

# The Innovation Imperative

By Stefan Hajkowicz, 22 December 2014

The fuel source for growth in a modern economy isn't land, minerals or water. The fuel source of a modern economy is ideas. That's because ideas are how industry achieves more output for the same or fewer inputs. Ideas allow us to light a room with energy efficient bulbs which have the same luminosity but consume less power. Ideas allow us to construct a building with fewer materials which performs the same functions. Ideas allow us to make cars, trains and planes that travel faster, safer and cleaner. In other words ideas allow us to do more with less.

When multiplied across the economy ideas allow us to increase productivity – the ratio of inputs to outputs in a production process. Productivity is an underlying driver of wealth creation. Productivity improvements ultimately mean we can raise people's incomes. The economics Nobel Prize laureate Paul Krugman is famous for saying *"Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker"*.

Data compiled by the Australian Bureau of Statistics [1] show that productivity has experienced a sustained period of strong growth over the latter part of last Century and into the beginning of this Century. However, at around 2004 it hits a peak. After that it starts to decline. There are some questions about how alarmed we should be about productivity decline and whether it's a cyclical phenomenon or a sustained slump [2]. However, regardless of how these questions are answered the overwhelming view is that it would be much better for the Australian economy (and people's incomes) if this graph resumed an upward-sloping trend. And quickly.

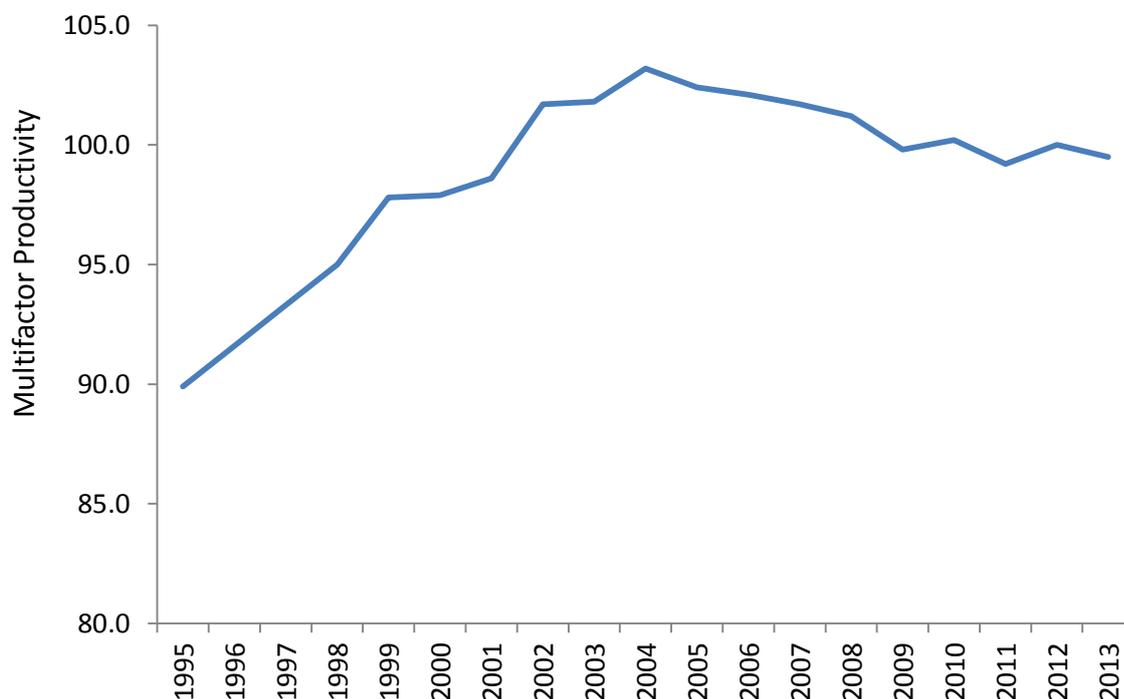


Figure 1. Multifactor productivity for all industries in the Australian Economy.

Source: Australian Bureau of Statistics [1]

So the question is what's behind this productivity decline and, perhaps more importantly, what can we do about it. Tyler Cowen is a professor in economics at George Mason University who argues that productivity decline is happening in advanced economies we've run out of ideas. The title of his book gives much away

about his thesis "*The Great Stagnation – How America Ate All the Low-Hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better*" [3]. This book supports the idea that productivity growth in the last Century was achieved by relatively easy innovations such as the development of unused land and mineral resources and skilled migrant labour. However, this Century productivity isn't so easy to achieve. To achieve productivity growth this Century we need to do deeper and more radical innovation. We need more and better ideas.

The quandary faced by Western Economies is perhaps best explained by an analogy. Imagine a company comprising a dozen employees that generated income through earth moving projects. The company is solely reliant on moving soil for their income and they get paid for the amount of soil moved within a given time period. At the beginning of their company the workers used only their hands. At this stage of development the productivity of the operation would be poor. Tonnes of soil moved per person hour would be a low ratio. Now we'll introduce the first innovation - spades. All of a sudden productivity would take a major jump. Now let's introduce another innovation – wheelbarrows. Again productivity would be much better. Now another innovation – mechanized diggers and bobcats. Now another – dump trucks. The ratio of tones of soil per person hour is now much better and this group of workers can earn higher incomes. But when we've got the team working with dump trucks and diggers it's hard to think of another innovation that would see a commensurate leap in productivity. We could give them training which might lead to a modest increase in productivity, but not of the magnitude experienced previously.

That's where Australia and other advanced economies are now. We've made some big jumps in productivity by innovations in the past. But we don't seem to be producing the new ideas that allow big jumps in the future. From some perspectives we may have hit a technology plateau [4] and can no longer hope for a pay rise to come as easily as in the past.

But the future is not that bleak. At least it doesn't need to be. Tyler Cowen's book title ends with the words "... and will eventually get better again". A return to productivity growth can and will happen in Australia as well. It will be achieved by a return to deeper innovation. Our rapidly changing world means what was once a bold idea is now mundane. Bold and new ideas will come from fundamental research which help us understand how physical and social systems operate. This will allow us to identify radically new and improved ways of manufacturing goods, extracting resources and doing everything industry does better.

That's the challenge before Australia's innovation system. We need to dive deeper and push the boundaries of knowledge into new places. We may also need to discover new industries. If we extend our analogy of the earth moving company it might be that they've reached a point where diversification into new areas (e.g. agriculture, construction...) is vital to enable continued income growth. Whether it be deeper dives or diving into new ponds the answer lies in innovation. Today Australia faces a greater imperative than ever before to find new ways of problem-solving and new sources of value. We are entering the era of the innovation imperative.

Technology has redesigned the landscape for businesses.

Why aren't we more innovative? Australia doesn't have a supply-side problem when it comes to innovation. We've got a demand side problem.

1. ABS, 2013. *Australian System of National Accounts. Catalogue Number 5204.0*, Canberra: Australian Bureau of Statistics.
2. Parham, D., 2012. *Australia's Productivity Growth Slump: Signs of Crisis, Adjustment or Both?*, Melbourne: Australian Government, Productivity Commission.
3. Cowen, T., 2011. *The Great Stagnation: How America Ate All the Low-Hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better*, New York: Dutton
4. Herring, M., 2013. *Has the ideas machine broken down?*, in *The Economist*, The Economist: New York.