

The Impact of the Clean Development Mechanism on Firms: Evidence from India

The Kyoto Protocol's Clean Development Mechanism (CDM) has the potential to drive the growth of clean and sustainable technology in developing countries such as India. However, it is not particularly effective in its current form. The CDM therefore needs to be given a more explicit technology transfer agenda. More investment is also needed to improve the capability of firms to adopt and use green technology. Such an approach is vital as, with appropriate reforms, the CDM can be turned into a valuable instrument to promote the diffusion of such technology in developing countries.



Background

Climate change is a global problem, but it is a particular challenge for developing nations that are dependent on climate-sensitive sectors such as farming. One of the key ways in which such countries can respond is to improve their technological capabilities and develop low carbon economies. The Kyoto Protocol's Clean Development Mechanism (CDM) was established in 1997 to incentivise the private sector (through the use of carbon credits) to transfer low-carbon technology to developing countries.

Currently, the CDM is facing a number of challenges and the usefulness of the mechanism is being questioned by both policymakers and climate advocates. However, it is clear that it will not be easy to design and implement a new instrument to take its place.

To provide vital information on the effectiveness of the CDM, and to help policy makers plan a way forward, Aradhna Aggarwal, from the Copenhagen Business School, has assessed the impact of CDM implementation on host firms' 'dynamic capability' – their capability to appropriately adapt and integrate new technology and to use it to enhance their operations and sustainability.

Approach

The analysis focused on India, which is one of the largest CDM-implementing countries in the world. As on October 2016, India had 1,599 CDM-linked projects (over 21 per cent of the global share). It has also issued 0.51 billion tons of Certified Emission Reductions (CERs) (more than 13% of worldwide CERs).

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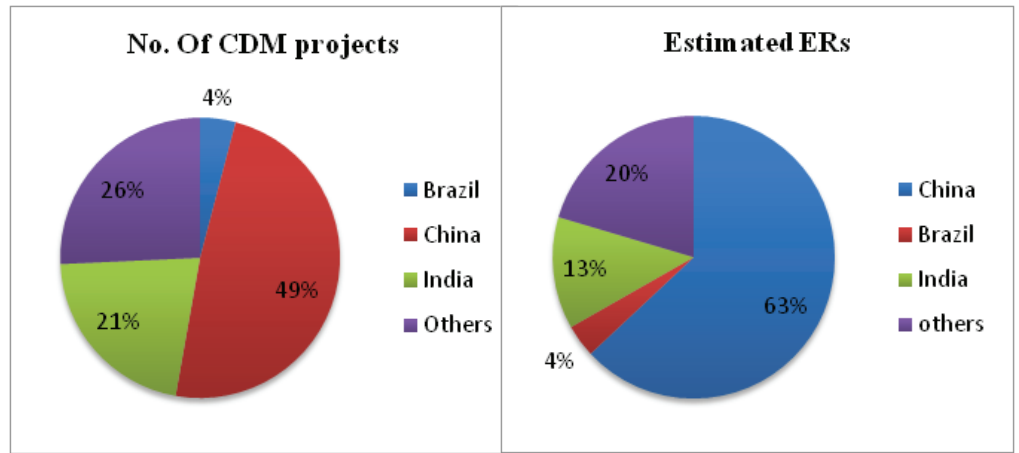
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To get a true understanding of the impact of CDM projects on the firms that implement them, the study employed a quasi-experimental design, the difference-in-difference (DiD) technique. This allowed a comparison of firms that had implemented CDM-projects and those that had not. The analysis drew on information from the balance sheets of 612 Indian firms from the period between 2001 and 2012.

The study used two sources of information: the CDM database of the Institute for Global Environment Strategies and the Centre for Monitoring Indian Economy's PROWESS database of Indian companies. It used this data, to assess the impact that CDM projects had on three indicators of dynamic capability: firms' indigenous R&D efforts, their fuel efficiency and their total factor productivity growth.

Results

Overall, the implementation of CDM projects does have some impact on the dynamic capabilities of firms, however, the impact is generally statistically weak and depends on the type and size of the projects, and the size of the firms involved.

The impact of CDM on domestic R&D is positive, particularly for large firms. There is also evidence that involvement in CDM project produces small improvements in fuel efficiency.

Large firms are more likely to improve their R&D while implementing multilateral/bilateral CDM projects. Their productivity growth is also positively affected by the implementation of large unilateral projects. It is clear that unilateral CDM implementation offers host firms an opportunity of 'learning by doing' to build their dynamic capabilities.

Small firms are more likely to augment R&D expenditures when they implement large CDM projects, but such firms learn more from the implementation of unilateral projects (which provide them with significant productivity enhancements).

In general, large and multilateral projects produce R&D and fuel-efficiency enhancements (although these are weak), while large unilateral projects tend to enhance productivity.

Recommendations

It is clear that the CDM has the potential to lay a foundation for the growth of green technology in developing countries. It is also clear that it is not particularly effective in its current form. This is partly explained by the finding that the CDM is more focused on the generation of low-cost CERs to help developed countries to meet their Kyoto commitments.

There is therefore a need to give the CDM a more explicit technology transfer agenda. Governments and firms should also invest in building local absorptive capacity to ensure that clean and greentechnologies are taken up by firms in developing countries.

To realise the full potential of the CDM it will also be necessary to introduce institutional reforms so that the transaction costs associated with administering the mechanism can be kept to a minimum. This will benefit small firms in particular. Finally, there is a need to develop a more attractive environment for investors and to provide more funding for CDM implementation.

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