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Nobel prize recognises two fixers of market failure

by **Richard Holden**

This year's Nobel Prize in Economic Sciences was awarded to William Nordhaus of Yale University for "integrating climate change into long-run macroeconomic analysis" and Paul Romer of the NYU Stern School of Business "for integrating technological innovations into long-run macroeconomic analysis".

Both scholars had been expected to win the Nobel at some point, but not win the prize together.

What ties these two halves of the prize together is that they are concerned with global, long-run macroeconomic questions: climate change and innovation. Before Nordhaus and Romer these had been considered outside the scope of economic analysis. Their prize-winning contributions involved connecting knowledge and nature to economics.

Nordhaus pioneered worked on the economics of climate change. As scientists began to understand the impact of fossil fuels on global warming, Nordhaus began, in the 1970s, to study the interactions between economics and the planet. In the 1990s he developed the so-called "integrated assessment model" which provides a quantitative estimate of relationship between the economy and the planet. There is no doubt this was pioneering.

The key question raised about this work is whether it provides an excuse for cautious action. Nordhaus later went on to put a lot of emphasis on our ability to adapt to climate change, our relative lack of knowledge about it, and even claimed that some countries might benefit from

climate change.

Even to a mainstream economist like yours truly this seemed troubling. It showed that his analysis was likely to underestimate the cost of climate change and hence, for instance, the level of an optimal carbon tax. It also downplayed catastrophic risks which any good analysis should factor in. A small chance of a cataclysmic climate event demands serious action.

To certain scientists and environmentalists it was intellectual treason. On balance Nordhaus gets big points for raising the question of the connection between the economy and the planet; rather fewer points for his answers.

Romer's contribution was to provide and economic model of the evolution of technical change – or what has become known as "endogenous growth theory". His good observation was that knowledge and ideas can be an important driver of long-run economic growth in a market economy. Moreover, they are determined by R&D activities.

Romer highlighted two crucial aspects of ideas. First, they are "non-rival". If one person is using Pythagoras's Theorem it doesn't prevent anyone else from finding the length of the hypotenuse of a triangle. This is very different from standard economic goods. If I am eating a salad it precludes you from eating it. Second, ideas may be "excludable" in that others may be prevented from using them through policies such as patents, or through technologies like encryption. This puts policies and technology front-and-center in the analysis of the production of knowledge, and hence long-run economic growth.

The importance of Romer's work is twofold. First, it has direct implications for policies that foster innovation. Unregulated markets will produce ideas and innovation, but too few. Second, a small increase in annual growth rates compounds up to a large difference in long-run outcomes. The difference between an economy that grows at 2 per cent and one that grows at 2.5 percent is large in the long-run. To paraphrase another economics Laureate, Robert Lucas: "once one starts thinking about it, it's hard to think about anything else".

In a very real sense both of this year's Laureates worked on the economics of market failure. And it is a good reminder that mainstream economics certainly does not advocate completely unfettered

markets. But it does focus on identifying clear market failures before advocating significant government intervention.

Nordhaus pointed out a negative externality and Romer a positive externality. When pollution is not factored into the price mechanism, people pollute too much. A carbon tax allows the price mechanism to work its magic and deliver the socially optimal amount of pollution. Similarly, innovation provides a positive externality so if not factored into the price mechanism there will be too little innovation. A subsidy – in one form or another – gets us back to the social optimum.

This is a bold prize awarded to bold work. It draws attention to climate change on the day that the International Panel on Climate Change suggested we have a dozen years left to take serious action. The Nobel Committee has recognised two scholars who have worked on some of society's biggest issues – climate change and innovation – and in so doing reminded us of their importance.

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