
Book Review

Shaun Hendy and Paul Callaghan

Get off the grass: Kickstarting New Zealand's innovation economy

Reviewed by Grant M Scobie

The fundamental proposition of this book is that the New Zealand economy has not performed to expectations. The authors make the case that we can improve our economic growth through science and innovation. They rightly identify that, in the long run, new knowledge and innovation are the key elements that underpin improved productivity, increased real incomes and higher living standards – and that this applies across all countries.

They start with the usual and somewhat dismal litany of our economic woes. They highlight the paradox that we rank highly on all the indicators of a well run, corruption-free, educated society – and yet we somehow fail to capitalise on these inherent qualities and turn them into valuable goods and services the world wants. The consequence is that, in real economic terms, we have slipped behind (except for the 400,000 or so of us who shot through to the West Island).

Then follows a broad and readable synthesis of some of the key literature on economic growth – Smith, Ricardo, Marshall and Solow – they are all there. One can but applaud the serious attempt of the authors to leave the comfort of their own disciplinary confines and venture into the broad sweep of economic history. The contribution of innovation to economic growth is then developed in Chapter 3.

This then leads to what is really the heart of the story – a most interesting chapter on innovation ecosystems. Drawing on the theory of complex systems, the authors describe the role of networks and clusters in the generation of ideas and the process of innovation. Collaboration and interconnectedness are seen as key factors governing successful innovating economies.

We are small and distant – but if we could start acting as a 'The City of Four Million People' (the title of Chapter 7), we might in some way emulate the large and productive innovation systems of countries whose performance to which we aspire. This would help us get more bang for the research buck, through joining forces rather than all competing from the same pool of funding.

There is certainly a case to be made that early reforms of the conduct and funding of research placed excessive weight on using competitive forces to ensure efficiency and create dividends for the Crown as a shareholder. I suspect that diverting world-class ruminant physiologists who lacked the entrepreneurial nous to run a garage sale into competitive funding and research management roles did little to enhance the productivity of our innovation system.

One does wonder if the lack of continuity in the institutional structures that govern, allocate funding, and conduct research have played a role in limiting the development of an innovative economy. We seem to constantly revamp those structures, from DSIR, to Research Associations, to STAB (remember that?), CRIs, MAFtech to AgResearch,



Published August 2013,
Paperback, 978 1 86940 762 9,
210 x 140 mm, 248 pages, \$34.99
Auckland University Press
Epub, 978 1 86940 780 3, NZ\$ and US\$24.99

MORST and FORST to the world's shortest-lived Ministry of Science and Innovation to MBIE. To these we could add the Knowledge Wave, the Growth and Innovation Framework, and now the Business Growth Agenda. When will it end? Surely the disruption and uncertainty created by constant change must have had a cost. One hopes the recently launched National Science Challenges will indeed help us focus on what really matters and do it rather more cooperatively. That is clearly the fervent wish of the authors.

The book has a catchy title (although it has nothing to do with marijuana!). It does suggest that our economic future will only be rosy if we move away from our primary-based export-led economy. However, the authors are at pains to celebrate the investment in productivity-enhancing research that has made our primary industries the envy of the world. But they make the case for greater diversity and investing in science and innovation that will enrich our range of high tech exports into niche markets.

Let me reveal my biases – I am an economist (albeit with a longstanding association with scientific research). So naturally I looked for a substantive discussion on the economics of R&D and specifically the returns to investment in scientific research. I was disappointed. These terms do not even feature in the index. And while the New Zealand literature on measuring the returns to investment research is not extensive the book manages to cite but one New Zealand study, and that focussed on productivity growth.

In an address to the Wellington Philosophical Society on 26 October 1932, Lord Bledisloe stressed...

.... it is essential for scientists, however distasteful the task may be, to prove to the farm community the value of their discoveries in terms of pounds, shillings and pence.

The reader is left assuming that, apparently, the authors did find the task distasteful, as they seem to have based their case for more scientific funding with scant evidence as to whether it might generate an acceptable rate of return.

Spending on R&D by the public sector has to generate a rate of return equal to, or in excess of, the opportunity cost of those funds (one assumes that this is precisely the type of financial calculus undertaken by the private sector in their decisions to invest in R&D). That opportunity cost is the return that society could generate from investment in hip replacements, pre-school education, financial literacy programmes, national parks or any one of a myriad of claims on the public purse.

In my judgment the case for more funding would have been greatly enhanced by drawing on both New Zealand and overseas studies that give serious attention to the funding and returns to investment in science. In this regard there are particularly useful studies by Arndt *et al.* (1977), and Alston *et al.* (1995, 1996, 1998, 2000).

A fundamental corollary that arises from measuring the rates of return to research is the allocation of scarce research funds across competing areas. Conceptually we would seek to ensure the marginal returns to investment were approximately equal in all areas of R&D. Were that not the case, a reallocation of funding from the lower to the higher return areas would enhance the total return to the science portfolio.

The case made for additional funding for areas beyond the primary sector would have greatly strengthened had the authors made the case that the marginal returns in those areas exceeded those for research in the primary sector, implying a degree of underfunding. Perhaps, as scientists working in the technology area on a daily basis and constantly scrambling for resources, they take underfunding as self-evident. But without firmer ground for the case, their pleas risk becoming perilously close to those of simply another lobby group.

The footnotes/references are conveniently listed by chapter at the end of the book and supplemented by a rather extensive list of Further Reading, again organised by chapter. An extensive index concludes the volume.

But in the end one is left with the feeling that even the mildest of cynics will regard this book as advocacy for more funding by the self-interested. Furthermore, given the repeated history of calls to increase science funding, there would seem to be every possibility that, ten or twenty years from now, the same book with the same pleading might well be written. The real tragedy is that Sir Paul is no longer the eloquent, articulate and forceful advocate for the cause.

Arndt, T.; Dalrymple, D.G.; Ruttan, V.W. (eds) 1977. *Resource Allocation and Productivity in National and International Agricultural Research*. University of Minnesota Press, Minneapolis.

Alston, J.M.; Norton, G.W.; Pardey, P.G. 1995. *Science under Scarcity: principles and practice of agricultural research evaluation and priority setting*. CAB International, Wallingford, UK.

Alston, J.M.; Pardey, P.G. 1996. *Making Science Pay: The economics of agricultural R&D policy*. American Enterprise Institute, Washington DC.

Alston, J.M.; Craig, B.J.; Pardey, P.G. 1998. Dynamics in the Creation and Depreciation of Knowledge, and the Returns to Research. *EPTD Discussion Paper 35, International Food Policy Research Institute, Washington DC*.

Alston, J.M.; Chan-Kang, C.; Marra, M.C.; Pardey, P.G.; Wyatt, T.J. 2000. A Meta-Analysis of Rates of Return to Agricultural R&D: Ex Pede Herculem? *Research Report 113, International Food Policy Research Institute, Washington DC*.