

Science for Environment Policy

Environmental taxation in the right place can increase business productivity

Industry has traditionally claimed that strict environmental regulation has a negative effect on its competitiveness. However, a recent theory proposes it may actually increase productivity and innovation. This study used a large database of inter-sectoral transactions to investigate the effect of environmental taxation on manufacturing businesses across Europe. The findings show that environmental regulation can increase innovation and productivity.

Environmental regulation is essential to limit the effects of human activity on the environment. However, some claim that this generates additional costs for businesses, and thus negatively affects industrial competitiveness. The argument put forward is that complying with environmental regulations generates higher operating costs, and so may decrease investments, productivity, and profit margins.

In the 1990s, this view was challenged by economist Michael Porter. He suggested quite the opposite – that strict environmental regulations improve efficiency, promote innovation and increase commercial competitiveness. The hypothesis of his name proposes that properly designed environmental regulations, even if stringent, can improve firms' innovation and productivity by highlighting underlying inefficiencies, with a further positive effect on other sectors and even on national economic competitiveness.

However, empirical studies have failed to reach a conclusion on whether these effects are really occurring. This study put the Porter hypothesis to test, by investigating the effect of [environmental regulations](#) on innovation and productivity in manufacturing companies in Europe. The researchers assessed eight European countries¹ and 13 different manufacturing sectors over the years 2001–2007. The EU-funded researchers² used an empirical framework, which investigates the links between the strictness of environmental regulation, innovation, and productivity.

The authors investigated the effects of environmental taxation within and across industries, using country- and year-specific input-output data from the World Input Output Database (WIOD)³. They were particularly interested in the different effects the taxes may have on downstream and upstream sectors. An example of regulation of an upstream process could be energy taxes on the electricity that is purchased by the manufacturing sector from the power generation sector, while an example of downstream regulation could be emission fees paid by the customers of a manufacturing company that produces abatement equipment.

The results of the analysis supported the Porter hypothesis; measures aiming at improving environmental performance were positively related to both innovation and productivity. This is the key finding of the study, and supports the idea that environmental regulation can be a source of economic competitiveness.

Other results showed that taxes imposed on downstream sectors (i.e. polluting industries that are upstream in the supply chain) had the strongest effects on innovation (measured by number of patents) and productivity (value added for country, sector). The authors suggest this is because downstream taxes induce corresponding upstream sectors to innovate to develop new products that improve the energy efficiency and environmental performance of downstream sectors.

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1. Austria, Belgium, the Czech Republic, Germany, Italy, the Netherlands, Sweden and the United Kingdom

2. Some of this study's results came from the Environmental Macro Indicator of Innovation (EMInInn) project, which is supported by the European Commission under the Seventh Framework Programme. See: <http://emininn.eu/>

3. WIOD is a public database of trade input-output tables for 40 countries and a model for the rest of the world for 1995-2011. It was originally supported by the European Commission under the Seventh Framework Programme. See: http://www.wiod.org/new_site/home.htm

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By contrast, upstream regulation (i.e. taxation imposed on suppliers) was found to have a negative impact on innovation and productivity. The authors suggest that while downstream taxes generate opportunities for innovation and create markets for new goods, upstream regulation constrains productivity as it increases the prices of intermediate inputs.

Within-sector taxes had a positive effect on productivity but no effect was observed on innovation. However, the authors suggest sectors may react to environmental regulations by innovating in ways that cannot be measured by patents (e.g. process innovations).

To conclude, the authors say environmental policymakers should carefully consider how regulations will affect not only the target sectors, but also sectors that are indirectly associated. They also point to the role of upstream sectors, such as suppliers of specialised equipment, in reducing the compliance costs of environmental regulations.

