Project Working Paper:

What influences the utilisation of economics research? –

The perspectives of academic researchers

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Abstract

This paper reports results from a survey of Australian academic economic researchers on their experience of research uptake and engagement with policy-makers. We examine a range of variables to understand factors perceived as influencing the use of economic research. Results indicate that while investments in linkage and exchange mechanisms improve research uptake, the dynamics of research collaborations have a significant bearing on research use. We identify some practices that appear to reinforce the research-policy gap. Findings provide insights into the types of constraints and challenges that are often faced when academics engage in research aimed at influencing policy.

I. *Introduction*

Within the field of economics there has been a growing recognition of an increasing disjunction between research conducted by academic economists and its translation and uptake by public or private sector agencies (Arndt 1996; Banks 2011; Sowey 2002). A number of studies have highlighted the view that government bureaucrats believe economic research emanating from academia is often irrelevant to their needs and that academic researchers have become overly concerned with theoretical or mathematical issues that have little relevance for public policy (Barber 1989; Nelson 1987). This has particularly been argued in relation to the policy value of econometrics (Sowey 2002). Other studies indicate that academic economists themselves rarely believe their work will have an impact on policy decision-making (e.g. Reay 2007). Recently, in Australia, senior public servants have criticised academics for being reluctant to enter into public debates about key economic policy, e.g. as it relates to climate change policy options (Banks 2011; Ross 2011). This disjunction can be partly understood as originating in communication problems between policymakers and academic researchers, with each operating according to different ideologies, modes of thinking, methodologies, values and professional rewards (Bogenschneider & Corbett 2010; Linquist 1990; Shonkoff 2000; Sovey 2002).

The above observations do not mean there have never been fruitful relationships between academic researchers and policy-makers in the field of economics. There are many instances of academic economists having had a major influence on public policy at various key points in economic debates (Colander 1989; Scherer 2011). Moreover, a number of academics have shifted into high level positions within government departments and international agencies such as the International Monetary Fund (Colander 1989; Markoff & Montecinos 1993; Scherer 2011). It would be unfair simply to conclude that academic

economic research has little practical relevance, since there are many clear examples of academic economic analyses having an impact on public policy issues, including health economics, macro economic reform, competition policy, labour market reform, industry regulation and deregulation (Norman 2007; Chapman 2010; McAllister, Dowrick & Hassan 2009; Scherer 2011). Nevertheless, there is a persistent belief that the transfer and policy uptake of academic economic research is not as significant as it could or should be (Banks 2011; McAllister, Dowrick & Hassan 2009). The policy relevance and impact of academic social science research has also been raised as a problem in areas such as education and social work (Nutley, Walter & Davies 2007).

One solution widely suggested is greater collaboration between academics who produce economic research and non-academic end-users within fields of policy and practice. Evidence suggests that collaborations between academic researchers and policy-makers does improve research uptake (Huberman, 1990; Nutley, Walter, & Davies, 2007; Ross 2003). However, closer collaboration alone is insufficient to ensure that research has a policy impact, with studies demonstrating that a range of individual and institutional level variables influence the use of academic social research by non-academic end-users (e.g. Bogenschneider & Corbett, 2010; Cherney & McGee, 2011; Huberman, 1990; Landry, Amara, & Lamari, 2001a, 2001b).

The issue of research impact and the role of closer synergies between economic researchers and non-academic end-users raise important issues concerning the value and orientation of economic research, and its contribution to evidence-based policy. This is a highly contested issue. Some have argued that greater policy or practical relevance can undermine the rigour of academic social research (Keiser & Leiner 2009). The present paper does not elaborate upon these issues in detail, but provides new analyses relevant to the debate concerning evidence-based policy in the field of economics. Using survey data from

academic university researchers in Australia who engage in research collaborations with external partners, the paper principally aims to examine factors that influence the perceived uptake of academic research, as interpreted through the experience of knowledge producers in the field of economics. Using an internationally adopted scale for measuring perceived research utilisation (Knott & Wildavsky 1980) we examine factors that appear to influence reported levels of research impact.

The paper is organised as follows. Firstly, the broader field of research utilisation is outlined so as to situate the current study and discuss the explanatory model underpinning the research (i.e. the ladder of utilisation). Secondly, the paper outlines the data collection methods. Thirdly, key results from the sub-sample of economic researchers are provided, focusing on reported levels of research utilisation and variables that appear to influence knowledge transfer and application. Finally, the paper discusses the results (and some data limitations) and qualitative quotes from the survey are included to help support the discussion. The paper concludes with some broader observations about the study of research uptake in the field of economics.

II.   Literature review

(i) Measuring Research Use

When it comes to measuring research utilisation, no single conceptual model has been unanimously adopted (Lester 1993). This study replicated a modified version of the Knott & Wildavsky (1980) research use (RU) scale (see Cherney & McGee 2011; Landry, Amara, & Lamari 2001a). Table 1 presents this model and provides the descriptions of each stage of research use, as they were presented in our questionnaire to Australian social scientists, which includes the sub-sample of academic economists that is the main focus on this paper. The benefit of this scale is that it operationalises research use as a cumulative process that progresses through a number of stages: transmission, cognition, reference, effort, influence

and application. The scale is cumulative in the sense that cognition builds on transmission, reference builds on cognition, effort on reference, influence on effort, and application on influence. The scale recognises the fact that research utilisation varies between a range of activities that involve knowledge transfer and uptake, which are influenced by the actions of researchers and end-users (Cherney & McGee 2011; Lester 1993).

Table 1 Research Utilisation Scale

Variable	
Transmission	I transmit my research results to end-users
Cognition	My research reports have been read and understood by end-users
Reference	My work has been cited in reports and strategies by end-users
Effort	Efforts were made to adopt the results of my research by end-users
Influence	My research results have influenced the choices and decisions of end-users
Application	My research has been applied by end-users

(ii) Independent Variables Influencing Research Use

Just as there is no agreed conceptual model relating to research utilisation, there is no definitive list of variables developed to help predict research use (Lester 1993). Most studies have categorised variables under broad groups relating to supply-side and demand-pull factors, as well as dissemination and interaction variables. *Supply-side* factors include research outputs and the context in which the researcher works. These can include the types of research outputs produced by academics (e.g. qualitative or quantitative studies), whether research is focused on non-academic users, the importance of internal or external funding sources and the institutional drivers that influence the initiation of collaborations with external partners (e.g. Bogenschneider & Corbett 2010; Cherney et al 2011). Barriers that researchers encounter within their own institutional settings, such as ethics processes and reward systems, also influence the production and supply of research to external agencies. *Demand-pull* factors concern whether end-users consider research to be pertinent, whether it

coincides with end-users' needs, whether users accord it credibility, and whether it reaches users at the right time to influence decision-making. Added to this are *organisational* processes such as the available level of skills to apply research knowledge, which could inhibit uptake of and demand for academic research within end-user organisations (Bogenschneider & Corbett 2010; Cherney & Head 2010; Ouimet et al 2009). *Dissemination* variables relate to efforts to adapt and tailor research products (e.g. reports) for end-users and to develop strategies focused on the communication of research (Huberman, 1990). The assumption is that the more researchers invest in adaptation and dissemination, the more likely research-based knowledge will be adopted. Adaptation includes efforts to make reports more readable and easier to understand, efforts to make conclusions and recommendations more specific or more operational, efforts to focus on variables amenable to interventions by users, and efforts to make reports appealing (Cherney & McGee 2011). Dissemination efforts include strategies aimed at communicating research to targeted end-users, such as when researchers use different social media to communicate their research messages, hold meetings to discuss the scope and results of their projects with specific users or partners, and target particular forums, e.g. reporting on their research to government committees. *Interaction* variables focus on the intensity of the relationships between knowledge producers and potential users. The types of factors considered relevant include informal personal contacts, participation in committees, or experience with research partnerships, e.g. the number of research partnerships in which an academic has engaged (Huberman, 1990; Landry, Amara, & Lamari 2001a).

III.   *Current study*

The data used in this research were drawn from a broader study examining evidence-based policy and practice (*author details removed*). The study has four phases and the data reported here was obtained from Phase 1, which used a purposive sampling technique to target

academic social scientists in Australian Universities[1]. The final sample recruited was 693, which constitutes an overall response rate of 32 per cent. For the purpose of this analysis, only data pertaining to academics who identified their primary research discipline as Economics were used (n=102). This was the second largest group that identified with a specific research discipline, with the largest group being drawn from education. The Academic Survey was partially based on existing items or scales (Bogenschneider & Corbett, 2010; Landry, Amara, & Lamari, 2001a, 2001b) but with additional items included to gauge the dynamics of research partnerships. There was also a survey section where respondents could enter qualitative results.

(i) Dependent variable

Knowledge utilisation was measured using a validated version of the Knott and Wildavsky (1980) research use scale, similar to that adopted in the study by Landry, Amara and Lamari (2001a). As indicated, the scale is based on six stages namely: transmission, cognition, reference, effort, influence, and application. For each of these six echelons (or stages) of the research utilisation ladder, respondents were asked to estimate what had become of their research using a 5-point scale ranging from 1 (never), 2 (rarely), 3 (sometimes), 4 (usually), to 5 (always) (see table 1 above for the wording of each stage). Previous research studies (e.g. Cherney & McGee, 2011; Landry, Amara & Lamari 2001a) have used this scale cumulatively with each stage building upon the next and assigned a value of 1 when respondents replied always, usually, or sometimes, and all other responses assigned the value of 0 or a 'fail'. There are a number of ways that this cumulative approach can be analysed. One is to run a

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[1]This included Fellows of the Academy of the Social Sciences in Australia (ASSA) as well as Australian academics who had secured at least one Australian Research Council (ARC) grant between 2001 and 2010 within the field of social and behavioural science. Academics were sent an electronic survey to complete. ASSA fellows are recognised for their outstanding contributions to the social sciences in Australia and abroad and comprise senior academics. Australian Research Council (ARC) grants fund a significant proportion of research activity in Australian Universities. This approach to sampling was adopted because studies have shown that seniority and the number of external competitive research grants are key determinants of engagement with non-academic end-users (Cherney & McGee 2011; Landry, Amara, and Lamari 2001a, 2001b).

separate logistic regression for each stage of research utilisation as Landry et al (2001a) did. Another is to create an ordinal variable with seven levels, including in each level only those individuals who passed that level. In this study we decided to use the items as an index to measure research use. The reason for doing so is that as indicated in Figure 1, failure in one stage does not preclude academic researchers from passing subsequent stages. This is an important consideration because the process of research utilisation has been argued to be non-linear, with data in Figure 1 indicating that one does not necessarily have to traverse in sequence each rung of the research utilisation ladder to reach the ultimate stage – i.e. application. A factor analysis of the items (or stages), revealed a 1-factor solution and a Cronbach's alpha coefficient of 0.94. Thus, the results indicate that these items are measuring one construct and that the index seems to be reliable. A mean index score was calculated for all 6 six stages (M=3.38, SD=0.08).

Figure 1: Number of Economic researchers passing or failing each stage of research utilisation
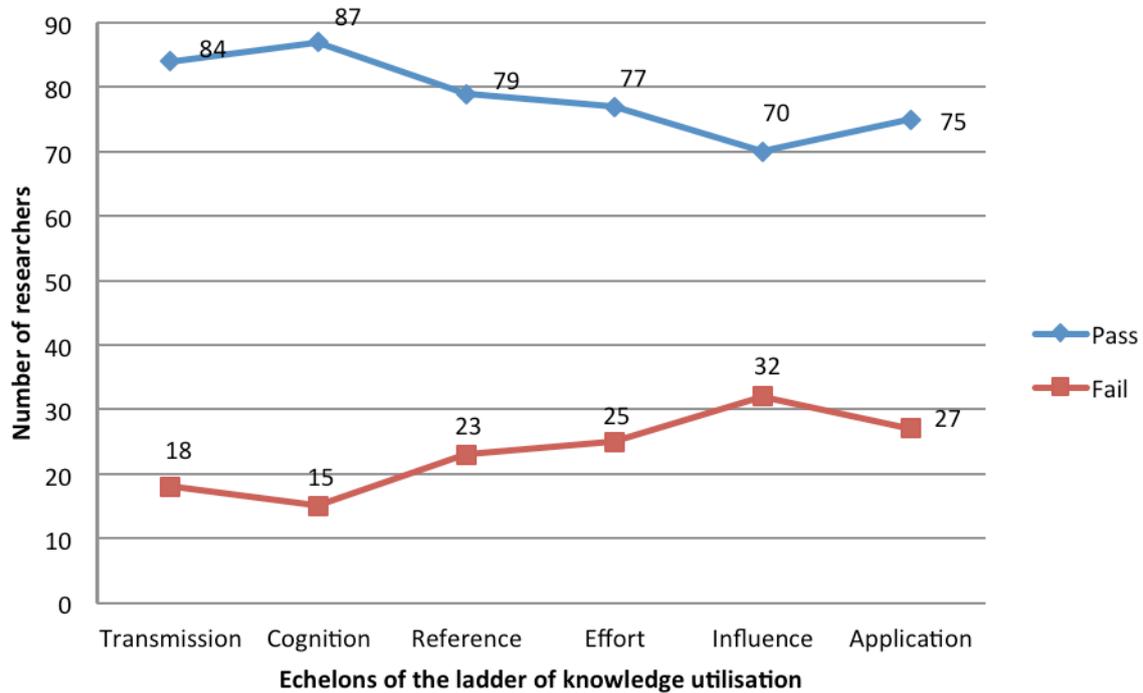
(ii) Independent variables

A number of indices were created and included in our model as independent variables. The items used in each index were determined by factor analyses, with each index comprising a 1-factor solution and detailed descriptions of index compositions are presented in Appendix 1. Descriptive statistics for each independent variable are presented in Table 2. Academic researchers from the economics discipline indicated that academic funding (i.e. national competitive grants or internal University funds) were more important than other funding in ensuring their research is conducted. They indicated that the useability of the research was given a higher priority by end-users than the quality or feasibility of the research. Table 4 also illustrates a high level of agreement among our sample of economic researchers concerning the fact that they encounter barriers in the transfer and uptake of their research. A very high level of importance is accorded by economic researchers to the use of refereed publications as a method through which to disseminate their research. The number of

research partners with whom researchers engaged ranged between 0 and 184, with an average of 12 research partners per researcher. The number of grants received by these researchers varies between 0 and 50, with the average researcher having received 8 grants. This was high compared to any other research discipline in our sample, e.g. academics who identified with the field or educational research, which was the largest single discipline in our sample, the average was 6 partners and 8 grants per researcher. In general, our sample has a high level of experience in engaging in research partnerships and securing research grants.

Table 2 Means and standard deviations[a] Economic research

	Range			
	Min	Max	Mean	Std. Err.
Research Utilization Ladder	1	5	3.38	0.08
Quantitative studies	0	1	0.85	0.04
Qualitative studies	0	1	0.13	0.03
Research targeted to user	1	4	2.22	0.06
Importance of academic funding	0	5	3.62	0.10
Importance of other funding	0	5	2.48	0.11
End-users prioritise high quality research	1	5	3.60	0.07
End-users prioritise the useability of the research	1	5	4.53	0.05
End-users prioritise the feasibility of the research	1	5	3.74	0.08
Policy-makers have found my policy focussed research to be relevant	0	5	3.70	0.14
Importance of tailoring research when end-users are the focus	0	5	3.68	0.11
Importance of meetings & dissemination activities with end-users	0	5	3.47	0.13
Importance of using contacts, seminar and reports to present research to policy-makers and practitioners	0	5	3.21	0.10
Importance of using contacts, seminar and reports to present research to private sector organizations	0	5	2.70	0.14
Importance of using presentations and reports to present research to parliamentary committees	0	5	2.26	0.15
Importance of using the media to present research	0	5	2.88	0.11
Importance of using refereed publications to present research	0	5	4.36	0.10
Benefits of collaborative research	0	5	3.10	0.11
Barriers academics experience in transfer & uptake of research	0	5	3.70	0.08
Barriers policy-makers experience in transfer & uptake of research	0	5	3.21	0.11
Consequences of investing into research partnerships	0	5	3.39	0.08
Problems relating to orientation of research partnership	0	5	2.59	0.10
Research Time (teaching and research or research only positions)	0	1	0.55	0.05
Number of external partnerships	0	184	12.43	2.35
Number of external grants	0	50	8.38	0.87

a. Standard deviations only reported for continuous measures.

IV Data analysis

Given that our dependent variable is approximately continuous, an Ordinary Least Squares (OLS) regression model was used to estimate the associations between research utilisation (our dependent variable) and a number of explanatory variables such as benefits and barriers associated with the uptake of academic research by policy-makers and practitioners. As a preliminary check, we examined the correlations between all variables in the model. They ranged between .002 and .84, suggesting that multicollinearity was unlikely to be a problem (the correlation matrix was too large to depict in the Appendix). This was confirmed by a relatively low value of the mean Variance Inflation Factor (VIF) of 2.58, with the individual variable's VIFs ranging from 1.32 to 5.46. The four highest correlations were between Importance of meetings and dissemination activities with end-users and Importance of tailoring research when end-users are the focus (0.84); benefits of collaborative research and importance of tailoring research when end-users are the focus (0.77); benefits of collaborative research and importance of meetings and dissemination activities with end-users (0.77); and importance of using contacts, seminars and reports to present research to policy-makers and practitioners and importance of tailoring research when end-users are the focus (0.75). All were statistically significant.

(i) Regression Results

The regression results are presented in Table 3. The results indicate that seven variables were significantly related to the utilisation of economic research. Economic researchers within academia indicated that when importance was attributed to other sources of funding outside of University research funds, the less likely research would lead to utilisation. Academic economic researchers indicated that the more policy-makers or practitioners prioritise high quality research, the more likely academic research will be utilised. In circumstances where policy-makers or practitioners prioritise the 'feasibility' of applying research the less likely were our sample to perceive that academic research would be used. University economists

also reported that when end-users felt research was relevant it was more likely to lead to utilisation. The more beneficial collaborations were seen to be, the more likely it was judged that research use would occur. On the other hand when academic researchers perceived there to be problems associated with the orientation of research partnerships they were less likely to report research uptake by external agencies. Finally economic researchers who have a teaching load are less likely to report research uptake as compared to University economists who are in research-only positions.

Table 3 Regression equations predicting utilization of Economic research

	β	SE β
Quantitative studies	0.22	(0.20)
Qualitative studies	-0.10	(0.23)
Research targeted to user	0.11	(0.15)
Importance of academic funding	-0.05	(0.08)
Importance of other funding	-0.22**	(0.09)
End-users prioritise high quality research	0.25**	(0.10)
End-users prioritise the useability of the research	-0.12	(0.20)
End-users prioritise the feasibility of the research	-0.22*	(0.12)
Policy-makers have found my policy focussed research to be relevant	0.12*	(0.06)
Importance of tailoring research when end-users are the focus	0.08	(0.13)
Importance of meetings & dissemination activities with end-users	-0.05	(0.11)
Importance of using contacts, seminar and reports to present research to policy-makers and practitioners	-0.05	(0.14)
Importance of using contacts, seminar and reports to present research to private sector organizations	0.06	(0.07)
Importance of using presentations and reports to present research to parliamentary committees	0.02	(0.06)
Importance of using the media to present research	0.09	(0.08)
Importance of using refereed publications to present research	-0.07	(0.08)
Benefits of collaborative research	0.22*	(0.12)
Barriers academics experience in transfer & uptake of research	0.11	(0.12)
Barriers policy-makers experience in transfer & uptake of research	-0.03	(0.08)
Consequences of investing into research partnerships	0.17	(0.16)
Problems relating to orientation of research partnership	-0.17*	(0.10)
Teaching & research position	-0.32*	(0.17)
Number of external partnerships	0.00	(0.00)
Number of external grants	-0.00	(0.01)
Constant	2.63***	(0.89)
Observations	98	
Adjusted R^2	0.38	

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

V Discussion

Before proceeding to discuss interpretations for this pattern of results, the methodological limitations of the present study should be noted. Firstly, the survey data is based on self-reports, which can be subject to social desirability biases. Furthermore it is possible there is a self-referential process occurring in that respondents' self-reported level of research utilisation is reinforced by how relevant they perceive their research to be for policy-makers or practitioners and vice versa. The survey data only gives insight into broad patterns of utilisation as reported by our sample of economic researchers – hence providing one relevant perspective and potentially reflecting particular biases. This limitation does not undermine the validity of the results reported here, because a full understanding of the process of research transfer and uptake requires a close examination of the experiences and perspectives of both knowledge producers and users, and an exploration of broad general patterns as well as specific instances of research uptake.

Our results do lend some support to the conclusion that academic economists can prioritise activities (or are required to prioritise activities) that exacerbate their isolation from potential non-academic end-users of their research. The high priority they accorded to publishing in academic journals and the tendency to prioritise University-based funds does reflect an inward looking focus that makes the research-policy gap in the field of economics potentially greater. This situation could largely be the result of the types of institutional drivers and incentives that influence the research activities of academics - scholarly quality and publishing in peer-refereed publications are typically rewarded over engagement with external partners or publication in practitioner outlets. Some commentators have noted that University Research Quality Assessment Exercises (e.g. the RAE in the UK and the ERA – Excellence in Research Australia initiative) have only intensified these trends (Elton 2000; Nightingale & Scott 2007; Shergold 2011). Some of the qualitative responses in the survey

did reflect such conclusions:

"In economics, the key currency... these days is publication in A*-tier journals, which tend to be theoretical rather than focused on policy. Those who publish in journals that do focus on policy tend to find their work is seen as inferior"

The funding preferences reported by our respondents may be the outcome of a concern with rigour and independence that can be sustained through internal university funds or academic grants that promote scholarship and a focus on basic research, by comparison with projects that emphasise application and relevance for policy or practice. The latter can be a particular emphasis of funding provided through public and private sector agencies, with their applied focus possibly acting as a deterrent for conventional academic researchers. The reported relationship between external funding sources (i.e. funding arising from government or private sectors sources) and the diminishing likelihood of research use occurring was unanticipated. This may reflect a general cynicism among our sample about the motivations of government or private sector agencies when they fund academic research, namely, that such funding is less about the pursuit of science and more about supporting pre-existing agendas, with the implication that independent academic research will be compromised, ignored or cherry-picked. These concerns were expressed by some respondents:

"Increasingly Universities are viewed as factories for research for 'end users' as you have defined them here. This corrupts academics' incentives and undermines the integrity of the research program"

The desire to maintain scientific rigour over practical relevance has been noted as exacerbating the research-policy gap (Shonkoff 2000). This predilection was further reflected in the fact that our sample judged 'quality' as central to influencing research use by non-academic end-users. While this judgement is certainly supported by other studies (e.g. Bogenschneider & Corbett 2010) there is still much to understand about how academics in different research fields (e.g. economics, education, law) define the key dimensions of research quality; how this is similar or different to the ways in which policy-makers or

practitioners understand these dimensions; and whether this affects their use of research. Understanding these dimensions would go a long way in helping to tackle problems associated with research translation and uptake.

Despite the conclusions outlined above, our sample of economic researchers recognise that, in order for their research to have a policy impact, there is a requirement to directly engage with end-users through meetings and dissemination processes and that it is important to tailor research projects and findings to end-user needs. In effect, the need is for economists to become bilingual in how they communicate their research across different policy or practitioner audiences, and to become more considered in their communication strategies, as noted by Pannell (2004). The problem though is that this does require investment in knowledge translation activities, which is not part of mainstream research training in academia and is also ignored in how funding for research is calculated. As one respondent stated:

> *"Knowledge transfer activities should be recognised in university funding formulas. Otherwise, it will remain ad hoc and ill done".*

However it would appear that economic researchers who occupy research-only positions are more successful at generating research impacts than their academic colleagues who hold teaching and research positions. This difference in how occupational profiles may influence research u[take has not been found in previous studies (see Fox & Milbourne 1999 as it relates to research outputs). This finding draws attention to the fact that academics have different capacities to devote time and resources to generate research outcomes that go beyond traditional academic outlets. Developing these broader capacities is important in ensuring that government and private sector personnel can draw upon a diversity of academic research that is relevant to economic policy.

Two noteworthy results that arose from the regression analysis are the findings about the reported importance of the 'feasibility' of research and the industry-orientation of

partnerships in relation to perceived levels of research use. The 'feasibility' variable comprised three items: research recommendations are seen as economically and politically feasible and research findings support a current position or practice (see Appendix 1). When feasibility is seen as a strong priority, our respondents reported that academic research is less likely to be used. This finding points to a key lesson that the quality of research evidence is not the only factor, nor the single most important factor, in determining research use and uptake. Furthermore, even if an academic accepts the realities of end-user preferences and tries to work within the policy and practice space offered by collaborations, the 'orientation' of research partnerships can further influence/undermine levels of research uptake. These outcomes are reflected in the finding that partnership orientation can create problems for research use. This 'orientation' variable comprised five items (see Appendix 1) relating to the fact that partnerships can become dominated by the priorities of industry funding partners, making collaborations a potentially compromised undertaking for those academics who highly value the integrity of scholarly outcomes and the rigor of the knowledge production process. The findings discussed above do not mean that economic researchers should avoid engagement in research collaborations with government or non-government partners. On the contrary, our data indicates that economic researchers need to be mindful of the priorities driving external agencies when they seek out their research partners and engage in collaboration. However, as Milton Friedman (1972) has argued, economists must avoid over-promising by claiming more than they can deliver because such claims can have disastrous policy consequences.

VI Conclusion

This paper provides insights into the types of challenges faced by academics in the field of economics in generating research use. It provides empirical backing to the broader debate and

commentary within the field of economics as to why there are substantial gaps between the research findings produced by academic economists, and research transfer and uptake within policy contexts. The survey data reported in this paper indicate how this research/policy gap could be reduced, but doing so through partnership between academic researchers and external agencies is shown to be a less than a straightforward solution. Understanding the dynamics of different research collaborations with government and non-government agencies is essential for ensuring that they are successful for participants; these dynamics require further study across various disciplines and not only in the field of economics. Our data focus on the perspectives of academics, which would need to be complemented by the perspectives of government and other potential end-users of economic research. Nevertheless, it has been important to investigate the experiences and perceptions of academic economists concerning the non-academic end-uses of research, as an essential component in understanding current research/policy relationships and some possible means for improving such linkages.

Appendix I: Independent variables measures

Research Approach

Quantitative studies

This is a single item variable that reflects how often researchers use a quantitative approach such as surveys research, statistical analysis, and GIS in their research. The results reported are the percentage of respondents who indicated always or usually. These responses were recorded as 1, while all other responses were recorded as 0.

Qualitative studies

This is a single item variable that reflects how often researchers use a qualitative approach such as interviews, focus groups, ethnography, and observation in their research. The results reported are the percentage of respondents who indicated always or usually. These responses were recorded as 1, while all other responses were recorded as 0.

Researchers' Context

Research targeted to user

Measures whether the majority of research conducted by academics is directed at policy-makers and practitioners. Comprised four dimensions that range on a 4-point scale, ranging 1 (never) to 4 (always). The four dimensions are: (1) policy makers within government; (2) practitioners/managers within the public sector; (3) practitioners/managers within the community sector; (4) practitioners/managers within the private sector.

Importance of academic funding

Measures how important academic type funding is in ensuring research is conducted. Comprised two dimensions that range on a 6-point scale, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important). The two dimensions are: (1) my university's internal research funds; (2) funding organisations such as Australian Research Council fund, National Health and Medical Research Council, Cooperative Research Centres.

Importance of other funding

Measures how important other funding sources are in ensuring research is conducted. Comprised five dimensions that range on a 6-point scale, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important). The five dimensions are: (1) not for profit organisations; (2) federal government agencies; (3) state government agencies; (4) local government agencies; and (5) private sector organisations.

Benefits of collaborative research

Based on academic perceptions of the benefits of carrying out research in collaboration with government, industry or community sector partners. Comprised ten dimensions that range on a 6-point scale, ranging from 0 (not applicable), 1 (strongly disagree) to 5 (strongly agree). The ten dimensions are: (1) I have been able to use data that would otherwise be difficult to access; (2) Research partnerships have

provided me with opportunities for my research to have an impact on policy and practice; (3) Research partnerships have helped to increase my industry contacts; (4) My industry contacts have helped with developing future research projects; (5) Research partnerships enable me to generate extra income for my work unit; (6) Such projects have provided me opportunities to commercialise research outcomes; (7) Research partnerships have helped me with career advancement; (8) Such projects have required me to be pragmatic and realistic in relation to research outcomes for industry partners (9) Research partnerships have enabled me to publish in a broad range of publication outlets (10) I find projects with external partners more satisfying than fundamental "blue sky" research.

Barriers academics experience in transfer & uptake of research	Index based on the barriers academics experience in the transfer and uptake of their research. Comprised five barriers that range on a 6-point scale, ranging from 0 (not applicable), 1 (strongly disagree) to 5 (strongly agree). The five dimensions are: (1) There are high costs (e.g. time and resources) in translating the results of research for policy-makers and practitioners; (2) There are insufficient forums and networks available for bringing together researchers and non-academic end-users of research; (3) Academic reward systems do not adequately recognise dissemination work to non-academic end-users; (4) The academic requirement to publish primarily in peer-reviewed journals inhibits a focus on policy and practitioner audiences; (5) Networks and partnerships that might support research uptake are often undermined by turnover of contact staff in public agencies.
Consequences of investing into research partnerships	Index based on problems relating to investing time and resources and accommodating partnership work that academic researchers encounter when carrying out research with partners from government, industry or the community sector. Comprised ten items that range on a 6-point scale, ranging from 0 (not applicable), 1 (strongly disagree) to 5 (strongly agree). The ten dimensions are: (1) There are inadequate university resources to support research partnerships with end-users; (2) I find there are different research orientations between academics and external partners; (3) You need to invest a lot of time in coordinating the work between different partners; (4) Confidentiality requirements often restrict what you can report and publish; (5) You can lose ownership of intellectual property; (6) You are subject to delays that impede your ability to publish results in a timely manner; (7) I am under pressure from my work unit to undertake contract research to meet budget requirements (8) External partners do not appreciate the full costs of research; (9) The ethics process can be time consuming and cumbersome; (10) The complexity of contractual arrangements can lead to delays in commencing research.
Problems relating to orientation of research partnership	Index based on problems relating to the priorities and expectations of the partners when carrying out research with partners from government,

industry or the community sector. Comprised five items that range on a 6-point scale, ranging from 0 (not applicable), 1 (strongly disagree) to 5 (strongly agree). The five dimensions are: (1) I find there is pressure to produce favourable results for partners; (2) I believe such projects overemphasise applied outcomes; (3) I do not feel comfortable working on projects carried out in collaboration with industry or government agencies; (4) I feel that industry partners place too much emphasis on specific deliverables; (5) I feel that there is too much pressure to meet deadlines.

Research Time	This is a dummy variable created from the question asking academics to indicate the nature of their position, either research and teaching or research only. The research only was used as the reference group.
Number of external grants	This index is the sum of all the research grants (i.e. ARC discovery, ARC linkage, other external competitive grants) academics have received.

Users' Context

End-users prioritise high quality research	Index is based on academic researcher's perceptions of what research characteristics end-users prioritise when using academically produced social science research. Comprised seven dimensions that range on a 5-point scale, ranging 1 (not a priority) to 5 (high priority). The seven dimensions are: (1) high quality research; (2) unbiased findings; (3) adds to theoretical knowledge; (4) statistical analysis is high quality; (5) findings can be generalised; (6) offers a new way of thinking; and (7) reputation of researcher.
End-users prioritise the useability of the research	Index is based on academic researcher's perceptions of what research characteristics end-users prioritise when using academically produced social science research. Comprised four dimensions that range on a 5-point scale, ranging 1 (not a priority) to 5 (high priority). The four dimensions are: (1) findings available when decisions need to be made; (2) findings have direct implications for policy & practice; (3) findings written in a clear style; and (4) report has brief summary of findings.
End-users prioritise the feasibility of the research	Index is based on academic researcher's perceptions of what research characteristics end-users prioritise when using academically produced social science research. Comprised three dimensions that range on a 5-point scale, ranging 1 (not a priority) to 5 (high priority). The dimensions are: (1) recommendations are economically feasible; (2) findings support a current position & practice; and (3) recommendations are politically feasible.
Policy-makers have found my policy focussed research to be relevant	Index is based on the experience of researchers who have had a policy focus in their research and whether policy-makers found their research to be relevant. Comprised three dimensions that range on a 6-point scale, ranging from 0 (don't know), 1 (strongly disagree) to 5 (strongly agree). The dimensions are: (1) relevant to their needs and expectations;

(2) valid and reliable; (3) trustworthy.

Barriers policy-makers experience in transfer & uptake of research	Index is based on the barriers policy-makers are perceived to experience in the transfer and uptake of academic research. Comprised two barriers that range on a 6-point scale, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important). The dimensions are: (1) Policy-makers and practitioners lack expertise in how to interpret or understand the findings of research; (2) Policy-makers and practitioners lack expertise in how to apply the results of research to policy problems.

Dissemination

Importance of tailoring research when end-users are the focus	Index is based on the importance attributed to various aspects of tailoring research when the focus is on end-users. Comprised of seven dimensions that range on a 6-point scale of adaption, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important). The seven dimensions are: (1) readability and use of comprehension of my reports and research articles; (2) specific, operational nature of conclusions or recommendations; (3) provision of data that can be analyses by end-users; (4) sensitivity to end-users' expectations; (5) presentation of reports (graphics, colour, packaging); (6) on-time presentation of research findings to end-users; (7) attention to 'deliverables'.
Importance of meetings & dissemination activities with end-users	Iindex is based on the importance attributed to organising meetings and dissemination activities for end-users when carrying-out research. Comprised four dimensions that range on a 6-point scale, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important). The four dimensions are: (1) preparing and conducting meetings in order to plan the subject and scope of projects with end users; (2) regular formal meetings to report on a study's progress with end-users; (3) formal meetings to discuss findings with end-users; (4) preparing and implementing research dissemination activities for end-users.
Importance of using presentations and reports to present research to parliamentary committees	Index is based on the importance attributed to using methods such as presentations and reports for presenting research to parliamentary committees. Based on two items measured on a 6-point scale, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important). The items are: (1) presentations to parliamentary committees and (2) sending reports to parliamentary committees.
Importance of using the media to present research	Index is based on the importance of using media to present research conducted by academics. This index is based on three items measured on a 6-point scale, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important). The items are: (1) participation in radio and/or television programs; (2) publication of articles in non-academic outlets; (3) publication in electronic media, e.g. blogs and other social media.
Importance of using	The Journal variable is comprised of one item, publication of articles in

refereed publications to present research	refereed journals and is another method employed by academics to present or discuss their research. The importance of this method is measured on a 6-point scale, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important).

Interactions

Importance of using contacts, seminar and reports to present research to policy-makers and practitioners	Index is based on the importance attributed to using methods such as informal contacts, seminars and reports for presenting research to policy-makers and public practitioners. Is based on six items measured on a 6-point scale, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important). The six items are: (1) informal contacts with policy personnel of government agencies; (2) informal contacts with public or community sector practitioners; (3) participation in seminars and workshops organised by government policy agencies; (4) participation in seminars and workshops organised by practitioners within public or community sectors; (5) sending reports to government policy agencies; (6) sending reports to practitioners within public or community sectors.
Importance of using contacts, seminar and reports to present research to private sector organizations	Index is based on the importance attributed to using methods such as informal contacts, seminars and reports for presenting research to private sector organizations. Is based on three items measured on a 6-point scale, ranging from 0 (does not apply), 1 (very unimportant) to 5 (very important). The three items are: (1) informal contacts with personnel of private sector organisations; (2) participation in seminars and workshops organised by private sector organisations; (3) sending reports to private sector organisations.
Number of external partnerships	This index is the sum of all the partnerships with external organisations that academic researchers have engaged in.

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