By John Bell
j.bell@acilallen.com.au

Innovation policy linked to productivity boost

New policies are urgently needed if we are to use innovation to maintain our standard of living.

What is the relationship between innovation and productivity? This question is, in essence, the topic being addressed by an Expert Working Group established by the Australian Council of Learned Academies (ACOLA). A report for the Prime Minister's Science, Engineering and Innovation Council is currently in preparation.

Productivity is a disarmingly simple concept – outputs divided by inputs. The problem is that, while there are good measures of outputs (for example, dollar value of production), counting all the inputs turns out to be a challenge.

In the past, we added capital, labour, energy and material costs to get inputs. However, there are other factors that also influence productivity. Innovation falls into this category.

During the mid-1990s Australia's overall productivity grew. Some commentators attribute this to micro-economic reform (including the floating the Australian dollar). However, similar growth was observed in other Organisation for Economic Co-operation and Development (OECD) countries, which supports another explanation – the impact of innovation in information and communications technologies (ICT).

Just think back to the days when our banks had significant numbers of tellers. Internet banking and electronic payment systems have had a dramatic impact. This is an example of innovation improving productivity – something that can be expected when innovation leads to new, more efficient processes.

While innovation can enhance productivity, we need to keep in mind that this is not its only purpose. Innovation provides new products and services that create jobs and increase GDP.

Take the case of the Australian mining industry. Innovation in products and services used in this industry contribute to its international competitiveness. Orica Ltd is an example of an innovative company suppling both explosives and services used by the mining industry to ensure safe and efficient operations.

If innovation is so important, does Australia have the best set of policies to ensure our international competitiveness? Improvements are needed.

Here are six reasons

1 We lie well behind the leaders when it comes to business expenditure on R&D

While research and development is only one element of innovation, business expenditure on R&D (BERD) is widely considered to be a useful indicator of the level of innovation activity. In Figure 1, Israel is the leader with BERD at

TECHNOLOGY TO FACE THE NATION'S CHALLENGES

Australia's resilient economy is facing significant structural change. The Academy's 2013-2017 Strategy Plan notes key areas where technological innovation has a role to play. These include:

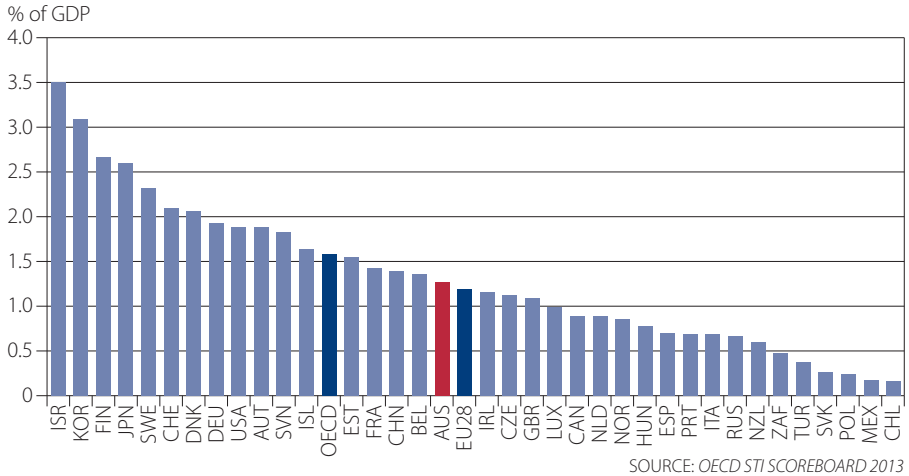
- **innovation policy, investment and productivity;**
- **healthcare for an ageing population;**
- **transition to low-carbon energy sources;**
- **natural resources management, including water;**
- **agricultural productivity;**
- **infrastructure and transport; and**
- **improved STEM education.**

This edition of ATSE *Focus* addresses most of these issues, with keynote articles contributed by Fellows with expertise in each area.

It omits agricultural productivity – covered extensively in *Focus* 182 (February 2014) – and STEM education, which will be the theme of the next edition of *Focus*.

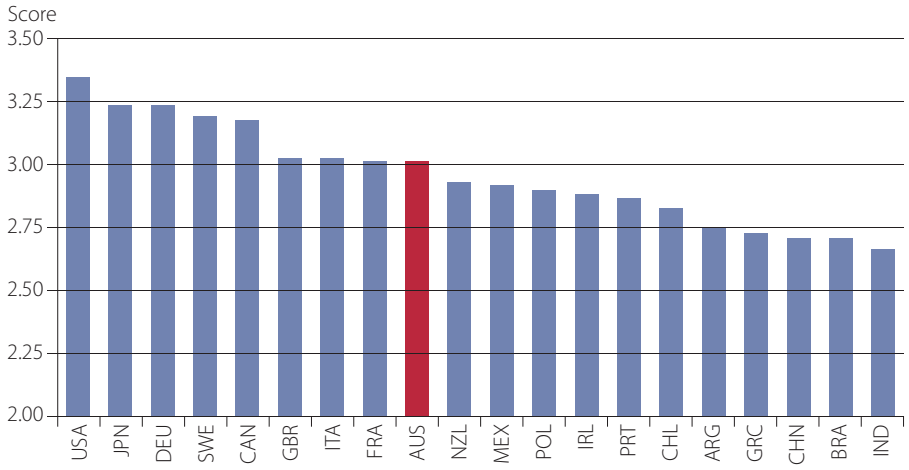
It additionally covers two important topics – advanced manufacturing and international collaboration.

Figure 1 Business enterprise expenditure on R&D 2011.



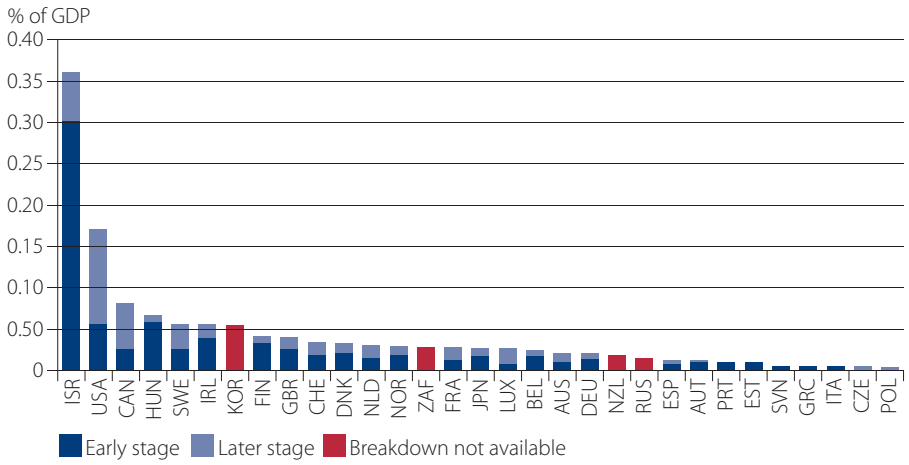
SOURCE: *OECD STI SCOREBOARD 2013*

Figure 2 Average management performance in manufacturing.



SOURCE: *BLOOM, GENAKOS, SADUN AND VAN REENEN, 2012*

Figure 3 Venture capital investment 2012.



SOURCE: *OECD STI SCOREBOARD 2013*

around 3.5 per cent of GDP. By contrast, the level of BERD in Australia is less than half that of Israel and well behind Korea and Finland.

2 Our business management skills are middling

The recent comparative rating shown in Figure 2 confirms earlier work by Professor Roy Green at the University of Technology, Sydney – Australian management performance is well behind the leaders. This is a problem because recent studies have demonstrated that business growth requires both innovation and good management.

3 It is difficult to find venture capital for new technology-based firms

Growing new technology-based firms requires venture capital. Measures such as the Government's Innovation Investment Funds are sound from a policy perspective, but are not achieving the levels of investment that we see in other countries. Figure 3 shows that Canada, in third place, is doing much better than Australia. A lack of venture capital means that some start-up companies with innovations fail, or move offshore before they have established an Australian base.

4 Government assistance for firms is relatively modest by OECD country standards

With the recent discussion about the closure of the car manufacturers in Australia, you could be excused for thinking that in the past Australia is generous in its provision of direct financial support to industry. What Figure 4 shows is that that the assistance for business R&D is anything but generous. By comparison, that bastion of free market economics, the US, provides eight times Australia's level of direct support.

5 Our publicly funded researchers are not well connected to business and industry

We have a strong public sector research base in our universities and government laboratories. However Australia needs to get a bigger dividend from this investment if we are to improve

Time is not on our side. Countries in our region are outpacing us in the growth of their investment in research and innovation.

productivity and grow the economy. Figure 5 shows one of the reasons behind this. Our publicly funded researchers are not well connected with Australian firms. Other countries have done better in recognising the opportunities to build innovation capacity in firms through research collaboration.

6 It is hard to be a 'fast follower' if we are not adequately linked to the rest of the world

Australia cannot expect to be a leader in many technologies. The smart strategy in such circumstances is to be a 'fast follower' – an early adopter of innovations developed elsewhere. This is particularly important for growing our productivity. As Figure 6 shows, we need to encourage and facilitate much more research collaboration between Australian firms and foreign firms or researcher organisations. We need to recognise that such collaboration, which requires considerable direct contact, is harder for Australian firms.

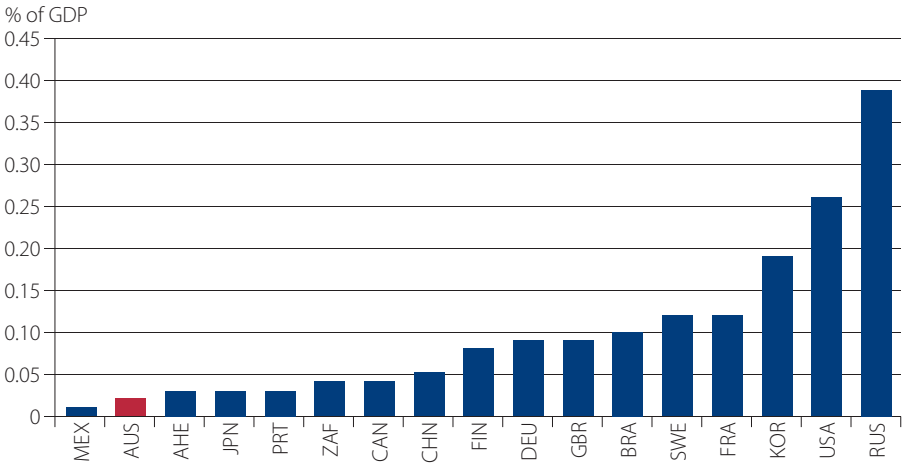
While various explanations can be found for the problems discussed above, the challenge is to find low-cost solutions that can be deployed rapidly.

Time is not on our side. Countries in our region are outpacing us in the growth of their investment in research and innovation.

New policies are urgently needed if we are to use innovation to maintain our standard of living.

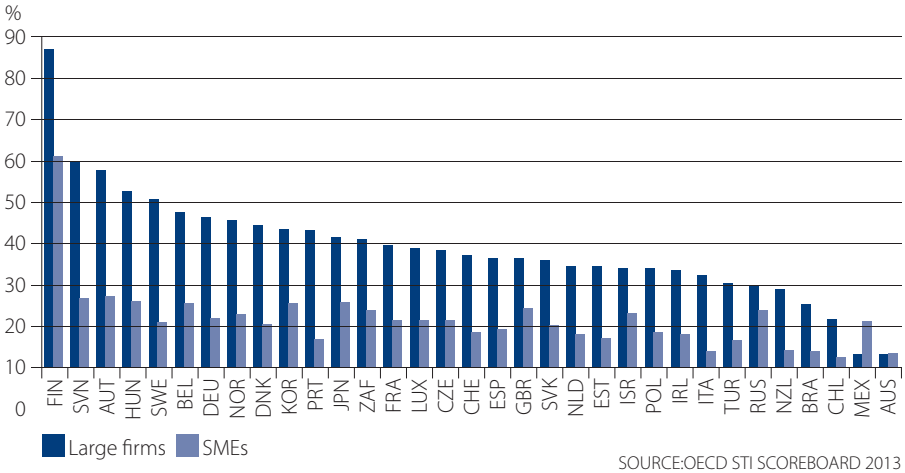
DR JOHN BELL FTSE is a Senior Associate with ACIL Allen Consulting and chairs the Expert Working Group referred to in this article. His experience includes representing Australia at the OECD and leading the OECD's Division responsible for policy and program analysis in science, technology and innovation. He is a former Deputy Secretary and Chief Science Adviser in the Department of Industry, Tourism and Resources, and Chairman of the Commonwealth Coordinating Committee on Science and Technology.

Figure 4 Direct government funding of business R&D in 2011.



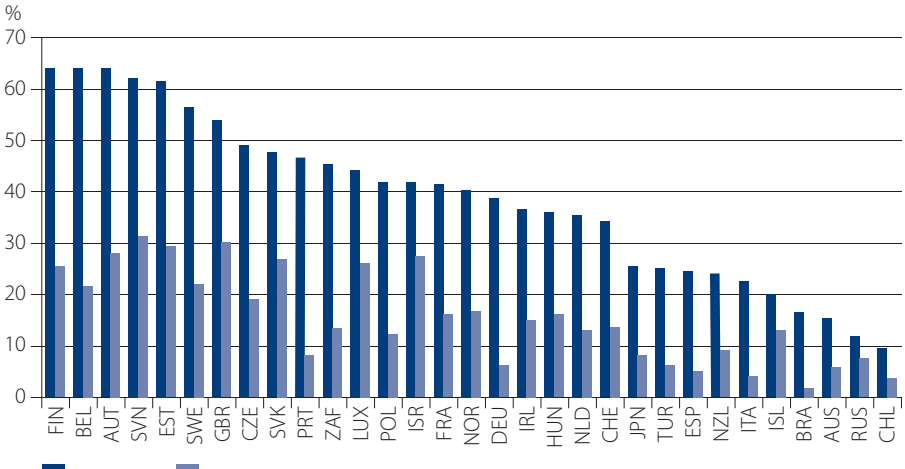
SOURCE: *OECD STI SCOREBOARD 2013*

Figure 5 Firms collaborating on innovation with higher education or public research institutions.



SOURCE:OECD STI SCOREBOARD 2013

Figure 6 International collaboration by firms.



SOURCE: *OECD STI SCOREBOARD 2013*