Prometheus, Vol. 22, No. 4, December 2004

Carfax Publishing
Taylor & Francis Group

Universities and Government-sponsored Contract Research: An Australian Case Study

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ABSTRACT *Based on interviews, this article provides a case study of the experiences of academic staff at one Australian regional university in undertaking contract research projects sponsored by government departments and agencies. Academics from a surprisingly diverse range of disciplines are attracted to government-sponsored research for a variety of reasons but particularly important is the financial support provided for research projects and postgraduate research students. Projects vary in scale, amounts of funding involved and purposes, with research activities covering a wide range of different activities including collection and analysis of data, provision of documentation on good practice, design of implementation strategies, evaluations, organisational reviews and policy recommendations. Overall, respondents are highly positive about their experiences, despite problems such as delays in payment of funds, inappropriately restricted timelines, frequent changes in senior agency personnel, unrealistic expectations, and restrictions in the use of data and publication of results. While many academics from different disciplines provide policy recommendations and carry out evaluative studies, few are well informed about the extent to which their work is actually utilised.*

Keywords: academic research; contract research; university–industry research links; public policy; policy recommendations; evaluative studies; intellectual property

Introduction

This article provides a case-study of the experiences of academic staff in one Australian regional university in undertaking contract research sponsored by government departments and agencies. The study is based on structured interviews conducted with academic staff across a range of different disciplines, focusing particularly on why academics undertake contract research with government departments and agencies, how they secure research contracts, their experiences (both positive and negative) in undertaking the research and reporting results, what use commissioning agencies make of research outputs and policy recommendations offered, and how Australian universities might enhance their role in contract research. For convenience, the term 'government agencies' is used to refer to government departments, commissions, boards and councils.

Prometheus ISSN 0810-9028 print/ISSN 1470-1030 online © 2004 Taylor & Francis Ltd
http://www.tandf.co.uk/journals
DOI: 10.1080/08109020412331311641

Universities in many countries in recent years have established closer and more effective links with research users, particularly business firms and government agencies. These links take a variety of different forms, including joint research centres and joint research appointments, shared use of facilities, contract research funded by industry and government agencies, and consultancies. Traditionally, a high proportion of university research was financed by governments as a 'public good' but over the past decade or so such funding in many countries has not increased or even declined, with the result that universities have been forced to seek new sources of support from industry and government agencies. Business firms often have cut back on corporate laboratories while many government agencies have reduced their in-house research capacity. At the same time, government funding has increased for mission oriented and contract research, which is more dependent on output and performance criteria and increasingly similar to contract research sponsored by business firms and government agencies.[1]

Overall these new partnerships have proved highly successful. In the United Kingdom, for example, a rapid increase in university–industry collaboration since the 1980s has led to a variety of different partnership arrangements with many positive outcomes, including an impressive increase in the number of joint scientific publications. By the late 1990s, joint university–industry papers accounted for about half of all industrial scientific output.[2] In Australia, recent studies indicate that about 45% of science and technology academics in 'Group of Eight' universities report being in receipt of industry or government agency research funding, with the highest concentrations of such funding being in the earth sciences, agriculture and engineering.[3] Generally these new arrangements in industrialised countries have increasingly broken down traditional arrangements whereby universities and public research institutes were viewed as being responsible for basic scientific and pre-commercial research, while industrial firms performed the bulk of applied research and product development.[4]

New relationships between universities and research users raise important questions about benefits versus risks in relation to university research and academic work. On the positive side, partnerships have operated generally to the mutual benefit of both universities and research users and have contributed significantly to innovation. They provide universities with substantial research funding support, consulting opportunities, support for postgraduate students, opportunities for graduate employment, and opportunities for academics to gain insights into new developments within industry, the professions and government agencies. Linkages with industry also substantially assist university efforts in research commercialisation. Research users too derive substantial benefits, through access to university expertise and facilities, access to university intellectual property (IP) emerging from research outputs, and a supply of well-trained graduates.[5]

On the other hand, considerable tensions are sometimes generated and even academic researchers involved acknowledge that there are considerable risks involved. While governments, universities and the researchers involved in partnerships are generally supportive, critics allege that such partnerships threaten traditional academic values, lead to distortions in the balance between basic and applied research, and tend to corrupt academics with commercial values to the extent that some academics neglect their responsibilities in teaching and research. It is also alleged that research contracts lead researchers to withhold scientific information and materials from colleagues and delay publication, thus adversely affecting the free flow of scientific information. In order to win contracts, critics claim that

academics sometimes willingly hand over not only their right to publish but also their right to make public comment.

Government-sponsored evaluative studies and independent social research projects have investigated various aspects of the impact of links between universities and research users. A number of American studies point to the dangers in these new relationships, particularly their impact on academic work and values, forcing scientists to abandon the traditional cooperative mode of research.[6] In their multinational study of academic capitalism, Slaughter and Leslie reported that while senior academics often respond positively to opportunities to attract funds from industry, many junior academics are confused and ambivalent, and have 'difficulty conceiving of careers for themselves which merged academic capitalism and conventional academic endeavor'.[7] Other scholars,[8] however, provide evidence that many academic researchers increasingly accept that profit generated from research need not corrupt, and conclude that to date there has not been any great effect on academic behaviour with regard to direct industry funding of academic research. Particularly important have been the detailed studies of researcher behaviour. One important study[9] reported that, in a survey of 1,200 academic researchers in 40 major American universities in the area of biotechnology, researchers with industrial support publish at higher rates, patent more frequently, participate in more administrative and professional activities and earn more than colleagues without such support. On the other hand, researchers with industry funds are also much more likely than other researchers to report that their research has resulted in trade secrets and that commercial considerations have influenced their choice of research projects.

American findings have been largely confirmed by similar studies and evaluations in other countries. In Australia, for example, officially sponsored evaluations point to a high level of overall success for particular linkage programmes[10] while studies of science and technology academics in leading universities show that researchers with industry funding tend to be more senior, more productive in publishing, work longer hours per week and are more likely to hold national competitive grants than colleagues without industry funding.[11]

Despite the extensive international literature available on university links with research users, comparatively little of this concentrates on contract research with government agencies and focuses particularly on the experiences of individual academics and research groups in a range of scientific and non-science based disciplines. Comparatively little is known, for example, regarding how academics win contracts, their experiences in relating to government agencies, and how contract research for government agencies fits with regular academic research agendas.

Contract research carried out by academics for government agencies also raises important questions about the contributions that academics make to policy development, implementation and evaluation. From the international literature, it is well known that in modern industrialised societies governments commission and make use of a wide range of specialist knowledge, including that gained from research, consultancy and various forms of evaluations including inspections and audits. Much of this specialist knowledge comes from external sources of which universities are important contributors. While sometimes academic research is highly influential, frequently both senior officials and researchers often report disappointment with the overall impact of university social research on policy development.[12] As a result, in recent years independent social research has lost some of its earlier hold on policy in favour of knowledge created by inspectors,

other evaluators and consultants. In Australia, similar trends operate but the studies of the contributions of university academics to government policy efforts have been largely confined to the field of education[13] and closely related fields. Curiously, there has been little work along the lines of the British studies of the place of scientists in Whitehall[14] and the application of the Rothschild policy in the former Department of Health and Social Security.[15]

For this study, interviews were conducted with a range of academics from different disciplines at the University of New England (UNE) in late 2002 and early 2003. Founded in 1938 as a university college, the University of New England is a regional university located in the 'college' town of Armidale on the northern tablelands of New South Wales, some 550 km from Sydney. It has a total enrolment of some 18,000 students, with faculties of arts; economics, business and law; education, health and professional studies; and the sciences (which includes physical and biological sciences, rural science, agriculture and environmental science). Some 70 academics known to have conducted contract research for government agencies were approached and in the end interviews with 30 were conducted. Respondents came from a wide range of disciplines, including the biological sciences, rural science, environmental science, education, business, and the social sciences and humanities. Most respondents were relatively senior in rank, with seven being professors.

Winning Research Contracts

UNE academics undertake sponsored research for government agencies for a range of different motives. In many cases, there are important elements of excitement and challenge in working with and for government agencies, and interacting with senior officials. Many academics see possibilities of enhancing their professional experience, gaining insights to contribute to teaching, and opportunities to see the results of their research applied more widely. In education and some social science fields, there is a strong attraction to contribute more directly to policy development and evaluation. However, by far the biggest attraction for most academics is that sponsored projects provide funding to support research efforts and, especially in science disciplines, to support the work of postgraduate and honours students. In some cases, researchers are able to support their research entirely by a series of relatively large contracts with government agencies while in other cases funding from sponsored projects complements other funding, such as Australian Research Council (ARC) Discovery or Linkage Grants. While most researchers interviewed use funds from government sponsored projects solely to support their research and their research students, some arrange for contracts to pay a proportion as additional salary or have funds paid into a restricted Academic Pursuits Fund that can be used to support various academic work and conference participation. One social scientist charges 30% over costs for personal income, and returns another 30% net for his school.

Research contracts with government agencies are won by a variety of means. Some are successfully negotiated in response to press advertisements, while other work comes as direct invitations (often on the basis of previous work) and through links with former UNE students now employed in government. A group of eight social scientists, for example, won a contract in response to an advertisement placed in major newspapers by the Commonwealth Department of Transport and Regional Services, offering funding support of up to A$30,000. However, the

research group was able to involve two additional partners in the project, both of which provided further funding support. Responding to advertisements does not always result in success and, in fact, a number of researchers reported that they had responded to a number of advertisements before winning their first contract. Lack of success in tender processes was attributed generally to lack of experience by the researchers involved, or competition from stronger bids. However, many respondents suspected that on occasions sponsoring agencies had already a favoured contractor in mind when they advertised a project.

Once individual researchers or research groups have a strong reputation with particular agencies new work comes increasingly from direct approaches from senior officials, or from close personal relationships with influential people. Researchers in environmental engineering reported winning the first of what became of series of contracts through personal links with an influential irrigator, who is a former member of New South Wales Parliament. The initial contract in turn led to work with the Gwydir Valley Irrigation Association and other community groups, and then to a major project with funding of A$350,000 over three years from the Natural Heritage Trust, a new initiative administered jointly by the Commonwealth Department of Agriculture, Fisheries and Forestry, and the Department of Environment and Heritage.

In other cases, experienced researchers bid only for those contracts that they think they have a high probability of winning. Occasionally departmental officials approach researchers informally about submitting a bid for a project before contracts are even advertised. Contracts that come via former research students are often for smaller scale projects. However, one notable exception was a major project in meat science that came from the initiative of a former international postgraduate student who now holds a major government position in his home country.

Individuals and groups without a strong track record and experience with government contracts experience considerable difficulties in winning their first contract. Less experienced researchers also often produce proposals regarded by government officials as too theoretical, or not sufficiently sympathetic or 'in tune' with the work and policies of the particular agency. One science respondent reported that he wins contracts by preparing detailed proposals and directly approaching agencies that he considers might be interested in such work. He claimed that he has never responded to an advertisement or been invited to undertake research work. At the same time, he is often successful with approaches to agencies when he knows that they have unspent funds.

Apart from having a track record with particular agencies, other factors judged by respondents to be important in winning contracts are experience and demonstrated expertise in the topic area, recent field or professional experience, quality of publications, and access by the researchers to particular university equipment or infrastructure. A senior education academic reported being approached on a number of occasions to do work for a State Ministry of Education since he was trusted, had maintained close links with schools, was well informed about school-based issues, and his previous reports for the Ministry gave him credibility. Others stressed the importance of a broad range of expertise in the research team, and a good track record in winning grants and in publications. One researcher believed that his group won a particular contract since the government agency concerned wished to secure an independent evaluation which was likely to challenge stakeholders about particular failings in a major government programme, while in another case a social scientist reported gaining a contract since she was a former

employee of the particular agency and was judged likely to provide policy advice in keeping with government policy. In still another case, researchers suspected that work was commissioned by a particular sub-unit in the agency as a way of enhancing its credentials for possible departmental restructuring.

Whatever the mechanisms by which contracts are won, any new projects invariably mean considerable effort in developing detailed proposals and work plans. This takes time and effort. Consequently many researchers are reluctant to develop proposals for agencies where they are not known, and for projects where there is likely to be strong competition amongst tenderers.

Respondents reported working with a wide range of government agencies. Commonwealth government agencies with whom academics held contracts included the Department of Education, Science and Training; the Department of Environment and Heritage; the Department of Transport and Regional Services; the Department of Family and Community Services; the Department of Health and Ageing; the Australian Centre for International Agricultural Research; the Australian Institute of Criminology; the Aboriginal and Torres Strait Islander Commission; the Dairy Research Board; Meat & Livestock Australia; the Murray Darling Basin Commission; the Grain Research & Development Corporation; the Natural Heritage Trust; Rail Services Australia; and Land & Water Australia. State and Territory government bodies came from a wide range of policy domains, including education; agriculture; land and water conservation; planning and environment; mineral resources; the AIDS Council; pollution control; local government; soil conservation; forests and fisheries; mineral resources; national parks and wildlife; transport; and training and industrial relations. Other researchers reported working with various regional and local government bodies, including individual city and shire councils, and groups of councils.

While most projects tend to be funded by a single agency, multiple sponsors fund other projects. For example, the main sponsors for a recent project undertaken by staff in agronomy and soil science on formulation of a national 'relational database' for sustainable grazing systems were Meat & Livestock Australia, Land & Water Conservation, and the Murray Darling Basin Commission. In addition, various State government agencies were minor sponsors, including Western Australia Agriculture, and New South Wales Agriculture and the New South Wales Department of Natural Resources and Environment. This project was a major activity involving more than 100 scientists and technical staff, and more than 100 graziers on 11 different sites around Australia. The national database system that was developed included recommendations for future data collection and research, as well as recommendations on policy issues regarding ownership of research. The initial contract was for one year but this was extended incrementally, year by year, to 4.5 years. The UNE component of the total project was initially funded at A$70,000 but, by the end of the project, total funding of A$300,000 had been received.

Total project financial support varies widely. Amounts reported ranged from A$500 to A$1m, with many projects being in the range from A$50,000 to A$100,000. One researcher in environmental engineering estimated that the average funding for a number of projects he had conducted over the past three years was about A$30,000. Larger projects tend to be in applied science technology areas, usually running over a number of years. Shorter projects with a more limited time span usually yield smaller amounts of funding but this is not always the case. The actual life of projects varied from a month or six weeks to three or four years. Particularly in the sciences, PhD and honours student scholarships and research

support often are provided in addition to project funding. Research student support is particularly important in supplementing other resources and providing schools with the capacity to attract well-qualified honours and PhD students.

The focus of sponsored projects also varies considerably. In some cases, the major emphasis is on collecting reliable data and providing sophisticated data analysis. In other cases, the work is to provide documentation on good practice, design guides to facilitate policy implementation, advise on organisational arrangements or reviews, prepare policy recommendations or undertake evaluations. Occasionally projects are commissioned to justify departmental plans, or to adjudicate in bureaucratic disputes. Evaluative studies can be difficult and controversial, particularly if the results are highly critical of continuation of existing programmes and activities. For this reason, government agencies tend to take particular care in the choice of consultants for evaluative studies, usually trying to attract those with extensive experience and a good 'track record' in providing technically competent and politically sensitive reports. One recent UNE evaluative study commissioned by the Commonwealth Department of Environment and Heritage investigated possible breaches of protocols by companies test-growing genetically modified crops in Tasmania, while in another case a senior environmental scientist was contracted to undertake a major review of the conservation programme of a particular State government.

Experiences in Working with Government Agencies

Overall, respondents were highly positive about their experiences in working with government agencies. Many commented favourably on a high degree of personal interest and challenge, and on supportive and collegial relationships with senior departmental officers. Generally there was little or no interference with the conduct of the research and in a large number of cases the first or an early project with a particular agency soon led to a sequence of research contracts. However, in order to work effectively with government agencies, many respondents emphasised that researchers need to be sufficiently flexible to undertake new lines of work and to be able to work within the constraints of politically or bureaucratically determined research agendas. According to one environmental scientist, 'You've gotta play their game!' At the same time, many researchers appear to be particularly skilful in ensuring that sponsored projects fit with both their own personal research agendas and those of their research group or school. One common strategy, especially in the sciences, is to design sponsored projects in such a way that they have good prospects of leading to further sponsored projects from the same agency.

At the same time, a range of different problems were identified by respondents with regard to government sponsored research projects. These related particularly to negotiation of contracts, timely payment of funds to the University and at times underfunding of projects, unrealistic timeframes and milestones set by agencies, frequent changes in agency personnel, unreal expectations in relation to the contract price, IP issues, conflicts or difficulties in relating to particular officials, and the impact of bureaucratic politics.

Difficulty in achieving timely payment of funds to the University was by far the most common complaint. In many cases, payments were slow in arriving, resulting in projects being delayed or being in debit for considerable periods when the University was willing to extend credit. In one case, researchers lost three months in waiting for funding to arrive and then had to use alternative school research funds

in order to get the project started. In a number of cases, respondents considered that their projects had been under-funded or that funds provided had been inadequate to meet the total costs of the work undertaken. In some cases, this problem resulted from government departments setting unrealistic upper limits for project funding, or being unaware of the real costs involved when a university undertakes sponsored research. However, in a number of cases researchers admitted that sometimes under-funding results from lack of experience in project costing.

Many respondents complained about tight or unrealistic timeframes for project completions and requirements in reporting on milestones, which placed considerable stress on researchers and often meant that, for brief periods, other work commitments might have to be neglected. One major science-based project carried out over an extended period has had no less than 48 reporting milestones. Plant breeding specialists complained that government agencies often set unrealistic timelines for experiments, especially ones involving breeding new varieties which can take years rather than months to achieve. However, in a number of cases researchers admitted that, in the end, senior departmental officers usually showed considerable understanding about meeting timelines, often agreeing readily to vary dates for submission of reports. Again some researchers admitted that problems arose because of their own lack of experience or being too ambitious about what they could achieve within a given period. One younger scientist reported that, with the benefit of hindsight, she believed that she 'tried to over-achieve and thus overstated my goals and projected achievements in the project specifications. Consequently I set myself up to fail!' Sometimes senior agency officials show surprising lack of knowledge about the time research projects will need and realistic funding requirements. One researcher reported that in early project discussions the agency concerned suggested a contract for A$50,000, with the work to be completed within one month, whereas in the end the project took 18 months and cost far more than anticipated. At other times, under pressure from Ministers, officials press for work to be completed quickly.

Not all projects sponsored by government departments have strict time constraints. In fact, in some cases scheduling and deadlines were not an issue at all, with departmental officials showing surprising flexibility. In other cases, officials were much more concerned about the relevance and quality of the work achieved, rather than the timelines. One senior researcher in education commented:

> The research should be at the cutting edge and up to speed, focusing on issues and problems and providing solutions to those problems. One should also always be prepared to forge partnerships through the research. If you can do that, then you can have a real influence.

Frequent changes in agency personnel was a commonly reported difficulty, with particular problems arising for projects that extended over a longer period. For example, a regional development team project for the Commonwealth Department of Transport and Regional Services had three different project managers over the life of the project. Not only did these changes affect project continuity but also at times it was difficult for researchers to know actually who was in charge of the project. In other cases, new senior staff came without previous knowledge about the project, and sometimes with different expectations about what the project was meant to achieve. Thus respondents found it necessary to 'educate' new officials about the aims and objectives of the project, and about realistic expectations.

Unreal expectations by the sponsoring agency was another common complaint. Officials often expect more than researchers are able to deliver for the contract price and, in a number of cases, respondents reported officials having little real understanding of how much contract research costs, and that universities quite rightly expect that the contract price for projects should pay all direct costs as well as contribute to indirect costs, such as use of equipment and maintenance of infrastructure.

Generally IP ownership was not a major issue with interviewees, although in a few cases academics felt frustrated in not being able to publish work from a project without prior approval of the agency concerned. While in contract negotiations senior UNE administrators try to persuade sponsoring agencies to agree that all IP that results from the project will be the property of the University, some agencies insist on ownership of all IP, including all reports and data, and prohibit independent publication from the project without approval. The New South Wales National Parks and Wildlife Service, for example, includes the following provisions in its standard contracts:

> The Service owns the property and copyright on all material prepared or collected in connection with the project. The contractor may not publish or use it for any purpose other than providing the service without obtaining written consent of the Service.[16]

While some government agencies insist on ownership of IP, others are willing to give way in negotiations. For instance, in a small number of cases with projects on Aboriginal pre-history, research leaders successfully insisted that all IP should be owned by the Aboriginal people and the findings of the research should be used to directly benefit Aboriginal people. No contracts in recent years have forbidden researchers from making public comments on issues related to the project topic, but generally researchers are reluctant to make adverse comments as this could adversely affect relations with the agency, and prospects of further contracts.

While relationships between researchers and government officials overall tended to be cordial and professional, some researchers reported unfortunate difficulties. In one case, a researcher found that until the agency accepted his proposal, staff 'were very unprofessional in the review process' and seemed to be 'a group of people bent on intimidating and bullying, making childish criticisms in a pompous and incompetent manner'. Others complained of efforts by particular officers to undermine or belittle their work.

Bureaucratic politics interferes in projects from time to time. In one case, a particular department officer tried to disrupt the project by spreading false rumours about the project and researchers, while in another case a social scientist was subject to bullying behaviour by departmental officers in the proposal negotiation stage. In an education project, researchers reported that internal conflicts within the sponsoring department hindered publication of their report while in another case government officials 'made inappropriate intrusions into the research methodology, adding and changing the scope of data collection'. Sometimes bureaucratic politics are closely related with conflict between community stakeholders, such as in one social science-based project where there was major conflict between the cotton farmers and other farmers.

While some sponsored projects have advisory or steering committees appointed by the sponsoring agency, others do not. Advisory or steering committees are

meant to provide technical advice and support to researchers, and to monitor progress and achievements particularly with regard to quality. Occasionally researchers feel that advisory or steering committees get in the way, but generally respondents reported positively, acknowledging the value of the advice and comments received. A project undertaken for the New South Wales AIDS Council, for example, had a project advisory committee comprising four lay persons from AIDS organisations, four academics and two hospital-based staff. Its role was to oversee the direction and organisation of the research, and liaise with the research team. While this advisory committee was provided with preliminary data in order to provide feedback, no criticisms were forthcoming and the research leader was able to set agendas for committee meetings.

A number of respondents compared their experiences with contract research with government agencies and 'research council' funding from the ARC. Generally ARC funding was preferred, since it provides block grants to researchers and allows freedom to carry out the project without any external interference, while sponsored research generally means more restrictions.

Government agencies sponsor contract research for a range of different reasons. Sometimes there are problems that need to be explored and policy advice needed to provide a basis for action. Sometimes agencies need to generate documentation on good practice, or materials to distribute widely as part of policy implementation. Other work aims to build databases or generate reliable information to settle disputes. Often a combination of motives operates, sometimes with different stakeholders in government having different political agendas. The research leader for a major environmental engineering project funded by the Natural Heritage Trust reported that he suspected a number of motivations might have been behind sponsorship of one major project. He thought that possibly the Trust considered that it was politically opportune to allocate some funding to north-west New South Wales and the proposed project happened to be in the electorate of the Deputy Prime Minister. Another possible motivation was public concern about water quality in the Gwydir River. One member of the team commented that commissioning the project may well have been primarily

> … a political move to resolve a conflict, but in order to do that, scientific data needed to be obtained. It was a good political move in showing that the government was doing something about the issue.

In the case of a particular criminology project, the research leader suspected that the agency commissioned the project largely because the particular kind of work envisaged by the researchers had not been attempted up to that time in Australia and there was considerable professional interest in what results would emerge.

Research Outputs and Reports

In most cases respondents were satisfied with the way that the results of their research were received by the sponsoring agency. In a number of cases, researchers expressed particular pleasure with the response of senior officials. One researcher in environmental studies had established particularly effective relations with one agency over an extended period. He reported that his work has always been well received and respected, and that departmental staff often continue to comment favourably on projects and their impact long after projects have been completed.

In other cases, while senior officials did not explicitly express satisfaction with the work, researchers assumed satisfaction since the agency moved to use the results of the work, and/or offer a further contract.

In a limited number of cases, respondents reported that research outputs and reports were not well received. Sometimes this was the result of misunderstandings about the project and what was expected. In one case in education, the research leader explained that a project report was not well received by a Commonwealth agency since it appeared that officials expected more 'in-house, inside discussion on policies governing international education, rather than academic analysis', but at no time had this been well-articulated. In the end, officials showed little interest in the initial report that was provided. In the case of a science-based project, the final report to a state agency was not well received and it was two years before any formal feedback was received and then such feedback was not positive at all. According to the researcher, the feedback called the work 'disappointing'. In still another case a social scientist reported that the report for a project for New South Wales agency was not well received probably because it was too critical and too academic, and was not written in the style commonly used by consultants. Further, the report was 'somewhat political in that it pointed out that some recipients of funding from the department did not meet specified selection criteria'. This latter point caused considerable embarrassment to the officials concerned.

Generally results from projects were conveyed to sponsoring agencies in formal reports, often accompanied by presentations and discussions. Frequently draft reports were provided for comment prior to submission of final reports. Commonly final reports run from 100 to 200 pages of text, although there appears to be significant differences between academic disciplines, and between different projects depending on the scale of the work, the terms of reference and the expectations of particular officials and agencies. Frequently researchers have discussions with officials about their findings and recommendations prior to and after submission of final reports, while in some cases researchers are asked to make supplementary presentations to interested stakeholders, either before or after submission of final reports. In one case in water engineering, presentations by the researcher resulted in open conflict between pro-irrigation and anti-irrigation community groups, both of whom had preconceived ideas of what the results of the project would show.

Projects also vary with regard to the extent that final reports offer policy recommendations. Some project briefs simply specify that researchers collect and analyse data, while in other cases researchers are explicitly required to offer recommendations on policy directions or possible changes in implementation strategies. However, apart from these differences researchers themselves appear to be somewhat divided on the important issue of whether or not academics should provide explicit policy recommendations, and about the extent to which universities should be involved in offering policy advice to governments. Some respondents clearly held strongly the view that academics should simply generate, collect and analyse data dealing with particular problems and phenomena, and should not offer policy advice. Their arguments essentially were that, while academics generally are often well qualified to carry out research of interest to government agencies, they are less competent to offer policy advice, and that by offering policy advice universities risk becoming embroiled in public controversy. Most respondents, however, took a totally different viewpoint, emphasising that many projects in which they have been engaged required them to make recommendations, and that generally such recommendations had been well received.

Occasionally research reports and associated issues become highly controversial with researchers often being drawn into public discussion, but on the whole such events are infrequent. More frequent, however, are concerns by researchers about failure of agencies to publish their research reports, or when reports are published but fail to acknowledge the contribution of the particular researchers. In other cases, researchers find ways to satisfy the needs of the sponsoring agency and still produce academic publications in refereed journals.

Contract Research and Academic Research Agendas

Overall respondents considered that their contract project work with government bodies fitted well with their overall personal and departmental research agendas. In some cases, they saw the contract work springing from earlier basic research that had resulted in publications, while in other cases they felt that sponsored research complemented earlier work, often in more applied ways. Frequently contract work provided opportunities for new research initiatives, or opportunities to trial particular research instruments or methodologies.

Despite restrictions on IP ownership and use, many researchers have been able to produce substantial numbers of scholarly papers and publications from their contract research projects. In addition, a number reported using the results of contract research to inform their teaching, or even to develop new course units for particular teaching programmes. A senior scholar in pre-history reported that contract research he undertook fitted well with other work regarding land-use histories. In this case, since the fieldwork was at a location relatively close to the university, it was able to provide valuable site experience for research students. In another case, the research leader of an environmental engineering project reported that the work fitted well with the separate research agendas of all scientists involved. In his own case, the research produced six scientific papers and also allowed aspects of the research to be integrated into teaching.

In some cases, the social and political orientations of academic researchers and their research approaches do not fit well with those of government agencies and senior officials, although generally where there is lack of fit academics do not undertake project work, or do not work with particular agencies. Surprisingly in many cases researchers reported close fits between their personal orientations and research styles and those of agencies and officials. In the case of a UNE regional development project that aimed to document best practices in each of the States, researchers reported a close fit between their 'neo-liberalist' paradigm and the orientations of senior officials. They explained that up to about 1980 regional development was a State government controlled activity, with a 'top-down' approach. More recently the regional development strategy in most States has been based much more on a self-help approach, placing major responsibility on local government bodies. As a result, both Commonwealth and State governments favour providing funding to local groups and voluntary associations that demonstrate initiative in conducting their own regional development efforts. Thus, the UNE project concentrated on documenting what local communities could do within the context of a 'self-help' policy and, according to the research leader, the work of this project fitted closely with his personal research on regional leadership.

Enhancing the University's Role in Contract Research with Government Agencies

Overall, respondents were enthusiastic about sponsored research with government bodies and considered that universities should work more strenuously to enhance their role in carrying out government agency sponsored research. Many believe that universities have a particular responsibility to make their expertise available to the wider community and that they should do more to support the work of their researchers in working with government bodies. According to one senior social scientist,

> … universities have a responsibility in their applied research to make available outcomes of independent research that may be of use. Such research provides analysis for governments to consider with regard to policy development and helps generate public debate for policy direction.

A number of suggestions were made as to how universities might enhance their role in carrying out contract research for government agencies. One common suggestion was that academics should be provided with stronger support by university research offices in identifying funding possibilities, and preparing proposals and in negotiating contracts. Some respondents believe that the research offices in larger metropolitan universities have much more impressive staff expertise in proposal development and contract negotiation. One senior social scientist commented that UNE does 'a fair job but the big universities who put serious money into "grantmanship" are in a much better position to win the money. Good grant writers are worth big money'. On the other hand, the interviews revealed that in many cases individual respondents themselves were highly skilled in proposal writing and contract negotiation, often with minimal university assistance being involved.

A number of respondents saw the need for efforts to convince governments and government agencies that universities have the capacity to provide both research findings and policy advice that is expert and impartial. Especially in the sciences, researchers were strongly committed to the idea that university researchers can be impartial and provide independent advice. While a number of scientists expressed concern about increasing pressure from the private sector for researchers to provide advice to suit the particular views of corporations, generally they felt that this was not a problem with public sector organisations that generally expected honest reporting of data and impartial advice. In contrast, social science researchers seldom used words such as impartial and value free, although they did see their work generally as being reasonably objective and rigorous. One senior education researcher said that in dealing with government agencies 'I always follow three principles. The research should be rigorous, relevant and accessible'.

Other suggestions related to the need for better communications with government agencies and better mechanisms to allow government officials to become acquainted regarding UNE research capabilities. Some thought that academics themselves should be more proactive, and should deliberately seek direct interaction with government officials. This, they considered, would not only facilitate better understanding by government officials of particular university capabilities, but hopefully 'rather than telling government what they need, university researchers … [would] listen to government more and find out what they really want from the research'. A number of respondents stressed the need for researchers to be more in tune with what agencies wanted. According to one

researcher in Aboriginal studies, 'government departments aren't interested in "post-colonialism" and "post-modernism"; they want sound, well-conceived, easy to understand recommendations'. Others saw the need for researchers to be more aware of government policy agendas and needs, while still others stressed the need for government officials to understand better some of the time limitations on particular kinds of work, such as environmental studies, and botany and plant breeding.

A number of respondents made useful suggestions about how university processes could be streamlined to make it simpler for researchers to develop and submit bids, and to respond to invitations for proposals. A number complained that UNE was too bureaucratic and legalistic in dealing with contract research; one professor took the view that it 'would actually be impossible to win a government contract and fulfil all UNE requirements within the timelines!'

Another significant problem is that government contract research often requires major academic staff time commitments over limited periods, yet current university mechanisms often do not provide appropriate and efficient means for academics to be released for short periods from teaching commitments. Related to this is the considerable difficulty that with more unfavourable staff:student ratios in Australian universities there often is not sufficient time for academics to take on work additional to their on-going teaching and research commitments. A number of respondents felt that provisions should exist for researchers involved in sponsored projects to have greater opportunities to gain directly financially from projects, usually arguing that additional incentives were needed to attract busy academics to sponsored project work.

Some researchers took the view that universities are less well placed than contracting firms to undertake sponsored projects with government agencies. According to this view, contracting firms are often seen by sponsoring departments to be more reliable, better able to meet deadlines, and more experienced with government work. In contrast, university academics are often seen to be less experienced with less capacity to produce results quickly because of teaching commitments and absences on study leave. One economist saw 'insider trading' between government departments and consulting firms as a major problem in his field, with contractors such as KPMG and Access Economics being generally preferred over university academics.

One particular problem identified relates to research based on social surveys and interviews when timelines are short. Since the University's human ethics approval processes are relatively slow, some researchers simply ignore requirements to gain ethics approval. One social scientist explained that 'the time it takes the UNE ethics approval to come through doesn't wash in the real world'.

Conclusions

The interviews demonstrated that contract research with government agencies plays an important role in the research activities of UNE, with academics from a surprising range of different disciplines being involved. Academics work with government agencies for different reasons but particularly important is the support it provides for both research projects and postgraduate research students. Some contracts for government-sponsored projects are won in response to press advertisements but in many cases experienced researchers are approached directly by government officials. Financial support for projects ranges from small amounts of

less than A$1,000 to total sums of over A$1 million, with most projects being in the range from A$50,000 to A$100,000. Projects may take from a few weeks to a number of years to complete, with research covering a wide range of activities from collection and analysis of data, provision of documentation on good practice, design of implementation strategies, evaluations, organisational reviews, and development of policy recommendations and advice. Overall respondents were highly positive about their experiences, despite a range of problems being encountered, such as delays in payment of funds, inappropriately tight timelines, frequent changes in senior agency personnel, and unrealistic expectations. Government agencies sponsor projects for a variety of reasons, including finding solutions for technical problems, seeking policy advice, generating documentation on good practice, and recruiting expertise in specialised areas such as database design and development. Generally respondents were highly satisfied with how agencies responded to their reports, although on occasions reports were not well received, or ignored. Respondents were frequently less sure about precisely what use was made of their work. Most respondents reported that sponsored research fitted well with their personal and school research agendas. Generally they were enthusiastic about the opportunities for universities to enhance their roles in government-sponsored research and made various suggestions about how this could be done, including provision of more help by research offices in writing proposals and negotiating contracts, speeding up university procedures for ethics approval, and increased efforts to convince government agencies about the level of university expertise and the capacity of academics to produce independent and valuable findings and policy recommendations.

The study provides further confirmation of the success of Commonwealth and State government and university efforts to enhance university research links with research users, ,including government agencies. For many disciplines and types of research, government agencies are more important as funding sources and research partners than business firms. The financial resources coming into universities for contract research with government agencies are considerable, with some projects continuing for years rather than months. The study also confirms that many academics that attract sponsored projects from government agencies also attract funds from other sources, including business firms and national competitive grant schemes.

One notable feature of the interviews was that few researchers even mentioned the possible risks in sponsored research, such as conflict of interest problems, restrictions on the publication of findings, and cooption of researchers to become effectively spokespersons for government agencies. Using American and Canadian examples, Harman and Sherwell[17] have demonstrated how easily conflict of interest problems can arise, while a recent American study [18] identifies the tensions that may easily develop when academics work with graduate research students on industrial projects, leading to problems over IP ownership, restrictions on publishing results and graduate student involvement in start-up companies. Curiously interviewees did not demonstrate any real concerns in this area, although some reported delays in being able to publish results from their projects. Such delays, however, were usually seen more as frustrations than serious threats to academic work and research independence.

Finally, the study demonstrates that academics in a wide range of different disciplines contribute to public policy in a wide range of different government departments and policy domains. While in a small number of cases, researchers were well

informed about the impact of their work and the utilisation of findings, most were not well informed at all on precisely how their work was regarded by officials and what use had been made of their research results. Even social scientists, who could be expected to be better informed and more interested than other academics about the contributions of research to public policy, were often surprisingly uninformed. Possibly a number of factors operate to create this curious situation, particularly the rapid turnover of senior personnel in government agencies, the considerable delays that often occur in the use of research results, and the lack of mechanisms within government agencies to provide feedback to external researchers and consultants.

Notes and References

1. Organisation for Economic Cooperation and Development, *Governance of Public Research: Towards Better Practices*, OECD, Paris, 2003; *Lambert Review of Business–University Collaboration: Final Report*, Hm Treasury, London, 2003.
2. J. Calvert and P. Patel, *University–Industry Research Collaboration in the UK*, SPRU, University of Sussex, Brighton, 2004.
3. G. Harman, 'University–industry research partnerships in Australia; extent, benefits and risks', *Higher Education Research & Development*, 20, 3, 2000, pp. 245–64; and G. Harman, 'Australian university–industry research links: researcher involvement, outputs, personal benefits and "withholding" behaviour', *Prometheus*, 20, 2, 2002, pp. 43–58.
4. B. H. Hall, 'University–industry research partnerships in the United States', conference paper, Kansan, February 2004.
5. D. Rahm, J. Kirkland and B. Bozeman, *University–Industry R&D Collaboration in the United States, the United Kingdom and Japan*, Kluwer Academic Publishers, Dordrecht, 2000.
6. S. Dickson, *The New Politics of Science*, Basic Books, New York, 1984; M. Kenny, *Biotechnology: The University Industrial Complex*, Yale University Press, New Haven, 1986.
7. S. Slaughter and L. Leslie, *Academic Capitalism: Politics, Policies, and the Entrepreneurial University*, The John Hopkins Press, Baltimore, 1997, p. 173.
8. For example, H. Etzkowitz and L. Peters, 'Profiting from knowledge: organizational innovations and the evolution of academic norms', *Minerva*, 1991, pp. 133–66.
9. D. Blumenthal, M. Gluck, K. S. Louis, M. A. Stoto and D. Wise, 'University–industry research relationships in biotechnology: implications for the university', *Science*, 232, 1986, pp. 1361–9.
10. T. Turpin, D. Aylward, S. Garrett-Jones, G. Speak, L. Grigg and R. Johnston, *University and Industry Research Partnerships in Australia: An Evaluation of ARC/DETYA Industry-linked Research Schemes*, Department of Education, Training and Youth Affairs, Canberra, 1999.
11. G. Harman, 'Science and technology academics and university–industry research links in Australian universities', *Higher Education*, 38, 1, 1999, pp. 83–103.
12. C. Weiss, *Social Science Research and Decision-making*, Columbia University Press, New York, 1980; B. Barber, *Effective Social Science; Eight Cases in Economics, Political Science and Sociology*, Russell Sage, New York, 1987; and B. J. Biddle and L. Saha, *The Untested Accusation: Principals, Research Knowledge, and Policy Making in Schools*, Ablex Publishing, Westport, 2002.
13. C. Selby Smith, 'The relationship between research and decision-making in education; an empirical investigation', in *The Impact of Educational Research*, Research Evaluation Programme, Higher Education Division, Department of Education, Training and Youth Affairs, Canberra, 2000; A. Holbrook, J. Ainley, S. Bourke, J. Owen, P. McKenzie, S. Misson and T. Johnson, 'Mapping educational research and its impact on Australian schools', in *The Impact of Educational Research*, Research Evaluation Programme, Higher Education Division, Department of Education, Training and Youth Affairs, Canberra, 2000.
14. P. Gummett, *Scientists in Whitehall*, Manchester University Press, Manchester, 1980.
15. M. Kogan and M. Henkel, *Government and Research*, Heinemann, London, 1983.
16. Based on interviews with senior staff in UNE Research Services.

17. G. Harman and V. Sherwell, 'Risks in university–industry research links and the implications for university management', *Journal of Higher Education Policy and Management*, 24, 1, 2002, pp. 37–51.
18. S. Slaughter, T. Campbell, M. Holleman and M. Morgan, 'The "traffic" in graduate students: graduate students as tokens of exchange between academe and industry', *Science, Technology & Human Values*, 27, 2, 2002, pp. 282–312.