

How best to capture value from basic research

As companies increasingly turn to outside partnerships for innovation, understanding how best to make use of them becomes paramount.

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With less basic research being performed by companies, their ability to capture value from their relationships with universities and research consortia grows in importance.

Using partnerships to bridge the gap between basic research and its application in the development of new technology is an established yet murky process. Knowledge, at this stage, is still tacit, or uncodified, and therefore harder to transfer.

In the working paper, "[Mind the Gap: Capturing Value From Basic Research; Boundary Crossing Inventors and Partnerships](#)," IESE's [Bruno Cassiman](#), together with Reinhilde Veugelers and Sam Arts of KU Leuven, examines the complementarity of partnerships and individuals in transferring knowledge across organizational boundaries.

They stress the importance of an institutional link between organizations to exploit the advantages of an inventor moving between organizations.

How firms benefit from research

Little is known about the process by which firms access basic research and transform it into applied research.

Basic research is necessary to acquire new knowledge and is performed without an application or use in sight. It is typically conducted by organizations with broad objectives.

Basic research guides applied research in the most promising directions and helps to avoid wasteful experimentation.

The challenge is to bridge the gap between the two.

Bridging the gap

Bridging is needed when projects are handed off and before insights can be translated and commercialized.

The authors find that individual inventors who are actively involved in both basic and applied research, and who move across firm boundaries, transfer knowledge more effectively and lead to more innovative performance.

As such, it is important to analyze inventor networks, paying special attention to the different organizational structures in which these inventors are embedded.

After all, these networks and structures affect the incentives of inventors to develop, communicate and assign basic research activities. The complementarity between establishing a partnership and inventors crossing organizational boundaries is critical for capturing returns from basic research.

The impact on invention

The authors studied more than 1,000 patents that arose from the use of different knowledge-transfer mechanisms between semiconductor companies and the Belgian Interuniversity Microelectronics Center (IMEC), which carries out basic research that is likely to form the basis of technological applications up to a decade ahead of industrial needs.

They differentiated these company-owned patents according to whether the patent was developed by a boundary-crossing inventor and whether the firm was a formal IMEC partner.

Boundary-crossing inventors of these companies had been active in the generation of intellectual property at IMEC at some point in time. This implied some mobility, i.e., the crossing of organizational boundaries during the inventor's career.

The authors outlined four types of company patents:

- *Boundary Crossing Partner*. A patent assigned to an IMEC partner and developed by a boundary-crossing inventor.

- *Citing Partner*. A patent assigned to IMEC partners and citing an original IMEC patent, but without being developed by a boundary-crossing inventor.
- *Boundary Crossing Non-partner*. A patent assigned to non-partner companies, but with a boundary-crossing inventor on the patent.
- *Citing Non-partner*. A patent assigned to non-partner companies and citing an original IMEC patent, but without being developed by a boundary-crossing inventor.

Invention quality & internal development efforts

The authors looked at invention quality subsequent to the linking activity, measured by the number of citations received from subsequent inventions.

For firms that were not IMEC partners, patents developed with boundary-crossing inventors were not more valuable compared with patents developed without that assistance.

However, patents of IMEC partner firms developed with the assistance of boundary-crossing inventors were found to be of much higher quality. During their tenure at IMEC, these inventors picked up valuable basic research ideas that were subsequently translated into applied company technologies and patents.

The authors also looked at the internal translation and subsequent development effort of the invention by the firm, measured by the proportion of citations that were self-citations, i.e., an organization citing its own prior inventions. Such citations would reflect the capacity of a firm to reap the returns of bridging the gap with basic research.

IMEC partners were more likely to build on these technologies extracted from their IMEC partnership and had more self-citations.

These findings suggest that the combination of boundary-crossing inventors and an institutional partnership link is significant in developing high-quality inventions, while firms with an institutional partnership link make more of an effort to develop these technologies internally.

Boundary-crossing inventors, hence, seem to play a significant role for firms to actually bridge this gap between basic and applied research.

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