

# The success of the R&D tax credit shows that there can be a role for public policy in stimulating innovation and growth.

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*Competition and labour market flexibility are key for spurring productivity growth, but there are other ways in which policymakers can influence innovation more directly. [John Van Reenen](#) argues that tax credits for business spending on research and development can increase UK firms' market value, productivity and innovation.*



In the wake of the Great Recession, the UK is hardly alone in looking for sources of economic growth. Economists and many other commentators agree that technological innovation must be at the heart of long run growth. It is also widely understood that left to itself the market is unlikely to provide enough incentives for innovation. This 'market failure' is primarily because only a small proportion of the benefits of invention are captured by the firm or individual who spends money and time on research. Most of the benefits of invention 'spill over' to other firms who can copy the new idea without having to pay the upfront research costs. For example, it took a lot of effort to invent the automobile and the personal computer – but once they were invented, imitators crowded in.

This means that there will be too little spent on research and development (R&D) from the point of view of society as a whole. Intellectual property rights, such as patents and copyright, were designed to protect inventors and increase their incentive to innovate. But in most cases patents can be designed around so they do not fully eliminate the market failure.

So can there be a role for public policy in stimulating innovation? Is it driven by fundamental factors, such as culture and luck, which are beyond the ability of governments to influence except in the most minor ways? Research from the LSE's Centre for Economic Performance has challenged the fatalistic attitude that innovation is not amenable to government action. One direct way to influence innovation is through the tax system, in particular by offering a tax break for business spending on R&D. I started working on fiscal incentives for R&D in the mid-1990s after being shocked to discover that the share of UK national income spent on business R&D had declined since the late 1970s. In just about every other developed country, it had been rising.

The United States introduced an R&D tax credit in 1981 under Ronald Reagan, but the UK Treasury had always resisted the idea, arguing that firms were unlikely to increase their R&D efforts significantly in response. Evaluations of the US system seemed to show, however, that after a few teething problems, American firms had responded to these tax incentives. Our review of all the existing evidence showed that when researchers used good quality firm-level data and tracked companies over time, they found that tax credits stimulated significant American R&D spending. Were UK firms likely to be so much more lethargic than their counterparts across the Atlantic?

At that time, international evidence on the effectiveness of innovation tax policy was almost non-existent. No one had even collected systematic information on the tax benefits to R&D across countries over time – not the International Monetary Fund, the OECD, the World Bank or the United Nations. We put together a team and embarked on a major effort to measure the impact of the tax system on the costs of R&D capital across all the major economies over 20 years, finding there had been a major shift towards R&D tax credits and away from direct subsidies. One of the advantages of tax credits over the more traditional grants was that the government could simply set the rules and it did not have to get involved with 'picking winners'. More importantly perhaps, we combined the tax data with information on national R&D and showed that tax credits had a large effect on increasing business R&D. Although a 10% reduction in the tax costs only increased private sector R&D spending by about 1% in the first year after an R&D tax credit was introduced, in the long run R&D volumes rose by a full 10%.

So far, so good. But what we care about is not R&D per se, as this is just an input. We care about economic growth, which will increase wages and consumption. To tackle this problem, we had to develop a new model of 'endogenous growth' that took account of not just the obvious effect of R&D on innovation but also the less obvious 'second face' of R&D, which fosters diffusion of existing innovations. Having more scientists helps the UK catch up with leading-edge countries because they can read and understand new ideas, which can then be 'absorbed' more effectively in the UK economy. For a country like the UK, which is sadly often far from the technological frontier, this is very important. It means that just sitting back and letting other

countries – the United States, Germany, Japan and increasingly China – do all the innovation is unlikely to be the right strategy. A strong R&D base helps a country to imitate as well as innovate.

In a series of studies with Princeton University's Steve Redding we created an econometric model for the whole OECD, which showed how R&D stimulated productivity growth through both innovation and imitation. We combined this with our R&D tax information to simulate the effects of introducing an R&D tax credit in the UK. We found that the benefits of an R&D tax credit would easily outweigh the costs, which implied that it could be a successful policy. But we also cautioned that, as ever, the devil was in the detail: making the tax complicated could unwind its effects. The proposals became part of Labour's 1997 manifesto, which ushered in the first ever R&D tax credit in the UK in 2001 – initially just for small and medium-sized enterprises, but later extended to firms of all sizes.

The R&D tax credit is under review by the current government, but it looks like it will remain a permanent fixture of the fiscal scene. The UK's R&D intensity stopped declining in the mid-2000s, which coincides with the bedding down of the R&D tax credit. This could be coincidence and more rigorous evaluations of the effects of the fiscal incentives are needed. Nevertheless, the initial findings are encouraging and our work in progress suggests that US R&D tax credits raise firms' market values, productivity and innovation.

The R&D tax credit story is a useful parable of the interaction of fundamental economic research with policy development and implementation. It contrasts with the 'patent box', a poorly targeted policy that consists of tax benefits to the royalties on patents: such rewards create few 'spillovers' as the research is already done. The patent box policy was proposed in the dying days of the Labour government and it will waste around £1 billion a year at a time when the country can ill afford it. While this looks like being another of the few Labour policies that the government is continuing, in this case the continuity is unfortunate.

*The full version of this article first featured in the Autumn 2011 edition of CentrePiece magazine, which is [now online](#).*