

# Submission to Productivity Commission review of Rural Research and Development Corporations

Dr. Russell Thomson<sup>1</sup>  
Professor Elizabeth Webster

The Intellectual Property Research Institute of Australia and the Melbourne Institute of Social and Economic Research, the University of Melbourne.

10 December 2010

We have five comments in relation to the Productivity Commission review on Rural Research and Development Corporations (the Report), which are outlined below.

## 1. **Additionality and the effect of the programme**

The term additionality, as used in the report, describes the amount of R&D that is conducted with the subsidy in place that would not be conducted in the absence of the scheme. An analogous metric is the degree of crowding out, that is, the reduction in private R&D funding that results from government funding.

The Report concludes that “*the overall degree of additionality from the contribution has most probably been modest.*” That is, the Report concludes that full crowding out is likely because the compulsory levy provisions enable industry participants to capture sufficient benefits of R&D investment, irrespective of the subsidy. This conclusion is the prime justification for the Report’s recommendation to halve the rate of co-contribution.

Stated plainly, this means the Report predicts growers to increase private levies in response to the proposed reduction in the government co-contribution. However, very little evidence is presented which supports this claim, and some evidence presented suggests this is not likely. For example, evidence that in the absence of the co-contribution, R&D programs would proceed “with narrower coverage and/or at a slower rate” (p. 81) certainly imply less R&D investment overall.

Some commentary within the report also appears to contradict the claim of no additionality. For example: “There is a risk that a large and immediate reduction in the Government’s contribution to the industry-specific RDCs might prompt a similarly large reactive and destabilising reduction in industry funding.” (p. XXVII). How can these assertions be reconciled with a conclusion of full crowding out?

We recognise that identifying the effect of R&D subsidies is, in general, a very difficult statistical problem due to the fact that no counterfactual can be observed. However, in our view the recommendation to halve the rate of subsidy should be based on a far more fulsome and careful analysis. International empirical literature may be of some guidance

---

<sup>1</sup> russell.thomson@unimelb.edu.au . Ph. 03 8344 2198

here. State of the art econometric studies on additionality of R&D subsidies at the firm and industry level generally reject crowding out.<sup>2</sup>

## 2. Report Recommendation: Rural Research Australia

The report recommends *the establishment of “a new RDC, ‘Rural Research Australia’ (RRA), to sponsor non-industry specific rural R&D. Leave industry specific RDCs to focus on research of direct benefit to levy payers.”*

The Report does not make a case why this new bureaucratic body will have advantages over RDCs or other existing institutions (including the Australian Research Council) in optimally allocating R&D funds. In a similar light, the Report does not make a case that “energy-related” R&D, which is to be housed within the newly established RRA is, in any way, specifically rural in nature. We elaborate below.

Of primary concern in identifying and designing institutions which optimally allocate R&D resources are incentives and information. Private incentives can be inadequate due to limited appropriability. An alternative policy is for governments to fund R&D directly. In the absence of risk and uncertainty (e.g., perfect information), government provision is welfare maximising, since it avoids static welfare loss associated with pricing technology above marginal cost associated with IP rights.

However, due to risk and uncertainty, optimal allocation of R&D funds faces huge information and knowledge requirements. Optimal allocation requires identifying the most valuable research priorities; how they should be approached (perhaps simultaneously undertaking multiple distinct approaches); which individuals or organisations are best placed to undertake them; the scale of the research effort and the rate at which it should be pursued.

The principle benefit of devolving allocative decision making to market forces, via interventions which restore appropriability (e.g., IP rights), is that private agents have superior information on which to base investment decisions. Similarly, the existing RDC structure has been designed to combine information from the R&D and farming sectors with the Government’s desire to fund ‘public good research’. And in fact, the report acknowledges that “the existing RDCs have developed considerable expertise in the procurement and management of rural R&D.” (p.76)

This recommendation is based on the implicit assumption that industry participants (such as RDCs) have no specific expertise or advantages in allocating funding to R&D which principally benefits those outside the industry. On the contrary, there appears *a priori* reason to think that, for example, the meat and livestock industry in many respects, are in a unique position to evaluate R&D activities to reduce CO<sub>2e</sub> emissions *in their industry* – despite the fact that the benefits do not accrue to the industry. Whether they chose to use this information to fund low CO<sub>2e</sub> emissions R&D depends on their mission and goals.

Given the cost and difficulties of mimicking this level of expertise in another government body (the proposed RRA), we believe a stronger case needs to be made for

---

<sup>2</sup> For an introduction to recent firm level studies see Czarnitzki and Aerts (2008). Cross country, studies may also be of interest, see for example Guellec and van Pottlesburge (2003).

recommending such a body. An alternative mechanism for allocating funding for cross-industry issues would be to add the remit to the existing RDCs or the Australian Research Council (ARC). The merits and shortcomings of these options should be considered before concluding that establishing a new entity is the best option.

We are sympathetic to the Reports stated concern that overt intervention by government (e.g., being overly prescriptive) in how RDCs allocate funding undermines this principal virtue and may risk government 'picking winners'. However, the report does not elaborate a case that moderate policy adjustment, such as earmarking a share of funding for research whose benefits accrue mostly outside the industry, would be unacceptable.

### **3. Should governments fund more or less? – the use of benchmarking**

In several instances, the report makes normative statements based on benchmarks. For example:

*“Another possible metric for assessing the adequacy of overall funding for rural R&D is to compare Australia’s spending... with other developed countries”*(p. 92)

*“Government funding support for rural R&D is much more generous than in most other parts of the economy”* (p94)

*“The public funding share for rural R&D appears to be higher in Australia than in many other developed countries”* (p.94)

Benchmarking against other sectors or countries does not provide any normative information. Benchmarking is not evidence. Additionally, where benchmarking is presented, it is important to report other comparisons which may account for (or result from) observed differences. For example, the productivity of Australia’s agricultural sector is high relative to other sectors.

### **4. Welfare costs of intellectual property rights**

The draft report discusses the potential role of intellectual property (IP) rights (page 54-55). The report identifies the positive role IP rights can play in the innovation system. The report also notes the limitations to IP which arise because (1) the degree to which they can practically address appropriability is limited; and (2) the potential for IP to stymie cumulative research (p.55). However, the draft report omits to mention the first order welfare cost (dead weight loss) associated with intellectual property rights is the monopoly power it creates over intellectual assets.

The principal function of IP rights is to give agents who invest in the creation of new technology the right to exclude others from its use. IP uses market forces to attract investment in R&D and allocate it to the most valuable projects. However, government sanctioned monopoly IP rights have a static welfare cost that is well recognised: IP owners can now charge a price above the marginal cost (often zero) of the utilization of their technology. This results in a loss of social welfare since people are prevented from

enjoying the benefits from something that has no cost to society (i.e., after technology is created).<sup>3</sup>

The second order cost (though arguably very important) which is identified in the report arises because underutilization can reduce the rate of technological progress. If innovators can exclude future researchers from using, and therefore building on, their technology, this will slow technological progress. In other words, the static ‘undersupply’ or underutilisation of existing technology results in reduced production of new technology.

## 5. Treatment of Risk

The policy framework outlined in the draft report (chapter 3) correctly identifies that limited excludability (i.e., spillovers) represents a key rationale for government intervention in research and development (R&D). However, we believe the report has not sufficiently considered the consequences of risk and uncertainty inherent in the R&D process.

R&D involves both actuarial risk and uncertain risk.<sup>4</sup> Actuarial risk is such that reliable statistical probabilities can be formed. In the case of uncertain risk, no information about (it is not possible to quantify) the likelihood of possible outcomes and so no objective probabilities exist. Uncertain risk is an inherent part of the inventing process since, by definition; invention is always something that has never been done before.

The level of actuarial risk facing society can be reduced by aggregation, since repeating an event an infinite number of times leads to a certain *ex ante* outcome. Uncertain risk, on the other hand, can not be eliminated by pooling and the best strategy for minimising the cost to society of uncertain risk to spread the responsibility for a given project across multiple entities (assuming there is an increasing marginal aversion to risk).<sup>5</sup> In the limit, ‘multiple entities’ is all tax payer.

The motive for funding uncertain activities via taxes is to minimise the total cost of an individual’s aversion to risk over time (or, if we sum over individuals, the total cost of risk to society during any given time period). Uncertainty is one reason governments (i.e. tax payers) traditionally fund basic scientific research and also commonly support early stage pre-seed funding.<sup>6</sup> Evidence of private returns from uncertain investments is not a reason to argue that *ex ante* funding of (R&D) investment activity should be paid for by the intended recipient.

---

<sup>3</sup> Note that where the benefits of R&D are perfectly captured within the industry, any levy requirement – which is equivalent to a price for technology- can lead to static under-utilization, due to inadequate market entry.

<sup>4</sup> See Knight (1921)

<sup>5</sup> This assumes increasing aversion to risk as level of risk rises, See Arrow and Lind (1972)

<sup>6</sup> Redistribution of wealth between tax payers may also be indicated after the outcomes of the activity are observed.

## References

Aerts and Czarnitzki, D., (2008) *Econometric evaluation of public R&D policies: Literature review and a guide for further research*, K.U.Leuven

Arrow and Lind (1972) Uncertainty and the Evaluation of Public Investment Decisions: Reply, *The American Economic Review*, 62(1), 171 - 72.

Guellec, D. and B. V. Pottelsberghe (2003). 'The Impact of Public R&D Expenditure on Business R&D.' *Economics of Innovation and New Technology* 12, 225 - 243.

Knight, F.H. (1921) *Risk, Uncertainty, and Profit*. Boston, MA: