Scaffolding Innovation: Constructing Collaboration Across Knowledge Domains

Laura Pedraza-Fariña

Traditional accounts of the role of patents and grants in fostering innovation justify these forms of governmental intervention as necessary to correct market failures. Patents prevent free riding by copyists who did not invest in research and development. Grants to individual researchers incentivize long-term socially beneficial activities for which there is no significant market demand. These accounts, however, assume that the knowledge required to make socially valuable innovations will be available to firms or individuals, so long as the free-riding and market-demand problems are eliminated. But this assumption is incorrect. It ignores a crucial determinant of innovation outcomes: the architecture of knowledge distribution. Indeed, some of the most socially-relevant discoveries and innovations (such as the discovery of the structure of DNA, and cosmic microwave background radiation) were severely delayed because the relevant knowledge was siloed in different institutions, disciplines, or communities that did not, could not, or would not communicate with each other.

Through a series of case studies and quantitative analysis, this project analyzes when and how the architecture of knowledge distribution erects barriers to knowledge acquisition, and how policy instruments such as patents and grants could be redesigned to bridge structural barriers to innovation. Using data from these case studies and quantitative analysis, the broader aim of the project is to develop a model of "innovation scaffolding." I introduce the term "scaffolding" to denote temporary bridges across communities of innovation that help seed and diffuse collaboration. I hypothesize, first, that rather than serve only as incentives to invest in innovation, a subset of grants and patents serve a scaffolding function that fosters collaboration across communities. Second, that scaffolding patents represent particularly creative and high-impact innovations. If this is the case, adequately incentivizing the most socially-desirable innovations will require re-conceptualizing innovation incentives to include a scaffolding component.