

# The Effectiveness of R&D Tax Credits

written by Lauri Moon | August 10, 2016

(SSTI – Jonathan Dworin: 7-28-16) When the U.S. government made their R&D tax credit *permanent* in December 2015, it made a long-term commitment to using incentives to entice private firms to invest in research and development, joining many countries around the world. Although [most studies](#) find that R&D tax incentives promote R&D, there is little consensus on the extent of this effect. A recent firm-level analysis from the United Kingdom finds some of the strongest evidence to date on the effectiveness of R&D tax credits in incentivizing innovation. At the same time, however, other studies suggest other elements of a national economy such as education and infrastructure may be more important.

In [Do Tax Incentives for Research Increase Firm Innovation? An RD Design for R&D](#), Antoine Dechezleprêtre, Elias Einiö, Ralf Martin, Kieu-Trang Nguyen, and John Van Reenen – four researchers from the London School of Economics – analyze a 2008 policy that changed the threshold for what size businesses counted as a small and medium-enterprise (SME) for the UK R&D Tax Credit system. Although the United Kingdom has had an R&D tax credit in place since the year 2000, firms with assets above €43 million (47.6 million USD) but below €86 million (95.2 million USD) were not counted as SME's prior to 2008; after the policy change, however, they were. Overall, the authors find that UK business R&D would be 10 percent lower in the absence of the tax breaks.

The authors utilize a “regression discontinuity design” to best view the impacts of the new tax threshold. Using confidential access to firm tax records and accounts from more than two million businesses, the authors are able to assess how firms changed their approach to R&D before and after the change went into place. *They find that expenditures on R&D roughly doubled and patenting increased by approximately 60 percent.* Additionally, the authors find that firms receiving a larger incentive to perform R&D through the policy change grew in both sales revenue and in number of jobs.

No other policies were implemented around the threshold analyzed, the authors argue, so the large jumps in both R&D expenditures and in patenting were likely due to the new policy. While increases in R&D expenditures are noteworthy, the authors consider the impact on

innovation and patenting particularly important. One concern with R&D tax credits, as mentioned by the authors, is that some firms may re-label other activities that were not previously considered R&D as a means to take advantage of the credits. While this would, perhaps, explain some of the variation in R&D expenditures, there is no incentive to do this for patenting. Furthermore, the authors find evidence that the quality of patents were not negatively impacted; firms increased the rate at which they applied for both EU-wide patents and UK-only patents, while the citation rate per patent did not decline.

The authors find that a 10 percent fall in the price of R&D generates an approximately 26 percent increase in the volume of R&D, an amount that is larger than that found in previous studies. The authors suggest that one potential reason for this is that most studies focus on large firms or on aggregate amounts that are heavily influenced by large firms, while the UK policy analyzed by the authors focuses explicitly on SMEs. Given that smaller firms are more likely to face cash constraints to fund their innovative endeavors, they were more responsive to the policy that effectively made these activities more affordable.

In the newly released book, [\*Rethinking Investment Incentives: Trends and Policy Options\*](#), the fourth chapter entitled *Use of Investment Incentives: The Cases of R&D Related Incentives and International Investment Agreements* and written by Christian Bellak and Markus Leibrecht, highlights the economic case for investment incentives, especially around topics such as research and development.

In the chapter, the authors suggest that the most important justification for public R&D investment incentives is rooted in an apparent positive discrepancy between private and social returns from R&D, which could lead to an underinvestment in R&D by profit-maximizing firms.

In categorizing R&D incentives, the authors distinguish between *direct incentives* and *fiscal incentives* and find considerable variation across nations. While all OECD countries offer direct incentives for R&D through subsidies, loans, and government procurement, not all countries grant fiscal incentives, which measure revenues foregone through programs such as R&D tax credits, R&D allowances, and other indirect government support.

The authors present varying degrees of empirical evidence on the effectiveness of R&D investment incentives, but ultimately conclude by noting that these incentives are of second-order importance for promoting R&D intensiveness, especially in developing countries. Instead, the authors posit, countries should focus more on continuously improving the institutions

needed to conduct intensive R&D, such as education systems that develop human capital, telecommunication infrastructure to support connectivity, responsible governance, and a transparent approach to patents.

Coupled together, these two pieces shed light on the impacts of research and development tax credits. One potential issue in measuring the effectiveness of R&D tax credits is that most empirical analyses take the perspective of the state or nation offering the credit and evaluate the aggregate, rather than assessing the impact on the firm.

At the aggregate level, Bellak and Leibrecht note that effectiveness of these policies is mixed; although many nations offer incentives for R&D, many factors could be considered more important to boosting innovation. For firms in an already developed economy, the Dechezleprêtre et al study, however, shows that *R&D tax credit policies could be particularly meaningful to SMEs*.

The findings of Bellak and Leibrecht's chapter largely echo a 2013 *Digest* article that [examined](#) the effectiveness of tax credits at the state level. That article found R&D tax credits "can be an effective tool in a state's economic development strategy, but only when designed with a particular state's economy in mind. *R&D incentives are most effective in states that already have a significant level of research activity, and a substantial high-tech business community.*" In other words, R&D tax credits may help to incentivize innovative activities, but they are hardly the only force at play.