- maintaining and growing their market position through the development of new or improved products, processes or services; and
- maintaining or growing revenues by reducing the costs of producing, operating or delivering existing products, processes or services.

The 10 percent of companies that reported that R&D was a "one-off activity", that is it was related to a non-continuing project, were all small and medium businesses.

Companies use at least one, and often all, of three R&D investment strategies:

- a proactive approach – investment in R&D to generate new products, processes or services;
- a reactive approach – investment in R&D to modify or improve their existing products, processes or services in response to customer demand or market opportunities;
- a production efficiency approach – investment in R&D to develop new or improved production processes to reduce costs and enhance productivity, while still delivering the same product or service.

2.2 Intended Outputs from Investment in R&D

Participating companies were asked about the focus, or intended output, of their R&D and selected from 4 options:

- adoption and/or adaptation of existing off-the-shelf technology;
- incremental extension of existing products, processes or services;
- development of next generation products, processes or services; or
- development of radical products, processes or services which are new to the industry.

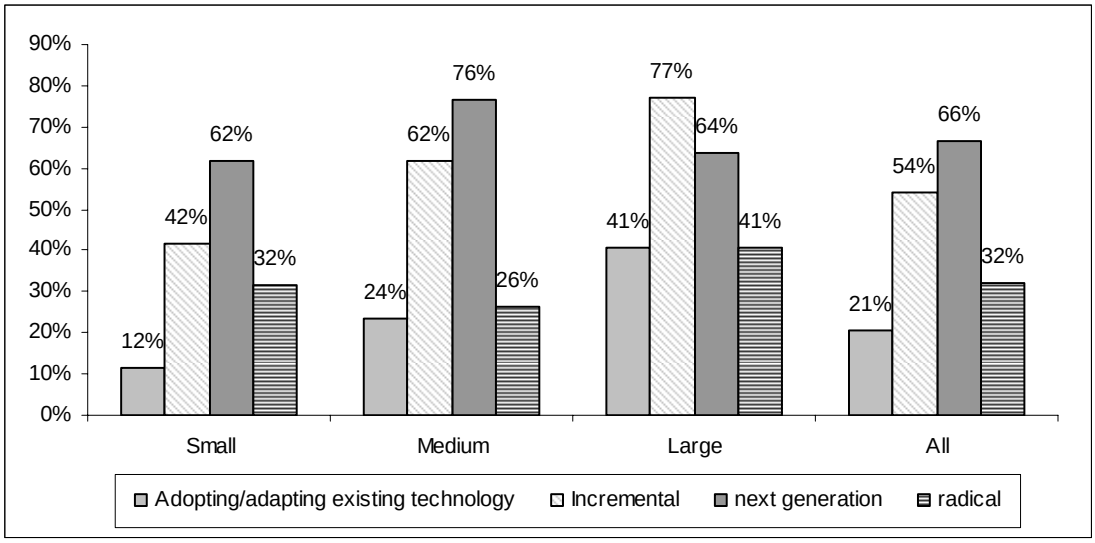
As recorded in **Figure 1**, companies were most likely to report that the focus of their R&D activities was to develop next generation versions of existing products, processes or services (66 percent), or to incrementally extend existing products, processes or services (54 percent). Fewer participants reported adopting/adapting existing off-the-shelf technology (21 percent) or the development of radical products, processes or services that are entirely new to an industry (32 percent) (percentages do not total to one hundred as firms could select more than one answer).

Most small businesses were focused on undertaking R&D to develop next generation products for the market, although a significant number also undertook incremental R&D.

Most medium businesses focused on developing next generation products, although a significant number also concentrated on incremental R&D (62 percent).

A number of large companies reporting undertaking the full spectrum of R&D activities from adopting/adapting off-the-shelf technology to developing radical new products, processes or services. Seventy seven percent of large firms focused on incremental R&D, the highest for that size of businesses. Large firms also had the strongest focus on radical R&D.

Figure 1 – Primary Focus of Research and Development



Firms could select more than one option, hence the numbers in **Figure 1** *reflect percentages of total respondents for each option.*

2.3 Expected Benefits from Investment in R&D

Key drivers for investment in R&D differ according to company size (**Table 1**). For small businesses, the most commonly nominated key drivers to invest in R&D were to develop new products or services, and to develop new markets.

Medium sized firms nominated the need to maintain or improve competitiveness, and to improve market share.

Among large businesses, almost two-thirds nominated developing new, or improving existing, methods or processes for production as the key driver to invest in R&D. Other key drivers to invest in R&D cited by large businesses were to maintain or improve competitiveness, and to improve market share.

Table 1 – Three Key Drivers for Investment in R&D (by company size)

	Small	Medium	Large	All
Maintain or improve competitiveness	17	**19**	**11**	**47**
Improve market share	15	**17**	**10**	**42**
Develop new markets	**27**	**10**	1	38
Improve profitability	**20**	9	9	38
Develop new products or services	**32**	8	5	**45**
Develop new or improve existing methods or processes for production	14	**10**	**15**	39
Improve or enhance existing products or services	9	8	7	24
Commercialising the outcomes of R&D	14	2	1	17
Commence exporting or increase existing exports	9	3	0	12
Other	10	6	10	26

Note: Not all firms identified 3 key drivers.

The drivers most cited by industry sector are set out in **Table 2**. Not all industries are included, either because numbers interviewed were too small to identify a meaningful trend or because companies in a particular industry reported an even spread of key drivers.

Table 2 – Dominant Drivers for Investment in R&D (by industry sector)

Driver	Industry
Maintain or improve competitiveness	Manufacturing
	Finance and Insurance
Develop or improve market share	Communication Services
	Cultural and Recreational Services
	Health and Community Services
Improve profitability	Property and Business Services
Develop new, or improve existing methods, for production	Agriculture, Forestry and Fishing Mining

The company seeks to fill market gaps where its technology can be applied into an existing product range.

Company 18

The company asked its customers to come up with a wish list for the next the next generation machine. During our quest to meet these needs, the company developed a lighter, more fuel efficient machine that leaves a smaller environmental footprint, thus exceeding all company and client expectations.

Company 43

2.4 Actual Benefits from Investment in R&D

The actual benefits gained by businesses, that is the outcomes of their investment, were generally consistent with their key drivers for investing in R&D (**Table 3**). In addition, few businesses reported that their expectations were either not met in full or met to some extent.

For small and medium businesses there was some variation between realised and intended outcomes of their investment in R&D.

For small businesses, the main benefits were those most often cited by those businesses as key drivers for investment in R&D – the development of new products or services for sale and improved revenue/profitability.

For medium businesses, the main benefit which accrues is improved market share, which is also one of the most important drivers for investment. Among medium businesses, investment in R&D was intended to improve production methods in slightly more firms than to result in new or improved products and services. However, new or improved products and services were more likely to be reported as a benefit of investment in R&D than improved production methods.

The most significant benefits from R&D reported by large businesses were improved revenue, reduced costs due to production process improvements, and improved market share. This is largely consistent with the key drivers for investment in R&D reported by large businesses. Large businesses also overwhelmingly reported that the benefits of R&D met their expectations.

Table 3 – Actual Benefits from Investment in R&D (by company size)

	Small	Medium	Large	All
Improved market share	13	**18**	**9**	**40**
Greater access to key markets	16	9	1	26
Increased exports	7	0	0	7
Improved revenue	**20**	11	**14**	**45**
New intellectual property	**20**	6	6	32
New product/service for sale	**33**	**15**	8	**56**
Better quality or improvements to product/service for sale	12	**13**	7	32
Reduced costs due to process improvements	8	9	**10**	27
Reduction in materials used or waste in production	2	3	4	9
Expansion of R&D activity/ research department	12	1	1	14
Increased employment	5	3	1	9

Note: Firms could select multiple benefits if applicable

Small businesses tended to report that their expectations were not fully met, with 36 percent of small firms indicating that their expectations were not met or only met to some extent. Overall, 65 percent of firms indicated that the outcomes of the R&D met their expectations (**Table 4**).

Table 4 – "Did the benefit of R&D meet company expectations?"

	Small	Medium	Large	All
Yes	64%	55%	83%	65%
No	24%	12%	4%	17%
To some extent	12%	33%	13%	18%
Total	100%	100%	100%	100%

There are waves that carry products through markets. Companies need to get the timing right or they miss out – too early or too late is too bad.

Company 57

R&D has benefited the company way more than we ever thought possible.

Company 21

Every project tends to cost 50 percent more and take 50 percent longer than expected. However, the company prefers to work with this rather than set less aggressive goals.

Company 5

The company expected to do things more quickly and did not anticipate research failures. It also had to constantly refine the product to meet customer needs and lacked deadlines and drivers, which slowed projects down.

Company 67

2.5 How R&D is Undertaken

2.5.1 In-House R&D

Around 90 percent of companies reported undertaking some or all of their R&D in-house. In-house R&D includes operation of a dedicated R&D department and/or production staff undertaking R&D during production down-time.

The main reason cited by firms for doing R&D in-house was to protect the commercial value of the outcomes and prevent competitors from accessing key information, know-how, and skills. This was particularly true for companies with short product cycles and low barriers to market entry or that were defending their established position in a high-value niche market.

A second reason for doing R&D in-house was to draw on internal expertise. Many firms advised that they had built-up research skills which were specific to the company's products, processes or services. In some cases there is a close relationship between R&D and manufacturing with staff working on R&D projects also working 'on the floor' in production areas – their knowledge and skills are transferable and inform the two processes.

Firms also noted the need to keep employees challenged and to continue to develop their skills.

2.5.2 Collaborative R&D

Thirty one of the small and medium firms collaborated with other organisations, including universities, Registered Research Agencies, Government research organisations and other firms. Reasons cited for entering into collaborative arrangements included accessing greater knowledge and complementary or specialised skills, and access to facilities or new technologies. In some instances, collaboration was also used as a tool to gain credibility for the business and its projects through association with a leading research organisation.

Fewer medium-sized firms entered into collaborative arrangements with other firms. When small companies enter into a partnership, it is most likely to be with another firm or a university. Some small businesses collaborate with larger companies to access well-established supply chains and distribution channels.

Large firms were most likely to collaborate with 58 percent of large firms reporting collaboration followed by 37 percent of small firms and 27 percent of medium firms. Collaboration does not appear to be a substitute for in-house R&D with 100 percent of large firms reporting in-house R&D followed by 94 percent of medium firms and 93 percent of small firms.

As shown in (Table 5 below), large firms were more likely than small and medium-sized firms to work in collaboration with registered research organisations, Co-operative Research Centres and Rural Research and Development Corporations. Large companies are also more likely to work with universities and/or technology institutes than smaller firms.

2.5.3 Contracted R&D

In addition, about half of participating businesses overall reported contracting out elements of their R&D projects. The contracted elements of R&D projects, across all businesses, tended not to involve the creation of commercially valuable knowledge. Rather contract services are most often used to access specialist services and equipment that would be impractical or costly to maintain in-house, particularly those related to testing or assembly activities rather than to key design or development activities.

The company didn't have the resources or level of expertise internally to undertake a specific R&D project. The project has become a community program and skill levels throughout the community have increased as partnerships have formed and expanded.

Company 78

The company had the product know-how but needed help with design. Through collaborative activities, we have developed relationships with employees in different companies which have led to other work.

Company 104

The company worked with a big international pharmaceutical client to gain awareness of both their clients and their markets. The potential for us to open up new markets was an important incentive.

Company 2

The company has a good relationship with the local university. The partnership has resulted in the development of a new surface coating technology.

Company 16

Our company contracted a university to develop key software for an innovation. The whole process was very expensive and unsatisfactory because the company didn't use the outcome. Although we gained some knowledge during the project, we had to re-write the software.

Company 57

Table 5 – How R&D is Performed (by company size)

	Small	Medium	Large	All
In-house	**55**	**31**	**24**	**110***
Collaboration	**22**	**9**	**14**	**45**
Universities and/or technology institutes	36%	44%	50%	42%
Registered research agencies	9%	11%	29%	16%
Co-operative Research Centres/ Rural Research and Development Corporations	9%	22%	50%	24%
Government agencies	18%	33%	21%	22%
Not for profit organisations	0%	0%	0%	0%
Other firms	77%	56%	64%	69%
Other organisation	5%	22%	7%	9%
Contracted out	**33**	**15**	**14**	**62**
Universities and/or technology institutes	36%	40%	57%	42%
Co-operative Research Centres/ Rural Research Development Corporations	6%	20%	29%	15%
Government agencies	3%	13%	21%	10%
Not for profit organisations	6%	7%	0%	5%
Other firms	58%	53%	50%	55%
Other organisation	30%	53%	14%	32%

* Not all participants answered this question

2.6 Intellectual Property (IP) Strategies

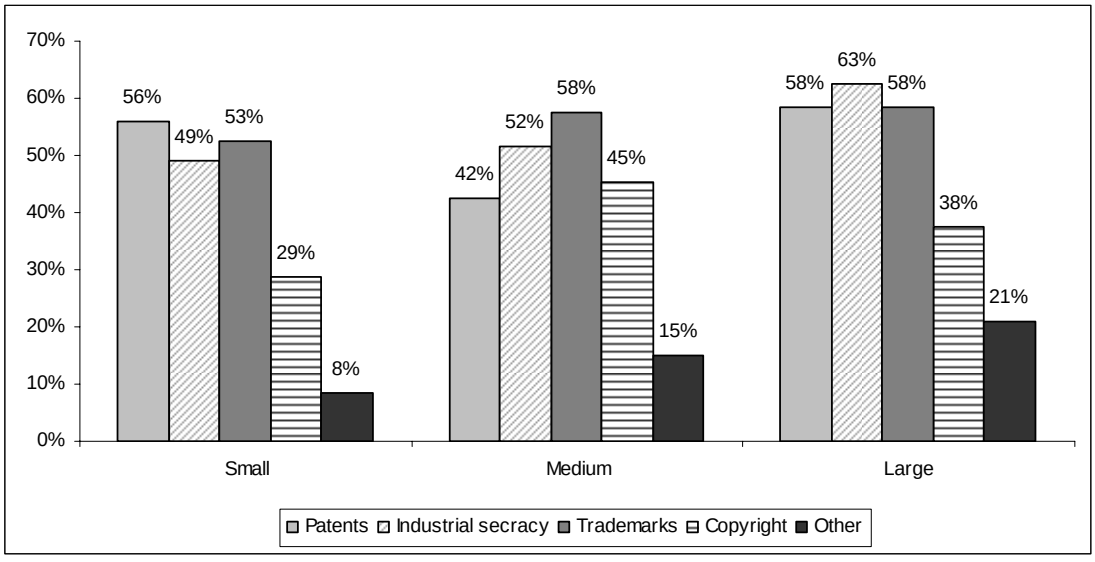
Eighty percent of participating companies had an intellectual property (IP) strategy, with most companies using more than one mechanism to protect their IP (**Figure 2**). Industrial secrecy was cited as an equally likely intellectual property (IP) strategy as seeking formal IP protection. Retaining knowledge in-house and industrial secrecy are used extensively by small firms.

Smaller businesses and/or businesses operating in markets with short product cycles and low entry barriers were most likely to cite industrial secrecy or speed to market as the main method of protecting the value of their R&D. They noted that gaining formal IP protection usually "does more harm than good". Larger businesses with more resources to obtain and defend patents, operating in sectors with slower product cycles, or operating in markets with high entry barriers, were more likely to use the patent system.

There were 2 sectoral exceptions:

- Businesses in the biotechnology/pharmaceutical sector rely heavily on formal IP protection, regardless of size. Given the decade-plus lead time in developing biotechnology products, for biotechnology companies the value of the company was measured by the value of their formal IP. For start-up biotechnology firms, patents were the prime currency used to deal with venture capitalists and larger pharmaceutical companies.
- Businesses in the ICT and related industries tended not to use patents at all, regardless of business size. Industrial secrecy, speed to market, constant product upgrades, encryption, and building in technical dead-ends or hidden code to slow reverse engineering efforts were preferred strategies.

Figure 2 – Intellectual Property Strategy (by company size)



The findings of this study differ markedly with those of the Australian Bureau of Statistics (ABS) survey of *Innovation in Australian Business, 2003*. According to the ABS, over three quarters of Australia's innovative businesses do not use any formal methods of IP protection while in this study around half used patents and trademarks.

The ABS survey of *Innovation in Australian Business, 2003* found that more than half of Australia's innovating businesses reported having no formal or informal protection of their IP, and only 4.4 percent of Australia's innovating businesses reported using patents to protect their work. Many businesses instead reported using informal methods of IP protection, such as secrecy, to protect their work.[1] By contrast this study found around 50 percent of businesses, of all sizes, used patents. The two studies agree that industrial secrecy is a frequently used method of protecting innovation.

2.7 Barriers to Undertaking R&D

Almost all companies reported experiencing at least one constraint to pursuing their desired R&D strategy (**Figure 3**). The constraint reported most frequently was financial, reported by almost three quarters of participating businesses, with no significant variation by business size.

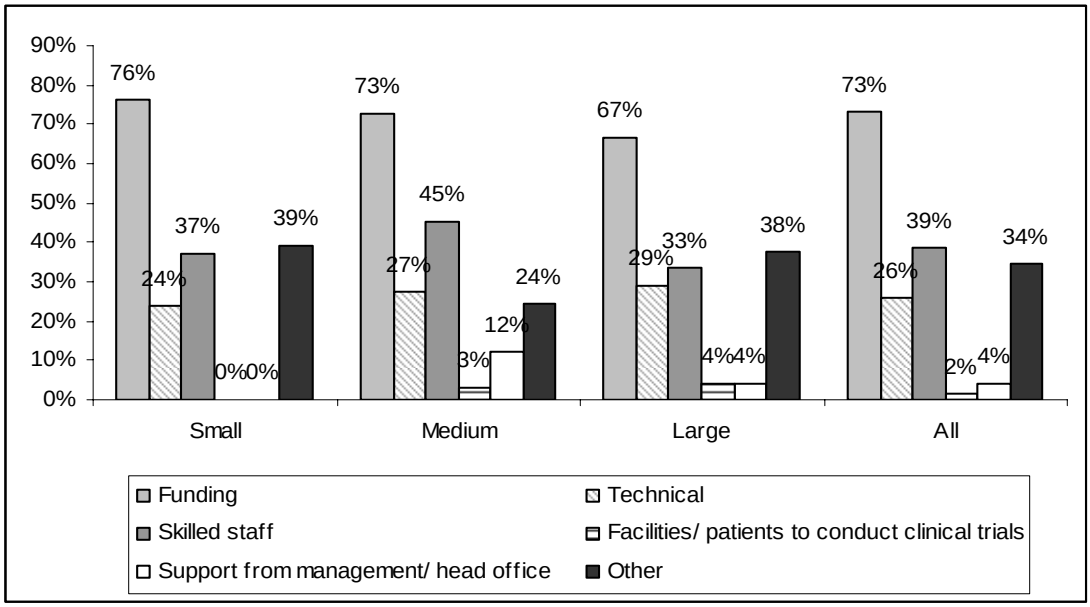
A lesser constraint, cited by all sized business, was trade and professional (especially engineering) skills shortages. Companies noted that problems in attracting and retaining skilled staff were largely a consequence of the strong economy. By industry sector, Manufacturing and Mining reported the most difficulty in accessing engineering staff.

Companies also commented on the disruptive effect of high turnover among the engineering and trades staff. As it takes time to customise generic skills to the particular needs of the company, high staff turnover tends to reduce the average effectiveness of the workforce in performing R&D.

While the skills issue was across all businesses, it was a particular problem for firms in regional areas. A number of regional firms reported being unable to attract and/or retain skilled staff, even when offering significantly higher than average wages and additional training opportunities.

[1] Australian Bureau of Statistics, 8158.0, *Innovation in Australian Business, 2003* (17 February 2005)

Figure 3 – Barriers to Commencing or Completing R&D



The 'other' constraints most reported by small businesses were time and lack of access to knowledge and technical information. For medium sized firms across all industries, time was the most reported 'other' constraint to completing R&D projects.

The biggest impediment to moving forward over the past 2 years has been the company's inability to get industry specialists.

Company 41

Skills are scarce and this situation is compounded by the remoteness of the location.

Company 29

The company employs graduate engineers, but about 9 months after training they tend to move on to larger companies.

Company 46

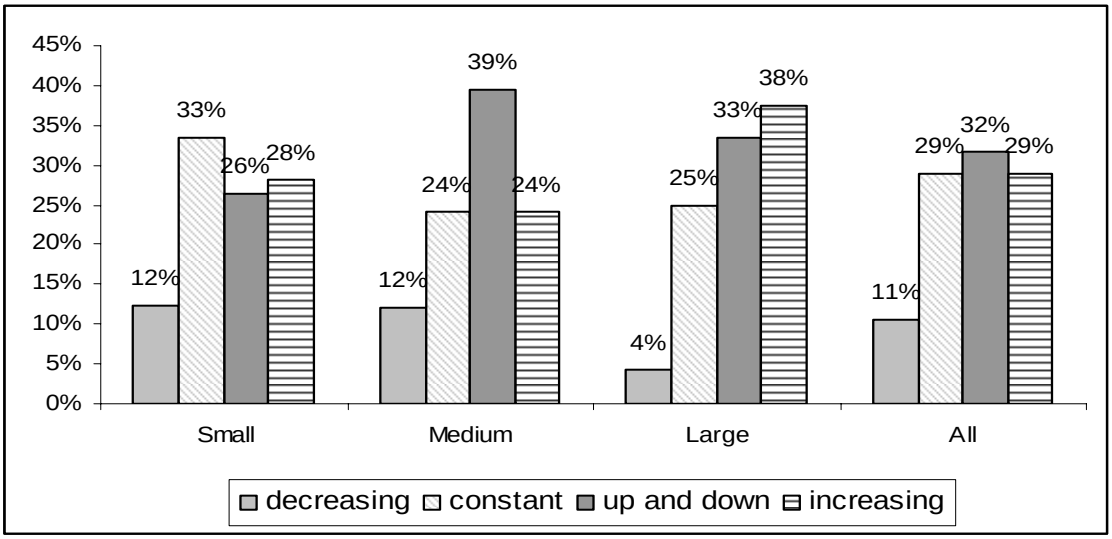
A shortage of engineering and trade staff is a limiting factor.

Company 68

2.8 Trends in R&D Investment

About 10 percent of participating businesses reported reducing investment in R&D over the last 5 years, while roughly equal proportions of the remainder reported that investment in R&D over the last 5 years had been constant, increased or had oscillated from year to year (**Figure 4**). No clear pattern of investment by size of firm or industry sector was evident over the 5 year period.

Figure 4 – R&D Investment Trends, 1999-2004 (by company size)



The small number of participating companies reported falling R&D expenditure in the last 5 years may be a reflection of strong business conditions. R&D tends to be one of the first outlays which are reduced during an economic downturn. It may also reflect that, for many of the businesses interviewed, R&D is fundamental to maintaining their competitive position.

In the early years of the project, the company's R&D expenditure increased dramatically to consume about 90 percent of available funds, but now the focus is on marketing.

Company 57

The company has constant growth in R&D expenditure of 10 to 20 percent per year due to increased turnover. Without business innovation and leading edge technology, the business would struggle to survive.

Company 104

As the company is small, it is heavily reliant on market forces. Work dictates the money and time spent on R&D.

Company 79

The [information] technology crash meant survival, rather than product development, was a priority.

Company 14

Commercial pressures and low margins put pressure on the R&D budget.

Company 115

R&D is crucial to firm's growth and competitiveness.

Company 66

2.9 Detailed Decision Making Processes

Participants stated that new projects are generally supported by management if they are considered to be essential to the firm's competitiveness or market position. Most companies constantly review their R&D budgets and research activity to ensure projects remain relevant to the market and to the company's business strategy.

The majority of firms undertake their R&D to meet their business needs, rather than according to a set budget (**Figure 5**). Most companies adopt a flexible approach to developing their R&D budgets, focusing on their R&D needs, rather than allocating a set portion of sales or profits (**Figure 6**).

Figure 5 – Basis for R&D Decisions

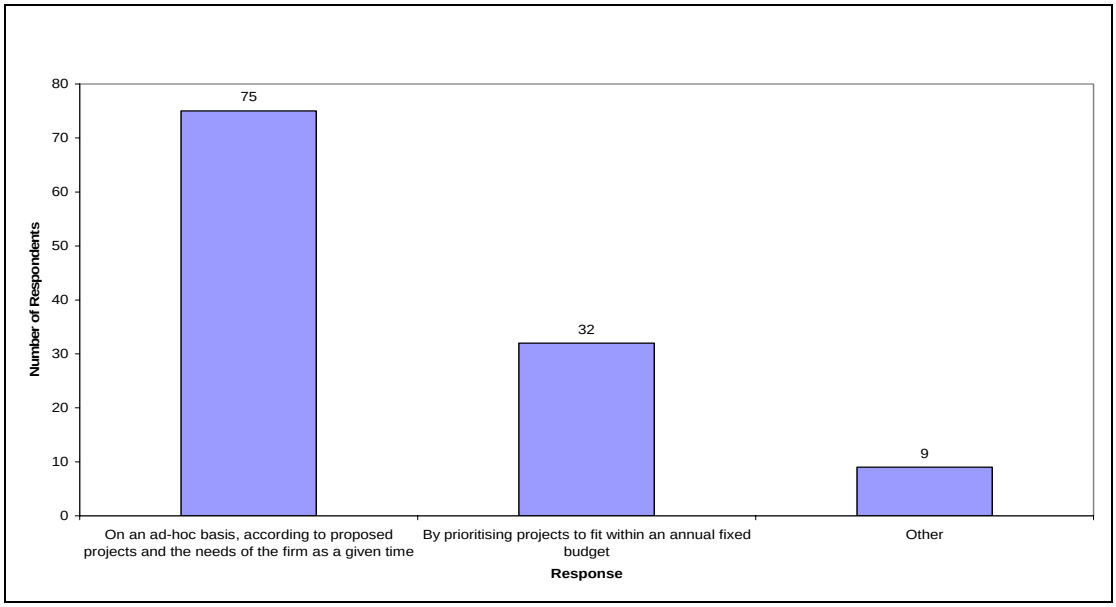
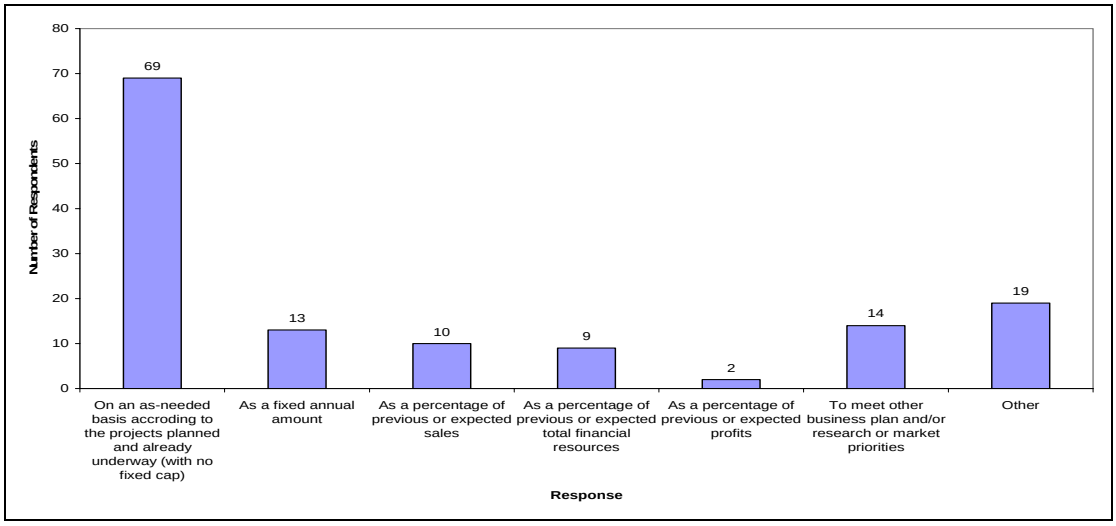


Figure 6 – Basis for Developing an R&D Budget



Sixty nine percent of companies interviewed have formal processes in place to identify and prioritise potential R&D projects. Firms indicated that projects are driven by customer needs, and R&D plans therefore need to be flexible and modified as new priorities emerged. As many companies observed, “the market doesn’t wait”.

Overall, it was found that:

- Smaller firms generally take a less structured approach, looking at what is necessary to get the job done, then “go on and do it”. Decision processes are generally informal, and made on an ‘as-needs’ basis by the owner/managing director.
- Larger companies are generally driven by cost and formal approval processes. R&D project decisions are usually made at Board level, based on a business case. However, decisions about changes to a project, or decisions to undertake small or lower-budget projects, tend to be made by

Directors or senior management according to a centralised, structured process.

The parent company will invest in R&D where there is a return on investment. The marketing manager approaches the R&D manager with proposals to meet specific customer requirements. If appropriate, the new designs will then be applied to all machines the company produces.

Company 43

The company has a formal internal process in place. Any R&D project proposal must have a commercial footing and lead to a new product, service or system.

Company 6

The company fits R&D around orders because R&D projects require the same personnel and facilities as production. R&D therefore has to wait for quieter times of the year.

Company 36

Case Study - RCR Stelform

RCR Stelform is an Australian leader in the design, supply, manufacture, installation and maintenance of pressure retaining equipment and a long term claimant of the R&D Tax Concession. Over the years Stelform has enjoyed a steady growth in sales, profit and number of employees. Profits have been reinvested into the organisation, ensuring business growth, improvements in plant and equipment, technology and training.

RCR Stelform operates in a low volume high value market, with very high levels of regulation. Its highly specialised industry makes use of materials which are developed and manufactured overseas and require R&D to be implemented into Australia.

R&D efforts are a mix of internally driven and customer driven projects, including the:

- **adoption of new materials and equipment into use in Australia;**
- **development and design new approaches to key functions;**
- **development of an IT system to track design (can be thousands of drawings), development, material procurement and quality control testing, manufacture, post manufacture testing/certification, installation, post-installation testing/certification, maintenance and problems of each system. Development of this in-house system has taken 5 years and development is ongoing, with 2 fulltime IT programmers /researchers;**
- **design, supply and establishment of new operational installations; and**
- **resolution of customer problems with in-situ systems, and the provision of refurbishment services.**

Through its focus on R&D, RCR Stelform became the first Australian company in the Fabricated Metal Product Manufacturing industry to achieve ISO9001. Success in its ongoing R&D program has led to new market opportunities and sustained annual increases in its R&D spend. R&D is now also more likely to be a longer term focus for the company.

The availability of the R&D Tax Concession is a significant factor for the company when considering high risk projects. The R&D Tax Concession assisted with the support of one highly risky collaborative project which has led to entrance into a new market for the company.

The R&D Tax Concession has allowed the upgrade of human resources and lead to a more structured approach to R&D within the firm. The R&D plan, while hard to develop, was especially constructive.
The 175% premium has encouraged the growth of R&D within the firm and enabled the company to dedicate more staff time to R&D projects. A number of projects may not have proceeded in the absence of the 175% Premium.

RCR Stelform participates in a local regional industrial forum, sharing ideas and working jointly where such projects are possible, including large international projects.

3. Benefits of the R&D Tax Concession

The Tax Concession instigated the need within the business to be more professional in how we manage R&D and instilled better auditing processes.

Company 59

3.1 Public Benefits

We are more focused on the benefits to the business and the company, but are proud of the resulting benefits to Australia.

Company 21

Huge benefits of additional serendipitous outcomes.

Company 20

Social benefits to Australia and addresses environmental issues.

Company 23

Changed the way they manage patients and this is saving lives.

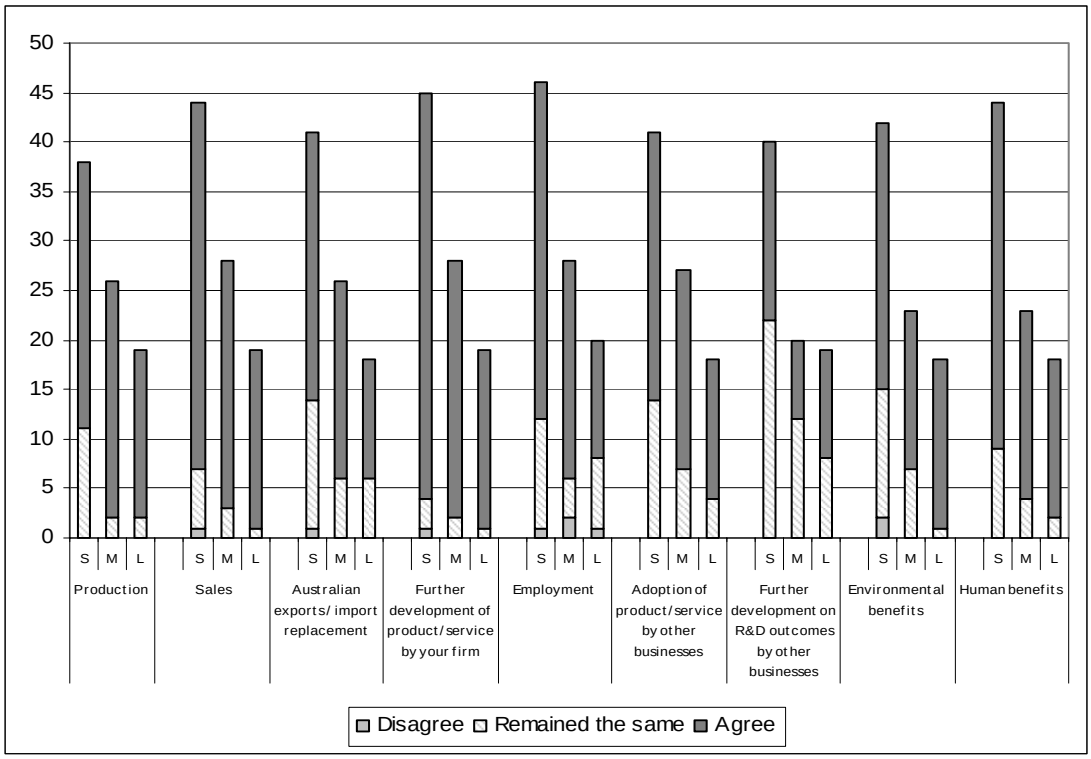
Company 45

3.1.1 Spillover Benefits

Companies were asked about the range of benefits, private and public, that accrued to Australia as a result of successful R&D projects. As shown in **Figure 7**, the greatest benefit to firms of all sizes was further the development of a new product or service. Eighty-five of the 96 firms that claimed the R&D Tax Concession for 2002-03 reported this as an outcome of their project. Eighty firms also identified increased Australian sales as a positive private consequence of their R&D activity.

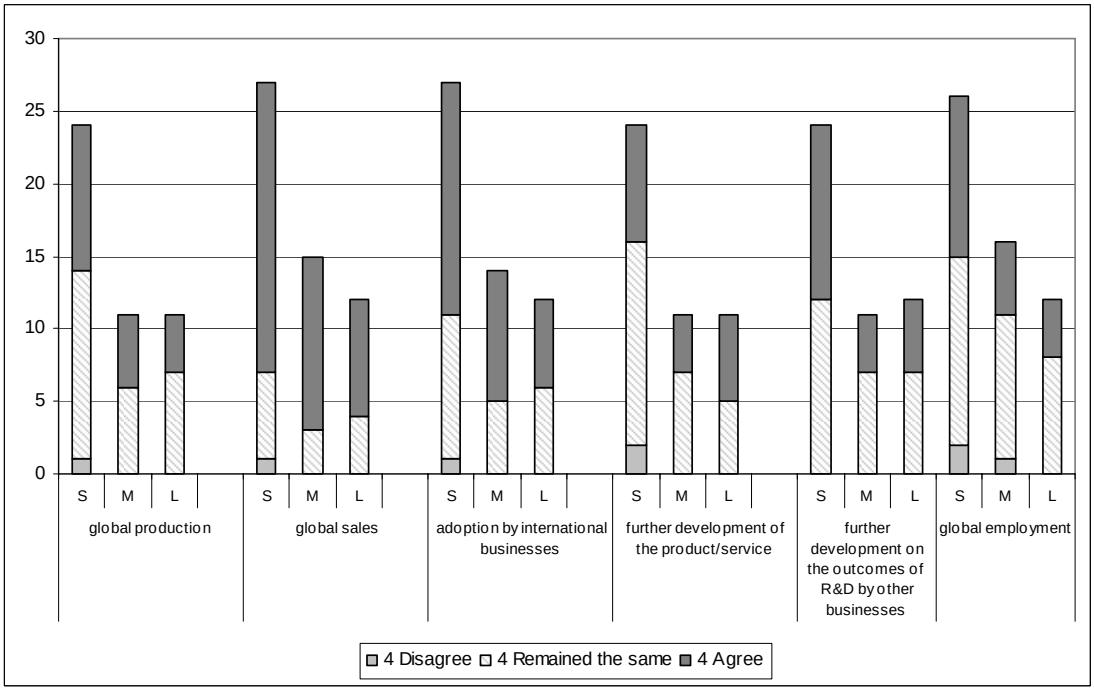
Companies were asked about 3 types of public benefit that had accrued from R&D projects – diffusion of knowledge, environmental benefits and human health benefits. Around one-third of companies answering the question were aware of other companies further developing the results of their R&D. The remaining two-thirds, including almost all large companies, identified positive impacts on the environment or human health (e.g. reduced pollution, improved occupational health and safety).

Figure 7 – Spillover Benefits Accrued to Australia



Relatively few participants that claimed the R&D Tax Concession in 2002-03 indicated that their R&D activity had led to spillover benefits on a global basis. Most benefits identified were private benefits, such as sales or employment outside Australia (**Figure 8**).

Figure 8 – Spillover Benefits Accrued Globally



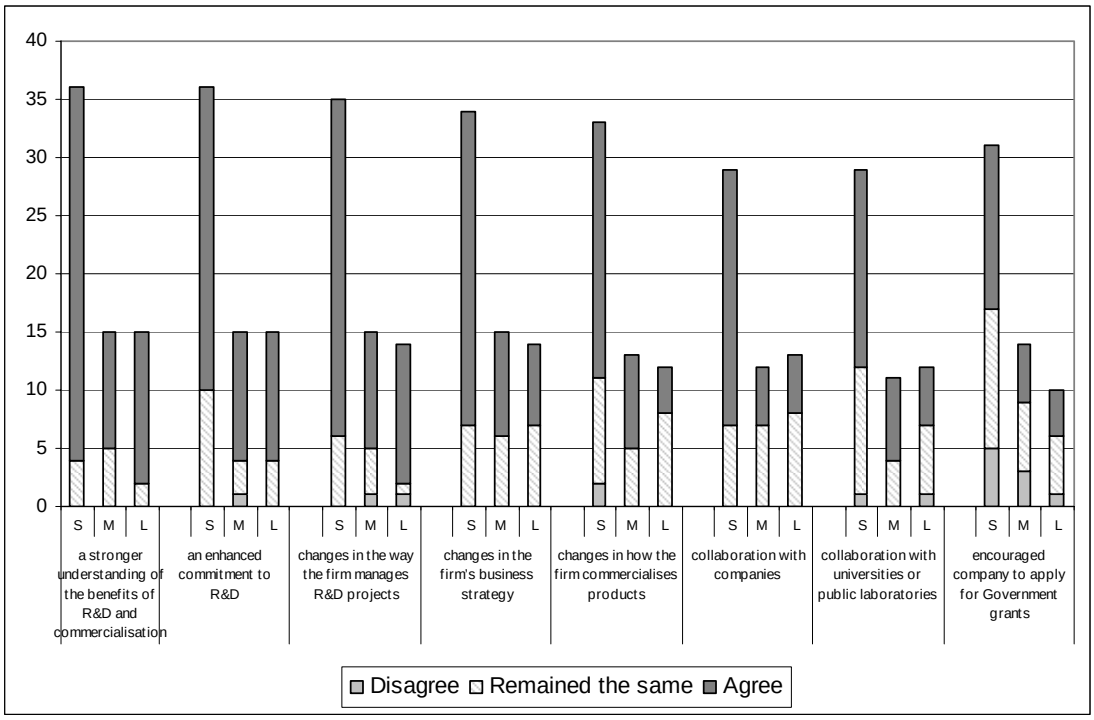
3.1.2 Learning Effects

Undertaking R&D has a positive impact on behaviour and capability across all participating firms, through:

- a stronger understanding of the benefits of R&D and commercialisation;
- an enhanced commitment to R&D;
- changes in the way firms manage R&D projects;
- changes in overall business strategy;
- changes in how new products are commercialised; and
- increased ongoing collaboration with other companies, or with universities or public research bodies.

These latter three changes were weaker among medium and large companies than small companies (**Figure 9**).

Figure 9 – Behavioural Changes Resulting from R&D Projects



3.2 Benefits for the Firm

> ***Claiming the Tax Concession is part of the decision making process and, over time, there would be a reduction in R&D without the Tax Concession.***
>
> ***Company 5***

3.2.1 Overall R&D Effort

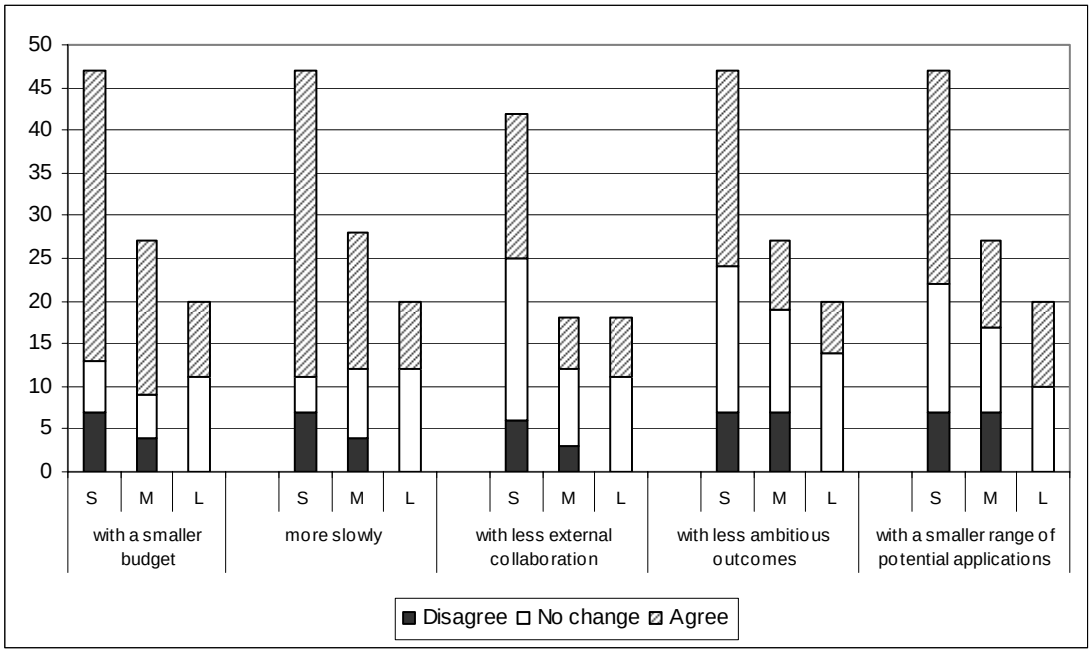
The decision to claim the R&D Tax Concession was generally made by companies prior to commencing R&D projects. Eighty participants made the decision to claim the R&D Tax Concession before proceeding with R&D projects for 2002-03 (36 small, 26 medium, 18 large). For most of these firms, it was simply assumed that an R&D Tax Concession claim would be made each year.

Without the R&D Tax Concession program, 81 of the 96 companies claiming the R&D Tax Concession for 2002-03 would have proceeded with their current portfolio

of R&D projects. However, those projects would have proceeded with a smaller budget and more slowly, impacting on the time to market, return in investment and overall benefit to the company.

To a lesser extent, the projects would have proceeded with less ambitious scope and a smaller range of potential outcomes. As shown in **Figure 10**, the impact of the R&D Tax Concession is greater among smaller firms.

Figure 10 – How Projects Would Proceed Without the R&D Tax Concession



Overall, firms commented that the R&D Tax Concession:

- provides a certain, direct and timely return on investment in R&D;
- raises awareness of R&D as an investment option among company decision makers (i.e. puts R&D on the radar screen);
- acts as leverage to raise equity to support further investment in R&D; and
- encourages companies to broaden the scope of R&D projects, with additional expenditure on projects tending to focus on finding a better solution to a problem and expanding the scope of R&D projects to meet market demand.

3.2.2 Individual R&D Projects

According to participants, the R&D Tax Concession:

- induces additional R&D expenditure through increased investment in projects that would not otherwise be supported in 13 percent of cases;
- brings forward R&D expenditure on projects to enable faster completion, increasing the commercial value of the results in 26 percent of cases; and
- influences the size of investment in R&D projects by companies in 51 percent of cases.

Eighty-three percent of firms that claimed the R&D Tax Concession for 2002-03 reported that their decision to proceed with a particular R&D project was not

contingent on their ability to claim the R&D Tax Concession. This was particularly true for medium and large companies.[2]

The contribution of projects to the overall R&D and business strategy strongly guided most decisions to commence particular R&D projects, not the availability of potential tax benefits.

The R&D Tax Concession did, however, have a more significant impact on the size of investment in an R&D project, with 50 percent of claimants in 2002-03 stating that it encouraged additional spending on projects, once the decision had been made to proceed. The impact differed little by company size, with 55 percent of small firms, 44 percent of medium sized firms and 50 percent of large firms reporting that the R&D Tax Concession influences size of investment in particular projects.

The company completed projects faster due to the R&D Tax Concession. Being first to market is an attractive competitive advantage.

Company 3

The project would have been slower and it would have been more difficult to justify the expected return on investment for such high risk work.

Company 18

The duration of more risky projects may be affected by the Concession. However, R&D is core to business and therefore most projects are unaffected.

Company 95

The company would be running smaller projects without the R&D Tax Concession.

Company 41

The R&D Tax Concession gave the company the confidence to spend the money needed on specific projects.

Company 102

The company would not have undertaken one major project that is currently underway in the absence of the R&D Tax Concession because the company could not afford it.

Company 6

3.2.3 R&D Attitudes, Behaviour and Capabilities

In addition to exploring the impact of the R&D Tax Concession on their R&D program and projects, the study also questioned participants that claimed the R&D Tax Concession in 2002-03 about the longer-term impact on R&D attitudes, behaviours and capabilities.

Seventy-one of participating companies reported that the processes required to claim the R&D Tax Concession have led to a more structured approach to R&D within their company. There is little difference by size of firm (**Figure 11**).

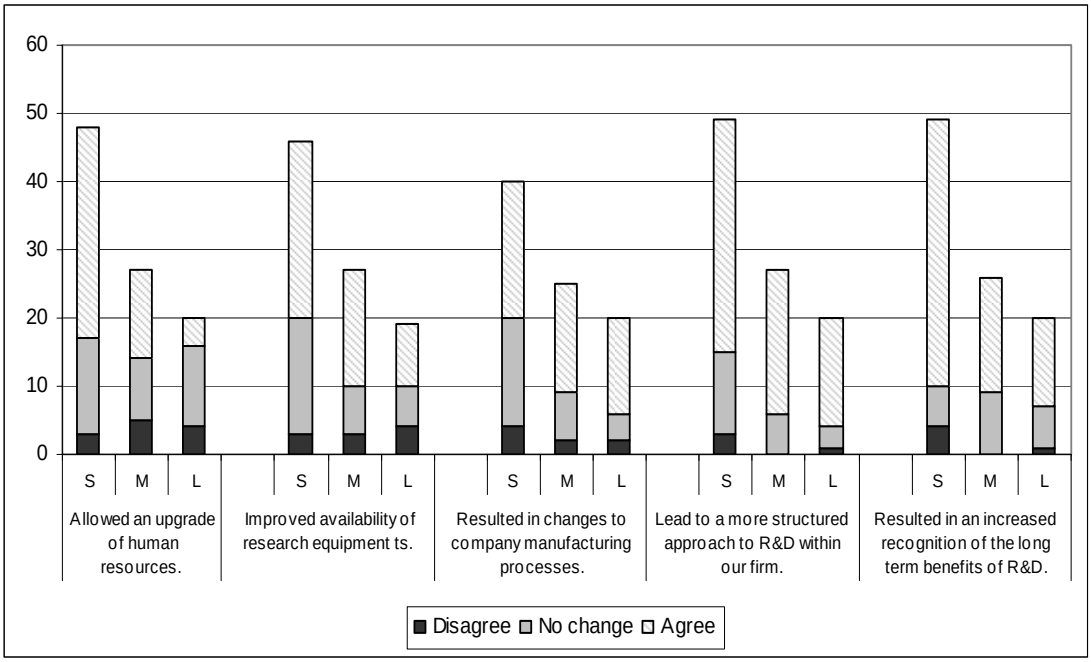
Sixty-nine companies also reported that claiming the R&D Tax Concession has led to a greater understanding of the long-term benefits of R&D to the firm, although the effect was much stronger among small firms. Many firms noted that Australian Government support for R&D activity sends a positive signal to senior management, staff and investors about the value of R&D. This is considered to be in addition to the dollar value of the support to the company.

[2] This is consistent with the finding in Chapter 3 that medium and large companies tend to report fewer difficulties in finding finance to undertake R&D projects once committed to undertaking them than small businesses, especially micro businesses.

A second positive effect of the R&D Tax Concession is the improved availability of research equipment and upgraded human resources. Companies generally reported that the R&D Tax Concession did not provide an incentive to collaborate with other companies or research organisations.

> ***The company is putting more effort into recording R&D expenditure. Without the Tax Concession, the company would not know what it is spending on R&D. In addition, the Concession sways the purchase of equipment.***
>
> ***Company 56***
>
> ***More innovative thinking, documentation and discipline around reporting***
>
> ***Company 8***
>
> ***'Change to a more production oriented, commercialisation culture***
>
> ***company 19***

Figure 11 – Support Received from the R&D Tax Concession …



Note: These questions were only asked of those firms registered for the R&D Tax Concession. Of these firms, not all responded to every question.

3.2.4 Location of R&D Activities

Firms overwhelmingly reported decisions on the location of R&D activities were made on the basis of available expertise, facilities and cost. Australian-owned multinationals tend to undertake their R&D at their headquarters, indicating a home country bias. Some subsidiaries of multinational corporations had a local R&D presence to adapt, modify or develop products to meet local needs.

The R&D Tax Concession influenced 19 participating companies (17 percent) towards undertaking R&D in Australia rather than overseas, although it was not necessarily the most important factor in their decision making process.

The impact of the R&D Tax Concession had a stronger impact on decisions on the location of R&D in larger companies. This tended to take the form of negating the

impact of foreign R&D tax credits, rather than making Australia a particularly attractive location for R&D activities.

The Australian Information Industries Association (AIIA) advised that there is some movement of ICT firms offshore, mostly to take advantage of lower costs and to minimise the time needed in accessing large international markets. Savings in countries such as India are considerable. However, a number of participant companies also reported bad experiences when attempting to collaborate with, or contract work out to firms in Asian countries. Such experiences resulted in a conscious decision in some IT and electronics companies to undertake R&D in Australia because they could not afford the risk associated with lower cost overseas contract research.

We operate, live and raise funds in Australia. That's not to say that the company will remain here as we are getting offers from overseas.

Company 82

The genius is here. The company wants to stay in control of development of its technology locally.

Company 2

Many people in the field undertake research in addition to their day- to-day jobs. We have taken this approach to maintain knowledge in the firm, and hence competitiveness.

Company 3

3.3 Limits on the Benefits of the R&D Tax Concession

All participants, whether they were claiming the R&D Tax Concession or not, were asked to identify any possible barriers to either deciding to claim the R&D Tax Concession or deriving maximum possible benefit from it.

A key barrier, which applied to particular to small and/or regional firms, was lack of awareness of the measure. Twenty two percent of participating companies were not aware of the program's existence at the time they initially decided to undertake R&D. In addition, small accounting practices were often not aware of the existence of the R&D Tax Concession. Many small and medium sized firms reported that they became aware of the program only when engaging a large accounting firm with a specialist R&D area.

The second major factor reported as limiting uptake of the R&D Tax Concession is the cost of preparing claims and limits on eligible activities:

- across all sizes of companies an unprompted 15 percent of survey participants said that compliance costs were too high.
- among small companies, especially micro firms with less than 5 employees, the administrative effort required to prepare claims was reported as being sufficiently disruptive to make claiming the R&D Tax Concession a questionable proposition, especially for firms not eligible for the R&D Tax Offset with its cash benefits.
- medium and large companies reported some administrative cost barriers, commenting that the size of tax benefit realised from projects of around $50,000 or less did not justify the expense of recording the activities in the required claim format.

The ineligibility of expenses associated with projects to produce software not for multiple sale had some sector-specific effects on the attractiveness of the R&D Tax Concession. This applied not just in the information and communication technology (ICT) sector but also among a number of manufacturers that write innovative

software to customise and/or automate the operation of sophisticated capital equipment.

A final, general comment made across all firms, regardless of size, was that the attractiveness of undertaking R&D and claiming the R&D Tax Concession is affected by the daunting challenge of commercialising R&D results. A number of firms made the observation that without assistance to commercialise R&D and to take it to the market, the incentive for businesses to undertake R&D is weak, regardless of the level of government R&D support available.

Case Study - Mildura Fruit Juices Australia Pty Ltd

***Mildura Fruit Juices Australia*, a wholly owned subsidiary of The Mildura Co-operative Fruit Company, is a regional company and that is recognised as the largest independent processor of citrus juice in Australia. Until around 8 years ago, the company processed one product, citrus juice sourced from local producers. Over recent years, however, it has developed a range of fruit and vegetable products for all segments of the beverage industry, producing hundreds of products from a wide range of locally grown produce.**

Until recently, the company exported to overseas markets that were seeking premium grade juice. However, the increasing strength of the Australian dollar has lead to exports declining to with the company unable to compete in the world market because of high labour costs and low-cost competitor products. Originally, R&D was seen by the company as a hobby, undertaken in a small kitchen by a manager and technician. After about a year of successful results, the company set up a small laboratory and started to formalise its R&D program. The outcome was the establishment of a new processing plant for a completely new line of product. As the R&D program grew, 3 managers became involved in discussions about developing new products to the company's existing range.

Due to the success of the in-house R&D model, the company has continued to expand its R&D program which has become critical to the company's capacity to maintain its position in the market. Expenditure on R&D is growing steadily and projects are now driven by customer demand.

***Mildura Fruit Juices Australia* is developing methods to reduce waste by creating new products from previously discarded elements. For example, it is investing in R&D to create new products from produce rejected by a sister company. It has also investigated production of an ingredient that another sister company is currently sourcing from a different firm.**

While the R&D Tax Concession has not had a notable financial impact on the firm, it has lead to positive changes in *Mildura Fruit Juices Australia,* encouraging more innovative thinking and discipline around project reporting. The R&D Tax Concession has, however, -encouraged the company to undertake more R&D, and enabled the upgrade of human resources and research equipment. The R&D Tax Concession has also lead to a structured approach to managing R&D and increased recognition of the long term benefits of R&D. The R&D Tax Concession assists the industry to undertake R&D, diversify product ranges, and enter new markets.

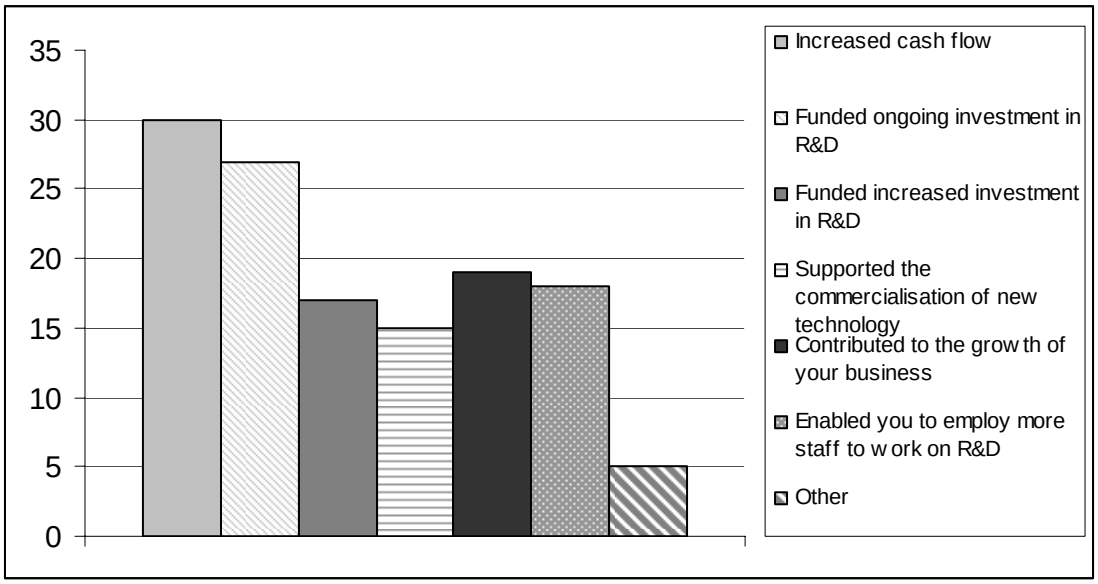
"It is a program that is really helpful in keeping R&D departments alive."

4. R&D Tax Offset and 175% Premium

4.1 R&D Tax Offset

Companies are eligible to claim the R&D Tax Offset if R&D expenditure exceeds $20,000, but grouped expenditure on R&D is not more than $1 million per year, and group turnover is less than $5 million per year. Thirty companies that participated in the R&D Tax Concession study claimed the R&D Tax Offset for 2002-03.

Figure 12 – Impact of the R&D Tax Offset



Participants indicated that the R&D Tax Offset (**Figure 12**):

- directly funds both ongoing and increased investment in R&D;
- contributes to the growth of recipient businesses;
- enables companies to employ more staff to work on R&D activities; and
- supports the commercialisation of new technologies.

The increased cash flow afforded by the R&D Tax Offset can have a significant impact on small businesses in the early stages of development and micro businesses with less than 5 employees. A small number of participants attempting to build up a business by exploiting an idea attributed their survival to the R&D Tax Offset, which provided a regular cash flow at a critical time.

Other comments indicated that the R&D Tax Offset significantly reduced the time taken to complete R&D projects and allowed R&D to be performed continuously (rather than intermittently depending on availability of funds).

There was little evidence that the requirement to spend less than $1 million on R&D per year encouraged companies to restrict growth in R&D investment to ensure eligibility for the R&D Tax Offset. Three companies reported restricting growth in R&D activity to be able to claim the R&D Tax Offset. Negative comments about the R&D expenditure limit were, however, made by small companies in research-intensive industry sectors, in particular the biotechnology/pharmaceutical sector.

Some companies in this sector with eligible turnover reported that they were ineligible for the R&D Tax Offset because they spent too much on R&D.

The limit of $5 million annual group turnover also did not appear to have any major impact on behaviour, with 3 companies reporting they restricted business activity in order to be eligible to continue claiming the R&D Tax Offset. Two of these 3 companies also reported restricting growth in R&D activity to be able to claim the R&D Tax Offset.

Some start-up companies reported that grouping rules excluded them from accessing the R&D Tax Offset, despite having no income or prospect of earning any until their R&D work was complete, due to being controlled by a large venture capital group.

Literally a lifesaver.

Company 41

The Offset would make a huge difference if the company could access it, especially with the long lead time associated with biotechnology.

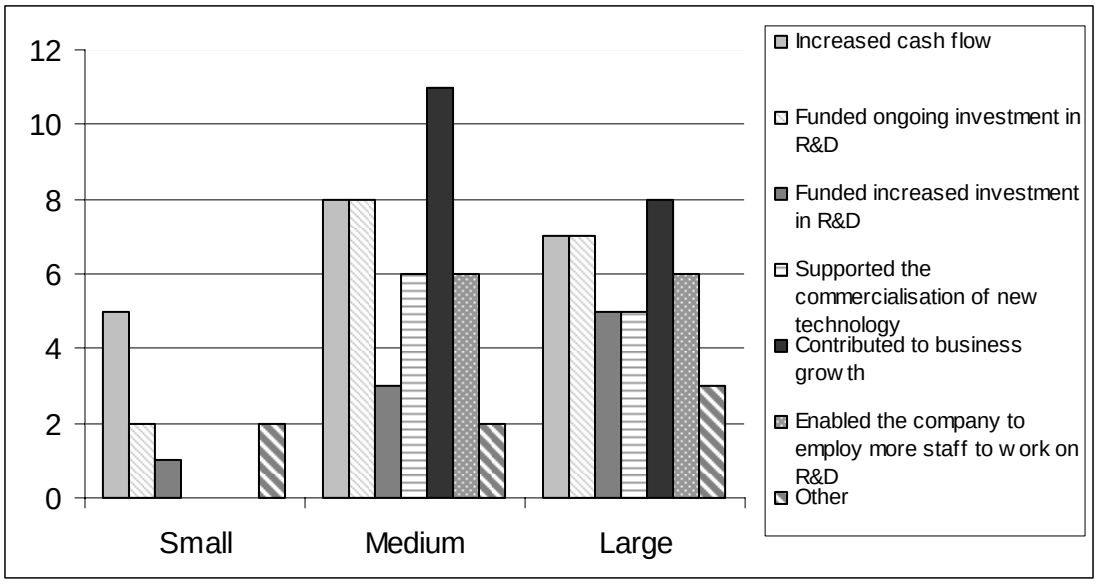
Company 3

4.2 175% Premium

Companies are eligible for the 175% Premium R&D Tax Concession when, in each of the previous 3 years, they have a history of registering for, and being eligible to claim, the 125% R&D Tax Concession and have increased their R&D expenditure for the current year above the average level for the previous 3 years.

Twenty-six companies included in the R&D Tax Concession study claimed the 175% Premium in 2002-03[3]. Participants in the study reported the impacts of the Premium and these are reported by firm size in **Figure 13**.

Figure 13 – Impact of the 175% Premium (by company size)



[3] The number of companies that claimed the 175% Premium R&D Tax Concession in the initial sample of companies randomly chosen was too small to draw any meaningful conclusions. As a result, a supplementary round of interviews was undertaken with companies selected on the basis that they claim the 175% Premium.

The impact of the 175% Premium is greatest on medium and large-sized firms. Amongst these businesses, it:

- contributes to the growth of the business;
- results in an increased cash flow; and
- funds ongoing investment in R&D.

Forty-four companies provided comments on the 175% Premium. An emergent theme of these was that it is complex and perceived to be of limited value due to:

- different rules on eligible activities between the 125% and 175% Premium rates;
- the need for a verifiable 3 year registration history; and
- that few small and medium companies have the capacity to consistently increase R&D expenditure and thus regularly draw on the benefit.

Concern was also expressed (although not solicited) that the 175% Premium provides a much greater benefit to a company if it maintains its R&D spending at a constant level for 3 years and then significantly increases R&D spending the next year, rather than increasing R&D expenditure at a moderate rate annually over the same period. The 175% Premium was seen as being useful mainly to large companies with the capacity to significantly increase R&D expenditure to undertake additional, speculative high risk projects which may not have a direct relationship to the business plan.

It's part of the company's thinking for future years, in regards to the future R&D spending and funding strategy. We will spend more in 2004-05 now that we know about it.
Company 25

Go ahead with more than you usually would to achieve the benefits. It is a prompt to go faster.
Company 85

It has encouraged growth of R&D but the Premium is pretty complex.
Company 95

The Concession allows the company to invest more and the 175% is a strong incentive.
Company 33

The 175% Premium rate appears to have little influence on underlying levels of R&D expenditure, with 21 of the 26 claimants indicating that they would have undertaken the R&D in the absence of the 175% Premium (**Table 6**). It did, however, enhance 17 of the 26 companies' commitment to R&D (**Table 7**).

Table 6 – "Would your firm have undertaken its current level of R&D expenditure in the absence of the 175% Premium?"

	Small	Medium	Large	All
Yes	6	8	7	21
No	0	4	1	5

Table 7 – "Has the availability of the 175% Premium influenced or enhanced your company's commitment to R&D?"

	Small	Medium	Large	All
Yes	1	10	6	17
No	5	2	0	7

APPENDIX – Background Information and Study Methodology

The R&D Tax Concession Program

Overview

The Research and Development (R&D) Tax Concession was introduced in 1985 to encourage Australian businesses to increase their R&D activities. It is a broad-based, market-driven program with the applicant deciding upon the scope and timing of R&D activities. The objectives of the R&D Tax Concession are to provide a tax incentive, in the form of a deduction, to make eligible companies more internationally competitive by:

- encouraging the development of innovative products, processes and services;
- increasing investment in defined R&D activities;
- promoting technological advancement though a focus on innovation or high technical risk in defined R&D activities;
- encouraging strategic R&D planning; and
- creating an environment that is conducive to increased commercialisation of new processes and product technologies.

The program provides for a deduction of 125% for eligible expenditure on R&D activities from assessable income when lodging a tax return. The equivalent of a benefit of 37.5 cents in the dollar for every dollar spent on eligible R&D is provided, based on Australia's 30 percent corporate tax rate.

Small firms (with a turnover of less than $5 million and spending less than $1 million per annum on R&D) can claim a refundable R&D Tax Offset, equivalent to the value of the R&D Tax Concession. This measure was introduced in 2001 in recognition of the importance of supporting small innovative companies, particularly those in tax loss that otherwise cannot gain immediate benefit from the R&D Tax Concession. It seeks to foster the growth of these companies by providing them with timely support and increases the cash flow of such companies when they most need it – during their initial growth phase. The R&D Tax Offset can be claimed at the 125% and 175% rates.

A 175% Premium rate is available to firms which increase their investment in R&D relative to their average claimed expenditure over the previous three years. This initiative was introduced in 2001 to encourage additional sustainable business investment in R&D. Companies require a 3 year history of registering for, and claiming, the R&D Tax Concession, or of receiving government grants for R&D projects under the R&D Start program. The 175% Premium provides a benefit of 52.5 cents in the dollar for eligible additional activity (based on Australia's 30 percent corporate tax rate).

The 175% Premium targets the labour-related components of R&D expenditure, which generates the greatest benefit for the economy. As such, the 175% rate covers all R&D expenditure, except expenditure which relates to core technology, R&D-related interest and plant (pilot, leasing and contracted).

Responsibility for the R&D Tax Concession program lies with two Australian Government Departments - the Department of Industry, Tourism and Resources

(DITR) and the Department of the Treasury. Day-to-day administration lies jointly with AusIndustry, the program delivery arm of the DITR, and the Australian Taxation Office.

Registration Data

Registration for the R&D Tax Concession program has been increasing steadily over recent years. In 2002-03, over 5 000 firms claimed the R&D Tax Concession and invested just over A$6.35 billion. This is an increase of 7 percent and 4 percent respectively on the previous year. Over a ten year period, the number of registrants grew by 48 percent and investment in R&D which is supported by the program increased by 87 percent (based on current dollar data).

Average investment by all firms claiming the 125% R&D Tax Concession was $1.3 million in 2002-03, up from $976 900 in 1992-93. Growth in average investment grew 35 percent over ten years.

The take-up of the R&D Tax Offset and 175% Premium elements of the program has also been strong. Just over 1830 firms claimed the R&D Tax Offset at the 125% rate in 2002-03, an increase of 20 percent on the previous year. These firms invested $496 million, an increase of 14 percent on the previous year. Firms claiming the R&D Tax Offset at the 125% rate invested an average $271,000 on R&D.

Use of the 175% Premium increased by 30 percent to 768 firms in 2002-03. These firms invested an additional $433 million in R&D. Firms claiming the 175% Premium rate invested an average $3.5 million in R&D, of which an average $564 000 was incremental expenditure and thus claimed at the 175% rate.

Purpose of the Study

The R&D Tax Concession has been the subject of several detailed quantitative and econometric analyses, which have generally concluded that the program has been of increasing support to innovative businesses and that it is inducing additional R&D expenditure[4]. However, past analyses have focused on surveys and examination of the broader impact on business expenditure on R&D and the economy, rather than its impact at the firm level. This study set out to build on existing data by analysing and reporting on:

- how the R&D Tax Concession fits into the R&D planning and decision-making processes at the firm level;
- its impact on specific projects and overall R&D programs;
- the full range of short-term and longer-term benefits for recipient firms and the nation;
- its impact on firm behaviour, culture and attitudes; and
- factors limiting its impact.

This study uses a quantitative and qualitative approach, facilitating a more detailed analysis of the impact of the program at the individual firm level.

This study will contribute to the ongoing assessment of the program against its policy objectives, policy development and administration. It does so by reporting and

[4] See for example Ralph Lattimore (1997), *Research and Development Fiscal Incentives in Australia: Impacts and Policy Lessons*, paper presented to the OECD Conference On Policy Evaluation In Innovation, Paris, France 26–27 June

analysing the responses of 116 innovative businesses, 96 of which claimed the R&D Tax Concession when interviewed, 12 which have claimed the R&D Tax Concession in previous years and 8 have never claimed the R&D Tax Concession.

Methodology for the Study

The study analysed both qualitative and quantitative data obtained through face-to-face interviews with 116 firms. Interviews were undertaken by officers of the DITR and were based on a standard questionnaire. Questions were designed to gather information on 4 overarching issues:

- business R&D strategies, and decision-making processes for individual projects;
- impact of the R&D Tax Concession on R&D strategies and decision-making processes, and in inducing additional R&D and attendant public benefits; and
- extent of public benefits resulting from business R&D activity;

This approach facilitated an in-depth understanding of the impact of the R&D Tax Concession on firms and allowed key issues raised in interviews to be pursued in more detail. It is also the first time a significant qualitative study on the R&D Tax Concession has been undertaken.

Small, medium and large firms that have accessed the 125% R&D Tax Concession, 175% Premium and/or the R&D Tax Offset were interviewed in all States and Territories, including regional and metropolitan areas. In order to obtain a sound cross section of views, firms included a mix of current registrants, firms that no longer claim the R&D Tax Concession and businesses that have never claimed the R&D Tax Concession. Most participants, however, were current claimants of the program. The study also included discussions with AusIndustry State Offices, State and Territory industry departments and industry associations.

Firms were randomly selected to represent the proportion and location of large, medium and small R&D Tax Concession registrants. By company size, 51 percent of companies interviewed were small, 28 percent were of a medium size and 21 percent were large firms. In 2002-03, small companies represented 65 percent of all R&D Tax Concession registrants, medium sized firms represented 25 percent and large firms represented 10 percent.

Overall, State representation for the study approximately matched that for the R&D Tax Concession, with the exception of Queensland and the three smallest States, Tasmania, the ACT and Northern Territory. Seventeen per cent of R&D Tax Concession participants are located in Queensland, however 9 percent of study participants were located in this State. This was primarily due to a lower response rate to invitations in this State and that a high proportion of mining companies contacted, while based in Queensland, have operations located in other States (in particular, Western Australia). The three smallest States represent about 3 percent of all R&D Tax Concession registrants, yet 17 percent of study participants. The over-representation occurred because it was considered important to ensure the smallest States had a voice in the study.

One hundred and sixty two companies were initially invited to participate in the study. The study team was unable to contact 16 firms, and 38 were not available for interview at a mutually convenient time. During the course of the study, an additional

16 large firms were invited to participate, resulting in 8 further interviews. These companies were included to ensure a data set on the 175% Premium which was of a size to allow meaningful analysis and to ensure the confidentiality of participants.

Overview of the Companies Interviewed

One hundred and sixteen companies were randomly selected from the AusIndustry R&D Tax Concession registration database. Participation spanned regional and metropolitan areas of all States and Territories:

- 27 percent were from NSW;
- 27 percent were from Vic;
- 9 percent were from Qld;
- 15 percent were from WA;;
- 5 percent were from SA;
- 4 percent were from Tas;
- 8 percent were from NT; and
- 5 percent were from ACT.

Table 8 – Location of Study Participants

New South Wales	Metropolitan	28
	Regional	3
	Total	**31**
Victoria	Metropolitan	24
	Regional	7
	Total	**31**
Queensland	Metropolitan	8
	Regional	3
	Total	**11**
Western Australia	Metropolitan	14
	Regional	3
	Total	**17**
South Australia	Metropolitan	6
	Total	**6**
Tasmania	Metropolitan	5
	Total	**5**
Northern Territory	Metropolitan	5
	Regional	4
	Total	**9**
Australian Capital Territory	Metropolitan	6
	Total	**6**
All States and Territories	Metropolitan	96
	Regional	20
	Total	**116**

A broad range of industry sectors were represented, as illustrated in **Table 9**.

Table 9 - Industries Represented in the Study

Sector	116 Firm Study - Number	116 Firm Study - Percent	R&D Tax Concession Registrants - Percent
Agriculture, Forestry and Fishing	9	8%	5%
Communication Services	7	6%	5%
Construction	3	3%	2%
Cultural and Recreational Services	3	3%	1%
Education	1	1%	4%
Finance and Insurance	2	2%	5%
Health and Community Services	5	4%	4%
Manufacturing	56	48%	47%
Mining	11	9%	7%
Property and Business Services	17	15%	25%
Wholesale & Retail Trade	2	2%	2%
Total	116	100%	100%

The study categorised small companies as those with a turnover of less that $5 million, medium-sized companies as those with a turnover between $5 million and $100 million, and large companies as those with a turnover greater than $100 million. Seventeen of the small companies were micro firms, that is, had less than five employees.

- 59 small companies were interviewed, representing 51 percent of interviewees (turnover of less than $5 million);
- 33 medium-sized companies were interviewed representing 28 percent of interviewees (turnover between $5 million and $100 million); and
- 24 large companies were interviewed or 21 percent of interviewees (turnover greater than $100 million).

As shown in **Table 10**, 96 of the 116 companies interviewed claimed the R&D Tax Concession in 2002-03. Of these, 30 claimed the R&D Tax Offset and 26 claimed the 175% Premium in 2002-03.

Table 10 – R&D Tax Concession Claimants (by company size)

Size of Firm	125%	R&D Tax Offset	175% Premium
Small	50	30	6
Medium	29	0	14
Large	17	0	6
Total	**96**	**30**	**26**

By company size:

- 50 small companies claimed the R&D Tax Concession in 2002-03. Of these, 30 claimed the R&D Tax Offset and 6 claimed the 175% Premium. Three companies claimed the R&D Tax Offset at the 175% Premium rate.
- 29 medium-sized firms claimed the R&D Tax Concession in 2002-03. Of these, 14 claimed the 175% Premium.
- 17 large companies claimed the R&D Tax Concession, and 6 claimed the 175% Premium.

Of the 26 companies that claimed the 175% Premium in 2002-03, one company had claimed for all the previous 3 years and 13 had claimed it for the past 2 years. Of the 20 companies which did not claim the R&D Tax Concession in 2002-03, many had been claimants in previous years.

The 116 companies interviewed for this study spent approximately $232 million on claimable R&D in 2002-03. Overall, these firms spent almost $400 million on innovative activities, including R&D, in the same year. Small and medium-sized firms, on average, claimed the R&D Tax Concession for about 70 percent of their total investment in R&D, while large companies generally claimed the R&D Tax Concession for less than 50 percent of all R&D expenses. By company size, average annual spending on claimable R&D by study participants was:

- Small firms - $438 000;
- Medium sized firms - $886 000; and
- Large firms - $8.6 million.

Three percent of study participants were in receipt of Commonwealth or State government grants, although some smaller firms had previously received R&D Start, Biotechnology Innovation Fund (BIF) and Export Market Development Grants (EMDG). Some others had been unsuccessful applicants for various government programs.