

## WHITHER THE CLEVER COUNTRY? AUSTRALIA'S INDUSTRY POLICY

Robin Stonecash

*Industry policy is an important topic in the high school economics syllabus. This Schools' Brief presents a survey and evaluation of industry policy initiatives currently provided by the Federal Government.*

Towards the end of the recent election campaign, estimates of our likely growth in the coming year were revised, suggesting that Australia might not be able to insulate itself from the decline in the economies of its trading partners and nearest neighbours in Asia. The government's industry policies in general, but its research and development (R&D) policies in particular, may be more significant than ever if we are to counteract the slowing influences of the Asian crisis and provide a foundation for sustained growth in the future. Since the re-election of the Howard Government, we can now examine its proposals for encouraging growth in the Australian economy. In this article, the government's policy towards R&D will be examined more closely.

When John Howard announced the government's industry policy at a speech to the National Press Club last December, he articulated a vision of Australian industry and business in the first quarter of the twenty-first century that included:

- a technologically advanced, competitive manufacturing sector;
- information industries which are a major source of employment growth, exports and new business opportunities in their own right and which transform other industries across the economy;
- a vibrant small business sector – the birthplace of many new firms and ideas – complementing our larger companies; and
- the export of our goods and services to the region and elsewhere satisfying the full range of their needs.

It is instructive to consider his vision of Australia in light of his government's policies towards R&D.

A look at recent events suggests that the level of expenditure on R&D in Australia is in fact fairly responsive to government policy. Business expenditures on R&D fell by 5 per cent last year after the reduction in the R&D tax concession from 150 per cent to 125 per cent by the government (*The Australian*, 27 July 1998:

35). A report by the Business Council of Australia (*Business Review Weekly*, 13 July 1998) predicts a further fall of around 23 per cent this year. This would worsen what some say is already a poor performance on R&D expenditure. Australia has always had a relatively low level of expenditure on R&D, around 1.6 per cent of GDP last year compared to the OECD average of around 1.94 per cent. However, our business expenditure on R&D is much lower than the OECD average. Business expenditure on R&D was only 0.74 per cent of GDP compared with the OECD average of 1.19 per cent. What these figures suggest is that industry has traditionally relied on government to be the major source of funding for R&D. Furthermore, they suggest that a drop in government funding will not be made up by the private sector.

What does this say about our ability to achieve the Prime Minister's vision of a strong, clever, growing economy? The answer to this question requires a reminder on why R&D is considered so important for sustaining economic growth. It has been only relatively recently that the link between innovation and economic growth has been formalised. In the foreword to Barro and Sala-i-Martin's book *Economic Growth* (1995), Mankiw said that 'Work on economic growth stopped in the 1960s because economists had nothing new to say.' He goes on to say that interest in economic growth was reawakened when a small group of economists began to explore the large differences in income observed from country to country. To explain these differences they examined ideas that played little part in the standard neo-classical growth theories, such as the linkages between increasing returns, human capital, research and development and learning-by-doing and economic growth.

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This so-called 'new growth theory' or endogenous growth emphasised the importance of technological change and recognised that technological change was not something determined exogenously, as was assumed in the neo-classical Swan-Solow growth models. Instead, economic growth is modelled as the result of rational, optimising decisions by agents in the economy. In the early papers of Romer (1987, 1990), technological advance resulted from intentional R&D activity by firms which would be rewarded by some sort of monopoly power. As long as there is an ongoing incentive for firms to try to attain a monopoly position and there is no shortage of ideas, then high rates of economic growth can be sustained. Of course, government policy can help or hinder this process depending on its policies on tax, on competition within markets, on the provision of infrastructure services and the protection of intellectual property.

Endogenous growth theory incorporates two aspects of market failure: imperfect competition and knowledge spillovers or externalities. One source of imperfect competition in the endogenous growth models is the existence of increasing returns. Increasing returns mean that firms gain cost advantages by increasing production. They may also benefit from first mover advantages through learning-by-doing, which also allows them to lower their costs of production. Either of these cost advantages can be used by domestic firms to increase their competitiveness on world markets.

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Externalities in the form of knowledge spillovers increase the capacity for growth. The knowledge spillovers are significant because they increase the productivity of any one firm's R&D effort by lowering the costs of other firms' activities. The externality effect is clear – firms will tend to underinvest in R&D expenditures because they will not be able to capture the full benefits of their expenditures for themselves. (For a brief discussion of the new growth theories, see the Bureau of Industry

Economics (1992) ).

Both of these aspects of endogenous growth theory, as well as the explanation of economic growth by the level of technological innovation, have been used to justify greater government involvement in the R&D process. If these models are accurate explanations of patterns of economic growth, then any government serious about increasing the level of economic growth would want to encourage the generation of knowledge, and the application of that knowledge to increasing productivity or the development of new products. The growth theories also have implications for the application of competition policies. One of the drivers in these models is the pursuit of potential monopoly status by firms that leads them to the self-interested expenditure on research and development. There may be an inherent conflict between letting these firms seek monopoly gains from their innovations and enforcing a competition policy that is designed to prevent firms from exercising their monopoly powers.

While the importance of R&D in the new growth theories and the implications for policy are well known in academic circles, it is important to restate the connection from time to time. Within the business community, R&D is often discussed as if it were some sort of panacea for all that ails Australia. R&D is a powerful driver of economic growth, but if the government is to devise a policy plan that is appropriate for the entire economy, it needs to be wary of special interest group lobbying, just as it does in deciding on tariff or other external policies. A well-thought out R&D policy will recognise both the self-interest of individual firms and the externality effects of the generation of knowledge.

#### **Why is Australia's R&D performance so poor?**

The statistics at the outset of the article are a brief indication that Australia's R&D performance is not up to international standards, and certainly not at the level we need if we are to enhance our growth potential. What has caused Australia to lag in this regard? In the Prime Minister's address to the Press Club, he lauded our scientists and our innovativeness. Yet, in spite of being 'the clever country,' we don't seem to be putting much money into our creativity. Many explanations for this have been suggested, including poor managerial attitudes towards adopting new technologies, a short-term profit mentality on the part of managers, poor government policies that don't encourage R&D or are poorly designed and easily rorted, the small size of Australia's market, underdeveloped venture capital markets, and the large

number of multinationals that service our markets who do their R&D elsewhere. Some of these things can be significantly affected by government policy, others less so.

### ***Poor managerial performance***

A common perception is that Australia's managers lack the forward thinking that is required to see the benefits of R&D and are therefore unwilling to put much money into R&D. This is a difficult notion to test, but anecdotal evidence suggests that there is some truth in it. An unpublished survey of business leaders<sup>1</sup> found a great deal of support for the argument. If businesspeople do not see the benefits from investing in knowledge, particularly firm-specific knowledge created by the firm itself, then government is unlikely to convince them of the wisdom of such activity. Tax incentives, however generous, will not correct this problem.

However, government encouragement of basic research and building of stronger connections between business and research institutions may help to overcome reticence on the part of managers to adopt new technologies. This will become increasingly important as the structure of Australia's economy shifts from a resource based to a service-based economy. Undertaking research is not the end of the process, though. There must be a well-defined mechanism for businesspeople to access basic research. Many businesspeople who have been successful at commercialisation of an idea say that their contact with the scientist or researcher who had the initial idea was a random event, and they would not want to rely on such chances for future developments.

### ***A small market***

A common complaint in discussions of Australia's poor performance on R&D is that we suffer from a small market that limits the potential benefits from any innovation. Very little work has been done to test the validity of this argument. Mitchell and Stonecash (1996) used a case study approach to see if the small market, and consequent inability of domestic firms to capture economies of scale, were significant. Our conclusion was that small market size was of relatively limited importance. What was more significant was whether or not firms needed to do their R&D in conjunction with production

or whether they could, in essence, develop blueprints for sale to the rest of the world. Most businesspeople see it as a failure if ideas generated here are not commercialised here. However, this, too, may be an outdated notion. In our survey of cases, some companies considered themselves very successful if they managed to sell their innovation overseas. Others formed joint ventures with multinationals who had more expertise in areas such as distribution and marketing. The implication of this work is that the small market size is not the primary reason for our lack of R&D effort. On the other hand, poor performance on R&D expenditure does not prevent us from buying technology from overseas, without all the attendant risks associated with development of technology locally.

### ***Underdeveloped venture capital markets***

The lack of a fully developed venture capital market is often cited as a reason for a failure of commercialisation. In addition, the knowledge that there will be little or no funding available for development of ideas is sufficient to prevent many, particularly small, firms from conducting the R&D in the first place. Venture capital firms will require a significant return on their investments, and this is often lacking in Australian firms. In this context, the size of the Australian market may be significant. If the firms seeking venture capital are relatively small and base their potential gains on the small size of the Australian market, they

may offer the venture capital firms an equity proportion that is too small, or that has insufficient growth potential. They will then be unable to obtain the financing required. It has also been said that the venture capitalists that do exist are relatively inexperienced and have not had great success in 'picking winners.' One policy implication of the undeveloped nature of Australia's venture capital market is that government should perhaps target funds to specific industries (Freed 1997). However, targeted policies are fraught with difficulties regarding who should do the choosing of the targets.

### ***Influence of multinationals***

Australia has a large number of multinationals operating domestically. There are clear spillover benefits from having these companies here – they bring with them technologies developed in their own research facilities and increase the

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<sup>1</sup> The survey is part of a research project on R&D in Australia by this author.

knowledge base of Australian industry. What is disappointing from the Australian point of view is that these research facilities are usually located overseas. Consider the major carmakers. While they may do some of their R&D locally, most would be conducted in centres located overseas that service their production facilities in several countries, not just Australia. A multinational like Phillips would have several research facilities, each of which is devoted to a particular type of research relevant to their products. Without some encouragement, they would be unlikely to uproot their existing facilities and re-establish them here – how much concern this should be to us is another matter.

There are several aspects to the multinational question. The first is that if the multinationals are bringing in their own technologies and new products from overseas research, but producing them here, Australia is still getting some benefit in the form of increased production jobs domestically. There would also be some spillover from the importation of the new technology, even if it were proprietary. On the other hand, if a multinational locates its research facility here and exports most of its research output to other countries where its production facilities are located, we would not achieve the benefits of increased output or improved productivity that would result from the local creation of knowledge. This then diminishes the benefits of having the multinational locate its research facilities here.

However, given that many of the gains in terms of economic growth come from the spillover benefits of having research generated by one firm improve the production capability or competitive advantage of other firms in the area, the domestic location of research facilities is likely to be of overall benefit. And it is this effect that is generating the most concern regarding the multinationals.

### **Government policies**

Whether the previous list is complete or not, it does give some insight into Australia's poor R&D performance. The next question is whether or not the current set of government policies goes any way toward correcting some of these problems. The first step is setting out what policies the government has retained and what it has let go.

#### ***125 per cent tax concession***

It is well known that the Howard government reduced the tax concession on R&D expenditures from 150 per cent to 125 per cent. What is more debatable is how much of an impact this has had on R&D expenditure. The Business Council of Australia (BCA) clearly attributes the decline in business R&D expenditure to the reduction

(*Business Review Weekly*, 13 July 1998). This reduction is the first in many years, with business R&D expenditures having increased significantly in the previous five years. The BCA points out that the reduction from 150 per cent to 125 per cent really reduces the tax advantage of R&D by 50 per cent since the first 100 per cent is simply a conventional tax deduction for business expenditure. According to the BCA, research-intensive sectors such as pharmaceuticals, biotechnology, mining, appliance manufacturing and telecommunications have responded significantly to the reduction. These are the sectors that have shown significant returns to R&D expenditure in the past. The flow-on effects of reductions in these sectors could be significant for long-term growth prospects.

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### ***R&D Start Up***

The R&D Start program is a grant scheme for R&D expenditures. It is available to different sized companies under different components of the plan, but has primarily been accessed by the larger companies. The government's original incarnation of R&D Start was heavily criticised for providing funding only to larger enterprises, so a revamped R&D Start program was announced early in 1998. The three components of the plan are:

- A core grants scheme that provides up to 50 per cent of the cost of an R&D project for firms that had less than \$50 million per year in turnover in the previous three years;
- R&D Start-plus to provide grants for up to 20 per cent of project cost to companies with more than \$50 million in turnover;
- R&D Start-premium which allows the Industry Research

and Development Board (IR&D Board) to provide additional funding, up to 72 per cent of project cost for particular applicants, to be determined by the IR&D Board.

These measures go some distance in redressing earlier criticisms of R&D Start. As part of the package introducing R&D Start, the government eliminated the Enterprise Development fund which was designed to assist small to medium enterprises. If market failure arguments do apply, it would be the small to medium enterprises that would suffer the most from lack of access to venture capital, from inability to find appropriate organisations with which to collaborate and lack of ability to commercialise their ideas. Providing a grant scheme targeted at the small to medium enterprise is an important addition to the program.

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However, there are still valid criticisms of the scheme. The R&D Start program got off to a relatively slow start, with only a small amount of the available funds being allocated in the first year. Several companies complained of the excessively bureaucratic procedures required to prove eligibility for the scheme. (This burden is greater for the small to medium enterprise that is unlikely to have the scale to have staff devoted to this type of exercise.) The government was clearly committed to reducing the possibility that any sort of R&D scheme could be used as a tax dodge or to pay for non-R&D related expenditure, but in doing so, they have created a process that unduly burdens those who might benefit from the assistance. Not only does this make firms less likely to apply for the assistance, but it also reduces the benefits to those that do apply.

### ***Innovation Investment Fund***

The Innovation Investment Fund is intended to overcome some of the failures associated with a poorly developed venture capital market. It is targeted at small technology-based firms who are commercialising technology and who have annual revenue of \$4 million or less. It will provide funding on a 2:1 basis with private sector capital. Again, it is a beginning, but still does not address some of the basic issues of the failures of the venture capital markets. It may reduce the risk for the venture capitalists by providing government funding, but one-third of the investment still needs to be found in the private sector. If that funding is not available, the government's offer doesn't amount to much. It also does not address the issue of the high degree of risk aversion of lending institutions in Australia in general.

### ***Cooperative Research Centres***

The Cooperative Research Centres (CRCs) program was established to increase links between research institutions such as universities and CSIRO and the business community. These research centres could bridge the communication gap that exists between the basic researchers and entrepreneurs in those sectors in which centres are established. But since the emphasis of the centres is commercialisation, and they bring together companies that may already be well-established in the commercialisation process, but who want to further their capabilities, they do not solve the problems faced by the small to medium enterprises that do not have the resources to become an active partner in a research centre. Again, these firms are left to their own devices. An example of the potential benefits not addressed by the research centres are those found in Silicon Valley in the 1970s and 1980s or along Lincoln Highway in Massachusetts. There are acknowledged spillovers in these areas because small, growing firms were able to rub shoulders with more established firms and both benefited.

### ***What the government's policies fail to address***

There are several issues that the government's policies do not address and that are part of deeper problems stated at the outset. Even though the government wants to be seen to be encouraging R&D policy in Australia, it has other policies that conflict with that objective. With regard to education, the government has performed poorly on many counts. The Vice-Chancellor of the University of New South Wales released a report last year on the poor state of science education in Australia (Niland 1998). Professor Stocker, the government's chief scientist, has urged the

government to put more resources into human capital development, through education, training and research and development (*The Age*, 27 July 1998). In the endogenous growth models discussed earlier, human capital plays a significant role in lifting economic growth.

The government's policies also do not deal with the lack of incentives to adopt new technologies. Reforming managers' attitudes may be more difficult, but even the most conservative manager will respond to the appropriate financial incentive. The tax incentive is one component of that. This is also related to improving incentives for multinationals to increase their R&D activities domestically. Careful consideration needs to be given to the design of tax incentives for multinationals, but if the benefits are significant enough, they may warrant consideration.

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### Conclusion

The Howard government has been re-elected. It has another term to implement and improve the policies created in its first term. It has responded to some criticisms of the original form of those policies, but it needs to consider the broader policy environment in which it has chosen to place its industry policy initiatives. In particular, it needs to address the inconsistencies in reducing funding for education and at the same time trying to encourage R&D. Australia does have an imaginative, inventive and highly skilled people who are a first class scientific, technical and engineering workforce. The issue for the Howard government is ensuring that these people want to stay in Australia, are given the right environment to continue to produce the good ideas and have a generation of well-educated scientists and entrepreneurs to follow them.

*Policy*

### References

- Barro, R.J. and X. Sala-i-Martin 1995, *Economic Growth*, McGraw-Hill.
- Bureau of Industry Economics 1992, *Recent Developments in the Theory of Economic Growth: Policy Implications*, Occasional Paper 11, AGPS, Canberra.
- Colebatch, T. 1998, 'Chief Scientist pushes R&D,' *The Age*, 27 July.
- Freed, G. 1997, 'R&D Incentives and their Economic Outcomes in the Australian Context,' *Prometheus* 15(2).
- Goldsworthy, A. 1997, *The Global Information Economy: The Way Ahead*, AGPS, Canberra.
- Kirby, J. 1998, 'Lights go out in research labs,' *Business Review Weekly*, 13 July.
- Mitchell, S.K. and R.E. Stonecash 1996, 'The Role of Economies of Scale in Australian R&D,' *Prometheus* 14(2).
- Mortimer, D. 1997, *Going for Growth: Business Programs for Investment, Innovation and Export*, AGPS, Canberra.
- Niland, J. 1998, *The Fate of University Science – The Future of Australian Universities*, Address to the National Press Club, 25 February.
- Romer, P.M. 1986, 'Increasing returns and long-run growth,' *Journal of Political Economy* 94(5).
- Romer, P.M. 1987, 'Growth based on increasing returns due to specialization,' *American Economic Review* 77(2).
- Romer, P.M. 1990, 'Endogenous technological change,' *Journal of Political Economy* 98(5), Part II.

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