Interventions to promote technology adoption in firms: limited evidence of positive effects

Some interventions lead to an increase in technology adoption among firms across manufacturing, services, and agriculture sectors, but these effects are context-specific, as well as intervention-specific. The effects of these interventions on other firm performance measures such as farm yields, firm profits, productivity, and employment are mixed.

What is this review about?
This review summarizes the evidence on the effects of interventions that may affect technology adoption, such as providing firms with training or grants, or a change in a trade policy. Interventions can be carried out by governments, private institutions (such as NGOs), or researchers trying to understand technology adoption, or they can occur as natural experiments.

What studies are included?
Included studies had to analyze firms, and examine the effects of an intervention. Studies at country or regional level were omitted.

Interventions were broadly defined, including the direct provision of funding for technological adoption (Direct Financial Support), support to pay for the cost of the adoption projects without directly providing funding (Indirect Financial Support), non-pecuniary interventions (Other Direct Support), and rules, policies, and characteristics of the environment that affect agents’ incentives (Regulations and Standards).

Studies had to assess the causal effects of interventions with experimental and quasi-experimental methods, excluding those that look at correlations. And they had to have technology adoption as the primary outcome of interest. This therefore excluded studies that do not present a measure of technology adoption.

Overall, 80 studies were included in the review, 79 analyzing effects of technology adoption in developing countries and one in high-income countries. These studies analyzed the effects on technology adoption in 4,762,755 firms.

What is the aim of this review?
This Campbell systematic review seeks to answer three questions: To what extent do interventions affect technology adoption in firms? To what extent does technology adoption affect profits, employment, productivity, and yields? Are these effects heterogeneous across sectors, firm size, countries, workers’ skill level, or workers’ gender?
What are the findings of this review?

Some interventions lead to positive impacts on technology adoption among firms, but these effects are context-specific and intervention-specific. In manufacturing and services, 19 of the 33 studies analyzed find positive and statistically significant standardized effects on technology adoption. In agriculture, 20 of the 47 studies analyzed find positive and statistically significant standardized effect sizes.

Most studies focused on analyzing the effects of “Other Direct Support,” which includes non-pecuniary interventions such as extension services, training, consulting, and SMS reminders. Overall, one group of interventions cannot be said to lead to a higher impact than others. Furthermore, the effects of these interventions on other firm performance measures such as farm yields, firm profits, productivity, and employment were mixed.

Due to the wide range of interventions and outcomes used across the studies analyzed, it is not possible to assess whether effects are similar across groups, or to calculate an average treatment effects across studies.

What do the findings of this review mean?

A statistically insignificant finding for a type of intervention in a particular context does not mean that all interventions of that type are not worthy of consideration. Policymakers should pay attention to how programmes can be improved and better tailored to particular environments, to achieve better outcomes.

Areas of future research could include both an understanding of barriers to technology adoption, and interventions that lead to increased adoption through removal of those barriers. This should analyze interventions that are less studied. For example, “Indirect Financial Support” including interventions such as access to credit, and incentive payments, as well as “Regulations and Standards” have been less studied for their effects on technology adoption.

Studies should also provide all the information required to compute standardized mean differences. They should also improve reporting on heterogeneous effects and the Hawthorne effect (in which the monitoring process itself affects behaviour).