Competitive research grants and industry collaboration: A challenge for universities in the 1990s

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Introduction

Many researchers within universities are undertaking collaborative research with industry for the first time in their careers. They are finding it difficult to come to terms with the pressures of working in a commercial environment. This article traces the reasons why universities and industry are collaborating more than ever before. It focuses on the competitive research grants schemes which have been established by government over the past decade, and especially on the research and development (R & D) corporations in the primary industries and energy sector. How well have universities and industry responded to the opportunities provided under these schemes? What are some of the problems? Have the various parties reached an understanding on issues such as the ownership and valuation of intellectual property, the right to publish and the importance of research milestones, etc? These and other issues are covered and some suggestions offered on what needs to be done in relation to both policy and attitudes in this area.

Responding to the challenge

Why are universities and industry collaborating in research more than ever before? A major reason is that government has made a concerted effort in recent years to encourage collaborative research between universities and industry. Initiatives such as the 15% tax incentive for research and development, the Generic Technology Grants Scheme, the establishment of R & D corporations in the primary industries and energy sector, the National Teaching Company scheme, the Cooperative Research Centre program, Australian Postgraduate Research Awards (Industry) and the Australian Research Council Collaborative Research Grants scheme have been developed to boost R & D expenditure. Must it fail if all of these schemes are administered and funded under the auspices of government departments or corporations (the "funding agencies")? They require formal links between researchers and commercial collaborators, including financial commitments by industry to the R & D cash or in kind. Government expects the results of the R & D to be exploited on normal commercial terms and to the benefit of the Australian economy.

On another front, the Government has also been taking steps to improve the intellectual property systems. Various forms of protecting intellectual property have been recognized, including amendments to the Copyright Act in 1984 and the passage of the Plant Variety Rights Act in 1987. The Australian Technology Group (ATAG) has also recently been established to provide the range of services required to translate Australian research and technology into products and services which can be delivered to the Australian and international markets on a totally commercial basis.

How are universities responding? Some have been quicker than others to adapt to the new environment, where the term "intellectual property" is now more fashionable than a decade ago. In those days, many believed that intellectual property with commercial significance was most likely to arise through serendipity, as a result of student or staff undertaking research primarily resourced by the university. Thus, the principal issues of concern were often whether to patent the discovery and how the inventor and the university might share in the proceeds from commercial exploitation. Issues such as the rights of funding agencies and other third parties to intellectual property were not commonly considered.

Initially, some universities responded to the new environment by establishing university companies to develop and manage links between the university sector, industry and government. Such companies have had mixed success, with many relying on income from consulting activities to maintain a satisfactory cash flow, rather than on royalties from the exploitation of intellectual property. They are not well suited, however, to processing proposals and grants arising out of the industry-focused competitive research grants schemes which have been introduced in recent years. Many of these schemes require a number of stages for each proposal. A preliminary proposal is usually around 2 - 3 pages in length, with insufficient information to enable a funding agency to decide whether to call for a full proposal. If a full proposal is submitted and is successful, further negotiations are often required to match the budget and research milestones, etc to the amount offered. Negotiations concerning a formal agreement between the funding agency and the university also take place at this point. Finally, many such agreements require the university and the commercial collaborator to enter into a further contract covenying matters such as intellectual property.

A growing number of universities are now appointing legally trained research contracts officers, attached in many cases to their research grants offices, to assist with the negotiation of these matters and to draft and review research agreements. Many universities have also sought the assistance of the Australian Vice-Chancellors' Committee (AVCC). As a result of all of this activity, the level of awareness of the various issues relating to collaborative research with commercial partners has risen considerably within universities.

There are some universities, however, which are still reluctant to commit additional resources to the commercial aspects of research, either because they do not feel that they currently have the capability, or are not convinced that income from commercial-oriented research ventures will justify the extra cost. Some fail to recognize that intellectual property matters are often too less to do with generating significant income from protecting the interests of parties to a contract where there may be a commercial return in the long term. Universities which neglect their contractual responsibilities may save money in the short term, but they expose themselves to the possibility of being sued for breach of contract if, for example, confidential information arising from collaborative research project is disclosed without the prior approval of the funding agency.

Adjusting to change

The relationship between funding agencies requiring collaboration
between industry and universities (particularly in the rural sector) has been a major factor in the development of the AVCC. Its objective is "to make the system more "demand led" to meet the needs of all end-users, including industry, government and the general community." The AVCC's representatives are drawn from many of the universities and industry, as well as Government, and are expected to provide feedback on research and development projects.

In addition, the AVCC has a role in the Private Industry and Energy portfolio and other research funding agencies increasingly refer to their participation in the R & D portfolio, rather than direct research grants. For some, investments are more at the research end of the R & D spectrum, for others, the emphasis is more on development.

The AVCC encourages industry to pursue its own research objectives, with little or no direction from funding agencies. As long as the research is broadly in line with the overall objectives of the funding agency, the government is prepared to allow industry to pursue its own research objectives, with little or no direction from funding agencies. As long as the research is broadly in line with the overall objectives of the funding agency, the government is prepared to allow industry to pursue its own research objectives.

Following lengthy discussions between industry, the AVCC and the Universities, awaiting conditions to form a joint venture with the AVCC into a university, the industry has been asked to consider the role of the AVCC in the process of research and development. The AVCC is not asking for more control over research, but rather for more involvement in the decision-making process.

Within universities' share of Commonwealth Competitive Grants (CCGs) over the five years from 1988-1992 has increased from 50% to 70% of total government support. A study from 1990 showed that CCG's share has remained steady at 17-18%. Some of these changes can be attributed to the increase in Commonwealth and AVCC funding over the period, to the degree that the industry has funded out of its own pockets. However, many of the CCG schemes encourage the utilization of the AVCC and other funding agencies, which continue to compete for limited funds with their own institutions or, if they cannot secure low cost research objectives which do not require external funding, they may be forced to rely on the AVCC.

In 1991, the AVCC released a policy document "Guidelines relating to intellectual property" for the benefit of all of its members. It is available on request from the AVCC and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and the AVCC in the long term if they do not respond sufficiently to the imperatives of the new environment.

Comparative research grants

There are two principal differences between competitive research grants and the Commonwealth Competitive Grants schemes. First, nearly all competitive research grants are awarded on a merit basis, rather than cost-plus basis, and the policies of those funding agencies place considerable emphasis on the research infrastructure of universities. Second, with competitive grants, there is often less time to give full consideration to issues of contract research project, it is frequently because he or she is in a "fiscal" sense, that the "core" of the university's research is funded through commerce. The AVCC is engaged in research studies to being a world leader in the discipline. Professor Larkins comments "I would not consider one of a law firm, one expects to carry out research in all cost, including the benefit of the research. I do not have to say, even to the University, what a research experience, but why such a norm is not as readily accepted when research is paid for from other sources." Professor Larkins' view is shared by many of the competitive funding agencies. They consider that universities are not commercially viable, that research funding agencies should take into account the costs of carrying out research, and that the fact that a person is awarded a grant in a high competitive area, the research is carried out in a manner that is commercial, if it is in the form of existing patents, or in a commercially significant manner and not yet in the public domain. The AVCC recognises that joint ownership of intellectual property, because of the short term at least, it appears equitable. Joint ownership gives all parties the right to decide how intellectual property should be developed and commercialised, it may be relatively simple to agree upon in the initial stages, and it enables the parties to decide how rights should be sublicensed. In the longer term, however, there are disadvantages, particularly if there are multiple owners with different objectives, or in different locations. These problems are exacerbated when the research is carried out in a university, a funding agency or an industry collaborative environment, and the funding is provided by a university, a funding agency, or an industry collaborative environment, and the funding is provided.

Within some universities acknowledge joint ownership, others believe that intellectual property should be vested in the university, because the property is developed by its staff or students and the university is able to retain ownership rights over its commercial exploitation. It has been argued that in any period in a university, a funding agency or an industry collaborator might grant exclusive ownership for a defined period by means of a copyright, patent or other exclusive right, for example, the use of non-inclusive, exclusive or non-exclusive, exclusive or non-inclusive. The reasons for this are not always well understood by industry collaborators, who criticise universities for wanting to retain ownership. If an industry collaborator grants exclusive rights to intellectual property for a defined period in return for an agreed royalty to the university, effective ownership for that period is vested in the industry collaborator, but not in the collaborative university. This arrangement is also recognised for tax purposes.

The advantage is that if the industry collaborator fails to perform, the collaborative university may be faced with a licensing situation of an intellectual property which has discovered. The university may also use the intellectual property for other research purposes not covered by the licence agreement.

Because the development of intellectual property with commercial potential is one of the prime short-term objectives, the AVCC and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the AVCC in the long term if they do not respond sufficiently to the imperatives of the new environment.

Ownership and valuation of intellectual property

Many standard agreements base ownership of intellectual property on a number of factors, including the cost of the research and the risks of the parties. The contributions may include full direct and indirect financial inputs, the value of background intellectual property inputs into the project, and the skills and experience of the parties. Professor Larkins, Deputy Vice-Chancellor (Research) at The University of Melbourne, argues, around a balance is to be achieved. The AVCC, it has not acknowledged and that too often industrial partners seek to negotiate only on a cost-plus basis. He points out that if a university professor is approached to participate in a collaborative or
provision is to apply for 12 months after the date of the request to
provision, and in the event of provision it is not possible to
arbitrary for a higher degree is involved in a project, all
reasonable steps should be taken to protect intellectual property.
to ensure that patent protection is obtained while the thesis is in
progress is important. All steps should also be taken to avoid a
delay in the submission of the thesis or the exclusion from the
submission of material which represents an essential or significant
part of the student's work. At the request of the sponsor and with
the concurrence of the student and the university, the thesis may be
submitted in advance by the sponsoring organization if the
publication after a limited period is not unreasonably withheld.

Very few funding agencies accept the AVCC's view that publica-
shoULDBE REPRINTED AS A REQUEST TO publish. For example, the RIRDC General Condition states:
(a) The Principal Investigator is encouraged to publish the results
of research projects that are conducted in Australia or
abroad, for the benefit of the Australian industry and
environment. However, published results will be
unreasonably withheld if the research is not
published in a way that may adversely
adversely affect the right of a Party to commercially exploit the Intellectual
Property resulting from the Project without the prior approval, in
writing, of both parties, such approval not to be unreasonably
withheld. This provision applies to the completion of the Project or the
receipt of a final report on the Project by the Corporation whichever
is the later.

The RIRDC and other corporations argue that an embargo for such
a lengthy period is not necessary and that universities should rely on the
fact that publication shall not be unreasonably withheld. Neverthe-
less, the approach to a possible embargo in Australia is not
entirely clear and is not necessarily consistent and that is unacceptable in a
university system.

The ARC Conditions of Award for projects grants merely state that
the grantee or institution shall ensure that the intellectual property in
intellectual property resulting from the Project is exclusively
property rights. Further, it is not necessary for grants which are predominantly funding basic research projects.

Research milestones

The milestone is not common in research agreements with universities until they were identified around four years ago by the R & D corporations in the Primary Industries and Energy, Resources, and Tourism (PIERT) in the form of milestones at which specified parts of the project will be completed. Non-completion of the milestones by the due dates may result in the termination of the contract.

Initially, there was little feeling that milestones be incorporated in research agreements, because researchers argued that the nature of research made it difficult to predict progress. In practice, however, the establishment of milestones is in the hands of the researchers themselves and they should be attainable.

In fact, it is generally accepted that research milestones should be formulated to reflect work that is to be completed in the project under contract. They should not refer to specific findings that cannot be obtained and that would lead, in the case of failure, to the university being obliged to continue experiments indefinitely and without further financial support.

Agreements should also provide for the parties to mutually agree on objectives and methodology, so that if the direction of the research changes, milestones are less likely to be unrealistic.

The RIRDC General Conditions are a good example of the power of a corporate sponsor. By thirty notices in writing a university does not achieve any milestones within thirty days of the date of expiry of the period specified for the achievement of that milestone. In practice, RIRDC and other corporations have built-in milestones that are specific and measurable. The University must ensure that the project is carried out in accordance with the terms of the Agreement, and that reasonable notice must be given to the sponsor in the event of any proposed amendments. The Agreement requires the submission of monthly reports which are completed and submitted to the University at the end of the project, if it is shown that the project will be aesthetically pleasing to the parties. If the report is not submitted, then it may be reasonable for the project to be retracted or, if necessary, for a project to be transferred to the sponsor.

Termination

All research agreements provide for the termination of a contract. In this case, the project may be terminated if no milestones have been achieved, or a progress report submitted on time. In these cases, universities should ensure that the funding agency is required to give 30 days' notice to enable the breach of contract to be remedied before termination takes effect. There are some issues, however, where it is reasonable for termination to have immediate effect, such as material misrepresentation where false statements may be made in the application.

Universities are particularly sensitive about termination clauses, because most research councils and, in many instances, the terms of the agreement will usually lead to the termination of the staff employed on the project. Not only in the unfortunate personal sense, but it could expose the university to a substantial payout to staff who may be long-term employees. Universities should protect themselves by ensuring that provisions for termination of employment are contained in the agreement, or in the offer of appointment to externally-funded research staff. For example, The University of Western Australia's clause is as follows:

You should note that your appointment is funded from a grant made for research purposes and that the University is unable to contrib-
ute to or finance your research costs. At the option of the University, the continuation of the appointment to the date shown in the offer is conditional on the donor's funding for the full period. Nevertheless it is considered unlikely that funding would be withdrawn by the donor during the period of your appointment. If this were to happen the University would be obliged to provide you with a revised date for the termination of your appointment, and would not accept liability for payments of any kind relating to the remaining period of your appointment. The revised date is shown in clause 6.1(b) of the University of Western Australia Research Grant Awarded Staff Award which forms part of the Agreement mentioned above, which provides that salary varia-
tions occur and available funds are insufficient to allow the continuation of appointment to the date shown in the offer, the term of the appointment will be shortened accordingly. In either case, it is the responsibility of the student to provide you with the revised date for the termination of your appointment, in accordance with the Close 6.1(b) of the Research Grant Award Agreement mentioned above.

The AVCC recommends that:
(a) any agreement, the terms and conditions of that agreement
should be written in such a manner as to recognise that staff should be employed in financial support of the project;
and that reasonable notice must be given to the sponsor in the event
of any proposed amendments. The Agreement requires the
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Professional Indemnity

Many funding agencies, especially in "one-off" negotiations, expect a contract to contain indemnity provisions which commit the funding agency from any responsibility arising out of the project. Universities must ensure that they are only held responsible for actions taken by the university, or employees of the university and not responsible for any action, claim, demand, costs, charges, or expenses (including the costs of defending or settling any action, claim or demand) made, sustained, or incurred by or on behalf of any person, firm or company, attributable to any injury to any one person (including death) or loss or damage to property which may arise from or be a consequence of any action, neglect, default, or omission of the employees, agents or employees of the author or any other author(s) in carrying out the research project.

Many funding agencies will not agree to limiting the extent of this indemnity to "reasonable care". In some cases, however, the universities should require indemnity by the university for any actions that may bring a claim against the university. This is because the university has control over any actions of the university, its officers, employees or agents during the course of a project.

The issue of indemnity should not be underestimated by universi-
ties. Most research agreements also state that a university remains liable if any part of a project is subcontracted. Universities are normally required to keep the funding agency indemnified against any damage or loss incurred as a result of acts or omissions of a subcontractor.

Other issues

There are many other issues which have arisen out of competitive research grants schemes involving industry collaboration which universities have not necessarily had to face up to in the past. For example, some funding agencies insist on clauses such as "the Research Organisation will pay all reasonable expenses incurred in the course of research that the University..." to restrain the commercialisation of scientific discoveries. Universities should, however, ensure that if they are to be reimbursed for the cost of the work, the University is required to provide a reimbursement for the costs of the work. The terms of the agreement must be specific and measurable. The University must ensure that the project is carried out in accordance with the terms of the Agreement, and that reasonable notice must be given to the sponsor in the event of any proposed amendments. The Agreement requires the submission of monthly reports which are completed and submitted to the University at the end of the project, if it is shown that the project will be aesthetically pleasing to the parties.

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other countries in respect of an invention". RIRDC states that the costs of applying for the grant of a patent are the registration fees, design or trade mark fees and any similar rights in respect of all such intellectual property shall be borne by the parties in the proportion in which they share the title to and ownership of the Intellectual Property. The cost of registering and maintaining patents worldwide is an expensive proposition and many universities may balk at the prospect, especially given the limited prospects of success. According to Mr R W Byrnes, Legal Officer at the University of Queensland, for example, the total fees for the 1999 fiscal year were $50,850. Therefore, it is crucial for universities to identify the other benefits which flow from the system as a consequence of success in attracting grants. The university sector is unlikely to extract many more concessions from funding agencies in relation to these issues. It is up to universities to develop the necessary policies and procedures to adapt to this new funding environment.

References

The future
In the long term, universities need to assess, on a case by case basis, the risks and benefits of operating under the restrictive conditions applying to competitive research grants schemes involving industry collaboration. Alternatively, universities might choose to give less emphasis to "research of this nature. A pragmatic approach based on experience, subject to judgement, the size of the research project and the potential risk of non-compliance is required to find a sensible balance between accepting research grants of this nature with little consideration of the implications, and being too concerned with the legal niceties of some of the conditions. In view of government policy to encourage greater interaction between universities and industry, universities are likely to find that access to external funds will become very limited in some disciplines if they choose not to accept grants from the commercially-based competitive research grants schemes. As research infrastructure funding to universities through Mechanisms A is also currently linked to some competitive schemes with commercial objectives, it is even more difficult for universities to ignore the other benefits which flow through the system as a consequence of success in attracting these grants. The university sector is unlikely to extract many more concessions from funding agencies in relation to these issues. It is up to universities to develop the necessary policies and procedures to adapt to this new funding environment.

Part I: University policy on patenting
Attitudes within universities in the United Kingdom towards the ownership and exploitation of inventions created within the university sector are in a state of flux. In order to understand the present approaches towards the patenting of research within universities and how these policies are likely to change in the future, it is necessary to outline the changing environment within which universities operate.

The first important change that occurred over the last decade is that the UK government has pursued a policy of greater public sector accountability. One of the consequences of this was that during the 1980s, there was a marked decline in the level of government funding of universities. As a result, universities have been forced to look to alternative sources for their income. In addition to expanding student numbers, universities have also sought to exploit their knowledge and, as it is now called, the information that they generate. That is, in order to make up for the short-falls in funding which have arisen, universities have begun to trade in the "products" that they produce.

As a part of the drive towards increased public sector accountability there has also been a new interest in the processes of university research, as with any aspect of university life, to be rendered more "useful". One of the consequences of this is that in examining research, there has been a move away from criteria such as the novelty or originality of the research towards an examination of its commercial relevance or, as it was put recently, "its direct application to real problems faced by society" (Cabinet Office 1992, p. 3). In turn, traditional academic criteria such as disinterestedness of knowledge and freedom of research have been downgraded as goals. Combined together with changes in the funding structure, the re-definition of the university as a public institution has led to an increase in demands for research to placed in a focus so that it can be exploited and used. One of the most obvious ways this goal could be achieved was through the use of intellectual property protection.

The second major change that has occurred in recent years is in terms of the way inventions created within universities are exploited. In 1981, the British Technology Group (BTG) was set up to oversee the proper exploitation and management of intellectual property rights generated in public sector research. To achieve this end, BTG was given the right of first refusal to the products of government funded research. The rationale behind the establishment of BTG was the belief that universities lacked the expertise to protect and exploit inventions and the patent system had little to do with promoting university research and university researchers little desire to profit from their inventions. The mutual disregard of the law for university research, and university researchers for the law has over the last decade come to an end. It is the aim of this paper to examine the nature of this changing relationship by focusing on the main points of interest between patents and university research in the United Kingdom. These are, first, the attitude within universities towards the ownership of research-generated inventions. In order to understand the question of who should have the right to patent inventions which are generated during university research; and third, the impact that the patenting of research will have upon university research itself.

Part II: University policy on patenting