

Innovation and the Management of Uncertainty and Risk

Seminar given at the
Australian Innovation Research Centre
University of Tasmania, 18th September 2008

Dr Mark Matthews

Executive Director

Forum for European-Australian Science and Technology
cooperation (FEAST)

&

Research School of Social Sciences

The Australian National University

mark.matthews@anu.edu.au

Summary

This is a story about efforts to stimulate a broadening of Australia's research and innovation policy framework

Rather than approaching innovation simply as the search for commercial outcomes, we sought to expand the understanding of innovation by giving a proper place to how it helps us to manage uncertainty and risk from a broader public policy perspective

Starting point

- Innovation is far broader than research exploitation
- Research has broader aims than innovation
- We don't have an effective policy narrative for articulating *non-innovation* outcome classes
- This gap distorts our policy framework
 - Unhelpful pressures on public research
 - Unrealistic expectations on what innovation policy must deliver (innovation is not the only outcome class)
 - Under-developed understanding of the inter-relationships between innovation policy and research policy
- Useful to move beyond the “things can only get better” &

Why uncertainty & risk matter

- The management of uncertainty and risk is a critical challenge for government
 - Governments handle the uncertainties and risks that markets can't cope with
 - Markets can deal with risk (within limits)
 - Governments and collective business/philanthropic research funds work that translates ignorance *into* the risks that markets can handle
- Widely recognised that innovating requires uncertainty and risk to be managed effectively
- Managing uncertainty and risk is also a key factor in *non-innovation* research outcomes
- The rest of the world views Australia as a world leader in risk-related thinking (a view expressed in Brussels) - *our natural circumstances are strongly risk-aware*
 - Productivity growth in the primary industries is a risk management game: searching for lower likelihoods of failure
 - Droughts/floods, bushfires are risks we need to manage well

Major lessons from programme evaluation & review

- Business tends to seek *options* from collaboration with the research base – not necessarily direct paths to commercialisation
 - Possessing viable options protects net worth in the face of uncertainties and risks (CSIRO is doing important work here)
 - Value of such options (even to business) not recognised, e.g. in the CRC guidelines
- Large corporations seek to gain corporate intelligence from collaboration with the research base – “early warning” of potential disruptive advances
- “Patent blocking” etc – critical competitive games in innovation that do not necessarily lead to innovation
- Implication: would help to have a complementary outcome class to “innovation” – avoid distorted programme design

Heritage

- Advanced cost modelling for defence aircraft (UK)
- Oil and gas companies' appraisals of the value of natural resources
- Attempts to influence UK Govt. thinking on managing risk and uncertainty (@ SQW Ltd in the UK)
- “Safeguarding Australia” expert sub-committee of NCRIS
- Several evaluations in which risk-aware approaches were both appropriate and well-received
- Some troubling encounters with “risk-averse” implementations of output-outcome budgeting
- Growing awareness of the ramifications of focusing on economic outcomes over political outcomes
- Attractiveness of applying Austrian economics (von Hayek & Co)

Von Hayek & Co

- Epistemological antidote to neo-classical economics
 - Subjective rather than objective knowledge
- The “dark forces of time and ignorance” dominate the human condition
- Makes sense to apply subjectivism to public policy (hence impact of the “new institutional economics”)
- Markets viewed as exploratory *processes* (not reified as “things”)
- Innovation framed as attempts to move from uncertainty (ignorance) to risk
 - We have a preference against ignorance
- Scientific and technological progress turn ignorance/uncertainty into risk
- A perspective articulated via a detailed case study of the start-up company “Radiata”

Output-Outcome Budgeting

- Derived from post-WW2 corporate methods
 - from Ford Motor Co into the Kennedy Administration then on to the World Bank etc
- Easily aligns with “accounting” perspectives
 - uncomfortable with ambiguity “there is one verifiable answer”
- Convenient for Razor Gangs of various political shades!
- Has tended to distort how departments and agencies agree to how their performance will be measured
- Deflected attention toward economic outcomes from innovation and away from (geo)political outcomes?

The UK Treasury's Green Book

“Appraisal and Evaluation in Central Government”

- The more recent versions have strengthened treatments of the risk and uncertainty dimension
 - R&D as a valuable source of uncertainty and risk reduction
 - More explicit treatment of risk and uncertainty
- Yet, whole-of-government approaches to managing risk and uncertainty in the UK down-play the “risk-averse” ways in which output-outcome budgeting has been implemented *in practice*
- A concern because we need governments to handle the risks and uncertainties that markets cannot cope with – but that key parts of “modern” governments are run in a way that makes this overly difficult!

Political Context to the 2006 Review

- Collapse of the old social contract between science and society (1945 to \approx 1980)
- Backing Australia's Ability (BAA)
 - Presuppositions (“we need more Cochlears”)
 - Government's evaluation of BAA (set up to fail!)
- Emerging dissatisfaction with the linear model (science to commercialisation)
 - E.g. CCST & Howard Partners' Knowledge Report
- Productivity Commission – claims made by the HE sector no longer had traction

The FASTS Submission

- “Preparedness” – a class of outcome associated with innovation but not necessarily requiring innovation
- Defence of formal R&D (including a broader view of business R&D – not just about widgets)
- Preparedness as a more realistic basis for National Accounts and corporate financial accounts (new International Financial Reporting Standards)
- New basis for defending broader spectra of R&D spending e.g. environment, social sciences, area studies & the humanities in general
- New angle on capacity building
- Geopolitical outcomes not just economic
- Technical suggestions for research funding and evaluation

Prescience & Preparedness in a nutshell...

By identifying, simulating and disseminating information on unwanted aspects of what the future may have in store for us we can change our behaviours *now* and therefore try to reduce the likelihood and severity of unwanted futures

This can be very valuable...

Similar to “net present value” calculations in economics and finance: rolling up the future into valuations today as distinct to the “more jam tomorrow” emphasis in conventional innovation policy

Mitigates risks to the value of both corporate and national balance sheets – re-enforced by the new “risk-aware” international financial reporting standards

Preparedness & Innovation

- Prescience from public research helps to drive corporate technology strategies – identifies opportunities and risks
- Translating prescience into preparedness options tends to require innovation – but may only involve (valuable) movements toward innovation and IP “ploys”
- Financial markets focus on prescience & preparedness related games – possessing preparedness options helps to protect & enhance the net worth/shareholder value
- Where prescience-driven innovation occur fairness to future generations can be a major outcome (e.g. climate

The Productivity Commission Response

- Accepted the argument
 - Changed their definition of innovation to explicitly take account of preparedness: defined as “an enhanced capacity for dealing with future uncertainties’ ”
- Recommended that evaluation of innovation programs included preparedness
- Argued that the pursuit of commercialisation for financial gain by universities should not be to the detriment of maximising the broader returns from

Subsequent Developments

- Intent to mainstream preparedness in PMSEIC Working Groups
- New CCST guidelines on R&D program evaluation
- Management of uncertainty and risk noted *in passing* as key issue at the *start* of the Cutler Review
- Re-inforced by CSIRO's experiments with option valuation methods
- Change of government: new policy narratives for innovation?
 - Preparedness not a feature in Rudd govt. innovation policy narratives
- **But, no significant progress on implementation: preparedness is an “orphan”**

Lessons learned 1.

- Strong vested interests in pushing the “traditional” innovation policy agenda
 - Other outcome classes viewed as complicating the politics (even if the perspective is viewed positively)?
- General notion of preparedness (easily) accepted at a rhetorical level
- Tendency to implement only as a specific (security threat-oriented) notion
 - Back to our starting point in using the term!
- Are we too wedded to the upside (“more bling”) rather than managing the downside of modernity (avoiding the Grim Reaper!)?

Lessons learned 2

- **No policy idea can succeed without being owned in the political process**
 - Not a vote winner in an election year
 - No political champion in the bureaucracy – technocratic support insufficient
 - We failed to articulate to politicians why this was an issue *for them*
- We weren't prepared for the next step after the Productivity Commission stage: we didn't expect such ready traction at the concept level hence had under-prepared for the political sales job

*We didn't do enough to show that the current policy narrative was a problem for **them** requiring **their** attention – we only approached it as a problem for the Sector*

Initial observations in the light of the Green Paper

- Backtrack from 2006 PC Review's argument for a more holistic approach?
 - Research policy as a whole now firmly conflated with innovation policy (Ministerial priority)
- Risk that *not* recognising prescience & preparedness as a distinct complementary outcome class will perpetuate programme and policy instrument design flaws
 - Not recognising the value of possessing options and IP “plays” irrespective of whether they actually lead to innovation
 - Not recognising the value of prescience from public research in good competitive intelligence/strategy formulation
- The Government's White Paper could respond by *strengthening* the nexus between industry policy and innovation policy by addressing the need for *prescience, preparedness* and *innovation* to be framed as distinct but complementary outcome classes
- Plays to our externally perceived strengths as a ‘risk-aware’ economy – lets move beyond simply following UK policy thinking!

The End