



Analysis of the Legal Framework for Patent Ownership in Publicly Funded Research Institutions

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Executive summary

1 Invention ownership in Australia

In Australia, it is a general principle of the common law that an employer is entitled to any IP rights created by an employee in the course of their employment. Universities can claim ownership of inventions created by academic staff in the course of their employment, both at common law and under university IP policies and statutes. Many IP policies and statutes also allow universities to claim ownership of all inventions created using university resources. Universities can claim ownership of inventions arising from publicly funded research undertaken pursuant to an agreement with a government funding agency such as the ARC or the NHMRC. Academics have no common law rights to the inventions they create in the course of their employment. In two universities however, academics can claim full or part ownership under university IP statutes. Academics cannot ordinarily claim ownership of the results of publicly funded research, where funds are provided through an agreement with the ARC or NHMRC. Students are entitled to claim ownership of inventions created during their studies. Some university IP statutes and policies modify this general rule, particularly where a student has relied substantially on university resources. As indicated by the *National Principles of Intellectual Property Management for Publicly Funded Research*, government funding agencies such as the ARC and NHMRC do not claim ownership of inventions created during the course of research. The position will normally be different where a government Research and Development Corporation such as the RIRDC is concerned.

As is the case with universities, government research organisations can claim ownership of inventions created by employees in the course of their employment under the common law and under their internal IP policies. Some IP policies in these organisations also allow the organisation to claim ownership of inventions created by employees outside their normal terms of employment but using the organisation's resources. None of the IP policies in the organisations surveyed allow employees to claim full ownership of their inventions whether within and outside their course of employment (but using the organisation's resources). Where there is an agreement with another party to undertake a research project, patent ownership rights are generally negotiated on a case to case basis (subject to the organisation's IP policy) before the commencement of the project.

2 Invention ownership in the United States

In contrast to the general position in Australia, under United States common law, an individual owns rights in any invention they create, regardless of whether than invention was created in the course of employment. In the absence of a clear common law right to inventions created by academics, most universities have enacted IP policies, which purport to claim ownership of inventions made using university resources and/or in the course of employment.

One of the most significant features of the United States framework is the existence of federal legislation (the *Bayh-Dole Act*) governing inventions created with project-specific public funds. Under the *Bayh-Dole Act*, universities and government funding agencies enter into a funding agreement which grants a right of ownership to the university subject to a number of obligations. Most importantly, the university must comply with various obligations concerning disclosure of the invention, election whether to retain title, royalty sharing and preference to small businesses and US industry.

If the university does not comply with the above obligations or chooses not to take title, the *Bayh-Dole Act* and its implementing regulations provide for the government to receive title by giving written notice. The inventor can apply to the government for title. If the university complies with its obligations, it will be permitted to retain title and commercialise the invention. However, the government will still have certain minimum rights, including a non-exclusive irrevocable licence to use the invention throughout the world. The government will also have ‘march-in rights’ which allow it to make the university grant (or itself grant) a licence to a third party where the university fails to commercialise the invention, where licensing is necessary for health and safety needs, or where preference for United States industry has not been observed.

All research institutions that receive funding from government funding agencies are subject to the *Bayh-Dole Act*. Invention ownership in government research organisations is governed exclusively by national technology transfer legislation. The United States government can claim ownership of inventions created by public servants under the authority of *Executive Order No 10096* and its implementing regulations, unless the government’s contribution is not sufficient to justify the assignment of ownership. Once a government research institution claims ownership of an invention, that organisation will be obliged under the *Stevenson-Wydler Act* to commercialise it where appropriate. The *Stevenson-Wydler Act* establishes various administrative structures to encourage commercialisation and specifies that if the research institution claims ownership and fails to commercialise, then the employee inventor can obtain title (subject to the government obtaining a non-exclusive licence).

3 Background to the United States' framework

The *Bayh-Dole* and *Stevenson-Wydler* legislation was introduced in the United States to address the problem that a large number of potentially valuable inventions created by universities and private research institutions with public funds were not being commercialised. This problem was attributed to the absence of a uniform policy governing the ownership of such inventions, and to the lack of incentives for institutions to actively pursue commercialisation as there was no guarantee that they would be given exclusive rights to the technology. Furthermore, government funding agencies lacked the expertise and the ability to see the commercial potential of a new invention. In this regulatory environment, it was thought that the US was unable to develop its own inventions and potential products were lost to overseas developers.

The primary aim of both the *Bayh-Dole* and *Stevenson-Wydler* legislation was to provide a clear and uniform system of managing IP rights in publicly funded institutions, which would, in itself, provide an incentive for improved technology transfer. *Bayh-Dole* vested title over all inventions created using public funds in universities and other research institutions, regardless of the funding agency. *Stevenson-Wydler* applied to government agencies and imposed a duty on federal departments to transfer technology to State and local governments and the private sector, and established administrative structures to support this obligation. *Bayh-Dole* empowered federal agencies to license federally owned inventions and enacted a detailed licensing regime. Both *Bayh-Dole* and *Stevenson-Wydler* provided that royalties from commercialisation should be shared with the inventor to provide an incentive to create inventions for practical use.

A secondary aim of the legislation was to create an additional incentive to patent inventions by introducing the potential for the government to confiscate ownership of an invention if it was not patented within a certain period of time. Further, to curtail the potential abuse of monopoly power, the government was granted a non-exclusive license to use the invention for government purposes and retain "march-in rights" which can be exercised in the public interest. An examination into the effectiveness of *Bayh-Dole* shows that the most probable effect of the legislation is that it accelerated the trend in patenting by universities, by removing obstacles surrounding complicated patent ownership rights.

4 Invention ownership in Canada and the United Kingdom

Experiences in both Canada and the United Kingdom generally support a *Bayh-Dole* style approach to ownership and management of patents resulting from publicly funded research. Experience in Canada reveals many problems that may arise out of a laissez-faire approach to IP ownership and especially out of the failure of research institutions to take responsibility for IP management. On the other hand, the UK experience reveals problems that arise when research funders maintain too much control over IP generated from their funds. Both experiences therefore point to research bodies as the most desirable owners of IP.

Both countries recognise the need to attach responsibilities to IP ownership, though each country seeks to implement them in different ways. The responsibilities are aimed at encouraging research bodies to implement strategies and systems to identify, protect, manage and commercialise valuable IP. In addition, both countries also emphasise the importance of incorporating knowledge transfer or innovation as an express part of research bodies' missions. They also require disclosure of all intellectual property owned by research bodies to the Government on a regular basis. Canada has proposed that research bodies give priority to local industry and small business when licensing IP. The UK, on the other hand, considers such an obligation unrealistic and inconsistent with the global nature of industry.

The common points shared by the UK and Canadian proposals for reform of IP management in publicly funded research bodies can be summarised as follows:

- IP should be vested in the research bodies
- IP ownership should be coupled with responsibilities designed to encourage research bodies to implement strategies and systems to identify, protect, manage and exploit valuable IP
- Knowledge transfer or innovation should be included as an express objective of research bodies
- IP owned by research bodies should be disclosed to the government on a regular basis

5 Lessons from overseas

Other studies have identified many impediments to the effective management and commercialisation of intellectual property by Australian universities and government research organisations. To date, the emphasis has been on encouraging universities to change their own practices. This strategy has had varied success. This study has identified a new strategy that the government could adopt, inspired by the key features of the United States' *Bayh-Dole* legislation and the *Stevenson-Wydler Act* and building on the existing mechanisms in Australia.

The proposed approach involves granting research institutions the benefit of ownership rights to publicly funded inventions, subject to the fulfilment of a number of responsibilities. These responsibilities concern the identification, protection, management and commercialisation of IP resulting from publicly funded research. Monitoring and supervision of the discharge of these responsibilities could occur by requiring research institutions to report periodically to government funding agencies. An incentive to comply could be based on the prospect of reduced funding for research for inadequate discharge of those responsibilities.

It is acknowledged that these new strategies will not remove all the impediments to the effective management and commercialisation of IP in publicly funded research institutions. Some issues, such as a lack of funding for invention development, cannot really be solved by placing obligations on research institutions. Nevertheless, a *Bayh-Dole* and *Stevenson-Wydler* type strategy is at least worthy of consideration by the Australian government. These initiatives could be implemented in research institutions by strengthening the *National Principles* and the *Interim Guidelines* and extending their operation to grants from a wider range of public funding agencies.

6 Recommendations for Australia

As experience has shown in the United States, Canada and the United Kingdom, the optimal initial owner of a patent for an invention is the research institution in which the invention was created. Research institutions are best placed to implement management structures to identify potentially valuable patents and they are also well positioned to pursue commercialisation of such inventions. The *default* position should not vest ownership of patents in employee inventors or funding agencies. However, whilst there should not be an automatic devolution of patent rights to employees or funding agencies, research institutions should be allowed the

freedom to assign patent rights on a case by case basis where the institution believes that such an assignment would lead to an optimal outcome with respect to commercialisation.

The right to ownership of patents should be coupled with the assumption of responsibility for the effective identification, protection, management and commercialisation of the invention. The following responsibilities should attach to the ownership of patent rights:

- A responsibility to identify, and have systems in place to support the identification of, commercially valuable inventions.
- A responsibility to protect commercially valuable inventions.
- A responsibility to reward employees who create commercially valuable inventions.
- A responsibility to appropriately exploit patented inventions.

The approach proposed above could be implemented by the adoption of a policy requiring certain federal government funding agencies to make grants to research institutions conditional upon the acceptance of the responsibilities recommended above. In particular, it could be implemented through an expansion of the approach already operating in Australia via the *National Principles* and the *Interim Guidelines*. This “expanded *National Principles* approach” would enlarge the content of the responsibilities currently applied to research institutions, as well as the range of funding agencies applying those responsibilities.

Preface

Background to this study

The effective development and exploitation of intellectual property (IP) resulting from publicly funded research has the potential to provide significant benefit to a nation's economy. Consequently, in the past 5 years, considerable attention has been devoted to the commercialisation of publicly funded research, both in Australia and overseas. Most studies have focused on the identification of formal and practical barriers to commercialisation by using empirical research into the experiences of university academics and government scientists in publicly funded research institutions. Such research has been undertaken with a view to developing strategies by which universities and government research organisations can facilitate the process of research commercialisation. However, those previous studies have only considered IP at the ground level, in terms of how academics and scientists currently manage their IP, in order to identify how these practices could be changed in order to facilitate research commercialisation. There is a separate, albeit related, question of whether the national legal framework for regulating the ownership of IP in Australian research institutions requires reform.

The motivation for this study is the apparently substantial success that United States research institutions have had in the past two decades in commercialising their IP, and in particular their patented inventions. Amongst certain circles, this apparent success is attributed primarily, if not exclusively, to the *Bayh-Dole Act of 1980*, the *Stevenson-Wydler Technology Innovation Act of 1980*, and the subsequent related enactments. The primary effect of the *Bayh-Dole Act* is to implement a change in the initial ownership of patents for inventions resulting from federally funded research. Given the apparent success of United States research organisations in exploiting their IP, and the attribution of the cause of this success to the *Bayh-Dole Act* and related enactments, the question has been asked whether Australia should introduce a *Bayh-Dole* style policy on patent ownership. This study seeks to answer that question. It does so by focussing on three main issues.

Foci of the study

The first focal point of this study is on the current legal framework in Australia for regulating patent ownership in publicly funded research institutions. The default common law position in Australia is that an employer owns patents created by all employees in the course of their employment. This law is modified by the practices of research institutions, through their IP policies, agreements with third parties, and the *National Principles* and *Interim Guidelines* which govern research undertaken with funding from the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC), respectively. In relation to universities, this project examines the IP statutes, policies and practices of the top 20 Australian universities (ranked by research expenditure) and analyses how these universities claim patent ownership, how that claim is subsequently affected by the decision to commercialise and the relevance of the *National Principles* and *Interim Guidelines* to IP management in universities. The study then surveys how patent ownership rights are allocated in a sample of five government research organisations.

The second focus of this study is upon overseas jurisdictions, with the aim of garnering some guidance as to how Australia should regulate patent ownership and IP management. The study analyses how the ownership of patents resulting from publicly funded research is regulated in the United States through the *Bayh-Dole Act*, the *Stevenson-Wydler Act* and related legislation. An analysis of the situation in the United States prior to this legislation is conducted, in order to identify the underlying motivations for their enactment, and their consequent practical and economic effect on patent ownership in government agencies and universities in the United States. The situation in Canada and the United Kingdom in relation to commercialisation of publicly funded research is also explored. The experiences of the three countries are reviewed, to identify the lessons for Australia from the United States *Bayh-Dole* legislation, the proposed Canadian model, and the recent United Kingdom policy initiatives.

The third focus of this study is on formulating an appropriate legal framework for patent ownership in Australian publicly funded research institutions. Firstly, the issues faced by Australian research institutions in the commercialisation of their IP are identified and the relevance of *Bayh-Dole Act* and *Stevenson-Wydler Act* is assessed in order to ascertain whether a US-style policy is necessary or desirable in Australia. This section also draws upon the experiences in Canada and the United Kingdom, in order to assess whether those approaches might be suitable for Australia. There are two main questions involved in formulating an Australian model: (1) *where* should patent ownership lie: with the research institution, the funding agency, or the

employee inventor?; and (2) what *responsibilities* regarding IP management should be attached to that ownership? Finally, this section will include an examination of how this proposed model would be best implemented, including whether these issues could be addressed by an expansion of the approach already applying in Australia through the *National Principles* and the *Interim Guidelines*.

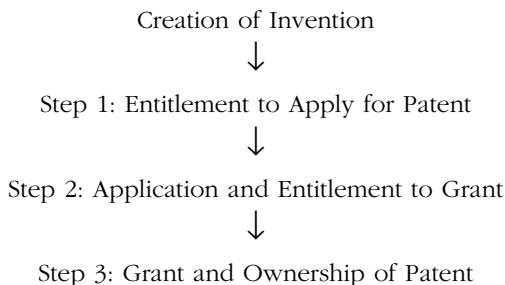
1 Invention ownership in Australia

1.1 Introduction

This section will examine the current legal framework for regulating the ownership of inventions in publicly funded research institutions. It will begin by outlining some general principles of patent law, stemming from the principal legislation in the area—the *Patents Act 1990* (Cth)—and the common law. It will then consider how these general principles have been modified by the practices of research institutions. Part 1.3 will address ownership in universities, while part 1.4 will look at other publicly funded research institutions. For both universities and other research institutions, the same process of analysis will be applied. This process will involve looking first at how ownership of inventions may be claimed, and second at how the allocation of ownership rights is subsequently affected by the decision to commercialise the invention.

1.2 General principles of patent ownership

It is important to remember that patent ownership is the culmination of a three step process:



An inventor has legal rights in his or her invention from the moment that invention is conceived. These rights, like any other rights to property, can be assigned or licensed at any stage. Strictly speaking therefore, in the present context it is perhaps more useful to analyse ownership of the *invention*

throughout all of the above stages, as opposed to focusing on ownership of any resulting *patent*.

Under the *Patents Act 1990* (Cth), a patent will generally only be granted to the person who created the invention to begin with.¹ However, the *Patents Act* also contemplates two exceptions to this rule. The first exception is where the inventor voluntarily assigns his or her ownership of the invention to another person,² for example to develop the invention further and bear the costs of commercialising it. The second exception is where another person is entitled ownership of the invention as a matter of law.³

Employment relationships are the key area in which this second exception applies. It is a general principle of common law that an employer is entitled to any IP rights created by an employee in the course of their employment. This entitlement is expressly provided for in the legislative schemes regulating copyright,⁴ designs,⁵ plant breeders' rights,⁶ and circuit layouts.⁷ Although the *Patents Act* does not expressly grant employers any rights to employee inventions, that principle is also firmly established at common law.⁸

Having established these fundamental principles, it remains to be seen how they are applied in practice by universities and other research institutions.

1.3 Ownership in universities

Ownership of inventions created in university research may be claimed by a number of interested parties. These include academics, students, the university itself, and third parties involved in providing funding or expertise.

The success of each party's initial ownership claim will firstly depend on the interaction between the following sources of ownership, which will be considered in turn:

- The general principles mentioned in 1.2 above
- University enacted statutes and policies, which may extend or modify the common law notion of 'course of employment' to claim ownership of staff or student IP

1 *Patents Act 1990* (Cth) s 15(1)(a).

2 *Patents Act 1990* (Cth) s 15(1)(b).

3 *Patents Act 1990* (Cth) s 15(1)(c).

4 *Copyright Act 1968* (Cth) s 35(6).

5 *Designs Act 1906* (Cth) s 19(3).

6 *Plant Breeders' Right Act 1994* (Cth) s 3(1).

7 *Circuit Layouts Act 1989* (Cth) s 16(2).

8 See *Sterling Engineering Co Ltd v Patchet [1955] AC 534*.

- External agreements with public and private bodies providing funding for particular research projects, which could modify all of the above

Second, ownership may be affected by the claimant deciding whether or not to commercialise the invention. It will therefore be necessary to separately consider how provisions in university statutes and policies, and agreements with third parties, could dictate a certain distribution of ownership rights if an invention is or is not commercialised.

1.3.1 General principles in the university context

Universities can rely on common law rights to claim ownership of patents created by staff, but not students. Claiming ownership of staff inventions gives rise to two main issues:

- Does the member of staff have an employment relationship with the university?
- What are the terms of that employment relationship and was the invention created in the ‘course of employment’?

Regarding the first issue, a distinction must be made between staff members who are employees and staff members who are independent contractors. For example, one academic might be engaged on a regular basis and paid an ordinary salary by the university, while another might conduct lectures irregularly and invoice the university through a private consulting company. If a member of staff is classified as an independent contractor rather than an employee, then the university cannot rely on common law principles to assert ownership of any IP generated by that staff member. In such situations the university would need to have some kind of agreement to be able to claim IP ownership.

The second issue depends on the nature and content of the employee’s duties and whether the invention was created in performance of those duties. A university academic might perform a range of functions, including teaching, research, and administration.⁹ While some academics exclusively conduct research and teach classes, others devote all their time to managing faculty staff or students. The duties of each employee must be ascertained on a case by case basis. The scope of those duties must also be precisely defined. For example, if an academic is engaged exclusively to conduct research in a particular field, then the university might not have any common law claim to inventions outside that research field. Whether an invention was made during the course of employment will also depend on other factors, such as when

⁹ Ricketson, 36.

and where the work was done, and whether university equipment and resources were used.¹⁰

Consequently, the simple proposition that an employer owns inventions made during the course of employment can be quite complex when applied to university staff. Universities have endeavoured to resolve this complexity by enacting IP statutes and policies.

1.3.2 University statutes and policies

IP statutes and policies can modify, limit or extend common law principles of patent ownership. This part will consider how universities enact and enforce IP statutes and policies, whether university staff and students can challenge their validity, and how IP statutes and policies affect ownership of inventions.

Australian publicly funded universities are established by legislation and given substantial powers of self-governance.¹¹ Depending on the terms of the enabling Act, a university may be given specific legislative power to regulate IP matters. In that case, the university executive will enact an IP statute. The university might rely on the legislative force of this statute to bind staff and students, but would normally make adherence to the statute a condition of enrolment or employment as well. If the university does not have the power to make an IP statute, it could simply rely on its general powers of management to implement an IP policy. Because policies have no binding force on their own they are also usually made conditions of enrolment, or terms of staff contracts of employment.¹²

In practice therefore, there is little difference between an IP statute and an IP policy. Staff employment and student enrolment will ordinarily be subject to either or both.

There is some uncertainty over whether staff and students can challenge the validity of IP statutes and policies. Monotti argues that in certain circumstances, IP statutes and policies can be successfully challenged and the parties will be governed instead by the default common law principles of patent ownership. For example, a university might not have adequately drawn an IP policy to the attention of an employee at the time the employee was hired.¹³ The employee could then argue that their employment was not subject to the IP policy. Alternatively, the IP policy might make such broad claims of patent ownership that a court will find it an unreasonable and unenforceable restraint of trade.¹⁴

10 Ricketson, 37–8.

11 Monotti, 429.

12 Monotti, 431–2.

13 Monotti, 439.

14 Monotti, 456–7.

In most cases however, IP statutes and policies will be binding. We must therefore consider how these documents initially allocate ownership of inventions created by staff and students.

i) Staff

A review of the top 20 Australian universities (ranked by research expenditure)¹⁵ reveals that almost all universities claim ownership of inventions created by staff during the course of employment, consistent with common law principles. Two universities which depart from the common law are the University of Melbourne, which assigns ownership to the employee inventor, and the University of Technology Sydney, which provides for ownership to be equally shared between the inventor and university. Assignment of invention ownership to University of Melbourne employees is however subject to certain conditions, including that the university retains a licence to use the invention for educational purposes.

In order to claim ownership of inventions created in the course of employment, most universities reviewed also impose on staff an obligation to notify the university of any new invention developed which might belong to the university. Some universities have procedures for written notification by filling out a form, while others rely on more informal mechanisms. Staff must refrain from disclosing the details of the invention to the public so that any subsequent patent application is not compromised.

Of those universities that claim ownership of inventions created during the course of employment, a subset also claim ownership of inventions created using university resources. University resources can include university owned IP, university facilities, human resources (in the form or supervision) and university funds. There are two key models for claiming ownership of inventions created using university resources. First, some universities claim ownership of inventions created during the course of employment and using university resources. This type of claim employs the use of university resources as a criterion for determining whether an invention was created during the course of employment and does not extend common law principles. However, a second type of claim is for inventions created during the course of employment or using university resources. This means, for

15 Macquarie University, University of New England, University of New South Wales, University of New Castle, University of Sydney, University of Technology Sydney, University of Wollongong, La Trobe University, Monash University, Royal Melbourne Institute of Technology, University of Melbourne, Griffith University, Queensland University of Technology, University of Queensland, University of Western Australia, Flinders University, University of South Australia, University of Tasmania, Australian National University and the University of Adelaide.

example, that a university could assert ownership over an invention created by an academic outside the terms of their employment but developed in a university laboratory. This second type of claim is what Monotti describes as an 'extended ambit' claim, and significantly broadens the normal common law course of employment test.

Extended ambit claims were found in six of the 20 university policies and statutes reviewed. For example, Macquarie University's proposed IP Policy Statement provides that if a staff member creates an invention using university resources but outside the scope of his or her employment, the university may negotiate an interest in the invention. Alternatively, the staff member must reimburse the university for use of the resources. Some universities also apply a threshold test to their extended ambit claims. The University of South Australia for example claims ownership of inventions produced using a 'significant' level of university resources.

It is also worth noting that two of the universities reviewed claim ownership of inventions created by visiting scholars, where those scholars have used university resources. RMIT for example claims a share, the exact amount of which is 'to be determined by the Intellectual Property Committee having regard to the funds, equipment, facilities or supervision provided by the University'. The University of Sydney also reserves the right to impose conditions on visitors using university resources or university-owned IP. These conditions include assigning to the university any IP created.

ii) Students

Of the 20 universities reviewed, none claim outright ownership of student inventions. Students generally enjoy full rights to any IP they create during their studies.

- There are however exceptions to this rule. These exceptions may be when a student:
- Uses a substantial amount of university resources;
- Uses university-owned IP;
- Receives project-specific funding from the university or a third party engaged by the university; or
- Participates in a university run research project.

In these situations, some universities assert ownership, while others reserve the right to negotiate an ownership agreement with the student.

1.3.3 Agreements with external bodies providing funding

Almost all the university IP statutes and policies examined provide that where the university has a funding agreement with an external organisation, that agreement will prevail over the provisions of the policy or statute.¹⁶ This is particularly important given that around 40% of university research is financed from sources other than general university funds.¹⁷ These sources include private enterprise and government funding agencies.

Regarding agreements with private enterprise, there is a huge range of possible ways ownership might be allocated between the university, the enterprise, university staff and university students. It is beyond the scope of this report to enter into a detailed analysis of privately funded research.

Universities can receive money through funding agreements with the government in a number of ways. The principal sources of funding for universities are grants from the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC). Other important funding agencies are statutory Research and Development Corporations (RDCs) created under the *Primary Industries and Energy Research and Development Act 1989* (Cth) (the *PIERD Act*).¹⁸ Universities may also receive funds through other schemes, such as the Cooperative Research Centre (CRC) scheme administered by the Department of Education, Science and Training or through overseas funding from the National Institutes of Health (NIH) in the United States. Last year, the NIH funded approximately 44 research projects in Australia, worth \$15 million.¹⁹

Funding agreements with the ARC and NHMRC are relatively straightforward. In August 2001, the *National Principles of Intellectual Property Management for Publicly Funded Research* were published.²⁰ The *National Principles* were developed by a group of organisations involved with providing and managing

16 This includes the IP statute of the University of Melbourne. As a consequence, the University of Melbourne's provision that assigns ownership to the employee inventor has limited application because over 80% of their research funding comes from external bodies. Thus most patent ownership is not dealt with under their IP statute but under the National Principles or pursuant to contractual provisions with third parties.

17 Online at <http://www.dest.gov.au/archive/highered/statistics/resexp98.pdf>.

18 Australian Pork Ltd, Australian Wool Innovation Pty Ltd, Cotton R&D Corporation, Dairy R&D Corporation, Fisheries R&D Corporation, Forest and Wood Products R&D Corporation, Grains R&D Corporation, Grape and Wine R&D Corporation, Horticulture Australia Ltd, Land and Water Australia, Meat and Livestock Australia, Rural Industries R&D Corporation, Sugar R&D Corporation, Tobacco R&D Corporation.

19 *The Age*, June 14 2002.

20 National Principles of Intellectual Property Management for Publicly Funded Research, (2001).

public funds for research, including the ARC and NHMRC, the Department of Education, Training and Youth Affairs (now the Department of Education, Science and Training), the Department of Industry, Science and Resources (now the Department of Industry, Tourism and Resources), and the Australian Vice-Chancellors Committee (AVCC). The *National Principles* reflect a unified approach to the management of IP rights arising from publicly funded research where that research is funded by ARC and NHMRC grants.

The *National Principles* provide that research institutions should have policies in place governing the ownership, protection and exploitation of IP. These policies will ensure that IP is identified at an early stage, and that protection is not prejudiced by the premature disclosure of new inventions. Regarding ownership, the *National Principles* state:

Recognising the Common Law rights of research institutions as employers, the ownership and associated rights of all IP generated by the NHMRC and the ARC supported research will initially be vested in the research institutions supporting the grants.

Thus, a university can claim ownership of inventions arising from ARC and NHMRC funded research because any funding agreement will override the university's IP policy and vest ownership in the university. Similarly, while CRCs are not expressly party of the *National Principles*, the model CRC agreement with the Commonwealth provides that intellectual property shall be vested in the joint venture and not the government.²¹

RDCs on the other hand have slightly more complex (and less transparent) arrangements for allocating ownership in projects that they fund. Generally, RDCs have a policy of not granting ownership rights to universities or private research institutions that receive their funds. This general position is exemplified by one of the few RDC policies to be available to the public, that of the Rural Industries Research and Development Corporation (RIRDC). The RIRDC has indicated that, if it funds a research project and the results of that project are successfully commercialised, it will normally expect to own a share of the intellectual property. The RIRDC will negotiate its share on a case-by-case basis when the funding agreement is being drawn up. The RIRDC recognises a need to balance the desire of research institutions (and their investors) to have exclusive rights over their inventions, with the public interest in having access to the results of publicly funded research.²² Consistent with its policy of claiming ownership or part ownership, the RIRDC has resolved to establish procedures to identify inventions that might

21 Cooperative Research Centre.

22 RIRDC, policy 5.

be suitable for commercialisation, and mechanisms to monitor the progress of research throughout each project.²³

Currently, Australian universities who receive financial support from NIH are entitled to any intellectual property that is developed from these funds. However, NIH are planning to modify patent rights clauses for contracts and grants with foreign entities (such as Australian universities) in order to provide the US government with the right and title to subject inventions awarded to the foreign entity.²⁴ The new policy would allow Australian universities to elect to retain title to their subject inventions in Australia while the NIH can claim the entire right, title and interest in all other countries. While the universities may request greater rights on a case-by-case basis, the change in NIH policy would dramatically curtail the entitlement of universities to the IP rights of inventions developed using NIH funding. Australian funding agencies, such as NHMRC, have expressed their concerns that such a policy will act as a disincentive to future international collaboration.²⁵ As a result of strong lobbying by the Australian research community, the NIH has agreed to defer implementation of the policy for 12 months to allow further time for discussion.²⁶

As a result, it may be observed that there is some lack of uniformity among government agencies in dealing with inventions created pursuant to government funding agreements. The reason for this lack of uniformity could be the differences in the functions and powers of each agency. Each government funding agency is created under enabling legislation which sets out its role and responsibilities. Agencies like the ARC and NHMRC are established to provide general research policy advice to the government and administer research grant schemes.²⁷ RDCs by contrast are established as bodies corporate with the capacity to hold proprietary interests under the *PIERD Act*.²⁸ RDCs are not only empowered to provide research policy advice, but also to facilitate the commercialisation of research that they fund.²⁹

23 RIRDC, policy 6.

24 NIH Press Release, 2002.

25 Douez, 4.

26 NHMRC, 'NHMRC Welcomes NIH Deferment of IP Policy Change' (Press Release, 2 August 2002).

27 NHMRC Act 1992 s 7, ARC Act 2001 s 6.

28 *Primary Industries and Energy Research and Development Act 1989* (Cth) s 10.

29 *Primary Industries and Energy Research and Development Act 1989* (Cth) s 11(e).

1.3.4 Summary of ownership claims in universities

To summarise the discussion thus far, universities can claim ownership of inventions created by academic staff in the course of their employment, both at common law and under university IP policies and statutes. Many IP policies and statutes also allow universities to claim ownership of all inventions created using university resources. Universities can claim ownership of inventions arising from publicly funded research undertaken pursuant to an agreement with a government funding agency such as the ARC or NHMRC.

Academics have no common law rights to the inventions they create in the course of their employment. In two universities however, academics can claim full or part ownership under university IP statutes. Academics cannot ordinarily claim ownership of the results of publicly funded research, where funds are provided through an agreement with the ARC or NHMRC.

Students are entitled to claim ownership of inventions created during their studies. Some university IP statutes and policies modify this general rule, particularly where a student has relied substantially on university resources.

As indicated by the *National Principles*, government funding agencies such as the ARC and NHMRC do not claim ownership of inventions created during the course of research. The position will normally be different where a government Research and Development Corporation such as the RIRDC is concerned.

1.3.5 Ownership and the decision to commercialise

The foregoing discussion demonstrates that universities, staff and students may all be able to claim ownership of inventions arising from publicly funded research depending on the circumstances. The final issue to consider is what subsequently happens to that ownership, which will depend on whether and how the party claiming ownership decides to commercialise the invention.

i) Staff

In the two universities reviewed where staff are able to claim ownership of patents arising from publicly funded research, the decision to commercialise affects patent ownership in different ways.

At the University of Melbourne, staff members are free to assign ownership or commercialise as they wish, provided they notify the University in writing. Staff members or their assignees must grant the University a non-exclusive licence to use the invention for educational purposes, and the University retains a right to receive a share of the gross revenue from commercialisation

if that revenue exceeds \$50,000. If a staff member fails to commercialise, the University may require that staff member to grant the University a non-exclusive licence to exploit the invention. The staff member will be allocated a share of the revenue.

At the University of Technology Sydney, although staff members share ownership with the University the decision to commercialise is really made by the University itself. The University can for example require a staff member to execute any document which the University deems necessary for the purposes of commercialisation, or assign all their ownership rights to the University in return for a share of profits. Because the decision to commercialise is really made by the University it is better dealt with in (iii) below.

ii) Students

As noted above students can claim ownership of most inventions produced during their studies. They are free to seek patent protection for and commercialise these inventions without having their ownership rights affected. Some universities however encourage students to make use of university services which assist the commercialisation process. For example, the University of New England gives students the option of assigning ownership rights back to the University, in which case the University will manage commercialisation for the student and give them a share of the revenue.³⁰

iii) Universities

Ownership arrangements are most complex when a university asserts ownership of an invention.

A majority of the universities reviewed have statutes and policies in place to ensure that the decision to commercialise an invention is made within a certain period of time. Time limits range from 30 days³¹ to 12 months,³² with most universities providing for an eight week decision making period.³³

³⁰ Also RMIT.

³¹ Australian National University.

³² Macquarie University.

³³ Newcastle, Sydney, UTS, QUT, UNSW. Also Wollongong 120 days, Griffith 6 months, UWA and USA 90 days.

If the time period lapses and the university has failed to or decided not to commercialise the invention, a majority of universities (including the “great 8” universities with the highest research expenditure)³⁴ provide that the inventor may reclaim ownership and pursue commercialisation. This reassignment of ownership could be unconditional, or subject to a number of different conditions. The two most common conditions are the university receiving an agreed share of the revenue from commercialisation, and/or the inventor reimbursing the university for any costs it has incurred.

In the event that an invention is successfully commercialised, most universities grant the inventor a right to receive a certain share of the revenue. Revenue may be spread between one or more of the university, the inventor, the inventor’s faculty or department, and any university owned company that is involved in commercialisation. Scales for distribution vary widely, and some require development and marketing costs to be paid back before any revenue distribution occurs. For example, if an academic at Macquarie University creates an invention which the university successfully commercialises, under Macquarie’s proposed IP policy, after expenses are paid the academic inventor will get 50% of the revenue, the university 25%, the relevant division(s) 10%, and the university’s commercialisation company—Macquarie Research Limited—15%. Commercialisation companies are employed by seven of the 20 universities reviewed by this report, in order to assist the development and marketing of the invention.

It is also worth noting that if the university has derived title to an invention under an agreement with a government funding agency such as the ARC or NHMRC, the *National Principles* do not affect the allocation of ownership rights following commercialisation. However, the *National Principles* do oblige research institutions ‘to consider the most appropriate way of exploiting the IP generated from publicly funded research’ and ‘to recognise the rights and needs of all stakeholders involved’. CRC agreements place a more explicit obligation on researchers to ‘[c]ommercialise or otherwise make available any Intellectual Property in Contract Material to maximise the benefits accruing to Australia’. RDCs on the other hand will usually reserve some degree of power to determine the appropriate method of commercialisation. The RIRDC for example might choose to assign rights to the research institution outright, or grant an exclusive licence, non-exclusive licence or equity partnership.³⁵

34 The “great eight universities” are the University of New South Wales, University of Sydney, Monash University, University of Melbourne, University of Queensland, University of Western Australia, Australian National University and the University of Adelaide.

35 RIRDC, policy 9,10.

1.3.6 Co-ownership

Many discoveries that occur in universities involve research collaboration; either between staff members or between staff and students. In situations where more than one person contributes to the making of an invention, the possibility of co-ownership of patents arises. The *Patents Act 1990* (Cth) provides that a patent can be jointly owned by two or more persons.³⁶ Subject to an agreement to the contrary, each patentee is entitled to an equal and undivided share in the patent and is entitled to exercise the exclusive rights given by the patent.³⁷ However, none of the patentees can grant a licence under the patent, or assign an interest in it, without the consent of the others.³⁸

The potential for co-ownership (or fragmentation of ownership) in universities can lead to significant practical problems for the process of commercialisation of an invention. The requirement that co-owners need the consent of the other co-owners in order to grant licences can stall or even stop commercialisation. This predicament can be exacerbated if the patentees are not in the same department or university. Although the Act provides recourse to the Commissioner in the event of a conflict between patentees,³⁹ this process can be long and drawn out. Therefore, co-ownership is only productive and efficient if the patentees are unanimous in their decisions.

Another problem with co-ownership is the possibility of uncertainty as to title to the invention, which may dissuade private sector investment in commercialisation. Private sector partners may be reluctant to negotiate with a patentee if there is a possibility that more researchers may appear to claim co-ownership and to reject the agreement that was negotiated between the parties. Thus, the adoption of a policy by universities of devolving IP to academic staff is not ideal due to the undesirable practical consequences of fragmented ownership.

³⁶ *Patents Act 1990* (Cth) s16.

³⁷ *Patents Act 1990* (Cth) s16(1)(a), s16(1)(b).

³⁸ *Patents Act 1990* (Cth) s16(1)(c).

³⁹ *Patents Act 1990* (Cth) s17.

1.4 Ownership in government research organisations

Government research institutions, such as the Commonwealth Scientific and Industrial Research Organisation and the Defence Science and Technology Organisation, receive public funds directly from the government. For government research institutions, in the absence of a uniform executive or legislative policy, it is necessary to examine two sources of ownership: general common law principles and institutional policies. It is also necessary to consider the effect of commercialisation (or non-commercialisation) of the invention. This analysis was conducted by surveying a sample of five government research organisations.⁴⁰

1.4.1 General principles in the context of government research organisations

Under general common law principles, government research institutions may claim ownership of inventions created by employees in the course of their employment. It was noted above that universities face two problems applying these general principles to academic employees: whether the academic is in an employment relationship with the university, and whether the invention was created in the course of employment. The same difficulties face government research institutions. Hence, like universities, some government research institutions have enacted IP policies to forestall employer/employee conflicts.

1.4.2 Government research organisation policies

All the surveyed government research organisations have a formal intellectual property policy for staff, reinforced by the inclusion of a section on intellectual property rights within all employment contracts for new staff members. Most of the organisations also have internal documents dealing with intellectual property ownership, such as business guidelines or commercial practices manuals.

In concurrence with common law principles (and university practice), all the government research organisations claim full ownership of inventions created by employees in the course of their employment. The definition of “in the

⁴⁰ Two of these organisations were Australian Nuclear Science and Technology Organisation (ANSTO) and Geoscience Australia (GA). The other three organisations completed the survey on the basis that the information would not be linked to their organisation, and thus accordingly these organisations cannot be named.

course of employment” is defined by ANSTO as including activities outside normal working hours provided there is a “direct relationship to official duties.”

The prevalence of extended ambit claims (inventions created by employees outside the normal terms of their employment, but using the organisation’s resources), was higher in government research organisations than universities. Two of the surveyed organisations claim full ownership of the invention in these circumstances, whilst one of the organisations shares the ownership between the organisation and the inventor and another reviews ownership on a case by case basis with the inventor, supervisor and IP officer. One of the organisations has no policy on this issue as there has been no record of such events. None of the organisations assign full ownership to the employee inventor.

Most of the organisations impose an obligation upon employees, under all circumstances, to notify their employer upon the development of a potentially valuable invention and to keep such information confidential so as not to jeopardise the patentability of the invention. Thus, the premature publication of research, which may prejudice patent applications, does not seem to be a problem for government research organisations, as it is in universities. It is the policy of only one organisation, Geoscience Australia, that this obligation does not apply where inventions are created partially offsite and partially with the Geoscience’s facilities or time. In the other four organisations, the obligation is irrespective of the type of technology or invention.

1.4.3 Agreements with external bodies providing funding

Government research organisations all enter into agreements with other organisations to undertake research projects. In such cases, patent ownership rights with the third party are generally negotiated on a case by case basis before commencing work on the project. Some organisations express a preference for maintaining full ownership where possible whilst giving the other organisation non-exclusive rights to use the invention. Others agree to a share in the ownership in proportion to the respective inputs in the project. By contrast, the policy of one organisation is that the party best able to exploit them should retain IP rights and thus that organisation only acquires the rights needed for their effective operation. Their IP policy aims to promote sustainable Australian industry by cooperatively exploiting IP, and so IP rights generated under contracts with this organisation are generally owned by the industry.

1.4.4 Ownership and the decision to commercialisation

There is a large variance in the approach that government research organisations take towards the ownership and distribution of revenue generated by commercialisation of the invention. One institution states that commercialisation is carried out separately from research because the organisation cannot be perceived as commercial. Whilst commercialisation is still possible in this particular organisation, the approval of the Minister is required and thus commercialisation does not generally occur within this organisation but may be taken up by industry. Likewise, another organisation states that their use of the technology and the development of Australian industry are the prime objectives, and commercialisation by this organisation is a secondary aim. Inventors are not usually included in the revenue distribution of this organisation, but their contributions are recognised in other ways. Only one organisation allocates a set percentage of the net proceeds to the inventor (30% up to \$100,000 and 2.5% thence). Another organisation is currently considering a scheme where the inventor would share in the proceeds of the invention.

Inventions that the organisations choose not to commercialise are offered for sale, assignment or exclusive licence if they are not needed for further use. Two of the organisations require Ministerial approval to transfer IP rights.

1.4.5 Summary of ownership claims in government research organisations

In summary, the allocation of IP ownership rights in private research institutions will be determined by funding agreements. The *National Principles* will apply to research that is funded by ARC or NHMRC and thus IP created using such funds will be vested in the private research institution.

Just as is the case with universities, government research organisations can claim ownership of inventions created by employees in the course of their employment under the common law and under their internal IP policies. Some IP policies in these organisations also allow the organisation to claim ownership of inventions created by employees outside their normal terms of employment but using the organisation's resources, while one shares ownership between the organisation and the inventor and another reviews the situation on a case to case basis. None of the IP policies in these organisations allow employees to claim full ownership of their inventions whether within and outside their course of employment (but using the organisation's resources). Where there is an agreement with another party to undertake a research project, patent ownership rights are generally negotiated on a case to case basis (subject to the organisation's IP policy) before the commencement of the project.

Commercialisation of inventions is an objective of some of the organisations, and in these cases, the inventor or third party may be entitled to a proportion of the ownership rights and proceeds on a case by case basis. Other organisations did not consider the commercialisation of their IP to be important, and thus either chose not to commercialise or assigned their IP rights to their industry. Inventions that the organisations did not commercialise were sold, assigned or licensed to third parties.

1.5 Summary

In Australia, universities, other private research institutions and government research organisations can claim ownership of inventions created by academic staff, in the course of their employment, both at common law and under IP policies and statutes. Those research bodies can also claim ownership of inventions arising from publicly funded research undertaken pursuant to an agreement with a government funding agency such as ARC or NHMRC. Under the *National Principles*, the ownership of inventions created during the course of research is initially vested in the research institution. The *National Principles* provide a unified approach to the management of IP arising from research funded by ARC and NHMRC and provide that research institutions should have policies in place governing the ownership, protection and exploitation of IP. In contrast to the policy adopted by the ARC and NHMRC under the *National Principles*, Government Research and Development Corporations adopt a policy of claiming part or full ownership of project results.

Under the common law, academic staff members cannot claim ownership of the inventions they create during the course of their employment. Also, academics can not ordinarily claim ownership of results of publicly funded research where funds are provided through an agreement with the ARC or NHMRC. Students are entitled to claim ownership of inventions created during their studies, though this may be modified by university IP policies where the student has relied heavily on university resources.

2 Invention ownership in the United States

2.1 Introduction

This section will consider the ownership of patentable inventions arising from publicly funded research in the United States. It will apply the same process of analysis as for Australia in section 1, beginning with general principles of patent law, then considering how those principles work in practice in universities, other research institutions and government research organisations.

Like their Australian counterparts, universities in the United States endeavour to modify the general principles of patent law using their IP policies. In addition, where research is conducted pursuant to a funding agreement made with a federal agency, the *Bayh-Dole Act of 1980* has a major impact on the allocation of ownership rights. Other research institutions that receive public funds are also regulated by *Bayh-Dole*. *Bayh-Dole* has some impact on government research organisations, though these are principally governed by the *Stevenson-Wydler Act of 1980* and other national technology transfer legislation.⁴¹

2.2 General principles of patent ownership

In contrast to the general position in Australia, under United States common law an individual owns rights in any invention they create regardless of whether that invention was created in the course of employment.⁴²

There are two exceptions to this rule. The first is where the individual assigns to their employer any inventions they create.⁴³ Normally, this will occur under

⁴¹ Note that the term “technology transfer” is used widely in the United States while the term “research commercialisation” is used in Australia to refer to the process whereby IP created by government research organisations is transferred to the business sector. The difference between the two terms is that technology transfer is a generic term that may not necessarily involve financial gain whereas research commercialisation refers to a transfer which involves financial gain for the transferor. DETYA, 7.

⁴² Chisum, 22–11.

⁴³ Chisum, 22–11.

an express agreement between the employer and employee. However, some courts have indicated a willingness to imply an assignment agreement in certain circumstances.⁴⁴ The second exception is where the employee was ‘hired to invent’.⁴⁵ This involves considering whether the employee was engaged to solve a particular problem or directed to exercise their ‘inventive faculties’ in a specific area.

If an employer is unable to claim ownership based on these two exceptions, courts may still grant the employer a ‘shop-right’ in the invention based on any non-inventive contribution made by the employer (such as laboratory space or facilities).⁴⁶ This gives the employer a non-exclusive, non-transferable royalty free license to use the employee’s invention for a limited period.

2.3 Ownership in universities

Ownership of inventions in the university context is affected by four main sources:

- The general principles mentioned in 2.2 above
- University IP policies, which endeavour to modify the general principles and allow the university to make broader ownership claims
- External agreements with private enterprise providing funding for particular projects (beyond the scope of this report)
- The *Bayh-Dole Act of 1980*, which regulates ownership of inventions created pursuant to funding agreements between universities and government funding agencies

Academic staff, the university or students may be able to claim ownership based on one of these sources depending on the circumstances. Any claim for ownership will then be affected by the decision to commercialise.

2.3.1 General principles in the university context

Whether a university is able to assert ownership over an academic’s invention at common law depends on the operation of the two exceptions to employee ownership mentioned above. It is therefore relevant to ask:

- Has the academic assigned to the university rights in any inventions they create? and/or
- Is the academic ‘hired to invent’?

⁴⁴ *University Patents, Inc. v. Kligman et. al.*, 762 F. Supp. 1212 (1991) in Weidemier, 3.

⁴⁵ Chisum, 22–29.

⁴⁶ Kulkarni, 232, also 239 citing *United States v. Dubilier Condenser Corporation*.

If the university has been careful enough to require express assignment as a condition of employment, the first question might easily be resolved in favour of the university. In the absence of express assignment, the university might be able to argue implied assignment based on, for example, the academic's adherence to a university IP policy (see below), or an academic's assignment of inventions to the university in the past. United States District Courts have indicated a willingness to entertain implied assignment arguments, however their success is far from guaranteed.⁴⁷

It is also difficult to answer the second question, whether the academic employee was 'hired to invent'. Courts have indicated that the concept of being 'hired to invent' requires something more than being engaged to conduct general research in a particular field.⁴⁸ A greater degree of specificity is required.⁴⁹ Hence if the academic is engaged on normal terms, to conduct teaching, administration and research, that will not normally be enough to give the university a right to claim any inventions. The academic must be engaged with the specific obligation of inventing.

2.3.2 University policies

In the absence of a clear common law right to inventions created by academics, most universities have enacted IP policies which purport to claim ownership of inventions made using university resources and/or in the course of employment.

As in Australia, the enforceability of university IP policies in the United States can sometimes be questioned.⁵⁰ For example, if a policy has not been properly brought to the attention of a staff member, it is unlikely that the policy will have been incorporated into that person's contract of employment.⁵¹ Some universities endeavour to use national legislation such as the *Bayh-Dole Act* to justify claims of ownership. As will be seen however, that legislation only allows universities to take title to inventions created pursuant to a federal funding agreement in certain circumstances.⁵²

⁴⁷ Note Kligman case which suggests that it is open for a jury to find implied assignment based on IP policy, but only summary judgment case however.

⁴⁸ United States v. Dubilier Condenser Corporation.

⁴⁹ Chisum, 22–30.

⁵⁰ Chew, 286–293.

⁵¹ Ibid also Weidemier 6 .

⁵² Chew, 293 ff.

Assuming such policies apply however, a 1992 survey of the top 20 United States universities ranked by research expenditure describes three main approaches to claiming ownership:⁵³

- ‘Resource-provider’ approach: university claims ownership if the invention is made using university resources
- ‘Maximalist’ approach: university claims ownership if the invention is made using university resources or in the course of employment
- ‘Supra-maximalist’ approach: university claims ownership of any invention developed by an academic

The only exception to these three models is where the university makes no ownership claim at all. Harvard University for example only claims ownership of inventions primarily concerned with medical diagnostics or public health. Academics are free to patent and commercialise inventions in other fields if they wish.⁵⁴ Universities that make no ownership claims at all are rare however. A more recent survey of 62 American universities (conducted in 2000) found only one that did not claim ownership.⁵⁵

2.3.3 Agreements with external bodies providing funding: *The Bayh Dole Act*

Perhaps the most important feature of the United States’ framework is the existence of federal legislation governing inventions created with project-specific public funds. That legislation was introduced by the *Bayh-Dole Act of 1980*, and is now contained in Chapter 18 (‘Patent Rights in Inventions Made with Federal Assistance’) of Title 35 (‘Patents’) of the United States Code. The *Bayh-Dole Act* may be read in conjunction with a number of other documents, including its implementing regulations.⁵⁶

i) Rights and obligations of universities under the *Bayh-Dole Act*

Under the *Bayh-Dole Act* a university can elect to retain title to any invention created using public funds. The scheme contemplated by the *Bayh-Dole Act* involves the university (whether public or private) entering into a funding agreement with a government funding agency. In this context, government funding agency has a broad meaning under the *Act*, and can encompass any

53 Chew, 273ff.

54 Harvard University, Statement of Policy in Regard to Inventions, Patents and Copyrights.

55 Thursby et al.

56 37 CFR 401 (1990).

executive department, military department or statutory corporation.⁵⁷ The *Bayh-Dole Act* specifies certain provisions that must be incorporated into the funding agreement, which grant a right of ownership to the university subject to a number of obligations. Most importantly, the university must:

- Disclose the invention to the government funding agency within a reasonable period of time (and the agency is obliged to keep that information confidential to enable patent applications to be filed);
- Elect whether or not to retain title within a reasonable period of time;
- If retaining title, agree to file a patent application within a reasonable period to time (and include in the application a statement that the invention was made with federal assistance);
- Seek agency approval if any rights in the invention are to be assigned (unless the assignment is to an organisation in the business of managing inventions);
- Endeavour to license the invention to small business firms;
- Give preference to United States industry when granting licences to sell or use the invention;
- Share royalties from commercialisation with the inventor; and
- Spend any resulting profits on scientific research.

These obligations are spelt out in greater detail by the regulations implementing the *Bayh-Dole Act*, which prescribe model clauses to be incorporated into every funding agreement.⁵⁸ For example, under the model clauses the notion of a ‘reasonable period of time’ is articulated with greater precision. A university is required to notify the relevant government funding agency of the existence of a new invention within two months of the invention first being reported to the university by the inventor. The university must then elect whether or not to take title within two years, and file a patent application within one year of electing to take title.

ii) The relationship between the university and the government funding agency

If the university does not comply with the above obligations or chooses not to take title, the *Act* and its implementing regulations provide for the government to receive title by giving written notice. The invention will then become subject to normal rules affecting the licensing and commercialisation

57 Examples include the National Institutes of Health, the United States Food and Drug Administration, the Center for Disease Control and Prevention, the National Science Foundation, and the Air Force Office of Scientific Research.

58 Regs 401.14.

of government owned inventions, considered in part 2.4 below. The government will however consider any application made by the inventor to have ownership reassigned to them.⁵⁹

If the university complies with its obligations, it will be permitted to retain title and commercialise the invention. However, the government will still have certain minimum rights, including a non-exclusive irrevocable licence to use the invention throughout the world, plus any other rights the agency might require in the particular situation. Under the implementing regulations the university must confirm the government's non-exclusive licence in writing.⁶⁰

The government will also have 'march-in rights' which allow it to make the university grant (or itself grant) a licence to a third party in certain circumstances. These circumstances include where the university fails to commercialise the invention, where licensing is necessary for health and safety needs, or where preference for United States industry has not been observed. The march-in rights procedure is contained in the implementing regulations, and requires the government agency to notify the university in writing of their intended course of action and give the university 30 days to respond. If the university disputes the facts relied on to support the exercise of the agency's march-in rights, the matter will be referred to official fact-finding.⁶¹ There is an administrative review procedure available if the result is unfavourable to the university.⁶² March-in rights are considered in greater detail in part 2.3.4 below.

iii) Exemptions from the *Bayh-Dole* requirements

In some situations a university-government funding agreement will not have to comply with *Bayh-Dole*. One exemption that is particularly important for universities is where funds are provided primarily for educational purposes.⁶³ In that situation, the funding agency is not entitled to any rights in a resulting invention.

A second exemption is where—in the opinion of the funding agency—there are 'exceptional circumstances', such that allowing the university to retain title would ultimately compromise the policy objectives of the legislation. For example, an invention may be so important for scientific development that giving ownership to a university might not 'promote free competition and

⁵⁹ 35 USC 202(d).

⁶⁰ (f)(1) of model clauses.

⁶¹ Regs 401.6.

⁶² Act 203(2) and regs 401.6(j).

⁶³ Act 212.

enterprise without unduly encumbering future research and technology'.⁶⁴ If exceptional circumstances exist, the funding agreement between the agency and the university can depart from the *Bayh-Dole* standard. However, the regulations still provide that the agency should endeavour to incorporate the model clauses as much as possible and give universities their prescribed rights and obligations.

iv) Administration of *Bayh-Dole*

According to a 1998 report by the United States General Accounting Office (GAO), the administration of *Bayh-Dole* is largely decentralised. Primary responsibility for compliance is given to universities themselves. Universities are left to establish their own policies and procedures to implement the *Act*. Most universities have established special administrative units to handle the reporting, licensing and monitoring of inventions.⁶⁵ The Massachusetts Institute of Technology (MIT) for example does this through its Technology Licensing Office.⁶⁶

Although the Department of Commerce is largely responsible for the policy behind *Bayh-Dole*, there is no single government department responsible for monitoring university compliance with the *Act*. Each government funding agency administers the *Act* in relation to its own funding agreements. These administration activities are generally limited to collecting and managing the information provided by universities.⁶⁷ Most agencies rely on universities to provide accurate information and make no further inquiries, unless the results of the research clearly indicate an obligation under *Bayh-Dole* has not been complied with.

Some government funding agencies participate in a computerised monitoring system known as Interagency Edison, first created by the National Institutes of Health. Using Interagency Edison, universities and other grant recipients can disclose information about inventions to government agencies by adding entries to an online database. The database covers all the significant obligations of the university under the *Bayh-Dole Act*. At a glance, the funding agency can see, for example, whether a university has taken title to an invention, whether a patent application has been filed, whether the invention has been licensed and so on. As at May 2002, fourteen government agencies had subscribed to Interagency Edison.⁶⁸

64 Act 200.

65 GAO, 2.

66 Massachusetts Institute of Technology, Technology Licensing Office
<<http://web.mit.edu/tlo/www/>>.

67 GAO, 4.

68 Interagency Edison, (2002) <<http://www.iedison.gov/>>.

While many government funding agencies adopt a relaxed attitude to disclosure and reporting of inventions, most insist that if any inventions are disclosed, the government gets confirmation of its non-exclusive licence to use them.⁶⁹ Once confirmation is received, information about each license is provided to the Department of Commerce's Patent and Trademark Office, which maintains a Government Register.

2.3.4 Ownership and the decision to commercialise

To summarise the foregoing discussion, while at general law an academic would normally be entitled to ownership of any invention they create, universities usually claim ownership by requiring an express assignment of rights, or pursuant to an IP policy which is incorporated into the contract of employment. Where an invention is created pursuant to a government funding agreement, the *Bayh-Dole Act* gives universities a clear mandate to take ownership. If the university does not comply with one of its obligations under *Bayh-Dole* or decides not to take title, the government can receive title by giving written notice. The inventor can apply to the government for title.

The remaining issue to consider is how ownership is affected by the decision to commercialise the invention. It is useful to focus on the decision to commercialise as made by a university claiming ownership under an IP policy or under the *Bayh-Dole Act*.

i) Inventions not falling under the *Bayh-Dole Act*

Where the invention is created in the normal course of an academic's employment and not pursuant to a federal funding agreement, commercialisation will be regulated by the IP policy of the university concerned. As with Australian universities, there is a diverse range of possible approaches, and a thorough review would be beyond the scope of this report. Generally speaking however, if the relevant invention does not fall under *Bayh-Dole*, the inventor will clearly be in a better position. If the university decides not to commercialise, there is no need to consider the interests of the government and the inventor will have a good chance of regaining title. If commercialisation occurs and revenue is generated, normally the inventor will receive royalties in accordance to the same university policy as for inventions under *Bayh-Dole*.

⁶⁹ GAO, 7.

ii) Inventions falling under the *Bayh-Dole Act*

Where the invention is made pursuant to a funding agreement, the *Bayh-Dole Act* has an important impact on the commercialisation process.

If the university decides to commercialise the invention, as noted above the university will have to comply with certain prescribed obligations. Any assignment of rights in the invention so that it can be commercialised must be approved by the funding agency. Approval would not be required however where the invention is assigned to a university commercialisation company, which has the primary function of managing inventions. Any licensing of rights in the invention must also give preference to small business firms and United States industry. Royalties from commercialisation must be shared with the inventor, and the university's profits must be applied to further scientific research.

The practical implementation of these obligations may however be different. In relation to giving priority to small business for example, the 1998 GAO report found that of the ten major research universities reviewed, none had a policy in place to implement this obligation. All the universities reviewed did however have procedures in place for sharing royalties between the inventor and other relevant contributors, such as the inventor's faculty or department. Royalties are typically shared according to a progressive scale depending on the revenue generated. For example, at Harvard University 35% of the first \$50,000 goes to the inventor, while 30% goes to the inventor's department, 20% to the inventor's school and 15% to the university. For revenue above \$50,000 those proportions change to 25%, 40%, 20% and 15% respectively.

If the university does not commercialise an invention, as mentioned above this would give the government grounds for exercising its march-in rights. There is only one recorded instance of a petition being made to a government funding agency to do this. In March 1997, Cellpro Inc asked the National Institutes of Health (NIH) to grant a licence to Cellpro so it could continue to sell an approved method for purifying bone marrow stem cells, useful in the treatment of cancer. The method and its associated technology had been developed by researchers at Johns Hopkins University. After Hopkins took infringement action against Cellpro the latter sought to overcome the effect of an injunction by obtaining a compulsory licence to use the technology.

Cellpro's two key arguments were that Hopkins or its licensee had not taken effective steps to commercialise the technology, and that a compulsory licence was necessary for public health reasons to keep Cellpro's own product in the market. Regarding the commercialisation argument, Hopkins had licensed the technology to Baxter Healthcare (incidentally not a small business), and Baxter had failed to apply for regulatory approval of the

technology. Meanwhile, Cellpro had developed and obtained approval for its own version. Cellpro therefore argued that Baxter's 'inordinate delay' in commercialising the invention justified their petition. Hopkins on the other hand argued that Baxter had taken sufficient steps to commercialise as it had sublicensed the technology to two other companies and obtained regulatory approval in Europe.

Ultimately NIH refused Cellpro's petition. NIH was persuaded by two facts: Hopkins had modified the injunction to allow continued use of Cellpro's products (thus addressing the public health argument), and Baxter had quickly sought approval for its own product (thus addressing the non-commercialisation argument). Hopkins and Baxter effectively eliminated the need for NIH intervention through their voluntary action. The Cellpro controversy perhaps demonstrates how the threat of a government agency exercising its march-in rights could spur a university or its licensee to step up the commercialisation process. There are negative aspects of the Cellpro case however, including the attempted use of the march-in provisions to circumvent what ultimately became a successful infringement action.

Because of the way the Cellpro case progressed, it is less useful for gauging the willingness of government funding agencies to exercise march-in rights where a university has totally failed to commercialise an invention. According to the 1998 GAO report however, agency officials have indicated that if a university does not commercialise an invention then commercialisation would rarely appeal to the government (or any other party).⁷⁰ This makes some economic sense, and may explain why there has been no reported instance of a government agency licensing an invention that a university has failed to commercialise.

2.4 Ownership in other research institutions

Discussion thus far has focused on patent ownership and commercialisation in universities. It is necessary to consider two other types institutions that receive public funds: other research institutions and government research organisations.

⁷⁰ GAO, 8.

2.4.1 Other research institutions

All research institutions that receive funding from government funding agencies are subject to *Bayh-Dole*. The framework considered in the context of universities above thus has a very broad application.

The *Bayh-Dole Act* is expressed to apply to funding agreements made between government agencies and ‘contractors’. Under the legislation itself, the term ‘contractor’ is defined as any person, small business firm or non-profit organisation.⁷¹ The definition of ‘small business firm’ is contained in Title 15 (‘Commerce and Trade’) of the United States Code⁷² and its implementing regulations,⁷³ and varies according to the industry concerned.⁷⁴ ‘Non-profit organisation’ means universities and other higher education institutions, and various other organisations exempt from income tax under federal or state law.⁷⁵

While small businesses and universities are covered under the *Act* itself, large businesses are bound by *Bayh-Dole* owing to a *Memorandum to the Heads of Executive Departments and Agencies* issued by President Reagan in 1983.⁷⁶ This Presidential Memorandum requires agency policy towards *any* invention created using federal funds to be the same as for inventions subject to *Bayh-Dole*.

2.4.2 Government research organisations

Invention ownership in government research organisations is governed exclusively by national technology transfer legislation.

i) Ownership claims in government research organisations

The United States government can claim ownership of inventions created by public servants under the authority of *Executive Order No 10096* and its implementing regulations.⁷⁷ *Executive Order No 10096* was issued by the President in 1950 and provides that the government obtains

the entire right, title and interest in and to all inventions made by any Government employee (1) during working hours, or (2) with a contribution by the Government of facilities, equipment, materials, funds or information, or of time or services of other Government

71 35 USC 201(c).

72 15 USC 632.

73 13 CFR 121.201.

74 35 USC 201(h).

75 35 USC 201(i).

76 1983 Pub Papers 248, 252 (Feb 18 1983).

77 Lacy, 16.

*employees on official duty, or (3) which bear a direct relation to or are made in consequence of the official duties of the inventor.*⁷⁸

An exception is provided however where the government's contribution is not sufficient to justify the assignment of ownership. In that situation, the employee shall retain title and the government will only hold a non-exclusive, royalty-free licence to use the invention.

In 1988 the Department of Commerce issued regulations to administer *Executive Order No 10096*, entitled 'Uniform Patent Policy for Rights in Inventions Made by Government Employees'.⁷⁹ These regulations provide that if the government research organisation decides to leave title in the inventor subject to a non-exclusive licence, the organisation can impose on the inventor certain conditions, including that the invention not be assigned to any foreign corporation.⁸⁰ The regulations also contain an appeal process for aggrieved employees.

If the government decides not to claim ownership or a non-exclusive licence pursuant to the *Executive Order* or its regulations, then full title remains with the employee inventor.⁸¹

ii) Obligations of the government once ownership is claimed

Once a government research organisation claims ownership of an invention, that organisation will be under an obligation to commercialise it where appropriate. This obligation is contained in Chapter 63 ('Technology Innovation') of Title 15 ('Commerce and Trade') of the United States Code.⁸² Chapter 63 of Title 15 was first introduced under the *Stevenson-Wydler Technology Innovation Act of 1980* and is more commonly known by that name.

In addition to placing an obligation on government organisations, laboratory directors and employees to commercialise government inventions, the *Stevenson-Wydler Act* establishes various administrative structures to encourage commercialisation. For example, since the *Act* was introduced in 1980 each federal laboratory has been required to establish an Office of Research and Technology Applications to manage the development of potentially useful inventions.⁸³ The National Technical Information Service⁸⁴

⁷⁸ 'Uniform Government Patent Policy for Inventions by Government Employees', Executive Order No 10096, January 23 1950, reprinted at 35 USC 266 (2002).

⁷⁹ 37 CFR Part 501.

⁸⁰ 37 CFR 501.7.

⁸¹ Executive Order 1(d), regs 501.6(a)(4).

⁸² 15 USC 3710d.

⁸³ 15 USC 3710(b).

⁸⁴ U.S Department of Commerce, National Technical Information Service.

within the Department of Commerce has also been empowered to collect and disseminate information about government owned inventions to the public. Additionally, amendments to *Stevenson-Wydler* in 1986 formally provided for the creation of the Federal Laboratory Consortium for Technology Transfer (FLC).⁸⁵ Among the functions of the FLC are to advise government research organisations on how they can successfully implement technology transfer programs and to provide a clearinghouse for requests for federal laboratory assistance.

iii) Government claims ownership and fails to commercialise

If the government research organisation claims ownership of an invention and fails to file a patent application or does not intend to commercialise the invention, then the employee inventor can obtain title (subject to the government obtaining a non-exclusive licence). This key principle became part of the *Stevenson-Wydler Act* as a result of amendments made by the *Federal Technology Transfer Act of 1986*.

iv) Government claims ownership and commercialises

If the government research organisation pursues commercialisation, various legislative provisions will apply.

First, there is a regulatory regime dealing with the ability of the organisation to grant licences for the development of the invention. Government research organisations were generally authorised to apply for patent protection and grant licences over government owned inventions by the original *Bayh-Dole Act* in 1980.⁸⁶ There were certain restrictions on the granting of licences however. These restrictions have changed over time, and were most recently amended by the *Technology Transfer Commercialisation Act of 2000*.⁸⁷ Now, organisations can only grant licences if:

- It is necessary to bring the invention to practical application or otherwise promote its utilisation;
- The public will be served by the granting of the licence, and the proposed scope of exclusivity is no greater than reasonably necessary;
- The licensee makes a commitment to achieve commercialisation within a reasonable period of time;
- The licence will not have anti-competitive effects; and

85 Federal Labs Consortium, Federal Labs Consortium for Technology Transfer.

86 35 USC 207(a).

87 Pub Law 106-404.

- If a foreign patent is being licensed, the interests of the United States in foreign commerce will be enhanced.

Preference must be given to licensees who undertake to manufacture products in the United States, and also to small businesses (although licences can still be granted to other government agencies).⁸⁸ A licence agreement must contain various terms and conditions, including a right for the government research organisation to revoke the licence if the licensee does not observe its undertaking to commercialise the invention.⁸⁹ Prospective licensees must supply to the institution a plan for the development and marketing of the invention.⁹⁰ The Department of Commerce has issued regulations for the implementation of this licensing regime.⁹¹ The regulations prescribe some other conditions for licences, including that they be non-assignable without approval by the organisation.⁹²

As an alternative to using the licensing regime to pursue commercialisation, government research organisations can enter into Cooperative Research and Development Agreements (CRADAs) with the private sector. Government research organisations were first authorised to do this under the *Federal Technology Transfer Act of 1986*. The CRADA scheme involves government laboratories providing personnel, equipment, facilities or other resources (apart from funding), in exchange for funding and/or resources from collaborating parties. Government research organisations can assign or license inventions made under a CRADA to the collaborating party, subject to the government retaining a non-exclusive licence to use them. Owing to amendments made by the *Technology Transfer Commercialisation Act of 2000*, government research organisations can license previously created inventions as part of a new CRADA.⁹³

If an invention is successfully commercialised under a licensing arrangement or CRADA, further legislative provisions will affect the distribution of royalties. Since the enactment of the *Federal Technology Transfer Act of 1986*, government research organisations have been permitted to collect and distribute royalties from commercialisation.⁹⁴ Institutions must pay the first \$2,000 and at least 15% of any additional royalties to the inventor or co-inventors.⁹⁵ A maximum of \$150,000 can be received by each employee.⁹⁶

88 35 USC 209.

89 35 USC 209(d)(3).

90 35 USC 209(f).

91 'Licensing of Government Owned Inventions' 37 CFR 404.

92 37 CFR 404.5(a)(3).

93 TTCA 2000 (PL 106-404) s 3, now in 15 USC 3710a(b)(1).

94 15 USC 3710c.

95 15 USC 3710c(a)(1)(A)(i).

96 15 USC 3710c(a)(3).

A reward can also be provided to any person who substantially increased the technical value of the invention.⁹⁷ Once employees have been paid, the agency should transfer any remaining royalties to its laboratories.⁹⁸ If the total royalties collected exceeds 5% of the agency's annual budget, 75% of the excess must be paid to Treasury.⁹⁹

2.5 Summary

A complicated framework regulates the ownership of inventions arising from publicly funded research in the United States. The table overleaf provides a brief summary of the important factors to consider in determining how rights to an invention are allocated.

In conclusion, the United States framework is characterised by a number of important themes. These include:

- The obligatory nature of commercialisation, in particular for universities under *Bayh-Dole* and government agencies under *Stevenson-Wydler*.
- Administrative structures to promote and encourage commercialisation—established in universities probably as a result of *Bayh-Dole*, and established in government research organisations as a result of *Stevenson-Wydler*
- Provisions that give preference to United States industry and small businesses throughout the commercialisation process.
- Royalty-sharing between the inventor and their employer (be it the government or a university/other institution) to provide an incentive for the creation of inventions with practical use.
- Retention of a non-exclusive, royalty-free licence by the government in most inventions created using public funds.

97 15 USC 3710c(a)(1)(A)(ii).

98 15 USC 3710c(a)(1)(B).

99 15 USC 3710c(a)(2).

Distribution of Public Funds			
	To universities for their core operational costs.	To a contractor (university /private research institution) pursuant to a project specific funding agreement with a . government funding agency	To government research organisations for their core operational costs.
SOURCE LAW			
What sources of law apply?	Common law (modified by university IP policies).	Bayh-Dole Act (Chapter 18, Title 35 of US Code).	Executive Order 10096. Stevenson-Wylder Act (Chapter 63, Title 15 of US Code) and amending legislation.
OWNERSHIP			
Can the inventor claim ownership?	Usually the inventor's common law rights will have been assigned to the university.	Agency has discretion to give inventor ownership if university elects not to take title.	Only if the government has not made enough of a contribution to justify government ownership (and subject to the government retaining a non-exclusive licence).
Can the employer of the inventor claim ownership?	University usually claims full ownership pursuant to IP policy.	Contractor can claim ownership subject to government's non-exclusive licence.	Yes
Can the government claim ownership?	No.	Yes, the funding agency can claim if university elects not to take title, or if march-in rights are exercised.	Yes, the research institution can claim as employer of the inventor.
COMMERCIALISATION			
Who usually decides whether to commercialise the invention?	University.	Contractor.	Government research organisation.
What happens if commercialisation is not pursued?	Depends on university policy: inventor may have right to regain ownership.	Government could exercise its march-in rights.	Inventor can obtain title by law.
What happens if commercialisation is successful?	Depends on university policy: royalties usually shared between university, faculty and inventor.	Royalties must be shared with inventor by law, and balance utilised for research or education.	Royalties must be shared with inventor by law, and balance retained by institution.

3 Background to the United States' framework

3.1 Introduction

This section will describe the background to legislative initiatives in the United States to promote commercialisation of inventions arising from publicly funded research. The purpose of this description will be to contextualise *Bayh-Dole*, *Stevenson-Wydler* and related legislation, so as to provide a clearer basis for comparison with Australia. The section will begin by outlining developments prior to 1980 and the enactment of *Bayh-Dole* and *Stevenson-Wydler*. It will give an overview of the key issues the United States hoped to address through this legislation. Some evaluation will then be made of whether the legislative solution has been successful.

3.2 Background to the United States' legislation

The United States has been developing its policy on ownership rights in publicly funded inventions since the mid-twentieth century. Prior to World War II, most publicly funded research occurred in government research organisations, with the results being made freely available to the public.¹⁰⁰ From 1941 to 1965 however, the amount of government sponsored research conducted by universities and other research institutions grew dramatically, from around 24% of total research to nearly 60%.¹⁰¹ This prompted general debate over how ownership rights in publicly funded research—conducted by the government itself and by universities and other research institutions—should be distributed.

This debate came to be dominated by two main positions.¹⁰² Proponents of a 'title' policy argued that the government should have full ownership rights to all inventions created using public funds. These inventions should only be licensed on a non-exclusive basis and should as far as possible be kept in the public domain. This view was recommended by, for example, a Report of the

¹⁰⁰ Lacy, 4.

¹⁰¹ Lacy, 4.

¹⁰² Eisenberg, 1673.

Attorney General to the President in 1947. The main concerns expressed by that Report were a need to respect the public's rights to inventions it had paid for, and the anti-competitive nature of giving a private enterprise a monopoly over a particular invention. On the other hand, proponents of a 'license' policy argued that the government should merely obtain a non-exclusive licence to use any inventions created with public funds. Ownership should be placed in the hands of the entity which conducted the research, as it is better equipped to develop the new technology.

Due to the absence of a coordinated federal policy, different practices for allocating ownership rights developed among government agencies. Most government agencies, for example the Department of Health, Education and Welfare, adhered to a 'title' policy. Some agencies, including the Department of Defense followed a 'license' approach.¹⁰³ Other agencies, such as the National Aeronautics and Space Administration (NASA), had a policy of keeping title but granting waivers to that policy on a case-by-case basis.¹⁰⁴ NASA and some other departments had the additional problem of being constrained in their policy choice by their enabling legislation.

Attempts at achieving some level of uniformity were made in 1963 and 1971, through two Presidential Memoranda issued by Presidents Kennedy and Nixon respectively. These Memoranda largely took a middle ground between the 'title' and 'licence' approaches explained above. The prevailing view, supported by a study in 1968, was that there is no ideal policy to support commercialisation: government agencies would have to individually consider each invention to work out the appropriate distribution of ownership rights. While the Presidential Memoranda could establish guidelines for government funding agencies to follow, in practice government funding agencies would still need a large amount of discretion. As a result, the Presidential Memoranda ultimately failed to achieve any consistency between agency practices.¹⁰⁵

During the 1970s the case for giving universities and other research institutions greater rights gathered momentum. In 1972 the Congressional Commission on Government Procurement recommended legislative reform which would grant universities and other research institutions title to publicly funded inventions, subject to a system of government march-in rights. This approach was echoed by a Domestic Policy Review on Industrial Innovation initiated by President Carter in 1978. President Carter's efforts to introduce legislation were frustrated by continued debate over whether large businesses should be treated differently, due to the increased risk they would misuse their market power if given exclusive rights to an invention.

103 Eisenberg, 1677.

104 Stanfield, 1440.

105 Lacy, 8; Eisenberg, 1679.

Bipartisan support was eventually secured in 1980 for the *Stevenson-Wydler* and *Bayh-Dole* legislation. This legislation marked a new era in United States patent policy.

3.3 Objectives of the United States' legislation

Three key objectives underpin the *Bayh-Dole* and *Stevenson-Wydler* framework:

- Encourage the commercialisation of inventions created by universities and other research institutions receiving public funds
- Encourage the transfer of technology from the government to the private sector
- Provide an incentive for individual inventors to create new technologies capable of practical application

3.3.1 Commercialisation of inventions created by universities and other research institutions

As noted above, prior to 1980 there was no uniform policy governing the ownership of inventions created by universities and other research institutions with public funds. Each government funding agency had developed its own rules, and there was no guarantee that an institution would get title to any invention they created. The theoretical benefits of this system were that funding agencies had the flexibility and discretion to allocate ownership to the party best able to develop the invention, be it the institution receiving the funds, the funding agency itself or another party.¹⁰⁶

In practice however, most government funding agencies retained ownership of inventions created with public funds. There was great reluctance to grant universities or other research institutions exclusive rights (in the form of ownership or an exclusive licence) over those inventions that the government owned.¹⁰⁷ This trend can be demonstrated using statistics from that period. From 1970 to 1975, the government assumed ownership of 80% of approximately 53,000 inventions created with public funds. Of those inventions that the government owned, only 10% were licensed, and only 5% were put to commercial use.¹⁰⁸

¹⁰⁶ Eisenberg, 1697.

¹⁰⁷ CMH, 13.

¹⁰⁸ CMH, 13 quoting Stanfield, 1440.

There were two important reasons why so many inventions were left uncommercialised. One was that government funding agencies simply lacked the expertise and ability required to see the commercial potential of a new invention. The parties with the best ability to manage commercialisation—the university / other research institution, and its employees—were excluded from the decision making process. Another reason was the lack of any incentive for institutions to actively pursue commercialisation. Universities and other research institutions were reluctant to invest any significant amount of time or resources into the practical application of new technology, because there was no guarantee that they would be given exclusive rights to that technology. The delay and uncertainty associated with the bureaucratic process of negotiating for exclusive rights compounded this problem.

The ultimate conclusion was that a vast number of potentially valuable inventions were being lost, and the public was not getting the best return on their investment in scientific research. The United States was seen as suffering from an ‘innovation lag’, or a decline in competitiveness relative to other industrialised countries. The ‘innovation lag’ was seized upon as a factor contributing to the country’s worsening balance of trade.¹⁰⁹ Not only was the United States unable to develop its own technologically advanced products, but any potential products were lost to overseas developers as a result of the local regulatory environment.¹¹⁰

In the words of the House of Representatives’ Committee on the Judiciary, *Bayh-Dole* responded to this situation by replacing

*the existing melange of 26 different agency policies ... [with] a single, uniform national policy designed to cut down on bureaucracy and encourage private industry to [commit] the risk capital necessary to develop such inventions to the point of commercial application.*¹¹¹

Bayh-Dole allowed universities and other research institutions to take title over all inventions created using public funds, regardless of the funding agency. This cut the government out of the commercialisation process,¹¹² and gave contractors the power and the incentive to put their inventions to practical use.

The key concern with *Bayh-Dole* that needed to be addressed at the time came from consumer groups. They argued that the public was being forced to pay twice: once through the taxes that were funding the invention and twice through the cost of the monopoly given to the institution over the new

109 Stanfield, 1436.

110 Stanfield, 1441.

111 HR report Schacht CRS-4.

112 Eisenberg, 1697-98.

technology.¹¹³ The risk of monopoly pricing was seen as particularly high where inventions were created and commercialised by large corporations. One way of addressing this problem was to exclude large businesses from the scope of *Bayh-Dole*. Only small businesses and non-profit organisations such as universities could retain title to publicly funded inventions. Of course, large businesses were eventually included through a Presidential Memorandum issued by President Reagan in 1984. Nevertheless *Bayh-Dole* still requires contractors to give preference to small business when considering the licensing of their inventions. A second way of curtailing the potential abuse of monopoly power was to grant the government a non-exclusive licence to use the invention for government purposes, and allow the government to retain ‘march-in rights’ which might be exercised in the public interest.

3.3.2 Transfer of technology from the public to the private sector

As noted above, the government took ownership of the vast majority of inventions created prior to 1980. These inventions consisted of inventions created by universities/other research institutions and retained by the government, and inventions created by employees of government research organisations. Very few inventions from either category were transferred to the private sector or put to commercial use.

In 1979, the Senate conducted a series of hearings to investigate the role of federal laboratories in domestic technology transfer.¹¹⁴ Three institutional barriers were identified: the lack of a clear legislative mandate to transfer technology, a lack of funding, and few incentives for individual professionals to engage in technology transfer.¹¹⁵ There was a clear perception that potentially valuable inventions were left sitting on government shelves, unused.¹¹⁶

One way *Bayh-Dole* addressed this problem was by restricting the ability of government funding agencies to take title to begin with, by allowing universities and other research institutions to obtain ownership of inventions they created with public funds. But what if the university/other research institution chose not to obtain ownership, leaving the invention in the hands of the government? And what about those inventions created by government employees during the normal course of their employment?

113 CMH 13, also Eisenberg 1666.

114 Eisenberg, 125.

115 Eisenberg, 1705.

116 Stanfield, 1440.

Enacted two months prior to *Bayh-Dole*, the *Stevenson-Wydler* legislation made it a duty of federal departments to transfer technology to State and local governments and the private sector, and established administrative structures to support this obligation. In 1986, the obligation to transfer technology was imposed on government science and engineering professionals individually. *Bayh-Dole* and *Stevenson-Wydler* were thus designed to complement each other: *Bayh-Dole* took the government out of the commercialisation process where it was more efficient for a university or other research institution to manage commercialisation, while *Stevenson-Wydler* encouraged the government to take the initiative where there was no university or other institution involved.

One gap left by *Stevenson-Wydler* was that government departments did not have any clear direction in their licensing policies. A general obligation to transfer technology to the private sector would be difficult to implement in the context of the differing agency practices mentioned above. *Bayh-Dole* therefore addressed this by expressly empowering federal agencies to license federally owned inventions and enacting a detailed licensing regime.

3.3.3 Incentives for individual inventors

The final way the 1980 reforms encouraged commercialisation was by providing incentives to research workers to develop inventions capable of commercial application. *Bayh-Dole* provided that royalties from commercialisation must be shared with the inventor, and left the exact basis for royalty sharing up to the university or other research institution. As mentioned in part 2.3.4, universities for example have subsequently implemented their own scales for royalty sharing to honour this legal obligation. Regarding government research organisations, amendments made to *Stevenson-Wydler* in 1986 were more specific. The *Federal Technology Transfer Act* provided for a specific proportion of revenue to be given to the inventor and any co-inventors if applicable.¹¹⁷ A statutory basis for royalty sharing provided the promise of a reward for inventing commercially useful technology, and ensured that the fruits of commercialisation filtered down to the laboratory level.

In the lead up to the 1980 reforms, some doubts were expressed over whether it is appropriate to give publicly funded researchers a profit motive to create commercially valuable technology.¹¹⁸ It may be argued that public funds should be provided to researchers when there is no potential for a market-based reward. This is usually the case for researchers conducting basic

117 See Section 2.4.

118 CMH 13 also Eisenberg, 1666–7.

rather than applied research. It is unnecessary and improper to give public funds to researchers while at the same time encouraging them to create marketable inventions. This is tantamount to the public subsidy of essentially private enterprise.

Ultimately, a choice had to be made: between public research for the sake of public knowledge, and public research for the sake of commercial return. In the context of the United States in 1980, the benefits of taking basic research and developing it to commercial application prevailed.

3.3.4 Ancillary objectives

The United States' framework had two other objectives, which have been referred to indirectly above.

First, the government was particularly concerned to maximise the benefits of publicly funded research for the local economy. As noted above, there was a concern that valuable technology was being lost to overseas countries due to the difficulty of negotiating exclusive rights in the United States. The United States government endeavoured to address through a provision in *Bayh-Dole* which required universities and private research institutions to ensure that 'any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States'.¹¹⁹ Inventions can only go offshore if the government funding agency consents, and is satisfied that the institution has made 'reasonable but unsuccessful efforts' to licence the invention to local industry, or the local manufacture is not 'commercially feasible'.¹²⁰ *Bayh-Dole* also required any government agency granting a licence to a federally owned invention to ensure that any associated products would be 'manufactured substantially in the United States'.¹²¹

Second, the government wanted to give small businesses an advantage over large businesses in the development and commercialisation of inventions with public funds. As noted above this was partly a response to competition concerns raised by consumer groups. In addition, there was a perception at the time that small businesses were simply better innovators than large businesses. It was thought that even though small businesses were more responsive and flexible than large businesses, they were often overlooked by government funding agencies in awarding research contracts. Large businesses by contrast had the power to secure ownership rights from the government, and yet were often slower and more inefficient in bringing

119 35 USC 204.

120 35 USC 204.

121 35 USC 209(b), also 37 CFR 404.5(a)(2).

products to the market.¹²² To address this imbalance, *Bayh-Dole* provided that universities must endeavour to license inventions to small businesses ‘except where it proves infeasible after a reasonable inquiry’.¹²³ Government agencies licensing federally owned inventions would also have to give ‘first preference’ to small business.¹²⁴

3.4 Assessment of the effectiveness of the legislation

3.4.1 Economic aims of the legislation

While the explicit objective of both the *Bayh-Dole Act* and *Stevenson-Wydler Act* was to enhance the process of technology transfer from universities, their implicit aim was to increase productivity of US workers and thereby improve the standard of living of US citizens. In practical terms, improved technology transfer means better performance in all the steps from the laboratory to the household. These steps are:

- The recognition of an invention,
- The disclosure of the invention,
- The establishment of optimal property rights over the invention
- The matching of the most appropriate parties for further development
- The development of the invention to a commercially-ready stage
- The establishment of optimal property rights over this development
- The licensing to manufacturers or establishment of spin-off companies
- The production of the product, and finally
- The consumption by householders.

Correct incentives, which include the removal of superfluous barriers, are required for the optimal function of this technology transfer pathway in addition to adequate levels of supporting infrastructure.¹²⁵ The advocates of *Bayh-Dole* and *Stevenson-Wydler* assumed that clear, uniform intellectual property rights over the invention would be a necessary, if not sufficient, incentive system to perfect the whole gamut of steps outlined above.

122 Eisenberg, 1696.

123 18 USC 202(c)(7)(D).

124 35 USC 209(c).

125 The latter very broadly includes the provision of appropriately skilled labour and the provision of communication structures.

Secondary rules, such as the potential for loss of ownership of an invention due to failure to patent within a reasonable time, and the requirement to give priority to small US companies when licensing patents,¹²⁶ were also invoked to further the interests of US citizens.

3.4.2 The nature and scope of the economic literature

There appears to be no academic economic literature analysing the effects of the *Stevenson-Wydler Act* and accordingly the remaining section is limited to *Bayh-Dole*. A considerable portion of the academic research uses data only up to the end of the 1980s and the conclusions are subject to the assumption that the situation since then has not changed markedly. In order to assess the effects of the *Bayh-Dole Act*, researchers have asked whether the Act is a sufficient condition to change the nature of technology transfer from universities.

There are a number of US government and university administration reports which have reviewed the effects of the *Bayh-Dole Act*.¹²⁷ In general, these reports assess the success of the Act simply by reporting the change since the 1970s in a number of indices such as the number of universities active in patenting and licensing, the number of new spin-off companies formed around university research and the number of products on the market derived from university patents. Commonly they conclude that ‘...the results support the conclusion that the *Bayh-Dole Act* has promoted a substantial increase in technology transfer from universities to industry, and ultimately to the public’.¹²⁸

However, this type of assessment does not account for other factors which may have either caused or contributed toward (or indeed, detracted from) these increases in patenting and technology transfer activities. As such they would not be acceptable evidence for use in policy formation. The limited number of academic studies in this field, however, try to account for these intervening factors. Most academic assessments of *Bayh-Dole* have looked for evidence of the different outcomes because of a change from the situation whereby inventions financed by public funds could only be patented on an ad hoc basis to the situation whereby universities have a blanket right to elect to retain title to any invention created using public funds.

126 This was broadened in 1984 to include all US companies.

127 For example: CGR (1999); AUTM (1997); Campbell (1998); Cornell Research Foundation, (2001); GAO (1998); USGA, (2002).

128 CGR (1999).

There has been no explicit discussion of the effects of the secondary obligations in the *Bayh-Dole Act*, such as the requirement to disclose the invention to the government agency and file the patent within a reasonable period of time, or the requirement to give preference to United States industry when granting licences. The lack of discussion about these secondary obligations is not surprising, because they do not materially change the incentive to patent and commercialise and therefore would not be expected to have any effects. An invention that is not considered valuable without the existence of a requirement to notify and patent within a reasonable time, will not be valuable with the existence of that requirement. Giving priority to US companies when licensing is also unlikely to affect the commercialisation process, since the importance of tacit knowledge transfer in the initial development stages means that local companies will always be more efficient partners, all other things being equal.

The academic papers considering the effectiveness of *Bayh-Dole* primarily deal with one or two effects: first, whether there were changes in the level of university technology transfers after 1981; and secondly, whether there have been adverse effects on the quality of university research since that time.

3.4.3 Effects of *Bayh-Dole* on the propensity of universities to patent

The first issue, concerning the level of technology transfers since 1981, has attracted the most empirical attention. Simple indices of disclosures to government agencies of university inventions, of patent grants to universities and of university licensing revenue are the main sources of information used to judge the effects of *Bayh-Dole*. Since a high proportion of university licence fees arise from the licensing of software that is protected primarily (if not exclusively) by copyright, and so is intellectual property not affected by *Bayh-Dole*, the strongest evidence is derived from patent data. US patent statistics have shown that not only did the number of university patents granted annually grow strongly - from about 150 a year in the 1960s to over 1000 in 1988—but that there was also strong growth in the ratio of patents per research dollar spent over the same period (see Panels A and B of Figure 1).¹²⁹ This stands in contrast to the trendless level of all domestic US patents and the decline in the ratio of domestic patent per domestic industrial research R&D in the 2 decades to 1988. This propensity for universities to patent is mirrored in the number of institutions patenting each year. While patenting had been generally concentrated among the top 20 universities, the number of patenting universities grew five-fold in the 30 years to 1991 and ten-fold to 1999.¹³⁰ Membership of the Association of University Technology Managers in the US increased from 113 in 1979 to 2,178 in 1999.¹³¹

129 Henderson et al. (1998).

130 CGR (1999).

131 CGR (1999).

Figure 1a University patents, all US patents and domestic US patents

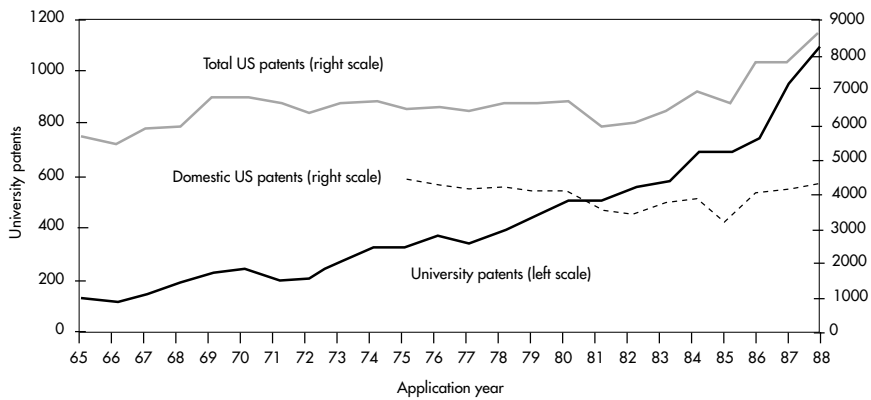
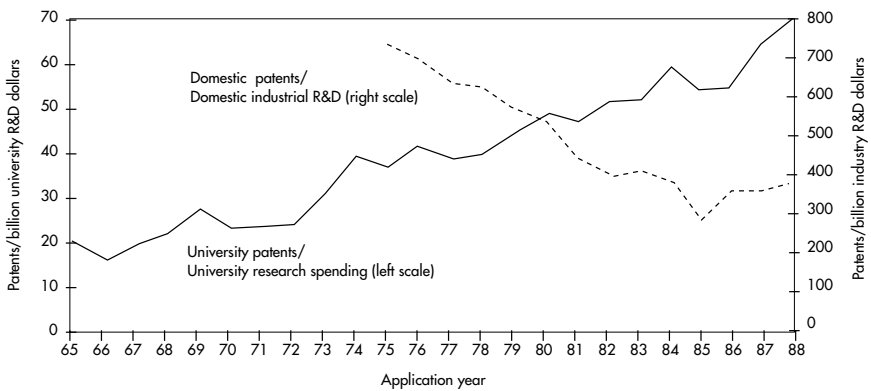


Figure 1b Patents/research ratios



Source: Henderson et al (1998)

As mentioned above, these data are suggestive, but do not in themselves provide strong evidence, that *Bayh-Dole* has affected patenting per se. We expect that the passage of the Act would make a once and for all difference to either the level of technology transfer or the growth rate in technology transfer. As Figures 1 and 2 indicate, the positive trend for universities was well underway before 1981 and a simple reading of the data

does not clearly suggest that growth rates¹³² increased after then. Casual observation of these trend data makes it difficult to rule out the argument that there was a learning process in place among university circles before 1981 that favoured the establishment of technology transfer offices and a culture of commercialisation.

In addition, two other changes that occurred during this period have also been cited as possible contributors to the positive trends in university patenting. The first change was the introduction in 1982 of a Court of Appeals for the Federal Circuit. This court was established to expedite patent appeals and thus reduce the uncertainty surrounding patent rights. A quicker resolution of the uncertain outcome of patent disputes will reduce the rate at which both parties to a patent dispute discount expected future new income from the patent. This will accordingly increase the parties' combined present values of the patent. However, while the establishment of this court should accordingly increase the net rewards to the combined parties, it cannot explain the growth in US university patents vis-à-vis other domestic US patents. The second factor was the growth in bio-medical research, which became considerably more amenable to patenting as a result of a court ruling in 1980.¹³³ However as Figure 2 shows while bio-medical patents have been the strongest area of growth, increases are also apparent for the chemical, electronic and mechanical fields. Both the 1980 supreme court decision and the *Bayh-Dole Act* may have been necessary, but not by themselves sufficient, conditions for the growth in bio-medical patents.

To identify more carefully the effects of *Bayh-Dole*,¹³⁴ compared the performance of 2 universities which were active in patenting before 1981 (University of California and Stanford) and one university which did not begin to patent until after 1981 (Columbia). They found that before 1981, the University of California and Stanford had well established technology transfer procedures (rules and organisational support) and also strong positive trends in disclosures, patents and licenses. There were no clear accelerations in these indices post-1981. On the other hand, the level of technology transfer from Columbia very clearly rose from a negligible level in 1981 to a level comparable with Stanford by 1990. They concluded that while pressure from the bio-medical area on its own most likely caused Columbia to institute sophisticated technology transfer procedures, *Bayh-Dole* heightened Columbia's response.

132 A growth rate of, for example, patent grants is a change in the level of patent grants with respect to time. An increase in growth rates in patent grants is, therefore, an acceleration in the level of patent grants over time.

133 Supreme Court decision in 1980 *Diamond vs. Chakrabarty*; Mowery et al.

134 Mowery, et al.

Figure 2a University patents by broad fields

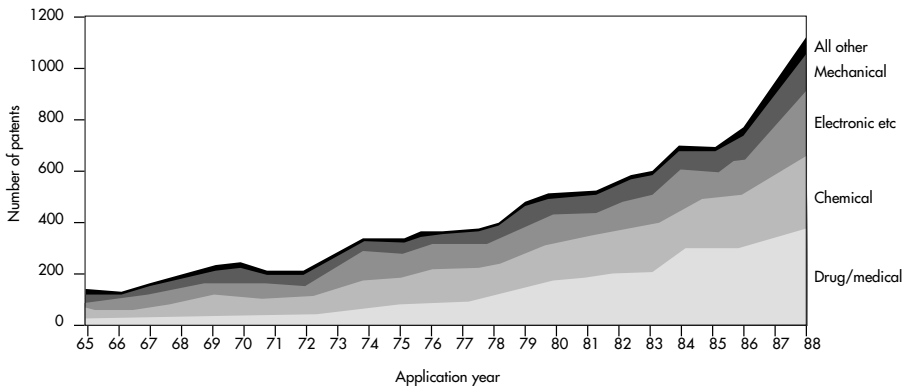
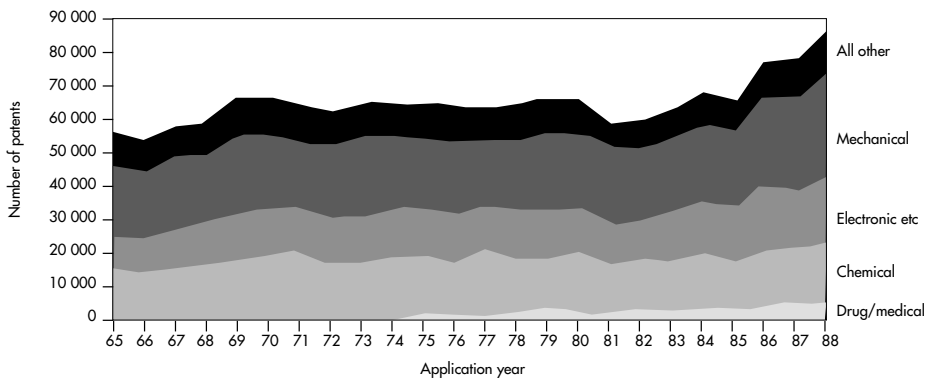


Figure 2b All US patents by broad fields



Source: Henderson et al (1998)

Thus, to summarise, the most probable effect of *Bayh-Dole* was that it accelerated the trend in patenting by removing obstacles surrounding complicated patent ownership rights and by raising the awareness of the gains to universities of successful technology transfer. However, the extent of this induced acceleration may be smaller than a simple comparison of patent rates pre- and post-*Bayh-Dole* would suggest.

3.4.4 Indirect effects of *Bayh-Dole* on the quality of university research

The second area of effect of *Bayh-Dole* concerns its indirect impact on the nature and quality of research undertaken at universities. If an unintended effect of *Bayh-Dole* is to reduce the quality of university research and thus the calibre of inventions in the US economy, then the growth in technology transfer shown above may be short lived or lacking substantial effect on American standards of living. It has been hypothesised that *Bayh-Dole* may have had derived adverse effects on research in the US for two reasons.

The first reason is that increased emphasis on patenting and commercialisation may inhibit knowledge spillovers, that is the transfer of tacit knowledge within the university sector and between universities and industry. Increasing universities' incentives to patent and commercialise could allow the culture of the 'private world of patents'¹³⁵ to dominate the 'open public world of science'. Conferences, informal networking and even publications become more guarded and delayed. Both Henderson¹³⁶ and Mowery¹³⁷ have tried to estimate whether patent quality declined after 1981 using citation rates¹³⁸ as indices of the quality of a patent. While Henderson argued that the quality of university patents declined significantly during the 1980s compared with the 1960s and 1970s, Mowery using a slightly different data set argued that this effect was only found among universities which started to patent seriously after 1981 and also that this effect was short lived. Henderson conceded that in contrast to the average, the quality of the 'top' patents did continue to rise throughout the 1980s. In sum, there is no clear or compelling evidence of a short term decline in the quality of university patents beyond the immediate few years following the introduction of *Bayh-Dole*. However, the effects of a changing research culture on knowledge spillovers is potentially more serious and it would not be expected that the effects of this would be realised for some time.

The second reason *Bayh-Dole* may have had an indirect adverse effect on research quality also arises from the changed culture in favour of property rights that the Act has engendered. A more aware and aggressive attitude towards these rights within universities may reduce the incentive for the private sector to seek collaborative university research ventures. This is because the greater are the costs and troubles associated with negotiating

135 Henderson, et al.

136 Henderson, et al.

137 Mowery, et al.

138 A citation rate is number of times a patent was listed as prior art in later patent applications.

intellectual property rights between parties, the lower is the incentive for collaboration. In all likelihood, a lower incentive for collaboration will result in less collaboration, which in turn will lead to research of a lesser quality than would otherwise have occurred.

In a study of 28 Advanced Technology Program participants,¹³⁹ found that one third of respondents believed that intellectual property issues were a major impediment to collaborative university-industry research. Most of the issues involved difficulties when universities wanted to own the intellectual property created under sponsored research. Companies believed that if the universities wanted to share in the ownership of these rights, then they should take an equity position in the venture. In addition, some companies reported that the universities had an inflated view of the value of their intellectual property. These views were more pronounced for companies that were undertaking short duration projects and for those that had previously held collaborative ventures with universities.

In sum, while there is very limited empirical evidence that the *Bayh-Dole* Act has affected the quality of university research, there are some a priori grounds for believing that deleterious longer term effects may be underway.

3.5 Summary

The *Bayh-Dole* and *Stevenson-Wydler* legislation was introduced in the United States to address the problem that a large number of potentially valuable inventions created by universities and private research institutions with public funds were not being commercialised. This problem was attributed to the absence of a uniform policy governing the ownership of such inventions, and to the lack of incentives for institutions to actively pursue commercialisation as there was no guarantee that they would be given exclusive rights to the technology. Furthermore, government funding agencies lacked the expertise and the ability to see the commercial potential of a new invention. In this regulatory environment, it was thought that the US was unable to develop its own inventions and potential products were lost to overseas developers. As a consequence, the US was decreasing in competitiveness in comparison with other industrialised countries.

The primary aim of both the *Bayh-Dole* and *Stevenson-Wydler* legislation was to provide a clear and uniform system of managing IP rights in publicly funded institutions, which would, in itself, provide an incentive for improved technology transfer. *Bayh-Dole* vested title over all inventions created using public funds in universities and other research institutions, regardless of the

139 Hall.

funding agency. *Stevenson-Wydler* applied to government agencies and imposed a duty on federal departments to transfer technology to State and local governments and the private sector, and established administrative structures to support this obligation. *Bayh-Dole* empowered federal agencies to license federally owned inventions and enacted a detailed licensing regime. Both *Bayh-Dole* and *Stevenson-Wydler* provided that royalties from commercialisation should be shared with the inventor to provide an incentive to create inventions for practical use.

A secondary aim of the legislation was to create an additional incentive to patent inventions by introducing the potential for the government to confiscate ownership of an invention if it was not patented within a certain period of time. Further, to curtail the potential abuse of monopoly power, the government was granted a non-exclusive license to use the invention for government purposes and retain “march-in rights” which can be exercised in the public interest.

The legislation also aimed to maximise the benefits of publicly funded research to the national economy by requiring that universities and private research institutions ensure that products of the invention would be manufactured substantially in the United States. Moreover, the legislation provides that universities and government agencies must endeavour to license inventions to small business in order to give small businesses an advantage over large businesses in the development and commercialisation of inventions created using public funds.

An examination into the effectiveness of *Bayh-Dole* shows that the most probable effect of the legislation is that it accelerated the trend in patenting by universities, by removing obstacles surrounding complicated patent ownership rights. It has been hypothesised that a longer term effect of *Bayh-Dole* is that it may adversely affect the quality of university research by changing the research culture on knowledge spillovers, and engendering a more aggressive attitude towards IP rights which may reduce the incentive of the private sector to seek collaborative ventures. However, there is limited empirical evidence that the *Bayh-Dole* Act has lessened the quality of university research in this way, though these effects may be underway.

4 Invention ownership in Canada and the United Kingdom

4.1 Introduction

This section will review the situations in Canada and the United Kingdom, with respect to the commercialisation of publicly funded research results. Each examination will outline briefly the legal framework governing IP ownership in publicly funded research institutions. The various issues relating to commercialisation of publicly funded research in the relevant country will then be identified on the basis of reports commissioned by its government, and the governmental response to these issues will be canvassed. Each examination will conclude with an analysis of the general lessons to be learnt from the country's experience.

Particular attention will be given as to how the issues that each country faced concerning commercialisation relate to the problems identified in the 1980s in the United States and how the countries' responses relate to the *Bayh-Dole/Stevenson-Wydler* approach. The analysis will also note any other issues that were not raised by the United States analysis.

4.2 Canada

4.2.1 The Canadian framework

Like Australia, the Canadian framework begins with the basic common law principle that an employer owns inventions created by employees during the course of their employment.¹⁴⁰ Again, as in Australia, the ownership of inventions created with public funds is determined to a large extent by the policy of each research institution. University policies may be divided into three main groups:¹⁴¹

¹⁴⁰ Vaver.

¹⁴¹ Canadian report, 3.

- Some provide that the academic inventor owns any invention resulting from publicly funded research and can commercialise as they wish
- Others provide that the academic inventor owns any invention but must assign ownership to the university for the purpose of commercialisation
- Others provide that the university owns any invention and will manage the commercialisation process

4.2.2 Perceived impediments to commercialisation

In 1998, the Canadian government's Advisory Council on Science and Technology commissioned an Expert Panel on the Commercialisation of University Research to investigate how Canada might better capture the benefits from university research. The Expert Panel released its report in August 1999 and made recommendations in a number of key areas, including intellectual property. These recommendations were subsequently put to the public for discussion and have not yet been implemented.

The Expert Panel describes four problems arising from the absence of a coherent national policy on intellectual property ownership in publicly funded research institutions. These problems are to a large extent particular to the Canadian situation, as the following discussion will demonstrate.¹⁴²

- **Lost commercialisation opportunities.**

The Expert Panel found that universities that vest invention ownership in the employee inventor may face the problem of lost commercialisation opportunities, especially when more than one individual has contributed to the development of the invention. In this situation, patent ownership will normally be shared, and any subsequent development must be approved by all co-owners. If there is a dispute between co-owners about the appropriate course of action, then the commercialisation process can be paralysed. Also, where ownership is vested in the employee inventor, industry is reluctant to invest in university inventions due to the possibility that other researchers are entitled to co-ownership, and might later challenge the terms of any licensing agreement.

This problem is less relevant in the Australian context than in Canada because, as discussed in section 1, nearly all Australian universities have a policy of claiming ownership of inventions themselves, rather than vesting ownership in the academic inventor.

¹⁴² Canadian report, 19–20.

- **Leaked benefits.**

The Expert Panel was particularly concerned about situations where an academic inventor obtains ownership of an invention then licenses the new technology to foreign firms for development. As there is no obligation to act in Canada's best interests, the country is deprived of valuable innovations.

A similar problem has been identified in Australia. However, the Australian problem concerns licensing overseas by universities rather than by academic inventors.

- **Litigation.**

Vesting ownership in the researcher has resulted in many universities being sued for inappropriate business decisions made by academics. These include granting 'exclusive' licences to more than one firm, and failing to take into account graduate student contributions to the development of an invention.

In Australia, ownership is usually claimed by the university and the university has primary responsibility for managing commercialisation, thus inappropriate decisions by academics is not a significant concern. However most universities do not claim ownership over IP generated by students, which can create significant problems with regard to the commercialisation of inventions to which students have made a contribution

- **Limiting innovative capacity of Canadian firms.**

The diversity of university policies in Canada acts as a disincentive for collaborations between university and industry. Negotiation over invention ownership can be a time consuming process, especially where multiple universities with different policies are involved. The negotiation process also has the potential to create ill feelings and mistrust between universities, academics and industry.

Agreements between universities and private enterprise in Australia were beyond the scope of this study. However, there is the potential for this problem to exist in Australia as such agreements comprise nearly 40% of university funding.

4.2.3 Proposed solution

The Expert Panel concluded that the *laissez-faire* approach of the government was inadequate. The Expert Panel proposed to remedy the situation by requiring all universities to adopt an intellectual property policy consistent with the following principles:

- Universities must recognise ‘innovation’ as a critical part of their mission
- All intellectual property with commercial potential, which has been supported with federal funds, must be disclosed by the researcher to the university
- All intellectual property with commercial potential must be disclosed annually by the university to the government
- Inventions should be owned by the university, or if owned by the researcher should be assigned to the university for commercialisation
- Universities must make reasonable efforts to commercialise inventions and maximise the benefits for Canada
- Universities can assign inventions back to the creator if they decide not to pursue commercialisation, if commercialisation has been unsuccessful, or if the university and the creator both agree
- Universities can assign inventions to private enterprise or non-university research institutions if this is necessary for the commercialisation process
- Universities must provide incentives to academics to create commercially valuable inventions, through both royalty sharing and recognition for commercial activities
- Small business spin-offs should be given priority in commercialisation to licensing
- Local industry should be given preference
- Universities must establish organisational structures to support their obligations

The Expert Panel hopes that this proposed policy framework will bring about a change in culture within Canadian universities, similar to that which occurred in the United States after the passage of *Bayh-Dole*.¹⁴³

4.2.4 Lessons from Canada

Although the impediments faced by Canadian universities with regard to commercialisation process were very different from those in the United States, the proposed approach for Canada is similar to *Bayh-Dole* in that title to employee inventions would vest in the university subject to responsibilities regarding IP management. However, unlike *Bayh-Dole*, the Canadian proposal lacks a means of sanctioning universities if they do not fulfil their obligations. The Expert Panel states that universities must have the above IP policy in place in order to qualify for research funding; there is however no mention of whether future funding will be denied if the policy is in place but not observed in practice.

¹⁴³ Canadian report, 28.

Another important aspect of the Canadian model is that it recognises that universities are better placed than academics to manage the commercialisation process. In considering how to change the framework for the ownership of inventions in Canada, the Expert Panel found that most academics are severely constrained by a lack of time and expertise to commercialise their inventions and thus the Expert Panel proposed to vest title to employee inventions in the universities.¹⁴⁴ To a certain degree this validates the approach already taken by many Australian universities.

4.3 United Kingdom

4.3.1 The UK framework

In the United Kingdom, the *Patents Act* 1977 provides that an invention made by an employee in the course of his or her normal duties shall be taken to belong to his or her employer.¹⁴⁵ This provision can, of course, be overridden by a university IP policy and employment contracts. In the past, some university policies provided that academic staff were the owners of any intellectual property they produced and at least one university in the UK has retained this policy.¹⁴⁶ Nevertheless, on the whole UK public sector research establishments (PSREs), which include universities, seem to maintain a policy in concurrence with the *Patents Act*. Indeed, there is now an increasing trend for Universities to claim ownership not only over academic inventions, but also over inventions by students in the course of their studies or using university resources.¹⁴⁷ In the UK, in contrast to the US under *Bayh-Dole* and *Stevenson-Wydler*, the government makes no distinction between universities and other publicly funded research institutions for the purposes of policy making, but names them all PSREs.

As in Australia, public funding for research in the UK may come from two main sources: Government departments, or one of seven government funding agencies, known as Research Councils. In some instances in the past, usually where non-university PSREs were concerned, the government sponsor would assert ownership or substantial control over inventions generated using its funds. It would do so via the funding agreement between the funder and the

¹⁴⁴ Canadian report, 27.

¹⁴⁵ Patents Act 1977 (UK) s 39.

¹⁴⁶ Cookson, 10. Cookson comments that 'the only University in the UK, to the author's knowledge, that has an IP policy that vests ownership of IP in its research staff is UMIST.'

¹⁴⁷ David.

research institute. This practice was, however, strongly criticised by the 1999 Baker Report¹⁴⁸ (see below) and, although not forbidden, is now strongly discouraged by the Patent Office Guidelines for Public Sector Purchasers of Research and Research Providers¹⁴⁹ (see below). Thus, the legal framework with regard to IP ownership in the United Kingdom is substantially similar to that currently existing in Australia.

4.3.2 The Baker Report

In 1998, the Treasury and the Department for Trade and Industry Ministers commissioned a report to investigate the commercialisation of research in PSREs¹⁵⁰ and to “make recommendations for increasing the rate at which their research is successfully commercialised.”¹⁵¹ The report was handed down in August 1999 and is known as the Baker Report. Amongst other things this report considered intellectual property ownership and management.

The Baker Report reached its conclusions on the basis of surveys sent to over 40 PSREs and meetings held with key individuals in PSREs, their sponsor government bodies and Research Councils. The report acknowledged the active role that many PSRE play in commercialisation and the government policy encouraging such action.¹⁵² Thus, the report noted that its role would be more to “give fresh impetus to efforts already in train, rather than suggesting totally new departures for Government.”¹⁵³ Nevertheless the report made various recommendations based on its observations about the current situation in UK PSREs with regard to knowledge transfer. These observations and recommendations were directed to four main issues affecting IP development: a) culture and commitment to knowledge transfer; b) PSRE/Sponsor relationships regarding IP ownership and financial freedom; c) Incentives for PSRE Staff; and d) Access to commercialisation expertise.

It should also be noted that in its review of current practice with regard to knowledge transfer in the UK, the Baker Report addressed suggestions that research bodies be required to prioritise local industry when seeking to license their IP or collaborate with industry in order to commercialise it. Whilst it was sympathetic to the sentiment behind such suggestions it ultimately concluded that:

148 Baker, ‘Creating Knowledge Creating Wealth: Realising the Economic Potential of Public Sector Research Establishment’.

149 The Patent Office (UK) ‘Intellectual Property in Government Research Contracts’.

150 Baker Report, [1.1].

151 Ibid.

152 Ibid [1.5].

153 Ibid.

If Government is keen to see industry demand for PSRE outputs maximised, it must accept that industry is global and that some commercialisation deals will entail the export of UK-generated intellectual property as well as the import of foreign generated IP.¹⁵⁴

i) Observations made by the Baker Report

The key observations made by the Baker Report with regard to the four issues mentioned above were:

a. Culture and Commitment to knowledge transfer

- *A sense of mission and culture to commercialise.* The report noted that knowledge transfer “is most effectively pursued in those PSREs which see it as an explicit part of their mission and culture, and where it is enthusiastically led by senior management, and supported by the sponsor department or Research Council.”¹⁵⁵ However, it also noted that such a sense of mission and culture was not universal amongst PSREs and their sponsors and could be encouraged more by Government.
- *Attitude to Risk.* The report advised that effective knowledge transfer is a risky pursuit and that successful knowledge transfer comes at the price of occasional failure. However, the report found the public sector to be “predominantly risk averse”¹⁵⁶, which hampered the pursuit of commercial opportunities. It found that this tendency was not sufficiently discouraged by Government, which tended to take a punitive approach to risk, focusing too much on ‘risk avoidance’ rather than ‘risk management’.

b. PSRE/sponsor relationship regarding IP ownership and financial freedom

- *IP Ownership.* Crucially, the report made reference to “several instances...[where PSRE] ability [to manage IP] is seriously compromised by the insistence of the parent body (or other Government funder) on retaining the ownership of the IP and the authority to assign it to third parties.”¹⁵⁷ This can lead to critical delay in negotiating licensing deals and is sometimes exacerbated when a PSRE receives funding from multiple sources, each with different IP ownership policies.
- *Funding.* The report detected problems amongst PSREs in finding development (pre-seed) funding and resources for administering knowledge transfer activities. It also noted that these problems are worsened substantially when PSREs lack freedom to maintain and deploy

154 Ibid [1.14].

155 Ibid [1.15].

156 Ibid [1.16].

157 Ibid [1.21].

surpluses due to strict control over their revenue by their sponsor body. The end result is that such PSREs can “neither afford nor have the incentive to engage in commercialisation.”¹⁵⁸

c. Staff Incentives to commercialise their IP

- *Academic Culture.* The report commented that currently scientists are motivated by esteem derived from publication and peer review. However, in order to encourage knowledge transfer staff need to be rewarded “not only for doing science but also for exploiting it.”¹⁵⁹ The report recognised that reward and incentive schemes are now common in PSREs, nevertheless the report encouraged government to support this trend to make such a policy universal.

d. Access to Commercialisation Expertise

- *Access to Skills.* Finally, the report emphasised that developing IP requires specialised skills in a number of areas and that the right combination of skills and experts is often hard (and expensive) to find. It noted, that whilst some larger PSREs may find it economically viable to employ in-house specialists, most will need to work with industry and to this end they need assistance in developing networks.

ii) Recommendations

Drawing upon the above observations, the Baker Report made the following recommendations under its four headings of review:

a. Culture and Commitment to knowledge transfer

- *A sense of mission and culture to commercialise.* The report recommended that knowledge transfer be made an explicit part of both PSRE and research sponsors’ missions, as well as part of the job description of PSRE chief executives. It also recommended making knowledge transfer the *personal* responsibility of PSRE chief executives and even including the ability to lead and motivate as part of the recruitment criteria for future chief executive positions.
- *Attitude to Risk.* The report recommended that various government departments work together to develop an accountability framework for commercialisation that “emphasises portfolio risk management and transparency rather than incentivising risk avoidance.”¹⁶⁰

158 Ibid [1.23].

159 Ibid [1.31].

160 Ibid [1.18].

b. PSRE/Sponsor Relationship regarding IP ownership and financial freedom

- *IP Ownership.* The report strongly recommended departmental PSREs be put at great arm's length from their Government departments and that IP generated by all PSREs be owned by the PSRE and assigned by authority of the chief executive unless effective alternative arrangements already exist.
- *Funding.* The report emphasised that sponsors should allow their PSREs "full freedoms to carry forward surpluses and retain receipts and other financial freedoms"¹⁶¹ and that revenue sharing agreements between sponsors and PSREs should "err on the side of generosity to the PSRE."¹⁶² However, the report also recommended that other initiatives be taken to address funding problems faced by PSREs including extending eligibility criteria of initiatives for promoting knowledge transfer, and looking at the scope for drawing PSREs into incentive schemes for industry. Significantly, the report stated: "PSREs should be explicit about the costs associated with implementing a knowledge transfer strategy [and] Government must be prepared to meet these costs if it wants to give parity of esteem to the knowledge transfer mission."¹⁶³

c. Staff Incentives to commercialise their IP

- *Academic Culture.* The report concluded PSRE chief executives should be required to have in place effective schemes for encouraging and rewarding staff participation in knowledge transfer activities.

d. Access to Commercialisation Expertise

- *Access to Skills.* The report recommended that PSRE sponsors encourage the development of networks amongst PSREs for sharing best practice in knowledge transfer and to promote synergies. It also recommended obliging PSRE chief executives to ensure they have access to necessary skills and experience and that Ministers consider creating a small expert unit within central government to promote knowledge transfer by, amongst other things, providing advice and encouragement to PSREs and their sponsors on knowledge transfer. Finally the report noted that Government should seek to improve the PSRE's ability to pay market rates to attract and retain people with commercialisation expertise.

161 Ibid [1.29].

162 Ibid.

163 Ibid [1.30].

4.3.3 Responses to the Baker Report

The UK government has responded to the Baker Report with numerous documents, which combined address all the issues raised by the report.¹⁶⁴ Most relevant to this study, however, is the Patent Office Guidelines relating to PSREs.¹⁶⁵ Based on the Baker Report recommendations, these guidelines set out the new Government policy for intellectual property ownership, management and exploitation. As the title suggest they are directed at both research purchasers (such as funding agencies) and research providers.

From the Guidelines three key elements of the new Government policy with regard to intellectual property can be discerned. These three elements concern: (i) ownership of intellectual property; (ii) responsibilities attached to ownership; and (iii) the need to protect public sector purchasers' interests in results generated by research they have funded. The Guidelines impose obligations on both research purchasers and research providers with regard to all three elements.

(i) Ownership of intellectual property

Fundamentally, the Guidelines recognise that research providers are generally best suited to exploit their own research results, thus they state that

*“[o]wnership of IP generated in publicly funded research... is to reside with the research provider, as the body best placed to secure exploitation, unless there are valid and compelling reasons to the contrary.”*¹⁶⁶

According to the Guidelines, such valid and compelling reasons to the contrary may include: national security; dissemination of information; aggregation of work, protection of purchasers' own standards or regulatory responsibilities; and lack of resources on behalf of the research provider.

Hence, the guidelines do not impose upon research purchasers any strict obligation to assign ownership of intellectual property to the research providers, but they do require the purchaser to “consider the best strategy

164 These documents include: Department of Trade and Industry, ‘Excellence and Opportunity: A Science and Innovation Policy for the 21st Century’ (2000); HM Treasury, ‘Selling Government Services into Wider Markets’, (1998); HM Treasury, ‘Cross Cutting Review of the Knowledge Economy: Review of Government Information’ (2000); HM Treasury Taskforce, ‘Implementing Baker: Developing the Bridge between Public Sector Science and the Market’ (2000); Comptroller and Auditor General, ‘Delivering the Commercialisation of Public Sector Science’ (2002).

165 The Patent Office (UK) ‘Intellectual Property in Government Research Contracts’.

166 Ibid [15] (emphasis added).

towards ownership”¹⁶⁷. The guidelines also impose an obligation on *research providers* to accept ownership of intellectual property unless there are compelling reasons to the contrary.

(ii) Responsibilities attached to ownership of intellectual property

The new policy articulated in the Guidelines also emphasises that:

*“rights of ownership need to be accompanied by its responsibilities, specifically a responsibility for research organisations to identify, protect and manage IP effectively and to pursue commercial exploitation diligently.”*¹⁶⁸

However, primary responsibility for implementing this policy is given to research purchasers. Hence, purchasers are required to: a) “mandate the research provider to perform certain actions”¹⁶⁹; b) have a system in place to monitor, at a strategic level, the effectiveness of exploitation by providers; and c) ensure that they have a means of addressing any shortfall in exploitation by the providers.

The guidelines state that responsibilities imposed upon the research providers by the purchasers must be contained in the research contract and may include:

- A responsibility to identify exploitable results and report them to the purchaser
- A responsibility to secure intellectual property protection for research results and promote the commercial exploitation of these results
- A responsibility to notify the purchaser of all patent applications and other intellectual property rights
- A responsibility to report on the progress of commercial exploitation and of all licences granted
- A responsibility to keep accounts of revenue generated by exploitation of its intellectual property

The guidelines also suggest various means by which to address a providers’ lack of exploitation of its intellectual property, but ultimately leave the decision up to the research purchaser whether and how to implement sanctions. The suggestions made in the guidelines are:

- Securing a compulsory licence that can be invoked if provider fails to secure adequate exploitation;

167 Ibid [9].

168 Ibid [4(iv)].

169 Ibid [46].

- Securing a ‘march in right’; or
- Rating providers on the basis of their exploitation of IP and using the rating as a factor in determining whether to award new contracts or as a factor that would justify making alternative arrangements for commercial exploitation

With regard to research providers, the Guidelines state generally such providers’ responsibility for exploiting the results of research, including responsibility for costs, risks and any potential liability involved in protecting, exploiting and enforcing the intellectual property generated from such results. The Guidelines recognise that not all research will yield exploitable results and express the expectation that research providers will make commercial decisions in this regard. More specifically, the Guidelines require research providers to seek expert advice and assistance regarding exploitation where necessary and to resist the temptation to reduce short-term costs by not seeking such advice. The Guidelines also require research providers to supply research purchasers with regular feedback on their systems for exploitation and their exploitation activities and to inform the purchasers of any assignment of intellectual property ownership.

Finally, the Guidelines impose obligations upon research providers with respect to a publications policy, management of conflicts of interest and staff incentive schemes. Regarding a publications policy, research providers are required to establish a policy that ensures valuable research results are not compromised by their publication before their suitability for patent protection or for exploitation as confidential information is considered. With respect to management of conflict of interest, providers are required to ensure terms of employment for staff working on publicly funded research enable research results to vest in the research provider. Finally, research providers are expressly required to ensure that they have staff reward schemes in place for inventors and those engaged in technology transfer.

(iii) Protecting public sector purchasers’ interests in research results

Whilst the Guidelines are generally concerned with ensuring exploitation of research results via a policy of ownership and attached responsibility, they are also concerned to ensure that the Government and its funding bodies retain a right to use the intellectual property generated by the research they fund and that the wider public/taxpayer benefits from its investment in the research. To this end, the obligations require public sector research purchasers to:

- Ensure, when assigning intellectual property rights, that they maintain a licence to use the intellectual property by way of a “suitable, specific clause” in the research contract *before* research begins. This licence must

be “perpetual and irrevocable” and should preserve government entitlement if the intellectual property rights are assigned in any way or under any circumstances.

- Consider whether a “royalty or share of revenue generates should be secured for the public purse”¹⁷⁰ and if so, to include an entitlement clause in the research contract.

Finally, the guidelines permit purchasers to control or limit the provider’s exploitation of its intellectual property if necessary. They also impose an obligation upon research providers to respect the right of the Government to use the results of the research for Government business.

4.3.4 Lessons from the United Kingdom

Experience in the UK reveals that for the purposes of knowledge transfers, including commercialisation, intellectual property created by employees of research bodies is generally best owned by research bodies as opposed to research funders. This concurs with the policy approaches adopted in the US and proposed in Canada, giving strong support for an approach in Australia that starts with the assumption that IP ownership should lie with research bodies.

The UK experience also supports the view that IP ownership should be coupled with certain responsibilities regarding IP identification, protection, management and commercialisation, and that failure to fulfill such responsibilities may require sanctions. Thus, although the problems faced by the UK concerning knowledge transfer (outlined in the summary of the Baker Report in part 5.3.2, above) lie more in management strategies and structures rather than ownership policy as compared to the issues identified in the United States and Canada, new UK policy essentially corresponds to a *Bayh-Dole* model. Some of the details of the policy are, of course, different from *Bayh-Dole*. Of particular interest is the emphasis on a sense of mission to commercialise, and the various recommendations regarding possible sanctions, especially the third proposal of establishing a rating system based on patent exploitation.

The UK model also applies to all publicly funded research providers including government research organisations, rather than having two separate but similar policies as in the United States under the *Bayh-Dole/Stevenson Wydler* structure. The Patent Office Guidelines propose general responsibilities attaching to ownership rights with the specific means of fulfilling these responsibilities being left to the discretion of the research body, so long as it can account for its management decisions. The Guidelines

170 Ibid [42].

are not unduly prescriptive (perhaps because they cover a broad range of research bodies), but instead allow research bodies to manage their IP.

Like *Bayh-Dole*, the UK model is implemented via funding agreements between the funding body and the research provider. However, the proposed UK approach places even more emphasis on the responsibilities of funding bodies to ensure that the new policy works. Thus funding bodies must take responsibility for establishing and monitoring the responsibilities of the research providers, and are also expected to provide the research providers with necessary support for the fulfillment of their management responsibilities. This is in line with the constant recognition, within all the UK reports on commercialisation of publicly funded research results, that research bodies have responsibilities other than commercialisation and that whilst increased commercialisation is important it must not jeopardise those other responsibilities.

Further to this previous point, it should be noted that in concurrence with the Baker Report's observation that "effective knowledge transfer costs money", the Patent Office Guidelines form only a small part of the UK Government's new approach to encouraging commercialisation of publicly funded research results. The UK Government has also committed significant funds to infrastructure and schemes aimed at facilitating the transfer of knowledge, including establishing partnerships between research bodies and industry. This wider approach ensures that the obligations imposed upon the research bodies do not create an added burden, which could jeopardise the quality and/or quantity of the research they produce.

4.4 Summary

Experiences in both Canada and the United Kingdom generally support a *Bayh-Dole* style approach. Experience in Canada reveals many problems that may arise out of a laissez-faire approach to IP ownership and especially out of the failure of research institutions to take responsibility for IP management. On the other hand, the UK experience reveals problems that arise when research funders maintain too much control over IP generated from their funds. Both experiences therefore point to research bodies as the most desirable owners of IP.

Both countries recognise the need to attach responsibilities to IP ownership, though each country seeks to implement them in different ways. The responsibilities are aimed at encouraging research bodies to implement strategies and systems to identify, protect, manage and exploit valuable IP. In addition, both countries also emphasise the importance of incorporating

knowledge transfer or innovation as an express part of research bodies' missions. They also require disclosure of all intellectual property owned by research bodies to the Government on a regular basis. Canada has proposed that research bodies give priority to local industry and small business when licensing IP. The UK, on the other hand considers such an obligation unrealistic and inconsistent with the global nature of industry.

The common points shared by the UK and Canadian proposals for reform of IP management in publicly funded research bodies can be summarised as follows:

- IP should be vested in the research bodies
- IP ownership should be coupled with responsibilities designed to encourage research bodies to implement strategies and systems to identify, protect, manage and exploit valuable IP
- Knowledge transfer or innovation should be included as an express objective of research bodies
- IP owned by research bodies should be disclosed to the government on a regular basis

5 Lessons from overseas

5.1 Introduction

This chapter will draw on the understanding of experiences in the United States, Canada and United Kingdom developed in Chapters 2, 3 and 4 to address whether a *Bayh-Dole/Stevenson-Wydler* style approach towards IP ownership could be of benefit to Australia. In furtherance of this task it will first look at whether Australia currently experiences any of the problems *Bayh-Dole* and *Stevenson-Wydler* were originally designed to address. It will also draw on a number of recent reports in order to identify what other issues might be most relevant to commercialisation of inventions generated by Australian research institutions. This section will also examine whether the *National Principles* and *Interim Guidelines* address these issues. Based on this information and our understanding of experiences in other jurisdictions, this chapter will then assess:

- Where IP ownership would best lie in order to facilitate effective commercialisation of IP generated by Australian research institutions; and
- Whether there are any aspects of the *Bayh-Dole/Stevenson-Wydler* style model that could be useful in Australia; and if so,
- Whether the issues relevant to commercialisation in Australia could be addressed by an expansion of the *National Principles* approach; and if so
- What would be a suitable model for IP management in Australian research institutions.

5.2 Relevance of *Bayh-Dole* and *Stevenson-Wydler* to Australia

5.2.1 Are the problems *Bayh-Dole* addressed in the United States relevant to Australia?

We have seen that in the United States prior to *Bayh-Dole*, when an invention was created using public funds under an agreement with a government funding agency, three key barriers hindered the commercialisation of that invention:

- There were a large number of government funding agencies, each with a different policy on ownership
- The government funding agency had the power to manage the commercialisation process but was often not in the best position to do this
- Universities and other research institutions were reluctant to invest in commercialisation because there was no guarantee of obtaining exclusive rights.

As a result, *Bayh-Dole* was enacted to give universities and other research institutions the opportunity to take title to inventions, to take the government out of the commercialisation process, and to provide an incentive for commercialisation to occur.

One way of assessing the relevance of *Bayh-Dole* to Australia is by looking at whether Australian universities currently face the same issues that *Bayh-Dole* was designed to correct in the United States. In Chapter 1, it was noted that in Australia, government funding agencies have different policies regarding patent ownership. The two main sources of funding—the ARC and the NHMRC—follow the policy contained in the *National Principles* and *Interim Guidelines* and do not claim ownership of inventions generated using public funds. RDCs, (and indeed certain other funding agencies) in contrast, do not subscribe to the *National Principles* and *Interim Guidelines*. They are usually unwilling to relinquish any entitlement to inventions created under projects that they fund. One might argue that the differing practices among government funding agencies makes it more difficult to develop a consistent approach to the commercialisation of publicly funded research.

Regarding the second and third impediments mentioned above, it is clear that they are not relevant to research funded by the ARC and NHMRC. Consistent with their policy of not claiming ownership, the ARC and NHMRC do not exercise any control over the commercialisation process. The only obligation imposed on the university through the *National Principles* is to consider commercialisation. The ARC and NHMRC also give universities the maximum incentive to commercialise because each university has full ownership and can get a full return on its investment. It may be argued that where ARC and NHMRC research is concerned, to the extent to which there are problems in Australia, they do not stem from the level of control exercised by the ARC or NHMRC, but rather from the lack of a sense of responsibility upon the university to manage the commercialisation process (see below).

Where RDCs are concerned, the second and third impediments may be more relevant. It may be argued that RDCs are unnecessarily intervening in the commercialisation process and granting universities something less than full ownership, making them reluctant to pursue commercialisation. As against

this however, the main reason why an RDC would be interested in obtaining ownership rights is to maximise revenue. Unlike the government agencies of the United States in the pre-*Bayh-Dole* era, RDCs are commercially oriented and interested in making profits from public investments to put back into their industry. A circumspect attitude is demonstrated for example by the RIRDC in its commercialisation policy. The RIRDC emphasises that it will only involve itself in the commercialisation process if there are ‘exceptional circumstances’,¹⁷¹ and recognises that ‘other organisations are often better placed to commercialise intellectual property than RIRDC’.¹⁷²

In conclusion, whilst the concerns that led to the implementation of *Bayh-Dole* in the United States are of some relevance in Australia, particularly that regarding consistent ownership policy, they are not significant to the same degree as they were in the United States prior to *Bayh-Dole*.

5.2.2 Are the problems *Stevenson-Wydler* addressed in the United States relevant to Australia?

We have seen that in the United States, prior to *Stevenson-Wydler*, there were three significant barriers to the commercialisation of inventions created by government research organisations.

- There was a lack of obligation on government agencies to commercialise their IP;
- There was a lack of administration support structures;
- There was a lack of uniform licensing powers.

As a result, *Stevenson-Wydler* was enacted to impose a duty on federal agencies to commercialise their IP once ownership has been claimed, and to establish administrative structures and licensing guidelines to support this obligation.

It seems that these concerns are relevant to Australian government research organisations to a limited extent. In the sample survey of 5 organisations, there are two main approaches that organisations generally take towards commercialisation:

- Aim to commercialise their IP within their organisation and may share a percentage of the rights and proceeds with the inventor
- Do not aim to commercialise their IP within their organisation but instead transfer most of their IP to industry

171 RIRDC, policy 7.

172 RIRDC, policy 7.

Organisations adopting the second approach tend to assign or licence their IP rights to private sector even though there is no obligation to do so, as the organisations aim to help build sustainable Australian industry. This is the outcome sought by *Stevenson-Wylder*. The other organisations do not aim to transfer IP rights to industry but instead commercialise inventions within their organisation. In practice, four out of the five organisations seek to commercialise their IP (whether internally or by licence or assignment to industry) and therefore there seems to be no need to impose an obligation of commercialisation upon most of these organisations.

Regarding the second and third impediments mentioned above, it was not possible to obtain information on the adequacy of administrative support structures and licensing powers and thus they are not included in the analysis. On the basis of this analysis, it would appear that Australia is not experiencing the same type of problems that were experienced in the United States prior to the implementation of *Stevenson-Wylder*. Therefore, the *Stevenson-Wylder* legislation may not be relevant to Australia as it may not be able to address the issues relevant to commercialisation of IP in Australian government research organisations.

5.2.3 Distinction between universities and government research organisations

In the United States, put simply, the *Bayh-Dole* legislation applies to universities while the *Stevenson-Wylder* legislation applies to government research organisations. Both pieces of legislation have similar aims and effects: by allowing government laboratories and recipients of government funding to retain title to their inventions whilst giving them responsibility to promote utilization, they seek to encourage commercialisation and ensure public availability of new technology.

In Australia, it is questionable whether a distinction between universities and government research organisations is necessary. Government research organizations clearly differ from universities in that their sole focus is upon research rather than research and teaching, and therefore it would be expected that government research organizations produce more IP than universities. However, despite the differing importance attributed to research, reports indicate that the issues relevant to IP management and commercialisation are similar for both entities. Indeed, in the UK, universities and government research organisations are all treated in the same way– as public sector research establishments. Likewise, the *National Principles* and *Interim Guidelines* use the terminology “research institutions” rather than differentiating between different types of research bodies. In order to minimise costs and bureaucracy, a lower level of regulation would seem to

be preferable. The implementation of separate policies for government research organisations and universities seems counterproductive and futile, since both types of research institutions are essentially facing the same issues regarding IP commercialisation. Instead, a policy could be implemented to apply to all publicly funded research in research institutions. This policy could be inspired by the approach taken in the US under *Stevenson-Wydler* and *Bayh-Dole*, and be based around a supplementation of the *National Principles* and *Interim Guidelines*.

5.2.4 Issues relevant to commercialisation in Australia

From the previous analysis, it seems that Australia is not experiencing the same problems as the US was in the 1980s before the *Bayh-Dole* and *Stevenson-Wydler* legislation was adopted. However, as we have seen from our review of experiences in Canada and the United Kingdom, a *Bayh-Dole/Stevenson-Wydler* style approach to patent ownership may be useful in addressing concerns regarding commercialisation of IP other than those experienced in the United States. Indeed, a different way of approaching the question is to ask whether, regardless of the problems that the US legislation was designed to address, some aspects of the legislation could be adopted to address the issues relevant to commercialisation of IP in Australian research institutions. The next section of this report will, therefore, review commonly cited issues surrounding commercialisation of IP generated by publicly funded research in Australia. It will do this with a view to determining whether these issues might be addressed by a revised patent ownership policy in Australia, that is inspired by the *Bayh-Dole/Stevenson-Wydler* approach and that builds on the already existing framework provided by the *National Principles* and the *Interim Guidelines*.

An examination of recent reports¹⁷³ on commercialisation of IP generated by universities and other publicly funded research bodies in Australia, revealed that most concerns regarding commercialisation pertain to intellectual property management. While there are certain issues that are specific to either universities or government research organizations, the reports seem to deal with these bodies together as the main issues surrounding commercialisation of their IP are similar. Amongst these reports, there are some commonly identified factors that can affect commercialisation of IP generated by Australian research institutions. These may be summarised by the following list, which is not intended to be exhaustive, but rather gives an indication of the kinds of issues that face research institutions in commercialising their intellectual property.

173 PMSEIC, FASTS, NIS

- ***Identifying commercially valuable IP.*** Identifying the commercial potential of research results often requires skills and expertise outside researchers' traditional training. Thus, although many Australian research institutions require academic researchers to disclose potentially valuable inventions, an effective IP management system may also need to include mechanisms to assist academics in recognising such inventions. The surveyed reports recommend various mechanisms including additional training for researchers, employing specific personnel to monitor research activities and encouraging researchers to develop closer ties with industry.¹⁷⁴
- ***Rewards and Incentives for Commercialisation.*** All the reports recognise the importance of rewarding employee inventors as an incentive to pursue commercialisation. Where university research is successfully commercialised, most universities grant the inventor a right to receive a share of the revenue, which will be also distributed between the university, the inventor's faculty and department and any university company involved in commercialisation. However, whilst universities may have royalty sharing schemes when an invention is commercialised, academic performance appraisal is still often based on publication or grants received rather than efforts to commercialise. Not only does this provide inadequate incentive to commercialise, but when "commercialisation activities remove them from 'mainstream' activities" it can jeopardise academics' chances for promotion and thus act as a disincentive.¹⁷⁵ According to our survey, only one government research organisation specifically allocates a percentage of their net proceeds of commercialisation to the inventor; the other organisations do not award ownership rights nor a percentage of the proceeds to the inventor.
- ***Publication of research.*** Premature publication of research can prejudice patent applications, because if an invention is disclosed to the public it will no longer satisfy the novelty requirement of patentability. However, academic culture often encourages early publication, as promotion and peer recognition are often based around publication in peer reviewed journals.¹⁷⁶ Most universities have pre-publication review procedures in order to identify potentially patentable inventions, but many acknowledge that these procedures are not particularly effective. In contrast, the premature publication of research does not seem to be an issue in government research organisations because an obligation of confidentiality is imposed on employees who develop new technology.

174 PMSEIC 19, FASTS.

175 FASTS. See also PMSEIC 21.

176 NIS, 39.

- **Management infrastructure.** Specific commercial management skills and experience are required to facilitate the commercialisation of IP.¹⁷⁷ Researchers often do not possess such expertise and thus need access to people who have the relevant skills and experience.¹⁷⁸ A concentration of the necessary skills in a central technology management “arm” of the university would make the process more efficient. Where the imperative for commercialisation is placed on individual academics, those academics usually lack the expertise to value and manage inventions, let alone market them in an entrepreneurial fashion.¹⁷⁹ Furthermore, there is also evidence that universities are too risk averse and not commercially oriented enough. Indeed, there is little incentive for universities to practice risk management as opposed to risk avoidance. Furthermore, certain government research organisations require Ministerial approval to transfer IP rights, which seems to be a possible impediment to commercialisation.
- **Funding the commercialisation process.** There is also a lack of capital for the later stages of commercialisation, in particular product development.¹⁸⁰ The lack of funding is exacerbated by the pressure on researchers to publish earlier rather than later, as that means that patent protection must also come at an early stage. However, if an invention is in its infancy it is also more difficult to secure funding for patent protection.¹⁸¹
- **Loss of Australian inventions overseas.** When commercialising IP, research institutions have a tendency to engage offshore companies to develop new inventions due to a lack of industry receptors in Australia. This benefits the research institutions financially in the short term, but ultimately deprives Australia of valuable innovation.¹⁸²

It should be noted that not all the foregoing concerns are applicable to all research institutions in Australia. Indeed, as well as listing the various problems currently affecting commercialisation, the FASTS report also refers to a number of ‘success stories’. Likewise, the Australian Tertiary Institutions Commercial Companies Association (ATICCA) survey indicated that the rate of creation of technology start-ups arising from university research seems to be increasing and that about one-third of technology start-ups in Australia in the

177 NIS, 40.

178 FASTS.

179 PMSEIC, 21, FASTS.

180 NIS, 39, FASTS, PMSEIC, 17.

181 NIS, 39.

182 ARC study 2000 (see below: (ii)). This argument has also been brought to the attention of the Senate Employment, Workplace Relations, Small Business and Education References Committee. See Ferguson submission.

period between 1996-1998, stemmed from universities.¹⁸³ However, the ATICCA working group noted that analysis is required about the number and proportion of start-up companies that originate from universities prosper in the long term. It is difficult to elicit a definite and direct assessment of the performance of Australian research institutions in research commercialisation due to inconsistent definitions and the absence of data.¹⁸⁴ Data is not readily available due to a lack of desire or will to collect such data or for reasons of commercial secrecy.¹⁸⁵ Indeed, it would also be difficult to assess the appropriate or ideal level of achievement in commercialisation for each university or government research organisation as each body has differing emphasis on research and capabilities.

The ARC and NHMRC are due to release a report, mid 2002, that will benchmark the performance of Australian university research and health and medical institutes in research commercialisation and technology transfer against international best practice (specifically in the US and Canada).¹⁸⁶ The study is applying AUTM's *Licensing Survey* in the US and Canada to the situation in Australia. It is hoped that this report will aid in the development of an accurate and comprehensive measure of the performance of Australian research institutions, in terms of innovation and commercialisation as well as eliciting empirical evidence. Such data should aid future analysis into this issue.

Currently available reports indicate that the commercialisation of publicly funded research in Australia may be improving.¹⁸⁷ As research institutions become more used to the commercialisation process, it is likely that they will further improve their IP management systems. Nevertheless, as the Baker Report observed with regard to the United Kingdom, in the increasingly competitive global market for inventions, there will always be room for fine tuning and adding "fresh impetus to" the commercialisation process. Addressing the above list of concerns could provide a solid starting point.

5.2.5 Would a *Bayh-Dole* style model be useful in Australia?

(i) Where should patent ownership lie?

Most of the surveyed reports seek to address the issues they identify, surrounding the commercialisation of university-generated IP, at a micro level by recommending better management strategies and systems to be adopted

183 DETYA, 25.

184 PMSEIC, 10.

185 DETYA, 25.

186 ARC, *Investing in Our Future*.

187 FASTS, ATTICA.

by universities. In 1999, for example, the Melbourne Consulting Group set out a very comprehensive checklist of issues that universities and other research institutions needed to consider in order to improve their intellectual property management practices.¹⁸⁸ Some also suggest changes to government policy, particularly with regard to taxation and funding. These recommendations will need to be heeded if Australian universities are to maximise their knowledge transfer potential. However, the focus of this report is to ascertain whether a new or varied approach to patent *ownership* may better facilitate increased knowledge transfer from publicly-funded research bodies to the wider community, in particular through commercialisation of IP generated by such bodies.

Perhaps the only recent study to consider this option was conducted by the ARC in 2000. In that study, the ARC was concerned with the loss of Australian inventions to overseas companies through the commercialisation process, which tends to happen when IP management is put in the hands of the universities. As a possible solution to this problem, the ARC considered changing the ownership framework by giving academics greater rights over inventions that they create with public funds. For example, it could be a condition of ARC grants that academics obtain an exclusive licence to exploit any IP they create using the funds provided. This might provide an incentive for academics to engage in entrepreneurial behaviour, which is more than that provided by a mere royalty sharing arrangement. The ARC noted, however, that there are risks with this approach. Academics usually do not have the time, flexibility in career path, expertise or funds to commercialise their inventions. The ARC is not the only study to observe that academics are generally not well equipped to manage commercialisation¹⁸⁹ and, as we have seen in Chapter 4, experience in Canada supports such observations. The ARC proposed that these problems be addressed by providing academics with adequate support structures. The ARC favoured the approach taken by the University of Cambridge, which has an Industrial Liaison and Technology Transfer Office to help researchers exploit new discoveries.

An alternative approach to changing the patent ownership framework in Australia would be to revert ownership of patents generated by universities to the government or government funding body. As our analysis of experiences in the United States and the United Kingdom reveals, however, this may cause problems of fragmentation of ownership when funding is received from more than one source. Moreover in the United States and the United Kingdom, the government and its funding agencies were generally less well

188 Melbourne Consulting Group, 'University Research: Technology Transfer and Commercialisation Practices'.

189 FASTS, 4 and PMSEIC, 21.

equipped to commercialise IP and there is no evidence that the situation would be any different in Australia.

Thus, it would appear that the optimal default position with regard to ownership of patents generated by research institutions is that ownership should lie with the research institution. This is the position under *Bayh-Dole* and *Stevenson-Wydler*. It is also the most common situation in Australian research institutions at present. Thus, adopting a *Bayh-Dole/ Stevenson-Wydler* style model in Australia would not alter dramatically the patent ownership situation in Australia, although it would enshrine the preferred position in an official policy, ensuring consistency with regard to patent ownership now and in the future.

The key significance of a *Bayh-Dole/ Stevenson-Wydler* style model in Australia, however, would not be so much in the policy it enshrines as to *where* ownership should lie, but in the *approach* towards patent ownership, especially in relation to the responsibilities that should attach to patent ownership.

(ii) Attaching responsibilities to patent ownership

As explained in Chapter 1, the *Bayh-Dole Act* specifies that a right of IP ownership is to be granted to universities subject to various conditions. Those conditions essentially ensure that with the right of IP ownership comes a responsibility to manage that IP appropriately. This includes adopting management strategies designed to ensure that the potential to commercialise IP is not lost inadvertently. Specifically, *Bayh-Dole* provides that ownership comes with responsibilities to: disclose valuable inventions to the funding agency; elect whether to retain title within a reasonable period; file a patent application within a reasonable period; seek agency approval for assignment; endeavour to license to small business; give preference to local industry; reward academic inventors; and to spend resulting profits on future research. If the university does not meet these responsibilities, the government may reassert its rights over the particular invention concerned.

It may be argued that in the United States, the conditions attached to the right of ownership, combined with the newness of universities' entitlement to own the IP they generate, have contributed to a culture within universities that encourages a sense of responsibility with regard to the commercialisation of their IP. In Australia, it may be surmised, that since it has long been general practice that universities own any invention they create with public funds, ownership rights tend to be taken more for granted and the sense of responsibility that comes with those rights is less sharp than it became in the US after *Bayh-Dole*. Rather than altering *where* ownership generally lies, adopting a *Bayh-Dole* style model in Australia would establish a new *conditional approach* to ownership. In so doing it would establish certain

basic principles with regard to IP management strategies and thus may kindle a more active culture of commercialisation within universities. Whilst it is no substitute for other measures aimed at improving universities' commercialisation record, such as investment in commercialisation infrastructure and assistance establishing links between universities and industry, *Bayh-Dole* style conditional ownership could compliment these measures by providing a uniform default position with regard to ownership and by fostering a culture of responsibility for commercialisation.

The foregoing conclusion appears to be supported by experience in the United Kingdom. In Chapter 4, we saw that in the United Kingdom, as in Australia, most of the concerns surrounding commercialisation of publicly funded research pertained to the management of IP rather than its ownership. The United Kingdom has addressed these concerns through a wide range of measures, which include a *Bayh-Dole* style approach to ownership through the establishment of the Patent Office Guidelines. These Guidelines seek to ensure that universities are uniformly given ownership to any IP they generate, unless there are valid and compelling reasons to do otherwise. An essential component of these Guidelines is the emphasis on the responsibilities that come with the right to IP ownership.

iii) National principles and interim guidelines

The above analysis suggests that a *Bayh-Dole/Stevenson-Wylder* style model, where patent ownership is initially vested in the research institution and coupled with responsibilities for IP management, would address the issues relevant to IP commercialisation in Australian research institutions. This is the direction that Australia is already taking in the *National Principles* and *Interim Guidelines*. Instead of adopting a new legislative policy, the changes suggested in the following section could be implemented through such existing mechanisms. Indeed, the *National Principles* and *Interim Guidelines* were deliberately written in general language as they were designed to “evolve over time” and develop in parallel with the experiences and needs of funding agencies, research institutions and researchers.¹⁹⁰

The approach that we propose for Australia is an expansion of the scope of the *National Principles* and *Interim Guidelines*, by supplementing the responsibilities that are attached to patent ownership in publicly funded research, and by extending the application of these principles to a wider range of funding grants. This will be referred to as the “expanded *National Principles*” model.¹⁹¹

190 National Principles, foreword.

191 The “expanded National Principles model” also includes the analogous expansion of the Interim Guidelines.

5.3 Expansion of the national principles

5.3.1 Patent ownership

Whilst the great majority of experiences, both in Australia and overseas, support the conclusion that the best default position regarding ownership of patents generated by research institutions is that it lie with the generating research institution, both the United States and the United Kingdom have recognised that there may be occasions when ownership would better lie with the government or its funding agency. Hence *Bayh-Dole* provides an exception to the general rule that research institutions may elect to retain ownership where, in the opinion of the funding agency, ‘exceptional circumstances’ exist such that allowing the research institution to retain title would ultimately compromise the objectives of the legislation. Similarly, the Patent Office Guidelines establish a policy whereby funding agencies and government departments are required to grant IP ownership to the public researcher unless there are “valid and compelling reasons” not to.

It seems sensible for Australia to take a similar approach, establishing a default policy that ownership of patents generated with public funds lie with research institutions unless the research funder considers there to be compelling reason for it to lie elsewhere. Our analysis of *Bayh-Dole* and the UK Patent Office Guidelines indicate that such compelling reasons might include: national interest or security; public interest; dissemination of information; that in the particular circumstances the funding body is in a better position to commercialise; and/or that the research results are important to the function of the funding body. The onus would be on the funding agency or department to establish that such reasons exist on a case by case basis.

Australia could follow the approach that is proposed in Canada and in the UK, where title to patents is vested in the research institutions as a default position but allow the research institution to decide whether title should be assigned to the employee inventor and on what terms. In certain situations, the responsible management and commercialisation of an invention may be best served by the research institution granting title to the employee inventor. This view is already reflected in the *National Principles* and the *Interim Guidelines*, which both provide that research institutions should have policies in place for determining assignment of IP rights to employees.¹⁹² Assignment could be negotiated on a case-by-case basis by the employee and the research institution.

¹⁹² National Principles, principle 4, Interim Guidelines, principle 2.4.

5.3.2 Responsibilities that could be attached to patent ownership

The responsibilities attached to research institutions' ownership rights under *Bayh-Dole* and *Stevenson-Wylder* in the United States, were summarised in parts 2.3.3 and 2.4.1(ii). These responsibilities were designed to address the particular concerns relevant to the United States prior to 1980. In considering what responsibilities might be transposed into the Australian context, it is important to bear in mind the particular issues often identified with regard to the Australian framework. Hence the specific managerial concerns identified in section 5.2.4 above will be relevant to the establishment of an Australian model.

The following list gives some indication of the kinds of conditions that could be attached to patent ownership granted to Australian research institutions receiving public funds, to foster a sense of responsibility regarding IP management. They are designed to address the particular concerns relevant to Australia, drawing from overseas experience where necessary. Since research institutions vary considerably in size, structure, emphasis on research and the types of research they do, no one management system or structure will be relevant to all. Thus, the conditions mentioned in the following list are intended to establish some basic general responsibilities; the specific means of complying can be left to the research institutions, depending on their own circumstances.

Finally, it should be noted that many research institutions already fulfil a number of the responsibilities listed below. However, enshrining these responsibilities in an expanded *National Principles* model would ensure that all research institutions adhere to them. Furthermore, it would encourage research institutions that already have relevant structures and procedures in place to review and improve those structures and procedures as they periodically account to the funding agency for their IP management systems.

(i) Responsibilities regarding identification of commercially valuable inventions.

The first step in the commercialisation process is to identify inventions of potential commercial value. The United States, Canada and the United Kingdom all require research institutions to disclose all potentially valuable inventions generated with public funds to the funding body and/or government generally. The UK Patent Office Guidelines also include an express obligation to identify such inventions.

Most Australian publicly funded research institutions have for some time required employee inventors to disclose all potentially valuable inventions to

the research institution. However, a number of reports observed that employee inventors do not always have the skills or expertise to identify valuable inventions in order to disclose them. The *National Principles* and *Interim Guidelines* sought to address this by stipulating that research institutions have procedures that provide support to researchers so that they can recognise when their discoveries may have potential commercial value.¹⁹³ The *National Principles* and *Interim Guidelines* also require research institutions to provide for a review process to identify IP that can be protected or exploited.¹⁹⁴

The approach taken in the *National Principles* and *Interim Guidelines* could be supplemented, however, by a measure similar to those overseas, requiring disclosure by research institutions to the research funder. Indeed, such a measure is already included in the *Interim Guidelines*.¹⁹⁵ The additional benefit of a disclosure measure would be to ensure greater accountability by research institutions to make certain their identification processes are effective. With a record of potentially valuable inventions generated by a research institutions, the funding agencies will also be in a better position to assess the effectiveness of management and commercialisation strategies and procedures

(ii) Responsibilities regarding protection of commercially valuable inventions

These responsibilities concern the patenting of the invention, including the period between identification of the invention and obtaining the patent. Of the three foreign jurisdictions reviewed in this report, the UK is the most explicit with regard to patenting responsibilities. The Patent Office Guidelines suggest funding agencies require the research provider to secure IP protection for the results of publicly funded work. They also emphasise that seeking patent protection is complex and they encourage the research provider to seek expert advice. Finally they require research providers to establish a publications policy, so that patent applications are not compromised by precipitate or over detailed publication. *Bayh-Dole* simply requires that once a research body has elected to retain title, it must agree to file a patent application within a reasonable period of time (specifically, one year).

In Australia, the *National Principles* and *Interim Guidelines* require research institutions to have in place policies that make clear to staff their responsibilities in relation to IP protection.¹⁹⁶ The *National Principles* also

193 National Principles, principle 2, Interim Guidelines, principle 2.2.

194 National Principles, principle 2, Interim Guidelines, principle 2.2.

195 Interim Guidelines, principle 2.7.

196 National Principles, principle 3, Interim Guidelines, principle 2.3.

make particular reference to the importance of maintaining laboratory records and preventing premature public disclosure of research results, where appropriate.¹⁹⁷ Both the *National Principles* and the *Interim Guidelines* stipulate that research institutions should provide, wherever possible, assistance and encouragement to researchers in fulfilling such obligations.¹⁹⁸

Whilst it is important to ensure that employees are aware of their responsibilities to protect valuable inventions, the *National Principles* and the *Interim Guidelines* could be supplemented by emphasising the ultimate responsibility of the research institution to protect its valuable inventions. This could be done by adopting the time period measure in *Bayh-Dole*. Thus, once a research institution had disclosed a valuable invention, it would then be required to patent that invention within a specific period of time or give reasons for its decision not to. As noted in Chapter 1, many universities impose time limits on themselves for commercialisation milestones. However, including a responsibility to file a patent application within a specific time in an expanded *National Principles* model would ensure that all research institutions are subject to such limits and that these limits are uniform. Expedient application procedures could also reduce the instances of publication jeopardising patent applications without the need to retard publication unduly.

(iii) Responsibilities regarding rewards and incentives for academic inventors

All the reports on commercialisation in Australian publicly funded research institutions emphasise the importance of rewarding employee inventors for co-operating and assisting with the commercialisation process. They note, however, that only some universities have reward or incentive programmes in place and our survey of five government research organisations revealed that most of them do not financially reward their employees for successful research commercialisation. Moreover, the above reports on commercialisation observed that often inflexible work arrangements and competing responsibilities within research institutions can act as a *disincentive* for employees to commercialise.

In the United States, *Bayh-Dole* requires universities to share the royalties from commercialised inventions with the inventors. In Canada, the Expert Panel recommended that universities should be required to provide incentives to create commercially valuable inventions through royalty sharing and recognition for commercial activities. The Patent Office Guidelines in the

197 National Principles, principle 3.

198 National Principles, principle 3, Interim Guidelines, principle 2.3.

United Kingdom also require PSREs to have reward schemes in place for inventors and those involved in technology transfer.

In Australia, the *National Principles* and the *Interim Guidelines* include general requirements for research institutions to reward and encourage employee participation in commercialisation.¹⁹⁹ They also require institutions to adopt policies that recognise the rights and needs of all stakeholders involved in the research supported by public funds. More specifically, the *Interim Guidelines* stipulate that these policies will include a method by which income from the development and exploitation of the IP will be allocated to the inventors and other stakeholders.²⁰⁰

The responsibility to reward and provide incentives for employee inventors and other staff to participate in the commercialisation process is an important one, as evidenced by its mention in all the Australian reports canvassed above in section 5.2.4. Thus, an expanded *National Principles* model could place even greater emphasis on this responsibility than do the *National Principles* and the *Interim Guidelines*. In particular, an expanded *National Principles* model could emphasise the need to ensure that employees' work arrangements and responsibilities do not act as a disincentive to commercialise and thus counter any incentive offered.

Finally, it is also noted in one report that royalty sharing payments were used to maintain research programmes rather than directly benefit the research involved and thus, such a form of financial incentive may not be successful.²⁰¹ An additional or alternative form of incentive for the involvement of researchers in commercialisation, is to link such activity with promotion. Indeed, some universities have changed their policy so as to include the commercialisation of the IP as a criterion to assess performance.²⁰² However, this is currently not a widespread policy; instead, it seems that grants and publications are the primary criterion used in promotions. Thus, an expanded *National Principles* model could also supplement the *National Principles* and the *Interim Guidelines* by encouraging these types of incentives as well as royalty-sharing agreements.

(iv) Responsibilities to exploit IP

Both the UK Patent Office Guidelines and the Canadian Expert Panel report recommend that research bodies should regard exploitation of their IP as a critical part of their mission. They also stipulate that research bodies should

199 National Principles, principle 3, Interim Guidelines, principle 2.6.

200 Interim Guidelines, principle 2.6.

201 DETYA, 17.

202 DETYA, 17.

be expressly required to endeavour to exploit or commercialise their IP, where possible. In addition, the UK Patent Office Guidelines require PSREs to provide regular feedback on their systems for exploitation and their exploitation activities. *Bayh-Dole* does not expressly include a requirement to exploit IP, however such a requirement is clearly implicit in the fact that the government has a march-in right if the research body fails to exploit the IP.

In Australia, the *National Principles* and the *Interim Guidelines* contain no express requirement for research institutions to endeavour to exploit their IP. However, they do require that research institutions have procedures for regular review of IP and associated commercial activities and outcomes.²⁰³ Importantly, they also require research institutions to have procedures in place to provide advice to inventors on the options available for commercialisation.²⁰⁴

Engendering and improving a sense of responsibility to endeavour to exploit IP is at the very heart of the rationale behind extending the *National Principles* in Australia. Therefore, requiring research institutions to include knowledge transfer or commercialisation as an express component of their mission, as well as requiring them to make their best efforts to exploit their IP, could be useful supplements to the current responsibilities outlined in the *National Principles* and the *Interim Guidelines*.

The Australian approach could go further, to require research institutions to ensure that they have IP management infrastructure in place or that they allocate a certain proportion of granted funds towards exploitation. The latter requirement could remove the need for some government research organisations to acquire Ministerial approval for the transferral of IP rights and thus, simplify the commercialisation process. As noted earlier, however, Australian research institutions differ considerably in size and mission. It may not be necessary or desirable for all research institutions to develop IP management infrastructure. For some it may be more appropriate to license their invention to industry for exploitation or even to the academic inventor.

It should also be noted that unless the government and/or its funding agencies are prepared to supplement funds already granted, a requirement to allocate a proportion of granted funds to commercialisation may require the research institutions to divert funds normally allocated to research and, as such, it may affect either the quantity or quality of research produced by the research institution.

Thus, any additional responsibility with regard to commercialisation, which is most suitable to be included in an expanded *National Principles* model,

203 National Principles, principle 6, Interim Guidelines, principle 2.5.

204 National Principles, principle 6, Interim Guidelines, principle 2.5.

appears to be a general requirement for research institutions to include exploitation of IP as an express part of their mission and to be responsible for the commercial exploitation of their IP. Research institutions should be given the discretion to decide whether to fulfil this responsibility through in-house management, by forming commercialisation networks or alliances, or by licensing to industry or entrepreneurial inventors—so long as they can account for the decision.

(v) Responsibilities regarding licences to Australian industry or small business

The *Bayh-Dole* legislation requires universities to prioritise local industry and small business when licensing their IP. The Canadian Expert Panel proposal also suggests that such requirements be imposed upon universities. In Australia, the loss of inventions overseas does occur. However, the *National Principles* and the *Interim Guidelines* do not address this issue.

An expanded *National Principles* model could include provisions similar to those in the US and proposed by the Expert Panel in Canada. However, it should be noted that an obligation to favour Australian commercialisation has several fairly complex indirect and dynamic effects. While the obvious effect may be to enhance employment in Australia, it is not clear how large the net impact would be. It is not a simple sum of the number of additional jobs created in the Australian companies who undertake the commercialisation task, for two reasons: first, because the Australian company may have been the preferred partner in the world even without the obligation; and secondly, because of unintended adverse effects on the success of the commercialisation process. If there are a limited number and quality of Australian companies that have the expertise to undertake such a venture, then the venture may not be as successful as an alternative foreign development (or, indeed, may not be successful at all). In this case there is a loss of profits to the owner of the invention and possibly only a very small gain to domestic employment. Fewer profits for the inventor may affect funding for further research. Furthermore, an inventor who can freely deal with the ‘best’ company in the world is in a good position to receive the ‘best’ knowledge spillovers that assist the further development of the idea. To be on the forefront of knowledge in a field, requires the researcher and commercialiser to be appropriately integrated into the global environment.

However, while the requirement to seek a local partner may incur static losses on a particular project, there can also be dynamic benefits to the Australian industry that undertakes commercialisation activities. If there exists the potential for economies of scale and scope in these industries, then policies by government that subsidise or protect them in their fledgling years may have considerable benefits in subsequent years.

To assess properly these indirect and dynamic effects requires a careful theoretical and empirical consideration of the Australian sectors that commercialise inventions, and a full assessment of different policy options. While a case may be made for protecting some Australian industries, the best means of encouraging their maturation may not be through imposing an obligation on Australian inventors and patent owners to give preference to local firms. Indeed, this has been the conclusion reached by the Baker Report in the UK and as such, the Patent Office Guidelines do not suggest imposing such a responsibility.

(vi) Responsibilities regarding the public interest.

Also of significance in *Bayh-Dole* and the Patent Office Guidelines are the measures aimed at ensuring that the public funding agency or department does not lose its entitlements to benefit from, and to use, the research results generated as a result of its investment. *Bayh-Dole* stipulates that a funding agency “shall have a nonexclusive, nontransferrable, irrevocable, paid-up license” to use any invention it has funded throughout the world. The Patent Office Guidelines preclude a funding agency from entering into an agreement with a research body without securing the rights to IP generated, necessary to for the conduct of its business. The Guidelines also stipulate that a licence secured by the funder should be perpetual and irrevocable and should be preserved in the case of ownership assignment to a third party. These measures are designed to safeguard against the possibility that inventions could be lost to private enterprises that may not use them in the public interest or may charge exorbitant prices for their use.

In Australia, the *Interim Guidelines* state that the NHMRC will not claim any ownership or associated rights for IP generated from its research support.²⁰⁵ The *National Principles* state that ownership of ARC supported research will initially vest in the research institution.²⁰⁶ Both the *National Principles* and the *Interim Guidelines* also require research institutions to pay attention to cases where IP impinges or potentially impinges on the cultural, spiritual or other aspects of indigenous peoples.²⁰⁷

Whilst clauses preserving funding agency rights to IP might be necessary or desirable in individual contracts, it should be noted that the encumbrance they place on IP may make investment in commercialisation of that IP less desirable to industry. Since effective commercialisation of publicly funded research results in Australia will depend largely on investment from outside the research

205 *Interim Guidelines*, principle 2.4.

206 *National Principles*, principle 4.

207 *National Principles*, principle 4, *Interim Guidelines*, principle 2.4.

institution, any proposal to supplement the existing policy set out in the *National Principles* and the *Interim Guidelines*, by including a general measure to protect funding agency interests, should be treated with great caution. In particular, such a proposal should not be adopted without detailed evaluation of its potential to act as a disincentive to investment in commercialisation.

(vii) Responsibilities regarding assessment of existing IP.

Finally, it should be observed that the *National Principles* and the *Interim Guidelines* in Australia require that publicly funded research institutions have in place procedures to guide researchers in assessing existing IP in the field that is likely to affect their research in order to determine their freedom to operate in that field of research.²⁰⁸ Although not directly related to the commercialisation of IP, such a requirement is useful for ensuring that public funding is not wasted on projects that are later found to be impeded by other IP rights belonging to others. Thus, it would be wise to maintain this requirement in any further expansion of the *National Principles*.

5.3.3 Implementation of the Australian model

(i) Structural means for introducing responsibilities

If it is considered desirable to enhance the IP management responsibilities on Australian research institutions, the next issue to address is how to ensure that research institutions receiving public funds adopt these responsibilities. In the United States, this occurs through the grant agreement with the funding agency. All *Bayh-Dole* does is require each government funding agency to put a set of conditions into their grant agreements rather than imposing obligations directly on universities themselves. Likewise the UK Patent Office Guidelines give the responsibility for implementing the policy of IP management set out in the guidelines, and for monitoring the effects and success in commercialisation to the government departments and other public sector “purchasers” of research, rather than to the actual research institutions.

A similar approach could be taken in Australia. The federal government could adopt a policy that requires public funding agencies to make funding grants conditional on a number of matters. These conditions could be included in the funding rules or guidelines stipulated by the relevant funding agency as necessary to be fulfilled in order to receive a recommendation for funding by the agency, and in each funding agreement between the research institution and the agency. Indeed, this is the very approach that is currently adopted in Australia for implementing the *National Principles* and the *Interim Guidelines*.

208 National Principles, principle 5, Interim Guidelines, principle 2.7.

The ARC's guidelines for its various grant programs provide that the applicant for a grant must agree to comply with the *National Principles*, and the funding contracts between the ARC and successful applicants expressly state that the research institution "must comply with the *National Principles*".²⁰⁹ Likewise, the NHMRC in its Deed of Agreement with research institutions expressly provides that the research institution "will comply with the principles outlined in the *Interim Guidelines* as amended from time to time by the NHMRC".²¹⁰

The section above shows that the most efficient and effective means for implementing the suggested changes in IP management and commercialisation in Australia would be through an expansion of the approach already adopted in relation to the *National Principles* and the *Interim Guidelines*. As previously noted, many of the responsibilities outlined above are already encapsulated to some degree in the *National Principles* and the *Interim Guidelines*. To the extent to which those responsibilities are not already encapsulated in the *National Principles* and *Interim Guidelines*, they should be encapsulated therein through an expansion of the content of the *National Principles* and the *Interim Guidelines*.

Moreover, the application of the *National Principles* and the *Interim Guidelines* could be extended to apply to a wider range of funding grants. Currently, the adoption of the *National Principles* and the *Interim Guidelines* is mandatory only to funding grants from ARC and NHMRC, respectively. Although these funding bodies contribute most of the public funding for research in research institutions, there is still significant funding provided by other funding organisations (including, in particular, RDCs and government departments), which is not subject to the *National Principles* or the *Interim Guidelines*. In addition to expanding the *content* of the *National Principles* and the *Interim Guidelines*, the government could consider expanding their *application* to at least a wider range of (if not to all²¹¹) research grants for research institutions. Such an initiative would mean that the principles would then become more truly national.

209 See, clause 21.2 in the ARC's Funding Contract for Discovery projects to commence in 2002.

210 See clause 9.2 of the Deed of Agreement in respect of 2001 NHMRC Research Grant Schemes.

211 It is recognised that it may be neither feasible nor desirable to extend the application of the National Principles and Interim Guidelines to grants given by all funding agencies. Some funding agencies, especially the RDC's, have a self imposed commercial objective to commercialise the IP that is created using their funds. Even if these bodies chose not to adopt to the National Principles and Interim Guidelines, presumably they are still aiming to maximize the success of IP commercialisation. Thus, those funding agencies may reach the same ultimate goal (greater commercialisation) as the other agencies which adopt the National Principles and Interim Guidelines, albeit through a different pathway.

(ii) Monitoring and supervision of discharge of responsibilities

As this discussion suggests, if the *National Principles* were expanded, systems would have to be established to allow government funding agencies to monitor research institutions' compliance with their responsibilities. In the United States, universities have a specific obligation to report the existence of new inventions to funding agencies. As discussed in Chapter 2, many United States universities participate in an electronic system known as Interagency Edison to comply with this obligation. Most funding agencies rely to a large degree on voluntary compliance however, and few actively audit the information provided by universities.

In Australia, reporting could occur periodically to the funding agency and/or to DEST. There is some evidence that funding agencies are already beginning to take a more supervisory role over the intellectual property created using their funds. In 2000 for example, the ARC and NHMRC conducted a joint survey of research commercialisation at universities. In 2002, DEST has indicated that Research and Research Training Management Reports, which must be submitted by universities for their continued eligibility for funding under HEFA, should include a section on patenting and licensing activities.

(iii) Incentives for compliance with responsibilities

A further issue to address is how it might be possible to ensure that research institutions fulfil their responsibilities in relation to IP management. In the United States, the relevant incentive was provided by the government having the ability to take back title to any invention created under the funding agreement. As noted in Chapter 2 however, in practice this power has never been exercised. This is probably because government funding agencies are simply not interested in reasserting title. Compared with research institutions, they are usually in an even worse position to commercialise a particular invention. In Australia, the same arguments would apply.²¹²

212 Nevertheless, whilst perhaps not providing a viable alternative for commercialisation of the invention should the research institution fail to do so, the potential for confiscation of ownership probably would provide an incentive for compliance, in that it would constitute a threat to take away something of significant value to the research institution. Even if a research institution chooses not to develop the IP generated by its researchers, the ability to offer its academic staff members ownership of that IP may be used to entice the most sought after academic staff members. Therefore, title to IP can be seen by research institutions as a valuable asset. Certainly the inability to offer such ownership to its employees would put it at a disadvantage compared to other research institutions that have maintained control over their IP by developing adequate management strategies. Thus, introducing into the system the potential for transferring ownership to the funding agency in the event of non-compliance with IP management responsibilities probably would provide a degree of incentive for compliance. As a matter of policy, however, this approach is unattractive. Actual implementation of the sanction would not be productive, and so the sanction is likely to be seen by research institutions as a "hollow threat".

Another possible incentive for compliance with IP management responsibilities is to provide for ownership to be given to the academic inventor if the research institution fails to discharge its responsibilities. In the US, the employee inventor's ability to take back title to the invention provides the relevant incentive in *Stevenson-Wydler*. Again, it was noted in Chapter 4 that it is usually thought that the individual academic is also not ideally equipped to manage their intellectual property. It was also noted in section 1.3.6 of Chapter 1 that the vesting of IP ownership in academic staff members raises the potential for co-ownership within research institutions due to the frequency of research collaboration, which can thwart the process of commercialisation. If research institutions fail to honour their responsibilities regarding management and commercialisation of IP, then presumably they also lack the support structures envisaged by the ARC to help individual academics bring their inventions to the commercial world. Moreover, most universities already provide in their policies that the academic inventor may claim ownership over the invention should the university fail or choose not to commercialise within a specified time.²¹³ Thus, transferring ownership to the academic inventor would be neither a solution to the problem of uncommercialised inventions, nor an incentive for research institutions to fulfil their responsibilities.

An alternative incentive for fulfilment of enhanced IP management responsibilities in Australia might be to adopt the third approach suggested in the United Kingdom Patent Office Guidelines, whereby universities are rated on the basis of their IP management and the rating is used as a factor relevant to the granting of future funding contracts or as a justification for not granting future IP ownership. This approach would assess research institutions' overall performance rather than respond on a case by case basis, which would be less costly in terms of monitoring research institutions' fulfilment of responsibilities. It would also be more useful where the patent application has been prejudiced and there is no ownership to take over or to assign elsewhere, such as where premature publication of the invention has occurred. Thirdly, it might foster a sense of competition within research institutions and thus spur the creation of a commercialisation culture. The risk with this incentive, however, is that it may unfairly prejudice potential future projects, which deserve funding on their merits, but do not receive it due the past failings of the research institution in relation to other projects.

In conclusion, although there are a number of possible incentives which could be adopted to encourage research institutions to fulfil their expanded responsibilities for IP management, they are not without their difficulties. It would seem to follow that the best approach to this issue is to leave to

213 See section 1.3.5(iii) in Chapter 1.

individual funding agencies the task of identifying the most appropriate means for encouraging compliance by research institutions with their IP management responsibilities. This is the approach proposed in the United Kingdom.

5.4 Summary

There are many impediments to the effective management and commercialisation of intellectual property by Australian universities and government research organisations. To date, the emphasis has been on encouraging universities to change their own practices. This strategy has had varied success. This study has identified a new strategy that the government could adopt, inspired by the key features of the United States' *Bayh-Dole* legislation and the *Stevenson-Wydler Act* and building on the existing mechanisms in Australia. The expanded *National Principles* model involves granting research institutions the benefit of ownership rights to publicly funded inventions, subject to the fulfilment of a number of responsibilities. Monitoring and supervision can occur by requiring research institutions to report periodically to government funding agencies. An incentive to comply could be based on the prospect of reduced funding for research for inadequate discharge of those responsibilities.

It is acknowledged that these new strategies will not remove all the impediments to the effective management and commercialisation of intellectual property. Some issues, such as a lack of funding for invention development, cannot really be solved by placing obligations on universities. Nevertheless, a *Bayh-Dole* and *Stevenson-Wydler* type strategy is at least worthy of consideration by the Australian government. These initiatives could be implemented in research institutions by strengthening the *National Principles* and the *Interim Guidelines* and extending their operation to grants from a wider range of public funding agencies.

6 Recommendations for Australia

6.1 Introduction

An examination of the legislative and policy initiatives in the United States, Canada and the United Kingdom suggests a preferred general approach to the allocation of patent rights to inventions arising from publicly funded research. That approach is to give to the research institution both the ownership of those patent rights and certain responsibilities in relation to the management and commercialisation of them. This strategy vests the intellectual property rights in the body that is best placed to exploit commercially valuable inventions, and ensures that these bodies assume responsibility for commercialisation. There are various possible options for implementing this general approach. In the United States, this approach is achieved primarily through legislation (ie *Bayh-Dole* and *Stevenson-Wydler*), whereas in the United Kingdom, this approach is sought to be implemented through government guidelines as to the terms of the funding contracts between funding agencies and research institutions. In the Canadian proposal, the IP management policy must be in place to qualify for research funding, however there is no consequence for a research institution who does not comply with the policy in practice. In contrast, both the UK and the US incorporate consequences for non-compliance with the responsibilities and a process of monitoring and supervision.

This concluding chapter sets out our recommendations on the preferable approach to the issue of ownership of patents resulting from publicly funded research, and identifies some options for implementation of such an approach in Australia. These recommendations and options are drawn from the experience of other countries and the current practice in Australia.

6.2 Recommendations

(1) Vest title to patents in research institutions as a default position

As experience has shown in the United States, Canada and the United Kingdom, the optimal initial owner of a patent for an invention is the research institution in which the invention was created. Research institutions

are best placed to implement management structures to identify potentially valuable patents and they are also well positioned to pursue commercialisation of such inventions.

The default position should not vest ownership of patents in employee inventors nor funding agencies. This is because employees may not recognise the commercial value of their inventions and because of the potential problems with fragmentation of ownership. Indeed, experience in Canada has shown that academic staff members in universities often lack the time and expertise required for commercialisation. Funding agencies are also not well placed to assume ownership rights, as they are one step removed from the inventive process.

However, whilst there should not be an automatic devolution of patent rights to employees or funding agencies, research institutions should be allowed the freedom to assign patent rights on a case by case basis where the institution believes that such an assignment would lead to an optimal outcome with respect to commercialisation. In certain circumstances, the employee inventor may be better placed to fulfil the responsibilities attached to the right to ownership and exploit their invention and thus the organisation should possess the right to assign patents to such employees.

(2) Attach responsibilities to patent ownership

The right to ownership of patents should be coupled with the assumption of responsibility for the effective identification, protection, management and commercialisation of the invention. The following responsibilities should attach to the ownership of patent rights:

- A responsibility to identify, and have systems in place to support the identification of, commercially valuable inventions.
- A responsibility to protect commercially valuable inventions.
- A responsibility to reward employees who create commercially valuable inventions.
- A responsibility to appropriately exploit patented inventions.

The responsibilities listed above specifically seek to address the issues that have been identified as relevant to the management and commercialisation of intellectual property in publicly funded research institutions in Australia.

6.3 Options for implementation

(3) Require Federal Government funding grants to be conditional upon acceptance of responsibilities (“expanded National Principles approach”)

The approach proposed above could be implemented by the adoption of a policy requiring certain federal government funding agencies to make grants to research institutions conditional upon the acceptance of the responsibilities recommended above. In particular, it could be implemented through an expansion of the approach already operating in Australia via the *National Principles* and the *Interim Guidelines*. This “expanded National Principles approach” would enlarge the content of the responsibilities currently applied to research institutions, as well as the range of funding agencies applying those responsibilities. These responsibilities could apply to grants to all Australian research institutions, including universities and government research organisations.

(4) Institute processes for monitoring discharge of responsibilities

Consideration should also be given to whether to institute a process of monitoring and supervision of research institutions, to ensure that they discharge the management and commercialisation responsibilities set down by the funding agreements. This could occur by requiring universities to report to government funding agencies and obliging government research organisations to report to the relevant government department.

(5) Provide incentives for fulfilment of responsibilities

Consideration should be given to whether it would be desirable to institute incentives for research institutions to comply with the responsibilities that we recommend attach to the ownership of patents. Overseas experience suggests that the most appropriate incentives are negative consequences for non-compliance. Different incentives have been adopted or proposed in different countries. The preferred approach for Australia may be to require individual funding agencies to identify and apply the incentives most appropriate to their circumstances.

6.4 Other observations

It should be noted that the recommendations above will place an extra burden on, and may effect a cultural change within, research institutions. This burden and change may have some negative affect on the quality and/or quantity of research that these bodies produce. The United Kingdom has recognised the significance of this concern, by making their *Bayh-Dole* style policy only part of a much wider approach to knowledge transfer. Australia could learn considerably from this wider approach, especially from the additional support proposed in the United Kingdom for infrastructure aimed at facilitating knowledge transfer. Accordingly, Australia should give consideration to providing additional funding and other support for the development of the research commercialisation infrastructure in its publicly funded research institutions.

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Appendix 1: *Bayh-Dole Act of 1980*

Title 35. Patents

PART II Patentability of inventions and grant of patents

CHAPTER 18 Patent rights in inventions made with federal assistance

§ 200. Policy and objective

It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise without unduly encumbering future research and discovery; to promote the commercialisation and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.

§ 201. Definitions

As used in this chapter [35 USCS §§ 200 et seq.]—

- (a) The term “Federal agency” means any executive agency as defined in section 105 of title 5, United States Code, and the military departments as defined by section 102 of title 5, United States Code.
- (b) The term “funding agreement” means any contract, grant, or cooperative agreement entered into between any Federal agency, other than the Tennessee Valley Authority, and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government. Such term includes any assignment,

substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as herein defined.

- (c) The term “contractor” means any person, small business firm, or nonprofit organization that is a party to a funding agreement.
- (d) The term “invention” means any invention or discovery which is or may be patentable or otherwise protectable under this title [35 USCS §§ 1 et seq.] or any novel variety of plant which is or may be protectable under the Plant Variety Protection Act (7 U.S.C 2321 et seq.).
- (e) The term “subject invention” means any invention of the contractor conceived or first actually reduced to practice in the performance of work under a funding agreement: Provided, That in the case of a variety of plant, the date of determination (as defined in section 41(d) of the Plant Variety Protection Act (7 U.S.C. 2401(d))) must also occur during the period of contract performance.
- (f) The term “practical application” means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.
- (g) The term “made” when used in relation to any invention means the conception or first actual reduction to practice of such invention.
- (h) The term “small business firm” means a small business concern as defined at section 2 of Public Law 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration.
- (i) The term “nonprofit organization” means universities and other institutions of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a State nonprofit organization statute.

§ 202. Disposition of rights

- (a) Each nonprofit organization or small business firm may, within a reasonable time after disclosure as required by paragraph (c)(1) of this section, elect to retain title to any subject invention: Provided, however, That a funding agreement may provide otherwise (i) when the contractor is not located in the United States or does not have a place of business

located in the United States or is subject to the control of a foreign government, (ii) in exceptional circumstances when it is determined by the agency that restriction or elimination of the right to retain title to any subject invention will better promote the policy and objectives of this chapter[,] (iii) when it is determined by a Government authority which is authorized by statute or Executive order to conduct foreign intelligence or counter-intelligence activities that the restriction or elimination of the right to retain title to any subject invention is necessary to protect the security of such activities or, (iv) when the funding agreement includes the operation of a Government-owned, contractor-operated facility of the Department of Energy primarily dedicated to that Department's naval nuclear propulsion or weapons related programs and all funding agreement limitations under this subparagraph on the contractor's right to elect title to a subject invention are limited to inventions occurring under the above two programs of the Department of Energy. The rights of the nonprofit organization or small business firm shall be subject to the provisions of paragraph (c) of this section and the other provisions of this chapter [35 USCS §§ 200 et seq.].

(b) (1) The rights of the Government under subsection (a) shall not be exercised by a Federal agency unless it first determines that at least one of the conditions identified in clauses (i) through (iv) of subsection (a) exists. Except in the case of subsection (a)(iii), the agency shall file with the Secretary of Commerce, within thirty days after the award of the applicable funding agreement, a copy of such determination. In the case of a determination under subsection (a)(ii), the statement shall include an analysis justifying the determination. In the case of determinations applicable to funding agreements with small business firms, copies shall also be sent to the Chief Counsel for Advocacy of the Small Business Administration. If the Secretary of Commerce believes that any individual determination or pattern of determinations is contrary to the policies and objectives of this chapter or otherwise not in conformance with this chapter, the Secretary shall so advise the head of the agency concerned and the Administrator of the Office of Federal Procurement Policy, and recommend corrective actions.

(2) Whenever the Administrator of the Office of Federal Procurement Policy has determined that one or more Federal agencies are utilizing the authority of clause (i) or (ii) of subsection (a) of this section in a manner that is contrary to the policies and objectives of this chapter, the Administrator is authorized to issue regulations describing classes of situations in which agencies may not exercise the authorities of those clauses.

(3) At least once every five years, the Comptroller General shall transmit a report to the Committees on the Judiciary of the Senate and House of Representatives on the manner in which this chapter [35 USCS §§ 200 et seq.] is being implemented by the agencies and on such other aspects of Government patent policies and practices with respect to federally funded inventions as the Comptroller General believes appropriate.

(4) If the contractor believes that a determination is contrary to the policies and objectives of this chapter or constitutes an abuse of discretion by the agency, the determination shall be subject to the last paragraph of section 203(2).

(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

(1) That the contractor disclose each subject invention to the Federal agency within a reasonable time after it becomes known to contractor personnel responsible for the administration of patent matters, and that the Federal Government may receive title to any subject invention not disclosed to it within such time.

(2) That the contractor make a written election within two years after disclosure to the Federal agency (or such additional time as may be approved by the Federal agency) whether the contractor will retain title to a subject invention: Provided, That in any case where publication, on sale, or public use, has initiated the one year statutory period in which valid patent protection can still be obtained in the United States, the period for election may be shortened by the Federal agency to a date that is not more than sixty days prior to the end of the statutory period: And provided further, That the Federal Government may receive title to any subject invention in which the contractor does not elect to retain rights or fails to elect rights within such times.

(3) That a contractor electing rights in a subject invention agrees to file a patent application prior to any statutory bar date that may occur under this title [35 USCS §§ 1 et seq.] due to publication, on sale, or public use, and shall thereafter file corresponding patent applications in other countries in which it wishes to retain title within reasonable times, and that the Federal Government may receive title to any subject inventions in the United States or other countries in which the contractor has not filed patent applications on the subject invention within such times.

(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferrable,

irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world: Provided, That the funding agreement may provide for such additional rights;[,] including the right to assign or have assigned foreign patent rights in the subject invention, as are determined by the agency as necessary for meeting the obligations of the United States under any treaty, international agreement, arrangement of cooperation, memorandum of understanding, or similar arrangement, including military agreement relating to weapons development and production.

(5) The right of the Federal agency to require periodic reporting on the utilization or efforts at obtaining utilization that are being made by the contractor or his licensees or assignees: Provided, That any such information as well as any information on utilization or efforts at obtaining utilization obtained as part of a proceeding under section 203 of this chapter shall be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

(6) An obligation on the part of the contractor, in the event a United States patent application is filed by or on its behalf or by any assignee of the contractor, to include within the specification of such application and any patent issuing thereon, a statement specifying that the invention was made with Government support and that the Government has certain rights in the invention.

(7) In the case of a nonprofit organization, (A) a prohibition upon the assignment of rights to a subject invention in the United States without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions (provided that such assignee shall be subject to the same provisions as the contractor); (B) a requirement that the contractor share royalties with the inventor; (C) except with respect to a funding agreement for the operation of a Government-owned-contractor-operated facility, a requirement that the balance of any royalties or income earned by the contractor with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions, be utilized for the support of scientific research or education; (D) a requirement that, except where it proves infeasible after a reasonable inquiry, in the licensing of subject inventions shall be given to small business firms; and (E) with respect to a funding agreement for the operation of a Government-

owned-contractor-operated facility, requirements (i) that after payment of patenting costs, licensing costs, payments to inventors, and other expenses incidental to the administration of subject inventions, 100 per cent of the balance of any royalties or income earned and retained by the contractor during any fiscal year up to an amount equal to 5 per cent of the annual budget of the facility, shall be used by the contractor for scientific research, development, and education consistent with the research and development mission and objectives of the facility, including activities that increase the licensing potential of other inventions of the facility; provided that if said balance exceeds 5 per cent of the annual budget of the facility, that 75 per cent of such excess shall be paid to the Treasury of the United States and the remaining 25 per cent shall be used for the same purposes as described above in this clause (D); and (ii) that, to the extent it provides the most effective technology transfer, the licensing of subject inventions shall be administered by contractor employees on location at the facility.

(8) The requirements of sections 203 and 204 of this chapter [35 USCS §§ 203, 204].

- (d) If a contractor does not elect to retain title to a subject invention in cases subject to this section, the Federal agency may consider and after consultation with the contractor grant requests for retention of rights by the inventor subject to the provisions of this Act and regulations promulgated hereunder.
- (e) In any case when a Federal employee is a coinventor of any invention made with a nonprofit organization, a small business firm, or a non-Federal inventor, the Federal agency employing such coinventor may, for the purpose of consolidating rights in the invention and if it finds that it would expedite the development of the invention—
 - (1) license or assign whatever rights it may acquire in the subject invention to the nonprofit organization, small business firm, or non-Federal inventor in accordance with the provisions of this chapter [35 USCS §§ 200 et seq.]; or
 - (2) acquire any rights in the subject invention from the nonprofit organization, small business firm, or non-Federal inventor, but only to the extent the party from whom the rights are acquired voluntarily enters into the transaction and no other transaction under this chapter [35 USCS §§ 200 et seq.] is conditioned on such acquisition.
- (f)
 - (1) No funding agreement with a small business firm or nonprofit organization shall contain a provision allowing a Federal agency to

require the licensing to third parties of inventions owned by the contractor that are not subject inventions unless such provision has been approved by the head of the agency and a written justification has been signed by the head of the agency. Any such provision shall clearly state whether the licensing may be required in connection with the practice of a subject invention, a specifically identified work object, or both. The head of the agency may not delegate the authority to approve provisions or sign justifications required by this paragraph.

(2) A Federal agency shall not require the licensing of third parties under any such provision unless the head of the agency determines that the use of the invention by others is necessary for the practice of a subject invention or for the use of a work object of the funding agreement and that such action is necessary to achieve the practical application of the subject invention or work object. Any such determination shall be on the record after an opportunity for an agency hearing. Any action commenced for judicial review of such determination shall be brought within sixty days after notification of such determination.

§ 203. March-in rights

(1.[1]) With respect to any subject invention in which a small business firm or nonprofit organization has acquired title under this chapter [35 USCS §§ 200 et seq.], the Federal agency under whose funding agreement the subject invention was made shall have the right, in accordance with such procedures as are provided in regulations promulgated hereunder to require the contractor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the contractor, assignee, or exclusive licensee refuses such request, to grant such a license itself, if the Federal agency determines that such—

- (a) action is necessary because the contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;
- (b) action is necessary to alleviate health or safety needs which are not reasonably satisfied by the contractor, assignee, or their licensees;
- (c) action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the contractor, assignee, or licensees; or

(d) action is necessary because the agreement required by section 204 has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of its agreement obtained pursuant to section 204.

(2) A determination pursuant to this section or section 202(b)(4) shall not be subject to the Contract Disputes Act (41 U.S.C. § 601 et seq.). An administrative appeals procedure shall be established by regulations promulgated in accordance with section 206. Additionally, any contractor, inventor, assignee, or exclusive licensee adversely affected by a determination under this section may, at any time within sixty days after the determination is issued, file a petition in the United States Claims Court [United States Court of Federal Claims], which shall have jurisdiction to determine the appeal on the record and to affirm, reverse, remand or modify, [“,”] as appropriate, the determination of the Federal agency. In cases described in paragraphs (a) and (c), the agency’s determination shall be held in abeyance pending the exhaustion of appeals or petitions filed under the preceding sentence.

§ 204. Preference for United States industry

Notwithstanding any other provision of this chapter, [35 USCS §§ 200 et seq.], no small business firm or nonprofit organization which receives title to any subject invention and no assignee of any such small business firm or nonprofit organization shall grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency under whose funding agreement the invention was made upon a showing by the small business firm, nonprofit organization, or assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

§ 205. Confidentiality

Federal agencies are authorized to withhold from disclosure to the public information disclosing any invention in which the Federal Government owns or may own a right, title, or interest (including a nonexclusive license) for a reasonable time in order for a patent application to be filed. Furthermore, Federal agencies shall not be required to release copies of any document which is part of an application for patent filed with the United States Patent and Trademark Office or with any foreign patent office.

§ 206. Uniform clauses and regulations

The Secretary of Commerce may issue regulations which may be made applicable to Federal agencies implementing the provisions of sections 202 through 204 of this chapter [35 USCS §§ 202-204] and shall establish standard funding agreement provisions required under this chapter [35 USCS §§ 200 et seq.]. The regulations and the standard funding agreement shall be subject to public comment before their issuance.

§ 207. Domestic and foreign protection of federally owned inventions

(a) Each Federal agency is authorized to—

- (1) apply for, obtain, and maintain patents or other forms of protection in the United States and in foreign countries on inventions in which the Federal Government owns a right, title, or interest;
- (2) grant nonexclusive, exclusive, or partially exclusive licenses under federally owned inventions, royalty-free or for royalties or other consideration, and on such terms and conditions, including the grant to the licensee of the right of enforcement pursuant to the provisions of chapter 29 of this title [35 USCS §§ 281 et seq.] as determined appropriate in the public interest;
- (3) undertake all other suitable and necessary steps to protect and administer rights to federally owned inventions on behalf of the Federal Government either directly or through contract, including acquiring rights for and administering royalties to the Federal Government in any invention, but only to the extent the party from whom the rights are acquired voluntarily enters into the transaction, to facilitate the licensing of a federally owned invention; and
- (4) transfer custody and administration, in whole or in part, to another Federal agency, of the right, title or interest in any federally owned invention.

(b) For the purpose of assuring the effective management of Government-owned inventions, the Secretary of Commerce is authorized to—

- (1) assist Federal agency efforts to promote the licensing and utilization of Government-owned inventions;
- (2) assist Federal agencies in seeking protection and maintaining inventions in foreign countries, including the payment of fees and costs connected therewith; and
- (3) consult with and advise Federal agencies as to areas of science and technology research and development with potential for commercial utilization.

§ 208. Regulations governing Federal licensing

The Secretary of Commerce is authorized to promulgate regulations specifying the terms and conditions upon which any federally owned invention, other than inventions owned by the Tennessee Valley Authority, may be licensed on a nonexclusive, partially exclusive, or exclusive basis.

§ 209. Licensing federally owned inventions

(a) Authority. A Federal agency may grant an exclusive or partially exclusive license on a federally owned invention under section 207(a)(2) only if—

- (1) granting the license is a reasonable and necessary incentive to—
 - (A) call forth the investment capital and expenditures needed to bring the invention to practical application; or
 - (B) otherwise promote the invention's utilization by the public;
 - (2) the Federal agency finds that the public will be served by the granting of the license, as indicated by the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public, and that the proposed scope of exclusivity is not greater than reasonably necessary to provide the incentive for bringing the invention to practical application, as proposed by the applicant, or otherwise to promote the invention's utilization by the public;
 - (3) the applicant makes a commitment to achieve practical application of the invention within a reasonable time, which time may be extended by the agency upon the applicant's request and the applicant's demonstration that the refusal of such extension would be unreasonable;
 - (4) granting the license will not tend to substantially lessen competition or create or maintain a violation of the Federal antitrust laws; and
 - (5) in the case of an invention covered by a foreign patent application or patent, the interests of the Federal Government or United States industry in foreign commerce will be enhanced.
- (b) Manufacture in United States. A Federal agency shall normally grant a license under section 207(a)(2) to use or sell any federally owned invention in the United States only to a licensee who agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.
- (c) Small business. First preference for the granting of any exclusive or partially exclusive licenses under section 207(a)(2) shall be given to small business firms having equal or greater likelihood as other applicants to bring the invention to practical application within a reasonable time.

- (d) Terms and conditions. Any licenses granted under section 207(a)(2) shall contain such terms and conditions as the granting agency considers appropriate, and shall include provisions—
- (1) retaining a nontransferrable, irrevocable, paid-up license for any Federal agency to practice the invention or have the invention practiced throughout the world by or on behalf of the Government of the United States;
 - (2) requiring periodic reporting on utilization of the invention, and utilization efforts, by the licensee, but only to the extent necessary to enable the Federal agency to determine whether the terms of the license are being complied with, except that any such report shall be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code; and
 - (3) empowering the Federal agency to terminate the license in whole or in part if the agency determines that—
 - (A) the licensee is not executing its commitment to achieve practical application of the invention, including commitments contained in any plan submitted in support of its request for a license, and the licensee cannot otherwise demonstrate to the satisfaction of the Federal agency that it has taken, or can be expected to take within a reasonable time, effective steps to achieve practical application of the invention;
 - (B) the licensee is in breach of an agreement described in subsection (b);
 - (C) termination is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license, and such requirements are not reasonably satisfied by the licensee; or
 - (D) the licensee has been found by a court of competent jurisdiction to have violated the Federal antitrust laws in connection with its performance under the license agreement.
 - (E) Public notice. No exclusive or partially exclusive license may be granted under section 207(a)(2) unless public notice of the intention to grant an exclusive or partially exclusive license on a federally owned invention has been provided in an appropriate manner at least 15 days before the license is granted, and the Federal agency has considered all comments received before the end of the comment period in response to that public notice. This subsection shall not apply to the

licensing of inventions made under a cooperative research and development agreement entered into under section 12 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710a).

- (F) Plan. No Federal agency shall grant any license under a patent or patent application on a federally owned invention unless the person requesting the license has supplied the agency with a plan for development or marketing of the invention, except that any such plan shall be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

§ 210. Precedence of chapter

(a) This chapter [35 USCS §§ 200 et seq.] shall take precedence over any other Act which would require a disposition of rights in subject inventions of small business firms or nonprofit organizations contractors in a manner that is inconsistent with this chapter [35 USCS §§ 200 et seq.], including but not necessarily limited to the following:

- (1) section 10(a) of the Act of June 29, 1935, as added by title I of the Act of August 14, 1946 (7 U.S.C. 427i(a); 60 Stat. 1085);
- (2) section 205(a) of the Act of August 14, 1946 (7 U.S.C. 1624(a); 60 Stat. 1090);
- (3) section 501(c) of the Federal Mine Safety and Health Act of 1977 (30 U.S.C. 951(c); 83 Stat. 742);
- (4) section 30168(e) of title 49;
- (5) section 12 of the National Science Foundation Act of 1950 (42 U.S.C. 1871(a); 82 Stat. 360);
- (6) section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182; 68 Stat. 943);
- (7) section 305 of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457);
- (8) section 6 of the Coal Research Development Act of 1960 (30 U.S.C. 666; 74 Stat. 337);
- (9) section 4 of the Helium Act Amendments of 1960 (50 U.S.C. 167b; 74 Stat. 920);
- (10) section 32 of the Arms Control and Disarmament Act of 1961 (22 U.S.C. 2572; 75 Stat. 634);

- (11) section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901 [42 USCS § 5908]; 88 Stat. 1878);
- (12) section 5(d) of the Consumer Product Safety Act (15 U.S.C. 2054(d); 86 Stat. 1211);
- (13) section 3 of the Act of April 5, 1944 (30 U.S.C. 323; 58 Stat. 191);
- (14) section 8001(c)(3) of the Solid Waste Disposal Act (42 U.S.C. 6981(c); 90 Stat. 2829);
- (15) section 219 of the Foreign Assistance Act of 1961 (22 U.S.C. 2179; 83 Stat. 806);
- (16) section 427(b) of the Federal Mine Health and Safety Act of 1977 (30 U.S.C. 937(b); 86 Stat. 155);
- (17) section 306(d) of the Surface Mining and Reclamation Act of 1977 (30 U.S.C. 1226(d); 91 Stat. 455);
- (18) section 21(d) of the Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2218(d); 88 Stat. 1548);
- (19) section 6(b) of the Solar Photovoltaic Energy Research Development and Demonstration Act of 1978 (42 U.S.C. 5585(b); 92 Stat. 2516);
- (20) section 12 of the Native Latex Commercialisation and Economic Development Act of 1978 (7 U.S.C. 178(j); 92 Stat. 2533); and
- (21) section 408 of the Water Resources and Development Act of 1978 (42 U.S.C. 7879; 92 Stat. 1360).

The Act creating this chapter shall be construed to take precedence over any future Act unless that Act specifically cites this Act and provides that it shall take precedence over this Act.

(b) Nothing in this chapter [35 USCS §§ 200 et seq.] is intended to alter the effect of the laws cited in paragraph (a) of this section or any other laws with respect to the disposition of rights in inventions made in the performance of funding agreements with persons other than nonprofit organizations or small business firms.

(c) Nothing in this chapter [35 USCS §§ 200 et seq.] is intended to limit the authority of agencies to agree to the disposition of rights in inventions made in the performance of work under funding agreements with persons other than nonprofit organizations or small business firms in accordance with the Statement of Government Patent Policy issued on February 18, 1983, agency regulations, or other applicable regulations or to otherwise limit the authority of agencies to allow such persons to retain ownership of inventions except that all funding agreements, including those with other than small business firms and nonprofit organizations, shall include the requirements established in paragraph [section] 202(c)(4) and section 203 of this title.[.] Any disposition

of rights in inventions made in accordance with the Statement or implementing regulations, including any disposition occurring before enactment of this section, are hereby authorized.

(d) Nothing in this chapter [35 USCS §§ 200 et seq.] shall be construed to require the disclosure of intelligence sources or methods or to otherwise affect the authority granted to the Director of Central Intelligence by statute or Executive order for the protection of intelligence sources or methods.

(e) The provisions of the *Stevenson-Wydler Technology Innovation Act* of 1980 [15 USCS §§ 3701 et seq.] shall take precedence over the provisions of this chapter [35 USCS §§ 200 et seq.] to the extent that they permit or require a disposition of rights in subject inventions which is inconsistent with this chapter [35 USCS §§ 200 et seq.].

§ 211. Relationship to antitrust laws

Nothing in this chapter [35 USCS §§ 200 et seq.] shall be deemed to convey to any person immunity from civil or criminal liability, or to create any defenses to actions, under any antitrust law.

§ 212. Disposition of rights in educational awards

No scholarship, fellowship, training grant, or other funding agreement made by a Federal agency primarily to an awardee for educational purposes will contain any provision giving the Federal agency any rights to inventions made by the awardee.

Appendix 2: Stevenson-Wydler technology innovation act of 1980

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Title 15 Commerce and trade

Chapter 63 Technology and innovation

§ 3710. Utilization of Federal technology

(a) Policy.

- (1) It is the continuing responsibility of the Federal Government to ensure the full use of the results of the Nation's Federal investment in research and development. To this end the Federal Government shall strive where appropriate to transfer federally owned or originated technology to State and local governments and to the private sector.
- (2) Technology transfer, consistent with mission responsibilities, is a responsibility of each laboratory science and engineering professional.
- (3) Each laboratory director shall ensure that efforts to transfer technology are considered positively in laboratory job descriptions, employee promotion policies, and evaluation of the job performance of scientists and engineers in the laboratory.

(b) Establishment of Research and Technology Applications Offices.

Each Federal laboratory shall establish an Office of Research and Technology Applications. Laboratories having existing organizational structures which perform the functions of this section may elect to combine the Office of Research and Technology Applications within the existing organization. The staffing and funding levels for these offices shall be determined between each Federal laboratory and the Federal agency operating or directing the laboratory, except that (1) each laboratory having 200 or more full-time equivalent scientific, engineering, and related technical positions shall provide one or more full-time equivalent positions as staff for its Office of Research and Technology Applications, and (2) each Federal agency which operates or directs one or more Federal laboratories shall make available sufficient funding, either as a separate line item or from the agency's research and development budget, to support the technology transfer

function at the agency and at its laboratories, including support of the Offices of Research and Technology Applications. Furthermore, individuals filling positions in an Office of Research and Technology Applications shall be included in the overall laboratory/agency management development program so as to ensure that highly competent technical managers are full participants in the technology transfer process.

- (c) Functions of Research and Technology Applications Offices. It shall be the function of each Office of Research and Technology Applications—
- (1) to prepare application assessments for selected research and development projects in which that laboratory is engaged and which in the opinion of the laboratory may have potential commercial applications;
 - (2) to provide and disseminate information on federally owned or originated products, processes, and services having potential application to State and local governments and to private industry;
 - (3) to cooperate with and assist the the National Technical Information Service, the Federal Laboratory Consortium for Technology Transfer, and other organizations which link the research and development resources of that laboratory and the Federal Government as a whole to potential users in State and local government and private industry;
 - (4) to provide technical assistance to State and local government officials; and
 - (5) to participate, where feasible, in regional, State, and local programs designed to facilitate or stimulate the transfer of technology for the benefit of the region, State, or local jurisdiction in which the Federal laboratory is located.

Agencies which have established organizational structures outside their Federal laboratories which have as their principal purpose the transfer of federally owned or originated technology to State and local government and to the private sector may elect to perform the functions of this subsection in such organizational structures. No Office of Research and Technology Applications or other organizational structures performing the functions of this subsection shall substantially compete with similar services available in the private sector.

- (d) Dissemination of technology information. The National Technical Information Service shall—
 - (1) serve as a central clearinghouse for the collection, dissemination and transfer of information on federally owned or originated technologies having potential application to State and local governments and to private industry;
 - (2) utilize the expertise and services of the National Science Foundation and the Federal Laboratory Consortium for Technology Transfer; particularly in dealing with State and local governments;
 - (3) receive requests for technical assistance from State and local governments, respond to such requests with published information available to the Service, and refer such requests to the Federal Laboratory Consortium for Technology Transfer to the extent that such requests require a response involving more than the published information available to the Service;
 - (4) provide funding, at the discretion of the Secretary, for Federal laboratories to provide the assistance specified in subsection (c)(3);
 - (5) use appropriate technology transfer mechanisms such as personnel exchanges and computer-based systems; and
 - (6) maintain a permanent archival repository and clearinghouse for the collection and dissemination of nonclassified scientific, technical, and engineering information.

- (e) Establishment of Federal Laboratory Consortium for Technology Transfer.
 - (1) There is hereby established the Federal Laboratory Consortium for Technology Transfer (hereinafter referred to as the “Consortium”) which, in cooperation with Federal laboratories and the private sector, shall—
 - (A) develop and (with the consent of the Federal laboratory concerned) administer techniques, training courses, and materials concerning technology transfer to increase the awareness of Federal laboratory employees regarding the commercial potential of laboratory technology and innovations;
 - (B) furnish advice and assistance requested by Federal agencies and laboratories for use in their technology transfer programs (including the planning of seminars for small business and other industry);

- (C) provide a clearinghouse for requests, received at the laboratory level, for technical assistance from States and units of local governments, businesses, industrial development organizations, not-for-profit organizations including universities, Federal agencies and laboratories, and other persons, and—
 - (i) to the extent that such requests can be responded to with published information available to the National Technical Information Service, refer such requests to that Service, and
 - (ii) otherwise refer these requests to the appropriate Federal laboratories and agencies;
- (D) facilitate communication and coordination between Offices of Research and Technology Applications of Federal laboratories;
- (E) utilize (with the consent of the agency involved) the expertise and services of the National Science Foundation, the Department of Commerce, the National Aeronautics and Space Administration, and other Federal agencies, as necessary;
- (F) with the consent of any Federal laboratory, facilitate the use by such laboratory of appropriate technology transfer mechanisms such as personnel exchanges and computer-based systems;
- (G) with the consent of any Federal laboratory, assist such laboratory to establish programs using technical volunteers to provide technical assistance to communities related to such laboratory;
- (H) facilitate communication and cooperation between Offices of Research and Technology Applications of Federal laboratories and regional, State, and local technology transfer organizations;
- (I) when requested, assist colleges or universities, businesses, nonprofit organizations, State or local governments, or regional organizations to establish programs to stimulate research and to encourage technology transfer in such areas as technology program development, curriculum design, long-term research planning, personnel needs projections, and productivity assessments;
- (J) seek advice in each Federal laboratory consortium region from representatives of State and local governments, large

and small business, universities, and other appropriate persons on the effectiveness of the program (and any such advice shall be provided at no expense to the Government); and

- (K) work with the Director of the National Institute on Disability and Rehabilitation Research to compile a compendium of current and projected Federal Laboratory technologies and projects that have or will have an intended or recognized impact on the available range of assistive technology for individuals with disabilities (as defined in section 3 of the Assistive Technology Act of 1998 [29 USCS § 3002]), including technologies and projects that incorporate the principles of universal design (as defined in section 3 of such Act [29 USCS § 3002]), as appropriate.
- (2) The membership of the Consortium shall consist of the Federal laboratories described in clause (1) of subsection (b) and such other laboratories as may choose to join the Consortium. The representatives to the Consortium shall include a senior staff member of each Federal laboratory which is a member of the Consortium and a senior representative appointed from each Federal agency with one or more member laboratories.
- (3) The representatives to the Consortium shall elect a Chairman of the Consortium.
- (4) The Director of the National Institute of Standards and Technology shall provide the Consortium, on a reimbursable basis, with administrative services, such as office space, personnel, and support services of the Institute, as requested by the Consortium and approved by such Director.
- (5) Each Federal laboratory or agency shall transfer technology directly to users or representatives of users, and shall not transfer technology directly to the Consortium. Each Federal laboratory shall conduct and transfer technology only in accordance with the practices and policies of the Federal agency which owns, leases, or otherwise uses such Federal laboratory.
- (6) Not later than one year after the date of the enactment of this subsection [enacted Oct. 20, 1986], and every year thereafter, the Chairman of the Consortium shall submit a report to the President, to the appropriate authorization and appropriation committees of both Houses of the Congress, and to each agency with respect to which a transfer of funding is made (for the fiscal year or years involved) under paragraph (7), concerning the activities of the Consortium and the expenditures made by it

- under this subsection during the year for which the report is made. Such report shall include an annual independent audit of the financial statements of the Consortium, conducted in accordance with generally accepted accounting principles.
- (7) (A) Subject to subparagraph (B), an amount equal to 0.008 per cent of the budget of each Federal agency from any Federal source, including related overhead, that is to be utilized by or on behalf of the laboratories of such agency for a fiscal year referred to in subparagraph (B)(ii) shall be transferred by such agency to the National Institute of Standards and Technology at the beginning of the fiscal year involved. Amounts so transferred shall be provided by the Institute to the Consortium for the purpose of carrying out activities of the Consortium under this subsection.
- (B) A transfer shall be made by any Federal agency under subparagraph (A), for any fiscal year, only if the amount so transferred by that agency (as determined under such subparagraph) would exceed \$ 10,000.
- (C) The heads of Federal agencies and their designees, and the directors of Federal laboratories, may provide such additional support for operations of the Consortium as they deem appropriate.
- (f) Agency reports on utilization.
- (1) In general. Each Federal agency which operates or directs one or more Federal laboratories or which conducts activities under sections 207 and 209 of title 35, United States Code, shall report annually to the Office of Management and Budget, as part of the agency's annual budget submission, on the activities performed by that agency and its Federal laboratories under the provisions of this section and of sections 207 and 209 of title 35, United States Code.
- (2) Contents. The report shall include—
- (A) an explanation of the agency's technology transfer program for the preceding fiscal year and the agency's plans for conducting its technology transfer function, including its plans for securing intellectual property rights in laboratory innovations with commercial promise and plans for managing its intellectual property so as to advance the agency's mission and benefit the competitiveness of United States industry; and

- (B) information on technology transfer activities for the preceding fiscal year, including—
 - (i) the number of patent applications filed;
 - (ii) the number of patents received;
 - (iii) the number of fully-executed licenses which received royalty income in the preceding fiscal year, categorized by whether they are exclusive, partially-exclusive, or non-exclusive, and the time elapsed from the date on which the license was requested by the licensee in writing to the date the license was executed;
 - (iv) the total earned royalty income including such statistical information as the total earned royalty income, of the top 1 per cent, 5 per cent, and 20 per cent of the licenses, the range of royalty income, and the median, except where disclosure of such information would reveal the amount of royalty income associated with an individual license or licensee;
 - (v) what disposition was made of the income described in clause (iv);
 - (vi) the number of licenses terminated for cause; and
 - (vii) any other parameters or discussion that the agency deems relevant or unique to its practice of technology transfer.
- (3) Copy to Secretary; Attorney General; Congress. The agency shall transmit a copy of the report to the Secretary of Commerce and the Attorney General for inclusion in the annual report to Congress and the President required by subsection (g)(2).
- (4) Public availability. Each Federal agency reporting under this subsection is also strongly encouraged to make the information contained in such report available to the public through Internet sites or other electronic means.
- (g) Functions of the Secretary.
 - (1) The Secretary, through the Under Secretary, and in consultation with other Federal agencies, may—
 - (A) make available to interested agencies the expertise of the Department of Commerce regarding the commercial potential of inventions and methods and options for commercialisation which are available to the Federal laboratories, including research and development limited partnerships;
 - (B) develop and disseminate to appropriate agency and laboratory personnel model provisions for use on a voluntary

basis in cooperative research and development arrangements;
and

- (C) furnish advice and assistance, upon request, to Federal agencies concerning their cooperative research and development programs and projects.

(2) Reports.

- (A) Annual report required. The Secretary, in consultation with the Attorney General and the Commissioner of Patents and Trademarks, shall submit each fiscal year, beginning 1 year after the enactment of the Technology Transfer Commercialisation Act of 2000 [enacted Nov. 1, 2000] a summary report to the President, the United States Trade Representative, and the Congress on the use by Federal agencies and the Secretary of the technology transfer authorities specified in this Act [15 USCS §§ 3701 et seq.] and in sections 207 and 209 of title 35, United States Code.

- (B) Content. The report shall—

- (i) draw upon the reports prepared by the agencies under subsection (f);
- (ii) discuss technology transfer best practices and effective approaches in the licensing and transfer of technology in the context of the agencies' missions; and
- (iii) discuss the progress made toward development of additional useful measures of the outcomes of technology transfer programs of Federal agencies.

- (C) Public availability. The Secretary shall make the report available to the public through Internet sites or other electronic means.

- (3) Not later than one year after the date of the enactment of the Federal Technology Transfer Act of 1986 [enacted Oct. 20, 1986], the Secretary shall submit to the President and the Congress a report regarding—

- (A) any copyright provisions or other types of barriers which tend to restrict or limit the transfer of federally funded computer software to the private sector and to State and local governments, and agencies of such State and local governments; and
- (B) the feasibility and cost of compiling and maintaining a current and comprehensive inventory of all federally funded training software.

- (h) Duplication of reporting. The reporting obligations imposed by this section—
 - (1) are not intended to impose requirements that duplicate requirements imposed by the Government Performance and Results Act of 1993 (31 U.S.C. 1101 note);
 - (2) are to be implemented in coordination with the implementation of that Act; and
 - (3) are satisfied if an agency provided the information concerning technology transfer activities described in this section in its annual submission under the Government Performance and Results Act of 1993 (31 U.S.C. 1101 note).
- (i) Research equipment. The Director of a laboratory, or the head of any Federal agency or department, may loan, lease, or give research equipment that is excess to the needs of the laboratory, agency, or department to an educational institution or nonprofit organization for the conduct of technical and scientific education and research activities. Title of ownership shall transfer with a gift under this section.

§ 3710a. Cooperative research and development agreements

- (a) General authority. Each Federal agency may permit the director of any of its Government-operated Federal laboratories, and, to the extent provided in an agency-approved joint work statement or, if permitted by the agency, in an agency-approved annual strategic plan, the director of any of its Government-owned, contractor-operated laboratories—
 - (1) to enter into cooperative research and development agreements on behalf of such agency (subject to subsection (c) of this section) with other Federal agencies; units of State or local government; industrial organizations (including corporations, partnerships, and limited partnerships, and industrial development organizations); public and private foundations; nonprofit organizations (including universities); or other persons (including licensees of inventions owned by the Federal agency); and
 - (2) to negotiate licensing agreements under section 207 of title 35, United States Code, or under other authorities (in the case of a Government-owned, contractor-operated laboratory, subject to subsection (c) of this section) for inventions made or other intellectual property developed at the laboratory and other inventions or other intellectual property that may be voluntarily assigned to the Government.

- (b) Enumerated authority.
- (1) Under an agreement entered into pursuant to subsection (a)(1), the laboratory may grant, or agree to grant in advance, to a collaborating party patent licenses or assignments, or options thereto, in any invention made in whole or in part by a laboratory employee under the agreement, or, subject to section 209 of title 35, United States Code, may grant a license to an invention which is federally owned, for which a patent application was filed before the signing of the agreement, and directly within the scope of the work under the agreement, for reasonable compensation when appropriate. The laboratory shall ensure, through such agreement, that the collaborating party has the option to choose an exclusive license for a pre-negotiated field of use for any such invention under the agreement or, if there is more than one collaborating party, that the collaborating parties are offered the option to hold licensing rights that collectively encompass the rights that would be held under such an exclusive license by one party. In consideration for the Government's contribution under the agreement, grants under this paragraph shall be subject to the following explicit conditions:
- (A) A nonexclusive, nontransferable, irrevocable, paid-up license from the collaborating party to the laboratory to practice the invention or have the invention practiced throughout the world by or on behalf of the Government. In the exercise of such license, the Government shall not publicly disclose trade secrets or commercial or financial information that is privileged or confidential within the meaning of section 552(b)(4) of title 5, United States Code, or which would be considered as such if it had been obtained from a non-Federal party.
- (B) If a laboratory assigns title or grants an exclusive license to such an invention, the Government shall retain the right—
- (i) to require the collaborating party to grant to a responsible applicant a nonexclusive, partially exclusive, or exclusive license to use the invention in the applicant's licensed field of use, on terms that are reasonable under the circumstances; or
 - (ii) if the collaborating party fails to grant such a license, to grant the license itself.
- (C) The Government may exercise its right retained under subparagraph (B) only in exceptional circumstances and only if the Government determines that—
- (i) the action is necessary to meet health or safety needs that are not reasonably satisfied by the collaborating party;

- (ii) the action is necessary to meet requirements for public use specified by Federal regulations, and such requirements are not reasonably satisfied by the collaborating party; or
- (iii) the collaborating party has failed to comply with an agreement containing provisions described in subsection (c)(4)(B).

This determination is subject to administrative appeal and judicial review under section 203(2) of title 35, United States Code.

- (2) Under agreements entered into pursuant to subsection (a)(1), the laboratory shall ensure that a collaborating party may retain title to any invention made solely by its employee in exchange for normally granting the Government a nonexclusive, nontransferable, irrevocable, paid-up license to practice the invention or have the invention practiced throughout the world by or on behalf of the Government for research or other Government purposes.
- (3) Under an agreement entered into pursuant to subsection (a)(1), a laboratory may—
 - (A) accept, retain, and use funds, personnel, services, and property from a collaborating party and provide personnel, services, and property to a collaborating party;
 - (B) use funds received from a collaborating party in accordance with subparagraph (A) to hire personnel to carry out the agreement who will not be subject to full-time-equivalent restrictions of the agency;
 - (C) to the extent consistent with any applicable agency requirements or standards of conduct, permit an employee or former employee of the laboratory to participate in an effort to commercialise an invention made by the employee or former employee while in the employment or service of the Government; and
 - (D) waive, subject to reservation by the Government of a nonexclusive, irrevocable, paid-up license to practice the invention or have the invention practiced throughout the world by or on behalf of the Government, in advance, in whole or in part, any right of ownership which the Federal Government may have to any subject invention made under the agreement by a collaborating party or employee of a collaborating party.
- (4) A collaborating party in an exclusive license in any invention made under an agreement entered into pursuant to subsection (a)(1) shall have the right of enforcement under chapter 29 of title 35, United States Code [35 USCS §§ 281 et seq.].

- (5) A Government-owned, contractor-operated laboratory that enters into a cooperative research and development agreement pursuant to subsection (a)(1) may use or obligate royalties or other income accruing to the laboratory under such agreement with respect to any invention only—
- (A) for payments to inventors;
 - (B) for purposes described in clauses (i), (ii), (iii), and (iv) of section 14(a)(1)(B) [15 USCS § 3710c(a)(1)(B)]; and
 - (C) for scientific research and development consistent with the research and development missions and objectives of the laboratory.
- (6)
- (A) In the case of a laboratory that is part of the National Nuclear Security Administration, a designated official of that Administration may waive any license retained by the Government under paragraph (1)(A), (2), or (3)(D), in whole or in part and according to negotiated terms and conditions, if the designated official finds that the retention of the license by the Government would substantially inhibit the commercialisation of an invention that would otherwise serve an important national security mission.
 - (B) The authority to grant a waiver under subparagraph (A) shall expire on the date that is five years after the date of the enactment of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 [enacted Oct. 30, 2000]. The expiration under the preceding sentence of authority to grant a waiver under subparagraph (A) shall not affect any waiver granted under that subparagraph before the expiration of such authority.
 - (C) Not later than February 15 of each year, the Administrator for Nuclear Security shall submit to Congress a report on any waivers granted under this paragraph during the preceding year.
- (c) Contract considerations.
- (1) A Federal agency may issue regulations on suitable procedures for implementing the provisions of this section; however, implementation of this section shall not be delayed until issuance of such regulations.
 - (2) The agency in permitting a Federal laboratory to enter into agreements under this section shall be guided by the purposes of this Act.
 - (3)
 - (A) Any agency using the authority given it under subsection (a) shall review standards of conduct for its employees for resolving potential conflicts of interest to make sure they adequately establish guidelines for situations likely to arise through the use of this authority, including but not limited to cases where present or former employees

- or their partners negotiate licenses or assignments of titles to inventions or negotiate cooperative research and development agreements with Federal agencies (including the agency with which the employee involved is or was formerly employed).
- (B) If, in implementing subparagraph (A), an agency is unable to resolve potential conflicts of interest within its current statutory framework, it shall propose necessary statutory changes to be forwarded to its authorizing committees in Congress.
- (4) The laboratory director in deciding what cooperative research and development agreements to enter into shall—
- (A) give special consideration to small business firms, and consortia involving small business firms; and
- (B) give preference to business units located in the United States which agree that products embodying inventions made under the cooperative research and development agreement or produced through the use of such inventions will be manufactured substantially in the United States and, in the case of any industrial organization or other person subject to the control of a foreign company or government, as appropriate, take into consideration whether or not such foreign government permits United States agencies, organizations, or other persons to enter into cooperative research and development agreements and licensing agreements.
- (5)
- (A) If the head of the agency or his designee desires an opportunity to disapprove or require the modification of any such agreement presented by the director of a Government-operated laboratory, the agreement shall provide a 30-day period within which such action must be taken beginning on the date the agreement is presented to him or her by the head of the laboratory concerned.
- (B) In any case in which the head of an agency or his designee disapproves or requires the modification of an agreement presented by the director of a Government-operated laboratory under this section, the head of the agency or such designee shall transmit a written explanation of such disapproval or modification to the head of the laboratory concerned.
- (C)
- (i) Any non-Federal entity that operates a laboratory pursuant to a contract with a Federal agency shall submit to the agency any cooperative research and development agreement that the entity proposes to enter into and the joint work statement if required with respect to that agreement.

- (ii) A Federal agency that receives a proposed agreement and joint work statement under clause (i) shall review and approve, request specific modifications to, or disapprove the proposed agreement and joint work statement within 30 days after such submission. No agreement may be entered into by a Government-owned, contractor-operated laboratory under this section before both approval of the agreement and approval of a joint work statement under this clause.
 - (iii) In any case in which an agency which has contracted with an entity referred to in clause (i) disapproves or requests the modification of a cooperative research and development agreement or joint work statement submitted under that clause, the agency shall transmit a written explanation of such disapproval or modification to the head of the laboratory concerned.
 - (iv) Any agency that has contracted with a non-Federal entity to operate a laboratory may develop and provide to such laboratory one or more model cooperative research and development agreements for purposes of standardizing practices and procedures, resolving common legal issues, and enabling review of cooperative research and development agreements to be carried out in a routine and prompt manner.
 - (v) A Federal agency may waive the requirements of clause (i) or (ii) under such circumstances as the agency considers appropriate.
- (6) Each agency shall maintain a record of all agreements entered into under this section.
- (7) (A) No trade secrets or commercial or financial information that is privileged or confidential, under the meaning of section 552(b)(4) of title 5, United States Code, which is obtained in the conduct of research or as a result of activities under this Act [15 USCS §§ 3701 et seq.] from a non-Federal party participating in a cooperative research and development agreement shall be disclosed.
- (B) The director, or in the case of a contractor-operated laboratory, the agency, for a period of up to 5 years after development of information that results from research and development activities conducted under this Act [15 USCS §§ 3701 et seq.] and that would be a trade secret or commercial or financial information that is privileged or confidential if the information had been obtained from a non-Federal party participating in a cooperative research and development agreement, may provide appropriate protections against the dissemination of such information,

including exemption from subchapter II of chapter 5 of title 5, United States Code [5 USCS §§ 551 et seq.].

- (d) Definitions. As used in this section—
- (1) the term “cooperative research and development agreement” means any agreement between one or more Federal laboratories and one or more non-Federal parties under which the Government, through its laboratories, provides personnel, services, facilities, equipment, intellectual property, or other resources with or without reimbursement (but not funds to non-Federal parties) and the non-Federal parties provide funds, personnel, services, facilities, equipment, intellectual property, or other resources toward the conduct of specified research or development efforts which are consistent with the missions of the laboratory; except that such term does not include a procurement contract or cooperative agreement as those terms are used in sections 6303, 6304, and 6305 of title 31, United States Code;
 - (2) the term “laboratory” means—
 - (A) a facility or group of facilities owned, leased, or otherwise used by a Federal agency, a substantial purpose of which is the performance of research, development, or engineering by employees of the Federal Government;
 - (B) a group of Government-owned, contractor-operated facilities (including a weapon production facility of the Department of Energy) under a common contract, when a substantial purpose of the contract is the performance of research and development, or the production, maintenance, testing, or dismantlement of a nuclear weapon or its components, for the Federal Government; and
 - (C) a Government-owned, contractor-operated facility (including a weapon production facility of the Department of Energy) that is not under a common contract described in subparagraph (B), and the primary purpose of which is the performance of research and development, or the production, maintenance, testing, or dismantlement of a nuclear weapon or its components, for the Federal Government,

but such term does not include any facility covered by Executive Order No. 12344 [42 USCS § 7158 note], dated February 1, 1982, pertaining to the naval nuclear propulsion program;
 - (3) the term “joint work statement” means a proposal prepared for a Federal agency by the director of a Government-owned, contractor-operated laboratory describing the purpose and scope of a proposed cooperative research and development agreement, and assigning rights and

responsibilities among the agency, the laboratory, and any other party or parties to the proposed agreement; and

(4) the term “weapon production facility of the Department of Energy” means a facility under the control or jurisdiction of the Secretary of Energy that is operated for national security purposes and is engaged in the production, maintenance, testing, or dismantlement of a nuclear weapon or its components.

(e) Determination of laboratory missions. For purposes of this section, an agency shall make separate determinations of the mission or missions of each of its laboratories.

(f) Relationship to other laws. Nothing in this section is intended to limit or diminish existing authorities of any agency.

(g) Principles. In implementing this section, each agency which has contracted with a non-Federal entity to operate a laboratory shall be guided by the following principles:

- (1) The implementation shall advance program missions at the laboratory, including any national security mission.
- (2) Classified information and unclassified sensitive information protected by law, regulation, or Executive order shall be appropriately safeguarded.

§ 3710c. Distribution of royalties received by Federal agencies

(a) In general.

§ 3710d. Employee activities

(a) In general. If a Federal agency which has ownership of or the right of ownership to an invention made by a Federal employee does not intend to file for a patent application or otherwise to promote commercialization of such invention, the agency shall allow the inventor, if the inventor is a Government employee or former employee who made the invention during the course of employment with the Government, to obtain or retain title to the invention (subject to reservation by the Government of a nonexclusive, nontransferrable, irrevocable, paid-up license to practice the invention or have the invention practiced throughout the world by or on behalf of the Government). In addition, the agency may condition the inventor's right to title on the timely filing of a patent application in cases when the Government determines that it has or may have a need to practice the invention.

(b) Definition of “special Government employees”. For purposes of this section, Federal employees include special Government employees’ as defined in section 202 of title 18, United States Code.

(c) Relationship to other laws. Nothing in this section is intended to limit or diminish existing authorities of any agency.

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(c) Relationship to other laws. Nothing in this section is intended to limit or diminish existing authorities of any agency.

§ 3710c. Distribution of royalties received by Federal agencies

(a) In general.

(1) Except as provided in paragraphs (2) and (4), any royalties or other payments received by a Federal agency from the licensing and assignment of inventions under agreements entered into by Federal laboratories under section 12 [15 USCS § 3710a], and from the licensing of inventions of Federal laboratories under section 207 of title 35, United States Code, or under any other provision of law, shall be retained by the laboratory which produced the invention and shall be disposed of as follows:

(A)

(i) The head of the agency or laboratory, or such individual’s designee, shall pay each year the first \$ 2,000, and thereafter at least 15 per cent, of the royalties or other payments, other than payments of patent costs as delineated by a license or assignment agreement, to the inventor or coinventors, if the inventor’s or coinventor’s rights are assigned to the United States.

(ii) An agency or laboratory may provide appropriate incentives, from royalties, or other payments, to laboratory employees who are not an inventor of such inventions but who substantially increased the technical value of such inventions.

(iii) The agency or laboratory shall retain the royalties and other payments received from an invention until the agency or laboratory makes payments to employees of a laboratory under clause (i) or (ii).

(B) The balance of the royalties or other payments shall be transferred by the agency to its laboratories, with the majority share of the royalties or other payments from any invention going to the laboratory where the invention occurred. The royalties or other payments so transferred to any laboratory may be used or obligated by that laboratory during the fiscal year in which they are received or during the 2 succeeding fiscal years—

(i) to reward scientific, engineering, and technical employees of the laboratory, including developers of sensitive or classified

- technology, regardless of whether the technology has commercial applications;
- (ii) to further scientific exchange among the laboratories of the agency;
 - (iii) for education and training of employees consistent with the research and development missions and objectives of the agency or laboratory, and for other activities that increase the potential for transfer of the technology of the laboratories of the agency;
 - (iv) for payment of expenses incidental to the administration and licensing of intellectual property by the agency or laboratory with respect to inventions made at that laboratory, including the fees or other costs for the services of other agencies, persons, or organizations for intellectual property management and licensing services; or
 - (v) for scientific research and development consistent with the research and development missions and objectives of the laboratory.
- (C) All royalties or other payments retained by the agency or laboratory after payments have been made pursuant to subparagraphs (A) and (B) that is unobligated and unexpended at the end of the second fiscal year succeeding the fiscal year in which the royalties and other payments were received shall be paid into the Treasury.
- (2) If, after payments to inventors under paragraph (1), the royalties or other payments received by an agency in any fiscal year exceed 5 per cent of the budget of the agency for that year, 75 per cent of such excess shall be paid to the Treasury of the United States and the remaining 25 per cent may be used or obligated under paragraph (1)(B). Any funds not so used or obligated shall be paid into the Treasury of the United States.
- (3) Any payment made to an employee under this section shall be in addition to the regular pay of the employee and to any other awards made to the employee, and shall not affect the entitlement of the employee to any regular pay, annuity, or award to which he is otherwise entitled or for which he is otherwise eligible or limit the amount thereof. Any payment made to an inventor as such shall continue after the inventor leaves the laboratory or agency. Payments made under this section shall not exceed \$ 150,000 per year to any one person, unless the President approves a larger award (with the excess over \$ 150,000 being treated as a Presidential award under section 4504 of title 5, United States Code).
- (4) A Federal agency receiving royalties or other payments as a result of invention management services performed for another Federal agency or laboratory under section 207 of title 35, United States Code, may retain

such royalties or payments to the extent required to offset payments to inventors under clause (i) of paragraph (1)(A), costs and expenses incurred under clause (iv) of paragraph (1)(B), and the cost of foreign patenting and maintenance for any invention of the other agency. All royalties and other payments remaining after offsetting the payments to inventors, costs, and expenses described in the preceding sentence shall be transferred to the agency for which the services were performed, for distribution in accordance with paragraph (1)(B).

(b) Certain assignments. If the invention involved was one assigned to the Federal agency—

(1) by a contractor, grantee, or participant, or an employee of a contractor, grantee, or participant, in an agreement or other arrangement with the agency, or

(2) by an employee of the agency who was not working in the laboratory at the time the invention was made,

the agency unit that was involved in such assignment shall be considered to be a laboratory for purposes of this section.

(c) Reports. The Comptroller General shall transmit a report to the appropriate committees of the Senate and House of Representatives on the effectiveness of Federal technology transfer programs, including findings, conclusions, and recommendations for improvements in such programs. The report shall be integrated with, and submitted at the same time as, the report required by section 202(b)(3) of title 35, United States Code.

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(A)

(i) The head of the agency or laboratory, or such individual's designee, shall pay each year the first \$ 2,000, and thereafter at least 15 per cent, of the royalties or other payments, other than payments of patent costs as delineated by a license or assignment

- agreement, to the inventor or coinventors, if the inventor's or coinventor's rights are assigned to the United States.
- (ii) An agency or laboratory may provide appropriate incentives, from royalties, or other payments, to laboratory employees who are not an inventor of such inventions but who substantially increased the technical value of such inventions.
 - (iii) The agency or laboratory shall retain the royalties and other payments received from an invention until the agency or laboratory makes payments to employees of a laboratory under clause (i) or (ii).
- (B) The balance of the royalties or other payments shall be transferred by the agency to its laboratories, with the majority share of the royalties or other payments from any invention going to the laboratory where the invention occurred. The royalties or other payments so transferred to any laboratory may be used or obligated by that laboratory during the fiscal year in which they are received or during the 2 succeeding fiscal years—
- (i) to reward scientific, engineering, and technical employees of the laboratory, including developers of sensitive or classified technology, regardless of whether the technology has commercial applications;
 - (ii) to further scientific exchange among the laboratories of the agency;
 - (iii) for education and training of employees consistent with the research and development missions and objectives of the agency or laboratory, and for other activities that increase the potential for transfer of the technology of the laboratories of the agency;
 - (iv) for payment of expenses incidental to the administration and licensing of intellectual property by the agency or laboratory with respect to inventions made at that laboratory, including the fees or other costs for the services of other agencies, persons, or organizations for intellectual property management and licensing services; or
 - (v) for scientific research and development consistent with the research and development missions and objectives of the laboratory.
- (C) All royalties or other payments retained by the agency or laboratory after payments have been made pursuant to subparagraphs (A) and (B) that is unobligated and unexpended at the end of the second fiscal year succeeding the fiscal year in which the royalties and other payments were received shall be paid into the Treasury.

- (2) If, after payments to inventors under paragraph (1), the royalties or other payments received by an agency in any fiscal year exceed 5 per cent of the budget of the agency for that year, 75 per cent of such excess shall be paid to the Treasury of the United States and the remaining 25 per cent may be used or obligated under paragraph (1)(B). Any funds not so used or obligated shall be paid into the Treasury of the United States.
- (3) Any payment made to an employee under this section shall be in addition to the regular pay of the employee and to any other awards made to the employee, and shall not affect the entitlement of the employee to any regular pay, annuity, or award to which he is otherwise entitled or for which he is otherwise eligible or limit the amount thereof. Any payment made to an inventor as such shall continue after the inventor leaves the laboratory or agency. Payments made under this section shall not exceed \$ 150,000 per year to any one person, unless the President approves a larger award (with the excess over \$ 150,000 being treated as a Presidential award under section 4504 of title 5, United States Code).
- (4) A Federal agency receiving royalties or other payments as a result of invention management services performed for another Federal agency or laboratory under section 207 of title 35, United States Code, may retain such royalties or payments to the extent required to offset payments to inventors under clause (i) of paragraph (1)(A), costs and expenses incurred under clause (iv) of paragraph (1)(B), and the cost of foreign patenting and maintenance for any invention of the other agency. All royalties and other payments remaining after offsetting the payments to inventors, costs, and expenses described in the preceding sentence shall be transferred to the agency for which the services were performed, for distribution in accordance with paragraph (1)(B).

(b) Certain assignments. If the invention involved was one assigned to the Federal agency—

- (1) by a contractor, grantee, or participant, or an employee of a contractor, grantee, or participant, in an agreement or other arrangement with the agency, or
- (2) by an employee of the agency who was not working in the laboratory at the time the invention was made,
the agency unit that was involved in such assignment shall be considered to be a laboratory for purposes of this section.

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(A)

- (i) The head of the agency or laboratory, or such individual's designee, shall pay each year the first \$ 2,000, and thereafter at least 15 per cent, of the royalties or other payments, other than payments of patent costs as delineated by a license or assignment agreement, to the inventor or coinventors, if the inventor's or coinventor's rights are assigned to the United States.
- (ii) An agency or laboratory may provide appropriate incentives, from royalties, or other payments, to laboratory employees who are not an inventor of such inventions but who substantially increased the technical value of such inventions.
- (iii) The agency or laboratory shall retain the royalties and other payments received from an invention until the agency or laboratory makes payments to employees of a laboratory under clause (i) or (ii).

(B) The balance of the royalties or other payments shall be transferred by the agency to its laboratories, with the majority share of the royalties or other payments from any invention going to the laboratory where the invention occurred. The royalties or other payments so transferred to any laboratory may be used or obligated by that laboratory during the fiscal year in which they are received or during the 2 succeeding fiscal years—

- (i) to reward scientific, engineering, and technical employees of the laboratory, including developers of sensitive or classified

- technology, regardless of whether the technology has commercial applications;
- (ii) to further scientific exchange among the laboratories of the agency;
 - (iii) for education and training of employees consistent with the research and development missions and objectives of the agency or laboratory, and for other activities that increase the potential for transfer of the technology of the laboratories of the agency;
 - (iv) for payment of expenses incidental to the administration and licensing of intellectual property by the agency or laboratory with respect to inventions made at that laboratory, including the fees or other costs for the services of other agencies, persons, or organizations for intellectual property management and licensing services; or
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 - (3) Any payment made to an employee under this section shall be in addition to the regular pay of the employee and to any other awards made to the employee, and shall not affect the entitlement of the employee to any regular pay, annuity, or award to which he is otherwise entitled or for which he is otherwise eligible or limit the amount thereof. Any payment made to an inventor as such shall continue after the inventor leaves the laboratory or agency. Payments made under this section shall not exceed \$ 150,000 per year to any one person, unless the President approves a larger award (with the excess over \$ 150,000 being treated as a Presidential award under section 4504 of title 5, United States Code).

(4) A Federal agency receiving royalties or other payments as a result of invention management services performed for another Federal agency or laboratory under section 207 of title 35, United States Code, may retain such royalties or payments to the extent required to offset payments to inventors under clause (i) of paragraph (1)(A), costs and expenses incurred under clause (iv) of paragraph (1)(B), and the cost of foreign patenting and maintenance for any invention of the other agency. All royalties and other payments remaining after offsetting the payments to inventors, costs, and expenses described in the preceding sentence shall be transferred to the agency for which the services were performed, for distribution in accordance with paragraph (1)(B).

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- (iii) The agency or laboratory shall retain the royalties and other payments received from an invention until the agency or laboratory makes payments to employees of a laboratory under clause (i) or (ii).
- (B) The balance of the royalties or other payments shall be transferred by the agency to its laboratories, with the majority share of the royalties or other payments from any invention going to the laboratory where the invention occurred. The royalties or other payments so transferred to any laboratory may be used or obligated by that laboratory during the fiscal year in which they are received or during the 2 succeeding fiscal years—
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- (ii) to further scientific exchange among the laboratories of the agency;
- (iii) for education and training of employees consistent with the research and development missions and objectives of the agency or laboratory, and for other activities that increase the potential for transfer of the technology of the laboratories of the agency;
- (iv) for payment of expenses incidental to the administration and licensing of intellectual property by the agency or laboratory with respect to inventions made at that laboratory, including the fees or other costs for the services of other agencies, persons, or organizations for intellectual property management and licensing services; or
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(ii) An agency or laboratory may provide appropriate incentives, from royalties, or other payments, to laboratory employees who are not an inventor of such inventions but who substantially increased the technical value of such inventions.

(iii) The agency or laboratory shall retain the royalties and other payments received from an invention until the agency or laboratory makes payments to employees of a laboratory under clause (i) or (ii).

- (B) The balance of the royalties or other payments shall be transferred by the agency to its laboratories, with the majority share of the royalties or other payments from any invention going to the laboratory where the invention occurred. The royalties or other payments so transferred to any laboratory may be used or obligated by that laboratory during the fiscal year in which they are received or during the 2 succeeding fiscal years—
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 - (ii) to further scientific exchange among the laboratories of the agency;
 - (iii) for education and training of employees consistent with the research and development missions and objectives of the agency or laboratory, and for other activities that increase the potential for transfer of the technology of the laboratories of the agency;
 - (iv) for payment of expenses incidental to the administration and licensing of intellectual property by the agency or laboratory with respect to inventions made at that laboratory, including the fees or other costs for the services of other agencies, persons, or organizations for intellectual property management and licensing services; or
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- (1) by a contractor, grantee, or participant, or an employee of a contractor, grantee, or participant, in an agreement or other arrangement with the agency, or
- (2) by an employee of the agency who was not working in the laboratory at the time the invention was made,
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§ 3710d. Employee activities

(a) In general. If a Federal agency which has ownership of or the right of ownership to an invention made by a Federal employee does not intend to file for a patent application or otherwise to promote commercialisation of such invention, the agency shall allow the inventor, if the inventor is a Government employee or former employee who made the invention during the course of employment with the Government, to obtain or retain title to the invention (subject to reservation by the Government of a nonexclusive, nontransferrable, irrevocable, paid-up license to practice the invention or have the invention practiced throughout the world by or on behalf of the Government). In addition, the agency may condition the inventor's right to title on the timely filing of a patent application in cases when the Government determines that it has or may have a need to practice the invention.

(b) Definition of "special Government employees". For purposes of this section, Federal employees include special Government employees' as defined in section 202 of title 18, United States Code.

(c) Relationship to other laws. Nothing in this section is intended to limit or diminish existing authorities of any agency.

Appendix 3: Sample survey of Australian government research organisations

Analysis of the legal framework for patent ownership in publicly funded research institutions

June 2002

Reason for this survey

The Commonwealth Department of Education, Science and Training is currently considering the intellectual property arrangements that exist between public research organisations and their research staff. The Intellectual Property Research Institute of Australia at the University of Melbourne has been commissioned to submit a report on these arrangements. As part of this process, we are seeking information about how major governmental research institutions currently manage their intellectual property.

By using publicly available sources, we have obtained similar information from a number of universities in Australia. We wish to survey your organisation as we have not been able to find the relevant information in publicly available sources. We would prefer to be able to specifically identify your answers with your organisation. However, if you would prefer, your answers could be kept anonymous and not linked to your organisation. If you are not willing for this information to be disclosed at all, please inform us and do not complete this survey.

Who should fill in this questionnaire?

This survey is intended to be completed by a manager who oversees the intellectual property arrangement at your organisation. If you are unable to answer any of the questions, please pass the questionnaire on to another manager within your organisation who possesses such information. Participation in this survey is voluntary, and we greatly appreciate your completion of this questionnaire.

What do you do?

Most questions simply require you to choose an answer from a list of options and then circle the number that corresponds to your choice. In some instances, we require more specific details. We expect that this survey would take about five minutes. On completion, please return the survey in the enclosed postage paid envelope.

Any questions?

For more information, please telephone Melanie Howlett on (03) 83441018 or Kim Hugen on (03) 8344 1127. Alternatively, you may email Melanie at m.howlett@unimelb.edu.au.

Thank you for your assistance

Disclosure of Information for this Survey

1 My organisation is willing to have this information disclosed on the following basis:

The information can be used and specifically linked to my organisation1

The information can only be used if it is not linked to my organisation2

Neither of the above (in this case, proceed no further with this survey)3

Intellectual Property Policies

2 Does your organisation have a formal intellectual property policy for staff?

*(Circle the **one** number that corresponds to your answer.)*

Yes1

No2

Don't know3

3. Do employment contracts for new staff members include a section on intellectual property rights?

*(Circle the **one** number that corresponds to your answer.)*

Yes1

No2

Don't know3

4 Can you list any other relevant internal documents dealing with intellectual property ownership?

If you answered 'yes' to any of the questions 1–3, a copy of the relevant documentation would be greatly appreciated.

Ownership of Employee Inventions

5 In relation to inventions created by employees in the course of their employment, who claims ownership?

*(Circle the **one** number that corresponds to your answer.)*

Your organisation1

Inventor2

Your organisation and the inventor3

Don't know4

Other (please specify)5

6 In relation to inventions created by employees outside their normal terms of engagement but using the resources of the organisation (including its facilities, information, IP and so on), who claims ownership?

*(Circle the **one** number that corresponds to your answer.)*

- Your organisation1
 - Inventor2
 - Your organisation and the inventor3
 - Don't know4
 - Other (please specify)5
-

Research Undertaken with Third Parties

7 Does your organisation enter into agreements with other organisations (private or public) to undertake research projects?

If so, how are patent rights normally allocated between your organisation and the other party?

Disclosure and Confidentiality

8 Does your organisation legally require employees to notify their employer when potentially valuable inventions are developed?

*(Circle the **one** number that corresponds to your answer.)*

- Yes, always1
- Sometimes, depending on the invention . . .1
- Sometimes, depending on the technology . .3
- No, never4
- Don't know5

9 Does your organisation impose an obligation of confidentiality on employees who develop new technology?

*(Circle the **one** number that corresponds to your answer.)*

- Yes, always1
 - Sometimes, depending on the invention . . .2
 - Sometimes, depending on the technology . .3
 - No, never4
 - Don't know5
-

Commercialisation of Inventions

10 If your organisation successfully commercialises a new invention, how are ownership rights and/or revenue usually distributed between the inventor, your organisation, and any third party involved in commercialisation?

11 If your organisation chooses not to commercialise a new invention, what usually happens to ownership of that invention?

Thank you very much for your time.

Please return the completed questionnaire in the reply paid envelope.

