Evaluating Innovation Policies in Australian Government: Backing Australia's Ability

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Abstract

In industrialised countries, innovation is a key source of economic growth. Research is a key driver of technological innovation and involves the process of systematic investigation and/or experimentation to discover new knowledge. The Governments' industry innovation policy supports a business focus on Research and Development (R&D) through a range of programs in order to achieve these aims. The Innovation Statement, launched by the Australian Prime Minister in January 2001, commits an additional $3 billion over five years to encourage and support innovation. The Australian Government aims to build world competitive firms and strong research capability in industry to strengthen Australia's international competitiveness and increase national prosperity. It develops policies and programs to enhance investment in innovation. The Australian Government also undertakes analysis and comparisons of innovation policies, instruments and approaches to maintain a leading-edge National Innovation System. This includes analysis of the innovation activities of other nations, and evaluation of the impacts of innovation policies and programs on Australia's institutions and enterprises. This paper examines Australia's Innovation policies, Backing Australian Ability.

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Ⅰ. Introduction

Innovation and adaptability are key features of Australia's policy. Innovation has taken many forms, from the most humble practical changes to great nation building projects. The first mechanical refrigeration plant was invented in Australia back in 1850, followed by the stump jump plough, the first car radio and the heart pacemaker. Australia has been involved in the development of penicillin as a practical drug and produced the Hills hoist, the Victa mower and, in more recent times, the bionic ear and polymer bank notes. The Snowy Mountains Scheme and the Sydney Harbour Bridge are examples of great nation building projects which utilised Australian ideas, abilities and skills. However, too often the fruits of the invention have been lost overseas, for example the black box flight recorder and gene shears technology. Most importantly, some of the best and brightest people have left Australia never to return. And that means countless lost opportunities, never to translate Australian ideas into income and jobs at home for Australians. Now, more than ever, the realities of globalisation and the development of new technologies dictate that Australians must act. Australians must get behind the best and brightest so that they can take on the world for Australia's sake.

This is why the Government is committed to backing Australia's ability. Innovation is about turning Australian ideas into more jobs and higher wages in Australia. It is one of the keys to the prosperity in a world that is increasingly competitive and technologically advanced. Backing Australia's Ability is a comprehensive and integrated plan worth $2.9 billion over five years[1]. It builds on the Government's existing spending on innovation of $4.5 billion.

The practical initiatives in this statement complement the achievement of fiscal responsibility, industrial relations reform and improvements to the tax system which have provided the strongest economic foundations in a generation. The measures express confidence in the nation's abilities and the capacity to take on the world. These measures will only work if there is a genuine partnership between government, business, academia and other stakeholders. In this sense, this paper examines Australia's Innovation policies, Backing Australian Ability.

Ⅱ. BACKING AUSTRALIA'S ABILITY (BAA)

1. OVERVIEW OF BAA

Innovation - developing skills, generating new ideas through research, and turning them into commercial success- is key to Australia's future prosperity. Innovation is not only the province of new or high tech industries, but also essential to the future of many of the traditional sectors such as agriculture, manufacturing and mining.

Backing Australia's Ability outlines the next steps in the Government's strategy to encourage and support innovation and enhance Australia's international competitiveness, economic prosperity and social wellbeing. Government has two central roles - firstly to provide the best possible economic, tax and educational framework, and secondly to provide targeted direct support in areas where private sector funding is not appropriate or available. Backing Australia's Ability reinforces the Government's long standing support for these roles. It reinvigorates the research base, and provides targeted support to drive commercial outcomes. Each initiative addresses a priority area and is designed to have maximum impact while being fiscally responsible.

An important element in continuing to enhance Australia's capacity for innovation will be the acceptance of responsibility by the private sector and educational and research institutions to work in partnership with Government in these key areas. In February 2000, the Government and the Business Council of Australia convened the National Innovation Summit attracting over 500 participants, to assess the strengths and weaknesses of Australia's innovation system, and formulate ways to improve performance in this area. It also sought to provide a framework to address innovation policy issues in a comprehensive and coordinated manner.

The Innovation Summit Communique recognised that Australia has done well in the past using its ingenuity and natural resources to build a strong and robust economy, but noted that Australia is now at a crossroad[13]:

We are in the midst of a revolution from which a new order is emerging. The solutions of past decades will not suffice in the new knowledge age. Intangible assets-our human and intellectual capacity-are outstripping traditional assets-land, labour and capital-as the drivers of growth. If we are to take the

high road, a road of high growth based on the value of our intellectual capital, we need to stimulate, nurture and reward creativity and entrepreneurship.

Following the Summit, the Innovation Summit Implementation Group, a dedicated team chaired by Mr David Miles, developed the Innovation-Unlocking the Future report, which assessed and prioritised the Summit recommendations[8]. It highlighted the need for Government, business, education and research organisations to work together to harness the potential that innovation offers.

Prior to the Summit, in August 1999 the Government commissioned Australia's Chief Scientist, Dr Robin Batterham, to review the effectiveness of our science, engineering and technology base in supporting innovation. A preliminary Discussion Paper was circulated for public comment, and the final report, The Chance to Change, was presented to Government in November 2000[5].

In December 1999 the Government released its higher education White Paper, *Knowledge and Innovation: a policy statement on research and research training,* announcing a new policy and funding framework designed to ensure that universities were well placed to contribute knowledge and ideas to, and educate researchers for, the national innovation system[9].

Under the Prime Minister's chairmanship, his Science, Engineering and Innovation Council (PMSEIC) has also prepared a series of working papers and reports on priority issues to improve Australia's innovation performance. These documents have all played a crucial role in the Government's examination of the innovation system and were fundamental in developing important elements of *Backing Australia's Ability.*

A Ministerial Taskforce, comprising Nick Minchin, Minister for Industry, Science and Resources, David Kemp, Minister for Education, Training and Affairs, and Richard Alston, Minister for Communications, Information Technology and the Arts, was tasked with overseeing the development of this strategy and achieving an appropriate balance between competing priorities.

2. THE DETAILS OF BAA

A key aim of the strategy is to strengthen Australia's research capability, to ensure the flow of new ideas which underpin innovation, to create critical mass in leading research fields, and to build competitive advantage in ICT and biotechnology. The strategy provides significant new investment in these areas including additional funding and incentives to ensure Australia's research base-the backbone of the innovation system-remains strong and

internationally competitive.

The Government is introducing significant incentives to stimulate increased business investment in R&D. Initiatives include new tax concessions to encourage companies to increase R&D efforts, a rebate to assist small companies to undertake R&D and continued direct grant assistance.

Specific initiatives include[1] -

- To support internationally competitive research, the Government will double funding over the next 5 years for the national competitive research grants administered by the Australian Research Council (ARC). The extra $736 million will improve the competitiveness of researchers' salaries and increase the support available under the Discovery and Linkage elements of the grants program. Emphasis will be on areas in which Australia enjoys, or wants to build, a competitive advantage.
- To provide the infrastructure needed to support project-funded research, the Government will provide more than $337 million towards increased project-specific infrastructure over the next five years. This will support ARC and National Health and Medical Research Council grants.
- To upgrade the basic infrastructure of universities, such as scientific and research equipment, libraries and laboratory facilities, $246 million over the next five years will be provided to fund the best infrastructure proposals from universities.
- To ensure Australia participates in key emerging technologies, a total of $176 million will be provided (with approximately half contributed from the ARC) over the next five years to establish Centres of Excellence in ICT and biotechnology. With strong industry participation, these centres will undertake world-class R&D, focussing on commercialisation and encouraging spin-off companies.
- To provide researchers with the most up-to-date equipment and facilities the Government will provide $155 million towards establishing collaborative Major National Research Facilities.
- To provide a significant incentive for business to increase their R&D investment, the Government has enhanced the R&D tax concession arrangements. In addition to the existing 125 per cent R&D tax concession, companies that undertake additional R&D will be able to access a premium rate of 175 per cent on the additional investment. This premium targets the labour-related components of R&D expenditure where the greatest benefits for the whole economy occur.

In accordance with the approach taken to business tax reform, effective-life write off will apply to the Government's existing R&D tax concession scheme. This will simplify the application of the scheme and provide a consistent treatment between R&D plant and other capital items in the tax system. The Government is also introducing changes to the definition of R&D.

Overall, it is estimated that the Government's reform of the R&D tax concession scheme will cost $115 million over five years. OECD data indicate that these changes will provide Australia with one of the best tax based R&D support

mechanisms of member countries. To help the cash flow of small companies, the Government will introduce a tax rebate for the R&D tax concession[11]. Over five years, up to 1300 small companies that are in tax loss will get early access to $30 million at a net cost of $13 million. To support the hundreds of companies where grant assistance is most appropriate the Government will provide $535 million over five years to continue the START program, as well as streamline the program and make it easier to access to better meet the needs of business users[11].

Backing Australia's Ability supports greater commercial application of research results. In addition to direct support for R&D, the Government aims to improve the flow of finance into business innovation and to stimulate growth of innovative firms by improving Australia' s capacity to commercialise research and new technologies.

This will also be achieved through initiatives to enhance Australia's capacity to build and manage innovative enterprises, encourage the spin-off opportunities from industry research collaboration, strengthen the intellectual property (IP) management processes and increase access to global research and technologies.

Backing Australia's Ability assists the greater commercial application of research from universities and public sector research agencies, like the CSIRO, by strengthening the commercial linkages with industry and making it easier to take promising research to the stage of commercial viability.

Specific initiatives include -

- To continue and enhance the spin-off opportunities from industry research collaboration, the Government will boost the Cooperative Research Centres (CRC) Program by 80 per cent over the next five years at a cost of $227 million. More flexibility will also be incorporated so larger CRCs can be established and small and medium enterprises are provided with greater access to the program[2].
- To provide early assistance to firms by improving their commercialisation skills, the highly successful Commercialising Emerging Technologies (COMET) Program will be more than doubled in value, with an extra $40 million over four years[12].
- To ensure access to the best overseas technology and science, the Government will provide $100 million over the next five years for an Innovation Access Program. The new program will enhance Australian firms' access to new technologies, and accelerate the use of e-commerce business solutions, especially for small and medium enterprises. It will also showcase Australian science and technology overseas and develop international bilateral agreements that support strategic science and technology.
- To help commercialise public sector research the Government will provide $78.7 million over the next five years as pre-seed funding. Assistance through the fund will be available to universities and public sector research agencies

to take proposals to a venture capital ready stage.

- To encourage the development of new biotechnology firms, the Government will double the Biotechnology Innovation Fund, with an additional $20 million[12].
- To accelerate efforts to improve Australia's performance in the development and commercialisation of new agribusiness products, services and technologies, an additional $21.7 million over five years will be committed to the New Industries Development Program.
- To ensure that recent changes to the tax system will encourage venture capital investment, the Government will actively monitor the impacts of the new business tax arrangements, in particular entity taxation, on domestic and overseas investment in Australian venture capital.
- To ensure Australia has a regulatory environment that allows us to maximise the outcomes of innovation, the Government will develop regulation business advice tools and review the regulatory framework to determine how it can be improved.
- To strengthen Australia's IP protection system[14], the Government will continue to increase awareness and understanding of IP-for example by developing an IP Internet portal, improving IP management in public research agencies, and quickly implementing IP reforms such as introducing a 'grace period' to the Patents Act and acceding to the Madrid agreement regarding international registration of trade marks.

3. STRATEGY OF BAA

To be competitive in today's world, Australia must develop its strong research base and encourage further collaboration with the world's best. We need to continue to enhance the local expertise and skills, and to attract further overseas interest, talent and investment.

The well-educated and culturally diverse society provides a rich environment for generating original and groundbreaking ideas.

This can be build by strengthening the skills base, and encouraging a wider interest in science, mathematics and technology, through measures designed to excite and retain Australian researchers, by attracting increased business support and developing the next generation of innovators.

The Government's broad strategy in this area increases university places in critical fields, supports ongoing skills development and enhanced science and technology literacy, provides for increased access to online learning opportunities, and further boost our skills base through immigration. New Federation Fellowships will create new rewards and incentives for the leading researchers to apply their talents in Australia.

The strategy addresses the challenge to build Australia's capacity in key enabling technologies (such as ICT and biotechnology), not only for the growth and employment opportunities, but also so that Australia continues to be competitive in rapidly changing global markets. The expanding global market for these technologies is an

engine for growth, providing jobs, rejuvenating traditional industries and creating new ones.

Specific initiatives include -

- To increase the number of graduates in areas where Australia faces shortages, the Government will provide $151 million over five years for an additional 2 000 university places each year, with priority given to ICT, mathematics and science.
- To encourage lifelong learning and to help Australians upgrade and acquire new skills, the Government will establish an income-contingent loan scheme for postgraduate fee-paying students. It is expected that the loans provided under this scheme will amount to some $995 million over the next five years.
- To attract and retain leading researchers in key positions, part of the new funds to be provided for national competitive research grants will be used to introduce 25 new Federation Fellowships worth $225,000 a year for five years. In addition, the number of Australian Postdoctoral Fellowships will be doubled from 55 to 110 and remuneration of these positions will be improved.
- To foster scientific, mathematical and technological skills, develop school based innovation and build supportive school environments, the Government will provide, in those States where the Enrolment Benchmark Adjustment (EBA) is triggered, an additional $130 million over four years to government schools.
- To enhance student access to quality learning opportunities and provide experience of ICT as a learning tool, $34 million over five years will be provided to help develop online curriculum content in schools.
- To help meet the demand for ICT skills, the Government will adjust immigration arrangements to attract more migrants with skills in ICT.
- To raise the understanding of the importance and commercial potential of science and technology, particularly amongst the young, $35 million will be provided over five years to implement a National Innovation Awareness Strategy, including the development of new ways to measure our national innovation performance[6].

Ⅲ. EVALUATING BAA

1. RESULT OF BAA

In large measure, the success of *Backing Australia's Ability* will be underpinned by the Commonwealth Government's achievement in providing an economic climate in which innovation can thrive. The fundamental economic reforms of recent years have created a dynamic and competitive economic environment with high growth, low inflation and high productivity environment - the right framework for innovation. Economic growth has averaged 31/2 per cent over the last decade and over 41/2 per cent in the last three financial years, while the average rate of inflation in the 1990s was 21/4 per cent. Australia's recent strong economic growth has been underpinned by impressive

employment and productivity performances - the result of pursuing sound macro-economic policies and undertaking a comprehensive range of structural reforms in both product and labour markets.

The OECD and the US Federal Reserve have found Australia's productivity performance to be particularly impressive. For example, the OECD identified Australia as one of only six OECD economies to have raised its trend real per capita growth rate in the 1990s[10].

The Government has introduced a range of tax reforms that provide Australia with an internationally competitive tax system. From 1 July 2001, Australia's company tax rate will be one of the lowest rates in the region and the goods and services tax (GST) has replaced an inefficient and multi-layered indirect taxation system.

The new capital gains tax (CGT) system will encourage entrepreneurial behaviour (including risk taking), improve the incentives to save and invest and increase the ability of start-up and innovative enterprises to attract and manage capital. In the year following the introduction of these reforms, nearly twice as much venture capital was invested in Australian companies.

Australia's workplace relations reforms provide a flexible labour market with the capacity to realise the benefits and opportunities of jobs in emerging industries while improving the efficiency of more established industries. For example, the increased focus on workplace agreements provides greater scope for employers and employees to share the rewards of their firm's performance, encouraging increased productivity and a culture of continuous improvement and innovation.

Australia has a world-class financial sector regulatory framework, which is sound, secure, and sufficiently flexible to keep pace with the rapidly changing global financial sector. This regulatory framework is designed to support greater innovation, competition and efficiency, while maintaining financial sector stability, integrity and fairness.

Over the past few decades, Australia has made a major transition to become one of the world's most open economies. We have also introduced competition in key infrastructure sectors, including telecommunications, formerly dominated by public monopoly providers. This reform has delivered cost reductions for business through increased efficiency and greater competitiveness.

Overall, these changes have contributed to creating a high growth, high productivity, and low inflation economy - the ideal climate for innovation. The economic outlook remains very positive, with continued robust economic growth, inflation in check and

unemployment at its lowest rate in more than a decade.

Australian productivity, competitiveness and innovative capacity have also been enhanced by direct Federal Government support over recent years. The Government has provided approximately $4.5 billion funding for innovation in 2000-01 alone. This includes a record $2.7 billion for science, research and industry innovation programs and $1.8 billion for higher education research and research training. In addition this government has launched innovation programs targeted at the ICT sector with a total value of $189 million.

The Innovation Investment Fund (IIF), which was introduced to stimulate overseas and domestic early - stage venture capital investment in new technology, is successfully attracting significant amounts of new early stage capital for Australian companies.

A joint Industry-Government investment of $1.5 billion made over the past five years through rural R&D corporations maintains the place of Australia's primary industries as among the best in the world. The Government's continued commitment to this Industry-Government partnership will continue to strengthen our rural economy.

The Government supports the establishment and rapid growth of innovative small and medium sized businesses in the ICT sector. Initiatives include: the Building on IT Strengths (BITS) program, which supports incubator centres, test-beds and advanced infrastructures; the IT Online (ITOL) program, which encourages business to adopt e-commerce; the IT Skills Exchange which addresses skills shortages and facilitates training; and the Software Engineering Quality Centres program, which helps software developers improve their product quality[7].

The Commonwealth is also leading by example with the Government Online Strategy, which aims to see all appropriate Commonwealth services online this year.

Other specific initiatives have laid vital groundwork in developing new economy skills. The Government's Investing for Growth (1997) statement introduced programs to boost the innovative capacity of firms, as a key strategy to lift Australia's international competitiveness.

The implementation of the new funding and policy framework for higher education research and research training announced in Knowledge and Innovation is proceeding, with improvements in the quality of research training, more strategic identification of research strengths and greater collaboration between universities and industry already apparent.

The recommendations contained within the

Wills report Health and Medical Research Strategic Review, along with the Government's 1999 decision to double base funding for the NH&MRC by an additional $614M by 2005, will allow Australia to build on its already strong reputation as a leader in health and medical research.

2. FUTHER EFFORTS

The initiatives outlined in this strategy address immediate priorities to strengthen Australia's innovation capabilities. However, the Government recognises that further reforms may be desirable to support these initiatives in the longer-term.

As part of its ongoing commitment to *Backing Australia's Ability*, the Ministerial Committee will examine a number of areas to ensure that relevant policies provide the most effective support for R&D, its commercial application and skills development. The below areas are identified for further efforts to accomplish BAA[1,3,4]. These are:

- To ensure that the commercialisation of Government-funded research in Australia matches the world's best, the Government will examine barriers to commercialisation, and assess the effectiveness of current incentives. This will identify where stronger incentives are needed, for example, to increase the development of patents from scientific research by publicly funded institutions.
- To enhance the incentives for employees to drive stronger business productivity and to encourage start-up business activity, employee share ownership arrangements will be examined. This responds to the *Shared Endeavours: Inquiry into employee share ownership in Australian enterprises* report of by the House of Representatives Standing Committee on Employment, Education and Workplace Relations, which advocated extending employee share ownership schemes in small and medium unlisted companies, and companies in sunrise and new industries.
- To ensure that talented young people are attracted to teaching as a career, especially in the fields of science and technology education, teaching and teacher education will be reviewed, in consultation with State and Territory Governments.
- To ensure that funds support the highest quality research, there will be a review of access to Government-funded research by public sector research agencies.
- To develop the community's understanding of, and support for, innovation to bring it in line with our competitor countries, the Government will examine ways to increase philanthropic support for innovation.
- To create a flexible workforce which is responsive to changes, the Government will develop strategies to support lifelong learning so Australian ideas and inventiveness are nourished through continual updating of knowledge and skills.
- To encourage more consumers and businesses to take up online technologies, the Government will introduce measures that provide more equitable and affordable online access.

Ⅳ. CONCLUSION

Backing Australia's Ability has been developed with full understanding of current strengths and weaknesses, recognition of relevant national and international factors and a comprehensive assessment of likely conditions in the future.

This strategy supports the essential ingredients for a dynamic and productive innovation system. It focuses on the Government's commitment to three key elements in the innovation process:

- strengthening our ability to generate ideas and undertake research;
- accelerating the commercial application of these ideas; and
- developing and retaining Australian skills.

The Government's strategy builds on existing substantial Commonwealth support for innovation by boosting funding to key areas and introducing significant new initiatives. Backing Australia's Ability provides $2.9 billion of additional funding over 5 years, with $159 million in the first year growing to $947 million in 2005-06.

However, it also identifies areas for ongoing review and future action. The acceptance of responsibility by the private sector and educational and research institutions to work in partnership with Government is a key important element in continuing to enhance Australia's capacity for innovation. Through this, the strengths and weaknesses of Australia's innovation system can be assessed and be improved.

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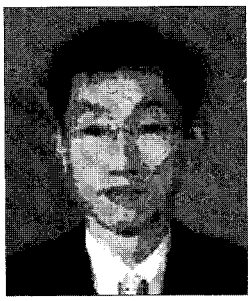

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