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Research Insights

Could tougher environmental policies boost economic growth?

There seems to be a working assumption in Australia that environmental "green tape" inhibits economic growth in the long run. But new research finds the opposite is true.

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Climate change: no longer a distant concern

No longer a distant concern, climate change and environmental degradation are urgent challenges facing the planet. And they're happening now.

According to the 2019 United Nations Climate Change report (UNFCCC, 2019), between 1990 and 2016, global aggregate greenhouse gas emissions increased by 46.7 per cent. In 2018, the global mean temperature had risen about 1°C above the pre-industrial baseline.

Countries around the world have experienced extreme and often unprecedented climate-related disasters including hurricanes, storms, heatwaves and bushfires, as well as slow-onset impacts like sea-level rise, soil degradation and coral bleaching. This is particularly the case for Australia. A range of vulnerable sectors, particularly water, agriculture, ecosystems, health and forestry, are all endangered (UNFCCC, 2019). It is now well accepted by most that no action is not an option.

World leaders will soon gather in Glasgow for the United Nations COP26 summit, where they will be asked for their plans to cut carbon emissions by 2030. This summit is crucial if climate change is to be brought under control.

In Australia, the main argument against more stringent environmental policies has been the concern that their added costs may be a burden on the economy. But experts like Australian economist Professor Ross Garnaut argue in his latest book that if we rise to the challenge of climate change, we "will emerge as a global superpower in energy, low-carbon industry and absorption of carbon in the landscape" (Garnaut, 2019). The Business Council of Australia is now also calling for strong action on climate change[1]. Our major banks and industries recognise that moving to a net-zero economy will create new jobs, opportunities, industries and maintain Australia's competitiveness.

According to Porter Hypothesis in economics (Porter, 1991 and Porter and Van Der Linde, 1995), more stringent environmental policies can have a positive effect on productivity growth by stimulating innovation.

The rationale is that a cleaner environment, in the long run will increase the quality of various production inputs, such as better health of the workforce, and better quality of water and air. Environmental regulations may also act as a possible stimulus for the production of capital goods (for example, machinery, equipment and vehicles that a company uses in the production process to manufacture products and services for consumers) that comply with environmental regulations. Additionally, imposing more stringent environmental regulations may also prompt industries to actively seek for and purge possible inefficiencies from their production processes and, as a result, boost their productivity in the long run.

Key Insights

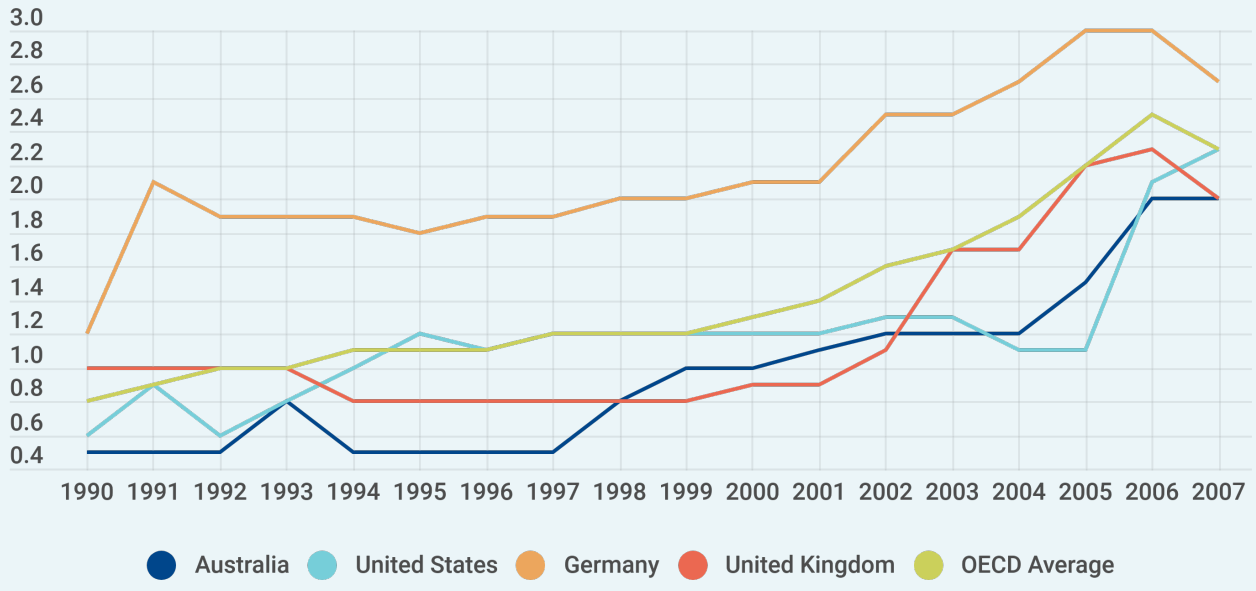
1 Australia ranked last in environmental protection stringency

We rated each nation's environmental policies using the OECD's Environmental Policy Stringency Index (EPS), developed in 2014. The index is a country-specific and internationally-comparable measure of the stringency of environmental policy. Stringency is defined as the degree to which environmental policies (such as a carbon tax and pricing mechanism) put an explicit or implicit price on polluting or environmentally harmful behaviour. The EPS ranges in value from 0 to 6, with higher numbers being associated with more stringent environmental policies.

The 22 OECD nations considered in our study scored between about 0.5 and 3.3 from 1990 to 2007.

All the 22 nations had gradually tightened their environmental regulation between 1990 and 2007. Denmark had the highest and Germany the second-highest average score over the 17 years, and Australia had the worst. Figure 1 shows the trajectory of a few example nations—Australia, Germany, United States and United Kingdom—against the OECD average.

Figure 1: Environmental Policy Stringency of Australia, United States, Germany, United Kingdom and OECD average between 1990 and 2007



2 A benefit in the long run

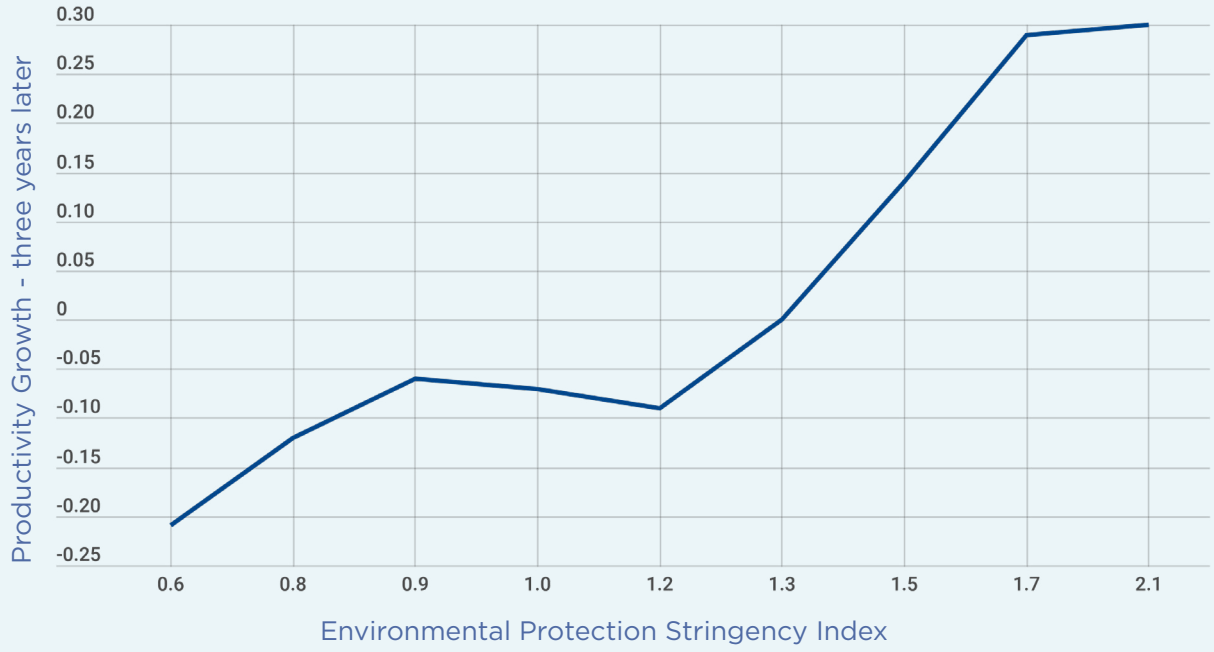
We modelled how productivity would change respectively in one, two and three years if environmental protection regulations strengthened, while keeping everything else about the production process (prices for material, cost of labour etc.) fixed at the average level of the 22 OECD countries, so that we can identify the change in productivity only attributed to change in environmental protection regulations. The three-year result is shown in Figure 2. It shows the estimated total factor productivity (TFP) growth[2] in three years, against a present EPS score, ranging from 0.6 to 2.1 which cover the scores of most countries observed in our data.

We found that tougher environmental policy in previous years, such as a carbon tax and pricing policy with more effective carbon rate, generally boosts a country's productivity growth in the future.

From Figure 2 we can see that productivity growth in three years, on average, would have been higher if the adopted environmental policy setting had been stricter. In particular, from 1990 to 2007, if an average OECD country managed to increase its environmental policy toughness by 1 unit, say from 1.5 to 2.5, its productivity would roughly see an increase of 0.30 percentage points.

While environmental regulations can increase the cost of production initially —for example, a carbon tax makes coal more expensive, which increases the costs of metal production—our results show that adopting tighter environmental policies has a positive impact on a country's overall future productivity growth.

Figure 2: Estimated future productivity growth against present Environmental Protection Stringency Index for an average OECD country.



3 The early bird gets the worm

From Figure 2, it can also be observed that if an average country had adopted an environmental policy setting that was strict enough (for example, with an EPS-score above 1.7), it would have seen a positive productivity growth in just three years time.

This observation indicates that countries demonstrating leadership on environmental protection and adopting stringent policies earlier would also expect to benefit from positive productivity growth sooner.

An important question of our time

The impact environmental policies have on production technology and productivity is an important question of our time.

Our findings show that while there might be a short-term hike in cost, countries whose governments implement strong environmental regulations reap the productivity rewards and economic growth in the long term.

As the US and EU moved forward with their green recovery plans, there was little talk of the climate crisis or the environment in Australia's 2021 Federal budget.

As Australia's largest trading partners make bigger and bolder commitments towards a decarbonised economy and use their COVID-19 recovery budgets to maximise the opportunity to boost a clean energy transition, the Australian Government has committed to a gas-fired recovery over a green one, pouring billions into fossil fuel projects.

In a very recent study, Best et al. (2020) examined data from 142 countries over a period of two decades and found clear evidence that the average annual growth rate of CO_2 emissions from fuel combustion has been around 2 percentage points lower in countries that have had a carbon price compared to countries without. Instead of adopting a wide range of effective and efficient environmental policies, the Australian government has pinned its hopes only on a 'low-emissions technology' approach including, for example, carbon capture and storage (CCS) as a priority technology, to achieve the net-zero emission target. The problems with this approach are most obvious in the context of CCS. For instance, a recent study examined 39 CCS projects in the US and found that more than 80% ended in failure (Abdulla et al., 2021). Australia also has the disappointing experience with its only CCS project so far, Chevron's Gorgon gas field off Western Australia, which fails to deliver on the pollution deal, adding millions of tonnes of more carbon a year than it's supposed to be.

If we want to reap the rewards, we need to act early on implementing policy approaches, such as a carbon tax and carbon pricing policy, which would be more effective and efficient.

Also, given the findings in our study suggest that countries demonstrating leadership on environmental protection and adopting stringent policies earlier would expect to benefit from long-term positive productivity growth, the government should make more ambitious commitments to Australia's 2030 emissions reduction target, to become a world leader in the race to achieve the zero-emission target.

Over a decade ago, Paul Krugman, the Nobel prize-winning economist, famously said: "Productivity isn't everything, but in the long run it is almost everything", which, together with our findings, indicates the urgent need for the Australian government to produce strong environmental protection policies. A more ambitious commitment to Australia's 2030 emissions reduction target would be a good start.

TOTAL PRODUCTIVITY FACTOR (TFP)

Total factor productivity (TFP) refers to the productivity of all inputs taken together. TFP is a measure of the output of an industry or economy relative to the size of all its primary factor inputs including labour and capital stock. It is often considered the primary contributor to GDP growth rate.

The Environmental Policy Stringency (EPS) index is a country-specific and internationally comparable measure of the stringency of environmental policy. Stringency is defined as the degree to which environmental policies put an explicit or implicit price on polluting or environmentally harmful behaviour. This composite index, recently developed by the OECD, renders cross-country comparison over a meaningful time dimension possible. The latest EPS composite index covers 28 OECD and 6 BRIICS countries, i.e., Brazil, Russia, India, Indonesia, China and South Africa, for the period 1990–2015.

[1]. https://www.bca.com.au/energy_and_climate

[2]. Total factor productivity (TFP) refers to the productivity of all inputs taken together. TFP is a measure of the output of an industry or economy relative to the size of all of its primary factor inputs including labour and capital stock. It is often considered the primary contributor to GDP growth rate.

Further Information

Datasets:

The EPS index was collected from OECD iLibrary (OECD, 2016). We also collected information on total values and prices of a country's total industry output and labour, intermediate (comprising energy, materials and services) and capital inputs from the EU KLEMS database for the period 1970–2007 (November 2009 release, see O'Mahony and Timmer (2009) for a summary overview of the methodology and construction of the EU KLEMS database). Among the 28 OECD countries covered in the EPS index, after excluding countries that are not covered in the EU KLEMS database for all the years with overlap between EPS index and the EU KLEMS database and excluding observations with missing values for variables used in our analysis, there are in total 375 observations for 22 OECD countries in the unbalanced estimation panel.

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Further reading

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This Research Insight was based on findings from the above publication, which was subsequently published in *Pursuit* as the following article: 'Tougher environmental policies can create economic winners', Dr Ou Yang, University of Melbourne.

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