

# Nudging towards innovation

By **Nicholas Gruen**

“An important change is taking place in the world of innovation. Put simply, innovation can be done very cheaply”.

Scott Anthony, 2011.<sup>1</sup>

Perhaps the most canonical definition of economics was given by Lionel Robbins of the London School of Economics in 1932. “Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses”.

As a result of this world view, you’ll find a lot of economics focuses on what economists call ‘resource allocation’. And most economists’ and policy makers’ thinking on innovation and economic development has been done within this framework.<sup>2</sup>

In this article, I’ll outline some of the basics of innovation policy from this traditional ‘resource allocation’ perspective, and then go on to explain some of the pitfalls. I’ll go on to expound a new agenda which doesn’t really fit the old thinking. It doesn’t render the old thinking obsolete, but it does open up exciting new vistas.

The case for innovation policy from the economic textbook goes like this. Innovation is about ideas and ideas can’t be locked down. If you spend your scarce resources – your hard-earned money or time – on initiating and developing new ideas, others can copy your work. This is the canonical ‘free rider’ problem. The result is that, in a standard economic model, innovation is under provided for by the market. This discloses the standard case for governments to involve themselves in innovation to address ‘market failure’.

## Opening up the Textbook

Speaking broadly, we can identify a few basic themes.

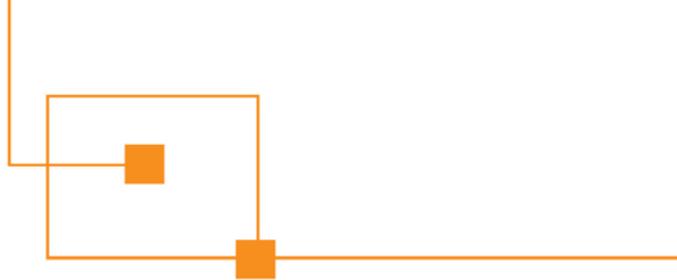
- Governments directly fund science and the development of knowledge that’s sufficiently general and/or speculative in its technical risk or practical application that businesses would be shy to invest in it for their own benefit. This is the case for government funding of ‘basic’ or ‘pre-competitive’ R&D.
- Where the development of new knowledge has foreseeable potential commercial application, it makes sense to encourage that activity – to intervene in the market to ensure it doesn’t undersupply innovation. One simple method is direct subsidies. This occurs in Australia under the R&D tax credit.

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<sup>1</sup> Anthony, Scott. 2011. “Making Innovation Cheap and Easy”, Atlantic Monthly, Nov 21 at

<http://www.theatlantic.com/business/archive/2011/11/making-innovation-cheap-and-easy/248718/>

<sup>2</sup> A recent article by two RMIT economists captures the same spirit when it says that “all policy mechanisms by design create rents” with these rents then attracting resources to various activities. Sinclair Davidson and Jason Potts, 2016. “The Social Costs Of Innovation Policy”, Economic Affairs Volume 36, Number 3, 282-293.



- Another means of rescuing R&D from ‘market failure’ is to ‘internalise’ the benefits of R&D to those funding it. Intellectual property protection offers the classic example of this. By creating an artificial (legal) monopoly on innovations, patents and copyright generate rents for the innovators and impose implicit taxes or prohibitions on those who copy them.
- Australia has always been a leader in agricultural R&D, and Rural Development Corporations (RDCs) and their institutional ancestors have melded both strategies of subsidy and internalising incentives. In RDCs, Governments co-fund innovation along with rural industries which impose compulsory levies on themselves to fund R&D that will benefit their industry.
- Australian governments also subsidise the provision of venture and other forms of early stage capital for firms to accelerate the development of deeper, more mature early stage capital markets in Australia.

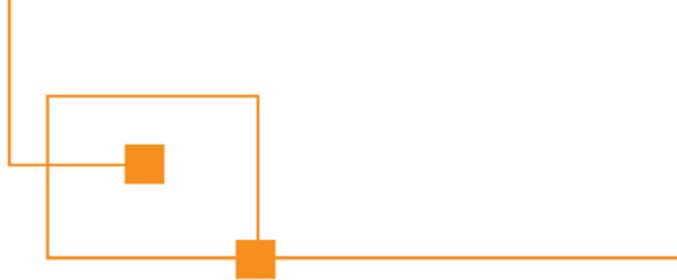
## Beyond the Textbook

Without suggesting we should ditch any of these policies, it’s worth itemising some of their profound imperfections.

- Direct funding is costly, and though government taxes money off some to give it to others, it’s not a zero sum game. Because taxes change behaviour, they harm the economy. Reasonable estimates suggest that for each dollar of revenue governments raise, the economy loses around a quarter in losses from the distortions those taxes impose. Further, the incentives within public and university research organisations are often skewed towards optimising researchers’ careers (for instance via maximising publications in learned journals) rather than maximising practical research impact in empowering successful innovation.
- Subsidies or tax credits are always subject to difficult dilemmas about where to draw the line between what does and does not qualify for assistance. And, of course, those same distinctions drive gaming of the system. Those people who think accountants aren’t creative haven’t seen them in pursuit of R&D tax subsidies. Thus, for decades after the R&D tax concession was first introduced in the 1980s, the presence of technical risk in a mining venture sent accountants on the task of claiming more and more of the mine’s total expenditure as supporting tax concessional R&D and thus eligible for the concession.
- IP is likely to involve more benefits than costs where free rider problems are particularly bad – for instance where the investment involved in an innovation is large and the cost of copying is low – the preeminent example being in pharmaceuticals – but even here it’s not without its costs as firms use their monopoly power to price some buyers out of the market. But in areas such as those we began this article with, where fixed costs have collapsed, intellectual property protection can not only be unnecessary to sustaining innovation, it can actually get in the way. Thus, there’s plenty of evidence that software patents actually slow down innovation – by raising risks of inadvertent breach of others’ property rights and by creating scope for ‘patent trolls’ who hold patents not to innovate themselves, but to run what amounts to a protection racket in which innovators must pay patent trolls royalties to avoid prosecution for inadvertent patent infringement.

## Bang for your Buck

But anyone knows that it’s not just the quantity of your resources but also their quality and the quality with which they are used. The recent penchant in policy making for deploying ‘nudges’ is a good example of policies that step outside the resource allocation mindset. They don’t ask, “how much more or less money



should we spend on this objective?” They ask, “could we achieve the objective by managing better rather than spending more money?”.

Thus, for instance, one US state program aimed at increasing the college enrolments of disadvantaged youth could have spent a lot of money on a marketing campaign, or more expensively still, a subsidy scheme. In fact, those running the program found that well-timed SMS reminders to attend college open days and interviews had a substantial effect on enrolments at negligible cost. In another famous example, the response rate to letters notifying their recipients of arrears on fines and taxes was increased simply by experimenting with differently worded letters. The principles that came out of this work were mostly commonsensical – make the letter clear, appeal to people’s better side – their desire not to be thought bad by their neighbours but at the same time let them know you mean business.

One of the new realisations of behavioural economics is that what happens ‘by default’ when you do nothing matters a lot to what happens. That knowledge has been used to get people eating in healthier ways (by positioning healthier food in places which encourage ‘impulse’ buying). Manipulating what happens by default has also proven to be particularly effective in changing investment behaviour.

In New Zealand, the US and the UK, policy makers and HR departments within corporations have established defaults so that people automatically save some portion of their income, and sometimes a rising share over time, often timed to cut in when pay rises are paid. Of course, they remain free to opt out at the click of a mouse, but many just go with what is easier – and come to feel good about the savings effort they’re making.

### Nudging in the right direction

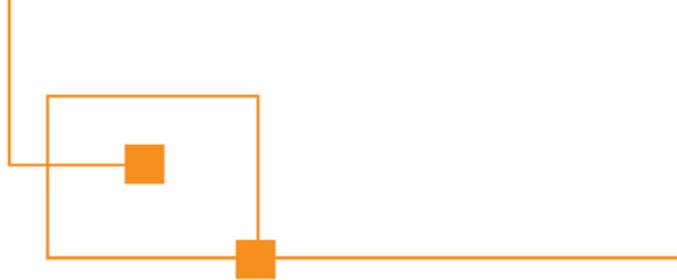
Though Australia has been one of the leaders in economic reform and policy making – introducing such innovations as HECS and the Child Support Scheme – we have never been much of a leader in the new world of using behavioural insights or ‘nudging’ towards better outcomes. That was partly because we didn’t need to bother about one of its preeminent areas of application – in savings policy – given the extent to which we compel people to contribute to their superannuation.

But we could lead the world in ‘nudging towards innovation’. In subsequent sections, I’ll outline some approaches to innovation policy that are trying to go beyond just getting more resources into innovation. But before we do, let’s take a brief detour to show how ‘nudging’ – essentially costless policy – could nevertheless help in tipping more resources into innovation. This is because we have a ‘default’ problem in the way our financial markets invest in funding some of our most innovative businesses – start-up and early stage ventures.

Most superannuation investment is in big funds that are risk averse and don’t bother to make small bets on early stage capital. Given all investments’ inherent riskiness, going with the herd makes career sense for fund managers. If the bet comes off, it’s onward and upward. If it doesn’t, they’re amongst friends: everyone made the same mistake. Indeed, following “normal professional practice” is a complete defence of negligence. If you work for a fund manager and your stock picking fails unconventionally, however well judged at the time – that spells peril for your career. Your performance reviews could well suffer. Meanwhile, your firm sweats it out wondering if there’ll be a class action.

In fact, while early stage investments are risky, their presence within a large portfolio would actually lower its risk – because, though it is high, the risk associated with early stage firms is highly idiosyncratic, so it correlates weakly with the rest of the market. So we should be on the lookout for ways to nudge institutional super funds towards better practice. How can we do that?

First, we should tackle institutional inertia by publishing ‘model portfolios’ specifying the minimum exposures to early stage capital suggested by portfolio theory – which calls for diversification across economic activities, generally in proportion to their share of the economy. It would probably be less than 1 percent – or \$20 billion



– for early stage capital. The model portfolio would then become the benchmark which the herd ignored at their peril. They could continue underinvesting in early stage capital, but not safely without due diligence.

We could also require funds to give their beneficiaries the model portfolio's exposure by default. Especially with under 1 percent of their portfolio, many Australians would embrace such a move: Some for a 'flutter' as they did on Cup day. Some for their country's – their children's – future. Others could opt out with the click of a mouse. Phased in to prevent too large a surge of finance swamping the market, coercing no-one, costing the budget nothing, what's there not to like?

## Other nudges

Now for some other 'nudges' towards innovation. It's always been the case that there are plenty of things governments can do – and not do – to foster innovation without spending much, if any, money.

Note that the backdrop for this is two huge transformations in our economy – both well advanced in large swathes of our economy. The first is that the costs of certain kinds of innovation are falling spectacularly. In the tech boom that became the 'tech wreck' at the turn of the 21st century – that is a little over 15 years ago – the cost of data storage was around USD 19 a gigabyte. Today, thanks to cloud services, it's a hundredth of that.<sup>3</sup>

According to Ian Gardner, under the old rules, an IT start-up would pay around 70 percent of the money it raised on IT infrastructure – "computers, ... software, the people to run it, the data centres."<sup>4</sup> Now that number is less than 1 per cent." Coming from Amazon Web Services, Gardner's numbers aren't from a disinterested source – but when the contrast is that big, you get the picture.

This has brought about an extraordinary transformation in start-up activity. In a recent ABC interview, Craig Blair commented that in about a decade, the venture funding company he founded – AirTree – has gone from seeing around 100 deals a year to over 10 times that amount.<sup>5</sup>

The second transformation is that the internet is proving to be what economists have termed a 'general purpose technology'. Like steam, electrical power, modern industrial chemical technology and the internal combustion engine, the technology doesn't just change or revolutionise one business or an industry. It revolutionises several industries and changes almost all of them significantly.

The result is that industries are being transformed just by the application of well-known technology. There's nothing 'high-tech' about Uber or Airbnb or any number of other businesses driving the burgeoning sharing economy. In this world, innovation is often driven by attending to all the nuts and bolts making the new connections that need to be made.

## Making Connections

*Making connections* has always been central to innovation. And making connections between things is very different from investing more in innovation via R&D to create new knowledge.

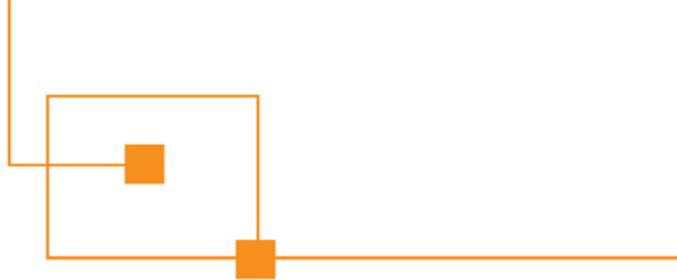
Let's illustrate with an example in which IT and the internet play a negligible role. Rain Bird is an American manufacturer of sprinklers and other lawn and garden irrigation systems. In 2010, it introduced its proprietary

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<sup>3</sup> <http://www.nesta.org.uk/publications/startup-factories>, p. 21.

<sup>4</sup> <http://www.abc.net.au/news/2016-05-26/digital-start-ups-cheap-but-competitive/7448416>

<sup>5</sup> <http://www.abc.net.au/news/2016-05-26/digital-start-ups-cheap-but-competitive/7448416>



'Convert to Drip' line, enabling gardeners to convert part of an installed system from sprinkling to drip irrigation. Rain Bird had developed this technology in another line of goods – marketed as drip irrigation with a sprinkler option. It hadn't been a particularly big seller when sold as intended, as a drip irrigation system. But Rain Bird's sales people noticed that when that system happened to be marketed with sprinkler systems, its dual capabilities made it a big seller. Rain Bird managed to fuel innovation not by increasing its R&D spend, but by making a connection – though it made the connection simply by having a keen eye for what was then unusual customer behaviour.<sup>6</sup>

This brings to mind Steve Jobs' definition of innovation or creativity as being essentially about making connections – about joining dots.

Creativity is just connecting things. When you ask creative people how they did something, they feel a little guilty because they didn't really do it, they just saw something. It seemed obvious to them after a while. That's because they were able to connect experiences they've had and synthesize new things.<sup>7</sup>

The point is that, as each part of the economy becomes more knowledge intensive, there are increasing benefits from simply making connections between them.

### Into the spider web

As a new generation of businesses help roll out the general purpose technology of IT and the internet and as that technology spawns new general purpose technologies like big data, the internet of things and the block-chain, rewards are increasingly going to those with the nous, the skills, the perseverance to adapt the market's burgeoning technical capabilities to specific new uses.

And government is ubiquitous. Not only is around 35 cents in every dollar spent in our economy remitted to government, but governments are an integral part of our most sophisticated knowledge intensive services. Indeed, as I've argued elsewhere,<sup>8</sup> policy discussion typically conceives of markets as comprising competitive firms subject to state regulation. But that's too simplistic.

In the arteries of the knowledge economy – like education, health, aged care, infrastructure delivery and city planning, research and legal services, banking, insurance and funds management, output is better thought of as the joint product of competitive and collective (collaborative and regulatory) activity. In some of these areas – for instance health, education and infrastructure development – governments are heavily involved in delivering services themselves as well as heavily involved in private sector firms that do the same. But in each of the other areas, regulation is heavy and there is often plenty of industry self-regulation.

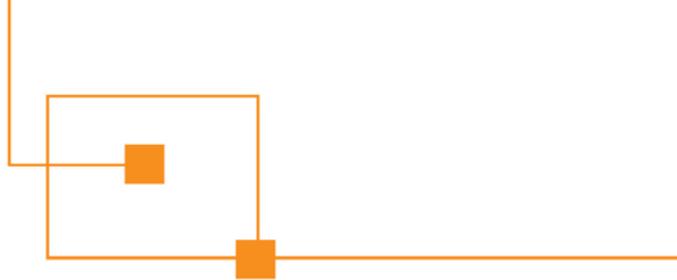
In that world there are increasing ways in which governments can drive innovation with a nudge – with some tweak to their own practices – rather than by getting out the chequebook.

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<sup>6</sup> <https://hbr.org/2011/06/innovating-on-the-cheap>.

<sup>7</sup> <https://www.brainyquote.com/quotes/quotes/s/stevejobs416925.html>

<sup>8</sup> Nicholas Gruen, 2014. "Time for the 'reform' mantra to be modernised", AFR, Sep 18 2014 available at <http://www.afr.com/news/politics/time-for-the-reform-mantra-to-be-modernised-20140917-jf52y>



## A system of opportunity

Let's consider just the two largest government dominated industries – health and education. Both offer exciting pickings for 'nudging towards innovation'. Fully reconfiguring health and education for the age of IT, the internet and big data will take generations. But here are two businesses at the interface between these systems and their users. [CareMonkey.com](http://CareMonkey.com) has digitised the irritating process by which parents authorise schools to take their children on excursion.

[Ollowearables.com](http://Ollowearables.com) built hardware that digitises the 'panic button' that older people often wear as pendants round their necks so they can call for help easily in the event of a fall or other mishap.

Each of these Australian founded innovations hugely improve the legacy technology that is still dominant in these systems. CareMonkey provides teachers with information on allergies and emergency contacts if your child comes to grief; Ollowearables detects Grandma's fall, asks her if she's OK before initiating a conference call to relatives and, failing satisfactory response from them, rings the ambulance. It even collects bio-data that might detect and prevent falls before the event.

In fact, CareMonkey is doing quite well. But how many schools or education departments actively scour the market to become aware of, and, where appropriate, subscribe to such products (let alone participate in their development)?

Ollowearables, on the other hand, was unable to receive funding to develop its project in Australia and joined the US Telco's Sprint Accelerator. After developing a promising product, it was unable to attract enough funding to complete all its hardware prototyping and wound up.

Of course, it was never a sure bet. It may have taken the wrong turn on the technology so we certainly can't know that it would ever have made a go of it. But in a country that led the world in funding Home and Community Care to keep older people at home for as long as possible to delay their entry into a nursing home, a country whose government continues to spend billions each year on that program and its successors, it seems absurd that it had to go overseas to access what capital there was to develop a product that would have done little more than apply existing technology to a well-known problem. And though it wasn't a sure bet, I'm pretty confident Ollowearables was a *good* bet. It had a reasonable chance of success and it seems likely that whoever solves the problem it was working on will stand to make billions.

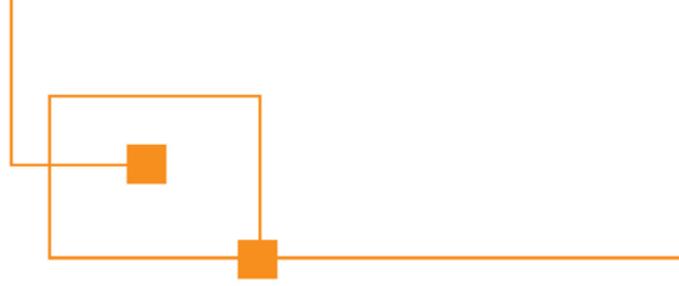
We should be looking for nudges that could improve this situation. Governments could establish a regime that requires schools and other government funded service deliverers to scan and access new market developments.<sup>9</sup> They'd remain free to use or not to use such products but only after due diligence rather than by default. As with fund managers in the example I provided above, inattention would be no excuse for inaction.

How might we have nudged Australia's health and aging eco-system to have tilted the dial a little more towards success in the case of Ollowearables? Often, all it takes is a little leadership – not ordering people around but exercising the 'convening power' – to get people together to realise what's at stake, what needs to be done, where changes would need to be made to get some project off the ground and where they might fit in.

Here, government could have asked all manner of stakeholders whether they might like to have been part of the action, from service providers under the Home and Community Care scheme, and other aged care

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<sup>9</sup> To operationalise this, it would probably make sense to have a power where the Minister could gazette some service such that, within a year of its being gazetted, service providers such as schools would be required to have performed due diligence on it.



providers to health insurers potentially interested in (anonymised) data that might have helped their premium payers live fall free for longer. Some of these players might be interested in funding the development (for a share of the upside, naturally), or in helping out by allowing their operations to be used for prototyping or by making advance purchase commitments on which finance from elsewhere might be raised.

Currently, both state and federal governments run grants schemes that tend to be built around the idea of commercial viability as if that could be defined on its own. But in an increasingly complex and interdependent world, whole systems in which governments play very substantial and often dominant roles need to find ways to nurture the tendrils of innovation into sturdy green shoots of economic development.

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