The Role of Target-Acquirer Cultural Fit in Technology Acquisitions

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The interest for cultural differences between target and acquirer and their implications for successful acquisitions is hardy new to both practitioners and academic research on post-merger integration. Yet, despite the conspicuous stream of literature originated on the topic, extant studies have not yet reached consensus with regards to the role cultural differences play in explaining performance differentials observed in M&A (see Stahl and Voigt 2008 for a review of the literature).

Three factors have likely hindered the identification of consistent results in previous studies. First, extant research has not converged yet towards a unified conceptualization of culture and cultural differences between target and acquirer and have therefore not agreed upon the mechanisms underlying its performance implications (Chatman and O’Reilly, 2016; Stahl and Voigt, 2008). Additionally, prior studies have often analyzed effects of various isolated culture properties on firm performance, while there might be interesting interaction effects at stake. Further, existing literature has generally confounded the two aspects of content and structure of an organization culture, while those might have different implications for different aspects of a firm’s strategy (Chatman et al., 2014; Chatman and O’Reilly, 2016). Second, organizational culture has been mostly measured using survey data, which are cross-sectional and narrow in scope, therefore not suited neither to study the dynamics of culture change, nor to uncover the theoretical mechanisms through which culture affect performance (Chatman and O’Reilly 2016). Third, research studying M&A performance has rarely addressed selection issues by investigating the properties of counterfactual samples, with resulting threats to inference.

In this paper, I propose to tackle the aforementioned issues to study how the construct of target-acquirer culture strength affects the outcomes of technology acquisitions. In so doing, I conceptualize organizational cultures as shared frames, and measure their properties empirically by drawing on machine learning methods for Natural Language Processing (NLP) applied to a longitudinal source of textual data written by employees describing internal organizational conditions, in the form of more than 700,000 employer reviews posted over time by employees on the website Glassdoor.com.

In theorizing about the role of culture to explain technology acquisition outcomes, I rely on extant literature which has defined organizational culture as cognitive constructs—in the form of values, norms, beliefs and frames—deeply and commonly held among a group of individuals (Giorgi, Lockwood, and Glynn 2015). More specifically, I adopt the definition of culture as frames, and conceptualize a “strong” culture in terms of intensely and commonly held frames (Marchetti and Puranam, 2019). Cultural frames identify organizational attributes that are important to individuals and shared among them (Fay, Garrod, and Roberts 2008), by representing “filters or brackets that delimit what we pay attention to” (Giorgi, Lockwood, and Glynn 2015: 6). We can therefore think of an individual’s frame as a distribution of importance over different contextual organizational attributes. Based on the definition of culture as frames, the culture of an organization can be described by the average proximity between the distributions of importance over contextual organizational attributes exhibited by its members (similarity), and by the property of the shared frame to sharply discriminate attributes into more and less important ones (focus). A strong culture is therefore defined as comprising individuals with similar and highly focused frames—i.e. they all perceive the same few out of many possible contextual organizational attributes as important.

I leverage the compound property of an organization’s culture strength to theorize about its implications for acquisition outcomes. Previous research has described organizations as coordination systems, which aim at achieving integration towards collaboration both within and across their boundaries (Daft, 2001; Galbraith, 1977; Gulati, Lawrence, and Puranam, 2005; Srikant and Puranam, 2014; Tushman and Nadler, 1978). Such organizational effort towards collaboration has been studied especially in the context of corporate acquisitions, in which the realization of anticipated synergies is largely contingent on the target and acquirer’s ability to achieve integration in the post-merger phase (e.g., Birkinshaw, Bresman, and Hakanson, 2000; Schweiger, 2002; Stahl and Voigt, 2008). Firms adopt formal authority and hierarchy to enforce coordination and cooperation, yet, as we know from the literature on relational contracts, those are neither perfect nor exclusive solutions to achieve collaboration (Gibbons and Henderson, 2011). Culture has been often described as a complement to hierarchy and formal structure to achieve collaboration (O’Reilly and Chatman, 1996; Ouchi, 1980; Schein, 1985). In particular, extant research has shown that, when organizations fail to accomplish coordination and cooperation through hierarchy, groups may succeed by leveraging a variety of social mechanism leading to high internal congruence over common values and norms (Barnard 1968, Chatman and O’Reilly 2014, Ostrom 2005, Ouchi 1980), especially in the case of non-routine challenges (Hackman and Wageman, 2005), as in the integration phase of technology acquisitions. High congruence over common values and norms within groups is, in turn, expected to provide organizational members with common ground, which enables collaboration by allowing agents sharing similar and intensely held representations of their organizations to anticipate and correctly interpret each other actions (Clark, 1996; Puranam, Singh, and Chaudhuri, 2009; Weick and Roberts, 1993).

The enforcement of hierarchy and formal contracts is fraught with challenges especially in the context of technology acquisitions, since the knowledge work they entail is hard to measure and verify (Birkinshaw et al., 2000; Holmström, 1989; Koçak and Puranam, 2018). It follows that, in the context of technology acquisitions, the cultural strength exhibited by the merging organization—defined as comprising both the target and acquirer at the time of the deal announcement—is likely to
positively affect the outcomes of such deals, as both internal and external stakeholders—i.e. managers and acquirers’ shareholders—use it to proxy for the ability of the merging entity to achieve collaboration and realize anticipated synergies in the post-merger phase. Therefore, I argue that the higher the pre-deal culture strength of the merging firm—a measure of the extent to which the merged firm will be able to induce collaboration between target and acquirer—at the time of deal announcement, the higher the likelihood of the technology acquisition to be announced and completed, as well as to generate superior value for the acquirers’ shareholders at the time of the deal announcement (H1a, b, and c).

If the proposed theory is correct, the positive effect of merging organization culture strength on the technology acquisition outcomes should be stronger under conditions which hinder the desired target-acquirer collaboration. I argue this is the case for foreign deals, as opposed to domestic deals (H2a)—since geographic co-location has been shown to favour collaboration (Testoni, 2018) and domestic deals have been shown to achieve better collaboration by reducing frictions caused by national culture differences (e.g., Barkema, Bell, and Pennings, 1996)—and for deals characterized by low levels of technological relatedness between target and acquirer, as opposed to deals exhibiting higher levels of technological relatedness (H2b)—since technological relatedness provides organizational members with common ground, which has been shown to substitute for structural integration to achieve collaboration in the context of technology acquisitions (Puranam et al., 2009).

I test my hypotheses on a sample of 349 M&A classified as technology acquisitions based on the acquirer and target SIC codes (Ahuja and Katila, 2001; Kapoor and Lim, 2007; Puranam, Singh, and Zollo, 2006; Ranft and Lord, 2002). To measure the strength of the merging organizations’ culture in terms of similarity and focus of the frames of its members at the time of the deal announcement, I leverage about 500,000 text reviews posted on the job-search website Glassdoor.com over time and before the acquisition is announced by employees from all the sampled acquires and targets. Using each employee review as an observation about the individual’s frame, I can build measures of average similarity and focus across employees, and jointly a measure of organizational culture strength. To extract the set of contextual organizational attributes over which to define individual frames and measure the properties of a merging organization’s culture, I follow recent developments in Natural Language Processing and use an unsupervised machine learning algorithm known as Latent Dirichlet Allocation (LDA) for topic extraction (e.g., Blei, Ng, and Jordan, 2003; Corritore, Goldberg, and Srivastava, 2019). For each focal technology acquisition in the sample, the corpus of text over which LDA operates comprises all the reviews posted on Glassdoor by employees at both the target and acquirer firms engaged in the focal deal prior to the deal announcement. To the extent that LDA extracts the universe of topics discussed by the members of the merging organization prior to the deal announcement and summarizes how important each of the identified topics is to each individual reviewer, it provides a suitable methodology to represent cultural frames consistent with the proposed conceptualization.

Empirical analyses yield support to the hypothesized relationships. Taken together, results suggest that acquirers select into deals—i.e. announce and subsequently complete deals—based on (among other factors) the cultural properties of the target and the extent to which those are compatible with the acquirer’s to create a strong culture, at the level of the merging organization, which enables collaboration. Further, acquirers’ shareholders exhibit consistent behaviours. These findings contribute to the literature on the management of corporate acquisitions, showing that culture strength, as measured at the merging organization level, might be an important antecedent of M&A success, by acting as enabler of collaboration, especially in cases in which formal contracts and hierarchy are hard to enforce, as in the chosen context of technology acquisitions. I further contribute to the literature studying organizational culture, by leveraging recent advances in computational methods for natural language processing to provide a large-scale, longitudinal and cross-organizational analysis of cultural properties and how they affect a special class of firm outcomes.
The Impact of Regulation on Firm Collocation Choices: Evidence from Commercial Fishing
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Abstract
Studies in economics and strategy have largely found benefits to agglomeration such as knowledge spillovers, location specific natural cost advantages, or production efficiencies that increase rents. However, it is unclear which firms choose to agglomerate or differentiate in response to a regulatory shock. The choice between agglomeration and differentiation is a dynamic choice for firms as they learn from not only their initial choices, but also from experiences of other firms, and then update their strategic response over time. The study uses a unique dataset of commercial fishing activity in ocean waters where the spatial and temporal nature of data provides us an opportunity to examine dynamic strategic responses for firms. The designation of marine protected areas (MPAs) in ocean waters serves as exogenous variation, whereby a range of prior market positions are made unavailable to commercial fishing vessels. The study uses difference-in-differences models to estimate the treatment effect of designation of an MPA on a firm’s choice to agglomerate or differentiate. I argue that firms from the same country and those with close ties are likely to pursue an agglomeration strategy, and the effect is expected to be stronger among foreign firms. Alternatively, some firms choose to violate new regulation as competitive pressures from collocation may make legal responses highly costly.
REVISITING THE LOCUS OF EXPERIENCE: 
A STUDY ON CORPORATE DEVELOPMENT EXECUTIVES, 
ORGANIZATIONAL LEARNING AND M&A PERFORMANCE

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ABSTRACT

Understanding how firms learn to make better M&A decisions and achieve superior M&A performance is a question of significant concern to managers and scholars. While learning from prior experience has been argued to be an important driver of M&A performance, existing works have often treated it as a collective property of the firm, with mixed findings on the relationship between M&A experience and performance. In this paper, I theoretically distinguish between the impacts of individual-level versus firm-level experience on M&A performance, and introduce an important but previously unexamined group of actors in the M&A process, the Corporate Development Executives (CDEs) in charge of inorganic strategies in firms. I argue that CDEs’ prior M&A experience has a nonlinear, inverted-U relationship with M&A performance because of learning benefits and misapplication costs. I also argue that the misapplication costs of CDEs’ prior M&A experience are moderated in contexts of high CEO M&A experience, and the learning benefits are moderated in contexts of low firm M&A experience. I test and find support for these arguments using a novel, hand-collected dataset on the heads of corporate development in S&P 500 information technology companies. In addition, I find that while firm M&A experience does not impact M&A performance directly, it is negatively associated with the variance of M&A performance. Together, these findings refine our existing notions of how, when and what experience impact M&A performance, and contribute to literatures on corporate strategy, organizational learning, dynamic capabilities and strategic human capital.

Keywords: M&A Experience; Corporate Development Executives; M&A Performance; Firm vs Individual-Level Learning; M&A Capability Development; Strategic Human Capital
More in Common, Further Apart? Common Institutional Ownership and Firms’ Innovation Decisions

The role firms’ institutional owners play in corporate innovation decisions has received significant attention from scholars across the economics, finance, and strategy fields. Past research has shown that institutional owners’ monitoring of portfolio firms can shape the incentives for managers to pursue particular types of innovation strategy. In recent years, there has been a large increase in institutional investors owning blocks of equity in multiple firms that compete in the same industry. Where institutions own blocks of equity in firms with little product market contact, the interests of institutional owners may be well-aligned with portfolio firms’ individual profit-maximising strategies. However, if institutional investors hold blocks of equity in competing firms, their portfolio returns may be maximized by managers making strategic decisions that differ from those that rational CEOs would otherwise make independently. Therefore, changes in institutional owners’ incentives to monitor and engage with portfolio firms due to the growth of common ownership may have significant effects on firms’ decision to pursue innovation in particular technological or product market spaces.

In this paper, I use detailed drug project data to analyze the relationship between common ownership and pharmaceutical companies’ decisions to invest in developing drug projects. I separate the firm-level effects of common ownership from the firm-market-level decisions to invest in developing drugs in specific therapeutic markets. I do not find any evidence that higher rates of common ownership are associated with firm-level changes in the overall level of innovation. However, by exploiting the within-firm variation in a focal firm’s ownership overlap with incumbents, I find significant changes in the direction of innovation within firms. I show that a focal firm’s level of common ownership with incumbents at the disease market-level is associated with a significantly lower probability that a given project is advanced by the firm in that market. Common ownership also appears to be associated with significant drug market-level changes in the balance of exploitation and exploration in firms’ research efforts. Where firms do innovate in disease markets in which they are exposed to greater common ownership, they are significantly more likely to do so with more novel projects. Conversely, firms appear to be far less likely to experiment with potential new applications of known drugs in disease markets where they have greater ownership overlaps with incumbents.

The results are consistent with common owners influencing portfolio firms’ innovation strategies to be more aligned with their portfolio interests. First, there is a reallocation of research efforts to projects in disease markets in which entry would appear to have a less negative effect on the returns of commonly owned firms. Second, where firms invest in innovation in markets in which they have greater common ownership, they do so with more novel projects. This type of project would be more likely either to occupy a different niche to incumbents or to provide a more radically improved product that would have the potential to command greater pricing power in the market and thus provide common owners with greater returns relative to the effect of lowered returns for incumbents.
Title: Firm innovation strategies and the private-to-public choices

My dissertation topic has been motivated by a unique phenomenon where the number of public firms in the US has nearly halved from the peak compared to two decades ago. Prior literature has studied this phenomenon from a macro-economic level, by examining economic and social/regulatory changes (Gao, Ritter, and Zhu, 2013; Doidge, Karolyi, and Stulz, 2017). Despite the importance and prevalence of the phenomenon, there has been very little research on the topic in strategy, relating to the strategic drivers. The three essays in this dissertation asks questions on why public firms decide to go private (i.e., delists), and why there are fewer private firms going public, from a strategy scholar’s perspective. Also, I expand on the topic by investigating the attributes of firm’s strategies that attract proactive investors, a persistent and growing manifestation of public market pressures in the US. Untangling this puzzle, I turn to the theoretical framework of a lemons problem in strategies, whereby the public markets’ lack of understanding might drive companies to avoid unique and complex, yet high quality strategies (Benner and Zenger, 2016).

The first essay in my dissertation examines privatizations. By examining firms’ privatization choices, I seek to understand how uncertainties in firms’ strategies lead to their choices of financial governance forms. The underlying logic is that privatization might alleviate information asymmetry by allowing investors to have access to private information that previously was only known by managers and not easily shared in public equity markets. To that end, the essay studies how firms’ innovative strategies relative to its industry peers would be subject to higher confusion among analysts, which in turn will lead to a higher likelihood of privatization. In the second essay, I examine why firms are increasingly acquired instead of going public, by focusing on the innovation activities of private firms that lead to different exit strategies, using patent data. The underlying mechanism is that firms that have more complex or novel innovations prior to IPO may be less understood by the public markets. As a result, those with better quality of innovation but with lower visibility than its peers in the industry may receive lower valuations or IPO pricing and may prefer to be acquired. Finally, the third essay looks at why certain firms attract activist investors’ (such as hedge funds) acquisition of blockholdings, and how public companies’ complex strategies play a role in this process, due to the lack of understanding by public market investors.
Learning to Experiment or Experimenting to Learn? Understanding how Early-Stage Entrepreneurs Frame and Conduct Experiments

An increasingly complex competitive landscape has recently called into question the usefulness of predictive strategies and pre-defined plans. At the same time, approaches that afford flexibility and faster responses to unexpected events have been championed by practitioner and scholars alike. In the last 15 years, firms have increasingly adopted experimental approaches better suited to complex and unstable environments, and management scholars have developed new theories that support experimentation. Empirical research has also recently shown through surveys and meta-analysis that experimentation offers performance benefits in dynamic and uncertain environments. However, it remains an open question as to what are the best practices that entrepreneurs can adopt to conduct experiments that enable them to both assess the viability of their ventures and further develop their business ideas.

I therefore examine these questions: can the application of a scientific approach (systematic and purposeful experimentation) to entrepreneurial decision making improve performance? If so, what are the mechanisms through which a scientific approach to experimentation aids performance? Answering this question through observational data and surveys presents several challenges. Firstly, it is extremely difficult to clearly identify causal relationships between experimentation and performance, as entrepreneurs self-select into decision-making strategies and there are several confounding effects. Secondly, decision-making processes are difficult to observe and measure, as most of them happen out of view and are normally measured retrospectively. Finally, several studies on entrepreneurship are subject to left-censoring problems, as researchers can only study start-ups that successfully commercialize products or services. To address these issues, I embed a field experiment in a pre-accelerator program geared towards early-stage entrepreneurial firms. This allows to: (1) create a treatment and a control group through random assignment and thus estimate the causal impact of different types of experimentation on performance, (2) observe entrepreneurial decision making while entrepreneurs decide what to do and over time, and (3) observe also entrepreneurs that abandon their original idea and never establish a new business.

I focus on early-stage entrepreneurial firms, which are defined as those run by founders in the process of starting a business. Experimentation is especially relevant in similar cases, since the vast majority of these firms fail to develop into fully-fledged start-ups, and face high uncertainty about their future performance. My basic prediction is that using the scientific approach reduces false positives and false negatives in the process of identifying viable business ideas. After a call for applications for a pre-acceleration program, I selected 250 entrepreneurial teams which are allocated through simple randomization to either a treatment group (126 teams) or a control group (124 teams). Treated and control teams have been trained during eight sessions from September 2017 to December 2017 (24 hours of training for each group). Both groups have been taught to use an experimental approach (rather than a planning approach) to business development through highly interactive training sessions. The difference between the treatment and control group is that the control group has not been taught how to develop business ideas using a scientific approach. Data on decision making and performance of all start-ups has been collected for 14 months through surveys and phone interviews. Results from the survey show that treated entrepreneurs become more aware of the wrong assumptions they had about their customers and their business compared to entrepreneurs in the control group. I am currently applying text analysis techniques to the telephone interviews to more precisely identify key differences in how entrepreneurs frame and conduct experiments. I expect to find that treated entrepreneurs are less prone to a confirmation bias, thus becoming more receptive to feedback from the market compared to entrepreneurs in the control group.

This study can contribute to literature on strategic decision-making by showing that the challenges of adopting an experimental approach can be mitigated by structured search strategies that reduce biases in integrating outside knowledge, as in the case of entrepreneurs trained to use a scientific approach to experimentation. This research also contributes to identify a set of practices that can help entrepreneurs navigate the difficult process of new venture creation, an aspect of great interest for practitioners and policy-makers alike.

**Keywords:** Early-stage Entrepreneurship, Decision-making, Strategy Formulation, Field Experiment.
Failing to Terminate: The Effect of Large Public Failures on Investment in Innovation

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Abstract

There is a growing literature on the positive role failure may play in organizational learning. Hypothetically, firms that can learn from past failures in innovation may be able to leverage that knowledge to eventually create newer, better projects generating a competitive advantage for the firm. In this paper, I hypothesize that failure may also be advantageous for recalibrating a firm’s decision making strategy for other products under development. This is important from a resource allocation perspective, because firms that can more objectively judge the products in their pipeline will be better able to “fail fast” and devote those resources to more useful pursuits. Using pipeline data from the pharmaceutical and biotechnology industry, I demonstrate that when firms experience a large failure in which they receive judgment from external critics, they are more conservative in investing in future products, and this leads to higher probabilities of future project success. In addition, I demonstrate that this result only holds when the feedback is from decision makers external to the firm. These results have novel implications for how the locus of feedback may effect organizational learning.
Go Big or Go Home: Considering the Lean Start-up Approach for Science-based Start-ups. Evidence from the I-Corps Program.

Abstract

The entrepreneurial management literature explores a number of strategic choices employed by entrepreneurial ventures to mitigate high levels of associated uncertainty. One prominent thread revolves around the notion of the lean startup, conceptualized by Eric Reis, the key element for which is the development of a minimum viable product (MVP) to generate rapid cycles of experimentation at low cost and commitment. For similar reasoning, Christensen (1997) extolls the importance of focus on small, underserved markets. Kerr, Nanda and Rhodes-Kropf (2013) highlight the importance of maintaining real option value through experimentation for highly uncertain entrepreneurial ventures.

Thus, by construction, the lean start up method and related literatures encourage firms to take the set of actions that provide the highest return to investment or effort. To borrow from the nomenclature of a separate, but related literature, the lean startup encourages firms to exploit existing technology rather than explore longer-term technological opportunities. Gans, Kearney, Scott and Stern (2019) formalizes this entrepreneurial choice to explore or exploit technology as a choice between different potential technology S-curves within an envelope of potential outcomes. A firm taking an exploitation path will iterate on existing technology, pursuing an S-curve with larger returns to effort upfront, but often one that plateaus at a lower performance level. A firm taking an exploration path will continue to pursue scientific advance, selecting a technology with an associated S-curve characterized by potentially small returns to effort initially, but higher performance upside in the future.

However, the understanding of the trade-offs between exploitation and exploration in firms is well understood (March 1991, Levinthal and March 1981, Levitt and March 1988), and the literature has recently made significant strides on the empirical side to identify the effect of incentives that induce exploration or exploitation (Azoulay et al., 2011; Ederer and Manso, 2013; Tian and Wang, 2014; Agrawal, Catalini, Goldfarb and Luo, 2016; Chammanur, Loutskina and Tian, 2014; Azoulay et al., 2018).

Important to the consideration of entrepreneurial strategy, work by Fang and Levinthal (2009) theoretically crystalizes the risks of exploitation strategies in multi-stage problem spaces. Given that entrepreneurship is a classic multi-stage problem space, we are presented with the paradox that the state of the art in practice, the Lean Startup, fundamentally is at odds with the academic literature. Partially, this stems from the reality that the study of exploitation or exploration as an entrepreneurial strategy is challenging because the choice is endogenous to many factors: investor pressure, market incentives, and regulatory regimes, to name a few. As a result, assessment of the entrepreneurial strategy implications of the choice to explore or exploit has been evasive.

This paper develops an economic framework for the choice to pursue exploitation or exploration in an entrepreneurial setting for innovation driven enterprises (IDEs) through an application of Aghion et al. (2008) with components from Manso (2011) and Ching, Gans and Stern (2017). The model outputs highlight that exploitation is the preferable path when (a) the probability of technological success increases, (b) the relative market risk is greater than the technical risk at a given stage, and (c) when the cost of experimentation in the market approaches the cost of technological experimentation. Fundamentally, an exploitation path prioritizes experimentation in the market over experimentation in technology, while an exploration path does just the opposite.
This modeling effort allows for the formation of a few hypotheses moving forward: (1) the entrepreneurial choice to exploit results in a slowing of the firm’s innovation production function, but does not affect commercialization outcomes. (2) Not only does the choice to exploit reduce innovative outputs, but the decision also has negative implications for long-term commercialization success. (3) The choice to exploit conceals potential for long-term welfare gains from technology development and deployment.

To explore these hypotheses empirically, this paper utilizes the implementation of the National Science Foundation (NSF) Innovation Corps (I-Corps) training program. I-Corps, founded and implemented at NSF by Steve Blank (Blank, 2007), exposes select NSF grant recipients to the lean startup method and encourages recipients to think about the commercial applications of their work. Applicants apply for a $50,000 grant and 7-week educational program in which they are tasked with engaging 100 customers and considering an MVP. In subsequent years, I-Corps has been replicated across the federal government, with programs at the National Institute of Health (NIH), Small Business Administration (SBA), Department of Energy (DOE), Department of Agriculture (DOA) and National Aeronautics and Space Administration (NASA). Additionally, NSF launched the I-Corps Sites Program and the I-Corps Nodes Programs across innovation ecosystems to increase participation in the I-Corps program.

This paper utilizes data gathered on all NSF grant recipients since 2008, including 10,476 researchers in the sample, of which 1,008 are I-Corps PIs, from hundreds of different targeted programs and 10 different NSF sub-agencies. I combine this data with publication data from Web of Science and Patent data from the U.S. Patent and Trademark Office, as well as company formation and firm funding data from SDC VentureXpert and Pitchbook. Methodologically, this paper combines select econometric strategies, including a difference-in-difference approach, coarsened exact matching and an instrumental variable (IV) to evaluate the entrepreneurial choice to exploit or explore among I-Corps and non-I-Corps NSF grant recipients.

Initial results show that, while I-Corps researchers are more innovative ex ante, measured through the production of publications and patents, their innovative productivity drops after participation in the I-Corps program. This suggests that in accordance with the Lean Startup training, I-Corps researchers on the margin move toward exploitative strategies. Simultaneously, while I-Corps PI’s are more likely to start companies, those companies are less likely to raise follow-on venture capital, and conditional on raising follow-on venture capital, I-Corps firms raise fewer dollars. These preliminary results suggest that the choice to exploit, in the early stages of firm creation, can have long-term implications for firm innovation and viability.

References


Agrawal, Catalini, Goldfarb and Luo, 2016


Nanda and Rhodes-Kropf (2013)


TOO BLIND TO SEE? EXAMINING ATTENTIONAL SELECTION IN THE CONTEXT OF ONLINE CUSTOMER FEEDBACK

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Abstract

As the number of industries not affected by online reviews continues to shrink, and the volume of reviews generated each day by users and consumers continues to grow, organizations find themselves in a position where it is hard to ignore the opinions customers express online as inconsequential. Human attention is, however, a finite resource. This implies that decision makers cannot consider and thoroughly evaluate all feedback directed toward their organization (Ocasio, 2011). In this paper, we try to understand what drives attentional selection in the context of online customer feedback. In particular, we examine the effect that features of feedback (content, sign, style) and its provider (experience) have on the propensity of the recipient to allocate attention to it, and use the information in online reviews for substantive changes in the organization.

We focus on the restaurant industry, where the phenomenon of online customer feedback is well established. We start by theorizing about the role that some specific features of feedback play in attracting or diverting the attention of decision makers, based on their expected consequences on the organization, as well as on the emotions they trigger in the decision maker. We complement extant theory with qualitative insights generated through a series of exploratory interviews with chefs, restaurant managers, and restaurant owners across France, Italy, and the United States. The result is a set of hypotheses, which we then test by means of a scenario-based experiment involving chefs and owners from around 200 restaurants in France. By running our scenario-based experiment with real industry players, we are able to combine the inference power of a randomized experiment with the external validity of a field study.

Our findings show that decision makers tend to allocate attention to feedback based on its expected consequences for the organization. We also find evidence of a significant “disturbance” effect of the emotions evoked by certain feedback features. In particular, when feedback pushes the decision maker to put the blame primarily on the provider of the feedback, with feelings of anger prevailing over feelings of guilt, we observed emotional processing taking over and decision makers discarding feedback regardless of its consequences for the organization.

We believe our study makes several contributions. By examining how and when organizations make concrete use of the information in online reviews, we complement prior work explaining how managers react symbolically to customer feedback with impression-management tactics (Conlon & Murray, 1996; Proserpio & Zervas, 2017; Wang & Chaudry, 2018; Wang, Wezel, & Forgues, 2016). By showing how analytical and emotional processing interact and sometimes compete to explain attention allocation, we emphasize the importance of incorporating affective mechanisms in the study of attention (Haas et al., 2015; Stevens et al., 2015; Piezunka & Dahlander, 2015; Sullivan, 2010). Finally, by uncovering the circumstances in which emotional processing takes over, pushing the decision maker to act in a manner that is not in the best interest of the organization, we shed light on how individual-level emotions can have an impact on organizational-level outcomes (Ashkanasy et al., 2017; Elfenbein, 2007; Huy, 2012).


Many scientists working today in low income countries pursued their training in more developed countries before returning home. While evidence illustrates that these high skilled returnees contribute directly towards innovation in their home countries (Gibson and McKenzie 2014), economic theory also suggests that they indirectly affect incumbent knowledge workers in their home countries through collaboration and team work, sharing of ideas, and providing a channel to access resources in more developed countries.

Despite these theorized positive effects, the extant literature on the impact of the arrival of scientists on incumbents in a location has yielded mixed results. Competing tensions between an increase in competition between scientists and benefits from knowledge spillovers have driven the hypotheses tested in the literature. While Borjas and Doran (2012) examine the arrival of Soviet mathematicians on research output of incumbent US mathematicians they find a decline in publication output for incumbents. On the other hand, Moser et al (2014) analyse the impact of the arrival of German Jewish emigres on US innovation and find an increase in productivity of US scientists at the level of the field due to a shift of innovators into the fields of the emigres. These studies have focused on countries with large scientific bases. Which effect dominates in emerging scientific communities, where there is potentially more competition for scarce resources but at the same time more of a need for co-located sources of knowledge, is an empirical question.

In this paper I examine how the return home of US trained researchers to African institutions impacts the publication outcomes of incumbent scientists. Studying the effect of the return home of 244 HIV researchers trained in the US under the Fogarty AITRP program between 1989-2014, I construct of panel dataset of 1,657 incumbent African scientists affected by these return events. Matching one to one with scientists not affected from other institutions in African countries I am able to control for career, field and temporal trends in research output. Difference in differences regressions compare within scientist changes in publication outcomes of active researchers in institutions following the return of a US trained researcher with changes in publication outcomes of observably similar researchers in other African institutions. The results reveal a lasting 6\% increase in the journal impact factor weighted publication output of scientists in response to the return home of a US trained scientist to their institution. These publications are mostly in HIV related fields. In exploring potential mechanisms driving the improvements in productivity I find that increased connectivity with US based scientists (network spillovers), and intellectual spillovers following the arrival of the returnee are more salient than team benefits from collaborating with the returnee.

This paper makes several contributions to the economics of immigration and innovation literature. First, it finds supporting evidence for the hypothesis that the return of high skilled workers to institutions in low income countries positively impacts incumbent scientists. Importantly, this suggests that the negative productivity impact felt by scientists returning home
(Kahn and MacGarvie 2014) is potentially offset by their positive spillovers onto incumbent scientists. Secondly, it provides new evidence that mobile high skilled workers carry not just ideas with them, but also their networks and connections. For low income countries with emerging scientific bases, this can be a very important channel by which high skilled returnees contribute to the economy. Finally, it contributes to a small group of papers that track mobility of high-skilled workers back to low income countries to see how they influence knowledge production in their home countries (Kahn and MacGarvie 2014; Kahn and MacGarvie 2016; Gibson and McKenzie 2014).
Recent advances in the fields of Artificial Intelligence (AI) and Machine Learning (ML) have facilitated the increasing adoption of automation within firms, and that in turn has attracted the attention of researchers, policymakers and practitioners. While previously automation was restricted to robots on the factory-floor that carried out well-defined, repetitive and simple tasks, it has now spread to complex, non-standardized and cognitively intensive tasks such as decision-making and problem-solving that previously could be carried out only by humans. The use of algorithms to imitate human decision-making is engendering deep and wide changes in work at the levels of individuals, organizations and society. However, there is little discussion about how automation will shape organizational outcomes such as knowledge production and innovation. This is an important consideration since organizations serve to combine existing non-codified knowledge spread out across its members, integrate it and use it to produce new knowledge and engage in problem-solving. This is even truer for creative, knowledge-based organizations which engage in collaborative, complex problem solving by drawing upon their existing knowledge sets and consequently produce new knowledge. Adopting technology that automates and changes even a part of this complex social process will present implications for various organizational processes and outcomes.

In this paper, I present a theory that explains why the automation of certain cognitive tasks such as the integration of knowledge might degrade the ability of organizational members to produce new knowledge that is impactful. I rely primarily on two mechanisms: 1) increased dependence on the automating tool, and 2) diminished opportunities for members to engage in joint evaluation and integration of new knowledge. I test the outlined theory using the empirical setting of GitHub projects. Some of these projects adopt automated testing and integration tools (also known as ‘bots’) which automate the review, testing and integration of new code contributions, a process that was previously carried out by project owners and maintainers. This review process is not dissimilar to the journal peer review process in academia. I look at the adoption and use of Travis-CI, a bot used by software projects to automate the review and integration of code contributions, and the impact of this automation on the scope of these contributions. I compare innovation outcomes for projects that adopt automation with those which do not and find that it leads adopting organizations to produce incremental innovation. To strengthen the causal explanation of the main results, I exploit a natural experiment on a separate sample of JavaScript GitHub projects, in which a “troll” bot randomly chose projects and sent requests to activate automation software on them. Furthermore, I find that this effect is lesser for organizations that are older at the time of adoption.

I aim to make both theoretical and empirical contributions to extant literature. Firstly, this study presents theory which explains the impact of cognitive task automation on organizational innovation-related outcomes. Secondly, this study also makes an empirical contribution to the nascent literature on automation within organizations. There are few existing studies on this topic mainly because secondary data for econometric analysis, especially at the organizational level, are either unavailable or difficult to access. Thus, this study also aims to provide some of the first empirical evidence of the effect of cognitive task automation on innovation within organizations.
Keith Pennington, University of Minnesota

CCC Abstract

My research is concerned with how the proximity of people can foster knowledge transfer and innovation. Proximity can alleviate the search frictions and social frictions that prevent a person from communicating with someone else. Alleviating these frictions can lead to collaborations or spillovers depending on the context: potentially innovative collaborations if the people involved are not employed by competing firms, but spillovers between the firms if they are. Mechanisms that lower these frictions, like social encounters, are more likely between those in closer physical proximity, and this is true both inside and outside of work contexts. To better understand the conditions where innovation and agglomeration effects are most prominent, I explore the mechanisms through which the proximity between knowledge workers may lead to organic communication and collaborations with strategically relevant outcomes.

Patterns of social behavior of people are normally highly endogenous and difficult to use in any quasi-experimental research design, but public health and epidemiology literature provides an exogenous influence that I exploit: the fear of disease can significantly influence social behavior, inducing self-imposed sequestration from in-person social interactions. I use flu data from multiple sources (the Center for Disease Control, attention to flu in regional news articles, and Google Flu data that aggregates flu search activity by region) to estimate the fear of flu as an exogenous influence on knowledge workers’ social behavior by time and location. The flu is especially well suited for study because of its relative prevalence to other diseases, attention in media, variance between regions and over time, as well as its well-known contagious nature of spreading through person-to-person proximity.

I find that a longer and more intense flu season in the geography of an inventor before a patent application corresponds to fewer new and local collaborators, which I interpret as a decrease in the ability of proximity to promote organic collaborations. This is consistent with my prediction that people sequester themselves from (local) social engagements but remain in search for collaborators, and the reduction of social encounters is likely responsible for the shift of collaborator choice.

I further explore the mechanisms through which proximity affects organic communications and collaborations in the rest of my dissertation, and discuss implications to firm strategic outcomes. In a separate study, I explore the relationship between the proximity of residences and innovative collaborations and find that proximity outside of work has an effect of workplace collaborations. I conclude from the nature of the setting, research design, and multiple robustness tests that this effect is likely driven by encounters outside of the workplace. In these ways I attempt to isolate relevant mechanisms through which proximity affects innovation and agglomeration.
Exposure to Entrepreneurial Advisors and Advisees’ Innovative Output

Maria Roche*

April 2019

Abstract

This paper examines the impact of exposure to an entrepreneurial advisor on the innovative output of their PhD students. Using a unique matched sample of advisors and advisees in computer sciences and engineering at a top US research university from 2000 - 2017, we assess variation in PhD students’ innovative and career outcomes before and after research faculty transitions into entrepreneurship. We do so by applying rich administrative data on over 2500 PhD students and over 500 professors, and by exploiting variation in PhD student cohorts’ exposure to entrepreneurial advisors. We address concerns associated with sorting using both student and professor fixed effects models and further examine factors determining an advisor-advisee match. To control for the potential endogeneity of entrepreneurial activity, we use a novel instrument that captures demand for commercial innovation. Our preliminary results suggest that exposure to an entrepreneurial advisor negatively influences the amount of top publications PhD students produce during as well as after completion of their graduate studies, and impacts the characteristics of their first job. Conversely, exposure to an entrepreneurial advisor does not seem to impact a student’s overall volume of publication output during the PhD program, nor their patenting output post-PhD. We provide evidence that these results are unlikely to be driven by selection, or reverse causality. Overall, this paper takes an important step towards understanding the consequences of academic entrepreneurship for both universities and future innovators.

Keywords: Academic Entrepreneurship, Innovation, Entrepreneurial Exposure

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Old drugs, new uses: Repurposing in the pharmaceutical industry

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April 20, 2019

Abstract

Standard economic theory recognizes a trade-off inherent in intellectual property protection between increased incentives for firms to innovate due to potential monopoly rights and the deadweight loss from those rights. In the pharmaceutical industry, patent protection is considered necessary to incentivize firms to undertake the high costs of new drug development, and government policies offer additional regulatory exclusivity for existing drugs that are repurposed for new uses. In fact, repurposing existing drugs for additional disease indications is now a common strategy in pharmaceutical development. While offering firms the opportunity to improve profits from a given drug, the effects of such regulatory incentives on innovative activity more broadly and consumers are uncertain. This paper asks the following research questions: How do extensions to government-granted monopolies influence pharmaceutical firms’ decisions to innovate? What are the implications for consumers?
THE BENEFITS OF REUSE:
WHEN DERIVATIVE WORK IMPROVES THE PERFORMANCE OF PARENT WORK

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Abstract

Advances in digital technology have considerably lowered the cost of replication and increased incentives for reuse of knowledge. Subsequently, one of the most important research questions has become how innovation should be governed in the digital era, in particular whether intellectual property rights should be strengthened or loosened. In this paper, I examine cumulative creativity and reuse through the release of derivative works on Thingiverse, an online 3D printing design community that is governed by creative commons licenses. Creative commons is an alternative innovation governance mechanism that allows individuals to freely use and build upon creations of others, as long as they give attribution to the original work. Using a matched sample of 122,774 observations for 1,338 designs and their weekly downloads during 2015-2016, I use a difference-in-differences estimator and find that the release of a derivative design increases demand for the original design, on average, by 13.2%. However, the release of derivative designs does not impact all designs equally. Artistic designs are more likely to benefit from reuse compared to functional designs. These results suggest that, under certain circumstances, derivative works can create benefits for the original works rather than hurting their success when intellectual property rights are less restrictive.
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There has been growing empirical evidence of large and persistent dispersion in performance across similar firms (Syverson 2004, Bloom and Van Reenen 2007). The strategy literature has long explored how this dispersion might be explained by the variation in strategy, where superior strategies drive superior performance. Various theories have proposed that superior strategies arise from earlier or better access to resources (Barney 1991), capabilities (Teece et al 1997), or market opportunities (Caves and Porter 1977).

One underlying driver of earlier or better access may be that information frictions prevent some firms from learning about better practices, capabilities, or positions (Lippman and Rumelt 1982, Yao 1988). A recent empirical literature has found that information barriers may be especially pervasive and important in explaining differences in even basic management practices that result in performance differences (Bloom et al 2013).

In recent years, there have been dramatic changes in storing, computing, and transmitting information. Online platforms collect granular data on consumers and competitors across many markets, increasing the availability of information for firms and lowering the costs to obtaining it – ultimately raising the possibility of reducing firms’ information gaps. How does this increased availability of information shape how firms make strategic choices?

In the main chapter of my dissertation, I explore the impact of increased availability of competitor information on the positioning choices of firms. I run a field experiment in collaboration with Yelp, an online reviews platform, across ~3,200 small and medium enterprises in four major markets in the United States (San Francisco Bay Area, New York City, Los Angeles, and Chicago). I focus on beauty salons that offer nail services, due to several reasons: (1) salons are densely located in every city and compete locally, (2) they are standardized in their service offering structure and have observable decisions that map to their strategic positions, (3) but services are not homogeneous, introducing more scope for strategic decision-making on various attributes. There are ~1.2 billion beauty salons in the US, with 61.4 billion in revenues in 2018. 16% of establishments offer only nail services and yield an estimated $9.8 billion in revenues, which is slightly larger than the men’s clothing stores industry ($8.6B) (IBIS World 2019).

Firms in both control and treatment groups are physically visited by a Yelp canvasser between June and November 2018, who informs businesses about Yelp and how they can manage their listing. I layer a treatment on top of this operation, where businesses randomly assigned to treatment receive an additional personalized report comparing their prices to those of nine geographically closest competitors.

In my analysis, I examine whether and how firms change their pricing decisions in response to receiving competitor information, by manually collecting prices of menu items across firms on a monthly basis. I analyze which firms change their prices and whether these changes ultimately improve their performance, using a combination of purchase intentions on the Yelp platform (calls to the business, pageviews, and map directions views), a manually-collected indicator of next-day availability for an appointment, and sales tax data from the city government of San Francisco. Beyond these main outcomes, I also explore changes in other elements of positioning such as quality and how the distribution of positions evolve across the market to better understand how competitor information impacts firm decisions and the market more broadly.

This paper contributes to the broader literature on strategic positioning, as well as research on the impact of information technology on firm performance (Benner and Waldfogel 2016, Brynjolfsson and McElheran 2016, Bloom, Sadun, and Van Reenen 2012), by exploring how increased information availability might shape firms’ strategic choices and ultimately impact their performance. This study provides three key advantages to understanding this impact on firm choices. First, by exploring firms in an industry with simplified strategy spaces across hundreds of local markets, I have a unique opportunity to empirically identify and compare granular decisions across firms and the distribution of strategies across markets. Second, I am able to randomly assign the treatment of competitor information, which enables me to tease out the selection versus causal effects of competitor information availability. Third, the Yelp setting enables me to examine an increasingly common context where firms obtain data through intermediary platforms, and provide insight on the broader market implications of platform design choices.
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References


Global Drug Diffusion and Innovation with a Patent Pool:
The Case of HIV Drug Cocktails

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April 2019

Abstract: Patent protection often leads to high drug prices that make life-saving medicines less affordable to patients, which further results in increasing patent infringement and invalidation to bring down prices, particularly in developing countries. The situation is severe for treatments that require multiple drugs owned by different firms with numerous patents, notably for HIV. I study the impact of the first joint licensing platform for drug bundling (the Medicines Patent Pool) on global drug diffusion and innovation. The pool allows generic firms worldwide to sublicense drug bundles cheaply and conveniently for sales in a set of developing countries. I construct a novel dataset from licensing contracts, public procurement, clinical trials, and drug approvals. Using difference-in-differences methods, I find robust evidence that the pool leads to a substantial increase in generic supply of the total drugs purchased. In addition, the branded-drug makers and other entities, such as public institutions, respond to the pool with higher R&D inputs as measured by clinical trials. The R&D input increase is accompanied by increases in generic drug product approvals. Finally, I estimate a simple structural model to quantify the welfare gains and simulate counterfactuals. The total benefit to patients and firms far exceeds the associated costs.

Keywords: Patent pool, drug bundling, innovation and diffusion, antitrust policy
JEL Code: O3, K2, I1
Financial Sustainability of Organizations in the Wake of a Legitimacy Shock: Evidence from the 2010 Indian Microfinance Scandal

ABSTRACT

Building upon recent strategy research theorizing about the comparative efficiency of for-profit and non-profit organizations, this study investigates whether and why for-profits and non-profits may suffer differential impact in the wake of a temporal variation in the institutional environment. Leveraging the 2010 Indian microfinance scandal as a natural quasi-experiment, the analyses reveal that a legitimacy shock, triggered by accusations of organizational misconduct, led to a decline in organizations’ financial sustainability. However, for-profit organizations suffered substantially more than their non-profit counterparts. Some of the adverse effects for both for-profits and non-profits were driven by an increase in non-repayment risk and a decrease in interest rate. These results also hold for the matched samples of for-profits and non-profits raising the possibility that the differential impact was not only due to the ex-ante greater opportunistic behavior of for-profits relative to non-profits but also due to the ex-post greater targeting of for-profits relative to observationally similar non-profits. Using natural-language processing techniques, I find further evidence suggesting that an increase in negativity in public opinion was associated with an adverse impact on the financial sustainability of for-profits but not on non-profits. While these results revealing an asymmetric liability of delegitimation between for-profits and non-profits have important managerial implications, further investigation of the regulatory intervention by a state government brings forth significant policy implications.

Keywords: For-profit vs non-profit organizations; legitimacy; financial sustainability; nonmarket strategy; natural quasi-experiment.
Great Minds Don't Think Alike: The Effects of Winning Awards on Stock Analysts' Herding Behaviors

Abstract. This paper examines the impact of reputation on herding, a common issue in managerial decision making. When managers are presented with noisy information, to avoid being uniquely wrong, they may choose to follow others’ actions even if it is not in the firm's best interest. However, individuals differ in their tendency to follow the herd. Understanding when and why individuals herd may help us reduce inefficient herding and improve firm performance. A formal model is built to predict how an increase in reputation may reduce herding behaviors. The model is informed by theories in psychology, economics, sociology, and management. The model provides a test that can distinguish between two mechanisms: informational herding whereby actors herd to be “correct,” and reputational herding whereby they herd due to reputational concerns. The reputational herding mechanism also predicts that herding occurs more often where experts’ information sources are homogenous, and hence the mitigating effect of reputation increase on herding will be more pronounced under such conditions. To evaluate the predictions of the model empirically, I combine a performance-based award for sell-side equity research analysts, Thomson Reuters Analyst Award, with the IBES dataset, and examine how a reputation increase through winning awards changes analysts' herding in recommendations and earnings forecasts. A difference-in-differences estimation compares award winners and control groups with equal ability to identify the causal impact of a change in reputation on the likelihood of herding. Results suggest that analysts' herding is reduced in stock recommendation after an increase in reputation. However, the winner's level of herding remains unchanged in earnings forecasts. This finding further suggests that the winning analysts did not receive better firm-specific information post-awards because of possible changes in status and network. Moreover, the found mitigating effect of reputation on herding is more pronounced where experts’ information sources are more homogenous. These findings support the reputational herding argument that analysts do not just herd to be “correct,” but also to avoid being uniquely wrong.
Language and Echo Chambers
CCC 2019 Abstract

Matthew Yeaton*

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Echo chambers are the amplification and reflection of beliefs within an organization beyond what Bayesian inference would suggest. Understanding how and why echo chambers arise within organizations can enhance our understanding of a variety of phenomena including organizational learning, organizational rigidity, and fake news. I propose that one key way of understanding the extent of echo chambers in organizations is by examining organizational structure and language. I develop a formal model of endogenous language convergence in organizations, and find support for the model using a natural experiment from the website reddit.com. Specifically, I examine what properties of the social network graph affect the possibility of convergence to a common language, and what properties this common language will have. The overall theory is fairly general with respect to social learning rules and nests two important models from the literature as special cases: DeGroot learning and Bayesian learning. However, common language may be a double-edged sword, especially in ad-hoc online organizations. While common language allows for rapid, shorthand communication of the organization’s most salient beliefs, “bad” beliefs (biased, racist, etc.) are encoded in language as easily as any other. Moreover, by encoding these beliefs in language, the language itself can become a source of organizational rigidity by acting as an organizational-level storage mechanism for initial members’ beliefs even after these members exit the organization. This is highlighted in the empirical setting. The website reddit.com banned an alt-right subforum, but did not ban any users, which resulted in a shock of the user interaction social network. In this case, the organizational shock affected their language in line with the predictions of the theory. Overall, the alt-right users language shifted toward the broader community’s, but we also observed a small increase in alt-right language from the rest of the community, emphasizing the double edged nature of the theory.

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Personal Data and the Value of Privacy

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Personal data have become increasingly relevant and valuable commodities, and contain highly sensitive information related to consumers’ behaviors, intentions, and attributes. An individual’s data is generated through a digital footprint, captured and linked across online platforms, and is often uniquely (sometimes personally) identifiable (Acquisti et al., 2016). Internet consumers regularly choose whether to generate and share personal data in return for “free” goods and services. The digital economy is financed and facilitated by consumer-generated data, and these data are often very valuable assets for firms. Businesses can participate in a market to buy and sell data; average consumers are excluded from this secondary market. Even in consumers’ initial choice to release information, they can lack awareness about how their data will be used by their recipients. Such an unawareness could explain what the research community refers to as the Privacy Paradox—that deep concerns individuals have over privacy are inconsistent with their actual information disclosure behavior (Norberg et al., 2007). If individuals care about what recipients gain by acquiring their data, then awareness of data usage could influence their revealed privacy choices.

In this experimental study, I define two stages in a data privacy choice. The first is the conventional privacy choice to allow a set of recipients to experience the data in the primary data market (which I refer to as the exposure dimension). The second is choosing to allow a set of recipients to exploit the data in a secondary data market (which I refer to as the exploitation dimension). I posit that privacy-seeking behavior is stronger when the individual is aware that her recipient can exploit her data for profits. Secondly, for reasonably innocuous data, I test for whether sharing data with many recipients is preferred to sharing with one recipient with exploitation abilities.

Using a Cornell University participant recruiting system, I run a controlled and incentive-compatible on-line experiment. Prior to revealing their privacy preferences, all participants create personal data by completing a series of survey questions related to their personality, and the survey calculates a set of personality scores and assigns personal identifiers. I then measure participants’ willingness-to-accept for sharing data and compare revealed preferences for privacy under different exposure and exploitation treatments. I find that when just choosing to share data with a set of participants, revealed preferences for privacy are consistently weaker. However, when treated with the information that a potential recipient of their data will use their data to gain profits, revealed preferences for privacy are strong.

The goal of this project is to shed light on the motivations behind consumers’ privacy-seeking (or lack of) behavior in the personal data market, under the premise that consumers generally lack awareness about how their data are used in the secondary markets. Doing so will help firms and policy-makers understand future data markets in which consumers are participating as more active and informed agents. Firms are challenged with innovation strategies related to the growing commoditization of data; policy-makers are tasked with regulating a new and changing digital information ecosystem, where existing intellectual property laws are inadequate. Understanding buying and selling choices in these markets informs firm innovation strategies surrounding the growing commoditization of information and advises policy-makers in regulating a new and challenging information ecosystem.
References


Title: How do firms choose which problems to solve?

Abstract: If problem solving is an important mechanism for value creation, as suggested by Felin and Zenger (2015), then the selection of which problems firms solve should be an important question in strategic management. Indeed, Felin and Zenger (2015) elaborate on the important connection between problem solving and strategy by pointing out there is “a need to place the microanalytics of problem finding and problem solving as vehicles of value creation ... within the wider strategic context in which firms actively orchestrate the process of what problems to address and solve” (pg. 223). Thus, the purpose of this paper is to better understand how firms select problems to solve and how that varies by firm type. On one hand, firms may choose to work on problems with many existing solutions. These problems are more likely to have established input markets (e.g. labor), and the solution landscape may be better understood, decreasing the degree of uncertainty the firm faces. On the other hand, problems with many existing solutions will be more competitive, raising the bar for the performance of the solution, while problems with few solutions reduce competitive pressures. I explore this tension in the context of the U.S. medical device industry from 2000-2017. I find that on average firms are more likely to work on problems with more existing solutions. However, startups are more likely to work on problems with few existing solutions. This is surprising given that startups are less diversified than incumbents, and therefore less fit for managing uncertain processes.

References

How start-ups design their organizational structure is an important question that every entrepreneur must answer but that has received little attention in the literature. As a step towards addressing this gap, I first conduct an exploratory analysis of 6,234 nascent start-ups established between 1971 and 2015 in the video game industry. In contrast to the conventional wisdom that start-ups are “flat” with one or two hierarchical levels, I find that a substantive share of these start-ups are actually “tall.” In fact, contrary to the widespread notion of “flattening,” taller start-ups have become more prevalent over the past five decades, despite the increasingly hostile environment and the successive advancements in information technology. To explain this variation and trend, I then use this unique dataset of game development start-ups to assess the question of how the hierarchy of start-ups influences performance in terms of creative and commercial success. The results show that hierarchy imposes a non-trivial trade-off between creative and commercial success—that is, a taller hierarchy increases commercial success at the expense of creative success. The results also shed light on how the organizational structure of start-ups may emerge to compensate for their employees’ cognitive and social structures. Overall, my work unveils surprising patterns that challenge the myth of the flat start-up, and contributes to a better understanding of how start-ups organize to capture entrepreneurial opportunities.

**Keywords:** organizational structure; hierarchy; start-up; entrepreneurship
In this paper, I ask how entrepreneurs’ prior experiences within the same industry are associated with a set of core choices entrepreneurs must make after the firm founding, including value creation and value capture. Choosing a path to value creation and value capture may require partial commitment and hence create path dependence for subsequent decisions the entrepreneur faces. Through a sequence of choices, entrepreneurial firms may choose their position in a market, including technology, customer, competitors, and identity (Gans, Stern, and Wu, 2019). The paper illustrates whether and how entrepreneurs from different knowledge contexts select different value creation and value capture strategies through a single industry study of the prosthetic limb market.

Prior knowledge of academic, user, and employee entrepreneurs within a technological system is important to understanding entrepreneurial strategy. To illustrate, not only is a prosthetic leg for amputees built from a variety of sub or component technologies, such as mechanic and electric joints, locks, microprocessors, sensors, actuators, and sockets, but part of the technology includes a firm’s nontechnical capabilities such as fitting the prosthetic limb through clinics that create a useful mobility solution for the consumer. As seen through the example of the prosthetic device, the technology can be viewed as a multi-layered system of various sub-technologies that collectively achieve a solution for a human need; the notion of the prosthetic technology can be extended to nontechnical capabilities including marketing and distribution (Arthur, 2009). Importantly, new ventures are created with different parts of new and existing sub-technologies of the system. Most entrepreneurs begin by tackling primary problems within the existing systems that are pressing and worthy of pursuit. They create differentiated solutions for the users based on their initial knowledge and capabilities. An amputee (user) entrepreneur may have insight about his/her experiences; for example, it is not fun for an amputee to walk in the sand based on his/her direct and repetitive experience of using a prosthetic limb. The user might desire waterproof legs. An entrepreneur in a university may utilize his/her insight about how to build a prosthesis with a sensory feedback function that mimics the peripheral nervous system in natural human legs. Academic, user, and employee entrepreneurs create a firm based on partial knowledge about different parts in the system (Agarwal and Shah, 2014); the heterogeneity in prior knowledge would lead to vast, effective choices of technological positioning (new vs. standard) and value chain positioning (final products vs. component providers). I argue that academic entrepreneurs are more likely to build products based on nascent technologies, but they are likely to remain as a component provider not only because of their lack of knowledge about how the users interface with the product but also because they chose more challenging technological problems. On the other hand, user entrepreneurs are more likely to choose to assemble standard sub-technologies for unique features and would create a final product for the end users. Employee entrepreneurs may have an advantage of integrating the components into a final product.

The paper assembles a unique longitudinal data set on entrepreneurs’ career experiences prior to firm founding, market entry, and the types of products being offered, focusing on a comprehensive set of active and inactive firms created between 1994-2016 within the prosthetic market. My data measures diverse sources of entrepreneurial knowledge including academic, employee, and user (amputees or prosthetists) startups and subsequent firm-level outcomes such as technological choice (bionic vs. mechanic) and product integration. My preliminary findings show that academic startups in the prosthetic limb market are most likely to choose more nascent, bionic prosthetic technology whereas user startups are likely to choose standard mechanic technology. I also found that employee startups are more likely to offer final products to the end users.

Reference
SOLO VS. CO: CAN SOLO-FOUNDED VENTURES PERFORM AS WELL AS CO-FOUNDED VENTURES?

Most new ventures are born facing severe resource constraints, producing what Stinchcombe (1965) classically titled the “liability of newness.” In particular, new ventures have a high-risk of failure or limited growth as they often begin with insufficient human, social, and financial capital relative to other more established organizations. As such, the process of resource mobilization plays a fundamental role in the entrepreneurial process, with many studies focused on explaining how a new venture’s initial stock of resources has major implications for its chances of survival and long-term evolution (Clough et al., 2018; Ensley et al., 2002; Freeman et al., 1983; Mens et al., 2011).

Yet, while much has been written about how new ventures overcome initial resource constraints, this literature surprisingly does not distinguish between new ventures founded by a single founder or new ventures founded by co-founders. Rather, the number of founders is overlooked as the literature largely refers to founders as a collective, assuming away differences between single or co-founded firms. Such an omission is problematic as it obscures understanding of which resource constraints may be particularly problematic for particular founder types and which strategies might be most effective in addressing them.

The literature that does exist suggests that solo-founded ventures should experience greater resource constraints and so exhibit lower performance. The logic is that founding a venture is too much for one person, and thus co-founders are important because they bring in necessary resources (human, social, and financial capital) that help the venture succeed. For example, co-founders help write code, craft strategy, chase leads, pitch investors, and support operations. Moreover, co-founders can share emotional drain, encourage and support, and complement deficiencies in a founding team in a way that may help ventures overcome liabilities of newness faster and better. Given these benefits, most new ventures have co-founders vs solo founders and most VCs are reluctant to fund a company with only one founder (Wasserman, 2012). The demand for co-founders has even given rise to online “matchmaking” services that pair co-founders by skill, personality and entrepreneurial pursuits. In addition, research shows that larger founding teams generally have better entrepreneurial performance (Eisenhardt & Schoonhoven, 1990; Roberts, 1991; Beckman, Burton, O'Reilly, 2007). Indeed, many argue that the selection of co-founders is the most important decision in starting a new venture and that more “unicorns” – i.e., extremely high performing new ventures such as Google, Apple, Microsoft, Intel, YouTube, Skype, Yahoo, Yelp, Twitter, Facebook - have all been started by co-founders, not solo founders.

However, the literature is largely silent on whether and when solo-founded ventures would perform as well as or even better than co-founded ventures. For example, some work suggests that co-founder challenges are a central cause for new venture failure. Indeed, some practitioner work suggests that up to 65% of startup failures may be tied to conflicts among the co-founders (Wasserman, 2012). In particular, co-founders often face role dilemmas (e.g., overlapping roles vs division of labor) as well as reward dilemmas (division of equity and control) that could exacerbate rather than mitigate liabilities of newness (Stinchcombe, 1965; Hellman and Wasserman, 2016). Given these conflicts among co-founders, it may be that solo founders could equal or outperform co-founders. As support, organizations such as Mint, Amazon, Tumblr, ServiceNow, FireEye and RetailMeNot are all solo founded ventures worth more on average than companies with co-founders.

Overall, unpacking the resource mobilization process for different types of founders is both important and underexplored. I address this gap. Specifically, I explore the question of “Under what conditions do solo-founded ventures perform as well as or better than co-founded ventures?” Using qualitative evidence from 70 new ventures, I examine the resource mobilization strategies of solo-founded ventures that could help them overcome their unique challenges and perform as well as multiple founders. Collectively, my findings contribute to the literature by revealing that solo-founded ventures mobilize resources in unique and unexpected ways. More broadly, these findings have important implications for entrepreneurship, strategy and organization theory.
Beyond scientific excellence: Are internationally mobile researchers more likely to become academic entrepreneurs?

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Across advanced economies, the number of highly educated immigrants has increased rapidly over the past decade. This has important positive implications for productivity and innovation. As part of this larger phenomenon, immigrant entrepreneurship is increasingly at the center of public policy discussion (Kerr et al., 2017). Most studies investigating the contribution of highly skilled immigrants to high-tech entrepreneurship find an over-representation of immigrants as founders of high-tech start-ups (Anderson & Platzer, 2006; Hunt & Gauthier-Loiselle, 2010; Hart & Acs, 2011; Saxenian, 2000; Wadhwa et al., 2007).

While these contributions suggest an important role for immigrants in U.S. high-tech entrepreneurship, there are still important issues to be investigated in order to draw more general conclusions about the existence of an immigrant premium in knowledge-intensive entrepreneurship. Locating our study in a non-Anglo Saxon country, Denmark, we therefore ask whether there is a premium or discount for immigrants in terms of entrepreneurial entry. By answering this question in the context of academia and comparing immigrants to natives with international experience, returnees, we reduce the potential for confounding effects of education as well as international mobility experience per se as compared to previous studies.

We show that when comparing foreign-born academics to returnee academics (Danish-born researchers who have spent a considerable period abroad before returning to Denmark), the "foreignness" discount is between 6% and 8%. Considering that the overall rate of entrepreneurship in our sample is 12%, this is indeed a sizable discount. In so doing, the paper contributes to the literature in three important ways. First, we provide one of the first population-wide studies on the participation of foreigners in high-value entrepreneurial activities, controlling at the same time for education as a confounding factor. Second, we make use of a population that is widely studied in development economics, namely returnees, in order to obtain a cleaner estimation of the effect of being a foreigner on the likelihood of starting company, beyond the selection effect of individuals who choose to be internationally mobile. Third, we contribute to the literature on academic entrepreneurship by investigating the role of international experience in spurring venture creation by university researchers.

For our empirical analysis, we draw on a unique dataset that combines a representative survey of academics in Denmark, their lifetime publication records, and information from various Danish registries. Our main data source is a survey that was addressed to the entire Danish academic population active in 2017, with an overall response rate was 38%. We linked the bibliographic information of the lifetime production to each individual in the survey, respondents as well as non-respondents. The bibliographic data was obtained from SCOPUS
and contains the lifetime production (1970-2018) of all researchers who have at least once published with a Danish affiliation. Further, we complemented this main dataset with information from a repository of Danish Ph.D. dissertations and the Danish business registry. Compared to a registry-based analysis, this measure has the advantage that it also allows us to observe entrepreneurial activities outside of Denmark and allows us to control for otherwise unobserved traits, such as personality characteristics as well as risk tolerance and attitudes towards research commercialization.

**Key Words:** Highly-skilled migration; academic entrepreneurship; scientist mobility; immigrant entrepreneurship

**References**


The ability of IT to substitute for labor in repetitive, relatively low-skilled tasks has been studied at length. Whether IT can substitute for skilled labor is of greater uncertainty. This paper seeks to shed light on that by looking at the use of IT in a time-critical, skill-intensive, uncertain task, the provision of medical care by doctors. Using data from a large hospital network in New York State, I estimate the outcomes effects of a sweeping telemedical intervention across intensive care units (ICUs) within the network, in which in-person critical care physicians are almost entirely replaced by a system comprised of advanced telepresence, remote monitoring, and software algorithms, leaving only a few remote doctors to care for hundreds of ICU patients at a time. I control for ex-ante health utilizing detailed, patient-encounter level medical records in combination with information on the precise method of triage within the ICU and estimate an average reduction in mortality of roughly 13-18% across a variety of specifications. I observe differential effects across the distribution of patient severity, with the healthiest patients observing a small increase in mortality, while patients presenting in more critical condition enjoy the greatest improvements. Telemedical care is more effective as a complement to traditional care than as a substitute—mortality improvements are two-times larger for patients treated at facilities that guarantee the presence of some on-site critical care physicians. Preliminary analyses of mechanisms indicate that the majority of the improvement comes from reduced monitoring burden, freeing up staff time to more actively pursue patient care. This relief of the monitoring constraint appears to be differentially distributed across patients as well, with the sickest patients receiving the majority of the increased treatment effort.
How Does Competitive Entry Affect Incumbent Firms? Evidence from an Online Platform

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Entry of new firms is often associated with increased competition and reduced performance of incumbent firms (competition or market share effect). However, in many settings, entrants also attract new consumers to the market and generate positive spillovers for incumbent firms. This force is especially prominent in two-sided markets, where entry makes the platform more appealing to consumers and raises total demand, effectively benefitting all firms in the market (market size effect). Given these countervailing forces, the ultimate impact of entry on incumbents’ performance is theoretically ambiguous and depends on the relative magnitude of these forces. The goal of this project is to empirically study how entry of new competitors affects incumbent firms in a two-sided market and the corresponding firm responses.

To study this question, I collaborate with Yelp Transactions Platform, an online platform connecting consumers and local services. The focus of the analysis is a platform-level institutional shock, YTP partnership with the delivery service Grubhub, which substantially and abruptly increased the number of suppliers on the platform, without directly affecting the number of users. The research design exploits quasi-experimental variation in the intensity of the shock across geographic regions to estimate the effect of entry on the performance of incumbent firms in platform markets, examine which types of firms benefit or lose from entry, and how entry shapes the nature of competition and changes firms’ responses. I complement the empirical results with a simulated model of entry and firm performance, which allows me to extend the results to other market settings.

I find strong evidence of increased participation and market size growth in areas where more new business entered the platform. In cities with high levels of entry the number of unique weekly customers grows by 36% more than cities with no entry. More surprisingly, on average, entry of competitors increases incumbent firms’ weekly revenue by approximately 4.5%. This average effect, however, masks substantial heterogeneities: The positive effect is driven solely by high-quality firms, which increase weekly revenue by over 10%. In contrast, low-quality firms perform unambiguously worse (revenue decline of 7%). Thus, entry changes the nature of competition in the market and increases the returns to quality. Accordingly, I find suggestive evidence that firms respond to this change in incentives and increase their subsequent investments in quality, as is evident in their reviews and ratings. Simulation analysis finds that the highest quality firms continue to benefit from market expansion up to the point where 40% of the firms are participating on the platform. Beyond that point, the market share effect dominates, and firm performance, even for high quality firms, suffers from additional entry.
Effect of Entry on the Total Number of Unique User on the Platform

(a) Weekly Number of Unique Users

Effect of Entry on Incumbent Firms’ Sales by Firm Quality

(a) High-rated Firms
(b) Low-rated Firms
Abstract: Contributing to the literature on the causes and impacts of rising market power on entrepreneurship and agglomeration, my dissertation examines the within and cross-industry externalities of large incumbent firms on entrepreneurship in the supply chain. This paper asks whether large firms support startup formation in other industries and influence location decisions of entrepreneurs. I employ restricted-use administrative Census employee-employer matched data, the register of all U.S. business establishments, and hand-collected data on large firm location decisions. Using a difference-in-differences approach comparing counties where the large firm opened a new facility with runners-up counties considered by the firm, I find that these anchor firms facilitate the formation, survival, and growth of startups in buyer-supplier networks geographically proximate to the anchor firm. The microdata further allows me to construct measures on input-output flows, coagglomeration patterns between industries, and industry labor similarity based on worker transitions across industries. Interestingly, I find that de novo entry tends to take place further downstream in the large firm’s value chain. Furthermore, successful startup founders are neither migrants nor have prior startup experience but have worked in the industry.
Modernizing Medicine: The Effects of Product, Process, and Market Innovation Adoption on Organizational Performance in the US Hospital Industry

Abstract

Does the adoption of external innovations lead to competitive advantage? While previous studies have established that the creation of new innovations drives broader economic growth and firm performance, less research exists on how the adoption of existing innovations affects competitive advantage and the performance of adopting firms. Certain internal and external factors may drive the ability of organizations to capitalize on external innovations and build competitive advantage. I examine how the adoption of new product, process, and market innovations affects inter- and intra-firm performance differences and survival using healthcare technologies in the US hospital industry. We create a unique dataset combining Hospital financial, operational, and technological information in order to explore these questions. This data combines data from the American Hospital Association, HIMSS Technology Survey, Irving-Levin Associates, and RAND Corporation Hospital Financial Data. Using this data, I explore how and under what circumstances the adoption of robotic surgery (a product innovation), EMR systems (a process innovation), and telemedicine (a market innovation) affect healthcare organizations’ performance. These analyses highlight the important role and potential effects external innovations can have on competitive advantage and firm performance. Initial findings suggest that product, process, and market innovations affect organizational performance in different ways. While each of our focal technologies is associated with an increase in ROA (between .6% and .8%), product innovations are associated with increased revenues (approx. $7.4 million), process innovations are associated with lower operating expenses (approx. $2.3 million lower), and market innovations are associated with both higher revenues and expenses. We further explore the characteristics that moderate this relationship by examining organizational size, status, and competition. This research has important implications for strategy, public policy, and public health where the adoption of external innovations can shape the performance of organizations and have a large impact on measures such as healthcare costs and patient outcomes.
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