

## **TIES: Selected Doctoral Theses**

**TITLE:**

**“Essays on Learning and Strategy in Research and Development”** – Joshua Krieger (2017)

**COMMITTEE:**

Pierre Azoulay (chair), Alessandro Bonatti, Fiona Murray, Scott Stern

**ABSTRACT:**

This dissertation investigates how research organizations learn from and adapt to new knowledge. In particular, I examine how news about scandals, stigmas and failures influences the direction of research and development efforts. These negative information shocks force research organizations to pause, interpret external signals, and apply any lessons to their own project portfolios. I investigate how these negative information events impact decisions in the settings of scientific publishing and drug development.

In the first essay, I study the impact of scientific retractions on citation patterns and funding in the retracted paper's intellectual field. I investigate how the retraction disclosure and affected field's characteristics influence the extent of these spillover effects. The second essay evaluates how retraction scandals damage individual scientists' reputations. This study shows that the magnitude of the retraction penalty depends on a scientist's prominence and whether or not the retraction event involved "misconduct." In the third essay, I analyze how late-stage drug development failures alter competitor's project continuation decisions. I separate technological learning effects from market competition effects, and grade decision-making across firms.

**TITLE:**

**“Evaluating Entrepreneurship Programs: Theory and Evidence”** – Daniel Fehder (2016)

**COMMITTEE:**

Fiona Murray (chair), Scott Stern, Ezra Zuckerman-Sivan, Yael Hochberg

**ABSTRACT:**

This dissertation consists of three essays studying the impact of a relatively recent type of entrepreneurship program (startup accelerators) on the performance of firms, regions, and the selection of early-stage projects in the economy. The first essay (joint work with Yael Hochberg) explores the impact of startup accelerators on the level of early-stage entrepreneurial activity in their region. Recent years have seen the rapid emergence of a new type of program aimed at seeding startup companies. These programs, often referred to as accelerators, differ from previously known seed-stage institutions such as incubators and angel groups. While proliferation of such accelerators is evident, evidence on efficacy and role of these programs is scant. Nonetheless, local governments and founders of such programs often cite the motivation for their establishment and funding as the desire to transform their local economies through the establishment of a startup technology cluster in their region. In this paper, we attempt to assess the impact that such programs can have on the entrepreneurial ecosystem of the regions in which they are established, by exploring the effects of accelerators on the availability and provision of seed and early stage venture capital funding in the local region.

The second essay explores the relationship between a startup's founding region, accelerator admission and startup performance. Entrepreneurs combine resources from numerous sources as they build their firms but are constrained by their social and geographic proximity to these resources. I use this insight as a starting point to explore whether accelerators act as a complement or substitute for initial location. Using data from MassChallenge, a leading startup accelerator in Boston, I use a regression discontinuity framework to evaluate both the overall impact of the program on its portfolio of startups and its heterogeneity based on: 1) the level of entrepreneurship resources in a startup's founding region and 2) their ability to access those resources. Startups birthed in neighborhoods with higher levels of entrepreneurial resources also derive a larger benefit from admission to MassChallenge. Within the accelerator, startups from richer ecosystems also receive referrals at higher rates, expanding their social capital relative to entrepreneurs from less rich regions. This finding suggests

that founding regions shape a startup's performance within the accelerator and that accelerators change the way in which startup founders are able to access and leverage resources in their home region.

The third essay explores the actual selection mechanisms inside an accelerator program. There is a growing awareness that variation in the institutional arrangements used in the selection of ideas and ventures can have an impact on the types of projects undertaken by innovators. This in turn shapes not only types of new innovations but also the types of innovators we expect that enter the economy. To date, research has focused on the composition of selection committees or differences across quite distinctive evaluation mechanisms (e.g. crowds versus expert committees). This study hopes to ask a related but unanswered question: Will a fixed set of judges evaluate a fixed set of businesses opportunities differently if they are assigned to different "evaluation regimes". Specifically, we examine the degree to which status characteristics such as gender and elite education are critical determinates of project evaluation across two distinct evaluation approaches – paper-based and committee-based.. We find a strong, positive effect for gender and other characteristics in a committee-based evaluation scheme where founder characteristics are more salient to judges. Our findings contribute to a deeper understanding of both the evaluation of early-stage firms and the role of bias in decision making in settings of considerable uncertainty.

**TITLE:**

**"Essays on the Impact of Digital Information on Innovation"** – Abhishek Nagaraj (2016)

**COMMITTEE:**

Scott Stern (chair), Pierre Azoulay, Catherine Tucker, Heidi Williams

**ABSTRACT:**

This dissertation consists of three essays studying the impact of new, digital information on innovation in different markets. The first essay sheds light on the impact of intellectual property in affecting the impact of new information on innovation, while the second and third essays identify the role of maps as a novel form of information and estimate their impact on innovation in different markets. The first essay describes how intellectual property (copyright law) might affect the diffusion of newly, digitized information. To evaluate this question, I focus on the digitization of a magazine as a part of the Google Books digitization project and estimate the impact of copyright on magazine issues on subsequent reuse of creative material on Wikipedia. I find that while digitization substantially increases the likelihood of reuse of digitized material on Wikipedia, copyright might substantially impede reuse. The impact of copyright is most pronounced for images as compared to text, for less-popular material with fewer substitutes and when the underlying material is available in digital form.

The second essay highlights maps as a new form of digital information and posits that the availability of publicly-provided maps is a crucial first step to fostering innovation and entrepreneurship. In order to examine this issue, I focus on the impact of the NASA Landsat satellite mapping program on shaping the level and distribution of new discoveries between firms in the gold exploration industry. By comparing regions that quasi-randomly did not receive mapping information due to technical failures in the satellites and cloud-cover in imagery with regions that received publicly-provided maps, I estimate that new maps almost doubled the likelihood of new discoveries in the global gold exploration market between 1950-1990 and also shifted the sources of new discoveries from larger senior firms to younger and smaller junior firms.

The third essay continues to explore the role of maps in shaping innovation by focusing on the role of mapping information in shaping innovative behavior in a crowdsourcing context. I analyze the impact of the US Census TIGER street-mapping program on shaping innovative activity on OpenStreetMap, a popular online street-mapping community similar to Wikipedia, and used widely on the internet in applications like Foursquare, Apple Maps and Uber. I focus on an error in the use of TIGER information on OpenStreetMap due to which about 60% of the US map benefited from highly-accurate TIGER maps from the US Census while the other 40% did not. In a difference-in-difference framework, I find that counties that received accurate TIGER information were negatively affected on OpenStreetMap as measured by the number of active users, the number of contributions and importantly the production of follow-on knowledge.