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The commercialization of academic discovery: a look at startup formation

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Relying on the work of others, the authors identify two sets of factors that may determine whether a discovery birthed in a university lab would make the leap to commercial application. The first set, emphasized by what Marx and Hsu term the “resource munificence” view of commercialization, revolves around the resource endowments of a given geographical area, including things such as local availability of venture capital and technical know-how. The second set of factors, which the authors attribute to what they call the “discovery team composition” view of startup formation, centers on the internal makeup of academic research teams, in particular the entrepreneurial experience and networking abilities of their members.

While Marx and Hsu do not challenge the logical grounds of these theoretical perspectives, they do identify a major omission in the empirical studies that test their predictions. Specifically, they observe that neither perspective accounts for potential differences in the intrinsic suitability of various inventions for commercial application—suitability referred to as “unmeasured latent commercializability” in the study—even though it stands to reason that discoveries in certain areas of academic inquiry would be markedly more easily to commercialize than others.

To capture this underappreciated quality of academic innovation, the authors adopt a “twin-discovery” research design, whereby startup formation outcomes are compared for academic breakthroughs with the same commercial potential. Using matched data on scholarly codiscoveries reported in tens of thousands of published academic articles, as well as information on paper–patent pairs and government disbursements of small-business research grants (measures aiming to capture startup formation and commercialization), Marx and Hsu report the results of two empirical analyses: one that controls for latent commercializability and another that does not.

The two sets of results are notably different. In the cross-sectional analysis that sidesteps commercial potential, the evidence is largely in line with that reported in earlier studies, backing both the resource and compositional views of commercialization. By contrast, in the twin-discovery analysis that controls for latent commercializability, the authors find no support for the resource availability account and strong support for the team composition account. Moreover, their results show that the primary characteristics of team composition that drive startup formation are entrepreneurial experience and interdisciplinary diversity, and that these factors work independently of project selection in successful commercialization.

In their concluding remarks, Marx and Hsu caution that their study examines only one channel of scientific commercialization—namely, startup formation initiated by academic researchers—and that other channels, such as making licensing arrangements with existing companies for product manufacturing, may be affected by a different set of factors. In addition, the authors recognize that their research design does not rule out possible

selection effects in team composition (effects that may influence the likelihood that a discovery will find its way into a research publication), noting that future studies should look more closely at the antecedents of team formation.