

NISTEP Seminar

Phone Home? Headquarters' Involvement in Foreign University Collaboration

On 24 October 2017, Professor René Belderbos of KU Leuven, one of the most renowned researchers in the field of innovation economics, gave a lecture entitled "Phone Home? Headquarters' Involvement in Foreign University Collaboration" at the National Institute of Science and Technology Policy (NISTEP), Tokyo. In his lecture, he discussed why firms opted for international research collaborations with foreign universities through R&D facilities at headquarters, instead of collaborating through their local R&D unit.

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Phone Home? Headquarters' Involvement in Foreign University Collaboration

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Professor Belderbos commenced his lecture by explaining the title "Phone Home?" which comes from the famous movie "E.T.". The beginning of the title highlights the need for local resources to connect to the central R&D laboratory. He mentioned that the goal of his talk was to attempt to understand the paradoxical phenomenon that large multinational companies with a network of dispersed R&D units often seek to bypass their affiliate's local R&D unit and instead collaborate with foreign universities directly from the headquarter's R&D unit.

Science is an important input for innovation in firms, in particular for the biopharmaceutical industry. The biopharmaceutical industry is primarily a science-based industry where drug development is reliant on basic scientific research conducted at universities and at spin-offs. Scientific research in this industry is important for firms' innovative performance.

Biopharmaceutical firms engage in scientific research collaboration with university scientists for a number of reasons. Firstly, by collaborating with scientists, firms get access to tacit knowledge, unpublished codified knowledge, as well as unique expertise, resources, and insights which otherwise are not available to them. Secondly, basic research experience allows for a better understanding of

scientific principles underlying diseases and the workings of drugs. Firms are also able to get a better view at the broader technological landscape. Such firms can then save cost on clinical and pre-clinical trials because they have a better understanding of promising molecules for drug development. Through these mechanisms, collaboration with universities can increase firms' overall innovation performance.

The related literature also suggests that proximity improves the effectiveness of university-industry collaborations. Proximity allows for frequent contacts with the university scientists through face-to-face interactions and collocation of R&D units. It also facilitates transfer of tacit or sticky knowledge that is more difficult to transfer. Moreover, since firms and universities work at some institutional distance with companies focusing on drug development and scientists on their publications, bridging this gap requires building of trust which is facilitated by collaboration in proximity.

These arguments suggest proximity matters a lot, however, the paradox is that a substantial share of scientific collaboration occurs at a distance. Professor Belderbos pointed out that international or geographically-distant collaboration is nowadays common in scientific research and industry-science collaboration. This fact is suggested by not only some primary research but also findings from his own dataset of about 150 biopharmaceutical firms. Professor Belderbos added that the dataset shows that more than a third of collaborations with foreign universities is carried out with the headquarter's R&D unit rather than with the local R&D affiliate, which the firm operates in the same region as the foreign university.

Therefore, Professor Belderbos stated that the purpose of his new paper was to understand the reasons why firms forgo the benefits of proximity, i.e., collaboration through the local R&D unit, and instead involve their headquarter's R&D unit in scientific collaborations with foreign universities. He did this through analysis of data on almost 10,000 firm-university co-publications over the period 1995-2003 by 148 European, US, and Japanese biopharmaceutical firms. Out of these firms, 77 firms exhibit international university collaboration in the presence of a local R&D affiliate.

An analysis of the broader literature on industry-science linkages and on international R&D organization throws some light on why distant collaborations occur and under which circumstances. The main reasons being scale and scope advantages of the central R&D laboratory and its advantages in appropriation, i.e., in securing commercial benefits of scientific research. Furthermore, the type of knowledge and collaboration also explains the choices between local and distant collaboration.

In general, the R&D laboratory at home is still the most important one, while firms are aiming to develop a network of R&D facilities around the world. In terms of the roles of foreign and central R&D units of multinational enterprise (MNE), recent literature suggests that foreign R&D units have a strategic role in global knowledge sourcing, that is, looking for new ideas, novel knowledge, and expertise that the firm cannot find at home. Therefore, the local R&D laboratories in different parts of the world look for novelty and complementary expertise. Foreign R&D affiliates do that by positioning themselves in local networks of universities and firms where there is a unique knowledge base or specific local expertise.

Central R&D units still tend to be the largest units of R&D in the MNE network. Firstly, their role can be seen as the orchestrators of global knowledge flows across the MNE network. The central R&D units look at the complementarity of different knowledge and cross-fertilization between different sets of knowledge. Hence, their tasks involve intra-firm knowledge sharing and creating synergies across multiple units. Secondly, because of their closeness to headquarters, central R&D units sup-

port functions related to intellectual property protection. There is stricter control over knowledge production and knowledge flows at the central R&D laboratory and, hence, they are more adept at appropriation strategies.

In order to find evidence for these ideas, Professor Belderbos looked at 10,000 individual linkages between firms and foreign universities using a probit model. Firms have the option to choose local R&D affiliate versus central R&D laboratory. The dataset included 148 firms which are the top investors in R&D and the top patentees in the biopharmaceutical industry, including about 30 Japanese pharma firms. Out of 148 firms, however, only 77 firms have collaboration between foreign universities and headquarters while a local R&D affiliate is also present. Hence, the co-publications and collaborations of only those 77 firms were finally analyzed for this specific research question.

Professor Belderbos presented the results that come out of the data analysis. Out of the 148 firms, it was found that 62% of all co-publications are with universities. Of those, more than half are with foreign universities, which suggest that the landscape of scientific collaboration is much internationalized in biopharmaceuticals. Also, 31% of those co-publications with foreign universities are conducted via headquarters. The majority is local foreign university collaboration, while 32% of co-publications with foreign universities are conducted at headquarters despite the presence of a local R&D affiliate.

Looking at the results of the probit model, the variables explain which choice was made by the firm. It shows that all the assumed variables have a systematic and significant relationship with the choice between headquarter and local collaboration in an expected manner. The result shows that novelty is negatively correlated with headquarter collaboration while basicness is positively correlated as are scale and scope advantages and collaboration in the core scientific field of the firm. Further, if the collaboration is in a core scientific field and there are rivals in the region, then the core field effect on headquarter collaboration is even stronger.

In conclusion, Professor Belderbos summarized his findings. He stated that although there is advantage of proximity, still many activities in a collaborative firm and university research is at a distance despite an R&D presence in the host region. Also, there is heterogeneity in collaboration, and the choice between local and distant collaboration is contingent on characteristics of the science field, region, and firm strength. Firms follow a strong rationale for centralization, related to scale and scope advantages, appropriation concerns, and the type of knowledge pursued, basic or applied.

However, regarding the proximity story, there are some nuances to when it holds and when it is most likely to hold. With novel technologies and novel scientific activities, proximity is very important. Also it's more important for applied research, which for many R&D affiliates is still the strongest focus, given the advantages of the central laboratory in basic research. Further, when there are strong scientific capabilities of the region, proximity becomes more important. The headquarter has also some kind of disadvantage in direct collaboration if there are obstacles to collaboration such as language distance, which makes it difficult to collaborate, as well as geographic distance, which makes it costly. In further work, the analysis will be extended to include other factors such as cultural distance. Professor Belderbos concluded by stating that while the noted proximity advantages are all very much similar to literature, what his research shows is that there are many factors that encourage distant collaboration given the special advantages of collaborations through the central R&D unit.