

R&D subsidies make firms nearly twice as innovative

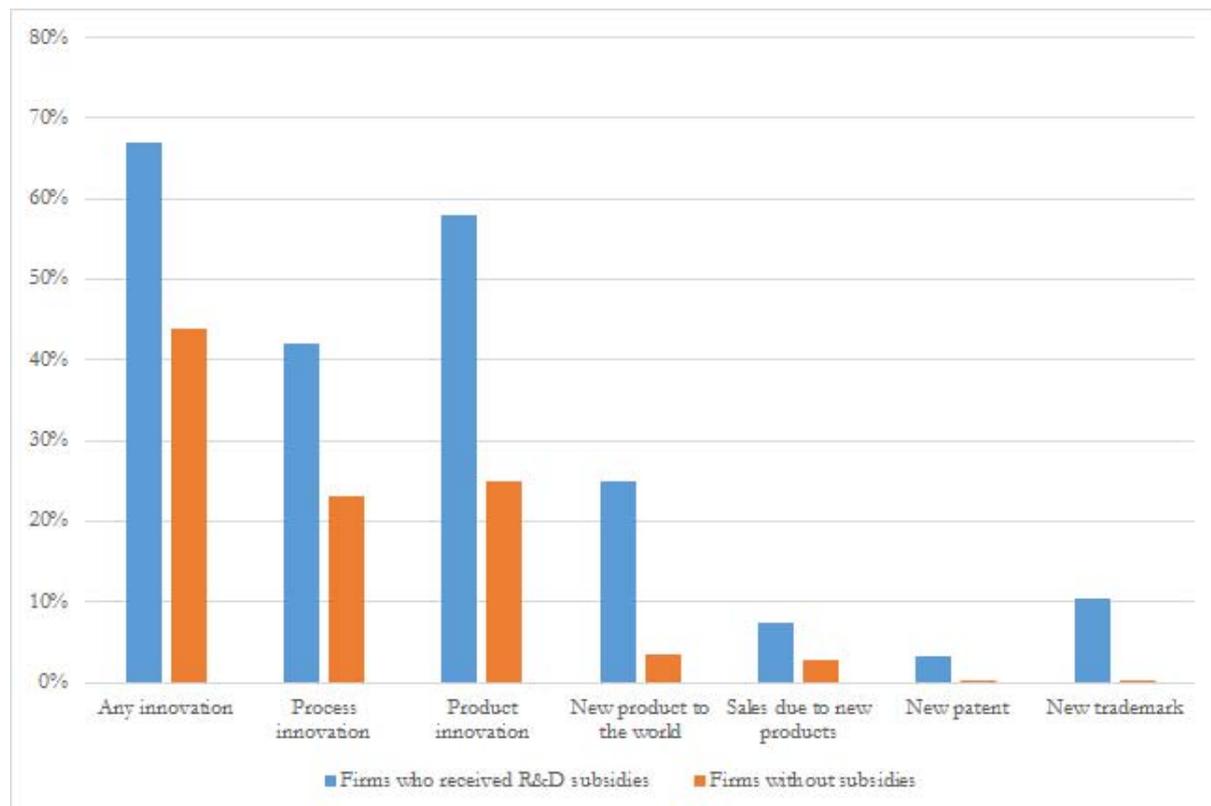
The Government spends millions per year on direct subsidies for research and development (R&D) in New Zealand businesses.

New research by Motu Economic and Public Policy Research - a not-for-profit, non-partisan research institute – found that receiving an R&D grant almost doubles the probability that a firm introduces a major innovation, defined as a product or service that is new to the world.

Government support for R&D ranged from NZ\$33 million to NZ\$90 million per year during 2009–2013 in various forms, including training, advice and funding. There were two main types of R&D funding: project grants and capability building grants.

Adam Jaffe and Trinh Le from Motu studied the levels of innovation among firms who received subsidies as compared to those who were not funded using data from New Zealand's Longitudinal Business Database. This is a longitudinal database that links administrative and tax data with survey data.

Jaffe and Le used seven measures of innovation outputs. Firms that received R&D grant in the previous three years were more innovative than other similarly characterised firms by every measure.



The study found no evidence that the effects of R&D grant receipt on these measures of innovation differ significantly between small to medium and larger firms, or between pre- and post-Global Financial Crisis periods.

“R&D grant receipt is estimated to increase the probability of applying for a patent by 55 to 65 percent,” said Dr Adam Jaffe, lead author of the research.

The study examined two forms of R&D grants. The average capability building grant was \$14,500 per year while the average project grant was \$326,500 per year in 2012.

“Project grants have much larger effects on innovation outcomes than capability building grants, which is to be expected, given the nature of each type of grant. Project grants raise the probability of product innovation and increase the share of sales due to new products. It seems that capability building grants can only boost innovative activity when they are subsequently accompanied by a project grant,” said Dr Jaffe.

This is indirect evidence that government assistance with limited funding is not effective in boosting innovative activity.

“Although there’s no way to know for sure if the differences between firms who are awarded funding and those who aren’t has created a selection bias in our research, our findings are broadly in line with recent international evidence from Japan, Canada and Italy that found positive impacts of public R&D subsidy on patenting activity and the introduction of new products,” said Dr Jaffe.

“A few years ago, the Ministry of Economic Development researched the impact of these R&D grants on sales, employment and productivity growth. They found some evidence of impact for capability building grants in small firms, but no evidence of impact for R&D project grants. Reconciling these results will require more research, looking at the relationship between innovation and economic performance for firms, regardless of whether or not they receive government R&D support,” said Dr Jaffe.

The working paper “[The impact of R&D subsidy on innovation: A study of New Zealand Firms](#)” by Motu researchers Adam Jaffe and Trinh Le, was produced under the Longitudinal Business Database Partnership, along with “[Measuring the innovative activity of New Zealand firms](#)”, by Simon Wakeman (NZPC) and Trinh Le (Motu).

The Wakeman and Le paper shows that R&D expenditure and activity is increasing across Kiwi firms, but rates of innovation are dropping. This apparent weakening of the link between R&D and innovation in the private sector overall only reinforces the importance of understanding the impact of government R&D programmes, as studied by Jaffe and Le.

The research was funded by the [Productivity Hub](#) under the Longitudinal Business Database Productivity Partnership programme.

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About Motu

Motu Economic and Public Policy Research is an independent economic research institute which never advocates an expressed ideology or political position. A charitable trust, Motu is founded on the belief that sound public policy depends on sound research accompanied by rigorous public debate.

Motu is the top-ranked economics organisation in New Zealand. It is in the top ten global economic think tanks, according to the Research Papers in Economics (*RePEc*) website, which ranks all economists and economic research organisations in the world based on the quantity and quality of their research publications.

If you would like to discuss these findings with Adam Jaffe, you can contact him on adam.jaffe@motu.org.nz or on 022 394 4501.

If you would like to receive the numbers behind any of the graphs, please reply to this email or contact Ceridwyn Roberts on 021 243 6995.

Background information

	Firms who received R&D subsidies	Firms without subsidies
Any innovation: whether the firm developed or introduced any new or significantly improved goods or services, operational processes, organisational/ managerial processes, or marketing methods in the last financial year	65%	58%
Process innovation: whether the firm implemented any new or significantly improved operational processes (i.e. methods of producing or distributing goods or services) in the last two financial years	41%	35%
Product innovation: whether the firm introduced onto the market any new or significantly improved goods or services in the last two financial years	55%	45%
New product to the world: whether the firm introduced to the world new goods or services that were developed by itself or developed by itself in partnership with others in the last two financial years	22%	12%
Sales due to new products: Percentage of sales that come from new goods and services in the last financial year (zero for firms without product innovation)	7%	5%
New patent: whether the firm applied for a patent in the last financial year	2.5%	1.4%
New trademark: whether the firm applied a trademark in the last financial year	9.0%	9.1%

Of the firms in the LBD studied who received project grants:

- 79 percent of project funding went to firms aged 10 years or over.
- 49 percent was for firms with at least 100 employees, compared with 30 percent for firms with under 20 employees.
- The largest receiving industries of project funding were 'Machinery and Equipment Manufacturing' (42 percent) and 'Business Services' (37 percent).

Firms who received subsidies were also:

- more than seven times more likely to have received non-R&D assistance.
- older and larger.
- more likely to be state-owned.
- more likely to belong to a business group.
- more likely to have recently requested new or additional capital (both with and without ease).
- less likely to operate in a perfectly competitive market.
- more likely to have international involvement (exporters, foreign owned, or with ownership of overseas capital).