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# How R&D subsidies helped Germany to weather the crisis

Government subsidies for R&D are usually justified on the grounds of their long-term economic effects, via the innovations that they help to bring to market. But all government spending has further consequences: simply by adding money to the economy, it can stimulate demand and help to create or secure jobs.

Little is known about these short-term effects of R&D subsidies, mainly because governments have long shied away from deficit spending. But during the economic crisis of 2008 and subsequent recession, many nations sought to stabilise their economies through initiatives to boost demand, consumption and lending.

In Germany, one such scheme involved the rapid expansion of an R&D subsidy available to small and medium-sized enterprises: the Central Innovation Programme for SMEs, or ZIM. The aim was to encourage companies to keep up their innovative activities, remain active and retain staff.

The ZIM scheme provides grants of up to €350,000 for individual companies with fewer than 250 employees, or a maximum of €2m for collaborative projects, and requires a proportion of co-funding that varies depending on the size of the company or companies involved.

In 2009, at the height of the crisis, the federal government added €900 million to the scheme's €626m budget. It also changed the criteria so that firms with up to 1,000 employees were eligible. In 2011, the scheme returned to its pre-crisis size and scope.

We have analysed the short-term effects of this expansion, and found it to have been a strikingly effective form of deficit spending. By our calculations, the spending triggered by the €900m increase in the programme's budget in 2009-10 added €3.9 billion to the national economy and secured or created nearly 70,000 jobs. Without the subsidy, Germany's GDP in 2009 would have shrunk by 0.5 per cent more than it did.

The extra money funded 4,237 additional grants in 2009-10, on top of the 924 made through the basic budget. Government figures show that their recipients contributed an additional €2.4bn—2.8 times what they received.

Firms spent this money on salaries, equipment, consumables and services. The vendors and employees spent this money in turn, and so on, so that the public funds for R&D triggered a chain reaction that touched all areas of the economy.

This effect is known as a multiplier. It reflects the total economic activity result-

ing from a unit of spending or, in other words, the number of times each euro is spent instead of being put into savings or used to pay off a debt.

Using a model of the functional relationship between different areas of an economy, called an input-output model, we calculated that the multiplier for the ZIM subsidy in 2009-11 was just over two. This is significantly more than other forms of economic stimulus, such as vouchers for private consumption, which have multipliers of less than two.

Our analysis treated R&D spending as an investment. In contrast, national accounting has historically treated it as expenditure—something that disappears in the production process, like fuel. It is recognised that this does not capture the long-term benefits of R&D, and in 2009 the UN recommended treating such spending as part of a nation's capital. In 2014, the European System of National and Regional Accounts followed suit, making this classification mandatory for EU members.

Even though the boost to the ZIM scheme represented less than 1 per cent of Germany's €100bn stimulus package, it helped to make the country's recession shorter and shallower. Added to this, we can expect to see the traditional fruits of R&D spending appearing in the next five to ten years.

Speed is crucial in stimulus spending. Another advantage of R&D subsidies is that they can be allocated and spent in a matter of months, and then stopped just as quickly. Construction and infrastructure projects, in contrast, can take longer to plan and implement than the recession they are meant to address.

In this light, Horizon 2020's emphasis on funding small businesses is positive. But R&D spending is not an economic cure-all. The ZIM scheme played to Germany's strengths, including a strong base of SMEs active in R&D.

Not all parts of Europe are equipped to make best use of such subsidies. Grant funding for R&D will only be well spent if it is part of a holistic approach that also takes account of physical infrastructure and human capital. This will require greater coordination, at both national and European levels, between education, research and economic ministries.

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'Speed is crucial: R&D subsidies can be allocated in a matter of months.'