

*Our latest note highlights the results of a program that provides grants to consortia of firms and research entities in Poland, showing it spurred innovation for the local market.*

### **Research grants for science-industry collaboration: Do they spur innovation?**

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Collaborations between science and industry are becoming increasingly important for the innovation process, in part because many new inventions are directly rooted in science, such as biotechnology, information technology, and new materials. Yet there are several barriers that inhibit collaboration, including financing constraints, information asymmetries which prevent researchers and firms interacting, and transaction costs in negotiating collaboration agreements.

Government subsidies may provide an incentive to seek out these connections and may foster increased interaction between firms and scientific units. While such policies have been used for some time in the U.S., Western Europe, and Japan, they are now also becoming common in middle and high income countries that are attempting to close the gap with the most developed countries through innovation. We studied the effect of the In-Tech program in Poland on science-industry collaboration, research and innovation, and product commercialization.

#### **Poland's In-Tech Program**

In-Tech is one of two program tracks offered under Poland's National Center for Research and Development (NCBiR)'s Innotech program. It is a program designed to support research entities and businesses in carrying out innovative projects in scientific and industrial areas. It does this through providing grant funding, mostly to scientific consortia consisting of at least one research unit and at least one enterprise. The median grant size is 2.3 million PLN (approximately USD 660,000), and is provided over three years with the intention of taking ideas from

the research stage through to commercialization.

Following a request from NCBiR, the World Bank conducted an impact evaluation of the In-Tech program.

#### **Data and Study Design**

Applications to the program receive a score based on peer reviewer ratings and those with a score above a threshold are offered funding. This feature provides a mechanism to rigorously evaluate the impact of the program, by comparing consortia with scores just above the threshold for funding to those just below this threshold using a regression-discontinuity analysis. Using data for applicants to the 2012 and 2013 calls for proposals, we show that applicants on either side of the funding threshold have similar characteristics, suggesting this approach can provide valid estimates of the impact of the program.

We focus on the 459 applications with scores within eight points of the funding threshold, and the lead research institute and enterprise within each consortia were surveyed between June and September 2016. Responses were received for 87 percent of projects. Since regression discontinuity analysis can be sensitive to the choice of estimation technique, we use several different methods to examine robustness of the results to the choice of functional form and bandwidth.

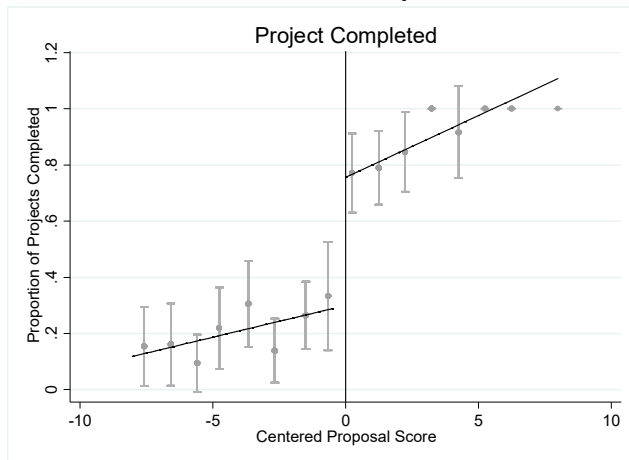
#### **Results**

- In-Tech funding provides additionality, largely funding projects which would not otherwise receive public funding and which would not otherwise be completed.

**Do you have a project you want evaluated?** DECRG-FP researchers are always looking for opportunities to work with colleagues in the Bank and IFC. If you would like to ask our experts for advice or to collaborate on an evaluation, contact us care of the Impact editor, David McKenzie ([dmckenzie@worldbank.org](mailto:dmckenzie@worldbank.org))

There is a 75 percentage point increase in the likelihood of receiving public funding as a result of In-Tech and a 59 percentage point increase in the likelihood that the project gets completed (see figure 1).

**Figure 1. Funding Resulted in Additionality**



Notes: Plot shows means and 95 percent confidence intervals within one-unit-interval bins on either side of the funding cutoff. Local linear regressions over the 8-point range plotted on either side of the cutoff.

- There is a 14 to 18 percentage point increase in the likelihood of new collaboration occurring between the leader and partner as a result of In-Tech funding, but most of the funding goes to consortia in which the enterprises and researchers were already collaborating before applying to the program.
- Receiving In-Tech funding increases the probability that the consortium applied for a patent related to their proposed project by 41 percentage points, and increases the likelihood of having a research publication out of this research by 59 percentage points. However, to date, many of these projects have not produced research that contributes at the international quality level. 44 percent of

funded projects have no publications in English, and 41 percent have no citations to date. Most of the patents applications have been to the Polish patent office, with no significant increase in applications to the European office. Also, there are no significant impacts on patents or publications for other projects consortia are undertaking outside of In-Tech.

- Receiving In-Tech funding results in a 23 percentage point increase in the likelihood of having a product ready to sell, with 53 percent of funded projects having reached this stage. Nevertheless, only 15 percent of funded consortia currently sell their product outside of Poland, and the new products only constitute 1 percent of total sales for the median firm.

### Policy Implications

Lack of funding appears to be a binding constraint for research and development activities, and the In-Tech program alleviates this constraint. The main reason given by consortia for not working on the project if it was rejected by In-Tech was that they could not fund it. As a result, In-Tech is funding research and development projects that would otherwise not take place. Whether the quality and social value of this innovation warrants public support is difficult to assess over the current time frame.

Research and innovation is a long-term process, and our analysis measures outcomes 2.5 to 3.5 years after funding was received. This captures the time needed for the initial research activities to have occurred, but it can take more time for patents to be granted, publications to be cited, and new innovations to achieve commercial success.

For further reading see: Bruhn, Miriam and David McKenzie. (2017) “Can grants to consortia spur innovation and science-industry collaboration? Regression-discontinuity evidence from Poland.” [World Bank Policy Research Working Paper no. 7934](#)

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